Nortel Ethernet Routing Switch 5000 Series

Configuration — System

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NN47200-500

Nortel Ethernet Routing Switch 5000 Series
Release: 6.2
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Contents

New in this release

The following sections detail what's new in Nortel Ethernet Routing Switch 5000 Series software release 6.2.

Features

See the following sections for feature changes:

Software Licensing enhancements

Software Licensing is a mechanism that allows you to use designated features, according to the license level that you purchase. In Release 6.2 the licensing process is simplified so that if you purchase a license, it remains valid when you upgrade to a version of software that includes additional features included in the license level—that is, you do not have to regenerate the license file, remove the old license from your switches and reload a new license file. Licensing is further simplified for a stack

scenario. Automatic Unit Replacement has been updated to enable automatic update of a license for any replacement stack unit, including the Base Unit. For more information, see:

- “Auto Unit Replacement (AUR)” (page 29)
- “Auto Unit Replacement using the NNCLI” (page 122)
- “Configuring AUR” (page 245)

Running configuration NNCLI display command enhancements

The show running-config NNCLI command enhancements change the operation of the **`show running-configuration`** command. By default, show running-configuration displays only parameters that differ from the default configuration. You can use the verbose qualifier to display the entire ASCII configuration for the switch or stack. You can also use the module qualifier in the command to display the ASCII configuration for a specific feature. For more information, see “Displaying the current configuration” (page 135)

The operation of the **`copy running-config tftp`** NNCLI command is modified. By default, **`copy running-config tftp`** copies the complete contents of the running configuration file to a specified file on the TFTP server. With Release 6.2, you can use the module qualifier in the command to display the ASCII configuration for a specific feature, or you can use the verbose qualifier to copy the entire ASCII configuration for the switch or stack. For more information, see“Storing the current configuration” (page 137)

Nortel Energy Saver

Nortel Energy Saver (NES) can reduce network infrastructure power consumption without impact to network connectivity. NES reduces direct power consumption by up to 40% because it uses intelligent switching capacity reduction in off-peak mode. NES can also use Power over Ethernet (PoE) port power priority levels to shut down PoE ports and provide more power savings. For more information, see .

- “Nortel Energy Saver” (page 33)
- “Nortel Energy Saver configuration using the NNCLI” (page 125)
- “Nortel Energy Saver configuration using Enterprise Device Manager” (page 268)

Route scaling

Up to 4000 routes, a doubling of routes available in the previous release, are available for the Ethernet Routing Switch 5600 Series products.

Secure Shell File Transfer Protocol (SFTP over SSH)

For enhanced network security, Secure FTP for secure file transfer over an SSH session is available in this release. For more information, see .

- “Secure Shell File Transfer Protocol (SFTP over SSH) ” (page 26)
- “Secure Transfer File Protocol configuration” (page 151)

SFP support

Release 6.2 supports the following additional SFPs:

- AA1419050-E6
- AA1419051-E6
- AA1419051-E6
- AA1419053-E6
- AA1419054-E6
- AA1419055-E6
- AA1419056-E6
- AA1419057-E6
- AA1419058-E6
- AA1419059-E6
- AA1419059-E6
- AA1419060-E6
- AA1419061-E6
- AA1419062-E6
- AA1419063-E6
- AA1419064-E6
- AA1419065-E6
- AA1419066-E6
- AA1419067-E6
- AA1419068-E6
- AA1419071-E6
- AA1403007-E6
- AA1419074-E6
- AA1419075-E6

- AA1419076-E6
- AA1419077-E6

For more information, see *Nortel Ethernet Routing Switch 5000 Series — Installation SFPs and XFPs* (NN47200-302)

802.1AB (LLDP) MED Network Policy

You can configure 802.1AB MED network policies to dynamically configure voice VLAN, DSCP, priority, and VLAN tagging on the switch for voice traffic received from an IP phone. When you enable LLDP and configure the MED network policies on the switch, the switch sends the network policies to the IP Phone. The IP phone processes the data in the LLDP PDU and transmits the voice traffic with the appropriate VLAN ID, VLAN tagging, DSCP and priority information.

When Automatic QoS is enabled, MED network policy is changed from the user defined DSCP value to DSCP 47 (0x2F) .

You can configure MED network policies on a switch port that has ADAC enabled. The network policies have priority over the ADAC configuration on the port. For more information, see:

- “802.1AB MED network policies” (page 75)
- “Configuring LLDP MED policies for switch ports” (page 194)
- “Setting lldp med-network-policies to the default values” (page 195)
- “Disabling LLDP MED policies for switch ports” (page 196)
- “Viewing lldp med-network-policies” (page 197)
- “LLDP MED policy management using Enterprises Device Manager” (page 353)

Other changes

See the following sections for information about changes that are not feature-related:

Enterprise Device Manager

Enterprise Device Manager (EDM) replaces both the Java-based Device Manager and Web-based management user interfaces. EDM is an embedded element management and configuration application for Ethernet Routing Switch 5000 Series switches. EDM provides a Web-based graphical user interface through a standard web browser for the convenience of full configuration and management on the switch, and retains the look and feel of Device Manager. For more information, see “System configuration with Enterprise Device Manager” (page 231).

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 more information about EDM, see *Ethernet Routing Switch 5000 Series Fundamentals* (NN47200-104).

Introduction

This document provides the information and procedures required to configure the software for the Ethernet Routing Switch 5000 Series.

Unless otherwise indicated, this information applies to:

- Nortel Ethernet Routing Switch 5510-24T
- Nortel Ethernet Routing Switch 5510-48T
- Nortel Ethernet Routing Switch 5520-24T-PWR
- Nortel Ethernet Routing Switch 5520-48T-PWR
- Nortel Ethernet Routing Switch 5530-24TFD
- Nortel Ethernet Routing Switch 5698-TFD
- Nortel Ethernet Routing Switch 5698-TFD-PWR
- Nortel Ethernet Routing Switch 5650-TD
- Nortel Ethernet Routing Switch 5650-TD-PWR
- Nortel Ethernet Routing Switch 5632-FD

The term "Ethernet Routing Switch 5000 Series" is used in this document to describe the features common to the switches mentioned above.

A switch is referred to by its specific name while describing a feature exclusive to the switch.

The Ethernet Routing Switch 5000 Series switches operate in the Stand-alone Mode and Stacking Mode in this product release. A switch can be in Stand-alone Mode or in Stacking Mode, not both.

NNCLI command modes

NNCLI provides the following command modes:

- User EXEC
- Privileged EXEC

- Global Configuration
- Interface Configuration
- Router Configuration

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

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

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

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

Command mode and sample prompt	Entrance commands	Exit commands
Interface Configuration `5530-24TFD(config-if)#` interface vlan	From Global Configuration mode: To configure a port, enter: **`interface fastethernet <port number>`** To configure a VLAN, enter: **`interface fastethernet <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-if)#`	From Global Configuration mode: To configure OSPF, enter: **`router ospf`** To configure RIP, enter: **`router rip`** 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`**

See *Nortel Ethernet Routing Switch 5000 Series Fundamentals* (NN47200-104) for more information about NNCLI command modes.

Navigation

- "System configuration fundamentals" (page 23)
- "Power over Ethernet fundamentals" (page 61)
- "LLDP fundamentals" (page 69)
- "System configuration with Enterprise Device Manager" (page 231)
- "Configuration reference" (page 371)

System configuration fundamentals

The following sections contain system configuration fundamentals for the Nortel Ethernet Routing Switch 5000 Series.

Feature licensing

An Advanced License or a Trial license is required to enable certain features. These software licenses support the following six features:

- Split Multi-Link Trunking (SMLT)
- Open Shortest Path First (OSPF)
- Virtual Router Redundancy Protocol (VRRP)
- Equal Cost Multi Path (ECMP)
- PIM-SM
- IPv6 Forwarding

For more information about licenses, see *Nortel Ethernet Switch 5000 Fundamentals* (NN47200-104).

Trial license

Beginning with release 6.0, the switch offers a Trial License which enables OSPF, ECMP, VRRP, and SMLT, or any combination thereof for a period of 30 days. At the end of the 30 day trial period, the features will be disabled, with the exception of SMLT.

For more information about licenses, see *Nortel Ethernet Switch 5000 Fundamentals* (NN47200-104).

User access limitations

NNCLI enables the administrator to limit user access through the creation and maintenance of passwords for Telnet and Console access. This is a two-step process that requires first creating the password and then enabling it.

Ensure that **Global Configuration** mode is entered in NNCLI before you begin these tasks.

Note: When a username and password is set to default, the change is only applied to the unit on which the command was run.

Customizing NNCLI banner

The banner presented when a user logs in to the switch through NNCLI can be configured to a user-defined value. The banner cannot exceed 1539 bytes, or 19 rows by 80 columns plus line termination characters.

The banner control setting is saved to NVRAM, and both the banner file and control setting are distributed to all units within a stack.

To customize NNCLI banner with NNCLI, refer to the following procedures:

- “show banner command” (page 210)
- “banner command” (page 211)
- “no banner command” (page 212)

To customize NNCLI banner with Enterprise Device Manager, refer to the following procedures:

- “Displaying the Banner tab” (page 243)
- “Displaying the Custom Banner tab” (page 244)

TFTP server

Many of the processes in the switch can make use of a Trivial File Transfer Protocol (TFTP) server. The following sections detail how to set a default TFTP server for the switch and to clear these defaults through the command line interface:

- “Configuring a default TFTP server with NNCLI” (page 151)
- “Displaying the default TFTP server with NNCLI” (page 212)
- “Clearing the default TFTP server with NNCLI” (page 151)

Configuration downloads to a switch

The following sections provide information about configuration downloads.

Updating switch software

Updating switch software is a necessary part of switch configuration and maintenance. Updating the version of software running on the switch can be accomplished through NNCLI.

Before attempting to change the switch software, ensure that the following prerequisites are in place:

- The switch has been given a valid IP address.
- A Trivial File Transfer Protocol (TFTP) server is present on the network that is accessible by the switch and that has the desired software version loaded.
- If you change the switch software on a Nortel Ethernet Routing Switch 5530-24TFD or 5600 series with software stored on a USB Mass Storage Device, ensure that the Mass Storage Device has the desired software version loaded on it and is inserted into the front panel USB port.
- If you use NNCLI, ensure that NNCLI is in **Privileged EXEC** mode.

For details on updating switch software, refer to the following sections

- “Changing switch software in the NNCLI” (page 133)
- “Config/Image/Diag file tab” (page 282)
- “LED activity during software download” (page 25)

LED activity during software download

During the software download process, the port LEDs light one after another in a chasing pattern except for ports 11, 12, 23, and 24 on a Nortel Ethernet Routing Switch 5510-24T and ports 35, 36, 47, and 48 on a Nortel Ethernet Routing Switch 5510-48T.

This chasing pattern is initially fast as the software image is downloaded but gradually slows as the switch erases the flash memory. This pattern speeds up again as the switch programs the new image into the flash memory.

When the process is complete, the port LEDs are no longer lit and the switch resets.

Unit quick configuration feature

You can use the quick configuration commands to automatically integrate a new unit into a stack. See“New Unit Quick Configuration” (page 81) for more information and the commands.

ASCII configuration file

With the Nortel Ethernet Routing Switch 5500 Series you can download a user-editable ASCII configuration file from a TFTP server.

After you download the file, the configuration file automatically configures the switch or stack according to NNCLI commands in the file.

With this feature, you can generate command configuration files that can be used by several switches or stacks with minor modifications.

The maximum size for an ASCII configuration file is 500 KB; split large configuration files into multiple files.

Use a text editor to edit the ASCII configuration. The command format is the same as that of NNCLI.

Download the ASCII configuration file to the base unit by using NNCLI commands. The ASCII configuration script completes the process.

See "Retrieving an ASCII configuration file" (page 290) for more information and NNCLI commands.

Multiple switch configuration management

The Nortel Ethernet Routing Switch 5000 Series supports the storage of two switch configurations in flash memory. The switch can use either configuration and must be reset in order for the configuration change to take effect.

A regular reset of the switch synchronizes any configuration changes to the active configuration whereas a reset to defaults causes the active configuration to be set to factory defaults. The inactive block is not affected.

In stack configurations, all units in the stack must use the same active configuration. If a unit joins a stack, a check is performed between the unit's active configuration and the stack's active configuration. If the two are not the same, the new stack unit resets and loads the stack's active configuration.

- "show nvram block command" (page 80)
- "copy config nvram block command" (page 80)
- "copy nvram config block command" (page 80)

Secure Shell File Transfer Protocol (SFTP over SSH)

With this feature, you can securely transfer a binary configuration file from a switch or stack to an SFTP server or from an SFTP server to the switch or stack using the SFTP protocol with SSH version 2.

Release 6.2 supports the following SFTP features:

- a binary configuration file upload to an SFTP server
- a binary configuration file download from a SFTP the server

- DSA-key authentication
- password authentication
- host key generation
- 1024-bit DSA-key use for authentication

Stacking fundamentals

Stacking capabilities

You can use the Nortel Ethernet Routing Switch 5000 Series switches in either of the following configurations:

- stand-alone
- stack

The Nortel Ethernet Routing Switch 5000 Series switches have a built-in cascade port to stack up to eight units.

A stack can consist of any combination of Nortel Ethernet Routing Switch 5000 Series switches.

ATTENTION
All units in the stack must use the same software version.

To set up a stack, perform the following procedure.

Procedure steps

Step	Action
1	Power down all switches.
2	Set the Unit Select switch in the back of the non base units to the off position.
3	Set the Unit Select switch in the back of the base unit to base position.
4	Ensure all the cascade cables are properly connected and screwed into the unit.
5	Power up the stack.

ATTENTION
In a hybrid stack of Nortel Ethernet Routing Switch 5000 Series, you must set an Nortel Ethernet Routing Switch 5600 Series switch type as the base unit.

--End--

Stack monitor

The Ethernet Routing Switch 5000 series stacks support the following two modes of operation:

- Pure
- Hybrid

You can create a pure stack with up to eight Ethernet Routing Switch 5500 Series switches or eight Nortel Ethernet Routing Switch 5600 Series switches.

You can create a hybrid or mixed stack of up to eight switches that is a combination of Ethernet Routing Switch 5500 Series switches and Ethernet Routing Switch 5600 Series switches.

ATTENTION
In a hybrid stack of Nortel Ethernet Routing Switch 5000 Series, you must set an Nortel Ethernet Routing Switch 5600 Series switch type as the base unit.

Stack manager is responsible for the following functions that form and maintain a stack.

- Base unit selection.
- Unit discovery.
- Unit number assignment.
- Database exchange.
- Join stack handling.
- Programming the hardware for the stack to function as a system.

Stack manager also handles link events from the Hello module when a unit is added or removed from the stack. Based on the event, the stack manager again runs through the state machine to discover the newly added unit or change the stack configuration. Stack manager supports following stack configurations:

- Ring topology: All the units are connected as a ring.
- Upstream: All the non-base units are upstream to the base unit.
- Downstream: All the non-base units are downstream to the base unit.
- Up Down: Non base units are both upstream and downstream of the base unit.

Stack manager supports a maximum of eight switches in a pure or hybrid stack. Although the design does not restrict the number of ports in a stack, Nortel recommends that the number does not exceed 400 ports.

To create a hybrid stack, you must first set the mode parameter on the Ethernet Routing Switch 5600 Series switches to hybrid mode. Ethernet Routing Switch 5500 Series switches do not have a mode parameter.

See “Stack manager” (page 77) for more information about the stack manager and the procedure and NNCLI commands to set the stack manager.

Agent Auto Unit Replacement (AAUR)

Software Release 4.2 and later supports Agent Auto Unit Replacement (AAUR), an enhancement to Auto Unit Replacement.

Enabled by default, AAUR inspects non base replacement units joining a stack. If the replacement units do not contain the same software image as the base unit, AAUR downloads the software image from the base unit to the replacement units.

You can use NNCLI commands to manage and configure AAUR.

How AAUR works

- When you insert a replacement unit into an AAUR-enabled stack, AAUR compares the switch software image on the replacement unit to the stack software image.
- If the replacement unit software image differs from the stack software image, AAUR downloads the stack software image from the base unit to the replacement unit.
- The system resets the new unit.
- The new unit becomes a member of the stack after reboot.

Once the replacement unit joins the stack, unless you have disabled Auto Unit Replacement (AUR), AUR installs the configuration from the old unit onto the replacement unit if it has the same hardware configuration, and the system resets the replacement unit. Now all units are running the same software version and the configurations are restored. For more information, see “Auto Unit Replacement (AUR)” (page 29)

For more information about AAUR and NNCLI commands, see “Agent Auto Unit Replacement (AAUR)” (page 216).

Auto Unit Replacement (AUR)

Enabled by default, Auto Unit Replacement (AUR) restores the configuration of the original unit to the replacement unit when you replace a unit in a stack. The new unit must be the same hardware configuration

as the old, including the same number of ports. If you add a new unit with a different hardware configuration, the system uses the configuration of the new unit.

From Release 6.2 and later, Automatic Unit Replacement (AUR) can automatically update a software feature license for any replacement stack unit, including the Base Unit.

You can disable AUR with NNCLI and the switch retains the AUR state after a reset. Logs messages are available for AUR.

AUR is not compatible with software versions prior to 4.1.

ATTENTION
For Auto Unit Replacement to operate, stack power must be on during the unit replacement because configuration images are retained in the stack DRAM.

AUR does not work on a stack of only two units because, if a unit fails, the remaining unit becomes a standalone switch and AUR does not load the configuration of the failed unit if it is replaced.

ATTENTION
Nortel recommends that the replacement unit runs the same version of diagnostics as the stack base unit.

When AUR is enabled, you can

- manually restore an associated configuration (same unit number) to a non base unit, regardless of the MAC address
- manually configure a non base unit to the base unit regardless of the state of AUR

When AUR is enabled, you cannot

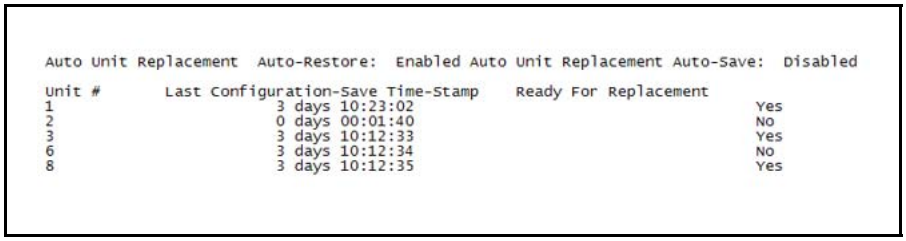
- manually restore configuration for a base unit
- manually save a configuration for a base unit

ATTENTION
If you reset the base unit before you restore the configuration, the base unit erases the saved configuration information for non base units.

After you reboot a stack, you can use NNCLI command **`show stack auto-unit-replacement`** from a unit console to determine whether that unit is ready for replacement.

Following is an example of the command output:

Figure 1
show stack auto-unit replacement



For information about configuring AUR with NNCLI, see “Configuring AUR with NNCLI” (page 213).

For information about configuring AUR with Enterprise Device Manager, see “Configuring AUR” (page 245).

Stack Forced Mode

Stack Forced Mode allows one or both units to become stand-alone switches if a stack of two units breaks. The Stack Forced Mode allows you to manage one of the stand-alone devices from a broken stack of two with the previous stack IP address.

If you enable Stack Forced Mode on a stack, you enable Stack Forced Mode on all units in the stack. Stack Forced Mode becomes active only if the stack fails.

For instructions to configure stack forced mode with NNCLI, see “Setting Stack Forced Mode” (page 219).

Stack Forced Mode applies to a stand-alone switch that is part of a stack of two units. When functioning in this mode, the stand-alone switch keeps the previous stack IP settings (IP address, netmask, gateway). That allows an administrator to reach the device through an IP connection by telnet or Enterprise Device Manager.

If one unit fails, the remaining unit (base or non-base unit) keeps the previous stack IP settings. The remaining unit issues a gratuitous ARP packet when it enters Stack Forced Mode, in order for other devices on the network to update their ARP cache.

If the stack connection between the two units fails (a stack cable failure, for example), both stand-alone units retain the IP settings. To detect if the other stack partner is also using the previous stack IP settings, each device issues an ARP request on the IP address.

When a failure occurs in a stack of 2 units when forced stack mode is enabled, the previous non-base unit will send out a gratuitous ARP onto the management network. The purpose of sending out this gratuitous ARP

is so that the non-base unit of a failed 2 unit stack can determine if the base unit is still operational and using the stack IP address. Such a failure situation in which both the base unit and non-base unit were operational, but not part of a stack could be possible if the 2 units in a stack were connected by a single stack cable and that stack cable were then removed or failed. If the previous non-base unit receives a reply from the previous base unit of the stack, then the previous non-base unit knows that the previous base unit is still operational and does not take over ownership of the stack IP address, but instead will use the local switch IP address if configured. If on the other hand the previous non-base unit does not receive a response from the previous base-unit; the previous non-base unit will now take over ownership of the stack IP address and issue a gratuitous ARP with it's own MAC address to ensure that all devices on the management VLAN have their ARP caches appropriately updated.

Stack Forced Mode allows non-EAP clients connected to the device to still authenticate themselves and maintain connectivity to the network. Non-EAP clients authenticate by the device with RADIUS, which is based on the stack IP address. In Stack Forced Mode, the device retains the IP settings of the stack of two.

The functional unit stays in Stack Forced Mode until either a reboot or it joins a stack.

A settlement timer prevents several stack failures that occur at an interval of a few seconds to lead to a device entering Stack Forced Mode after it was part of a stack larger than two units. A device enters Stack Forced Mode if and only if it was part of a stack of two for 30 seconds or longer.

If the switch is in Stack Force mode and you want to set a switch IPv6 address, you must first delete the active IPv6 interface and then configure the switch IPv6 address. If you use Telnet, SSH or Enterprise Device Manager to change the settings, the switch will lose IPv6 connectivity to the switch. Nortel recommends that you change the settings with the Console Interface to switch or use an IPv4 address for management.

IP blocking

Along with IP Routing, you can use Blocking Mode in two modes: full and none. The following paragraphs show how blocking mode acts for a stack.

You have a stack with IP Routing enabled and some Layer 3 VLANs. Assign VLANs ports from all the units. Set IP blocking-mode to Full on the base unit. Remove all the units from stack. All of the units will run in Layer 2 mode. No Layer 3 settings will be available on these units.

You have a stack with IP Routing enabled, and some Layer 3 VLANs. Assign VLANs ports from all the units. Set the IP blocking-mode to None on the base unit. Remove all of the units from stack. The Layer 3 settings made on the stack will be available on these units. By default IP blocking-mode is None.

Nortel Energy Saver

You can use Nortel Energy Saver (NES) to reduce network infrastructure power consumption without impacting network connectivity. NES uses intelligent switching capacity reduction in off-peak mode to reduce direct power consumption by up to 40%. NES can also use Power over Ethernet (PoE) port power priority levels to shut down low priority PoE ports and provide more power savings.

The power consumption savings of each switch is determined by the number of ports with NES enabled and by the power consumption of PoE ports that are powered off. If NES for a port is set to disabled, the port is not powered off, irrespective of the PoE configuration. NES turns off the power to a port only when PoE is enabled globally, the port NES is enabled, and the PoE priority for the port is configured to low.

You can schedule NES to enter lower power states during specified periods of time. These time periods can be a complete week, complete weekend, or individual days.

Nortel recommends disabling NES on uplink copper ports since activating or deactivating NES on copper ports will trigger a link down followed rapidly by a link up event. The best solution is to use fiber ports for uplinks since link status will not change when NES is activated or deactivated.

ATTENTION
If a switch is reset while energy-saver is activated, the PoE power saving calculation may not accurately reflect the power saving, and in some cases may display zero savings. This is because the switch did not have sufficient time to record PoE usage between the reset of the switch and energy-saver being reactivated. When energy saver is next activated, the PoE power saving calculation will be correctly updated.

Boot agent image

The Dual Agent feature provides support for two agents for Ethernet Routing Switch 5500 or 5600 series in stand-alone, pure stack or for a mixed (hybrid) stack configuration. Dual Agent functionality is not supported on Ethernet Routing Switch 5510.

The Dual Agent feature provides two agent images, the Agent Primary image and the Agent Secondary image. The Agent Primary image represents the agent image used for the next boot. User is able to select either image for the next boot.

An Ethernet Routing Switch 56xx unit has two combo images in the flash. In another word, an Ethernet Routing Switch 5600 unit has two Ethernet Routing Switch 56xx agent images and two Ethernet Routing Switch 55XX agent images in the flash. An Ethernet Routing Switch 55XX unit has two Ethernet Routing Switch 55XX images in the flash.

In a mixed stack with both Ethernet Routing Switch 5500 units and Ethernet Routing Switch 5600 units, an Ethernet Routing Switch 5600 must be the base unit. For a mixed stack to use the Dual Agent feature, the following conditions must be met:

- All Ethernet Routing Switch 5600 units must have the same agent software version.
- All Ethernet Routing Switch 5500 units must have the same agent software version.
- All unit agent software must have the same Interop Software Version Number (ISVN).

Special Case: If an Ethernet Routing Switch 5510 is the base unit, Dual Agent is disabled in the stack.

The Dual Agent Boot flag determines which agent image is the boot image. The diagnostics and agent software must use the same value for the Dual Agent Boot flag.

If the Dual Agent Boot flag is not set, the unit will boot from Agent 1 (default).

Next Boot image and system Boot-up in Dual Agent

The Next Boot image in Dual Agent is an agent image that is stored in the flash memory to be used for the next boot. In Dual Agent, there are two agent images in the flash memory, but only one image is assigned as the Next Boot image at a time.

When an agent image is downloaded to the switch, the unit resets and boots up with the newly downloaded image regardless of the value of the Next Boot image indicator. If an agent image is downloaded to the switch without a reset of the unit, the newly downloaded image becomes the Next Boot image.

You can change the Next Boot image at any time. The Next Boot image indicator (a value to indicate which agent image in the flash memory is used in the next boot) is stored in the NVRAM. This value, combined with other factors in the stack discovery process, determines which Dual Agent image the switch uses.

System boot-up for stand-alone

A stand-alone unit boots up with the Next Boot image from the NVRAM.

System boot-up for stack

The following lists the boot-up sequence:

- All the units in the stack start up with the Next Boot image.
- The stack does the following operations in the stack discovery phase:
  - The Next Boot image in the BU is used as the reference image.
  - If the Next Boot image in the NBU matches with the BU Next Boot image, the NBU continue to boot with the current Next Boot image.
  - If both images in the NBU do not match with the BU Next Boot image, the unit continues to boot with the current Next Boot image.
  - If the Next Boot image in the NBU does not match with the BU Next Boot image, but the other image in the NBU is matched, the matched image is selected as the Next Boot image then the unit is reset.

Dual Agent and Ethernet Routing Switch 5510

Dual Agent supports an Ethernet Routing Switch 5510 NBU with AAUR.

The following example shows how Dual Agent uses AAUR in a stack that contains Ethernet Routing Switch 5510 NBUs if you toggle the Next Boot image:

- All units in the stack reset with the new Next Boot image except for the Ethernet Routing Switch 5510 NBUs that will reset with only the agent image because they do not have the second image.
- All the units join stack except for the Ethernet Routing Switch 5510 units that now become stand-alone units because the agent image is now different from the one from in the stack.
- The Ethernet Routing Switch 5510 stand-alone units get the new image from the stack through AAUR and join the stack.

The following graphic shows what happens when you toggle the Next Boot image:

Figure 2
show boot image

```
5650TD (config)#show boot image

UNIT      PRIMARY       SECONDARY     ACTIVE

 1       6.1.0.141     6.1.0.140     6.1.0.141
 2       6.1.0.141     6.1.0.140     6.1.0.141
 3       6.1.0.141     6.1.0.140     6.1.0.141

5650TD (config)#toggle-next-boot-image
5650TD (config)#show boot image

UNIT      PRIMARY       SECONDARY     ACTIVE

 1       6.1.0.140     6.1.0.141     6.1.0.141
 2       6.1.0.140     6.1.0.141     6.1.0.141
 3       6.1.0.140     6.1.0.141     6.1.0.141

5650TD (config)#boot
```

After the restart, the device starts up with version 6.2.0.140. This becomes the active image:

Figure 3
show boot image after restart

```
5650TD (config)#show boot image

UNIT      PRIMARY       SECONDARY     ACTIVE

 1       6.1.0.140     6.1.0.141     6.1.0.140
 2       6.1.0.140     6.1.0.141     6.1.0.140
 3       6.1.0.140     6.1.0.141     6.1.0.140
```

Combination image

The Combination (Combo) Agent Image contains the header of the image and two agent images, a 56xx agent image and a 55XX agent image.

Download combination image

Any 55xx software release before release 6.0 does not support the Combo image.

A stand-alone unit or a stack that uses the Ethernet Routing Switch 5000 Series Software Release 6.2 can download a combo image. Release 6.2 is available in two different formats: a file in Combo format version 6.2 and a file in 55xx image format version 6.2.

The 55xx image format in this release is necessary because not all of the current 55xx releases support the Combo image.

Ethernet Routing Switch 5600 stand-alone

The unit downloads the combo image through the TFTP or USB port then stores the image in a flash device.

Ethernet Routing Switch 5000 Series mixed stack

The base unit receives the combo image through the TFTP or USB port then transfers the image to the non-base units. The Ethernet Routing Switch 5600 unit non-base units receive the combo image and the Ethernet Routing Switch 5500 non-base units receive the 5500 series image that is extracted from the combo image.

All of the units in the stack store the received image in flash devices.

Ethernet Routing Switch 5500 stand-alone

The unit extracts the 5500 series image from the combo image through the TFTP or USB port then stores the image in a flash device.

Ethernet Routing Switch 5000 Series mixed stack

The base unit extracts the 5500 series image through the TFTP or USB port then transfers the image to the non-base units.

All of the units in the stack store the received image in flash devices.

Combo Diagnostic Image

The Combo Diagnostic Image contains the header of the image and two Diagnostic images: a 56xx diagnostic image and a 55xx diagnostic image.

Any 55xx software release before release 6.0 does not support the Combo Diagnostic image.

A stand-alone unit or a stack that uses the Ethernet Routing Switch 5000 Series software release 6.0 can download a combo diagnostic image.

This diagnostic release for the new software release 6.2 is available in two different formats: a file in Combo format and a file in 55xx format. The 55xx image format in this release is necessary because all the current 55xx releases do not support the Combo diagnostic image.

The considerations for downloading a Combo Agent Image also apply to downloading a Combo Diagnostic Image.

Supported BootP modes

BootP mode

The Nortel Ethernet Routing Switch 5000 Series supports the Bootstrap protocol (BootP).

BootP enables you to retrieve an ASCII configuration file name and configuration server address.

A properly configured BootP server enables the switch to automatically learn its assigned IP address, subnet mask and the IP address of the default router (default gateway).

The Nortel Ethernet Routing Switch 5000 Series has a unique 48-bit hardware address, or MAC address, that is printed on a label on the back panel. Use this MAC address when you configure the network BootP server to recognize the Nortel Ethernet Routing Switch 5000 Series BootP requests.

The BootP modes supported by the Nortel Ethernet Routing Switch 5000 Series are:

- BootP or Last Address mode
- BootP When Needed. This is the default mode.
- BootP Always
- BootP Disabled. Disabling BootP also disables DHCP.

IPv6 management

This module provides information about the IPv6 management feature of the Nortel Ethernet Routing Switch 5000 Series switch platforms.

Navigation

IPv6 Management allows the user to configure an IPv6 address on the management VLAN. This enables IPv6 connectivity. The management VLAN can have both an IPv4 and an IPv6 address configured simultaneously (Ethernet Routing Switch 5000 Series switches function as a dual stack network node).

IPv6 routing is supported in the current phase. You can perform IPv6 interface configuration with NNCLI or SNMP (Enterprise Device Manager). For more control over IPv6, use NNCLI or Enterprise Device Manager.

IPv6 Management adds support for new standard MIBs (IP-MIB — RFC 4293, TCP-MIB — RFC 4022, UDP-MIB — RFC 4113) as well as the enterprise MIB rcIpv6.

The IPv6 header

The IPv6 header contains the following fields:

- a 4-bit Internet Protocol version number, with a value of 6
- an 8-bit traffic class field, similar to Type of Service in IPv4
- a 20-bit flow label that identifies traffic flow for additional Quality of Service (QoS)
- a 16-bit unsigned integer, the length of the IPv6 payload
- an 8-bit next header selector that identifies the next header
- an 8-bit hop limit unsigned integer that decrements by 1 each time a node forwards the packet (nodes discard packets with hop limit values of 0)
- a 128-bit source address
- a 128-bit destination address

IPv6 addresses

IPv6 addresses are 128 bits in length. The address identifies a single interface or multiple interfaces. IPv4 addresses, in comparison, are 32 bits in length. The increased number of possible addresses in IPv6 solves the inevitable IP address exhaustion inherent to IPv4.

The IPv6 address contains two parts: an address prefix and an IPv6 interface ID. The first 3 bits indicate the type of address that follows.

The following table shows the IPv6 address format.

Table 1
IPv6 address format

Type	Address	Interface ID (or token)

An example of a unicast IPv6 address is 1080:0:0:0:8:8000:200C:417A

Interface ID

The interface ID is a unique number that identifies an IPv6 node (a host or a router). For stateless autoconfiguration, the ID is 64 bits in length.

In IPv6 stateless autoconfiguration, the interface ID is derived by a formula that uses the link layer 48-bit MAC address. (In most cases, the interface ID is a 64-bit interface ID that contains the 48-bit MAC address.) The IPv6 interface ID is as unique as the MAC address.

If you manually configure interface IDs or MAC addresses (or both), no relationship between the MAC address and the interface ID is necessary. A manually configured interface ID can be longer or shorter than 64 bits.

Address formats

The format for representing an IPv6 address is

n:n:n:n:n:n:n:n

n is the hexadecimal representation of 16 bits in the address. An example is as follows:

FF01:0:0:0:0:0:0:43

Each nonzero field must contain at least one numeral. Within a hexadecimal field, however, leading zeros are not required.

Certain classes of IPv6 addresses commonly include multiple contiguous fields containing hexadecimal 0. The following sample address includes five contiguous fields containing zeroes with a double colon (::):

FF01::43

You can use a double colon to compress the leading zero fields in a hexadecimal address. A double colon can appear once in an address.

An IPv4-compatible address combines hexadecimal and decimal values as follows:

x:x:x:x:x:x:d.d.d.d

x:x:x:x:x:x is a hexadecimal representation of the six high-order 16-bit pieces of the address, and d.d.d.d is a decimal representation of the four 8-bit pieces of the address. For example:

0:0:0:0:0:0:13.1.68.3

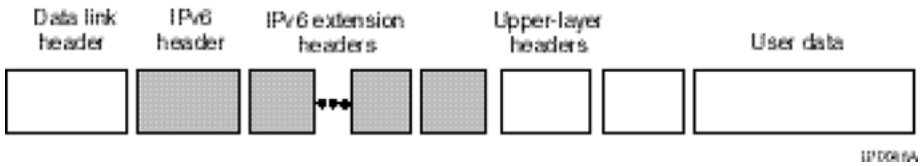
or

::13.1.68.3

IPv6 extension headers

IPv6 extension headers describe processing options. Each extension header contains a separate category of options. A packet can include zero or more extension headers.
The following graphic shows the IPv6 header and extension headers:

Figure 4
IPv6 header and extension headers



IPv6 examines the destination address in the main header of each packet it receives; this examination determines whether the router is the packet destination or an intermediate node in the packet data path. If the router is the destination of the packet, IPv6 examines the header extensions that contain options for destination processing. If the router is an intermediate node, IPv6 examines the header extensions that contain forwarding options.

By examining only the extension headers that apply to the operations it performs, IPv6 reduces the amount of time and processing resources required to process a packet.

IPv6 defines the following extension headers:

- The hop-by-hop extension header contains optional information that all intermediate IPv6 routers examine between the source and the destination.
- The end-to-end extension header contains optional information for the destination node.
- The source routing extension header contains a list of one or more intermediate nodes that define a path for the packet to follow through the network, to its destination. The packet source creates this list. This function is similar to the IPv4 source routing options.

- The fragmentation extension header uses an IPv6 source to send packets larger than the size specified for the path maximum transmission unit (MTU).
- The authentication extension header and the security encapsulation extension header, used singly or jointly, provide security services for IPv6 datagrams.

Comparison of IPv4 and IPv6

The following table compares key differences between IPv4 and IPv6.

Table 2
IPv4 and IPv6 differences

Feature	IPv4	IPv6
[1] Ethernet Routing Switch 5000 Series does not support IPsec. [2] Ethernet Routing Switch 5000 Series does not perform Router discovery or advertise as a router. [3] Ethernet Routing Switch 5000 Series does not implement any form of automatic configuration of IPv6 address in release 6.0.		
Address length	32 bits	128 bits
IPsec support[1]	Optional	Required
QoS support	Limited	Improved
Fragmentation	Hosts and routers	Hosts only
Minimum MTU (packet size)	576 bytes	1280 bytes
Checksum in header	Yes	No
Options in header	Yes	No
Link-layer address resolution	ARP (broadcast)	Multicast Neighbor Discovery Messages
Multicast membership	IGMP	Multicast Listener Discovery (MLD)
Router discovery[2]	Optional	Required
Uses broadcasts	Yes	No
Configuration[3]	Manual, DHCP	Automatic, DHCP

ICMPv6

Internet Control Message Protocol (ICMP) version 6 maintains and improves upon features from ICMP for IPv4. ICMPv6 reports the delivery of forwarding errors, such as destination unreachable, packet too big, time exceeded, and parameter problem. ICMPv6 also delivers information messages such as echo request and echo reply.

ATTENTION
ICMPv6 plays an important role in IPv6 features such as neighbor discovery, Multicast Listener Discovery, and path MTU discovery.

Neighbor discovery

IPv6 nodes (routers and hosts) on the same link use neighbor discovery (ND) to discover link layer addresses and to obtain and advertise various network parameters and reachability information. ND combines the services provided for IPv4 with the Address Resolution Protocol (ARP) and router discovery. Neighbor discovery replaces ARP in IPv6.

Hosts use ND to discover the routers in the network that you can use as the default routers, and to determine the link layer address of their neighbors attached on their local links. Routers also use ND to discover their neighbors and their link layer information. Neighbor discovery also updates the neighbor database with valid entries, invalid entries, and entries migrated to different locations.

Neighbor discovery protocol provides you with the following:

- Address and prefix discovery: hosts determine the set of addresses that are on-link for the given link. Nodes determine which addresses or prefixes are locally reachable or remote with address and prefix discovery.
- Router discovery: hosts discover neighboring routers with router discovery. Hosts establish neighbors as default packet-forwarding routers.
- Parameter discovery: host and routers discover link parameters such as the link MTU or the hop limit value placed in outgoing packets.
- Address autoconfiguration: nodes configure an address for an interface with address autoconfiguration.
- Duplicate address detection: hosts and nodes determine if an address is assigned to another router or a host.
- Address resolution: hosts determine link layer addresses (MAC for Ethernet) of the local neighbors (attached on the local network), provided the IP address is known.
- Next-hop determination: hosts determine how to forward local or remote traffic with next-hop determination. The next hop can be a local or remote router.
- Neighbor unreachability detection: hosts determine if the neighbor is unreachable, and address resolution must be performed again to

update the database. For neighbors you use as routers, hosts attempt to forward traffic through alternate default routers.

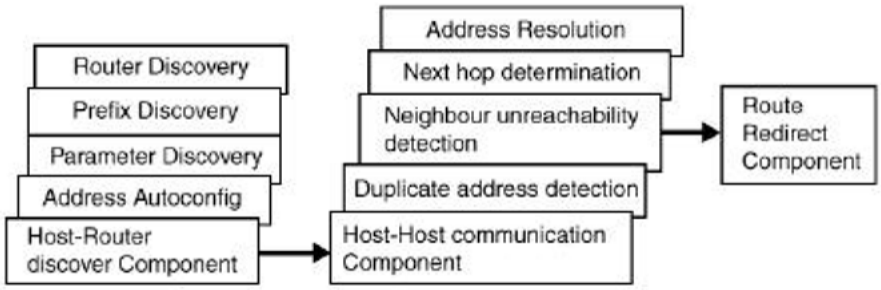
- Redirect: routers inform the host of more efficient routes with redirect messages.

Neighbor discovery uses three components:

- host-router discovery
- host-host communication component
- redirect

The following graphic shows the neighbor discovery components:

Figure 5
Neighbor discovery components



ND messages

The following table shows new ICMPv6 message types.

Table 3
IPv6 and IPv4 neighbor comparison

IPv4 neighbor function	IPv6 neighbor function	Description
ARP Request message	Neighbor solicitation message	A node sends this message to determine the link-layer address of a neighbor or to verify that a neighbor is still reachable through a cached link-layer address. You can also use neighbor solicitations for duplicate address detection.

Table 3
IPv6 and IPv4 neighbor comparison (cont'd.)

IPv4 neighbor function	IPv6 neighbor function	Description
ARP Reply message	Neighbor advertisement	A node sends this message either in response to a received neighbor solicitation message or to communicate a link layer address change.
ARP cache	Neighbor cache	The neighbor cache contains information about neighbor types on the network.
Gratuitous ARP	Duplicate address detection	A host or node sends a request with its own IP address to determine if another router or host uses the same address. The source receives a reply from the duplicate device. Both hosts and routers use this function.
Router solicitation message (optional)	Router solicitation (required)	The host sends this message upon detecting a change in a network interface operational state. The message requests that routers generate router advertisement immediately rather than at the scheduled time.
Router advertisement message (optional)	Router advertisement (required)	Routers send this message to advertise their presence together with various links and Internet parameters either periodically or in response to a router solicitation message. Router advertisements contain prefixes that you use for on-link determination or address configuration, and a

Table 3
IPv6 and IPv4 neighbor comparison (cont'd.)

IPv4 neighbor function	IPv6 neighbor function	Description
		suggested hop limit value.
Redirect message	Redirect message	Routers send this message to inform hosts of a better first hop for a destination.

Neighbor discovery cache

The neighbor discovery cache lists information about neighbors in your network.

The neighbor discovery cache can contain the following types of neighbors:

- static: a configured neighbor
- local: a device on the local system
- dynamic: a discovered neighbor

The following table describes neighbor cache states.

Table 4
Neighbor cache states

State	Description
Incomplete	A node sends a neighbor solicitation message to a multicast device. The multicast device sends no neighbor advertisement message in response.
Reachable	You receive positive confirmation within the last reachable time period.
Stale	A node receives no positive confirmation from the neighbor in the last reachable time period.

Table 4
Neighbor cache states (cont'd.)

State	Description
Delay	A time period longer than the reachable time period passes since the node received the last positive confirmation, and a packet was sent within the last DELAY_FIRST_PROBE_TIME period. If no reachability confirmation is received within DELAY_FIRST_PROBE_TIME period of entering the DELAY state, neighbor solicitation is sent and the state is changed to PROBE.
Probe	Reachability confirmation is sought from the device every retransmit timer period.

The following events involve Layer 2 and Layer 3 interaction when processing and affect the neighbor cache:

- flushing the Virtual Local Area Network (VLAN) media access control (MAC)
- removing a VLAN
- performing an action on all VLANs
- removing a port from a VLAN
- removing a port from a spanning tree group (STG)
- removing a multi-link trunk group from a VLAN
- removing a Multi-Link Trunking port from a VLAN
- removing a Multi-Link Trunking port from an STG
- performing an action that disables a VLAN, such as removing all ports from a VLAN
- disabling a tagged port that is a member of multiple routable VLANs

Router discovery

IPv6 nodes discover routers on the local link with router discovery. The IPv6 router discovery process uses the following messages:

- Router advertisement
- Router solicitation

Router advertisement

Configured interfaces on an IPv6 router send out router-advertisement messages. Router-advertisements are also sent in response to router-solicitation messages from IPv6 nodes on the link.

Router solicitation

An IPv6 host without a configured unicast address sends router solicitation messages.

Path MTU discovery

IPv6 routers do not fragment packets. The source node sends a packet equal in size to the maximum transmission unit (MTU) of the link layer. The packet travels through the network to the destination. If the packet encounters a link with a smaller MTU, the router sends the source node an ICMP error message containing the MTU size of the next link.

The source IPv6 node then resends a packet equal to the size of the MTU included in the ICMP message.

The default MTU value for a regular interface is 1500.

Dynamic Host Configuration Protocol

Dynamic Host Configuration Protocol (DHCP) is defined by the RFC 2131. DHCP allows individual TCP/IP hosts on an IP network to obtain their configuration information from a DHCP server (or servers) that have no exact information about the individual hosts until they request configuration parameters. This reduces the work of system administrators, especially in larger IP networks, by eliminating the need to manually set every IP address. The most significant pieces of information distributed through DHCP are:

- the IP address
- the network mask
- the IP address of the gateway

In many networks, DHCP must coexist with VLANs, and the DHCP client can make its broadcasts only in the trusted VLANs. The DHCP client will run at startup just like the BootP client. The DHCP client restricts its discovery broadcasts to the management VLAN.

The DHCP modes supported by the Nortel Ethernet Routing Switch 5000 Series Series are:

- DHCP or Last Address mode
- DHCP When Needed.

- DHCP Always
- DHCP Disabled. Disable DHCP by setting BootP Disabled.

The host cannot act as a DHCP relay while the DHCP client is running.

Simple Network Time Protocol

The Simple Network Time Protocol (SNTP) is a subset of the Network Time Protocol. It provides a simple mechanism for time synchronization. NTP enables clocks to be synchronized to a few milliseconds, depending on the clock source and local clock hardware.

SNTP synchronizes to the Universal Coordinated Time (UTC) with an error of less than one second. This feature adheres to the RFC 2030 (MIB is the s5agent). With this feature, the system can obtain the time from any RFC 2030-compliant NTP or SNTP server.

SNTP accuracy is typically in the order of "significant fractions of a second." This accuracy is related to the latencies between the SNTP client device and the NTP server. In a low latency network, the SNTP accuracy can be reduced to the sub-100 millisecond range and, to further increase the accuracy, a simple latency measurement algorithm can be used. The intended accuracy for this implementation is one second, which is sufficient for logs and time displays on user interfaces.

The SNTP feature allows you to set an offset from GMT for the time zone of your location. You can also set a start date and end date and offset for Daylight Savings Time.

The SNTP client implementation for this feature is unicast. The SNTP client operates typically in a unicast mode, but also can use the broadcast and multicast modes.

When SNTP is enabled (the default state is disabled), the system synchronizes with the configured NTP server at bootup (after network connectivity is established) and at user-configurable periods thereafter (the default synchronization interval is 24 hours). The synchronization also can happen upon manual request.

The SNTP feature supports both primary and secondary NTP servers. SNTP attempts to contact the secondary NTP server only if the primary NTP server is unresponsive. When a server connection fails, SNTP retries for a maximum of three times, with five minutes between each retry.

Ping enhancement

Using NNCLI you can specify additional ping parameters, including the number of ICMP packets to be sent, the packet size, the interval between packets, and the timeout. You can also set ping to continuous, or you can set a debug flag to obtain extra debug information.

For information about NNCLI ping command, see “ping command” (page 117).

Auto-MDI X

The term *auto-MDI/X* refers to automatic detection of transmit and receive twisted pairs.

Auto-MDI/X detects, receive, and transmit twisted pairs automatically. When auto-MDI/X is active, any straight or crossover category 5 cable can be used to provide connection to a port. If autonegotiation is disabled, then auto-MDI/X is not active.

Auto-polarity

The term *auto-polarity* refers to the ability of the port to compensate for positive and negative signals being reversed on the receive cables.

The Nortel Ethernet Routing Switch 5000 Series support auto-polarity. With autonegotiation enabled, auto-polarity automatically reverses the polarity of a pair of pins from positive to negative or negative to positive. This corrects the polarity of the received data, if the port detects that the polarity of the data has been reversed due to a wiring error. If autonegotiation is disabled, auto-polarity is not active.

Autosensing and autonegotiation

The Nortel Ethernet Routing Switch 5000 Series are autosensing and autonegotiating devices:

- The term *autosense* refers to ability of a port to *sense* the speed of an attached device.
- The term *autonegotiation* refers to a standardized protocol (IEEE 802.3u or 802.3z or 802.3ab) that exists between two IEEE-capable devices. Autonegotiation enables the switch to select the best speed and duplex modes.

Autosensing is used when the attached device is not capable of autonegotiation or is using a form of autonegotiation that is not compatible with the IEEE 802.3z autonegotiation standard. If it is not possible to sense the duplex mode of the attached device, the Nortel Ethernet Routing Switch 5000 Series reverts to half-duplex mode.

When autonegotiation-capable devices are attached to the Nortel Ethernet Routing Switch 5000 Series, the ports negotiate down from 1000 Mb/s speed and full-duplex mode until the attached device acknowledges a supported speed and duplex mode.

Custom Autonegotiation Advertisements

In the Nortel Ethernet Routing Switch 5000 Series, the Custom Autonegotiation Advertisements (CANA) feature enables you to control the speed and duplex settings that each Ethernet port of the device advertises as part of the autonegotiation process.

Without CANA, a port with autonegotiation enabled advertises all speed and duplex modes that are supported by the switch and attempt to establish a link at the highest common speed and duplex setting. By using CANA, the port can be configured to advertise only certain speed and duplex settings, thereby allowing links to be established only at these settings, regardless of the highest common supported operating mode.

CANA also enables control over the IEEE802.3x flow control settings advertised by the port, as part of the autonegotiation process. Flow control advertisements can be set to Symmetric, Asymmetric, or Disabled if neither is selected.

You may not want a port to advertise all speed and duplex modes supported, in the following situations:

- If a network can support only 10 Mb/s connection, a port can be configured to advertise only 10 Mb/s capabilities. Devices using autonegotiation to connect to this port connect at 10 Mb/s, even if both devices are capable of higher speeds.
- If a port is configured to advertise only 100 Mb/s full-duplex capability, the link becomes active only if the link partner is also capable of autonegotiating a 100 Mb/s full duplex connection. This prevents mismatched speed or duplex settings if autonegotiation is disabled on the link partner.
- For testing or network troubleshooting, it can be useful to configure a link to autonegotiate at a particular speed or duplex mode.

Configuring CANA with NNCLI

Use this procedure to configure CANA.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: **auto-negotiation-advertisements** **Example** To configure port 5 to advertise the operational mode of 10 Mb/s and full duplex, enter the following command line: **auto-negotiation-advertisements port 5 10-full**

--End--

The following figure shows sample output for this command.

Figure 6
auto-negotiation-advertisements command sample output

```
5510-48T(config-if)#auto-negotiation-advertisements port 5 10-full
5510-48T(config-if)#
```

Viewing current autonegotiation advertisements

Use this procedure to view autonegotiation advertisements for the device.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: **show auto-negotiation-advertisements [port <portlist>]**

--End--

The following figure shows an example of the output for the **show auto-negotiation-advertisements** command.

Figure 7
show auto-negotiation-advertisements command sample output

```
5510-48T#show auto-negotiation-advertisements
Port Autonegotiation Advertised Capabilities
---- -------------------------------------------------------------------
1    10Full 10Half 100Full 100Half 1000Full                        Pause
2    10Full 10Half 100Full 100Half 1000Full                        Pause
3    10Full 10Half 100Full 100Half 1000Full                        Pause
4    10Full 10Half 100Full 100Half 1000Full                        Pause
5    10Full
6    10Full 10Half 100Full 100Half 1000Full                        Pause
7    10Full 10Half 100Full 100Half 1000Full                        Pause
8    10Full 10Half 100Full 100Half 1000Full                        Pause
9    10Full 10Half 100Full 100Half 1000Full                        Pause
10   10Full 10Half 100Full 100Half 1000Full                        Pause
11   10Full 10Half 100Full 100Half 1000Full                        Pause
12   10Full 10Half 100Full 100Half 1000Full                        Pause
13   10Full 10Half 100Full 100Half 1000Full                        Pause
14   10Full 10Half 100Full 100Half 1000Full                        Pause
15   10Full 10Half 100Full 100Half 1000Full                        Pause
16   10Full 10Half 100Full 100Half 1000Full                        Pause
17   10Full 10Half 100Full 100Half 1000Full                        Pause
18   10Full 10Half 100Full 100Half 1000Full                        Pause
19   10Full 10Half 100Full 100Half 1000Full                        Pause
20   10Full 10Half 100Full 100Half 1000Full                        Pause
----More (q=Quit, space/return=Continue)----
```

The following figure shows an example of the output for the **`show auto-negotiation-advertisements`** command.

Figure 8
show auto-negotiation-advertisements command sample output

```
5510-48T#show auto-negotiation-advertisements port 5
Port Autonegotiation Advertised Capabilities
---- -------------------------------------------------------------------
5    10Full
5510-48T#
```

Note: Port 5 has been configured to only advertise an operational mode of 10 Mb/s full duplex

Viewing hardware capabilities

Use this procedure to view the operational capabilities of the device.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: **show auto-negotiation-capabilities [port <portlist>]**

--End--

The following figure shows an example of the output for the **show auto-negotiation-capabilities** command.

Figure 9
show auto-negotiation-capabilities command sample output

```
5510-48T#show auto-negotiation-capabilities
Port Autonegotiation Capabilities
---- ---------------------------------------------------------------
1    10Full 10Half 100Full 100Half 1000Full                      Pause
2    10Full 10Half 100Full 100Half 1000Full                      Pause
3    10Full 10Half 100Full 100Half 1000Full                      Pause
4    10Full 10Half 100Full 100Half 1000Full                      Pause
5    10Full 10Half 100Full 100Half 1000Full                      Pause
6    10Full 10Half 100Full 100Half 1000Full                      Pause
7    10Full 10Half 100Full 100Half 1000Full                      Pause
8    10Full 10Half 100Full 100Half 1000Full                      Pause
9    10Full 10Half 100Full 100Half 1000Full                      Pause
10   10Full 10Half 100Full 100Half 1000Full                      Pause
11   10Full 10Half 100Full 100Half 1000Full                      Pause
12   10Full 10Half 100Full 100Half 1000Full                      Pause
13   10Full 10Half 100Full 100Half 1000Full                      Pause
14   10Full 10Half 100Full 100Half 1000Full                      Pause
15   10Full 10Half 100Full 100Half 1000Full                      Pause
16   10Full 10Half 100Full 100Half 1000Full                      Pause
17   10Full 10Half 100Full 100Half 1000Full                      Pause
18   10Full 10Half 100Full 100Half 1000Full                      Pause
19   10Full 10Half 100Full 100Half 1000Full                      Pause
20   10Full 10Half 100Full 100Half 1000Full                      Pause
----More (q=Quit, space/return=Continue)----
```

The following figure shows an example of the output for the **show auto-negotiation-capabilities** command.

Figure 10
show auto-negotiation-capabilities command sample output

```
5510-48T#show auto-negotiation-capabilities port 5
Port Autonegotiation Capabilities
---- ---------------------------------------------------------------
5    10Full 10Half 100Full 100Half 1000Full                    Pause
5510-48T#
```

Setting default advertisements

Use this procedure to set default autonegotiation advertisements for the device.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **default auto-negotiation-advertisements [port <portlist>]**

--End--

Example

To set default advertisements for port 5 of the device, enter the following command line:

default auto-negotiation-advertisements port 5

Silencing advertisements

Use this procedure to set a port to not transmit any autonegotiation advertisements.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **no auto-negotiation-advertisements [port <portlist>]**

--End--

Exmale

To silence the autonegotiation advertisements for port 5 of the device, enter the following command line:

no auto-negotiation-advertisements port 5

The following figure shows an example of the output for the **default auto-negotiation-advertisements** command.

Figure 11
default auto-negotiation-advertisements command sample output

```
5510-48T(config-if)#default auto-negotiation-advertisements port 5
5510-48T(config-if)#
```

The following figure shows an example of the output for the **default auto-negotiation-advertisements** command.

Figure 12
no auto-negotiation-advertisements command sample output

```
5510-48T(config-if)#no auto-negotiation-advertisements port 5
5510-48T(config-if)#
```

Quick install

Quick Install allows users to take first configuration from a file found on a USB device or from a minimal configuration menu.

If the switch does not obtain an IP address using bootp, and, a file named IP.CFG exists on the USB device, then the switch loads the IP.CFG file as its first configuration.

See also "Set IP parameters using IP.CFG file on a USB memory device" (page 57).

If the switch cannot find an IP address after the user presses CTRL + Y from long console then it shows a minimal menu. Quick Configuration encompasses multiple menus consolidating them into a single menu for the user to access and make the required initial setup modifications.

The user must enter the following information into the menu:

- IP address
- Sub-net mask
- Default gateway
- Read-only community string

- Read-write community string
- Quick start VLAN

Set IP parameters using IP.CFG file on a USB memory device

If the switch does not obtain an IP address through BootP, you can load the IP address and optionally new switch software and configuration from the USB memory device using the ip.cfg file.

Note: The file name, ip.cfg, is case-insensitive.

If a properly formatted file exists on a USB port, the switch uses that ip.cfg as the first option, rather than the last. You can specify one or more of the optional parameters in the ip.cfg file. All of the parameters are optional.

The following table describes the ip.cfg file parameters:

Table 5
IP.CFG file parameters

Parameter	Description
IP <xx.xx.xx.xx>	Specifies the IP address for the switch. Example: 192.168.22.1
Mask <xx.xx.xx.xx>	Specifies the network mask. Example: 255.255.255.0
Gateway <xx.xx.xx.xx>	Specifies the default gateway. Example: 181.30.30.254
SNMPread <string>	Specifies the SNMP read community string. Example: public
SNMPwrite <string>	Specifies the SNMP write community string. Example: private
VLAN <number>	Specifies the management VLAN-ID. Example: VLAN 1
USBdiag <string>	Specifies the filename of the diagnostic image to load from the USB. Example: ers5600/ers5600_6.0.0.10.bin
USBascii <string>	Specifies the filename of the ASCII config file to load from the USB. Example: customer1.cfg
USBagent <string>DNEXTIP, NEXTMask, and NEXTGateway	Specifies the filename of the agent image to load from the USB and specifies IPs for next boot. Example: ers5600/ers5600_6.2.0.0.img

Note: If you download an ASCII file or diag/image with an Ip.cfg file, the specific ASCII file or diag/image must be present on the usb device.

The ip.cfg file loads information from the ASCII configuration file in order of precedence. For example, if you have an ip.cfg file with the following commands:

```
USBascii ip.txt
IP 181.30.30.113
Mask 255.255.255.0
Gateway 181.30.30.254
```

The stack IP becomes 181.30.30.113 no matter what IP address is in the ip.txt file.

If you have an ip.cfg file with the following commands:

```
IP 181.30.30.113
Mask 255.255.255.0
Gateway 181.30.30.254
USBascii ip.txt
```

The stack IP will be the IP address defined in the ip.txt file.

Note: The ip.cfg file runs only on a base or stand-alone unit. The file cannot be more than 4096 bytes or contain more than 200 lines.

The following figure shows an example of an ip.cfg file.

Figure 13
Ip.cfg file example

```
#Any lines starting with a # are comments
#IP <xx.xx.xx.xx> specifies the IP address for the switch

IP 172.16.1.23

#Mask <xx.xx.xx.xx> specifies the network mask Mask 255.255.255.0
#Gateway <xx.xx.xx.xx> specified the default gateway Gateway 172.16.1.1
#SNMPread <string> specified the SNMP read community string SNMPread public
#SNMPwrite <string> specified the SNMP write community string SNMPwrite private
#VLAN <number> specified the management VLAN-ID VLAN 1
#USBdiag <string> specifies the filename of the diagnostic image to load (noreset)

USBdiag ers5600/ers5600_5.1.0.4.bin

#USBagent <string> specifies the filename of the agent image to load (noreset)

USBagent ers5600/ers5600_5.2.0.0.img

#USBascii <string> specifies the filename of the ASCII config file to load

USBascii customer1.cfg

#NEXTIP <xx.xx.xx.xx> specifies the IP address for the switch NEXTIP 172.16.1.23
#NEXTMask <xx.xx.xx.xx> specifies the network mask NEXTMask  255.255.255.0
#NEXTGateway <xx.xx.xx.xx> specified the default gateway NEXTGateway 172.16.1.1
```

If the ip.cfg file specifies an image or agent code, the switch loads the software, even if the same version is already installed on the switch. Ensuring that the appropriate software is always upgraded on the units is the correct operation of ip.cfg.

Use the factory default command to reset the switch to the factory default after you insert the USB memory device in the USB port. The USB memory device must contain the properly formatted ip.cfg file in the root directory.

Power over Ethernet fundamentals

The information in this section provides an overview of Power over Ethernet (PoE). See the *Nortel Ethernet Routing Switch 5000 Series Installation* (NN47200-300) for detailed information about the installation of power supplies and details about PoE.

PoE in Nortel Ethernet Routing Switch 5000 Series switches uses the IEEE 802.3af standard.

PoE is the ability to power network devices over the Ethernet cable. Some such devices include IP Phones, Wireless LAN Access Points, security cameras, access control points, and so on.

The following 5000 Series switches provide PoE:

- Ethernet Routing Switch 5520-24T-PWR
- Ethernet Routing Switch 5520-48T-PWR
- Ethernet Routing Switch 5650-TD-PWR
- Ethernet Routing Switch 5698-TFD-PWR

The 5000 Series switches support the following PoE features:

- DTE power.
- Powered device (PD) discovery and classification.
- Capacitive detection to support legacy PD devices, including the Nortel and Cisco Legacy IP Phones.
- Port power management and monitoring for each port.
- AC and DC disconnection.
- Detection of load over or under voltage or current.
- PoE status LED for each port.
- Port prioritizing to guarantee DTE power available on high-priority ports
- Port pruning to prevent system failure

You can configure PoE with NNCLI or Enterprise Device Manager. See the following sections for details:

PoE overview

The 5000 Series switches are ideal to use with Nortel Business Communication Manager system, IP phones, hubs, and wireless access points. You can use these switches in conjunction with all network devices.

By using the 5000 Series switches, you can plug any IEEE 802.3af-compliant powered device into a front-panel port of a PoE-capable switch and receive power. Data can be passed simultaneously on that port.

The IEEE 802.3af draft standard regulates a maximum of 15.4 watts (W) of power for each port; that is, a power device cannot request more than 15.4 watts (W) of power. As different network devices require different levels of power, the overall available power budget of the 5000 Series switches depends on your power configuration and the particular connected network devices. If you connect an IP device that requires more than 16 W of power, you see an error on that port notifying you of an overload.

The 5000 Series switches automatically detect all IEEE 802.3af-draft-compliant powered devices attached to each front-panel port and immediately sends power to that appliance. The switch also automatically detects how much power each device requires and supplies the required DC voltage at a set current based on the load conditions and current availability. The switch supports both PoE and standard LAN devices.

The power detection function of the 5000 Series switches operate independently of the data link status. Power can be requested by a device that is already operating the link for data, or it can be requested by a device that is not yet operational. That is, the 5000 Series switches provide power to a requesting device even if the data link for that port

is disabled. The switch monitors the connection and automatically disconnects power from a port when the device is removed or changed, as well as when a short occurs.

The 5000 Series switches automatically detect those devices that do not require power connections from it, such as laptop computers or other switching devices, and does not send any power to those devices. You control the supply of power to specific ports by setting the maximum allowed power to each port in 1 W increments, from 3 W to 16 W.

> ***Note:*** Allow 30 seconds between unplugging and replugging an IP device to the switch to enable the IP device to discharge. If you attempt to make connection earlier, the switch may not detect the IP device.

Power source

The Nortel Ethernet Redundant Power Supply 15 is available as an optional external power source for the Ethernet Routing Switch 5520. Contact your Nortel representative for more information about the Nortel Ethernet Redundant Power Supply Unit 15.

The following are the available options to power the Nortel Ethernet Routing Switch 5520:

- Internal power source only
- External power source only:
  - Nortel Ethernet Redundant Power Supply 15
- Internal power source plus external power source:
  - Nortel Ethernet Redundant Power Supply 15

In a stack configuration, each unit can have its own external power source.

The 5650-TD-PWR and 5698-TFD-PWR switches use modular power supply units. The PoE capability at each 5600 Series switch port depends on the power supply modules that you install. See *Nortel Ethernet Routing Switch 5000 Series Installation* (NN47200-300) for information about the power supplies and PoE.

The PoE capability of each 5650-TD-PWR or 5698-TFD-PWR switch port depends on the power supply modules that you install. See the *Nortel Ethernet Routing Switch 5000 Series Installation* (NN47200-300) for information about the PoE capability at each port as a function of the power supply modules.

Stacking

You can stack the 5000 Series switches up to 8 units high. These stacks also can be configured for redundancy.

Power pairs

The 5000 Series switches support wiring as mentioned in the IEEE 802.3AF draft standard.

The 5000 Series switches supports power to Signal pair only.

See the *Nortel Ethernet Routing Switch 5000 Series Installation* (NN47200-300) for connector pinout tables and wiring specifics.

Diagnosing and correcting PoE problems

This section discusses some common problems that you can encounter while using the PoE features of the 5000 Series switches.

See the *Nortel Ethernet Routing Switch 5000 Series Troubleshooting* (NN47200-700) for detailed troubleshooting information.

Messages

The following table describes the error messages displayed by a port that supports PoE.

Table 6
Error messages displayed by PoE ports

Error Message	Descriptions
Detecting	The port detects an IP device that is requesting power.
Delivering power	Port delivers the requested power to the IP device.
Disabled	The port power state is disabled.
Invalid PD	The port is detecting a device that is not authorized to request for power.
Deny low priority	Power disabled from the port because of port setting and demands on power budget.
Overload	Power disabled from the port because the port is overloaded.
Test	The port is in testing mode. This was set by using SNMP.
Error	An unspecified error condition has occurred.

Connecting the PSU

Perform this procedure in the order specified to connect the PSU to the Nortel Ethernet Routing Switch 5520.

Procedure steps

Step	Action
1	Ensure that the DC ON/OFF switch on the back of the Nortel Ethernet Routing Switch 5520 is in the OFF position.
2	Plug the external power source into the DC connector receptacle on the back of the Nortel Ethernet Routing Switch 5520, by using the 2-pin power connector and 10-pin control connector.
3	Attach the ground lug on a cable to a grounding point.
4	Plug the power cord from the Nortel Ethernet RPSU 15 to the wall outlet.
5	Plug the power cord from Nortel Ethernet Routing Switch 5520 into the wall outlet.
6	Turn the DC ON/OFF breaker on the back of the switch to the ON position.

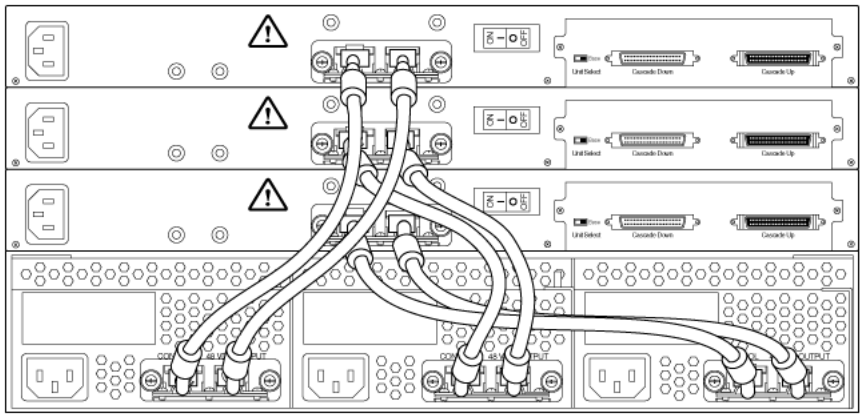
--End--

CAUTION
Ensure that the DC ON/OFF breaker is in the OFF position before you connect or disconnect the optional external power source.

The following figure shows 3 Nortel Ethernet RPSU 15s connected to the back of a stack of 3 Nortel Ethernet Routing Switch 5520 switches.

Note: The grounding wire is connected with a screw, and a star washer is provided on the base of the Nortel Ethernet Routing Switch 5520.

Figure 14
External power source connected to back of the Nortel Ethernet Routing Switch 5520



Power management

The 5000 Series switch uses several device management systems, such as Command Line Interface (NNCLI), and Enterprise Device Manager, as well as Optivity for network-level management services.

With NNCLI or Enterprise Device Manager, you can configure the level of power to specific ports, as well as enable or disable power to each port. You can set the maximum power level for each port by increments of 1 W; in the range of 3 to 16 W. The default power level for each port is 16 W.

You can configure the power priority of each port by choosing low, high, or critical power priority settings. The switch automatically drops low-priority ports when the power requirements exceed the available power budget. If the power requirements are lower than the switch power budget, the power is returned to the dropped port.

For example, assume the following scenario:

- Ports 1 to 20 are configured as low priority
- Port 21 is configured as high priority
- Ports 1 to 20 are connected to powered devices
- Devices on ports are consuming all the available 5000 Series switch power
- A device is connected to port 21 and requests power

In this scenario, the 5000 Series switch provides power to the device on port 21 because that port is configured as high priority. However, to maintain the power budget, the switch drops one of the ports configured as a lower priority. As all the other ports (1 to 20) are configured with a low priority, the switch drops power to the highest port number. In this case, the switch drops power to port 20 and provides power to port 21. If another port drops power, the switch automatically reinstates power to port 20.

You configure the autodiscovery power process as either IEEE 802.3af compliant or IEEE 802.3af draft compliant and legacy:

- 802.3af -- detection method outlined in IEEE 802.3af draft standard
- legacy -- detection standard in use prior to IEEE 802.3af draft standard

The default value is IEEE 802.3af draft compliant. You can set this parameter for the entire switch; you cannot set the discovery mode for each port.

You can obtain power usage information from the management systems. Statistics do not accumulate. The system automatically disconnects the port from power when it detects overload on any port, and the rest of the ports remain functioning.

Note: Ensure that the switch is set for the power detection mode used by the connected powered device. Consult the device documentation for this information.

LLDP fundamentals

Link Layer Discover Protocol (IEEE 802.1ab) Overview

Release 5.0 software supports the Link Layer Discovery Protocol (LLDP) (IEEE 802.1ab), which enables stations connected to a LAN to advertise their capabilities to each other, enabling the discovery of physical topology information for network management. LLDP-compatible stations can consist of any interconnection device including PCs, IP Phones, switches, and routers. Each LLDP station stores LLDP information in a standard Management Information Base (MIB), making it possible for a network management system (NMS) or application to access the information.

Each LLDP station:

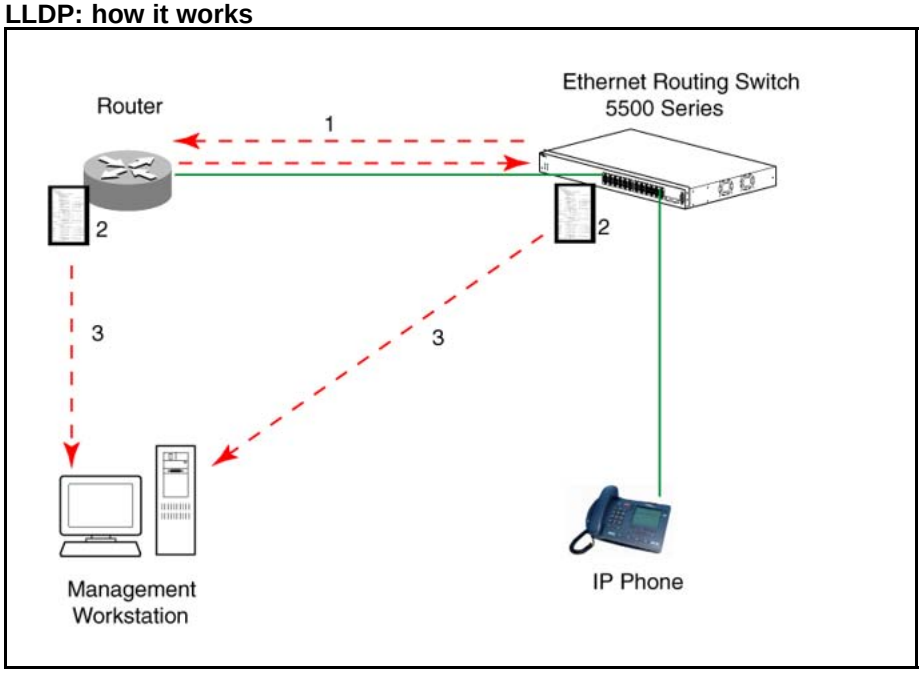
- advertises connectivity and management information about the local station to adjacent stations on the same 802 LAN (802.3 Ethernet with 5000 Series).
- receives network management information from adjacent stations on the same LAN.

LLDP also makes it possible to discover certain configuration inconsistencies or malfunctions that can result in impaired communications at higher layers. For example, it can be used to discover duplex mismatches between an IP Phone and the connected switch.

LLDP is compatible with IETF PROTO MIB (IETF RFC 2922).

The following figure shows an example of how LLDP works in a network.

Figure 15
LLDP: how it works



1. The Ethernet Routing Switch and LLDP-enabled router advertise chassis and port IDs and system descriptions (if enabled) to each other.
2. The devices store the information about each other in local MIB databases, accessible by using SNMP.
3. A network management system retrieves the data stored by each device and builds a network topology map.

LLDP operational modes

LLDP is a one-way protocol. An LLDP agent can transmit information about the capabilities and current status of the system associated with its MAC service access point (MSAP) identifier. The LLDP agent also can receive information about the capabilities and current status of the system associated with a remote MSAP identifier. However, LLDP agents cannot solicit information from each other.

You can set the local LLDP agent to transmit only, receive only, or to both transmit and receive LLDP information. You can configure the state for LLDP reception and transmission using SNMP or NNCLI commands.

Connectivity and management information

The information fields in each LLDP frame are contained in a Link Layer Discovery Protocol Data Unit (LLDPDU) as a sequence of short, variable length information elements known as TLVs (type, length, value).

Each LLDPDU includes the following four mandatory TLVs:

- **Chassis ID TLV**
- **Port ID TLV**
- **Time To Live TLV**
- **End Of LLDPDU TLV**

The chassis ID and the port ID values are concatenated to form a logical MSAP identifier that the recipient uses to identify the sending LLDP agent and port.

A non-zero value in the Time to Live (TTL) field of the TTL TLV indicates to the receiving LLDP agent how long the LLDPDU information from the MSAP identifier remains valid. The receiving LLDP agent automatically discards all LLDPDU information, if the sender fails to update it in a timely manner. A zero value in TTL field of Time To Live TLV tells the receiving LLDP agent to discard the information associated with the LLDPDU MSAP identifier.

In addition to the four mandatory TLVs, Release 5.0 software supports the TLV extension set consisting of Management TLVs and organizationally-specific TLVs. Organizationally-specific TLVs are defined by either the professional organizations or the individual vendors that are involved with the particular functionality being implemented. You can specify which of these optional TLVs to include in the transmitted LLDPDUs for each port.

For more information about the supported TLV extension set, refer to the following:

- "Management TLVs" (page 71)
- "IEEE 802.1 organizationally-specific TLVs" (page 72)
- "IEEE 802.3 organizationally-specific TLVs" (page 72)
- "Organizationally-specific TLVs for MED devices" (page 73)

Management TLVs

The optional management TLVs are as follows:

- **Port Description TLV**
- **System Name TLV**
- **System Description TLV**

- **System Capabilities TLV** (indicates both the system supported capabilities and enabled capabilities, such as end station, bridge, or router)
- **Management Address TLV**

IEEE 802.1 organizationally-specific TLVs

The optional IEEE 802.1 organizationally-specifc TLVs are:

- **Port VLAN ID TLV** contains the local port PVID.
- **Port And Protocol VLAN ID TLV** contains the VLAN IDs of the port and protocol VLANs that contain the local port.
- **VLAN Name TLV** contains the VLAN names of the VLANs that contain the local port.
- **Protocol Identity TLV** advertises the protocol supported. The following values are used for supported protocols on the 5000 Series:
  - Stp protocol {0x00,0x26,0x42,0x42,0x03, 0x00, 0x00, 0x00}
  - Rstp protocol string {0x00,0x27,0x42,0x42,0x03, 0x00, 0x00, 0x02}
  - Mstp protocol string {0x00,0x69,0x42,0x42,0x03, 0x00, 0x00, 0x03}
  - Eap protocol string {0x88, 0x8E, 0x01}
  - Lldp protocol string {0x88, 0xCC}

IEEE 802.3 organizationally-specific TLVs

The optional IEEE 802.3 organizationally-specifc TLVs are:

- **MAC/PHY Configuration/Status TLV** indicates the autonegotiation capability and the speed and duplex status of IEEE 802.3 MAC/PHYs.
- **Power-Via-MDI TLV** indicates the capabilities and current status of IEEE 802.3 PMDs that can provide power over twisted-pair copper links.
- **Link Aggregation TLV** indicates the current link aggregation status of IEEE 802.3 MACs.
- **Maximum Frame Size TLV** indicates the maximum supported 802.3 frame size.

Organizationally-specific TLVs for MED devices

The optional organizationally-specific TLVs for use by Media Endpoint Devices (MED) and MED network connectivity devices are:

- **Capabilities TLV** enables a network element to advertise the LLDP-MED TLVs it is capable of supporting.
- **Network Policy Discovery TLV** is a fixed length TLV that enables both network connectivity devices and endpoints to advertise VLAN type, VLAN identifier (VID), and Layer 2 and Layer 3 priorities associated with a specific set of applications on a port. In addition, an LLDP-MED endpoint advertises this TLV for supported application types to enable the discovery of specific policy information and the diagnosis of network policy configuration mismatch issues.
- **Location Identification TLV** allows network connectivity devices to advertise the appropriate location identifier information for an endpoint to use in the context of location-based applications. The Location Identification Discovery extension enables the advertisement of location identifier information to Communication Endpoint Devices (Class III), based on the configuration of the Network Connectivity Device to which it is connected. This is expected to be related to wiremap or similar network topology data, such that the configuration of the Network Connectivity Device can uniquely identify the physical location of the connected MED Endpoint, and hence the correct location identifier information for it to use.
- **Extended Power-via-MDI TLV** enables advanced power management between an LLDP-MED endpoint and network connectivity devices. The Extended Power-via-MDI TLV enables the advertisement of fine grained power requirement details, endpoint power priority, and power status for both endpoint and network connectivity devices.
- **Inventory TLVs** provide switch information. The LLDP Inventory TLVs consist of the following:
  - **LLDP-MED Hardware Revision TLV** allows the device to advertise its hardware revision.
  - **LLDP-MED Firmware Revision TLV** allows the device to advertise its firmware revision.
  - **LLDP-MED Software Revision TLV** allows the device to advertise its software revision.
  - **LLDP-MED Serial Number TLV** allows the device to advertise its serial number.
  - **LLDP-MED Manufacturer Name TLV** allows the device to advertise the name of its manufacturer.
  - **LLDP-MED Model Name TLV** allows the device to advertise its model name

You can also use the **show sys-info** command to display information about the Inventory TLVs.

Trasmitting LLDPDUs

When a transmit cycle is initiated, the LLDP manager extracts the managed objects from the LLDP local system MIB and formats this information into TLVs. TLVs are inserted into the LLDPDU.

LLDPDU are regularly transmitted at a user-configurable transmit interval (*tx-interval*) or when any of the variables contained in the LLPDU is modified on the local system (such as system name or management address).

Tx-delay is "the minimum delay between successive LLDP frame transmissions."

TLV system MIBs

The LLDP local system MIB stores the information for constructing the various TLVs to be sent. The LLDP remote systems MIB stores the information received from remote LLDP agents.

LLDPDU and TLV error handling

LLDPDUs and TLVs that contain detectable errors are discarded. TLVs that are not recognized, but that also contain no basic format errors, are assumed to be validated and are stored for possible later retrieval by network management.

Time to live interval

The Time to live interval represents the tx-interval multiplied by the tx-hold-multiplier.

Med fast start

Med fast start provides a burst of LLDPDU when the system initializes an LLDP MED transmission.

802.1AB MED network policies

You can configure 802.1AB MED network policies to dynamically configure voice VLAN, DSCP, priority, and VLAN tagging on the switch for voice traffic received from an IP phone. When you enable LLDP and configure the MED network policies on the switch, the switch sends the network policies to the IP Phone. The IP phone processes the data in the LLDP PDU and transmits the voice traffic with the appropriate VLAN ID, VLAN tagging, DSCP and priority information.

You can configure MED network policies on a switch port that has ADAC enabled. The network policies have priority over the ADAC configuration on the port.

When you enable Auto QoS, the MED network policy is changed to DSCP 47 (0x2F) from user defined DSCP.

Nortel Automatic QoS enhancement for LLDP-MED

The Nortel Automatic QoS enhancement for LLDP-MED allows Nortel Automatic QoS to set the DSCP, sent by Network Policy TLV for voice traffic application types, to a value that it recognizes. The LLDP compliant IP phone uses the received DSCP when sending voice traffic so that the traffic is recognized by the Nortel Aunotmatic QoS and is prioritized accordingly.

This feature is automatically enabled when Nortel Automatic QoS is enabled on switch.

System configuration with NNCLI

General switch administration with NNCLI

This section outlines the Command Line Interface commands used in general switch administration. It contains information about the following topics:

Stack manager

Use the following procedures to integrate switches in a stack with the stack manager:

Configuring a pure stack with stack manager

Use this procedure to configure a pure stack with stack manager.

Procedure steps

Step	Action
1	Upgrade the existing stack with release 6.2 software.

--End--

Configuring a hybrid stack with stack manager

Use this procedure to configure a hybrid stack with stack manager.

Procedure steps

Step	Action
1	Upgrade the existing stack with release 6.0 software.
2	Cable in one Ethernet Routing Switch 5600 Series switch into this stack. *Once the new Ethernet Routing Switch 5600 Series switch joins the stack, it will have learned the entire configuration from the base unit and programmed its NVRAM. This switch can now be configured as base unit.*
3	To configure the Ethernet Routing Switch 5600 Series switch as the base unit, turn the power off to the whole stack and set the base unit switch on the Ethernet Routing Switch 5500 Series switch to Off and set the base unit switch on the Ethernet Routing Switch 5600 Series switch to On.
4	Turn the power on to the stack. The Ethernet Routing Switch 5600 Series switch is now the base unit in the stack. *You can now add more than one Ethernet Routing Switch 5600 Series switch to the stack. You can add more Ethernet Routing Switch 5600 Series switches to the stack up to the maximum of eight units.*

--End--

show stack oper-mode

An Ethernet Routing Switch 5000 Series stack is in one of two modes: Pure or Hybrid.

Use this procedure to display the stack operation mode.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `show stack oper-mode`

--End--

stack oper-mode {Pure|Hybrid}

You can configure the operating mode on all the Ethernet Routing Switch 5600 Series switches in the stack. Ethernet Routing Switch 5500 Series switches do not have a configurable operating mode as the software operates in only one mode.

This command is available only on the Ethernet Routing Switch 5600 Series switches in the stack or on an Ethernet Routing Switch 5600 Series stand-alone switch.

Use this procedure to configure the stack as Pure or Mixed.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `stack oper-mode {Pure|Hybrid}`

--End--

Variable definitions

The following table defines the parameters for the `stack oper-mode {Pure|Hybrid}` command.

Table 7
stack oper-mode command parameters

Variable	Value
Pure	Sets stack manager for an Ethernet Routing Switch 5600 Series stack or stand-alone.
Hybrid	Sets stack manager for a hybrid Ethernet Routing Switch 5600 Series and Ethernet Routing Switch 5600 Series stack. ***Note:*** You must use an Ethernet Routing Switch 5600 Series switch as the base unit in a hybrid or mixed stack.

Multiple switch configurations

The following NNCLI commands are used to configure and use multiple switch configuration:

show nvram block command

Use this procedure to show the configurations currently stored on the switch.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **show nvram block**
	--End--

copy config nvram block command

Use this procedure to copy the current configuration to one of the flash memory spots.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **copy config nvram block <1-2> name <block_name>**
	--End--

Variable definitions

The following table describes the parameters for the **copy config nvram block <1-2> name <block_name>** command.

Table 8
copy config nvram block command parameters

Variable	Value
block <1 - 2>	The flash memory location to store the configuration.
name <block_name>	The name to attach to this block. Names can be up to 40 characters in length with no spaces.

copy nvram config block command

Use this procedure to copy the configuration stored in flash memory at the specified location and make it the active configuration.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **`copy nvram config block <1-2>`** Substitute **`<1-2>`** with the configuration file to load.
	--End--

This command causes the switch to reset so that the new configuration can be loaded.

New Unit Quick Configuration

In Software Release 4.2 and later, use the New Unit Quick Configuration feature to create a default configuration that can be applied to any new unit entering a stack configuration.
You do not need to manually configure a new unit that is added to the existing stack.
However, if required, you can set the default values for VLAN Ids, port speed, duplex mode, PVID, tagging, and spanning tree groups on the new unit without the need to reset the stack during the process.

Note: All commands in this section are executed in the Global Configu ration command mode except the **`quickconfig start-recording`** command which is executed in Privileged EXEC mode.

To configure and enable this feature with NNCLI, refer to the following commands:

- “quickconfig enable” (page 81)
- “no quickconfig enable” (page 82)
- “default quickconfig” (page 82)
- “quickconfig start-recording” (page 82)

quickconfig enable

Use this procedure to enable the quick configuration feature on the switch.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `quickconfig enable`

--End--

no quickconfig enable

Use this procedure to disable the quick configuration feature on the switch.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `no quickconfig enable`

--End--

default quickconfig

Use this procedure to set the quick configuration feature to the factory default value.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `default quickconfig`

--End--

quickconfig start-recording

Use this procedure on the stack base unit to record the default configuration that is applied to new units in the stack.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `quickconfig (start-recording) [u3]`
2	To record a VLAN configuration or port configuration enter the following commands one on each line in NNCLI:

```
enable
config term
vlan port $/13-40 tag untagPvidonly
vlan create 10 name vlan_10 type port
vlan create 20 name vlan_20 type port
vlan members add 10 $/13-40
vlan members add 20 $/13-40
vlan ports $/13-40 pvid 10
interface fast $/13-34
speed 100
end
.
```

--End--

CAUTION
The first two commands must be **enable** and **config term**, otherwise the **config** commands that follow will not be applied.

Use **$** as a wild card for the slot. When you add a new unit to the stack the unit number is not known so the wild card character can match any slot number. To end the recording process enter a dot on a separate line in NNCLI.

IP blocking

IP blocking provides a safeguard against the use of duplication IP addresses in a stack at the Layer 3 level. When a unit leaves a stack or reboots the IP blocking feature ensures that duplicate IPs are not present.

Use the following NNCLI commands to configure and manage IP blocking with NNCLI:

- "show ip-blocking" (page 83)
- "show ip blocking-mode" (page 84)
- "ip blocking-mode command" (page 84)
- "clear ip-blocking" (page 85)
- "default ip blocking-mode" (page 85)

show ip-blocking

Use this procedure to show the current IP blocking state.

Procedure steps

Step	Action
1	Use the following command from User EXEC mode: **show ip-blocking**

--End--

show ip blocking-mode

Use this procedure to show the current IP blocking parameters.

Procedure steps

Step	Action
1	Use the following command from User EXEC mode: **show ip blocking-mode**

--End--

ip blocking-mode command

Use this procedure to set the level of ip blocking to perform in the stack.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **ip blocking-mode {full | none}**

--End--

Variable definitions

The following table describes the parameters for the **ip blocking-mode {full | none}** command.

Table 9
ip blocking-mode command parameters

Variable	Value
full	Select this parameter to set IP blocking-mode to full. This never enables a duplicate IP address in a stack.
none	Select this parameter to set IP blocking-mode to none. This enables duplicate IP addresses unconditionally.

clear ip-blocking

Use this procedure to clear the current IP blocking-mode state.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: `clear ip-blocking`
	--End--

default ip blocking-mode

Use this procedure to set the IP blocking mode to factory defaults.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `default ip blocking-mode`
	--End--

Assigning and clearing IP addresses

You can assign, clear, and view IP addresses and gateway addresses with NNCLI. Use the following commands to perform various operations on IP and gateway addresses:

ip address command

Use this procedure to set the IP address and subnet mask for the switch or a stack.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **ip address [stack | switch] <A.B.C.D> [netmask <A.B.C.D>] [default-gateway <A.B.C.DX>]** If the stack or switch parameter is not specified, the system automatically modifies the stack IP address when in stack mode and modifies the switch IP address when in stand-alone mode.

--End--

Variable definitions

The following table describes the parameters for the **ip address [stack | switch] <A.B.C.D> [netmask <A.B.C.D>] [default-gateway <A.B.C.DX>]** command.

Table 10
ip address command parameters

Variable	Value
stack | switch	Sets the IP address and netmask of the stack or the switch.
A.B.C.D	Denotes the IP address in dotted-decimal notation; netmask is optional.
netmask	Signifies the IP subnet mask for the stack or switch.
Default Gateway A.B.C.D	Displays the IP address of the default gateway. Enter the IP address of the default IP gateway.

Note: When the IP address or subnet mask is changed, connectivity to Telnet can be lost.

ip address source command

Use this procedure to automatically obtain an IP address, subnet mask and default gateway on the switch or stack.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **ip address source {bootp-always | bootp-last-address | bootp-when-needed | configured-address | dhcp-always | dhcp-last-address | dhcp-when-needed}**

When you use DHCP, the switch or stack can also obtain up to three DNS server IP addresses.

--End--

Variable definitions

The following table describes the parameters for the **ip address source** command.

Table 11
ip address source command parameters

Variable	Value
bootp-always	Always use the bootp server.
bootp-last-address	Use the last bootp server.
bootp-when-needed	Use bootp server when needed.
configured-address	Use the manually configured IP configuration.
dhcp-always	Always use the DHCP server.
dhcp-last-address	Use the last DHCP server.
dhcp-when-needed	Use DHCP client when needed.

no ip address command

Use this procedure to clear the IP address and subnet mask for a switch or a stack.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **no ip address {stack | switch | unit}** This command sets the IP address and subnet mask for a switch or a stack to all zeros (0).

--End--

Variable definitions

The following table describes the parameters for the **no ip address {stack | switch | unit}** command.

Table 12
no ip address command parameters

Variable	Value
stack | switch	Zeroes out the stack IP address and subnet mask or the switch IP address and subnet mask.
unit	Zeroes out the IP address for the specified unit.

Note: When the IP address or subnet mask is changed, connectivity to Telnet can be lost. Any new Telnet connection can be disabled and is required to connect to the serial console port to configure a new IP address.

ip default-gateway command

Use this procedure to set the default IP gateway address for a switch or a stack to use.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **`ip default-gateway <A.B.C.D>`**

--End--

Variable definitions

The following table describes the parameters for the **`ip default-gateway`** command.

Table 13
ip default-gateway command parameters

Variable	Value
A.B.C.D	Enter the dotted-decimal IP address of the default IP gateway.

Note: When the IP gateway is changed, connectivity to Telnet can be lost.

no ip default-gateway command

Use this procedure to set the IP default gateway address to zero (0).

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `no ip default-gateway`

--End--

Note: When the IP gateway is changed, connectivity to Telnet can be lost.

show ip command

Use this procedure to display the IP configurations, BootP/DHCP mode, stack address, switch address, subnet mask, and gateway address.

Procedure steps

Step	Action
1	Use the following command from User EXEC mode: `show ip [bootp] [dhcp] [default-gateway] [address]` This command displays the parameters for what is configured, what is in use, and the last BootP/DHCP. If you do not enter any parameters, this command displays all IP-related configuration information.

--End--

Variable definitions

The following table describes the parameters and variables for the `show ip` command.

Table 14
show ip command parameters

Variable	Value
bootp	Displays BootP/DHCP-related IP information. The possibilities for status returned are: • BootP Always • Disabled • BootP or Last Address • BootP When Needed • DHCP Always

Variable	Value
	• DHCP or Last Address • DHCP When Needed
dhcp client lease	Displays DHCP client lease information. The command displays information about configured lease time and lease time granted by the DHCP server.
default-gateway	Displays the IP address of the default gateway.
address	Displays the current IP address.
address source	Displays the BootP or DHCP client information. The possibilities for status returned are: • DHCP always • DHCP when needed • DHCP or last address • Disabled • BootP always • BootP when needed • BootP or last address

Assigning and clearing IP addresses for specific units

You can use NNCLI to assign and clear IP addresses for a specific unit in a stack. For details, refer to the following:

- “ip address unit command” (page 90)
- Table 16 "no ip address command parameters" (page 91)
- “default ip address unit command” (page 91)

ip address unit command

Use this procedure to set the IP address and subnet mask of a specific unit in the stack.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `ip address unit <1-8> [A.B.C.D]`

--End--

Variable definitions

The following table describes the parameters the **ip address unit <1-8> [A.B.C.D]** command.

Table 15
ip address unit command parameters

Variable	Value
unit <1-8>	Sets the unit you are assigning an IP address.
A.B.C.D	Enter IP address in dotted-decimal notation.

Note: When the IP address or subnet mask is changed, connectivity to Telnet and the Internet can be lost.

no ip address unit command

Use this procedure to set the IP address for the specified unit in a stack to zeros (0).

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **no ip address unit <1-8>**

--End--

Variable definitions

The following table describes the parameters the **no ip address unit <1-8>** command.

Table 16
no ip address command parameters

Variable	Value
unit <1-8>	Zeroes out the IP address for the specified unit.

Note: When the IP address or subnet mask is changed, connectivity to Telnet and the Internet can be lost.

default ip address unit command

Use this procedure to set the IP address for the specified unit in a stack to all zeros (0).

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `default ip address unit <1-8>`

--End--

Variable definitions

The following table describes the parameters for the `default ip address unit <1-8>` command.

Table 17
default ip address unit command parameters

Variable	Value
unit <1-8>	Zeroes out the IP address for the specified unit.

Note: When the IP gateway is changed, connectivity to Telnet and the Internet can be lost.

Displaying interfaces

The status of all interfaces on the switch or stack can be viewed, including Multi-Link Trunk membership, link status, autonegotiation and speed.

show interfaces command

Use this procedure to display the current configuration and status of all interfaces.

Procedure steps

Step	Action
1	Use the following command from User EXEC mode: `show interfaces [names] [<portlist>]`

--End--

Variable definitions

The following table describes the parameters and variables for the `show interfaces` command.

Table 18
show interfaces command parameters

Value	Variable
names <portlist>	Displays the interface names; enter specific ports if you want to see only those.

Setting port speed

To set port speed and duplexing with NNCLI, refer to the following:

- "speed command" (page 93)
- "default speed command" (page 94)
- "duplex command" (page 94)
- "default duplex command" (page 95)

speed command

Use this procedure to set the speed of the port.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: `speed [port <portlist>] {10 | 100 | 1000 | auto}`

--End--

Variable definitions

The following table describes the parameters and variables for the **`speed`** command.

Table 19
speed command parameters

Variable	Value
port <portlist>	Specifies the port numbers for which to configure the speed. Enter the port numbers you want to configure. ***Note:*** If you omit this parameter, the system uses the port number you specified in the **`interface`** command.
10|100|1000|auto	Sets speed to: • 10--10 Mb/s • 100--100 Mb/s

Variable	Value
	• 1000--1000 Mb/s or 1 GB/s • auto--autonegotiation

Note: Enabling/disabling autonegotiation for speed also enables/disables it for duplex operation.When you set the port speed for autonegotiation, ensure that the other side of the link is also set for autonegotiation.

default speed command

Use this procedure to set the speed of the port to the factory default speed.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **`default speed [port <portlist>]`**
	--End--

Variable definitions

The following table describes the parameters for the **`default speed [port <portlist>]`** command.

Table 20
Default speed command parameters

Variable	Value
port <portlist>	Specifies the port numbers to set the speed to factory default. Enter the port numbers you want to set. ***Note:*** If you omit this parameter, the system uses the port number you specified in the **`interface`** command.

duplex command

Use this procedure to specify the duplex operation for a port.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **duplex [port <portlist>] {full | half | auto}**

--End--

Variable definitions

The following table describes the parameters for the **duplex [port <portlist>] {full | half | auto}** command.

Table 21
Duplex command parameters

Variable	Value
port <portlist>	Specifies the port numbers for which to reset the duplex mode to factory default values. Enter the port number you want to configure. The default value is autonegotiation. ***Note:*** If you omit this parameter, the system uses the ports you specified in the **interface** command.
full | half | auto	Sets duplex to: • full--full-duplex mode • half--half-duplex mode • auto--autonegotiation

Note: Enabling/disabling autonegotiation for speed also enables/disables it for duplex operation.When you set the duplex mode for autonegotiation, ensure that the other side of the link is also set for autonegotiation.

default duplex command

Use this procedure to set the duplex operation for a port to the factory default duplex value.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **default duplex [port <portlist>]**

--End--

Variable definitions

The following table describes the parameters for the **default duplex [port <portlist>]** command.

Table 22
Default duplex command parameters

Variable	Value
port <portlist>	Specifies the port numbers to reset the duplex mode to factory default values. Enter the port numbers you want to configure. The default value is autonegotiation. ***Note:*** If you omit this parameter, the system uses the ports you specified in the **interface** command.

Testing cables with the Time Domain Reflectometer

The Nortel Ethernet Routing Switch 5000 Series is equipped with a Time Domain Reflectometer (TDR). The TDR provides a diagnostic capability to test connected cables for defects (such as short pin and pin open). You can obtain TDR test results from NNCLI or Enterprise Device Manager.

The cable diagnostic tests only apply to Ethernet copper ports; fiber ports cannot be tested.

You can initiate a test on multiple ports at the same time.

When you test a cable with the TDR, if the cable has a 10/100 MB/s link, the link is broken during the test and restored only when the test is complete. If the cable has a 10/100 MB/s link, the test results may be incomplete as the test does not test all of the pins in the connector. Use of the TDR does not affect 1 GB/s links.

See the *Nortel Ethernet Routing Switch Troubleshooting Guide* () (NN47200-700) for more information on troubleshooting cables and for connector pin tables.

Note: The accuracy margin of cable length diagnosis is between three to five meters. Nortel suggests the shortest cable for length information be five meters long.

With the following NNCLI commands, you can initiate a TDR cable diagnostic test and obtain test reports.

- "tdr test command" (page 97)
- "show tdr command" (page 97)

tdr test command

Use this procedure to initiate a TDR test on a port or ports.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: **`tdr test <portlist>`**

--End--

Variable definitions

The following table describes the parameters for the **`tdr test <portlist>`** command.

Table 23
Tdr test command parameters

Variable	Value
<portlist>	Specifies the ports to be tested.

show tdr command

Use this procedure to display the results of a TDR test.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: **`show tdr <portlist>`**

--End--

Variable definitions

The following table describes the parameters for the **`show tdr <portlist>`** command.

Table 24
Show tdr command parameters

Variable	Value
<portlist>	Specifies the ports for which to display the test results.

Enabling Autotopology

The Optivity Autotopology protocol can be configured with NNCLI.

For more information about Autotopology, refer to http://www.nortel.com/support. (The product family for Optivity and Autotopology is Data and Internet.)

To enable autotopology with NNCLI, refer to the following:

- “autotopology command” (page 98)
- “no autotopology command” (page 99)
- “default autotopology command” (page 99)
- “show autotopology settings command” (page 99)
- “show autotopology nmm-table command” (page 100)

autotopology command

Use this procedure to enable the Autotopology protocol.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `autotopology`

--End--

no autotopology command

Use this procedure to disable the Autotopology protocol.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `no autotopology`

--End--

default autotopology command

Use this procedure to enable the Autotopology protocol.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `default autotopology`

--End--

Note: The `default autotopology` command has no parameters or values.

show autotopology settings command

Use this procedure to display the global autotopology settings.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: **show autotopology settings**

--End--

Note: The **show autotopology settings** command has no parameters or values.

show autotopology nmm-table command

Use this procedure to display the Autotopology network management module (NMM) table.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: **show autotopology nmm-table**

--End--

Note: The **show autotopology nmm-table** command has no parameters or values.

Enabling flow control

Gigabit Ethernet, when used with the Nortel Ethernet Routing Switch 5000 Series, can control traffic on this port using the **flowcontrol** command.

To enable flow control with NNCLI, refer to the following:

- “flowcontrol command” (page 100)
- “no flowcontrol command” (page 101)
- “default flowcontrol command” (page 102)

flowcontrol command

Use this procedure to control the traffic rates during congestion.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: `flowcontrol [port <portlist>] {asymmetric | symmetric | auto | disable}` ***Note:*** This command is used only on Gigabit Ethernet ports.

--End--

Variable definitions

The following table describes the parameters for the **`flowcontrol`** command.

Table 25
Flowcontrol command parameters

Variable	Value
port <portlist>	Specifies the port numbers to configure for flow control. ***Note:*** If you omit this parameter, the system uses the ports you specified in the **`interface`** command but only those ports which have speed set to 1000/full.
asymmetric | symmetric | auto | disable	Sets the mode for flow control: • asymmetric--PAUSE frames can only flow in one direction. • symmetric--PAUSE frames can flow in either direction. • auto--sets the port to automatically determine the flow control mode (default). • disable--disables flow control on the port.

no flowcontrol command

Use this procedure to disable flow control.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: `no flowcontrol [port <portlist>]` ***Note:*** This command is used only on Gigabit Ethernet ports.

--End--

Variable definitions

The following table describes the parameters for the **`no flowcontrol`** command.

Table 26
No flowcontrol command parameters

Variable	Value
port <portlist>	Specifies the port numbers for which to disable flow control. ***Note:*** If you omit this parameter, the system uses the ports you specified in the **`interface`** command, but only those ports that have speed set to 1000/full.

default flowcontrol command

Use this procedure to set the flow control to auto, which automatically detects the flow control.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: `default flowcontrol [port <portlist>]` ***Note:*** This command is used only on Gigabit Ethernet ports.

--End--

Variable definitions

The following table describes the parameters for the **`default flowcontrol`** command.

Table 27
Default flowcontrol command parameters

Variable	Value
port <portlist>	Specifies the port numbers to default to auto flow control. ***Note:*** If you omit this parameter, the system uses the port number you specified in the **`interface`** command.

Enabling rate-limiting

The percentage or packets per seconds of multicast traffic, or broadcast traffic, or both can be limited with NNCLI. For details, refer to the following:

- "show rate-limit command" (page 103)
- "rate-limit command" (page 103)
- "no rate-limit command" (page 104)
- "default rate-limit command" (page 105)

show rate-limit command

Use this procedure to display the rate-limiting settings and statistics.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: **`show rate-limit`**

--End--

rate-limit command

Use this procedure to configure rate-limiting on the port.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **`rate-limit {multicast | broadcast | both } {percent <0-10>| pps <0-262143 | <0-10>}`**

--End--

Variable definitions

The following table describes the parameters for the **rate-limit** command.

Table 28
Rate-limit command parameters

Variable	Value
multicast | broadcast | both	Applies rate-limiting to the type of traffic. • multicast--applies rate-limiting to multicast packets • broadcast--applies rate-limiting to broadcast packets • both--applies rate-limiting to both multicast and broadcast packets
percent <0-10> | pps <0-262143>	Specifies the mode for setting the rates of the incoming traffic. • percent <0-10>--enter and integer from 1 to 10 to set the rate-limiting percentage. • pps <0-262143>--enter an integer from 1 to 262143 to set the rate-limiting packets per second. For 10 Gb/s links, the default value for limiting both broadcast and multicast is 10 percent. When pps mode is used the limit on 10 Gb/s links cannot be configured to a value under 1000. Rate limiting using packet per seconds can only be configured using NNCLI.

no rate-limit command

Use this procedure to disable rate-limiting on the port.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **no rate-limit [port <portlist>]**

--End--

Variable definitions

The following table describes the parameters for the **no rate-limit** command.

Table 29
No rate-limit command parameters

Variable	Value
port <portlist>	Specifies the port numbers to disable for rate-limiting. Enter the port numbers you want to disable. ***Note:*** If you omit this parameter, the system uses the port number you specified in the **`interface`** command.

default rate-limit command

Use this procedure to restore the rate-limiting value for the specified port to the default setting.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **`default rate-limit [port <portlist>]`**

--End--

Variable definitions

The following table describes the parameters for the **`default rate-limit`** command.

Table 30
Default rate-limit command parameters

Variable	Value
port <portlist>	Specifies the port numbers on which to reset rate-limiting to factory default. Enter the port numbers on which to set rate-limiting to default. ***Note:*** If you omit this parameter, the system uses the port number you specified in the **`interface`** command.

Using Simple Network Time Protocol

The Simple Network Time Protocol (SNTP) feature synchronizes the Universal Coordinated Time (UCT) to an accuracy within 1 second. This feature adheres to the IEEE RFC 2030 (MIB is the s5agent). With this feature, the system can obtain the time from any RFC 2030-compliant NTP/SNTP server.

> ***Note:*** If you have trouble using this feature, try various NTP servers. Some NTP servers can be overloaded or currently inoperable.The system retries connecting with the NTP server a maximum of three times, with 5 minutes between each retry.

Using SNTP provides a real-time timestamp for the software, shown as Greenwich Mean Time (GMT).

If SNTP is enabled, the system synchronizes with the configured NTP server at boot-up and at user-configurable periods thereafter (the default synchronization interval is 24 hours). The first synchronization is not performed until network connectivity is established.

SNTP supports primary and secondary NTP servers. The system tries the secondary NTP server only if the primary NTP server is unresponsive.

To configure SNTP, refer to the following commands:

show SNTP command

Use this procedure to display the SNTP information, as well as the configured NTP servers.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: **show SNTP**

--End--

show sys-info command

Use this procedure to display the current system characteristics.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: **show sys-info**

--End--

Note: You must have SNTP enabled and configured to display GMT time.

SNTP enable command

Use this procedure to enable SNTP.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **SNTP enable**

--End--

Note: The default setting for SNTP is disabled.

no SNTP enable command

Use this procedure to disable SNTP.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `no SNTP enable`

--End--

SNTP server primary address command

Use this procedure to specify the IP addresses of the primary NTP server.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `sntp server primary address [<ipv6_address> | <A.B.C.D>]`

--End--

Variable definitions

The following table describes the parameters for the **`sntp server primary address`** command.

Table 31
SNTP server primary address command parameters

Variable	Value
<A.B.C.D>	Enter the IP address of the primary NTP server in dotted-decimal notation.

SNTP server secondary address command

Use this procedure to specify the IP addresses of the secondary NTP server.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `sntp server secondary address [<ipv6_address> | <A.B.C.D>]`

--End--

Variable definitions

The following table describes the parameters for the **sntp server secondary address** command.

Table 32
SNTP server secondary address command parameters

Variable	Value
ipv6_address	Enter the IPv6 address of the secondary NTP server.
<A.B.C.D>	Enter the IP address of the secondary NTP server in dotted-decimal notation.

no SNTP server command

Use this procedure to clear the NTP server IP addresses. The command clears the primary and secondary server addresses.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **no sntp server {primary | secondary}**

--End--

Variable definitions

The following table describes the parameters for the **no sntp server** command.

Table 33
no SNTP server command parameters

Variable	Value
primary	Clear primary SNTP server address.
secondary	Clear secondary SNTP server address.

SNTP sync-now command

Use this procedure to force a manual synchronization with the NTP server.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `SNTP sync-now`

--End--

Note: SNTP must be enabled before this command can take effect.

SNTP sync-interval command

Use this procedure to specify recurring synchronization with the secondary NTP server in hours relative to initial synchronization.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `sntp sync-interval <0-168>`

--End--

Variable definitions

The following table describes the parameters for the `sntp sync-interval` command.

Table 34
SNTP sync-interval command parameters

Variable	Value
<0-168>	Enter the number of hours for periodic synchronization with the NTP server. ***Note:*** 0 is boot-time only, and 168 is once a week.

Configuring the local time zone

Use this procedure to configure your switch for your local time zone.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `configure`

2 Enable sntp server.

3 Set clock time zone using the clock command.
clock time-zone zone hours [minutes]

setting time zone example

clock time-zone PST -8

This command sets the time zone to UTP minus 8 hours and the time zone will be displayed as "PST."

--End--

Variable definitions

The following table describes the parameters for the **clock time-zone zone hours [minutes]** command.

Table 35
clock time-zone command parameters

Variable	Value
zone	Time zone acronym to be displayed when showing system time (up to 4 characters).
hours	Difference from UTC in hours. This can be any value between -12 and +12.
minutes	Optional: This is the number of minutes difference from UTC. Minutes can be any value between 0 and 59.

Configuring daylight savings time

Use this procedure to configure local daylight savings time recurring change dates.

Step	Action
1	Use the following command from Global Configuration mode: **configure**
2	Enable sntp server.
3	Set the date to change to daylight savings time. **clock summer-time zone date day month year hh:mm day month year hh:mm [offset]**

set daylight savings time example

clock summer-time BST date 28 Mar 2007 2:00 30 Aug 2007 15:00 +60

This command sets the daylight savings time to begin at 02:00 on March 28, 2007 and end on August 30th, 2007 at 15:00. The change to daylight savings moves the clock forward by 60 minutes and "BST" will be displayed as the time zone acronym. These changes to and from daylight savings time will happen automatically.

--End--

Variable definitions

The following table describes the parameters for the **clock summer-time zone date day month year hh:mm day month year hh:mm [offset]** command

Table 36
daylight savings command parameters

Variable	Value
date	Indicates that daylight savings time should start and end on the specified days every year.
day	Date to start daylight savings time.
month	Month to start daylight savings time.
year	Year to start daylight savings time.
hh:mm	Hour and minute to start daylight savings time.
day	Date to end daylight savings time.
month	Month to end daylight savings time.
year	Year to end daylight savings time.
hh:mm	Hour and minute to end daylight savings time.
offset	Number of minutes to add during the summer time.
zone	The time zone acronym to be displayed when daylight savings time is in effect. If it is unspecified, it defaults to the time zone acronym set when the time zone was set.

Real time clock configuration

In addition to SNTP time configuration, a real-time clock (RTC) is available to provide the switch with time information. This RTC provides the switch information in the instance that SNTP time is not available.

Use the following commands to view and configure the RTC:

clock set command

Use this procedure to set the RTC. The syntax of the clock set.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: **`clock set {<LINE> | <hh:mm:ss>}`**

--End--

Variable definitions

The following table outlines the parameters for the **`clock set {<LINE> | <hh:mm:ss>}`** command.

Table 37
clock set command parameters

Variable	Value
<LINE>	A string in the format of mmddyyyyhhmmss that defines the current local time.
<hh:mm:ss>	Numeric entry of the current local time in the manner specified.

Clock sync-rtc-with-SNTP enable command

Use this procedure to enable the synching of the RTC with the SNTP clock when the SNTP clock synchronizes.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `clock sync-rtc-with-sntp enable`

--End--

no clock sync-rtc-with-SNTP enable

Use this procedure to disable the synching of the RTC with the SNTP clock when the SNTP clock synchronizes.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `no clock sync-rtc-with-sntp enable`

--End--

Default clock sync-rtc-with-SNTP enable

Use this procedure to set the synchronizing of the RTC with the SNTP clock to factory defaults.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `default clock sync-rtc-with-sntp enable`

--End--

Clock source command

Use this procedure to set the default clock source for the switch.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `clock source {sntp | rtc | sysUpTime}`

Substitute **{sntp | rtc | sysUpTime}** with the clock source selection.

--End--

default clock source

Use this procedure to set the clock source to factory defaults.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **default clock source**

--End--

Custom Autonegotiation Advertisements

Custom Autonegotiation Advertisement (CANA) customizes the capabilities that are advertised. It also controls the capabilities that are advertised by the Nortel Ethernet Routing Switch 5000 Series as part of the auto-negotiation process.

The following sections describe configuring CANA with NNCLI:

- “Configuring CANA” (page 115)
- “Viewing current autonegotiation advertisements” (page 52)
- “Viewing hardware capabilities” (page 116)
- “Setting default auto-negotiation-advertisements” (page 116)
- “no auto-negotiation-advertisements command” (page 117)

Configuring CANA

Use this procedure to configure CANA.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **auto-negotiation-advertisements** To configure port 5 to advertise the operational mode of 10 Mb/s and full duplex enter the following command

line:**auto-negotiation-advertisements port 5 10-full**

--End--

Viewing current autonegotiation advertisements

Use this procedure to view the autonegotiation advertisements for the device.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **show auto-negotiation-advertisements [port <portlist>]**

--End--

Viewing hardware capabilities

Use this procedure to view the available operational modes for the device.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **show auto-negotiation-capabilities [port <portlist>]**

--End--

Setting default auto-negotiation-advertisements

Use this procedure to make a port advertise all its auto-negotiation-capa bilities.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **default auto-negotiation-advertisements [port <portlist>]**

To set default advertisements for port 5 of the device, enter the following command line:

```
default auto-negotiation-advertisements port 5
```

--End--

no auto-negotiation-advertisements command

Use this procedure to make a port silent.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: `no auto-negotiation-advertisements [port <portlist>]`

--End--

Connecting to Another Switch

Using the Command Line Interface (CLI), it is possible to communicate with another switch while maintaining the current switch connection. This is accomplished with the familiar **ping** and **telnet** commands.

ping command

Use this procedure to determine if communication with another switch can be established.

Procedure steps

Step	Action
1	Use the following command from User EXEC mode: `ping <ipv6_address | dns_host_name> [datasize <64-4096>] [{count <1-9999>} | continuous] [{timeout | -t} <1-120>] [interval <1-60>] [debug]` Substitute `<ipv6_address | dns_host_name>` with either the IPv6 address or the DNS host name of the unit to test.

--End--

Variable definitions

The following table describes the parameters for the **ping** command.

Table 38
ping command parameters

Variable	Value
<ipv6_address | dns_host_name>	The IPv6 address or the DNS host name of the unit to test.
datasize <64–4096>	Specify the size of the ICMP packet to be sent. The data size range is from 64 to 4096 bytes.
count <1–9999> | continuous	Set the number of ICMP packets to be sent. The continuous mode sets the ping running until the user interrupts it by entering Ctrl+C.
timeout | -t | <1–120>	Set the timeout using either the **timeout** with the **-t** parameter followed by the number of seconds the switch must wait before timing out.
interval <1–60>	Specify the number of seconds between transmitted packets.
debug	Provide additional output information such as the ICMP sequence number and the trip time.

telnet command

Use this procedure to establish communications with another switch during the current NNCLI session.

Procedure steps

Step	Action
1	Use the following command from User EXEC mode: **telnet <ipv6_address | dns_host_name>** Substitute **<ipv6_address | dns_host_name>** with either the IPv6 address or the DNS host name of the unit with which to communicate. Communication can be established to only one external switch at a time using the **telnet** command.

--End--

Domain Name Server (DNS) Configuration

Domain name servers are used when the switch needs to resolve a domain name (such as "nortel.com") to an IP address. The following commands allow for the configuration of the switch domain name servers:

- “show ip dns command” (page 119)
- “ip domain-name command” (page 119)
- “no ip domain-name command” (page 119)

show ip dns command

Use this procedure to display DNS-related information.

Procedure steps

Step	Action
1	Use the following command from User EXEC mode: **`show ip dns`** ***Note:*** This information includes the default switch domain name and any configured DNS servers.

--End--

ip domain-name command

Use this procedure to set the default DNS domain name for the switch.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **`ip domain-name <domain_name>`** Substitute **`<domain_name>`** with the default domain name to be used. A domain name is determined to be valid if it contains alphanumeric characters and contains at least one period (.). ***Note:*** This default domain name is appended to all DNS queries or commands that do not already contain a DNS domain name.

--End--

no ip domain-name command

Use this procedure to clear a previously configured default DNS domain name for the switch.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `no ip domain-name`

--End--

default ip domain-name command

Use this procedure to set the system default switch domain name.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `default ip domain-name` ***Note:*** Because this default is an empty string, this command has the same effect as the `no ip domain-name` command.

--End--

ip name-server command

Use this procedure to set the domain name servers the switch uses to resolve a domain name to an IP address.

Procedure steps

Step	Action

1	Use the following command from Global Configuration mode:
	`ip name-server [<ipv6_address> | <ip_address_1>`
	`ip name-server [<ipv6_address> | <ip_address_2>]`
	`ip name-server [<ipv6_address> | <ip_address_3>]`
	
	A switch can have up to three domain name servers specified for this purpose.
	
	Note: To enter all three server addresses you must enter the command three times, each with a different server address.

--End--

Variable definitions

The following table outlines the parameters for the **ip name-server** command.

Table 39
ip name-server command parameters

Variable	Value
ipv6_address	The IPv6 address of the domain name server used by the switch.
<ip_address_1>	The IP address of the domain name server used by the switch.
<ip_address_2>	Optional. The IP address of a domain name server to add to the list of servers used by the switch.
<ip_address_3>	Optional. The IP address of a domain name server to add to the list of servers used by the switch.

no ip name-server command

Use this procedure to remove domain name servers from the list of servers used by the switch to resolve domain names to an IP address.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **no ip name-server <ip_address_1>** **no ip name-server [<ip_address_2>]** **no ip name-server [<ip_address_3>]** ***Note:*** To enter all three server addresses you must enter the command three times, each with a different server address.

--End--

Variable definitions

The following table outlines the parameters for the **no ip name-server** command.

Table 40
no ip name-server command parameters

Variable	Value
<ip_address_1>	The IP address of the domain name server to remove.

Table 40
no ip name-server command parameters (cont'd.)

Variable	Value
<ip_address_2>	Optional. The IP address of a domain name server to remove from the list of servers used by the switch.
<ip_address_3>	Optional. The IP address of a domain name server to remove from the list of servers used by the switch.

Auto Unit Replacement using the NNCLI

The following sections describe Auto Unit Replacement (AUR).

Prerequisites

- The units must be in a stack.

Auto Unit Replacement using the NNCLI navigation

- "Viewing Auto Unit Replacement using the NNCLI" (page 122)
- "Enabling Auto Unit Replacement using the NNCLI" (page 123)
- "Disabling AUR using the NNCLI" (page 123)
- "Restoring the default setting for AUR using the NNCLI" (page 124)
- "Configuring AUR operation settings using the NNCLI" (page 124)

Viewing Auto Unit Replacement using the NNCLI

View Unit Replacement (AUR) to understand the current setting and to discover if the unit is ready for replacement.

Procedure steps

Step	Action
1	Use the following command from the privileged EXEC mode: `show stack auto-unit-replacement`

--End--

Job aid

The following table describes the fields for the **`show stack auto-unit-replacement`** command.

Table 41
show stack auto-unit-replacement fields

Field	Description
Auto Unit Replacement Auto-Restore	Specifies whether the Auto Unit Replacement Auto-Restore is enabled for the stack.
Auto Unit Replacement Auto-Save	Specifies whether the Auto Unit Replacement Auto-Save is enabled for the stack.
UNIT #	Specifies the number of the unit in the stack.
READY FOR REPLACEMENT	Specifies whether the unit is ready for replacement.

Enabling Auto Unit Replacement using the NNCLI

Enable Unit Replacement (AUR) to permit the automatic update of a license for any stack unit, including the base unit.

Procedure steps

Step	Action
1	Use the following command from the Global Configuration mode: `stack auto-unit-replacement enable`

--End--

ATTENTION
The default mode is enable.

Disabling AUR using the NNCLI

Disable AUR to stop the automatic update of a license for any stack unit, including the base unit.

Procedure steps

Step	Action
1	Use the following command from the Global Configuration mode: `no stack auto-unit-replacement enable`

--End--

Restoring the default setting for AUR using the NNCLI

Restore the default setting for AUR to permit the automatic update of a license for any stack unit, including the base unit.

Procedure steps

Step	Action
1	Use the following command from the Global Configuration mode: `default stack auto-unit-replacement enable`

--End--

Configuring AUR operation settings using the NNCLI

Configure AUR to modify the operation settings.

Procedure steps

Step	Action
1	Restore the configuration of a unit from the saved configuration on the base unit by using the following command in Global Configuration mode: `stack auto-unit-replacement config restore unit <1-8>`
2	Force an immediate save of the new base unit (NBU) configuration to the base unit (BU) by using the following command in Global Configuration mode: `stack auto-unit-replacement config save unit <1-8>`
3	Enable AUR auto save by using the following command in Global Configuration mode: `stack auto-unit-replacement config save enable`
4	DIsable AUR auto save by using the following command in Global Configuration mode: `stack auto-unit-replacement config save disable`

--End--

Variable definitions

The following table explains the parameters for the **`stack auto-unit-replacement config {restore unit <1-8>|save {enable|disable|unit <1-8>}}`** cojmmand.

Table 42
stack auto-unit-replacement config parameters

Variable	Value
`disable`	Disables AUR auto save.
`enable`	Enables AUR auto-save.
`restore`	Restores the configuration of a unit from the saved configuration on the base unit by
`save`	Forces an immediate save of the NBU configuration to the BU.
`unit <1-8>`	Identifies the unit in the stack.

Nortel Energy Saver configuration using the NNCLI

You can use Nortel Energy Saver (NES) to configure the switch to utilize energy more efficiently.

NES configuration using the NNCLI navigation

Configuring global NES using the NNCLI

Use the following procedure to enable or disable the energy saving feature for the switch. Nortel recommends disabling NES on uplink copper ports since activating or deactivating NES on copper ports will trigger a link down followed rapidly by a link up event. The best solution is to use fiber ports for uplinks since link status will not change when NES is activated or deactivated.

ATTENTION
If a switch is reset while energy-saver is activated, the PoE power saving calculation may not accurately reflect the power saving, and in some cases may display zero savings. This is because the switch did not have sufficient time to record PoE usage between the reset of the switch and energy-saver being reactivated. When energy saver is next activated, the PoE power saving calculation will be correctly updated.

ATTENTION
Some RIP routes might be cleared when NES is activated or deactivated on the uplink ports. Routes are automatically recovered when routes are relearned.

Using **`ip rip advertise-when-down enable`** option on the IP interface affected by the link change will help to keep the routes learned.

ATTENTION
OSPF neighbors can disconnect when NES is activated or deactivated on uplink ports. Because of this link status change, some OSPF routes are cleared from the routing tables and automatically recovered when routes are relearned.

Using the **`ip ospf advertise-when-down enable`** command for the IP interface affected by the link change will help the routes remain learned.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **`[no] [default] energy-saver [enable] [efficiency-mode] [poe-power-saving]`**

--End--

Variable definitions

The following table defines optional parameters that you can enter with the **`[no] [default] energy-saver [enable] [efficiency-mode] [poe-power-saving]`** command.

Variable	Value
`[default]`	Configures NES efficiency mode, POE power saving, or global NES to default values (disabled).

Variable	Value
efficiency-mode	Enables NES efficiency mode. **ATTENTION** You must ensure that SNTP is enabled before you can enable NES efficiency mode. **ATTENTION** You must disable NES globally before you can modify NES efficiency mode. **ATTENTION** When enabled, NES efficiency mode overrides custom NES scheduling and PoE power saving mode. You will be prompted to confirm that you want to enable NES efficiency mode before proceeding.
enable	Enables NES globally.
[no]	Disables NES efficiency mode, POE power saving, or NES globally.
poe-power-saving	Enables POE power saving. **ATTENTION** You must disable NES globally before you can modify POE power saving.

Configuring port-based NES using the NNCLI

Use the following procedure to enable or disable energy saving for the accessed port, an alternate individual port, or a range of ports.

Prerequisites

- Disable NES globally.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **[default] [no] energy-saver port <portlist> enable**

--End--

Variable definitions

The following table defines optional parameters that you enter after the **[default] [no] energy-saver port <portlist> enable** command.

Variable	Value
<enable>	Enables NES for the accessed port.
[no]	Disables NES for the accessed port, an alternate port, or list of ports.
port <portlist> enable	Enables NES for a port or list of ports.

Activating or deactivating NES manually using the NNCLI

Use the following procedure to have NES enabled, but not activated. Activate NES to ensure that NES is enabled and activated.

Prerequisites

- Disable NES globally.
- Log on to the in NNCLI.

Procedure steps

Step	Action
1	Activate NES by using the following command from Pivileged EXEC mode: **energy-saver activate**
2	Deactivate NES by using the following command from Pivileged EXEC mode: **energy-saver deactivate**

--End--

Configuring NES scheduling using the NNCLI

Use the following procedure to configure an on and off time interval for the switch to enter lower power states. The time interval can be a complete week, complete weekend, or individual days.

Prerequisites

- Disable NES globally.

Procedure steps

Step	Action
1	Configure NES scheduling by using the following command from Global Configuration mode: **energy-saver schedule {weekday|weekend|monday|tuesday|wednesday|thursday|friday|saturday|sunday} <hh:mm> {activate|deactivate}**

--End--

Variable definitions

The following table defines parameters that you can enter with the **energy-saver schedule {weekday|weekend|monday|tuesday|wednesday|thursday|friday|saturday|sunday} <hh:mm> {activate|deactivate}** command.

Variable	Value
<activate>	Specifies the NES on time.
<deactivate>	Specifies the NES off time.
friday|monday|saturday|sunday|thursday|tuesday|wednesday	Configures NES scheduling for a specific day.
<hh:mm>	Specifies the scheduled NES start time (hour and minutes).
weekday	Configures NES scheduling for all weekdays.
weekend	Configures NES scheduling for Saturday and Sunday.

Disabling NES scheduling using the NNCLI

Use the following procedure to discontinue using an on and off time interval for the switch to enter lower power states.

Prerequisites

- Disable NES globally.

Procedure steps

Step	Action
1	Configure NES scheduling by using the following command from the Global Configuration mode:

```
no energy-saver schedule
```

--End--

no

Variable definitions

The following table defines optional parameters that you can enter after the **no energy-saver schedule** command.

Variable	Value
friday|**monday**|**saturday**|**sunday**| **thursday**|**tuesday**|**wednesday**	Disables NES scheduling for a specific day.
weekday	Disables NES scheduling for all weekdays.
weekend	Disables NES scheduling for Saturday and Sunday.
<hh:mm>	Specifies the scheduled NES start time (hour and minutes).

Configuring NES scheduling to default using the NNCLI

Use the following procedure to completely disable scheduling for the switch or to disable specific energy saver schedules.

Prerequisites

- Disable NES globally.

Procedure steps

Step	Action
1	Configure NES scheduling by using the following command from Global Configuration mode: **default energy-saver schedule**

--End--

Variable definitions

The following table defines optional parameters that you can enter after the **default energy-saver schedule** command.

Variable	Value
friday|**monday**|**saturday**|**sunday**| **thursday**|**tuesday**|**wednesday**	Configures NES scheduling for a specific day to default (disabled).

Variable	Value
weekday	Configures NES scheduling for all weekdays to default (disabled).
weekend	Configures NES scheduling for Saturday and Sunday to default (disabled).
<hh:mm>	Specifies the scheduled NES start time (hour and minutes).

Viewing NES scheduling using the NNCLI

Use the following procedure to review configured energy saving schedule information.

Procedure steps

Step	Action
1	View NES savings by using the following command from User EXEC mode. **show energy-saver schedule**

--End--

Job aid: show energy-saver schedule command output

The following figure displays sample output for the **show energy-saver schedule** command.

Figure 16
show energy-saver schedule command output

```
5650TD-PWR(config)#show energy-saver schedule
Day        Time  Action
---------- ----- ----------
Monday     01:01 Activate
Tuesday    01:01 Activate
Wednesday  01:01 Activate
Thursday   01:01 Activate
Friday     01:01 Activate
```

Viewing NES savings using the NNCLI

Use the following procedure to review the switch capacity energy saving (Watts) and the PoE energy saving (Watts).

Procedure steps

Step	Action
1	View NES savings by using the following command from User EXEC mode:

```
show energy-saver savings
```

--End--

Viewing the global NES configuration using NNCLI

Use the following procedure to review the NES configuration for the switch.

Prerequisites

- Log on to the User EXEC mode in NNCLI.

Procedure steps

Step	Action
1	View the global NES configuration by using the following command from User EXEC mode: `show energy-saver`

--End--

Job aid: show energy-saver command output

The following figure displays sample output for the **show energy-saver** command.

Figure 17
show energy-saver command output

```
5530-24TFD(config)#show energy-saver
Avaya Energy Saver (AES):  Enabled
AES PoE Power Saving Mode: Disabled
AES Efficiency-Mode Mode:  Disabled
Day/Time:                  Not set
Current AES state:         AES is Inactive
```

Viewing port-based NES configuration using the NNCLI

Use the following procedure to review NES configuration for all ports on the switch, an individual port, or range of ports.

Prerequisites

- Log on to the User EXEC mode in NNCLI.

Procedure steps

Step	Action
1	View NES savings by using the following command: **show energy-saver interface**
	--End--

Variable definitions

The following table defines optional parameters that you can enter after the **show energy-saver interface** command.

Variable	Value
<portlist>	Specifies a port or range of ports.

Job aid: show energy-saver interface command output

The following figure displays sample output for the **show energy-saver interface** command using the **<portlist>** variable.

Figure 18
show energy-saver interface command output

```
5650TD-PWR(config-if)#show energy-saver interface
Port      AES State PoE Savings PoE Priority
--------- --------- ---------- ------------
1         Enabled   Enabled    Low
2         Disabled  Disabled   Low
3         Enabled   Enabled    Low
4         Disabled  Disabled   Low
5         Enabled   Enabled    Low
6         Disabled  Disabled   Low
7         Disabled  Disabled   Low
8         Disabled  Disabled   Low
9         Disabled  Disabled   Low
```

Changing switch software in the NNCLI

Use this procedure to change the software version running on the switch.

Procedure steps

Step	Action
1	Use the following command from User EXEC mode: **download [address <ipv6_address> | <a.b.c.d>] {primary | secondary} {image <image name> | image-if-newer <image name> | diag <image name> | poe_module_image <image name>} [no-reset] [usb]**

2 Press **Enter**.

--End--

The software download process occurs automatically without user intervention. This process deletes the contents of the flash memory and replaces it with the desired software image. Do not interrupt the download process. Depending on network conditions, this process make take up to 10 minutes.

When the download process is complete, the switch automatically resets unless the **no-reset** parameter was used. The software image initiates a self-test and returns a message when the process is complete.

The following table shows an example of this message.

Table 43
Software download message output

```
Download Image [/]

Saving Image [-]

Finishing Upgrading Image
```

During the download process the switch is not operational.

The progress of the download process can be tracked by observing the front panel LEDs. For more information about this topic, refer to "LED activity during software download" (page 25).

Variable definitions

The following table outlines the parameters for the **download** command.

Table 44
download command parameters

Variable	Value
address <ipv6_address> | <a.b.c.d>	This parameter is the IPv6 or IP address of the TFTP server to be used. The address <ip> parameter is optional and if omitted the switch defaults to the TFTP server specified by the **tftp-server** command unless software download is to take place using a USB Mass Storage Device.
primary | secondary	This parameter determines if the image is the primary or secondary image.
The image, image-if-newer, diag, and poe_module_image parameters are mutually exclusive and only one can be executed at a time.	

Table 44
download command parameters (cont'd.)

Variable	Value
image <image name>	This parameter is the name of the software image to be downloaded from the TFTP server.
image-if-newer <image name>	This parameter is the name of the software image to be downloaded from the TFTP server if newer than the currently running image.
diag <image name>	This parameter is the name of the diagnostic image to be downloaded from the TFTP server.
poe_module_image <image name>	This parameter is the name of the PoE module image to be downloaded from the TFTP server. This option is only available in 5000 Series switches that support Power Over Ethernet.
no-reset	This parameter forces the switch to not reset after the software download is complete.
usb	In the 5530-24TFD or 5600 series switches, this parameter specifies that the software download is performed using a USB Mass Storage Device and the front panel USB port.
The `image`, `image-if-newer`, `diag`, and `poe_module_image` parameters are mutually exclusive and only one can be executed at a time.	

Configuration files in NNCLI

NNCLI provides many options for working with configuration files. Through NNCLI, configuration files can be displayed, stored, and retrieved.

For details, refer to the following:

- "Displaying the current configuration" (page 135)
- "Storing the current configuration" (page 137)
- "Restoring a system configuration" (page 138)
- "Saving the current configuration" (page 140)

Displaying the current configuration

Use this procedure to display the current configuration of switch or a stack.

Procedure steps

Step	Action
1	Log on to the Privileged EXEC mode in the NNCLI.

2 Display the current configuration parameters that differ from the default configuration by using the following command:

```
show running-config
```

3 Display all the current configuration parameters t by using the following command:

```
show running-config verbose
```

4 Display the current configuration for a specific application by using the following command:

```
show running-config module <value>
```

--End--

ATTENTION
If the switch CPU is busy performing other tasks, the output of the above**`running- config`** command can appear to intermittently start and stop. This is a normal operation to ensure that the switch management tasks receive appropriate priority.

Variable definitions

Use the data in the following table to help you use the **`show running-config [verbose] [module <value>]`** command.

Table 45
show running-config parameters

Variable	Value
`verbose`	Displays all the configuration including defaults and nondefaults.
`module <valu`	Displays the configuration of an application for any of the following parameter values: [802.1ab] [aaur] [adac] [arp-inspection] [asset-id] [aur] [banner] [core] [dhcp-relay] [dhcp-snooping] [eap] [energy-saver] [interface] [ip] [ip-source-guard] [ipfix] [ipmgr] [ipv6] [l3] [l3-protocols] [lacp] [logging] [mac-security] [mlt] [nsna] [port-mirroring] [qos] [rate-limit] [rmon] [rtc] [snmp] [ssh] [ssl] [stack] [stkmon] [stp] [vlacp] [vlan]

Storing the current configuration

Copy the running configuration to store the information. The **copy running-config** command copies the contents of the current configuration file to another location for storage. For all switches in the 5000 Series, the configuration file can be saved to a TFTP server. The Nortel Ethernet Routing Switch 5530-24TFD or 5600 Series switches also provide the ability to save the configuration file to a USB Mass Storage Device through the front panel USB drive.

Procedure steps

Step	Action
1	Log on to the Privileged EXEC mode in the NNCLI.
2	Copy the running configuration to the TFTP server by using the following command: **copy running-config tftp address {<A.B.C.D>|<WORD>} filename <WORD>**
3	Copy the running configuration to the USB by using the following command: **copy running-config usb {[module <value>]|[verbose]} filename <WORD>**

--End--

Variable definitions

The following table outlines the parameters of the **copy running-config [tftp address {<A.B.C.D>|<WORD>}| usb {[module <value>]|[verbose]}} filename <WORD>** command.

Table 46
copy running-config parameters

Variable	Value
address {<A.B.C.D>|<WORD>}	Specifies the address of the TFTP server to be used: • **A.B.C.D**—specifies the IP address. • **WORD**—specifies the IPv6 address.
filename <WORD>	Specifies the name of the file that is created when the configuration is saved to the TFTP server or USB Mass Storage Device.

Table 46
copy running-config parameters (cont'd.)

Variable	Value
`module <value>`	Displays the configuration of an application for any of the following parameter values: [802.1ab] [aaur] [adac] [arp-inspection] [asset-id] [aur] [banner] [core] [dhcp-relay] [dhcp-snooping] [eap] [energy-saver] [interface] [ip] [ip-source-guard] [ipfix] [ipmgr] [ipv6] [l3] [l3-protocols] [lacp] [logging] [mac-security] [mlt] [nsna] [port-mirroring] [qos] [rate-limit] [rmon] [rtc] [snmp] [ssh] [ssl] [stack] [stkmon] [stp] [vlacp] [vlan]
`tftp`	Copies all of the running configuration file to a specified file on the TFTP server.
`verbose`	Copies all the configuration, including defaults and non-defaults, to the USB.
`usb`	Copies all of the running configuration file to the USB.

Restoring a system configuration

NNCLI provides three commands for restoring a system configuration to a switch:

- "copy tftp config" (page 138)
- "copy usb config" (page 139)
- "copy tftp config unit" (page 139)

copy tftp config

Use this procedure to restore a configuration file stored on a TFTP server.

Procedure steps

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

--End--

Variable definitions

The following table outlines the parameters of the **copy tftp config** command.

Table 47
copy tftp config command parameters

Variable	Value
address <A.B.C.D>	The IP address of the TFTP server to be used.
filename <name>	The name of the file to be retrieved.

copy usb config

Use this procedure to restore a configuration file stored on a USB Mass Storage Device.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: **copy usb config filename <name>** ***Note:*** The only parameter for this command is the name of the file to be retrieved from the USB device.

--End--

copy tftp config unit

Use this procedure to enable the configuration of a switch in a stack to be copied to a stand-alone switch for the purpose of replacing units in a stack.

Procedure steps

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

--End--

Variable definitions

The following table outlines the parameters of the **copy tftp config unit** command.

Table 48
copy tftp config unit command parameters

Variable	Value
address <A.B.C.D>	The IP address of the TFTP server to be used.
filename <name>	The name of the file to be used.
unit <unit number>	The number of the stack unit to be used.

Saving the current configuration

The configuration currently in use on a switch is regularly saved to the flash memory automatically. However, you can manually initiate this process using the **copy config nvram** command. This command takes no parameters and you must run it in Privileged EXEC mode. If you have disabled the AutosaveToNvramEnabled function by removing the default check in the AutosaveToNvRamEnabled field, the configuration is not automatically saved to the flash memory.

write memory command

Use this procedure to copy the current configuration to NVRAM.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: **write memory**

--End--

save config command

Use this procedure to copy the current configuration to NVRAM.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: **save config**

--End--

Automatically downloading a configuration file with NNCLI

Use this procedure to enable a script to be loaded and executed immediately as well as configure parameters to automatically download a configuration file when the switch or stack is booted.

Procedure steps

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

Note: The current switch settings relevant to this process can be viewed using the **show config-network** command. This command takes no parameters and must be executed in Privileged EXEC mode.

--End--

Variable definitions

The following table outlines the parameters of the **configure network** command.

Table 49
configure network command parameters

Variable	Value
load-on-boot {disable | use-bootp | use-config}	Specifies the settings for automatically loading a configuration file when the system boots: • **disable** - disables the automatic loading of config file • **use-bootp** - specifies loading the ASCII configuration file at boot and using BootP to obtain values for the TFTP address and filename • **use-config** - specifies loading the ASCII configuration file at boot and using the locally configured values for the TFTP address and filename ***Note:*** If you omit this parameter, the system immediately downloads and runs the ASCII config file.
address <A.B.C.D>	The IP address of the desired TFTP server.
filename <name>	The name of the configuration file to use in this process

Terminal setup

Use this procedure to configure terminal settings.

These settings are transmit and receive speeds, terminal length, and terminal width.

Procedure steps

Step	Action
1	Use the following command from User EXEC mode: **terminal speed {2400 | 4800 | 9600 | 19200 | 38400} length <0-132> width <1-132>** ***Note:*** The **show terminal** command can be used at any time to display the current terminal settings. This command takes no parameters and is executed in the EXEC command mode.

--End--

Variable definitions

The following table outlines the parameters of the **terminal** command.

Table 50
terminal command parameters

Variable	Value
speed {2400|4800|9600|19200| 38400}	Sets the transmit and receive baud rates for the terminal. The speed can be set at one of the five options shown; the default is 9600.
length	Sets the length of the terminal display in lines; the default is 23. ***Note:*** If the terminal length is set to a value of 0, the pagination is disabled and the display continues to scroll without stopping.
width	Sets the width of the terminal display in characters; the default is 79.

Setting the default management interface

You can set the default management interface with NNCLI to suit the preferences of the switch administrator. This selection is stored in NVRAM and propagated to all units in a stack configuration. When the system is started, the banner displays and prompts the user to enter **Ctrl+Y**. After these characters are entered, the system displays either a menu or the command line interface prompt, depending on previously configured

defaults. When using the console port, you must log out for the new mode to display. When using Telnet, all subsequent Telnet sessions display the selection.

Use this procedure to change the default management interface.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: `cmd-interface {cli | menu}`

--End--

Setting Telnet access

NNCLI can be accessed through a Telnet session. To access NNCLI remotely, the management port must have an assigned IP address and remote access must be enabled.

Note: Multiple users can access NNCLI system simultaneously, through the serial port, Telnet, and modems. The maximum number of simultaneous users is four, plus, one each at the serial port for a total of 12 users on the stack. All users can configure simultaneously.

For details on viewing and changing the Telnet-allowed IP addresses and settings, refer to the following:

- “telnet-access command” (page 143)
- “no telnet-access command” (page 144)
- “default telnet-access command” (page 145)

telnet-access command

Use this procedure to configure the Telnet connection that is used to manage the switch

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `telnet-access [enable | disable] [login-timeout <1-10>] [retry <1-100>] [inactive-timeout <0-60>] [logging {none | access | failures | all}] [source-ip <1-50>`

```
<51-100>
<A.B.C.D> <WORD> [mask <A.B.C.D>]
```

--End--

Variable definitions

The following table outlines the parameters of the **telnet-access** command.

Table 51
telnet-access command parameters

Variable	Value
enable | disable	Enables or disables Telnet connection.
login-timeout <1-10>	Specify in minutes the time to wait for Telnet and Console login before the connection closes. Enter an integer between 1 and 10.
retry <1-100>	Specify the number of times the user can enter an incorrect password before closing the connection. Enter an integer between 1 and 100.
inactive-timeout <0-60>	Specify in minutes the duration for an inactive session to be terminated.
logging {none | access | failures | all}	Specify the events whose details you want to store in the event log: none--Do not save access events in the log access--Save only successful access events in the log failure--Save failed access events in the log all--Save all access events in the log
[source-ip <1-50> <A.B.C.D> [mask <A.B.C.D>] [source-ip <51-100> <WORD>	Specify the source IP address from which connections are allowed. Enter the IP address in dotted-decimal notation. Mask specifies the subnet mask from which connections are allowed; enter IP mask in dotted-decimal notation. Specify the source IPv6 address and prefix from which to allow connections.

no telnet-access command

Use this procedure to disable the Telnet connection.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: • For an IPv4 address and mask pair: **no telnet-access [source-ip [<1-50>]]** • For an IPv6 address and mask pair: **no telnet-access [source-ip [<51-100>]]**

--End--

Variable definitions

The following table outlines the parameters of the **no telnet-access** command.

Table 52
no telnet-access command parameters

Variable	Value
source-ip [<1-50>] source-ip [<51-100>]	Disables the Telnet access. When you do not use the optional parameter, the source-ip list is cleared, meaning the first index is set to 0.0.0.0/0.0.0.0, the second to fiftieth indexes are set to 255.255.255.255/255.255.255.255, the fiftyfirst index is set to ::/0, and the fiftysecond to hundredth indexes are set to ffff:ffff:ffff:ffff:ffff:ffff:ffff:ffff/128. When you specify a source-ip address, the specified pair is set to 255.255.255.255/255.255.255.255 for indexes between 1 and 50 and the specified pair is set to ffff:ffff:ffff:ffff:ffff:ffff:ffff:ffff/128 for indexes between 51 and 100.

default telnet-access command

Use this procedure to set the Telnet settings to the default values.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `default telnet-access`

--End--

Setting boot parameters

The command outlined in this section is used for booting the switch or stack as well as setting boot parameters.

boot command

Use this procedure to perform a soft-boot of the switch or stack

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: `boot [default] [partial default] [unit <unitno>]`

--End--

Note: When you reset to factory defaults, the switch or stack retains the last reset count and reason for last reset; these two parameters do not default to factory defaults. Stack operational mode is retained only when resetting to partial-default.

Variable definitions

The following table outlines the parameters of the **`boot`** command.

Table 53
boot command parameters

Variable	Value
default	Reboot the stack or switch and use the factory default configurations
partial-default	Reboot the stack or switch and use partial factory default configurations
unit <unitno>	Unit number

Defaulting to BootP-when-needed

The BootP default value is BootP-when-needed. This enables the switch to be booted and the system to automatically seek a BootP server for the IP address.

If an IP address is assigned to the device and the BootP process times out, the BootP mode remains in the default mode of BootP-when-needed.

However, if the device does not have an assigned IP address and the BootP process times out, the BootP mode automatically changes to BootP disabled. But this change to BootP disabled is not stored, and the BootP reverts to the default value of BootP-when-needed after rebooting the device.

When the system is upgraded, the switch retains the previous BootP value. When the switch is defaulted after an upgrade, the system moves to the default value of BootP-when-needed.

Configuring with the command line interface

This section covers NNCLI commands needed to configure BootP parameters:

- "ip bootp server command" (page 147)
- "no ip bootp server command" (page 148)
- "default ip bootp server command" (page 148)

ip bootp server command

Use this procedure to configure BootP on the current instance of the switch or server.

This command is used to change the value of BootP from the default value, which is BootP-when-needed.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **`ip bootp server {always	disable	last	needed}`**
	--End--

Variable definitions

The following table outlines the parameters of the **`ip bootp server`** command.

Table 54
ip bootp server command parameters

Variable	Value
always | disable | last l needed	Specifies when to use BootP: • always - Always use BootP • disable - never use BootP • last - use BootP or the last known address • needed - use BootP only when needed ***Note:*** The default value is to use BootP when needed.

no ip bootp server command

Use this procedure to disable the BootP server.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `no ip bootp server`
	--End--

default ip bootp server command

Use this procedure to use BootP when needed.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `default ip bootp server`
	--End--

shutdown command

The **`shutdown`** command proves a mechanism for safely shutting down a switch or stack without interfering with device processes or corrupting the software image. After this command is issued, the configuration is saved, auto-save functionality is temporarily disabled, and configuration changes are not allowed until the switch or stack restarts. If the shutdown is cancelled, auto-save functionality returns to the state in which it was previously functioning.

Use this procedure to shut down a switch or stack.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: **shutdown [force] [minutes-to-wait <1-60>] [cancel]**

--End--

Variable definitions

The following table outlines the parameters of the **shutdown** command.

Table 55
shutdown command parameters

Variable	Value
force	This parameter forces the shutdown without confirmation.
minutes-to-wait <1-60>	This parameter represents the number of minutes to wait before the shutdown occurs. If no value is specified, the default value of 10 minutes is used.
cancel	This parameter cancels a scheduled shutdown any time during the time period specified by the **minutes-to-wait** parameter.

reload command

The reload command operates in a similar fashion to the shutdown command. However, the reload command is intended more to be used by system administrators using the command functionality to configure remote devices and reset them when the configuration is complete.

The reload command differs from the shutdown command in that the configuration is not explicitly saved after the command is issued. This means that any configuration changes must be explicitly saved before the switch or stack reloads.

The reload command does temporarily disable auto-save functionality until the reload occurs. Cancelling the reload returns auto-save functionality to any previous setting.

Use this procedure to reload a switch or stack.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: **reload [force] [minutes-to-wait <1-60>] [cancel]**

--End--

Variable definitions

The following table outlines the parameters of the **reload** command.

Table 56
reload command parameters

Variable	Value
force	This parameter forces the reload without confirmation.
minutes-to-wait <1-60>	This parameter represents the number of minutes to wait before the reload occurs. If no value is specified, the default value of 10 minutes is used.
cancel	This parameter cancels a scheduled reload any time during the time period specified by the **minutes-to-wait** parameter.

NNCLI Help

Use this procedure to obtain help on the navigation and use of Command Line Interface (NNCLI).

Procedure steps

Step	Action
1	Use the following command: **help {commands | modes}** ***Note:*** These commands are available in any command mode.

--End--

Use **help commands** to obtain information about the commands available in NNCLI organized by command mode. A short explanation of each command is also included.

Use **help modes** to obtain information about command modes available and NNCLI commands used to access them.

Clearing the default TFTP server with NNCLI

Use this procedure to clear the TFTP server and reset it to 0.0.0.0.

Procedure steps

Step	Action
1	The default TFTP server can be cleared from the switch and reset to 0.0.0.0 with the following two commands: • **no tftp-server** This command has no parameters and is executed from the Global Configuration command mode. • **default tftp-server** This command has no parameters and is executed from the Global Configuration command mode.

--End--

Configuring a default TFTP server with NNCLI

The switch processes that make use of a TFTP server often give the switch administrator the option of specifying the IP address of a TFTP server to be used. Instead of entering this address every time it is needed, a default IP address can be stored on the switch.

Use this procedure to specify a default TFTP server.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: **tftp-server [<ipv6_address> | <A.B.C.D>**
2	To complete the command, replace either the **ipv6_address** or **<A.B.C.D>** with the IPv6 or IP address of the default TFTP server

--End--

Secure Transfer File Protocol configuration

This section describes Secure Transfer File Protocol (SFTP) configuration using the NNCLI.

Navigation

Uploading a config file to an SFTP server

Upload a config file to a SFTP server using SFTP protocol.

Procedure steps

Step	Action
1	Use the following command from the Global Configuration mode: `copy config sftp address <A.B.C.D | WORD> filename <WORD> [username <WORD> password <WORD>]`

--End--

ATTENTION

If you do not enter the username and password, and the default values are not available, you are prompted for these parameters if the password authentication is enable.

If the password authentication is disable and you enter the username and password, the password authentication changes from the inactive to active state.

Variable definitions

Use the data in the following table to help you upload a config file.

Table 57
copy config sftp address command parameters

Variable	Value
address <A.B.C.D | WORD>	Specifies the address of the SFTP server: • **A.B.C.D** specifies the IP address. • **WORD** specifies the IPv6 address.
filename <WORD>	Specifies the config file name.
password <WORD>	Specifies the password.
username <WORD>	Specifies the username.

Downloading a config file to an SFTP server

Download a config file to a SFTP server using SFTP protocol.

Procedure steps

Step	Action
1	Use the following command from the Global Configuration mode: **copy sftp config address <A.B.C.D | WORD> filename <WORD> [username <WORD>] [password <WORD>]**

--End--

ATTENTION
If you do not enter the username and password, and the default values are not available, you are prompted for these parameters if the password authentication is enable.

If the password authentication is disable and you enter the username and password, the password authentication changes from the inactive to active state.

Variable definitions

Use the data in the following table to help you upload a config file.

Table 58
copy sftp config address command parameters

Variable	Value
address <A.B.C.D | WORD>	Specifies the address of the SFTP server: • **A.B.C.D** specifies the IP address. • **WORD** specifies the IPv6 address.
filename <WORD>	Specifies the config file name.

Table 58
copy sftp config address command parameters (cont'd.)

Variable	Value
password <WORD>	Specifies the password.
username <WORD>	Specifies the username.

Host keys

This section describes how to configure host keys.

Navigation

- "Generating a host key (public and private)" (page 154)
- "Deleting the host keys (public and private)" (page 154)
- "Uploading the public host key" (page 155)

Generating a host key (public and private)

Generate a host key to replace an old key in the NVRAM. The new key immediately becomes active and the DSA authentication state does not change.

Step	Action
1	Use the following command from Global Configuration mode: `sshc dsa-host-key`

--End--

Deleting the host keys (public and private)

Delete the DSA host keys from the NVRAM. The DSA authentication state does not change.

Step	Action
1	Use the following command from Global Configuration mode: `no sshc dsa-host-key`

--End--

Uploading the public host key

Upload the DSA public host key to an TFTP Server or an USB flash drive if available

Step	Action

1	Use the following command from Global Configuration mode:
	`sshc upload-host-key address <A.B.C.D | WORD> filename <WORD>`
	
	OR
	
	`sshc upload-host-key usb filename <WORD> unit <#>`

--End--

Variable definitions Use the data in the following table to help you upload the public host key.

Table 59
sshc upload-host-key command parameters

Variable	Value
address <A.B.C.D | WORD>	Specifies the address of the SFTP server: • **A.B.C.D** specifies the IP address. • **WORD** specifies the IPv6 address.
filename <WORD>	Specifies the config file name.
unit <#>	Specifies the unit number.
usb filename <WORD>	Specifies the USB key file.

Enabling DSA authentication

Enable DSA authentication to generate DSA keys if they are not available.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `sshc dsa-auth`

--End--

Disabling DSA authentication

Disable DSA authentication to generate DSA keys if they are not available.

Procedure steps

top

Step	Action
1	Use the following command from Global Configuration mode: `no sshc dsa-auth`

--End--

Enabling Password authentication

Use this procedure to enable Password authentication.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `sshc pass-auth`

--End--

Disabling Password authentication

Use this procedure to disable Password authentication.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `no sshc pass-auth`

--End--

Setting the Transmission Control Protocol port

Use this procedure to set the Transmission Control Protocol (TCP) port.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `sshc port TCP-port <portlist>`

--End--

Variable definitions

Use the data in the following table to help you set the TCP port.

Table 60
sshc port TCP-port command parameters

Variable	Value
portlist	Specifies the TCP port. The default portis 22.

Setting timeout

Set the time expired used during a session.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `sshc timeout <1-120>`

--End--

Variable definitions

Use the data in the following table to help you set the time expired parameter.

Table 61
sshc timeout parameters

Variable	Value
<1-120>	Specifies the time expired in the range of 1 to 120 seconds. The default is 60 seconds.

Viewing SFTP

View the current SFTP configuration.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `sshc show`

--End--

Job aid

The following table describes the fields for the **sshc show** command.

Table 62
sshc show command

Field	Description
Version	Specifies the current SSH version.
SFTP Server IP	Specifies the IP or IPv6 address.
Port	Specifies the port number.
The Remote Config File Name	Specifies the Filename.
DSA Authentication	Specifies if DSA authentication is enabled.
Password Authentication	Specifies if Passwor authentication isenabled
User Name (pw auth)	Specifies the use name.
Password (pw auth)	Specifies if
DSA Host Keys	
Key Gen In Process	Specifies whether key generation is in progress.

Configuring daylight savings time with NNCLI

Use the following procedure to configure the daylight savings time adjustment with NNCLI:

Step	Action
1	Use the following command from Global Configuration mode: `configure`
2	Enable sntp server.
3	Set the date to change to daylight savings time.

```
clock summer-time zone date day month year hh:mm day
month year hh:mm [offset]
```

--End--

Variable definitions

The following table outlines the parameters of the **clock summer-time** command.

Table 63
clock summer-time command parameters

Variables	Value
date	Indicates that daylight savings time should start and end on the specified days every year.
day	Date to start daylight savings time.
month	Month to start daylight savings time.
year	Year to start daylight savings time.
hh:mm	Hour and minute to start daylight savings time.
day	Date to end daylight savings time.
month	Month to end daylight savings time.
year	Year to end daylight savings time.
hh:mm	Hour and minute to end daylight savings time.
offset	Number of minutes to add during the summer time.
zone	The time zone acronym to be displayed when daylight savings time is in effect. If it is unspecified, it defaults to the time zone acronym set when the time zone was set.

set daylight savings time example

This command sets the daylight savings time to begin at 02:00 on March 28, 2007 and end on August 30th, 2007 at 15:00. The change to daylight savings moves the clock forward by 60 minutes and "BST" will be displayed as the time zone acronym. These changes to and from daylight savings time will happen automatically.

```
clock summer-time BST date 28 Mar 2007 2:00 30 Aug 2007 15:00
+60
```

Configuring default clock source with NNCLI

Use this procedure to set the default clock source for the switch.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **clock source {rtp | sntp | sysUpTime}** ***Note:*** Substitute **{rtp | sntp | sysUpTime}** with the clock source selection.

--End--

Configuring Dual Agent with NNCLI

Use the following procedures to configure the Dual Agent feature with NNCLI:

- "Enhanced download command" (page 160)
- "Set the next boot Image" (page 161)
- "Show agent images" (page 162)

Enhanced download command

You can update either active image or non-active image. Once the image download is done, the unit resets and restarts with the new image regardless of the value of the Next Boot image indicator. In case of image download without reset, the new image in the flash will be the Next Boot image.

Use this procedure to specify the download target image.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **download [address <ipv6_address> | <a.b.c.d>] {primary | secondary} {image <image name> | image-if-newer <image name> | diag <image name> I poe_module_image <image name>} [no-reset] [usb]**

--End--

Variable definitions

The following table outlines the parameters of the **download** command.

Table 64
download command parameters

Variable	Value
ipv6_address	IPv6 IP address
a.b.c.d	IP address in dot notation.
primary | secondary	Choose which image to download.
image <image name>	Download the specified image.
image-if-newer <image name>	Only download the image if the version is newer than the installed version.
diag <image name>	Download the specified diagnostic image.
poe_module_image <image name>	Download the specified PoE module image.
no-reset	Do not reset the switch.
usb	Download the image from the USB drive.

Note: Dual Agent supports the Ethernet Routing Switch 5510 NBUs through AAUR.

Set the next boot Image

You can use NNCLI commands to change the next boot image of the device. Use the following procedures to change the next boot image:

- "toggle-next-boot-image" (page 161)
- "boot secondary" (page 161)

toggle-next-boot-image

Use this procedure to toggle the next boot image.

Procedure steps

Step	Action
1	sue the following command from Global Configuration mode: **`toggle-next-boot-image`**.

Note: You must restart the switch or stack after this command to use the next boot image as the new primary image.

--End--

boot secondary

Use this procedure to use the secondary boot image.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **`boot secondary`**. ***Note:*** The switch or stack will restart automatically with the new image.

--End--

Show agent images

You can use NNCLI commands to list the following information about the agent images stored in flash memory:

- Primary image version
- Secondary mage name
- Active image version

Use this procedure to show the agent image information for agent images stored in the flash memory.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **`show boot image`**.

--End--

Configuring IPv6 with NNCLI

Use the following procedures to configure IPv6:

You can only execute NNCLI commands for IPv6 interface configuration on the base unit of a stack. Use the Global Configuration mode to execute IPv6 commands.

Enabling IPv6 interface on the management VLAN

Use this procedure to enable an IPv6 interface on the management VLAN.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **`interface vlan 1`**.
2	Enter **`ipv6 interface enable`**.
3	Enter **`exit`** to return to the main menu.

--End--

Use this procedure to enable or disable ipv6 admin status and set icmp error interval:

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **`[no] ipv6 enable [icmp error-interval <0-2147483647> | icmp unreach-msg]`**

2 Enter **exit** to return to the main menu.

--End--

Variable definitions

The following table outlines the parameters for **ipv6 enable**:

Table 65
IPv6 enable command parameteres

Variable	Value
enable	Default admin status: enabled
icmp error-interval <0-2147483647>	Specifies the ICMP error interval. Values range from 0 to 2147483647 seconds.
icmp unreach-msg	Enables the IPv6 ICMP unreach message.

Configuring IPv6 interface on the management VLAN

Use this procedure to assign an IPv6 address to a VLAN.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **interface vlan 1**
2	Enter **ipv6 interface enable**.
3	Enter **exit** to return to the main menu.

--End--

Displaying the IPv6 interface information

Use this procedure to display the IPv6 interface information.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **show ipv6 interface**.

--End--

Job aid

The following figure shows the results of the **show ipv6 interface** command.

Figure 19
show ipv6 interface

```
(config)#show ipv6 interface
================================================================================
                                    Interface Information
================================================================================
IFINDX VLAN-ID  MTU  PHYSICAL          ADMIN   OPER  RCHBLE RETRAN TYPE
                     ADDRESS           STATE   STATE TIME   TIME

--------------------------------------------------------------------------------
10001  1        1522 0:11:f9:34:88:0   enabled up    30000  1000   ETHER

================================================================================
                                    Address Information
================================================================================
INTF   IPV6                                    TYPE    ORIGIN    STATUS
INDEX  ADDRESS

--------------------------------------------------------------------------------
10001  3000:0:0:0:0:0:0:99                     UNICAST MANUAL    PREFERRED
10001  fe80:0:0:0:211:f9ff:fe34:8800           UNICAST OTHER     UNKNOWN

1 out of 1 Total Num of Interface Entries displayed.
2 out of 2 Total Num of Address Entries displayed.
```

Displaying IPv6 interface addresses

Use this procedure to view IPv6 interface addresses to learn the addresses.

Step	Action
1	Use the following command from User EXEC mode: **show ipv6 address interface [<WORD 0-45> | vlan <1-4094>]**

--End--

Variable definitions

The following table outlines the parameters of the **show ipv6 address interface** command.

Table 66
show ipv6 address interface command parameters

Variable	Value
<word 0–45>	Specifies the IPv6 address length assigned to the management interface.
vlan <1-4094>	Specifies the VLAN ID for which to display IPv6 interface address information. Values range from 1 to 4094.

The following table shows the field descriptions for this command.

Table 67
show ipv6 address interface command field descriptions

Field	Value
IPV6 ADDRESS	Specifies the IPv6 destination address.
VID/BID/TID	
TYPE	Specifies Unicast, the only supported type.
ORIGIN	Specifies a read-only value indicating the origin of the address. The origin of the address is other, manual, DHCP, linklayer, or random.
STATUS	Indicates the status of the IPv6 address. The values of the status are as follows: • PREFERRED • DEPRECATED • INVALID • INACCESSIBLE • UNKNOWN • TENTATIVE • DUPLICATE

Configuring an IPv6 address for a switch or stack

Use this procedure to configure and IPv6 address for a switch or stack.

Procedure steps

Step	Action

1	Use the following command from Global Configuration mode:
	`ipv6 address {`
	`[<ipv6_address/prefix_length>]`
	`[stack <ipv6_address/prefix_length>]`

```
[switch <ipv6_address/prefix_length>]
[unit <1-8> < ipv6_address/prefix_length>]
```

--End--

Variable definitions

The following table outlines the parameters of the **ipv6 address** command.

Table 68
IPv6 address command parameters

Variable	Value
ipv6_address/prefix_length	Specifies the IPv6 address and prefix length.
stack	IPv6 address and prefix length of stack.
switch	IPv6 address/prefix length of switch.
unit	IPv6 address/prefix length of unit number: 1 to 8

Displaying the IPv6 address for a switch or stack

Use this procedure to display the IPv6 address for a switch or stack.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **show ipv6 address**

--End--

Use this procedure to display all ipv6 interface addresses.

Procedure steps

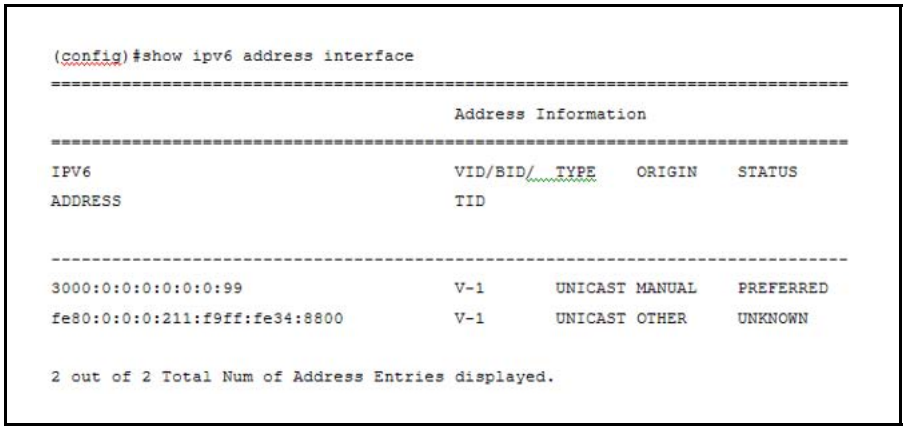
Step	Action
1	Use the following command from Global Configuration mode: **show ipv6 address interface**

--End--

Job aid

The following figure shows the results of the**show ipv6 address interface** command.

Figure 20
show ipv6 address interface



Configuring IPv6 management interface

Use this procedure to configure the IPv6 interface and create the VLAN IPv6 interface and set the parameter.

Step	Action
1	Use the following command from Global Configuration mode: **`interface vlan <mgmt_vlan_id>`**.
2	Enter **`ipv6 interface [address <ipv6_address/prefix_length>]`**.

--End--

Variable definitions

The following table outlines the parameters of the **`ipv6 interface`** command.

Table 69
ipv6 interface command parameters

Variable	Value
address <ipv6_address/prefix_length>	Address or prefix length.
name <1-255>	Name: integer from 1 to 255
link-local <WORD 0-19>	Interface identifier,
mtu <1280-9600>	Default status: MTU 1280

Table 69
ipv6 interface command parameters (cont'd.)

Variable	Value
reachable-time <0-3600000>	Time in milliseconds neighbor is considered reachable after a reachable confirmation message. Default: 30000
retransmit-timer <0-3600000>	Time in milliseconds between retransmissions of neighbor solicitation messages to a neighbor. Default: 1000

Disabling IPv6 globally

Use this procedure to disable IPv6 globally.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **`no ipv6 interface [address <ipv6_address>] [all] [enable]`**

Note: If you do not specify a parameter, you can use the **`no ipv6 interface`** to delete an IPv6 interface.

--End--

Variable definitions

The following table outlines the parameters for the **`no ipv6 interface`** command.

Table 70
no ipv6 interface command parameters

Variable	Value
address	Delete an IPv6 address.
all	Disable interface administrative status or delete an IPv6 address.
enable	Disable interface administrative status.

Returning IPv6 to default settings

Use this procedure to return an IPv6 interface or address to the default settings.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **`default ipv6 interface [all	enable	link-local	mtu	reachable-time	retransmit-timer]`**.

--End--

Variable definitions

The following table outlines the parameters for the **`default ipv6 interface`** command.

Table 71
default ipv6 interface command parameters

Variable	Value
all	Disable interface administrative status or delete an IPv6 address.
enable	Disable interface administrative status.
link-local	Default identifier.
mtu	Default MTU.
reachable-time	Default reachable time.
retransmit-timer	Default retransmit timer.

Configuring IPv6 global properties

Use this procedure to configure the IPv6 global properties.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **`ipv6 [enable	icmp <error-interval	unreach-msg >]`**.

--End--

Variable definitions

The following table outlines the parameters for the **`ipv6`** command.

Table 72
ipv6 command parameters

Variable	Value
enable	Enable the IPv6 global administrative status.
icmp	Set the IPv6 ICMP parameters. • error-interval: Set the IPv6 ICMP error interval. • unreach-msg: Enable the IPv6 ICMP unreach-msg

Displaying the global IPv6 configuration

Use this procedure to display the global IPv6 configuration.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `show ipv6 global`

--End--

Job aid

The following table describes the `show ipv6 global` command results.

Table 73
show ipv6 global command results

Field	Default setting
forwarding	disabled
default-hop-cnt	30
number-of-interfaces	1
admin-status	enabled
icmp-error-interval	1000
icmp-redirect-msg	disabled
icmp-unreach-msg	disabled
multicast-admin-status	disabled

Configuring an IPv6 default gateway for the switch or stack

Use this procedure to configure an IPv6 default gateway for the switch or stack.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **ipv6 default-gateway <ipv6_gateway address>**
2	Enter **no ipv6 default-gateway** to disable a default gateway.

--End--

Displaying the IPv6 default gateway

Use this procedure to display the IPv6 address for the default gateway.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **show ipv6 default-gateway**.

--End--

Configuring the IPv6 neighbor cache

Use this procedure to add or remove a static neighbor cache entry.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode to add a static neighbor cache: **ipv6 neighbor <ipv6_address> [port <port/slot>] [mac <H.H.H>]**
2	Use the following command from Global Configuration mode to remove a static neighbor cache entry: **no ipv6 neighbor <ipv6_address> [port <port/slot>] [mac <H.H.H>]** to

--End--

Displaying the IPv6 neighbor information

Use this command to display IPv6 neighbor information.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **show ipv6 neighbor [<ipv6_address>] [type {other | dynamic | static | local}]**

--End--

Job aid

The following figure shows the output of the **show ipv6 neighbor** command.

Figure 21
show ipv6 neighbor

```
(config)#show ipv6 neighbor
================================================================================
                                  Neighbor Information
================================================================================
NET ADDRESS/                                PHYS  TYPE    STATE      LAST
PHYSICAL ADDRESS                            INTF                     UPD

--------------------------------------------------------------------------------
3000:0:0:0:0:0:0:0/                         V-1   LOCAL   REACHABLE  0
00:11:f9:34:88:00
3000:0:0:0:0:0:0:1/                         1/5   STATIC  REACHABLE  387452
00:01:02:03:04:05
3000:0:0:0:0:0:0:99/                        V-1   LOCAL   REACHABLE  385251
00:11:f9:34:88:00
fe80:0:0:0:211:f9ff:fe34:8800/              V-1   LOCAL   REACHABLE  385193
00:11:f9:34:88:00
```

Displaying IPv6 interface ICMP statistics

Use this procedure to display IPv6 interface ICMP statistics.

Step	Action
1	Use the following command from Global Configuration mode: **show ipv6 interface icmpstatistics [<1-4094>]**.

--End--

Job aid

The following figure shows a sample of the results from the **show ipv6 interface icmpstatistics** command.

Figure 22
show ipv6 interface icmpstatistics

```
(config)#show ipv6 interface icmpstatistics
================================================================================
                                    Icmp Stats
================================================================================
Icmp stats for IfIndex = 10001

IcmpInMsgs: 1
IcmpInErrors: 1
IcmpInDestUnreachs : 1
IcmpInAdminProhibs : 0
IcmpInTimeExcds : 0
IcmpInParmProblems : 0
IcmpInPktTooBigs : 0
IcmpInEchos : 0
IcmpInEchoReplies : 0
<truncated>
```

Displaying IPv6 interface statistics

Use this procedure to display IPv6 TCP statistics.

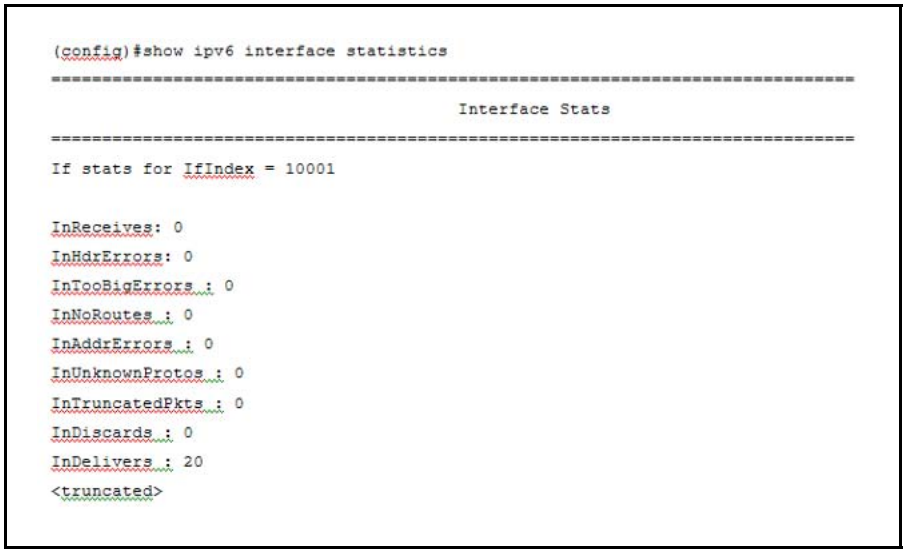
Step	Action
1	Use the following command from Global Configuration mode: **show ipv6 interface statistics [<1-4094>]**.

--End--

Job aid

The following figure shows a sample of the results from the **show ipv6 interface statistics** command.

Figure 23
show ipv6 interface statistics



Displaying IPv6 TCP statistics

Use this procedure to display IPv6 TCP statistics.

Procedure steps

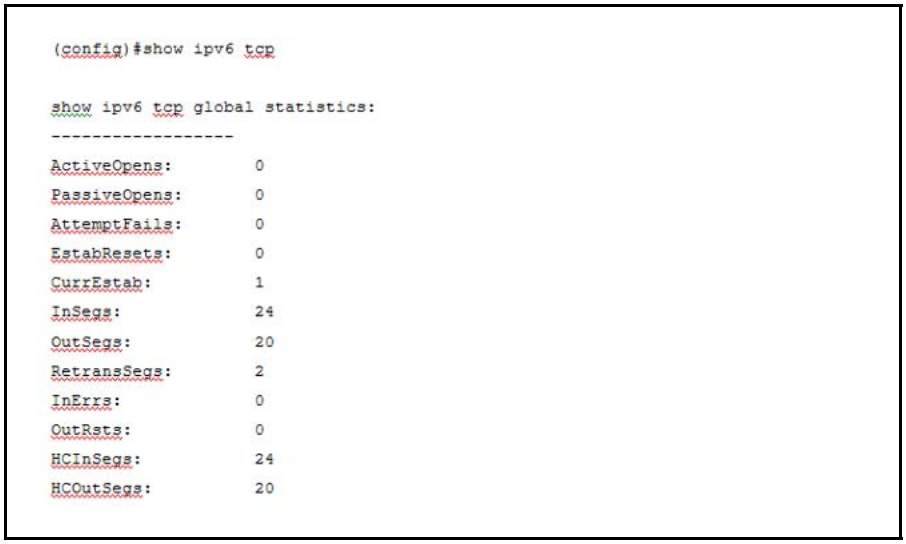
Step	Action
1	Use the following command from Global Configuration mode: **`show ipv6 tcp`**

--End--

Job aid

The following figure shows a sample result from the **`show ipv6 tcp`** command.

Figure 24
show ipv6 tcp



Displaying IPv6 TCP connections

Use this procedure to display IPv6 TCP connections.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **show ipv6 tcp connections [<WORD 0-128>] [<portList>] [<WORD 0-128>]**
	--End--

Displaying IPv6 TCP listeners

Use this procedure to display IPv6 TCP listeners.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **show ipv6 tcp listener**
	--End--

Displaying IPv6 UDP statistics and endpoints

Use this procedure to display IPv6 UDP statistics and endpoints.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode to show UDP statistics: **show ipv6 udp**
2	Use the following command from Global Configuration mode to show UDP endpoints: **show ipv6 udp endpoints**

--End--

Configuring LLDP with NNCLI

You can enable and configure LLDP with NNCLI. For more information about LLDP, see "Link Layer Discover Protocol (IEEE 802.1ab) Overview" (page 69). This section covers the following commands:

- "no lldp tx-tlv med command" (page 190)
- "show lldp port command" (page 192)
- "LLDP configuration example" (page 197)

lldp command

Use this procedure to set the LLDP transmission parameters.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `lldp [tx-interval <5-32768>] [tx-hold-multiplier <2-10>] [reinit-delay <1-10>] [tx-delay <1-8192>] [notification-interval <5-3600>] [med-fast-start <1-10>]`

--End--

Variable definitions

The following table outlines the parameters of the **lldp** command.

Table 74
lldp command parameters

Variable	Value
tx-interval <5-32768>	sets the interval between successive transmission cycles
tx-hold-multiplier <2-10>	sets the multiplier for the tx-interval used to compute the Time To Live value for the TTL TLV
reinit-delay <1-10>	sets the delay for the reinitialization attempt if the adminStatus is disabled
tx-delay <1-8192>	sets the minimum delay between successive LLDP frame transmissions
notification-interval <5-3600>	sets the interval between successive transmissions of LLDP notifications
med-fast-start <1-10>	sets the MED Fast Start repeat count value

lldp port command

Use this procedure to set the LLDP port parameters.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: `lldp port <portlist> [config notification] [status {rxOnly | txAndRx | txOnly}]`

--End--

Variable definitions

The following table outlines the parameters of the **`lldp port`** command.

Table 75
lldp port command parameters

Variable	Value
port <portlist>	specifies the ports affected by the command
config notification	enables notification when new neighbor information is stored or when existing information is removed
status {rxOnly | txAndRx | txOnly}	sets the LLDPU transmit and receive status on the ports rxonly: enables LLDPU receive only. txAndRx: enables LLDPU transmit and receive. txOnly: enables LLDPU transmit only.

lldp tx-tlv command

Use this procedure to set the optional Management TLVs to be included in the transmitted LLDPDUs.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: `lldp tx-tlv [port <portlist>] [local-mgmt-addr] [port-desc] [sys-cap] [sys-desc] [sys-name]`

--End--

Variable definitions

The following table outlines the parameters of the **`lldp tx-tlv`** command.

Table 76
lldp tx-tlv command variables

Variables	Value
local-mgmt-addr	Specifies the local management address TLV.
port <portlist>	Specifies the ports affected by the command.
port-desc	Specifies the port description TLV.
sys-cap	Specifies the system capabilities TLV.
sys-desc	Specifies the system description TLV.
sys-name	Specifies the system name TLV.

lldp tx-tlv dot1 command

Use this procedure to set the optional IEEE 802.1 organizationally-specifc TLVs to be included in the transmitted LLDPDUs.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **`lldp tx-tlv [port <portlist>] dot1 [port-protocol-vlan-id <vlanlist>] [port-vlan-id] {protocol-identity [EAP] [LLDP] [STP]} [vlan-name <vlanlist>]`**

--End--

Variable definitions

The following table outlines the parameters of the **`lldp tx-tlv dot1`** command.

Table 77
lldp tx-tlv dot1 command parameters

Variable	Value
port <portlist>	specifies the ports affected by the command
port-vlan-id	Port VLAN ID TLV
vlan-name	VLAN Name TLV
port-protocol-vlan-id	Port and Protocol VLAN ID TLV
protocol-identity [EAP] [LLDP] [STP]	Protocol Identity TLV

lldp tx-tlv dot3 command

Use this procedure to set the optional IEEE 802.3 organizationally-specifc TLVs to be included in the transmitted LLDPDUs.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **`lldp tx-tlv [port <portlist>] dot3 [link-aggregation] [mac-phy-config-status] [maximum-frame-size] [mdi-power-support]`**

--End--

Variable definitions

The following table outlines the parameters of the **`lldp tx-tlv dot3`** command.

Table 78
lldp tx-tlv dot3 command parameters

Variable	Value
port <portlist>	specifies the ports affected by the command
mac-phy-config-status	MAC/Phy Configuration/Status TLV
mdi-power-support	Power Via MDI TLV
link-aggregation	Link Aggregation TLV
maximum-frame-size	Maximum Frame Size TLV

lldp tx-tlv med command

Use this procedure to set the optional organizationally-specific TLVs for use by MED devices to be included in the transmitted LLDPDUs.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **`lldp tx-tlv [port <portlist>] med [extendedPSE] [inventory] [location] [med-capabilities] [network-policy]`**

--End--

Variable definitions

The following table outlines the parameters of the **lldp tx-tlv med** command.

Table 79
lldp tx-tlv med command parameters

Variable	Value
port <portlist>	specifies the ports affected by the command
med-capabilities	MED Capabilities TLV (MED TLVs are transmitted only if MED Capabilities TLVs are transmitted)
extendedPSE	Extended PSE TLV
inventory	Inventory TLVs
location	Location Identification TLV
network-policy	Network Policy TLV

lldp location-identification coordinate-base command

Use this procedure to set the coordinate-base parameters for LLDP location identification information.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **lldp location-identification coordinate-base [altitude] [datum] [latitude] [longitude]**

--End--

Variable definitions

The following table outlines the parameters of the **lldp location-identification coordinate-base** command.

Table 80
lldp location-identification coordinate-base command parameters

Variable	Value
altitude [+ | -] [0-4194303.fraction] [meters | floors]	Altitude, in meters or floors.

Table 80
lldp location-identification coordinate-base command parameters (cont'd.)

Variable	Value
datum [NAD83/MLLW | NAD83/NAVD88 | WGS84]	Reference datum The valid options are: • NAD83/MLLW: North American Datum 1983, Mean Lower Low Water • NAD83/NAVD88: North American Datum 1983, North American Vertical Datum of 1988 • WGS84: World Geodesic System 1984, Prime Meridian Name: Greenwich
latitude [0-90.00] [NORTH | SOUTH]	Latitude in degrees, and relative to the equator.
longitude [0-180.00] [EAST | WEST]	Longitude in degrees, and relative to the prime meridian.

lldp location-identification civic-address command

Use this procedure to set the LLDP civic address parameters.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: `lldp location-identification civic-address country-code [additional-code] [additional-information] [apartment] [block] [building] [city] [city-district] [county] [floor] [house-number] [house-number-suffix] [landmark] [leading-street-direction] [name] [p.o.box] [place-type] [postal-community-name] [postal/zip-code] [room-number] [state] [street] [street-suffix] [trailing-street-suffix]`

--End--

Variable definitions

The following table outlines the parameters of the `lldp location-identification civic-address` command.

Table 81
lldp location-identification civic-address command parameters

Variable	Value
additional-code	Additional code

Table 81
lldp location-identification civic-address command parameters (cont'd.)

Variable	Value
additional-information	Additional location information
apartment	Unit (apartment, suite)
block	Neighborhood, block
building	Building (structure)
city	City, township, shi (JP)
city-district	City division, city district, ward
country-code	Country code value (2 capital letters)
county	County, parish, gun (JP), district (IN)
floor	Floor
house-number	House number
house-number-suffix	House number suffix
landmark	Landmark or vanity address
leading-street-direction	Leading street direction
name	Residence and office occupant
p.o.box	Post office box
place-type	Office
postal-community-name	Postal community name
postal/zip-code	Postal/Zip code
room-number	Room number
state	National subdivisions (state, canton, region)
street	Street
street-suffix	Street suffix
trailing-street-suffix	Trailing street suffix

lldp location-identification ecs-elin command

Use this procedure to set the LLDP emergency call service - emergency location identification number (ECS-ELIN).

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **`lldp location-identification ecs-elin <ecs-elin>`** ***Note:*** **`<ecs-elin>`** specifies a 10 to 25 digit numerical string.

--End--

default lldp command

Use this procedure to set the LLDP transmission parameters to their default values.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **`default lldp [tx-interval ] [tx-hold-multiplier ] [reinit-delay] [tx-delay] [notification-interval] [med-fast-start]`** ***Note:*** If no parameters are specified, the **`default lldp`** sets all parameters to their default parameters.

--End--

Variable definitions

The following table outlines the parameters of the **`default lldp`** command.

Table 82
default lldp command parameters

Variable	Value
tx-interval	sets the retransmit interval to the default value (30)
tx-hold-multiplier	sets the transmission multiplier to the default value (4)
reinit-delay	sets the reinitialize delay to the default value (2)
tx-delay	sets the transmission delay to the default value (2)
notification-interval	sets the notification interval to the default value (5)
med-fast-start	sets the MED Fast Start repeat count value to the default value (4)

default lldp port command

Use this procedure to set the port parameters to their default values.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **default lldp port <portlist> [config notification] [status]**

--End--

Variable definitions

The following table outlines the parameters of the **default lldp port** command.

Table 83
default lldp port command parameters

Variable	Value
port <portlist>	specifies the ports affected by the command
config notification	sets the config notification to its default value (disabled)
status	sets the LLDPU transmit and receive status to the default value (txAndRx)

default lldp tx-tlv command

Use this procedure to set the LLDP Management TLVs to their default values.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **default lldp tx-tlv [port <portlist>] [port-desc] [sys-name] [sys-desc] [sys-cap] [local-mgmt-addr]**

--End--

Variable definitions

The following table outlines the parameters of the **default lldp tx-tlv** command.

Table 84
default lldp tx-tlv command parameters

Variable	Value
port <portlist>	specifies the ports affected by the command
port-desc	Port description TLV (default value is false: not included)
sys-name	System name TLV (default value is false: not included)
sys-desc	System description TLV (default value is false: not included)
sys-cap	System capabilities TLV (default value is false: not included)
local-mgmt-addr	Local management address TLV (default value is false: not included)

default lldp tx-tlv dot1 command

Use this procedure to set the optional IEEE 802.1 organizationally-specifc TLVs to their default values.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **default lldp tx-tlv [port <portlist>] dot1 [port -vlan-id] [vlan-name] [port-protocol-vlan-id] [protocol-identity [EAP] [LLDP] [STP]]**

--End--

Variable definitions

The following table outlines the parameters of the **default lldp tx-tlv dot1** command.

Table 85
default lldp tx-tlv dot1 command parameters

Variable	Value
port <portlist>	specifies the ports affected by the command
port-vlan-id	Port VLAN ID TLV (default value is false: not included)
vlan-name	VLAN Name TLV (default value is none)
port-protocol-vlan-id	Port and Protocol VLAN ID TLV (default value is none)
protocol-identity [EAP] [LLDP] [STP]	Protocol Identity TLV (default value is none)

default lldp tx-tlv dot3 command

Use this procedure to set the optional IEEE 802.3 organizationally-specifc TLVs to their default values.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **default lldp tx-tlv [port <portlist>] dot3 [mac-phy-config-status] [mdi-power-support] [link-aggregation] [maximum-frame-size]**

--End--

Variable definitions

The following table outlines the parameters of the **default lldp tx-tlv dot3** command.

Table 86
default lldp tx-tlv dot3 command parameters

Variable	Value
port <portlist>	specifies the ports affected by the command
mac-phy-config-status	MAC/Phy Configuration/Status TLV (default value is false: not included)
mdi-power-support	Power Via MDI TLV (default value is false: not included)
link-aggregation	Link Aggregation TLV (default value is false: not included)
maximum-frame-size	Maximum Frame Size TLV (default value is false: not included)

default lldp tx-tlv med command

Use this procedure to set the optional organizationally-specifc TLVs for MED devices to their default values.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **default lldp tx-tlv [port <portlist>] med**

```
[med-capabilities] [extendedPSE] [inventory]
[location] [network-policy]
```

--End--

Variable definitions

The following table outlines the parameters of the **default lldp tx-tlv med** command.

Table 87
default lldp tx-tlv med command parameters

Variable	Value
port <portlist>	specifies the ports affected by the command
med-capabilities	MED Capabilities TLV (default value is false: not included)
extendedPSE	Extended PSE TLV (default value is false: not included)
inventory	Inventory TLVs (default value is false: not included)
location	Location Identification TLV (default value is false: not included)
network-policy	Network Policy TLV (default value is false: not included)

no lldp port command

Use this procedure to disable LLDP features on the port.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **no lldp [port <portlist>] [config notification] [status]**

--End--

no lldp tx-tlv command

Use this procedure to specify the optional Management TLVs not to include in the transmitted LLDPDUs.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: `no lldp tx-tlv [port <portlist>] [port-desc] [sys-name] [sys-desc] [sys-cap] [local-mgmt-addr]`

--End--

no lldp tx-tlv dot1 command

Use this procedure to specify the optional IEEE 802.1 TLVs not to include in the transmitted LLDPDUs.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: `no lldp tx-tlv [port <portlist>] dot1 [port-vlan-id] [vlan-name] [port-protocol-vlan-id] [protocol-identity [EAP] [LLDP] [STP] ]`

--End--

no lldp tx-tlv dot3 command

Use this procedure to specify the optional IEEE 802.3 TLVs not to include in the transmitted LLDPDUs.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: `no lldp tx-tlv [port <portlist>] dot3 [mac-phy-config-status] [mdi-power-support] [link-aggregation] [maximum-frame-size]`

--End--

no lldp tx-tlv med command

Use this procedure to specify the optional Management TLVs not to include in the transmitted LLDPDUs.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: `no lldp tx-tlv [port <portlist>] med [med-capabilities] [extendedPSE] [inventory] [location] [network-policy]`

--End--

show lldp command

Use this procedure to display the LLDP parameters.

Procedure steps

Step	Action
1	Use the following command from User EXEC mode: `show lldp [local-sys-data {dot1 | dot3 | med | detail}] [mgmt-sys-data] [rx-stats] [tx-stats] [stats] [pdu-tlv-size] [tx-tlv {dot1 | dot3 | med }] [neighbor { dot1 [vlan-names | protocol-id] } | [dot3] | { med [capabilities] [network-policy] [location] [extended-power] [inventory] } | [detail]] [neighbor-mgmt-addr]`

--End--

Variable definitions

The following table outlines the parameters of the **`show lldp`** command.

Table 88
show lldp command parameters

Variable	Value
local-sys-data {dot1 | dot3 | med | detail}	Displays the organizationally-specific TLV properties on the local switch: • dot1: displays the 802.1 TLV properties • dot3: displays the 802.3 TLV properties • med: displays the MED TLV properties • detail: displays all organizationally specific TLV properties

Variable	Value
	To display the properties of the optional management TLVs, include only the local-sys-data parameter in the command.
mgmt-sys-data	Displays the local management system data.
rx-stats	Displays the LLDP receive statistics for the local system.
tx-stats	Displays the LLDP transmit statistics for the local system.
stats	Displays the LLDP table statistics for the remote system.
pdu-tlv-size	Displays the different TLV sizes and the number of TLVs in an LLDPDU.
tx-tlv {dot1 | dot3 | med }	Displays which TLVs are transmitted from the local switch in LLDPDUs: • dot1: displays status for 802.1 TLVs • dot3: displays status for 802.3 TLVs • med: displays status for MED TLVs To display the transmission status of the optional management TLVs, include only the tx-tlv parameter in the command.
neighbor { dot1 [vlan-names | protocol-id] } | [dot3] | { med [capabilities] [network-policy] [location] [extended-power] [inventory] } | [detail]	Displays the neighbor TLVs: • dot1: displays 802.1 TLVs: — vlan-names: VLAN Name TLV — protocol-id: Protocol Identity TLV • dot3: displays 802.3 TLVs • med: displays MED TLVs: — capabilities: Capabilities TLV — network-policy: Network Policy Discovery TLV — location: Location Identification TLV — extended-power: Extended Power-via-MDI TLV — inventory: Inventory TLVs • detail: displays all TLVs
[neighbor-mgmt-addr]	Displays the LLDP neighbor management address.

show lldp port command

Use this procedure to display the LLDP port parameters.

Procedure steps

Step	Action
1	Use the following command from User EXEC mode: `show lldp port <portlist> [rx-stats] [tx-stats] [pdu-tlv-size] [tx-tlv {dot1 | dot3 | med}] [neighbor {dot1 [vlan-names | protocol-id] } | [dot3] | {med [capabilities] [network-policy] [location] [extended-power] [inventory]} | [detail] ]} [neighbor-mgmt-addr]`

--End--

Variable definitions

The following table outlines the parameters of the **`show lldp port`** command.

Table 89
show lldp port command parameters

Variable	Value
rx-stats	Displays the LLDP receive statistics for the local port.
tx-stats	Displays the LLDP transmit statistics for the local port.
pdu-tlv-size	Displays the different TLV sizes and the number of TLVs in an LLDPDU.
tx-tlv {dot1 | dot3 | med }	Displays which TLVs are transmitted from the local port in LLDPDUs: • dot1: displays status for 802.1 TLVs • dot3: displays status for 802.3 TLVs • med: displays status for MED TLVs To display the transmission status of the optional management TLVs, include only the tx-tlv parameter in the command.

Table 89
show lldp port command parameters (cont'd.)

Variable	Value
neighbor { dot1 [vlan-names | protocol-id] } | [dot3] | { med [capabilities] [network-policy] [location] [extended-power] [inventory] } | [detail]	Displays the port neighbor TLVs: • dot1: displays 802.1 TLVs: — vlan-names: VLAN Name TLV — protocol-id: Protocol Identity TLV • dot3: displays 802.3 TLVs • med: displays MED TLVs: — capabilities: Capabilities TLV — network-policy: Network Policy Discovery TLV — location: Location Identification TLV — extended-power: Extended Power-via-MDI TLV — inventory: Inventory TLVs • detail: displays all TLVs.
[neighbor-mgmt-addr]	Displays the port neighbor LLDP management address.

Configuring LLDP MED policies for switch ports

Use the following procedure to configure LLDP Media Endpoint Devices (MED) policies.

Procedure 1
Procedure steps

Step	Action
1	Use the following command from the Interface Configuration mode: `lldp med-network-policies [port <portList>] {voice|voice-signaling} [dscp <0-63>] [priority <0-7>] [tagging {tagged|untagged}] [vlan-id <1-4094>]`

--End--

Variable definitions

The following table outlines the parameters of the **`lldp med-network-policies`** command.

Table 90
lldp med-network-policies

Variable	Value
port <portlist>	Specifies the port or ports on which to configure LLDP MED policies.
voice	Specifies voice network policy.
voice-signaling	Specifies voice signalling network policy.
dscp <0-63>	Specifies the value of the Differentiated Service Code Point (DSCP) as defined in IETF RFC 2474 and RFC 2475 that is associated with the selected switch port or ports. Values range from 0–63.
priority <0-7>	Specifies the value of the 802.1p priority that applies to the selected switch port or ports. Values range from 0–7.
tagging {tagged | untagged}	Specifies the type of VLAN tagging to apply on the selected switch port or ports. • tagged—uses a tagged VLAN • untagged—uses an untagged VLAN or does not support port-based VLANs. If you select untagged, the system ignores the VLAN ID and priority values, and recognizes only the DSCP value.
vlan-id <1-4094>	Specifies the VLAN identifier for the selected port or ports. Values range from 1–4094. If you select priority tagged frames, the system recognizes only the 802.1p priority level and uses a value of 0 for the VLAN ID of the ingress port.

Setting lldp med-network-policies to the default values

Use this procedure to return lldp med-network-policies to the default values.

Procedure 2
Procedure steps

Step	Action
1	Use the following command from the Interface Configuration mode:

```
default lldp med-network-policies [port <portList>]
{voice|voice-signaling}
```

--End--

Variable definitions

The following table outlines the parameters of the **default lldp med-network-policies** command.

Table 91
default lldp med-network-policies parameters

Variable	Value
port <portlist>	Specifies the port or ports on which to configure default LLDP MED policies.
voice	Specifies the default voice network policy.
voice-signaling	Specifies the default voice signalling network policy.

Disabling LLDP MED policies for switch ports

Use this procedure to disable LLDP MED policies for switch ports.

Procedure 3
Procedure steps

Step	Action
1	Use the following command from the Interface Configuration mode: **no lldp med-network-policies [port <portList>] {voice|voice-signaling}**

--End--

Variable definitions

The following table outlines the parameters of the **no lldp med-network-policies** command.

Table 92
no lldp med-network-policies parameters

Variable	Value
port <portlist>	Specifies the port or ports on which to disable LLDP MED policies.

Table 92
no lldp med-network-policies parameters (cont'd.)

Variable	Value
voice	Specifies the voice network policy to disable.
voice-signaling	Specifies the voice signalling network policy to disable.

Viewing lldp med-network-policies

Use this procedure to display LLDP MED policy information for switch ports.

Procedure 4
Procedure steps

Step	Action
1	Use the following command from the Privileged EXEC mode: `show lldp med-network-policies [port <portList>] {voice|voice-signaling}`

--End--

Variable definitions

The following table outlines the parameters of the **`show lldp med-network-policies`** command.

Table 93
show lldp med-network-policies parameters

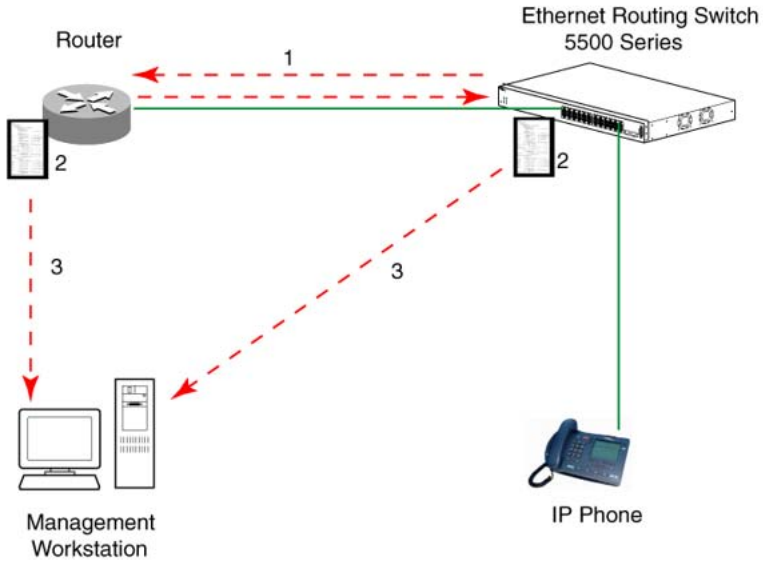
Variable	Value
port <portlist>	Specifies the port or ports for which to display LLDP MED policy information.
voice	Displays the voice network policy for which to display information.
voice-signaling	Specifies the voice signalling network policy to disable.

LLDP configuration example

By default, LLDP is enabled for Tx and Rx on all switch ports. The default value for the LLDP Tx interval is 30 seconds (LLDPDUs are sent at 30 seconds). With the default settings, only the mandatory TLVs are sent, but the switch can receive any LLDP Core, DOT1, DOT3 or MED TLV from its peers.

shows an example of LLDP configuration. For this example, the router is connected to the ERS 5000 Series port 1 and the IP Phone uses port 13.

Figure 25
LLDP configuration example



Configuring LLDP

Use this procedure to configure the example shown above.

ATTENTION
If a switch is reset while energy-saver is activated, the PoE power saving calculation may not accurately reflect the power saving, and in some cases may display zero savings. This is because the switch did not have sufficient time to record PoE usage between the reset of the switch and energy-saver being reactivated. When energy saver is next activated, the PoE power saving calculation will be correctly updated.

Procedure steps

Step	Action
1	Modify the default LLDP Tx interval from (the default 30 second value) to 60 seconds. Notice that if any modification is detected in the LLDP local-sys-data before the Tx interval expires, an LLDPDU is immediately sent on all active links in order to update the peers neighbor tables.
2	Enable the Port Description TLV for transmission. (contains the description of the LLPD sending port)

3 Enable the System Name TLV for transmission. (contains the name of the LLDP device)

4 Enable the System Description TLV for transmission. (contains the description of the LLDP device)

5 Enable the System Capabilities TLV for transmission. (contains the capabilities of the LLDP device)

6 Enable the Management Address TLV for transmission. (contains the management address of the LLDP device)

7 Enable the Port VLAN ID TLV for transmission. (contains the PVID of the LLDP sending port)

8 Enable the Port And Protocol VLAN ID TLV for transmission. (indicates the Port and Protocol VLANs to which the LLDP sending port belongs to).

9 Enable the VLAN Name TLV for transmission. (indicates the names of the VLANs to which the LLDP sending port belongs to)

10 Enable the Protocol Identity TLV for transmission. (indicates the supported protocols by the LLDP sending port)

11 Enable the MAC/PHY Configuration/Status TLV for transmission. (indicates the IEEE 802.3 duplex and bitrate capabilities and settings of the LLDP sending port)

12 Enable the Power Via MDI TLV for transmission. (indicates the MDI power support capabilities of the LLDP sending port)

13 Enable the Link Aggregation TLV for transmission. (indicates the link aggregation capability and status of the LLDP sending port)

14 Enable the Maximum Frame Size TLV for transmission. (indicates the maximum frame size that could be handled by the LLDP sending port)

15 Configure the location information for the LLDP-MED Location Identification TLV.

There are three coordinate sets available for location advertisement.

16 Enable the LLDP-MED Capabilities TLV for transmission. (indicates the supported LLDP-MED TLVs and the LLDP-MED device type of the LLDP sending device)

MED TLVs are transmitted only if MED-Capabilities TLV is transmitted

17 Enable the Network Policy TLV for transmission. (advertises the available MED applications available on the LLDP sending device and the policies required to use the applications)

18 Enable the Location Identification TLV for transmission. (indicates the physical location of the LLDP sending port; three coordinate sets are available to configure and send)

19	Enable the Extended Power-via-MDI TLV for transmission. (provides detailed informations regarding the PoE parameters of the LLDP sending device)
20	Enable the Inventory – Hardware Revision TLV for transmission. (indicates the hardware revision of the LLDP sending device)
21	Enable the Inventory – Firmware Revision TLV for transmission. (indicates the firmware revision of the LLDP sending device)
22	Enable the Inventory – Software Revision TLV for transmission. (indicates the software revision of the LLDP sending device)
23	Enable the Inventory – Serial Number TLV for transmission. (indicates the serial number of the LLDP sending device)
24	Enable the Inventory – Manufacturer Name TLV for transmission. (indicates the manufacturer name of the LLDP sending device)
25	Enable the Inventory – Model Name TLV for transmission. (indicates the model name of the LLDP sending device)

--End--

Note: The switch only transmits LLDP MED information if the neighbor is a MED-capable unit.

Detailed configuration commands

The following section describes the detailed NNCLI commands required to carry out the configuration depicted in Figure 25 "LLDP configuration example" (page 198).

Modifying the default LLDP Tx interval

Use this procedure to modify the default LLDP Tx interval.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `lldp tx-interval 60`

--End--

Checking the new LLDP global settings

Use this procedure to show LLDP global settings.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **show lldp**

--End--

Job aid

The following job aid shows the output for the **show lldp** command.

```
5520-24T-PWR(config)#show lldp

----------------------------------------
TxInterval:60
TxHoldMultiplier:4
RxInitDelay:2
TxDelay:2
NotificationInterval:5
MedFastStartRepeatCount:4
```

Enabling all LLDP Core TLVs for transmission on the router and IP Phone ports

Use this procedure to enable all LLDP Core TLVs for transmission on the route and IP Phone ports.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **interface fastEthernet 1,13** **lldp tx-tlv port 1,13 port-desc** **lldp tx-tlv port 1,13 sys-name** **lldp tx-tlv port 1,13 sys-desc** **lldp tx-tlv port 1,13 sys-cap** **lldp tx-tlv port 1,13 local-mgmt-addr**

--End--

Checking the LLDP settings of the router and IP Phone ports

Use this procedure to check the LLDP settings of the router and IP Phone ports.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **show lldp port 1,13 tx-tlv**

--End--

Job aid

The following job aid shows the output for the **show lldp port 1,13 tx-tlv** command.

```
5520-24T-PWR(config-if)#show lldp port 1,13 tx-tlv

-------------------------------------------------------
lldp port tlvs
-------------------------------------------------------
Port PortDesc SysName SysDesc SysCap MgmtAddr
-------------------------------------------------------
1 true true true true true
13 true true true true true
```

Enabling all LLDP DOT1 TLVs for transmission on the router and IP Phone ports

Use this procedure to enable all LLDP DOT1 TLVs for transmission on the router and IP Phone ports.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **lldp tx-tlv port 1,13 dot1 port-vlan-id** **lldp tx-tlv port 1,13 dot1 port-protocol-vlan-id** **lldp tx-tlv port 1,13 dot1 vlan-name** **lldp tx-tlv port 1,13 dot1 protocol-identity EAP LLDP STP**

--End--

Checking the LLDP settings of the router and IP Phone ports

Use this procedure to check the LLDP setting of the router and IP Phone ports.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **show lldp port 1,13 tx-tlv dot1**

--End--

Job aid

The following job aid shows the output for the **show lldp port 1,13 tx-tlv dot1** command.

```
5520-24T-PWR(config-if)#show lldp port 1,13 tx-tlv dot1


-------------------------------------------------------------
lldp port dot1 tlvs
-------------------------------------------------------------
Dot1 protocols:  STP,EAP,LLDP
-------------------------------------------------------------
Port PortVlanId VlanNameList PortProtocolVlanId ProtocolIdentit
y
-------------------------------------------------------------
1 true 1 1 ALL
13 true 1 1 ALL
```

Enabling all LLDP DOT3 TLVs for transmission on the router and IP Phone ports

Use this procedure to enable all LLDP DOT3 TLVs for transmission on the router and IP Phone ports.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **lldp tx-tlv port 1,13 dot3 mac-phy-config-status** **lldp tx-tlv port 1,13 dot3 mdi-power-support** **lldp tx-tlv port 1,13 dot3 link-aggregation** **lldp tx-tlv port 1,13 dot3 maximum-frame-size**

--End--

Checking the LLDP settings of the router and IP Phone ports

Use this procedure to check the LLDP settings of the router and IP Phone ports.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **show lldp port 1,13 tx-tlv dot3**

--End--

Job aid

The following job aid shows the output for the **show lldp port 1,13 tx-tlv dot3** command.

```
5520-24T-PWR(config-if)#show lldp port 1,13 tx-tlv dot3


-------------------------------------------------------------
----
lldp port dot3 tlvs
-------------------------------------------------------------
----
-------------------------------------------------------------
----
Port MacPhy MdiPower Link MaxFrameSize ConfigStatus Support
Aggregation
-------------------------------------------------------------
-----
1 true true true true
13 true true true true
```

Enabling all LLDP MED TLVs for transmission on the router and IP Phone ports

Use this procedure to enable all LLDP MED TLVs for transmission on the router and IP Phone ports.

Note: The first three commands are required to configure the location identification for the LLDP-MED Location Identification TLV.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **lldp location-identification civic-address country-code US city Boston** **lldp location-identification coordinate-base altitude 3 floors** **lldp location-identification ecs-elin 1234567890** **lldp tx-tlv med port 1,13 med-capabilities**

```
lldp tx-tlv med port 1,13 network-policy
lldp tx-tlv med port 1,13 location
lldp tx-tlv med port 1,13 extendedPSE
lldp tx-tlv med port 1,13 inventory
```

--End--

Checking the new LLDP settings of the router and IP Phone ports

Use this procedure to check the new LLDP settings of the router and IP Phone ports.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **show lldp tx-tlv med**

--End--

Job aid

The following job aid shows the output of the **show lldp tx-tlv med** command.

```
5530-24TFD(config-if)#show lldp tx-tlv med

-------------------------------------------------------------
lldp port med tlvs
-------------------------------------------------------------
-------------------------------------------------------------
Port Med Network Location Extended Inventory Capabilities Policy
PSE
-------------------------------------------------------------
1 true true true true true
13 true true true true true
-------------------------------------------------------------
```

Configuring local time zone with NNCLI

SNTP uses Coordinated Universal Time (UTC) for all time synchronizations so it is not affected by different time zones. To have the switch report the time in your local time zone, you need to use the clock commands to set the local time zone.

You must enable SNTP before you set the time zone. If SNTP is not enabled, this command has no effect. If you enable SNTP and do not specify a time zone, UTC is shown by default.

Use this procedure to configure your switch for your local time zone.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `configure`
2	Enable sntp server.
3	Set clock time zone using the clock command. `clock time-zone zone hours [minutes]`

--End--

Variable definitions

The following table outlines the parameters for the **`clock time-zone`** command.

Table 94
clock time-zone command parameters

Variable	Value
zone	Time zone acronym to be displayed when showing system time (up to 4 characters).
hours	Difference from UTC in hours. This can be any value between -12 and +12.
minutes	Optional: This is the number of minutes difference from UTC. Minutes can be any value between 0 and 59.

Configuring PoE detection method with NNCLI

Configuring PoE with NNCLI

The following section details the commands necessary to configure PoE with NNCLI:

- "Show port power status" (page 210)
- "Show port power measurement" (page 210)

Set port power enable or disable

Use this procedure to disable Power Over Ethernet to a port.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **poe poe-shutdown [port <portlist>]**
	--End--

Use this procedure to enable Power Over Ethernet to a port.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **no poe poe-shutdown [port <portlist>]**
	--End--

Note: In either command, substitute **<portlist>** with the ports on which PoE is enabled or disabled.

Set port power priority

Use this procedure to set the port power priority.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **poe poe-priority [port <portlist>] {critical | high | low}**
	--End--

Variable definitions

The following table outlines the parameters of the **poe-priority** command.

Table 95
poe-priority command parameters

Variable	Value
port <portlist>	The ports to set priority for.
{low | high | critical}	The PoE priority for the port.

Set power limit for channels

Use this procedure to set the power limit for channels.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **poe poe-limit [port <portlist>] <3-16>**

--End--

Variable definitions

The following table outlines the parameters of the **poe-limit** command.

Table 96
poe-limit command parameters

Variable	Value
port <portlist>	The ports to set the limit on.
<3 - 16>	The power range to limit at from 3 to 16 Watts.

Set traps control

Use this procedure to enable PoE-related traps for PoE-enabled ports.

Procedure steps

Step	Action
1	Use the following command from Interface Configuration mode: **poe poe-trap [unit <1-8>]**

--End--

Note: Substitute **<1-8>** with the number of the unit on which to enable traps.

Show main power status

Use this procedure to display the power configuration.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: **show poe-main-status [unit <1-8>]**

--End--

Note: Substitute **<1-8>** with the number of the unit for which to display the configuration.

Set power usage threshold

Use this procedure to set the power usage threshold in percentage on individual units.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **poe poe-power-usage-threshold [unit <1-8>] <1-99>**

--End--

Variable definitions

The following table outlines the parameters of the **poe-power-usage-threshold** command.

Table 97
poe-power-usage-threshold command parameters

Variable	Value
unit <1 - 8>	The unit for which to set the power threshold.
<1 - 99>	1--99 percent

Setting PoE detection method

Use this procedure to enable either 802.3af or Legacy compliant PD detection methods.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `poe poe-pd-detect-type [unit <1-8>] {802dot3af | 802dot3af_and_legacy}`

--End--

Show port power status

Use this procedure to display the power configuration.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `show poe-port-status [<portlist>]`

--End--

Note: Substitute `<portlist>` with the ports for which to display configuration.

Show port power measurement

Use this procedure to display the configuration.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `show poe-power-measurement [<portlist>]`

--End--

Note: Substitute `<portlist>` with the ports for which to display configuration.

Customizing NNCLI banner with NNCLI

show banner command

Use this procedure to display the banner.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: **show banner [static | custom]**

--End--

Variable definitions

The following table outlines the parameters of the **show banner** command.

Table 98
show banner command parameters

Variable	Value
static | custom	Displays which banner is currently set to display: • static • custom

banner command

Use this procedure to specify the banner displayed at startup.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: **banner {static | custom} <line number> "<LINE>"**

--End--

Variable definitions

The following table outlines the parameters of the **banner** command.

Table 99
banner command parameters

Variable	Value
static | custom	Sets the display banner as: • static • custom

Table 99
banner command parameters (cont'd.)

Variable	Value
line number	Enter the banner line number you are setting. The range is 1 to 19.
LINE	Specifies the characters in the line number.

no banner command

Use this procedure to clear all lines of a previously stored custom banner.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: `no banner` ***Note:*** This command sets the banner type to the default setting (STATIC).

--End--

Displaying the default TFTP server with NNCLI

Use this procedure to display the default TFTP server configured for the switch.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: `show tftp-server`

--End--

Displaying complete GBIC information

Use this procedure to display complete GBIC information.

Procedure steps

Step	Action
1	Use the following command in any command mode: **show interfaces gbic-info <port-list>** ***Note:*** Substitute **<port-list>** with the GBIC ports for which to display information. If no GBIC is detected, this command does not show any information.

--End--

Displaying hardware information

Use this procedure to display hardware information about the status of the switch.

Procedure steps

Step	Action
1	Use the following command from any command mode: **show system [verbose]** ***Note:*** The inclusion of the **[verbose]** option displays additional information about fan status, power status, and switch serial number.

--End--

Configuring AUR with NNCLI

Use the following commands to configure AUR with NNCLI:

show stack auto-unit-replacement command

Use this procedure to display the current AUR settings.

Procedure steps

Step	Action
1	Use the following command from any command mode: `show stack auto-unit-replacement`

--End--

Variable definitions

Table 100
show stack auto-unit-replacement command parameters

Variable	Value
Auto Unit Replacement Auto-Restore	**Enable**: During a unit replacement, the configuration will be automatically restored to the new unit.
	Disable: During a unit replacement, the configuration will not be restored automatically.
Auto Unit Replacement Auto-Save	**Enable**: The current configuration of a non base unit will be automatically saved to the base unit.
	Disable: The current configuration of a non base unit will not be automatically saved to the base unit.
Last Configuration-Save Time-Stamp	The system-up time of the non base unit recorded when the non base unit sends configuration to the base unit.
Ready for Replacement	**Yes**: The current configuration of the non base unit has been saved to the base unit. This unit is currently ready for replacement.
	No: The current configuration of the non base unit is not saved to the base unit. The latest changes of the configuration of the non base unit will be lost if the unit is replaced with a new unit.

For information about configuring AUR with NNCLI, see "Configuring AUR with NNCLI" (page 213).

For information about configuring AUR with Enterprise Device Manager, see "Configuring AUR" (page 245).

stack auto-unit-replacement enable command

Use this procedure to enable AUR on the switch.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `stack auto-unit-replacement enable`

--End--

no stack auto-unit-replacement enable command

Use this procedure to disable AUR on the switch.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `no stack auto-unit-replacement enable`

--End--

default stack auto-unit-replacement enable command

Use this procedure to restore the default AUR settings.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `default stack auto-unit-replacement enable`

--End--

stack auto-unit-replacement config save enable

Use this procedure to enable automatic configuration saves for non-base units.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `stack auto-unit-replacement config save enable`

--End--

stack auto-unit-replacement config save disable

Use this procedure to disable automatic configuration saves for non-base units.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `stack auto-unit-replacement config save disable`

--End--

stack auto-unit-replacement config restore unit

Use this procedure to restore the saved configuration to a non-base unit. Use the base unit console in Privileged Mode to enter this command.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: `stack auto-unit-replacement config restore unit <1-8>`

--End--

stack auto-unit-replacement config save unit

Use this procedure to save the configuration of the selected non-base unit to the base unit, regardless of the state of the AUR feature.

Step	Action
1	Use the following command from Privileged EXEC mode: `stack auto-unit-replacement config save unit <1-8>`

--End--

Agent Auto Unit Replacement (AAUR)

Use the following commands to configure and use AAUR.

stack auto-unit-replacement-image enable command

Use this procedure to enable AAUR.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `stack auto-unit-replacement-image enable` ***Note:*** AAUR is enabled by default; this command is only used if this functionality was previously disabled.

--End--

no stack auto-unit-replacement-image-enable command

Use this procedure to disable AAUR.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `no stack auto-unit-replacement-image enable` ***Note:*** AAUR is enabled by default,; this command must be executed if the AAUR functionality is not desired on a switch.

--End--

default stack auto-unit-replacement-image enable command

Use this procedure to set the AAUR functionality to the factory default of enabled.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `default stack auto-unit-replacement-image enable`

--End--

show stack auto-unit-replacement-image command

Use this procedure to view the current status of the AAUR fuctionality.

Procedure steps

Step	Action
1	Use the following command from User EXEC mode: **show stack auto-unit-replacement-image**

--End--

Enabling Autosave

With autosave enabled the system checks every minute to see if there is any new configuration data. If there is, it will automatically be saved to NVRAM. While autosave is enabled, the AUR feature should perform normally.

Use the following command to enable the autosave feature.

autosave enable command

Use this procedure to enable the autosave feature.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **autosave enable**

--End--

Disabling Autosave

With autosave disabled, the unit will not save the new configuration data to NVRAM. The user can restore via AUR all the configuration data that is configured before the feature is disabled. The user can also restore via AUR all the configuration data that is configured before NNCLI command **copy config nvram** is executed.

When resetting a stack with autosave disabled the stack will form with the configuration from NVRAM of each unit in the stack. The original configuration of a unit should be restored if the user replaces that unit in the stack without having to use the **copy config nvram** command.

no autosave enable command

Use this procedure to disable the autosave feature.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `no autosave enable`

--End--

Setting Stack Forced Mode

This section describes the procedures and commands to configure Stack Forced Mode on a two unit stack.

Use NNCLI Global Configuration command mode to configure Stack Forced Mode.

This section contains the procedures to configure **`stack forced-mode`**.

Configuring stack forced-mode

Use this procedure to configure stack forced-mode.:

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `<no | default | show>`

--End--

Variable definitions

The following table outlines the parameters for the **`stack forced-mode`** command.

Table 101
stack forced-mode command parameters

Variable	Value
<>	Enable Stack Forced Mode.
no	Disable Stack Forced Mode.

Variable	Value
default	Return to the default setting for Stack Forced Mode.

show	Show Stack Forced Mode status for the switch. The following list shows the possible responses:
	• `Forced-Stack Mode: Enabled`
	`Device is not currently running in forced Stack Mode.`
	• `Forced-Stack Mode: Enabled`
	`Device is currently running in forced Stack Mode.`
	• `Forced-Stack Mode: Disabled`
	`Device is not currently running in forced Stack Mode.`

Enabling feature license files

With the following commands, you can copy the software license file to your switch and display or clear the existing license information:

- “copy tftp license command” (page 220)
- “show license command” (page 221)
- “clear license command” (page 221)

copy tftp license command

Use this procedure to copy the features software license file from a TFTP server to your switch.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: **`copy tftp license <A.B.C.D> <WORD>`** After you copy the license to the switch, you must perform a reboot to activate the license.

--End--

With the command, you can copy the features software license file from a TFTP server to your switch.

Note: The software license is copied to NVRAM. If you reset the switch to default, this removes the software license from the switch. In this case, you must recopy the license file to the switch and reboot to reactivate the licensed features.

Variable definitions

The following table outlines the parameters of the **copy tftp license** command.

Table 102
copy tftp license command parameters

Variable	Value
<A.B.C.D>	The TFTP server address.
<WORD>	The software license filename on the TFTP server.

show license command

Use this procedure to display the existing software licenses on your switch.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: **show license { <1-10> | all }**

--End--

clear license command

Use this procedure to delete the existing software licenses on your switch.

Procedure steps

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

--End--

Setting user access limitations

Setting the read-only and read-write passwords

The first step to requiring password authentication when the user logs in to the switch is to edit the password settings..

Use this procedure to se the read-only and read-write passwords.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: **cli password {read-only | read-write} <password>**

--End--

Variable definitions

The following table outlines the parameters of the **cli password** command.

Table 103
cli password command parameters

Variable	Value
{read-only | read-write}	This parameter specifies if the password change is for read-only access or read-write access.
<password>	If password security is disabled, the length can be 1-15 chars. If password security is enabled, the range for length is 10-15 chars.

Enabling and disabling passwords

After the read-only and read-write passwords are set, they can be individually enabled or disabled for the various switch access methods. When enabled, password security prompts you for a password and the value is hidden.

Use this procedure to enable or disable passwords.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: **cli password {telnet | serial} {none | local | radius | tacacs}**

--End--

Variable definitions

The following table outlines the parameters of the **cli password** command.

Table 104
cli password command parameters

Variable	Value
{telnet | serial}	This parameter specifies if the password is enabled or disabled for telnet or the console.
{none | local | radius | tacacs}	This parameter specifies if the password is to be disabled (none), or if the password to be used is the locally stored password created in "Setting the read-only and read-write passwords" (page 221), or if RADIUS authentication or TACACS +AAA services is used.

Configuring RADIUS authentication

The *Remote Authentication Dial-In User Service* (RADIUS) protocol is a means to authenticate users through the use of a dedicated network resource. This network resource contains a listing of eligible user names and passwords and their associated access rights. When RADIUS is used to authenticate access to a switch, the user supplies a user name and, when prompted, a password. The password value is hidden when entered. This information is checked against the preexisting list. If the user credentials are valid they can access the switch.

If RADIUS Authentication was selected when enabling passwords through NNCLI, the RADIUS server settings must be specified to complete the process.

Use this procedure to enable RADIUS athentication.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **`radius-server host <address> [secondary-host <address>] port <num> key <string> [password fallback]`**

--End--

Variable definitions

The following table outlines the parameters of the **`radius-server`** command.

Table 105
radius-server command parameters

Variable	Value
host <address>	This parameter is the IPv6 or IPv4 address of the RADIUS server that is used for authentication.
[secondary-host <address>]	The secondary-host <address> parameter is optional. If a backup RADIUS server is to be specified, include this parameter with the IPv6 or IPv4 address of the backup server.
port <num>	This parameter is the UDP port number the RADIUS server uses to listen for requests.
key	This parameter prompts you to supply a secret text string or password that is shared between the switch and the RADIUS server. Enter the secret string, which is a string up to 16 characters in length. The password is hidden when entered.
[password fallback]	This parameter is optional and enables the password fallback feature on the RADIUS server. This option is disabled by default.

Related RADIUS Commands

During the process of configuring RADIUS authentication, there are three other NNCLI commands that can be useful to the process. These commands are:

- **`show radius-server`** —The command takes no parameters and displays the current RADIUS server configuration.
- **`no radius-server`**—This command takes no parameters and clears any previously configured RADIUS server settings.
- **`radius-server password fallback`**—This command takes no parameters and enables the password fallback RADIUS option if it was not done when the RADIUS server was configured initially.

Configuring serial console port and USB host port

You can enable or disable the serial console and USB host ports to control access to an operational switch. Disabling the USB or serial console ports can prevent unauthorized access and configuration. Both the serial console and USB host ports are enabled by default. NNCLI and ACG are used to enable and disable the serial console and USB host ports. ACG support allows users to save the current settings as text files using NNCLI commands.

While disabled, the USB host port does not provide power to attached USB devices. No operation which uses the USB host port will be able to complete.

While disabling a console port, the current session ends. While it is disabled and the device is rebooted, the banner is no longer displayed. After enabling the port the user will see the login banner.

If the **show running config** command is running while disabling the serial console port, the execution is aborted.

The following NNCLI commands are used to enable and disable the serial console port and the USB host port:

serial-console command

Use this procedure to enable serial console ports to grant users console access.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **serial-console [unit <1-8>] [enable]**

--End--

Variable definitions

The following table outlines the parameters of the **serial-console** command.

Table 106
serial-console command parameters

Variable	Value
[unit <1-8>]	Identifies the unit number in a stack. Values range from 1 to 8.

no serial-console command

Use this procedure to disable the serial console port to deny users console access.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `no serial-console [unit <1-8>] [enable]`

--End--

Variable definitions

The following table outlines the parameters of the **`no serial-console`** command.

Table 107
no serial-console command parameters

Variable	Value
[unit <1-8>]	Identifies the unit number in a stack. Values range from 1 to 8.

default serial-console command

Use this procedure to reset the serial console port to its default setting of enabled.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `default serial-console [unit <1-8>] [enable]`

--End--

Variable definitions

The following table outlines the parameters of the **`default serial-console`** command.

Table 108
default serial-console command parameters

Variable	Value
[unit <1-8>]	Identifies the unit number in a stack. Values range from 1 to 8.

show serial-console command

Use this procedure to display the operational status of the serial console ports on all switches.

Procedure steps

Step	Action
1	Use the following command from Privileged EXEC mode: **show serial-console command [unit <1-8>]**

--End--

Variable definitions

The following table outlines the parameters of the **show serial-console** command.

Table 109
show serial-console command parameters

Variable	Value
[unit <1-8>]	Identifies the unit number in a stack. Values range from 1 to 8.

usb-host-port command

Use this procedure to enable USB ports to grant users console access.

Procedure steps

Step	Action
1	Use the following command from Global Configuarion mode: **usb-host-port [unit <1-8>] [enable]**

--End--

Variable definitions

The following table outlines the parameters of the **usb-host-port** command.

Table 110
usb-host-port command parameters

Variable	Value
[unit <1-8>]	Identifies the unit number in a stack. Values range from 1 to 8.

no usb-host-port command

Use this procedure to disable the USB host port to deny users console access.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **no usb-host-port [unit <1-8>] [enable]**

--End--

Variable definitions

The following table outlines the parameters of the **no usb-host-port** command.

Table 111
no usb-host-port command parameters

Variable	Value
[unit <1-8>]	Identifies the unit number in a stack. Values range from 1 to 8.

default usb-host-port command

Use this procedure to reset the USB host port to its default setting of enabled.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: **default usb-host-port [unit <1-8>] [enable]**

--End--

Variable definitions

The following table outlines the parameters of the **default usb-host-port** command.

Table 112
default usb-host-port command parameters

Variable	Value
[unit <1-8>]	Identifies the unit number in a stack. Values range from 1 to 8.

show usb-host-port

Use this procedure to display the operational status of the USB ports on all switches.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `show usb-host-port`

--End--

Restoring factory default

Use this procedure to reset the switch or stack back to its default configuration.

Procedure steps

Step	Action
1	Use the following command from Global Configuration mode: `restore factory-default [-y]`

--End--

where

`the [-y] parameter instructs the switch not to prompt for confirmation.`

System configuration with Enterprise Device Manager

This section contains information about the following topics:

Prerequisites

- Open one of the supported browsers.
- Enter the IP address of the switch to open an EDM session.

Configuring Quick Start using EDM

Perform this procedure to configure Quick Start to enter the setup mode through a single screen.

Procedure steps

Step	Action
1	From the navigation tree, double-click **Administration**.
2	In the Administration tree, double-click **Quick Start** .
3	In the IP/Community/Vlan work area, type a switch or stack IP address in the **In-Band Stack IP Address** dialog box.
4	In the **In-Band Stack Subnet Mask** dialog box, type a subnet mask.
5	In the **Default Gateway** dialog box, type an IP address.
6	In the **Read-Only Community String** box, type a character string.
7	In the **Re-enter to verify** dialog box immediately following the Read-Only Community String box, retype the character string from Step 6.
8	In the **Read-Write Community String** dialog box, type a character string.
9	In the **Re-enter to verify** dialog box immediately following the Read-Write Community String: box, retype the character string from Step 8.
10	In the **Quick Start VLAN** dialog box, type a VLAN ID ranging from 1 to 4094.
11	Click **Apply** .

--End--

Configuring remote access using EDM

Use this procedure to configure remote access for a switch.

Procedure steps

Step	Action
1	From the navigation tree, double-click **Administration**.
2	In the Administration tree, double-click **Remote Access** .
3	In the work area, click the **Setting** tab.
4	In the Telnet Remote Access Setting section, select a value from the **Access** list.
5	In the Telnet Remote Access Setting section, select a value from the **Use List** list.
6	In the SNMP Remote Access Setting section, select a value from the **Access** list.
7	In the SNMP Remote Access Setting section, select a value from the **Use List** list.
8	In the Web Page Remote Access Setting section, select a value from the **Use List** list.
9	In the SSH Remote Access Setting section, select a value from the **Access** list.
10	In the SSH Remote Access Setting section, select a value from the **Use List** list.
11	Click **Apply** .
	--End--

Use the data in this table to configure remote access for a switch.

Table 113
Variable definitions

Variable	Value
Telnet Remote Access Setting	Specifies the remote access settings for telnet sessions. • Access—allows or disallows telnet access to the switch • Use List—enables (Yes) or disables (No) the use of listed remote Telnet information.

Table 113
Variable definitions (cont'd.)

Variable	Value
SNMP Remote Access Setting	Specifies SNMP remote access settings. • Access—allows or disallows SNMP access to the switch • Use List—enables (Yes) or disables (No) the use of listed remote SNMP information.
Web Page Remote Access Setting	Specifies web page remote access settings. • Use List—enables (Yes) or disables (No) the use of listed remote web page information.
SSH Remote Access Setting	Specifies SSH remote access settings. • Access—allows or disallows SSH access to the switch • Use List—enables (Yes) or disables (No) the use of listed remote SSH information.

Configuring the IPv4 remote access list using EDM

Use this procedure to configure a list of IPv4 source addresses for which to permit remote access to a switch.

Procedure steps

Step	Action
1	From the navigation tree, double-click **Administration**.
2	In the Administration tree, double-click **Remote Access** .
3	In the work area, click the **Allowed List(IPv4)** tab.
4	To select a source to edit, click the source row.
5	In the source rowdouble-click the cell in the **Allowed Source IP Address** column.
6	In the dialog box, type a value.
7	In the source rowdouble-click the cell in the **Allowed Source Mask** column.
8	In the dialog box, type a value.

9	Click **Apply** .

--End--

Use the data in this table to configure to configure a list of IPv4 source addresses for which to permit access to the switch.

Table 114
Variable definitions

Variable	Value
Allowed Source IP Address	Specifies the source IPv4 address to permit remote access to the switch.
Allowed Source Mask	Specifies subnet mask associated with the source IPv4 address to permit remote access to the switch.

Configuring the IPv6 remote access list using EDM

Use this procedure to configure a list of IPv6 source addresses for which to permit remote access to a switch.

Procedure steps

Step	Action
1	From the navigation tree, double-click **Administration**.
2	In the Administration tree, double-click **Remote Access** .
3	In the work area, click the **Allowed List(IPv6)** tab.
4	To select a source to edit, click the source row.
5	In the source rowdouble-click the cell in the **Allowed Source IPv6 Address** column.
6	In the dialog box, type a value.
7	In the source rowdouble-click the cell in the **Allowed Prefix Length** column.
8	In the dialog box, type a value.
9	Click **Apply** .

--End--

Use the data in this table to configure to configure a list of IPv6 source addresses for which to permit access to the switch .

Table 115
Variable definitions

Variable	Value
Allowed Source IPv6 Address	Specifies the source IPv6 address to permit remote access to the switch.
Allowed Prefix Length	Specifies prefix length for the source IPv6 address to permit remote access to the switch. Values range from 0 to 128.

Viewing PoE ports with Enterprise Device Manager

The Front Panel view of Enterprise Device Manager provides additional information for PoE ports on the Nortel Ethernet Routing Switch 5520. This additional information is provided in the form of a colored "P" that appears inside the graphic representation of the port. This colored "P" represents the current power aspect of the PoE port.

Figure 26 "Nortel Ethernet Routing Switch 5520-48T-PWR" (page 236) displays an example of the Front Panel view of a Nortel Ethernet Routing Switch 5520-48T-PWR.

Figure 26
Nortel Ethernet Routing Switch 5520-48T-PWR

Table 116 "Power Aspect color codes" (page 236) explains what the different colors displayed by the power aspect represent.

Table 116
Power Aspect color codes

Color	Description
Green	Indicates that the port is currently delivering power.
Red	Indicates that the power and detection mechanism for the port is disabled.

Table 116
Power Aspect color codes (cont'd.)

Color	Description
Orange	Indicates that the power and detection mechanism for the port is enabled. The port is not currently delivering power.
White/Gray	Indicates that the power and detection mechanism for the port is unknown.

Note: The data and power aspect coloring schemes are independent of each other. The initial status for both data and power aspect for the port can be viewed. To refresh the power status, right-click the unit, and select **Refresh PoE Status** from the shortcut menu.

For more information about PoE, see the following sections:

- "Displaying the PoE tab for a single unit" (page 239)
- "Viewing the PoE power settings" (page 256)

General Switch Administration with Enterprise Device Manager

This section contains information about the following topics:

Displaying the Unit dialog box

The Power over Ethernet (PoE) parameters that apply to the whole switch can be configured and viewed using the Unit screen.

Note: View and edit the PoE parameters for each Nortel Ethernet Routing Switch 5520 one by one. If more than one unit is selected, the PoE power parameters, such as the PoE tab, are not displayed.

To open the Unit dialog box:

Procedure steps

Step	Action
1	In the **Device Physical View**, select the unit.

2 From the navigation tree, double-click **Edit**.

3 From the Edit tree, double-click **Unit**.

--End--

This sections contains information about the following topics:

- “Displaying the Unit tab for a single unit” (page 238)
- “Displaying the PoE tab for a single unit” (page 239)

Displaying the Unit tab for a single unit

To display the Unit tab for a single unit:

Procedure steps

Step	Action
1	In the **Device Physical View**, select the unit.
2	From the navigation tree, double-click **Edit**.
3	From the Edit tree, double-click **Unit**.
4	Select the **Unit** tab.

--End--

The following table outlines the parameters for the **Unit** tab.

Table 117
Variable definitions

Variable	Value
Type	Specifies the type number.
Descr	Specifies the type of switch.
Ver	Specifies the version number of the switch
SerNum	Specifies the serial number of the switch.
BaseNumPorts	Specifies the base number of ports.
TotalNumPorts	Specifies the total number of ports.

Displaying the PoE tab for a single unit

To set the power usage threshold, the power pairs to use, and the power detection method to use, select a *single* Nortel Ethernet Routing Switch 5520 unit.

> ***Note:*** These parameters only can be viewed and set by selecting a *single* unit. If more than one unit is selected, the **PoE** tab is not displayed.

To open the PoE tab for a *single* unit:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Unit**.
3	Select the **PoE** tab.

--End--

The following table outlines the parameters of the **PoE** tab.

Table 118
Variable definitions

Variable	Value
Power	Displays the total power available to the Nortel Ethernet Routing Switch 5520.
OperStatus	Displays the power state of the Nortel Ethernet Routing Switch 5520.: • on • off • faulty
Consumption Power	Displays the power being used by the Nortel Ethernet Routing Switch 5520.
Usage Threshold	Enables you to set a percentage of the total power usage of the Nortel Ethernet Routing Switch 5520 switch based on which the system sends a trap. ***Note:*** You must have the traps enabled (see NotificationControlEnable) to receive a power usage trap.

Table 118
Variable definitions (cont'd.)

Variable	Value
Notification Control Enable	Enables you to enable or disable sending traps if the switch's power usage exceed the percentage set in the UsageThreshold field.
PowerDevice DetectType	Enables you to set the power detection method that the switch uses to detect a request for power from a device connected to all ports on the switch: • 802.3af • 802.3af and legacy
PowerPairs	Displays the RJ-45 pin pairs that the switch uses to send power to the ports on the switch.

Displaying the Chassis dialog box

To open the Chassis dialog box:

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 **Chassis**.

--End--

The following sections provide a description of the tabs in the **Edit Chassis** screen:

- "Viewing system properties" (page 240)
- "Displaying the Asset ID tab" (page 243)
- "Displaying the Banner tab" (page 243)
- "Displaying the Custom Banner tab" (page 244)
- "Viewing stack mode properties" (page 245)
- "Configuring AUR" (page 245)

Viewing system properties

Use the System tab to specify, among other things, tracking information for a device and device descriptions.

To view the System tab:

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 **Chassis**.
4	Select the **System** tab.

--End--

The following table outlines the parameters for the **System** tab.

Table 119
Variable definitions

Variable	Value
sysDescr	A description of the device.
sysUpTime	The time since the system was last booted.
sysObjectID	The system object identification number.
sysContact	Type the contact information (in this case, an e-mail address) for the system administrator.
sysName	Type the name of this device.
sysLocation	Type the physical location of this device.
AuthenticationTraps	Click to enable or disable. When you select enabled, SNMP traps are sent to trap receivers for all SNMP access authentication. When you select disabled, no traps are received. To view traps, click the Trap toolbar button. 

Table 119
Variable definitions (cont'd.)

Variable	Value
Reboot	Action object to reboot the agent. Reset -- initiates a hardware reset. The agent attempts to return a response before the action occurs. If any of the combined download actions are requested, neither action occurs until the expiration of s5AgInfoScheduleBootTime, if set. • bootPrimary: Use the primary boot image. • bootSecondary: Use the secondary boot image.
AutoPvid	Click enabled or disabled. When you select enabled, Port VLAN ID (PVID) is automatically assigned.
StackInsertionUnitNumber	The unit number to be assigned to the next unit that joins the stack. The value cannot be set to the unit number of an existing stack member. When a new unit joins the stack, and the value of this object is used as its unit number, the value reverts to 0. If the value of this object is 0, it is not used when determining the unit number of new units.
JumboFramesEnabled	Click to enable or disable jumbo frames.
NextBootMgmtProtocol	The transport protocols to use after the next boot of the agent.
CurrentMgmtProtocol	Read only: The current transport protocols that the agent supports.
BootMode	The source from which to load the initial protocol configuration information to boot the switch the next time. The options available are • bootpDisabled • bootpAlways • bootpWhenNeeded • bootpOrLastAddress • dhcp • dhcpWhenNeeded • dhcpOrLastAddress
CurrentImageVersion	Read only: The version number of the agent image that is currently used on the switch.

Table 119
Variable definitions (cont'd.)

Variable	Value
NextBootDefaultGateway	Read only: The IP address of the default gateway for the agent to use after the next time the switch is booted.
CurrentDefaultGateway	Read only: The IP address of the default gateway that is currently in use.
NextBootLoadProtocol	Read only: The transport protocol to be used by the agent to load the configuration information and the image at the next boot.
LastLoadProtocol	Read only: The transport protocol last used to load the image and configuration information about the switch.

Displaying the Asset ID tab

To open the Asset ID tab:

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 **Chassis**.
4	Select the **Asset ID** tab.

--End--

The following table outlines the parameters for the **Asset ID** tab.

Table 120
Variable definitions

Variable	Value
Class	Specifies the local MED device class.
AssetID	Specifies the vendor-specific asset tracking identifier as advertised by the local device.

Displaying the Banner tab

To display the Banner tab:

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 **Chassis**.
4	Select the **Banner** tab.

--End--

The following table outlines the parameters for the **Banner** tab.

Table 121
Variable definitions

Variable	Value
BannerControl	BannerControl specifies the banner to be displayed as soon as you connect to a Nortel Ethernet Routing Switch 5000 Series device. BannerControl has the following three options: • The static option causes the predefined static banner to be used. • The custom option causes the previously set custom banner to be used when displaying a banner. • The disabled option prevents the display of any banners.

Displaying the Custom Banner tab

To display the Custom Banner tab:

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 **Chassis**.
4	Select the **Custom Banner** tab.

--End--

The following table outlines the parameters for the **Custom Banner** tab.

Table 122
Variable definitions

Variable	Value
Type	Identifies the banner type. There are two types of banner - one type is used in switch or stand-alone mode while the other is used in the stack mode.
Id	Identifies the line of text within a custom banner
Line	Displays a one line of a fifteen line banner. If the line contains non-printable ASCII characters, then the line is rejected and an error message returned.

Viewing stack mode properties

To view the Stack Mode tab:

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 **Chassis**.
4	Select the **Stack Mode** tab.

--End--

The following table outlines the parameters for the **Stack Mode** tab.

Table 123
Variable definitions

Variable	Value
CurrentOperationalMode	View operational mode.
NextBootOperationMode	View boot operation mode.

Configuring AUR

To configure AUR:

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 **Chassis**.
4	Select the **AUR** tab.
5	Enable Auto Unit Replacement by selecting the **AutoUnitReplacementEnabled** check box.
6	Enable Auto Unit Replacement saving by selecting the **AutoUnitReplacementSaveEnabled** check box.
7	Enter a value for forced saves in the **AutoUnitReplacementForceSaves** field.
8	Enter a value for AUR restore in the **AutoUnitReplacementRestore** field.
9	Click **Apply**.

--End--

The following table outlines the parameters for the **AUR** tab.

Table 124
Variable definitions

Variable	Value
AutoUnitReplacementEnabled	Specifies whether AUR is enabled.
AutUnitReplacementSaveEnabled	Specifies whether AUR Save is enabled.
AutUnitReplacementForceSave	Specifies whether an immediate save of the new base unit (NBU) configuration to the base unit (BU) is forced.
AutUnitReplacementRestore	Specifies whether the configuration of a unit from the saved configuration on the base unit is restored.

Displaying the Switch/Stack dialog box

The following section provides information about how to display switch/stack details.

- “Displaying the Base Unit Info tab” (page 247)
- “Viewing stack operating status” (page 248)
- “Renumbering stack switch units using EDM” (page 250)

Displaying the Base Unit Info tab

The Base Unit Info tab provides read-only information about the operating status of the hardware and whether or not the default factory settings are being used.

To display the Base Unit Info tab:

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 **Switch/Stack**.
4	Select the **Base Unit Info** tab.

--End--

The following table outlines the parameters for the **Base Unit Info** tab.

Table 125
Variable definitions

Variable	Value
Type	The switch type.
Descr	A description of the switch hardware, including number of ports and transmission speed.
Ver	The switch hardware version number.
SerNum	The switch serial number.
LstChng	The value of sysUpTime at the time the interface entered its current operational state. If the current state was entered prior to the last reinitialization of the local network management subsystem, the value is zero.
AdminState	Administrative state of the switch. Select either **`enable`** or **`reset`**. ***Note:*** In a stack configuration, Reset only resets the base unit.
OperState	The operational state of the switch.
Location	Type the physical location of the switch.
RelPos	The relative position of the switch.
BaseNumPorts	The number of base ports of the switch.
TotalNumPorts	The number of ports of the switch.

Table 125
Variable definitions (cont'd.)

Variable	Value
IpAddress	The base unit IP address.
RunningSoftwareVer	The software version.

Viewing stack operating status

The Stack Info tab provides read-only information about the operating status of the *stacked* switches and whether or not the default factory settings are being used.

To open the Stack Info tab:

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 **Switch/Stack**.
4	Select the **Stack Info** tab.

--End--

The following table outlines the parameters for the **Stack Info** tab.

Table 126
Variable definitions

Variable	Value
Descr	A description of the component or subcomponent. If not available, the value is a zero length string.
Location	The geographic location of a component in a system modeled as a chassis, but possibly physically implemented with geographically separate devices connected together to exchange management information. Chassis modeled in this manner are sometimes referred to as virtual chassis. An example value is: **4th flr wiring closet in blg A**. Notes: 1. This field is applicable only to components that can be found in either the Board or Unit groups. If the information is unavailable, for example, the chassis is not modeling a virtual chassis or component is not in Board or Unit group, the value is a zero length string.

Table 126
Variable definitions (cont'd.)

Variable	Value
	2. If this field is applicable and is not assigned a value through a SNMP SET PDU when the row is created, the value defaults to the value of the object s5ChasComSerNum.
LstChng	The value of sysUpTime when it was detected that the component/sub-component was added to the chassis. If this action has not occurred since the cold/warm start of the agent, then the value is zero.
AdminState	The state of the component or subcomponent. The values that are read-only are: • other -- currently in some other state • notAvail -- actual value is not available The possible values that can be read and written are: • enable--enables operation • reset--resets component
OperState	The current operational state of the component. The possible values are: • other--some other state • notAvail--state not available • removed--component removed • disabled--operation disabled • normal--normal operation • resetInProg--reset in progress • testing--doing a self test • warning--operating at warning level • nonFatalErr--operating at error level • fatalErr--error stopped operation The allowable (and meaningful) values are determined by the component type.
Ver	The version number of the component or subcomponent. If not available, the value is a zero length string.

Table 126
Variable definitions (cont'd.)

Variable	Value
SerNum	The serial number of the component or subcomponent. If not available, the value is a zero length string.
BaseNumPorts	The number of base ports of the component or subcomponent.
TotalNumPorts	The number of ports of the component or subcomponent.
IpAddress	The IP address of the component or subcomponent.
RunningSoftwareVer	The software version.

Renumbering stack switch units using EDM

Use this procedure to change the unit numbers of switches in a stack.

ATTENTION

Step	Action
1	From the navigation tree, double-click **Edit**.
2	In the Edit tree, double-click **Chassis** .
3	In the Chassis tree, double-click **Switch/Stack**.
4	In the work area, click the **Stack Numbering** tab.
5	To select a switch unit, click a unit row.
6	In the unit rowdouble-click the cell in the **New Unit Number** column.
7	Select a value from the list.
8	Click **Apply** . A warning message appears indicating that initiating the renumbering of switch units in a stack results in an automatic reset of the entire stack.

--End--

Procedure steps The following table outlines the parameters for the **Stack Numbering** tab.

Table 127
Variable definitions

Variable	Value
Current Unit Number	Indicates the current switch numbering sequence.
Descr	Provides a description of hardware included with the selected stack switch.
New Unit Number	Specifies the updated switch numbering sequence.

Variable definitions Use the information in the following table to change the unit numbers of switches in a stack.

Displaying the Ports dialog box

Port configuration tasks are performed in Enterprise Device Manager on the **Port** screen.

To open the Port screen:

Procedure steps

Step	Action
1	In the **Device Physical View**double-click the port. Multiple ports can be edited by selecting ports with the Control (CTRL) key depressed. **Or** From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Chassis**.
3	From the Chassis tree, double-click **Ports**.

--End--

Note: The presentation of the Port screen differs when one port is selected or multiple ports are selected. This difference is mainly in presentation although some options are not be available when multiple ports are selected. These exceptions are noted in their descriptions.

The following sections describe some of the tabs on the Port screen:

- “Displaying port status” (page 252)
- “Viewing VLAN port properties” (page 255)
- “Viewing the PoE power settings” (page 256)
- “Displaying the LACP tab” (page 258)

- "Viewing VLACP properties" (page 259)
- "Configuring rate limiting for a single port" (page 261)
- "Testing port cables" (page 262)

Displaying port status

The Interface tab shows the basic configuration and status of a port.

To open the Interface tab:

Procedure steps

Step	Action
1	In the **Device Physical View**double-click the port. Multiple ports can be edited by selecting ports with the Control (CTRL) key depressed. **Or** From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Chassis**.
3	From the Chassis tree, double-click **Ports**.
4	Select the **Interface** tab.
5	Click **Apply** after making any changes.

--End--

The following table outlines the parameters for the **Interface** tab.

Table 128
Variable definitions

Variable	Value
Index	A unique value assigned to each interface. The value ranges between 1 and 128 standalone. On stack, the index value of the first port of the second unit is 129. The maximum value is 512.
Name	Use this field to enter an optional name for the port.
Descr	The type of switch and number of ports.
Type	The media type of this interface.
Mtu	The size of the largest packet, in octets, that can be sent or received on the interface.
PhysAddress	The MAC address assigned to a particular interface.

Table 128
Variable definitions (cont'd.)

Variable	Value
AdminStatus	The current administrative state of the interface, which can be one of the following: • up • down When a managed system is initialized, all interfaces start with AdminStatus in the down state. AdminStatus changes to the up state (or remains in the down state) as a result of either management action or the configuration information available to the managed system.
OperStatus	The current operational state of the interface, which can be one of the following: • up • down • testing If AdminStatus is up, then OperStatus is also up if the interface is ready to transmit and receive network traffic. If AdminStatus is down, then OperStatus is also down. It remains in the down state if and only if there is a fault that prevents it from going to the up state. The testing state indicates that no operational packets can be passed.
LastChange	The value of sysUpTime at the time the interface entered its current operational state. If the current state was entered prior to the last reinitialization of the local network management subsystem, the value is zero.
LinkTrap	Indicates whether linkUp/linkDown traps are generated for this interface. By default, this object has the value enabled for interfaces that do not operate on top of any other interface (as defined in the ifStackTable).
AutoNegotiate	Indicates whether this port is enabled for autonegotiation or not.
AdminDuplex	Sets the administrative duplex mode of the port (half or full).
OperDuplex	Shows the current administrative duplex mode of the port (half or full).
AdminSpeed	Set the port speed.

Table 128
Variable definitions (cont'd.)

Variable	Value
OperSpeed	The current operating speed of the port.
AutoNegotiation Capability	Specifies the port speed and duplex capabilities that hardware can actually support on a port, and which can be advertised by the port using auto-negotiation. Bit 7 tells if a port supports pause frame capabilities (for full-duplex links) as a part of the advertisement. bit 0 - 10 half duplex advertisements bit 1 - 10 full duplex advertisements bit 2 - 100 half duplex advertisements bit 3 - 100 full duplex advertisements bit 4 - 1000 half duplex advertisements bit 5 - 1000 full duplex advertisements bit 6 - PAUSE frame support advertisements bit 7 - Asymmetric PAUSE frame support advertisements If auto-negotiation is not supported by the port hardware, then all bits reflect a value of zero.
AutoNegotiation Advertisements	Specifies the port speed and duplex abilities to be advertised during link negotiation. • 10Half: 10 half duplex advertised • 10Full: 10 full duplex advertised • 100Half: 100 half duplex advertised • 100Full: 100 full duplex advertised • 1000Half: 1000 half duplex advertised • 1000Full: 1000 full duplex advertised • PauseFrame: PAUSE frame support advertised. • AsymPauseFrame: Asymmetric PAUSE frame support advertised.

Table 128
Variable definitions (cont'd.)

Variable	Value
	The abilities specified in this object are only used when auto-negotiation is enabled on the port. If all bits in this object are disabled, and auto-negotiation is enabled on the port, then the physical link process on the port is disabled.
WanMode	Set the area network type for a 10 GE port. • none • wan • lan
MltId	The multilink trunk to which the port is assigned (if any).
IsPortShared	Displays if the selected port is a shared port or not.
PortActive Component	Displays the active component of shared ports.

Viewing VLAN port properties

To view the VLAN tab:

Procedure steps

Step	Action
1	In the **Device Physical View**double-click the port. Multiple ports can be edited by selecting ports with the Control (CTRL) key depressed. **Or** From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Chassis**.
3	From the Chassis tree, double-click **Ports**.
4	Select the **VLAN** tab.

--End--

The following table outlines the parameters for the **VLAN** tab.

Table 129
Variable definitions

Variable	Value
VlanIds	Specifies the IDs of the VLANs.

Table 129
Variable definitions (cont'd.)

Variable	Value
DefaultVlandId	The VLAN ID assigned to untagged frames received on a trunk port.
PortPriority	Specifies the port priority value from the list as a value between 0 and 7.
Tagging	Indicates the type of VLAN port. A trunk port can be a member of more than one VLAN. An access port can be a member of only VLAN, if no membership conflict exists. There are four types of VLAN port: • tagAll(trunk) • untagAll(access) • tagPvidOnly • untagPvidOnly

For more information on the VLAN tab, see *Nortel Ethernet Routing Switch 5000 Series Configuration — VLANs, Spanning Tree, and Multi-Link Trunking* (NN47200-502).

Viewing the PoE power settings

The PoE tab enables the configuration of the PoE power settings for a port in the Nortel Ethernet Routing Switch 5520. This tab is not displayed for units other than the 5520.

To open the PoE tab:

Procedure steps

Step	Action
1	In the **Device Physical View**double-click the port. Multiple ports can be edited by selecting ports with the Control (CTRL) key depressed. **Or** From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Chassis**.
3	From the Chassis tree, double-click **Ports**.

4 Select the **PoE** tab.

Note: The **PoE** tab is for setting Power over Ethernet (PoE) parameters for each port. The **Power Supply** tab on the **Chassis** screen displays the status of the internal Nortel Ethernet Routing Switch power supply.

--End--

The following table outlines the parameters for the **PoE** tab.

Table 130
Variable definitions

Variable	Value
AdminEnable	Enables or disables PoE on this port.
Detection Status	Displays the operational status of the power-device detecting mode on the specified port: • disabled: detecting function disabled • searching: detecting function is enabled and the system is searching for a valid powered device on this port • detected: detecting function detects a valid powered device but the port is not supplying power • deliveringPower: detection found a valid powered device and the port is delivering power • fault: power-specific fault detected on port • invalidPD: detecting function found an invalid powered device • denyLowPriority: port disabled by management system to supply power to higher-priority ports • test: detecting device in test mode ***Note:*** Nortel recommends against using the test operational status.
PowerClassifications	Displays the operational status of the port PD classification.
PowerPriority	Sets the power priority for the specified port to: • critical • high • low

Table 130
Variable definitions (cont'd.)

Variable	Value
PowerLimit	Enter an integer from 3 to 16 W to set the power limit for the port.
Power Measurement	Read only: • Voltage: in 1/10 v. • Current: in 1/1000 A. • Power: in 1/1000 W.

Displaying the LACP tab

To display the LACP tab:

Procedure steps

Step	Action
1	In the **Device Physical View** double-click the port. Multiple ports can be edited by selecting ports with the Control (CTRL) key depressed. **Or** From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Chassis**.
3	From the Chassis tree, double-click **Ports**.
4	Select the **LACP** tab.

--End--

The following table outlines the parameters for the **LACP** tab.

Table 131
Variable definitions

Variable	Value
ActorSystemPriority	A 2-octet read-write value indicating the priority value associated with the Actor's System ID.
OperEnabled	The current operational state for the port. A value of true means the port is participating in LACP. A value of false means the port is not participating in LACP.
ActorAdminState	A string of 8 bits, corresponding to the administrative values of Actor_State as transmitted by the Actor in LACPDUs.

Table 131
Variable definitions (cont'd.)

Variable	Value
ActorOperState	A string of 8 bits, corresponding to the current operational values of Actor_State as transmitted by the Actor in LACPDUs.
AggregateOrIndividual	The current operational state of the port, either aggregate and participating in a LAG, or individual link, not participating in a LAG. Value is read-only.
ActorPortPriority	The priority value assigned to this Aggregation Port. This 16-bit value is read-write.
ActorySystemID	The identifier for the actor system, currently the MAC address of the actor system. Value is read-only.
ActorOperKey	The current operational value of the Key for the Aggregation Port. This is a 16-bit read-only value.
SelectedAggID	The identifier value of the Aggregator that this Aggregation Port has currently selected. Zero indicates that the Aggregation Port has not selected an Aggregator, either because it is in the process of detaching from an Aggregator or because no suitable Aggregator exists for it to select.
AttachedAggID	The identifier value of the Aggregator that this Aggregation Port is currently attached to. Zero indicates that the Aggregation Port is not currently attached to an Aggregator. This value is read-only.
ActorPort	The port number locally assigned to the Aggregation Port. The port number is communicated in LACPDUs as the Actor_Port. This value is read-only
PartnerOperPort	The operational port number assigned by the port's protocol partner. This value is read-only.

For more information on the LACP tab, see *Nortel Ethernet Routing Switch 5000 Series Configuration — VLANs, Spanning Tree, and Multi-Link Trunking* (NN47200-502).

Viewing VLACP properties

To view the VLACP tab:

Procedure steps

Step	Action
1	In the **Device Physical View**double-click the port. Multiple ports can be edited by selecting ports with the Control (CTRL) key depressed.

Or
From the navigation tree, double-click **Edit**.

2 From the Edit tree, double-click **Chassis**.

3 From the Chassis tree, double-click **Ports**.

4 Select the **VLACP** tab.

--End--

The following table outlines the parameters for the **VLACP** tab.

Table 132
Variable definitions

Variable	Value
OperEnable	Indicates whether VLACP is operationally enabled (true) or disabled (false). **ATTENTION** VLACP is only operational when OperEnable is true and PortState is up.
FastPeriodicTimer	Indicates the number of milliseconds between periodic transmissions using short timeouts. Valid values range from 400-20000 with a default of 500.
SlowperiodicTimer	Indicates the number of milliseconds between periodic transmissions using long timeouts. Values range from 10000-30000 with a default of 30000.
Timeout	Indicates whether the timeout control value is a short or long timeout.
TimeoutScale	Indicates the scale value used to calculate timeout from periodic time. Values range from 1–10. The default is 3. With VLACP, a short interval exists between a port transmitting a VLACPDU and the partner port receiving the same VLACPDU. If the timeout-scale is set to 1, the port timeout value does not take into account the normal travel time of the VLACPDU. The port expects to receive a VLACPDU at the same moment the partner port sends it. Therefore, the delayed VLACPDU results in the link being blocked, and then enabled again when the packet arrives. Nortel recommends that you set the timeout scale to a value larger than 1.

Table 132
Variable definitions (cont'd.)

Variable	Value
EtherType	Indicates VLACP protocol identification. The value can be entered as a numerical value ranging from 33025–33279 or a hexadecimal equivalent (8101–81ff). The default is 8103. Use the prefix 0x to type a hexadecimal value in the dialog box. Only hexadecimal values display in the EtherType column of the VLACP work area.
EtherMacAddress	Indicates the MAC address of the switch or stack to which this port is sending VLACPDUs. This value cannot be configured as a multicast MAC. The default value is 00:00:00:00:00:00. VLACP uses only the multicast MAC address configured when VLACP is enabled globally. This is the Layer 2 destination address used for the VLACPDUs. The port-specific EtherMACAddress specifies the MAC address of the switch or stack to which this port is sending VLACPDUs. If you do not type a value for the EtherMACAddres s, the first VLACP-enabled switch that receives the PDUs from a sending port becomes the intended recipient and processes the PDUs. If you want an intermediate switch to drop VLACP packets, configure EtherMACAddress with the desired destination MAC address. With EtherMACAddress configured, the intermediate switches do not misinterpret the VLACP packets.
PortState	Indicates whether the VLACP port state is up or down. **ATTENTION** VLACP is only operational when OperEnable is true and PortState is up.

For more information on the VLACP tab, see *Nortel Ethernet Routing Switch 5000 Series Configuration — VLANs, Spanning Tree, and Multi-Link Trunking* (NN47200-502).

Configuring rate limiting for a single port

You can use the Rate Limit tab to configure the Rate Limiting for a single port.

To open the Rate Limit tab:

Procedure steps

Step	Action
1	In the **Device Physical View**double-click the port. Multiple ports can be edited by selecting ports with the Control (CTRL) key depressed. **Or** From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Chassis**.
3	From the Chassis tree, double-click **Ports**.
4	Select the **Rate Limit** tab.

--End--

The following table outlines the parameters for the **Rate Limit** tab.

Table 133
Variable definitions

Variable	Value
TrafficType	Specifies the two types of traffic that can be set with rate limiting: broadcast and multicast.
AllowedRate	Sets the rate limiting percentage. The available range is from 0% (none) to 10%.
Enable	Enables and disables rate limiting on the port for the specified traffic type. Options are true (enabled) or false (disabled).

Testing port cables

The 5000 Series switch is equipped with a Time Domain Reflectometer (TDR). The TDR provides a diagnostic capability to test connected cables for defects (such as short pin and pin open). Use the TDR tab to initiate cable diagnostic tests on attached cables.

The cable diagnostic tests only apply to Ethernet copper ports; fiber ports cannot be tested. You can initiate a test on multiple ports at the same time.

When you test a cable with the TDR, if the cable has a 10/100 MB/s link, the link is broken during the test and restored only when the test is complete. Use of the TDR does not affect 1 GB/s links.

Note: The accuracy margin of cable length diagnosis is between three to five meters. Nortel suggests the shortest cable for length information be five meters long.

To initiate a TDR test:

Procedure steps

Step	Action
1	In the **Device Physical View**double-click the port. Multiple ports can be edited by selecting ports with the Control (CTRL) key depressed. **Or** From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Chassis**.
3	From the Chassis tree, double-click **Ports**.
4	Select the **TDR** tab.
5	Select the **StartTest** option. (If multiple ports are selected, select **true** from the **StartTest** field for each port that you want to test.)
6	Click **Apply**.

--End--

The following table outlines the parameters for the **TDR** tab.

Table 134
Variable definitions

Variable	Value
StartTest	Enables the TDR test.
TestDone	Indicates whether a TDR test is complete.
CableStatus	Status of the cable as a whole. The status of a cable is, in a sense, a summation of the status of its pairs. If all the pairs are normal, the cable is normal. If the cable consists of zero or more normal pairs and one or more open pairs, the cable is considered open. If the cable consists of shorted pairs and normal pairs, it is considered shorted. Any combination of open and shorted pairs is considered simply failed. • cableFail • cableNormal • cableOpen • cableShorted • cableNotApplicable • cableUntested

Table 134
Variable definitions (cont'd.)

Variable	Value
Pair1Status	The status of a single pair in the cable: • pairFail • pairNormal • pairOpen • pairShorted • pairNotApplicable • pairNotTested • pairForce ***Note:*** If a 10MB or 100MB link is established without autonegotiation, Pair 1 will return Forced mode. The pair length is meaningless in this case.
Pair1Length	Pair Length, in meters, measured by Time Domain Reflectometry.
Pair2Status	The status of a single pair in the cable.
Pair2Length	Pair Length, in meters, measured by Time Domain Reflectometry.
Pair3Status	The status of a single pair in the cable.
Pair3Length	Pair Length, in meters, measured by Time Domain Reflectometry.
Pair4Status	The status of a single pair in the cable.
Pair4Length	Pair Length, in meters, measured by Time Domain Reflectometry.
CableLength	Length of cable in meters based on average electrical length of 4 pairs. Measurement can be done when traffic is live or not.
Pair1Polarity	The polarity of a single pair in the cable. This capability is available only when the cable gigabit link is up, regardless of traffic activity.
Pair1Swap	The pair swap in the cable: • normal • swapped • invalid • error This capability is available only when the cable gigabit link is up, regardless of traffic activity.

Table 134
Variable definitions (cont'd.)

Variable	Value
Pair1Skew	Pair skew is measured in nanoseconds. Skew measurement only can be performed when the cable gigabit link is up, regardless of traffic activity. A value of -1 means an error occurred when trying to get the length.
Pair2Polarity	The polarity of a single pair in the cable. This capability is available only when the cable gigabit link is up, regardless of traffic activity.
Pair2Swap	The pair swap in the cable. This capability is available only when the cable gigabit link is up, regardless of traffic activity.
Pair2Skew	Pair skew is measured in nanoseconds. Skew measurement only can be performed when the cable gigabit link is up, regardless of traffic activity. A value of -1 means an error occurred when trying to get the length.
Pair3Polarity	The polarity of a single pair in the cable. This capability is available only when the cable gigabit link is up, regardless of traffic activity.
Pair3Swap	The pair swap in the cable. This capability is available only when the cable gigabit link is up, regardless of traffic activity.
Pair3Skew	Pair skew is measured in nanoseconds. Skew measurement only can be performed when the cable gigabit link is up, regardless of traffic activity. A value of -1 means an error occurred when trying to get the length.
Pair4Polarity	The polarity of a single pair in the cable.
Pair4Swap	The pair swap in the cable.
Pair4Skew	Differential cable pair length in meters. Skew measurement only can be performed when the cable gigabit link is up, regardless of traffic activity. A value of -1 means an error occurred when trying to get the length.

Displaying the Environment dialog box

The following section provides information about how to display switch environment details.

- “Viewing the switch power supply properties” (page 266)
- “Displaying status of switch fans” (page 267)
- “Viewing temperature information” (page 268)

Viewing the switch power supply properties

The Power Supply tab provides read-only information about the operating status of the switch power supplies.

The power supply parameters are slightly different for the Nortel Ethernet Routing Switch 5520, as it supports Power over Ethernet (PoE).

To view the Power Supply tab:

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 **Environment**.
4	Select the **PowerSupply** tab.

--End--

The following table outlines the parameters for the **PowerSupply** tab.

Table 135
Variable definitions

Variable	Value
Description	Indicates the chassis number, power supply number, and the type of power supply.
OperStat	The operational state of the power supply. Possible values include: • other: Some other state. • notAvail: State not available. • removed: Component was removed. • disabled: Operation disabled.

Variable	Value
	• normal: State is in normal operation. • resetInProg: There is a reset in progress. • testing: System is doing a self test. • warning: System is operating at a warning level. • nonFatalErr: System is operating at error level. • fatalErr: A fatal error stopped operation. • notConfig: A module needs to be configured. The allowable values are determined by the component type.

Displaying status of switch fans

The Fan tab provides read-only information about the operating status of the switch fans.

To display status of switch fans:

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 **Environment**.
4	Select the **Fan** tab.

--End--

The following table outlines the parameters for the **Fan** tab.

Table 136
Variable definitions

Variable	Value
OperStat	The operational state of the fan. Values include: • other: Some other state. • notAvail: This state is not available. • removed: Fan was removed. • disabled: Fan is disabled. • normal: Fan is operating in normal operation.

Variable	Value
	• resetInProg: A reset of the fan is in progress. • testing: Fan is doing a self test. • warning: Fan is operating at a warning level. • nonFatalErr: Fan is operating at error level. • fatalErr: An error stopped the fan operation • notConfig: Fan needs to be configured. The allowable values are determined by the component type.

Viewing temperature information

The Temperature tab provides read-only information about the temperature of the switch.

To view the Temperature tab:

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 **Environment**.
4	Select the **Temperature** tab. A report of the temperature settings of the switch appears in the Environment window.
5	Click the **Refresh** tab to update the data.
	--End--

Nortel Energy Saver configuration using Enterprise Device Manager

You can use Nortel Energy Saver (NES) to configure the switch to utilize energy more efficiently.

Global NES configuration

Use the information in this section to configure NES for an single switch or a stack.

Navigation

Enabling global NES

Use the following procedure to enable energy saving for the switch.

Procedure steps

Step	Action
1	From the navigation tree, double-click **Power Management**.
2	In the Power Management tree, double-click **Energy Saver**.
3	In the work area, click the **Energy Saver Globals** tab.
4	Click the **EnergySaverEnabled** box.
5	On the toolbar, click **Apply**.
6	On the toolbar, you can click **Refresh** to update the work area data display.

--End--

The following table outlines the parameters of the **Energy Saver Globals** tab.

Table 137
Variable definitions

Variable	Value
EnergySaverEnabled	Enables or disables energy saving for the switch.
PoePowerSavingEnabled	Enables or disables NES PoE power save mode for the switch.
EfficiencyModeEnabled	Enables or disables NES efficiency mode for the switch.
EnergySaverActive	Activates or deactivates the Nortel Energy Saver.

Disabling global NES

Use the following procedure to disable energy saving for the switch.

Procedure steps

Step	Action
1	From the navigation tree, double-click **Power Management**.
2	In the Power Management tree, double-click **Energy Saver**.
3	In the work area, click the **Energy Saver Globals** tab.
4	Click the **EnergySaverEnabled** box.
5	Click **Apply**.
6	On the toolbar, you can click **Refresh** to update the work area data display.

--End--

Enabling global NES PoE power save mode

Use the following procedure to enable NES PoE power save mode for the switch.

When enabled, NES PoE power save mode provides the capability to control power consumption savings for only ports that have NES enabled, and PoE priority configured to low.

Prerequisites

- Disable NES globally.

Step	Action
1	From the navigation tree, double-click **Power Management**.
2	In the Power Management tree, double-click **Energy Saver**.
3	In the work area, click the **Energy Saver Globals** tab.
4	Click the **PoePowerSavingEnabled** box.
5	Click **Apply**.
6	On the toolbar, you can click **Refresh** to update the work area data display.

--End--

Disabling global NES PoE power save mode

Use the following procedure to disable NES PoE power save mode for the switch.

When enabled, NES PoE power save mode provides the capability to control power consumption savings for only ports that have NES enabled, and PoE priority configured to low.

Prerequisites

- Disable NES globally.

Procedure steps

Step	Action
1	From the navigation tree, double-click **Power Management**.
2	In the Power Management tree, double-click **Energy Saver**.
3	In the work area, click the **Energy Saver Globals** tab.
4	Click the **PoePowerSavingEnabled** box.
5	Click **Apply**.
6	On the toolbar, you can click **Refresh** to update the work area data display.

--End--

Enabling NES efficiency mode

Use the following procedure to enable NES efficiency mode for the switch.

When enabled, NES efficiency mode enables NES globally and for each port, enables NES PoE power save mode, and configures NES scheduling to predetermined values (on time 18:00 and off time 07:30 daily).

ATTENTION
NES efficiency mode overrides custom NES scheduling and PoE power saving mode. You will be prompted to confirm that you want to enable NES efficiency mode before proceeding.

Prerequisites

- Disable NES globally.

Procedure steps

Step	Action
1	From the navigation tree, double-click **Power Management**.

2 In the Power Management tree, double-click **Energy Saver**.

3 In the work area, click the **Energy Saver Globals** tab.

4 Select the **EfficiencyModeEnabled** check box.

5 Click **Apply**.

6 On the toolbar, you can click **Refresh** to update the work area data display.

--End--

Disabling NES efficiency mode

Use the following procedure to disable NES efficiency mode for the switch.

When enabled, NES efficiency mode enables NES globally and for each port, enables NES PoE power save mode, and configures NES scheduling to predetermined values (on time 18:00 and off time 07:30 daily).

Prerequisites

- Disable NES globally.

Procedure steps

Step	Action
1	From the navigation tree, double-click **Power Management**.
2	In the Power Management tree, double-click **Energy Saver**.
3	In the work area, click the **Energy Saver Globals** tab.
4	Click the **EfficiencyModeEnabled** box.
5	Click **Apply**.
6	On the toolbar, you can click **Refresh** to update the work area data display.

--End--

NES schedule configuration

Use the information in this section to configure a time interval for the switch to enter lower power states.

Navigation

- “Configuring the NES schedule on time ” (page 273)
- “Configuring the NES schedule off time” (page 274)
- “Modifying an NES schedule on and off time status” (page 275)

Configuring the NES schedule on time

Use the following procedure to configure the start of a time interval for the switch to enter lower power states. The time interval can span a complete week, a complete weekend, multiple days, or be configured within an individual day.

Prerequisites

- Disable NES globally.

Procedure steps

Step	Action
1	From the navigation tree, double-click **Power Management**.
2	In the Power Management tree, double-click **Energy Saver**.
3	In the work area, click the **Energy Saver Schedules** tab.
4	Click **Insert**.
5	To choose a day for the NES schedule on time, click a button in the **ScheduleDay** section.
6	To choose an hour of the day for the NES schedule on time, type a value in the **ScheduleHour** box.
7	To choose a portion of an hour for the NES schedule on time, type a value in the **ScheduleMinute** box.
8	To configure the selected day, hour, and minutes as the NES schedule on time, click the **activate** button in the **ScheduleAction** section. Activate is selected by default.
9	Click **Insert**.

--End--

The following table describes the fields of **Insert Energy Saver Schedule** window.

Table 138
Variable definitions

Variable	Value
ScheduleDay	Indicates the day on which this schedule entry takes effect.
ScheduleHour	Indicates the hour on which this schedule entry takes effect.

Table 138
Variable definitions (cont'd.)

Variable	Value
ScheduleMinute	Indicates the Minute on which this schedule entry takes effect.
ScheduleAction	Activates or deactivates the energy savings.

Configuring the NES schedule off time

Use the following procedure to configure the end of a time interval for the switch to enter lower power states. The time interval can span a complete week, a complete weekend, multiple days, or be configured within an individual day.

Prerequisites

- Disable NES globally.

Procedure steps

Step	Action
1	From the navigation tree, double-click **Power Management**.
2	In the Power Management tree, double-click **Energy Saver**.
3	In the work area, click the **Energy Saver Schedules** tab.
4	Click **Insert**.
5	To choose a day for the NES schedule off time, select a button in the **ScheduleDay** section.
6	To choose an hour of the day for the NES schedule off time, type a value in the **ScheduleHour** box.
7	To choose a portion of an hour for the NES schedule off time, type a value in the **ScheduleMinute** box.
8	To configure the selected day, hour, and minutes as the NES schedule off time, click the **deactivate** radio button in the ScheduleAction section. Activate is selected by default.
9	Click **Insert**.

--End--

The following table describes the fields of **Insert Energy Saver Schedule** window.

Table 139
Variable definitions

Variable	Value
ScheduleDay	Indicates the day on which this schedule entry takes effect.
ScheduleHour	Indicates the hour on which this schedule entry takes effect.
ScheduleMinute	Indicates the Minute on which this schedule entry takes effect.
ScheduleAction	Activates or deactivates the energy savings.

Modifying an NES schedule on and off time status

Use the following procedure to change an existing schedule off time to on time or to change an existing schedule on time to off time.

Prerequisites

- Disable NES globally.

Procedure steps

Step	Action
1	From the navigation tree, double-click **Power Management**.
2	In the Power Management tree, double-click **Energy Saver**.
3	In the work area, click the **Energy Saver Schedules** tab.
4	To select a schedule time to edit, click a schedule day.
5	In the schedule day rowdouble-click the cell in the **ScheduleAction** column.
6	Select a value from the list—**activate** to configure the schedule time as the on time, or **deactivate** to configure the schedule time as the off time.
7	Click **Apply**.

--End--

Port-based NES configuration

Configure port-based NES to enable or disable energy saving for individual ports, or all ports on a switch or stack.

Navigation

- "Enabling NES on individual ports" (page 276)
- "Disabling NES on individual ports" (page 277)

Enabling NES on individual ports

Use the following procedure to turn on NES for individual ports on a switch or stack.

Procedure steps

Step	Action
1	From the navigation tree, double-click **Power Management**.
2	In the Power Management tree, double-click **Energy Saver**.
3	In the work area, click the **Ports** tab.
4	In the **Multiple Port Configuration** area, click the **Switch/Stack/Ports** elipsis **(...)**.
5	Click a port or ports, or click **All**.
6	Click **Ok**. The portlist appears in the **Switch/Stack/Ports** box.
7	In the **Multiple Port Configuration** areadouble-click the cell under **EnergySaverEnabled**. A downward arrow appears.
8	Click the arrow. A list appears.
9	Click **true**.
10	Click **Apply Selection**.
11	On the toolbar, click **Apply**.
12	Repeat steps **4 to 11** to enable NES for additional ports as required.
13	Click **Apply**.
14	On the toolbar, you can click **Refresh** to update the work area data display.

--End--

The following table describes the fields of the **Ports** tab.

Table 140
Variable definitions

Field	Description
Port	Indicates the port.
EnergySaverEnabled	Indicates whether the Nortel Energy Saver feature is enabled for the port.

Disabling NES on individual ports

Use the following procedure to turn off NES for individual ports on a switch or stack.

Procedure steps

Step	Action
1	From the navigation tree, double-click **Power Management**.
2	In the Power Management tree, double-click **Energy Saver**.
3	In the work area, click the **ports** tab.
4	In the **Multiple Port Configuration** area, click the **Switch/Stack/Ports** elipsis **(...)**.
5	Click a port or ports, or click **All**.
6	Click **Ok**.
	The portlist appears in the **Switch/Stack/Ports** box.
7	In the **Multiple Port Configuration** areadouble-click the cell under **EnergySaverEnabled**.
	A downward arrow appears.
8	Click the arrow.
	A list appears.
9	Click **false**.
10	Click **Apply Selection**.
11	On the toolbar, click **Apply**.
12	Repeat steps **4 to 11** to disable NES for additional ports as required.
13	Click **Apply**.
14	On the toolbar, you can click **Refresh** to update the work area data display.

--End--

Viewing NES information using EDM

Use the following procedure to display energy saving information for an individual switch or switches in a stack.

Procedure steps

Step	Action
1	From the navigation tree, double-click **Power Management**.
2	In the Power Management tree, double-click **Energy Saver**.
3	In the work area, click the **Energy Savings** tab.
4	On the toolbar, you can click **Refresh** update the data.

--End--

Use the data in this table to help you understand the displayed NES information.

Table 141
Variable definitions

VariableValue	Value
UnitIndex	Indicates the unit number of the switch.
UnitSavings(watts)	Indicates the total power capacity being saved on the switch.
PoeSavings(watts)	Indicates the total PoE power being saved on the switch.

Bridge configuration using Enterprise Device Manager

Bridge information displays the MAC Address Table for the switch.

To open the Bridge dialog box:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Bridge**.

--End--

This section provides information about the following topics:

Dispalying bridge information

The Base tab displays basic Bridge information including the MAC address, type, and number of ports participating in the Bridge.

The MAC address used by the bridge must be referred to in a unique fashion; moreover, it must be the smallest MAC address (numerically) of all ports that belong to the bridge. However, it is only required to be unique when integrated with *dot1dStpPriority*. A unique *BridgeIdentifier* is formed that is used in the Spanning Tree Protocol.

To open the Base tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Bridge**.
3	Select the **Base** tab.

--End--

The following table outlines the parameters for the **Base** tab.

Table 142
Variable definitions

Variable	Value
BridgeAddress	MAC address of the bridge when it is referred to in a unique fashion. This address must be the smallest MAC address of all ports that belong to the bridge. However, it is has to be unique. When concatenated with dot1dStpPriority, a unique bridge ID is formed that is then used in the Spanning Tree Protocol.
NumPorts	Number of ports controlled by the bridging entity.
Type	Indicates the type of bridging this bridge can perform. If the bridge is actually performing a certain type of bridging, this fact is indicated by entries in the port table for the given type.

Displaying the Transparent tab

The Transparent tab is used to view information about learned forwarding entries.

To display the Transparent tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Bridge**.
3	Select the **Transparent** tab.
4	Click **Apply** if the **AgingTime** field is modified.

--End--

The following table outlines the parameters for the **Transparent** tab.

Table 143
Variable definitions

Variable	Value
LearnedEntryDiscards	Number of Forwarding Database entries learned that have been discarded due to a lack of space in the Forwarding Database. If this counter is increasing, it indicates that the Forwarding Database is becoming full regularly. This condition affects the performance of the subnetwork. If the counter has a significant value and is not presently increasing, it indicates that the problem has been occurring but is not persistent.
AgingTime	Timeout period in seconds for aging out dynamically learned forwarding information. ***Note:*** The 802.1D-1990 specification recommends a default of 300 seconds.

Displaying the Forwarding tab

The Forwarding tab displays the current state of the port, as defined by application of the Spanning Tree Protocol.

To display the Forwarding tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Bridge**.
3	Select the **Forwarding** tab.

--End--

The following table outlines the parameters for the **Forwarding** tab.

Table 144
Variable definitions

Variable	Value
Status	The values of this fields include: • invalid: Entry is no longer valid, but has not been removed from the table. • learned: Value of the corresponding instance of dot1dTpFdbPort was learned and is being used. • self: Value of the corresponding instance of dot1dTpFdbAddress represents an address of the bridge. The corresponding instance of dot1dTpFdbPort indicates that a specific port on the bridge has this address. • mgmt(5): Value of the corresponding instance of dot1dTpFdbAddress is also the value of an existing instance of dot1dStaticAddress. • other: None of the preceding. This includes instances where some other MIB object (not the corresponding instance of dot1dTpFdbPort or an entry in the dot1dStaticTable) is being used to determine if a frames addressed to the value of dot1dTpFdbAddress are being forwarded.
Address	A unicast MAC address for which the bridge has forwarding or filtering information.

Table 144
Variable definitions (cont'd.)

Variable	Value
Port	Either the value "0" or the port number on a frame has been seen. The source address must be equal to the value of the corresponding instance of dot1dTpFdbAddress A value of "0" indicates that the port number has not been learned, so the bridge does have the forwarding/filtering information for this address (located in the dot1dStaticTable). You must assign the port value to this object whenever it is learned even for addresses for which the corresponding value of dot1dTpFdbStatus is not learned(3).
Id	The VLAN ID.

File System configuration using Enterprise Device Manager

This section provides information about the following topics:

- "Config/Image/Diag file tab" (page 282)
- "ASCII file tab" (page 287)
- "Configuring the license file" (page 290)
- "File configuration" (page 292)
- "Displaying Boot Image information" (page 294)
- "Displaying the Help File Path tab" (page 295)

Config/Image/Diag file tab

This section provides information about the following topics:

- "Changing the switch software" (page 282)
- "Storing a binary configuration file" (page 285)
- "Retrieving a binary configuration file" (page 286)

Changing the switch software

The Config/Image/Diag file tab is used to change the switch software.

To open the Config/Image/Diag file tab:

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. In the fields provided, specify the information necessary to perform the download process.
4	Click **Apply**.

--End--

The software download process occurs automatically after clicking **Apply**. This process erases the contents of flash memory and replaces it with the new software image. Do not interrupt the download process. Depending on network conditions, this process can take up to 10 minutes. When the download process is complete, the switch automatically resets and the new software image initiates a self-test. During the download process, the switch is not operational.

The following table outlines the parameters for the **Config/Image/Diag file** tab.

Table 145
Variable definitions

Variable	Value
TftpServerInetAddressType	The type of TFTP server on which the new software images are stored for download.
TftpServerInetAddress	The IP address of the TFTP server on which the new software images are stored for download.
BinaryConfigFileName	The binary configuration file currently associated with the switch. This field is used when working with configuration files and is not used when downloading a software image.
BinaryConfigUnitNumber	The unit number of the portion of the configuration file that has to be extracted and used for the stand-alone unit configuration. If this value is 0 it is ignored. This field is used when working with configuration files and is not used when downloading a software image.
ImageFileName	The name of the image file currently associated with the switch. If needed, change this field to the name of the software image to be downloaded.

Table 145
Variable definitions (cont'd.)

Variable	Value
FwFileName (Diagnostics)	The name of the diagnostic file currently associated with the switch. If needed, change this field to the name of the diagnostic software image to be downloaded.
UsbTargetUnit	This field indicates the unit number of the USB port to be used in file upload or download operation.
Image	Specify if the image to download is the primary or secondary image.
Action	This group of option buttons represents the actions that are to be taken during this file system operation. The options applicable to a software download are: • dnldImg - Select this option to download a new software image to the switch. This option replaces the software image on the switch regardless of whether it is newer or older than the current image. • dnldFw - Select this option to download a new diagnostic software image to the switch. This option replaces the image regardless of whether it is newer or older than the current image. • dnldImgIfNewer - Select this option to download a new software image to the switch only if it is newer than the one currently in use. • dnldImgFromUsb - Select this option to download a new software image to the switch using the front panel USB port. This option replaces the image regardless of whether it is newer or older than the current image. This option is only available on the Nortel Ethernet Routing Switch 5530-24TFD. • dnldFwFromUsb - Select this option to download a new diagnostic software image to the switch from the front panel USB port. This option replaces the image regardless of whether it is newer or older than the current image. This option is only available on the Nortel Ethernet Routing Switch5530-24TFD or 5600 Series. • dnldImgNoReset - Select this option to download a new software image to the switch. This option replaces the software image on the switch regardless of whether it is newer or older than the

Table 145
Variable definitions (cont'd.)

Variable	Value
	current image. After the download is complete, the switch is not reset. • dnldFwNoReset - Select this option to download a new diagnostic software image to the switch. This option replaces the image regardless of whether it is newer or older than the current image. After the download is complete, the switch is not reset.
Status	Displays the status of the last action that occurred since the switch was last booted. The values that are displayed are: • other - No action has taken place since the last boot. • inProgress - The selected operation is currently in progress. • success - The selected operation was successful. • fail - The selected operation failed.

Storing a binary configuration file

To store the current binary configuration file to a TFTP server or USB storage 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	If a default TFTP server is not already specified (or another TFTP server is to be used), enter the IP address of the TFTP server to use in the **TftpServerInetAddress** field. If the file is stored on a USB storage device, skip this step.
5	In the **BinaryConfigFilename** field enter the name to assign to the configuration file .
6	If the configuration file to be stored is part of a stack, enter the stack unit number in the **BinaryConfigUnitNumber** field. If it is a stand-alone unit, specify 0.

7 If the configuration file is saved to a USB storage device, enter the stack unit number in which the USB device is inserted in the **UsbTargetUnit** field.

8 In the **Action** field, select the **upldConfig** option to upload to a TFTP server or **upldConfigtoUsb** to upload it to a USB storage device.

9 Click **Apply**.

--End--

For more information, see Table 145 "Variable definitions" (page 283).

Retrieving a binary configuration file

To retrieve 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	If a default TFTP server is not already specified (or another TFTP server is to be used), enter the IP address of the TFTP server to use in the **TftpServerInetAddress** field. If the file is retrieved from a USB storage device, skip this step.
5	Enter the name of the configuration file to retrieve in the **BinaryConfigFilename** field.
6	If the configuration file to be retrieved to a member of a stack, enter the stack unit number in the **BinaryConfigUnitNumber** field. If it is a stand-alone unit, specify 0.
7	If the configuration file is retrieved from a USB storage device, enter the stack unit number in which the USB device is inserted in the **UsbTargetUnit** field.
8	In the **Action** field, select the **dnldConfig** option to download the file from a TFTP server or **dnldConfigFromUsb** to download it from a USB storage device.
9	Click **Apply**.

--End--

For more information, see Table 145 "Variable definitions" (page 283).

ASCII file tab

This section provides information about the following topics:

Downloading an ASCII configuration file

This feature is enabled through Enterprise Device Manager by using the **File System** screen.

To enable the automatic downloading of a configuration file:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **File System**.
3	Select the **AsciiConfigFile** tab.
4	Type the IP address of the desired TFTP server in the **TftpServerInetAddress** field.
5	Type the name of the configuration file to be used in the **AsciiConfigFilename** field.
6	From the **AsciiConfigAutoDownload** field, select the option button that represents how the configuration file is to be downloaded. The options are: • **disabled** - Automatic downloading is disabled. • **useBootp** - Use BootP to obtain the settings needed to connect to the TFTP server that contains the configuration file. Using this option overrides the value in the **LoadServerAddr field**. • **useConfig** - Use the TFTP settings on the screen to connect to the TFTP server.
7	Click **Apply**.

--End--

The following table outlines the parameters for the **Ascii Config File** tab.

Table 146
Variable definitions

Variable	Value
TftpServerInet AddressType	Specifies the IP address of the TFTP server for all TFTP operations. If not used, then the value is 0.0.0.0. Further, if the value of s5AgTftpServerInetAddressType is not ipv4(1), then the value of this object must be 0.0.0.0.
TftpServerInetAddress	This object indicates the type of address stored in the related object s5AgSysTftpServerInetAddress.
AsciiConfigFilename	Specifies the name of the ascii configuration file that is downloaded/uploaded either at boot time when the s5AgSysAsciiConfigAutoDownload object is set to useConfig(3), or when the s5AgSysAsciiConfigManualDownloadobject is set to downloadNow(4) or downloadFromUsb(5). When not used, the value is a zero length string.
UsbTargetUnit	Indicates the unit number of the USB port to be used in file upload/download operations
AsciiConfigAuto Download	Indicates whether an ASCII configuration file should be downloaded at boot time. The file can be downloaded using either the configured filename and TFTP server address, or a BOOTP server can be used to determine the filename and TFTP server address.
AsciiConfigAutoDld Status	Indicates the status of the last automatic ASCII configuration file download at boot time. If no automatic download at boot time has been attempted, the value returned is failed.
AsciiConfigManual Download	Indicates the last manual attempt to download an ASCII configuration file.
AsciiConfigManualDld Status	Indicates the status of the last manual attempt to download an ASCII configuration file. The value of this object when retrieved can be either passed(1), inProgress(2), or failed(3). Setting this object to downloadNow(4) initiates a manual ASCII configuration file download from a TFTP server. Setting this object to downloadFromUsb(5) initials a manual ASCII configuration file download from a USB flash dongle. If no attempt has been made to manually download a configuration file, the value returned is failed(3).
Applications	Specifies the application.

Table 146
Variable definitions (cont'd.)

Variable	Value
AsciiConfigManual Upload	Indicates the the last manual attempt to upload an ASCII configuration file.
AsciiConfigManual UpldStatus	Indicates the status of the last manual attempt to upload an ASCII configuration file. The value of this object when retrieved can be either passed(1), inProgress(2), or failed(3). Setting this object to uploadNow(4) initiates a manual ASCII configuration file upload to a TFTP server. Setting this object to uploadToUsb(5) initiates a manual ASCII configuration file upload to a USB flash dongle. If no attempt has been made to manually upload a configuration file, the value returned is failed(3)." ::= { s5AgentSystem 19 }

Storing the current ASCII configuration

To store the current ASCII switch configuration file to a TFTP server or USB storage 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 the **TftpServerInetAddress** box type the IP address of the desired TFTP server.
5	In the **AsciiConfigFilename** box type the name of the configuration file.
6	To save the configuration file to a USB storage device, select 9 if the device is a standalone or 1-8 if the device is a stack.
7	In the **AsciiConfigManualUpload** field select **Upload Now** to transfer the file to a TFTP server or **UploadToUsb** to transfer the file to a USB mass storage device.
8	Click **Apply**.
9	Check the **AsciiConfigManualUpload** field for the file transfer status. If the status of the file upload is *InProgress*, wait for up to two minutes and then click **Refresh** to see the new status. The

file upload is complete when the status displays either *Passed* or *Failed*.

--End--

For more information, see Table 146 "Variable definitions" (page 288).

Retrieving an ASCII configuration file

To retrieve an ASCII configuration file from a TFTP server or USB storage 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 the **TftpServerInetAddress** box type the IP address of the desired TFTP server if you are retrieving the configuration file from a TFTP server.
5	If you retrieve the configuration file from a USB storage device, select 9 if the device is a stand-alone or 1-8 if the device is a stack.
6	Select **downloadNow** in the **AsciiConfigManualDownload** field to transfer the file from a TFTP server or **downloadFromUsb** to transfer the file from a USB mass storage device.
7	Click **Apply**.
8	Check the **AsciiConfigManualDldStatus** field for the file transfer status. If the status of the file upload is *InProgress*, wait for up to two minutes and then click **Refresh** to see any new status applied to the upload. The file upload is complete when the status displays either *Passed* or *Failed*.

--End--

For more information, see Table 146 "Variable definitions" (page 288).

Configuring the license file

To configure the license file:

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 the **TftpServerInetAddressType** field, select the address type, IPv4 or IPv6.
5	In the **TftpServerInetAddress** field, enter the TFTP server address in the format selected in the previous step.
6	In the **LicenseFileName** field, enter the software license filename for the TFTP server.
7	In the **UsbTargetUnit** field, select the target location using an integer ranging 0-9. 0 specifies TFTP retrieval. 1-8 are used to specify USB in a stack unit. 9 is used to specify a standalone unit.
8	In the **LicenseFileAction** field, select **dnldLicense**.
9	Click **Apply**.
10	Click **Refresh**. The LicenceFileStatus field displays the file copy progress. After the file copy completes, a warning message appears prompting you to reboot the switch and activate the license.
11	To reboot the switch, choose **Edit, Chassis**
12	Under the **System** tab, select the **reboot** option and click **Apply**.

--End--

The following table outlines the parameters for the **License File** tab.

Table 147
Variable definitions

Variable	Value
TftpServerInetAddressType	Specifies the IP address of the TFTP server for all TFTP operations. If not used, then the value is 0.0.0.0. Further, if the value of s5AgTftpServerInetAddressType is not ipv4(1), then the value of this object must be 0.0.0.0.
TftpServerInetAddress	Specifies the type of address of the TFTP server for all TFTP operations as IPv4 or IPv6.
LicenseFileName	Specifies the name of the license file.

Table 147
Variable definitions (cont'd.)

Variable	Value
UsbTargetUnt	Specifies the USB target location. • 1–8 specifies that the USP target unit is in the stack. • 9 specifies that the USB target is a standalone unit. • 0 specifies a TFTP server.
LicenseFileAction	Specifies the license file action. Only dnld license is supported.
LicenseFileStatus	Displays the file copy process.
RemoveLicense	Removes the license from a unit.

File configuration

Enterprise Device Manager provides tools for the storage and retrieval of configuration files.

This section provides information about the following topics:

- "Saving the current configuration" (page 292)
- "Enabling autosave" (page 293)
- "Disabling autosave" (page 294)

Saving the current configuration

The configuration currently in use on a switch is regularly saved to the flash memory automatically. However, you can manually initiate this process using the **Save Configuration** tab.

To save the current configuration:

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	Choose the **Save Configuration** tab.

The **Save Configuration** tab appears.

Note: The shared graphic was removed in accordance with the NTDA for cloning of documents. The graphic that was removed was Edit_FileSystem_Save_Config.png

5 In the **Action** field, choose **copyConfigToNvram**.

6 Click **Apply**.

7 Click **Refresh**

The Status field displays the file copy progress.

--End--

The following table outlines the parameters for the **Save Configuration** tab.

Table 148
Variable definitions

Variable	Value
AutosaveToNvramEnabled	Controls whether autosaving to NVRAM is enabled. Autosaving normally occurs periodically in a background task if any configuration changes have been made
Action	Specifies where the current configuration file is saved. Only copyConfigToNvram is supported.
Status	

Enabling autosave

To enable autosave:

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	Select the **AutoSaveToNvramEnabled** check box.
5	Click **Apply**.

--End--

For more information, see Table 148 "Variable definitions" (page 293).

Disabling autosave

To disable autosave:

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 the **AutoSaveToNvramEnabled** check box.
5	Click **Apply**.

--End--

For more information, see Table 148 "Variable definitions" (page 293).

Displaying Boot Image information

You can view boot image information with the Boot Image tab.

To see the version of the primary and secondary boot images on your system:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **File System**.
3	Select the **Boot Image** tab.
4	Click **Refresh** to renew the information.

--End--

The following table outlines the parameters for the **Boot Image** tab.

Table 149
Variable definitions

Variable	Value
Chassis <1 to 8> Primary Image version	Displays the version number of the primary boot image.

Table 149
Variable definitions (cont'd.)

Variable	Value
Chassis <1 to 8> Secondary Image version	Displays the version number of the secondary boot image. This line is blank if the switch does not have a secondary image in memory.
Chassis <1 to 8> Running Image version	Displays the version number of the boot image currently running.

Displaying the Help File Path tab

To open the Help File Path tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **File System**.
3	Select the **Help File Path** tab.

--End--

ADAC Configuration using Enterprise Device Manager

This section provides information about the following topics:

- "Displaying the ADAC tab" (page 295)
- "Displaying the ADAC MAC Ranges tab" (page 296)
- "Displaying the ADAC Ports tab" (page 297)

Displaying the ADAC tab

To open the ADAC tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **ADAC**.
3	Select the **ADAC** tab.

--End--

The following table outlines the parameters of the **ADAC** tab.

Table 150
Variable definitions

Variable	Value
OperEnable	Indicates ADAC operational state: true is enabled and false is disabled. **ATTENTION** If AdminEnable is True and OperEnable is False, this indicates an error condition such as missing Uplink and Call Server ports.
OperatingMode	Selects the ADAC operation mode: • untaggedFramesBasic—IP Phones send untagged frames, and the Voice VLAN is not created. • untaggedFramesAdvanced—IP Phones send untagged frames, and the Voice VLAN is created. • taggedFrames—IP Phones send tagged frames.
VoiceVlan	Sets the Voice VLAN ID.
CallServerPortList	Selects the Call Server port. A maximum of 8 Call Server ports are supported.
UplinkPortList	Selects the Uplink port. A maximum of 8 Uplink ports are supported.
MacAddrRangeControl	Selects a MAC address range table control option. • none—default • clearTable—clears all MAC address range table entries. • defaultTable—replaces all MAC address range table entries to default values.

Displaying the ADAC MAC Ranges tab

To open the ADAC MAC Ranges tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **ADAC**.
3	Select the **ADAC MAC Ranges** tab.

--End--

The following table outlines the parameters of the **ADAC MAC Ranges** tab.

Table 151
Variable definitions

Variable	Value
MacAddrRangeLowEndIndex	The MAC address for the low end of the MAC address range.
MacAddrRangeHighEndIndex	The MAC address for the high end of the MAC address range.

Displaying the ADAC Ports tab

To open the ADAC Ports tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **ADAC**.
3	Select the **ADAC Portss** tab.

--End--

The following table outlines the parameters of the **ADAC Ports** tab.

Table 152
Variable definitions

Variable	Value
Index	Indicates the switch position in a stack and the port number. The default value for a standalone switch is 1.
AdminEnable	Indicates whether ADAC is enabled (true) or disabled (false) for the port.
OperEnable	Indicates whether the port ADAC operational state is true (enabled) or false (disabled). This is a read-only cell. **ATTENTION** If OperEnable is false and AdminEnable is true, ADAC is disabled. This can occur if you reach the maximum number of devices supported on a port.

Table 152
Variable definitions (cont'd.)

Variable	Value
ConfigStatus	Indicates the ADAC status for the port. • configApplied—the ADAC configuration is applied to the port. • configNotApplied—the ADAC configuration is not applied to the port. • This is a read-only cell.
TaggedFramesPvid	Indicates the unique Port VLAN identifier (PVID). Values range from 0–4094. A value of 0 indicates that Auto-Configuration cannot change the PVID for the port.
TaggedFramesTagging	Indicates the tagging value that Auto-Con figuration applies to a port that has ADAC enabled and has tagged frames selected as the operating mode. • tagAll—tagging is enabled on all frames • tagPvidOnly—tagging is enabled on frames with a PVID that matches the PVID of this port • untagPvidOnly—tagging is disabled on frames with a PVID that matches the PVID of this port • noChange—accepts frames without change
AdacPortType	Indicates how ADAC classifies the port: • telephony—autodetection is enabled for the port • callServer—the port is configured as a Call Server • uplink—the port is configured as an Uplink • other—the port is not classified as telephony, callServer, or uplink
MacDetectionEnable	Indicates whether Autodetection of Nortel IP Phones, based on MAC address is enabled (true) or disabled (false) on the interface. **ATTENTION** You cannot configure MacDetectionEnable to false if no other supported detection mechanism is enabled on the port.
LldpDetectionEnable	Indicates whether Autodetection of Nortel IP Phones, based on 802.1ab is enabled (true) or disabled (false) on the interface. **ATTENTION**

Table 152
Variable definitions (cont'd.)

Variable	Value
	You cannot configure LldpDetectionEnable to false if no other supported detection mechanism is enabled on the port.

Topology configuration using Enterprise Device Manager

This section describes topology diagnostic information available in Enterprise Device Manager through the following tabs:

- "Viewing topology information" (page 299)
- "Viewing topology table information" (page 300)

Viewing topology information

To view topology information:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **Topology**.
4	Select the **Topology** tab.

--End--

The following table outlines the parameters of the **Topology** tab.

Table 153
Variable definitions

Variable	Value
IpAddr	The IP address of the device.
Status	Whether Nortel topology is on (topOn) or off (topOff) for the device. The default value is topOn.
NmmLstChg	The value of sysUpTime the last time an entry in the network management MIB (NMM) topology table was added, deleted, or modified. If the table has not changed since the last cold or warm start of the agent, then the value is zero.

Table 153
Variable definitions (cont'd.)

Variable	Value
NmmMaxNum	The maximum number of entries in the NMM topology table.
NmmCurNum	The current number of entries in the NMM topology table.

Viewing topology table information

To view more topology information:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **Topology**.
4	Select the **Topology Table** tab.

--End--

The following table outlines the parameters of the **Topology Table** tab.

Table 154
Variable definitions

Variable	Value
Slot	The slot number in the chassis in which the topology message was received.
Port	The port on which the topology message was received.
IpAddr	The IP address of the sender of the topology message.
SegId (Slot/Port)	The segment identifier, slot , and port number from where the autotopology packets were received.
MacAddr	The MAC address of the sender of the topology message.
ChassisType	The chassis type of the device that sent the topology message.
BkplType	The backplane type of the device that sent the topology message.

Table 154
Variable definitions (cont'd.)

Variable	Value
LocalSeg	Indicates if the sender of the topology message is on the same Ethernet segment as the reporting agent.
CurState	The current state of the sender of the topology message. The choices are: • topChanged: Topology information has recently changed. • heartbeat: Topology information is unchanged. • new: The sending agent is in a new state.

System Log configuration using Enterprise Device Manager

This section has information on the following:

- "Viewing system log settings" (page 301)
- "Viewing remote system log properties" (page 302)
- "Viewing system logs" (page 303)

Viewing system log settings

To view the System Log Settings tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **System Log**.
4	Select the **System Log Settings** tab.

--End--

The following table outlines the parameters of the **System Log Settings** tab.

Table 155
Variable definitions

Variable	Value
Operation	Enables (on) or disables (off) the system log.

Table 155
Variable definitions (cont'd.)

Variable	Value
BufferFullAction	Specifies the action for the system to take when the buffer space allocated for system log messages is exhausted. • overwrite—previously logged messages are overwritten • latch—halts the saving of system log messages until overwrite is selected, or buffer space is made available by other means (for example, clearing the buffer).
CurSize	Indicates the number of messages currently stored in memory.
SaveTargets	Specifies the type of system messages to save in memory. • critical—only messages classified as critical are saved in memory • critical/serious—only messages classified as critical and serious are saved in memory • critical/serious/inform—only messages classified as critical, serious, and informational are saved in memory • none—no system log messages are saved in memory
ClearMessageBuffers	Specifies the types system log messages to delete from volatile and non-volatile memory. • volCritical—only messages classified as critical are deleted from volatile memory • volSerious—only messages classified as serious are deleted from volatile memory • volInformational—only messages classified as informational are deleted from volatile memory • nonVolCritical—only messages classified as critical are deleted from non-volatile memory • nonVolSerious—only messages classified as serious are deleted from non-volatile memory

Viewing remote system log properties

To view the Remote System Log tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **System Log**.
4	Select the **Remote System Log** tab.

--End--

The following table outlines the parameters of the **Remote System Log** tab.

Table 156
Variable definitions

Variable	Value
RemoteSyslogAddressType	Specifies the type of IP address of the remote system log server.
RemoteSyslogAddress	Specifies the IP address of the remote system log server when sending system log messages.
SecondarySyslogAddressType	Specifies the type of IP address of the secondary remote system log server.
SecondarySyslogAddress	Specifies the IP address of the secondary remote system log server when sending system log messages.
SaveTargets	Specifies the type of system messages to send to the remote system log server. • critical—only messages classified as critical are sent to the remote system log server • critical/serious—only messages classified as critical and serious are sent to the remote system log server • critical/serious/inform—only messages classified as critical, serious, and informational are sent to the remote system log server • none—no system log messages are sent to the remote system log server

Viewing system logs

To view the System Logs tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **System Log**.
4	Select the **System Logs** tab.

--End--

The following table outlines the parameters of the **System Logs** tab.

Table 157
Variable definitions

Variable	Value
OrigUnitNumber	Indicates the slot or unit number of the originator of a log message.
MsgTime	Indicates the time (in one hundredths of a second) between system initialization and the appearance of a log message in the system log.
MsgIndex	Indicates a sequential number the system assigns to a log message when it enters the system log.
MsgScr	Indicates whether a log message was loaded from non-volatile memory at system initialization or was generated since system initialization.
MsgString	Indicates the log message originator and the reason the log message was generated.

LLDP configuration using Enterprise Device Manager

Use the following tabs to configure and view LLDP global and transmit properties for local and neighbor systems:

- “Configuring LLDP transmit properties” (page 305)
- “Configuring LLDP ports” (page 307)
- “TX Stats” (page 309)
- “RX Stats” (page 311)
- “Viewing LLDP local system properties” (page 313)
- “Viewing LLDP local port properties” (page 315)
- “Viewing LLDP management properites” (page 316)
- “Viewing LLDP remote properties” (page 317)

- "Viewing LLDP remote management properties" (page 319)
- "Viewing unknown TLVs received" (page 320)
- "Viewing LLDP organizationally-specific properties" (page 321)

Configuring LLDP transmit properties

With the Globals tab, you can configure LLDP transmit properties and view remote table statistics.

To configure LLDP transmit properties:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **LLDP**.
5	Select the **Globals** tab.

--End--

The following table outlines the parameters of the **LLDP Globals** tab.

Table 158
Variable definitions

Variable	Value
lldpMessageTxInterval	The interval (in seconds) at which LLDP frames are transmitted on behalf of this LLDP agent.
lldpMessageTx HoldMultiplier	The time-to-live value expressed as a multiple of the object. The actual time-to-live value used in LLDP frames, transmitted on behalf of this LLDP agent, is expressed by the following formula: TTL = min(65535, (lldpMessageTxInterval *lldpMessageTxHoldMultiplier)) For example, if the value of lldpMessageTxInterval is 30, and the value of lldpMessageTxHoldMultiplier is 4, the value 120 is encoded in the TTL field in the LLDP header.
lldpReinitDelay	The lldpReinitDelay indicates the delay (in seconds) from when the LLDP Port AdminStatus of a particular port is disabled until reinitialization begins.

Table 158
Variable definitions (cont'd.)

Variable	Value
lldpTxDelay	The lldpTxDelay indicates the delay (in seconds) between successive LLDP frame transmissions initiated by value or status changes in the LLDP local systems MIB. The recommended value for the lldpTxDelay is set by the following formula: 1 <= lldpTxDelay <= (0.25 * lldpMessageTxInterval)
lldpNotificationInterval	This object controls the transmission of LLDP notifications. The agent must not generate more than one lldpRemTablesChange notification-event in the indicated period, where a *notification-event* is the "transmission of a single notification PDU type to a list of notification destinations." If additional changes in lldpRemoteSystemsData object groups occur within the indicated throttling period, these trap-events must be suppressed by the agent. An NMS must periodically check the value of lldpStatsRemTableLastChangeTime to detect any missed lldpRemTablesChange notification-events, for example, due to throttling or transmission loss. If notification transmission is enabled for particular ports, the suggested default throttling period is 5 seconds.
RemTablesLast ChangeTime	The value of the sysUpTime object (defined in IETF RFC 3418) at the time an entry is created, modified, or deleted in tables associated with the lldpRemoteSystemsData objects, and all LLDP extension objects associated with remote systems. An NMS can use this object to reduce polling of the lldpRemoteSystemsData objects.
RemTablesInserts	The number of times the complete set of information advertised by a particular MSAP is inserted into tables contained in lldpRemoteSystemsData and lldpExtensions objects. The complete set of information received from a particular MSAP is inserted into related tables. If partial information cannot be inserted for a reason such as lack of resources, all of the complete set of information is removed. This counter is incremented only once after the complete set of information is successfully recorded in all related tables. Any failures occurring during insertion of the information set, which result in deletion of previously inserted information, do not trigger any changes in lldpStatsRemTablesInserts because the insert is not completed yet or in lldpStatsRemTablesDeletes, because the deletion is only a partial deletion. If the failure is the result of a lack of resources, the

Table 158
Variable definitions (cont'd.)

Variable	Value
	lldpStatsRemTablesDrops counter is incremented once.
RemTablesDeletes	The number of times the complete set of information advertised by a particular MSAP is deleted from tables contained in lldpRemoteSystemsData and lldpExtensions objects. This counter is incremented only once when the complete set of information is completely deleted from all related tables. Partial deletions, such as a deletion of rows associated with a particular MSAP, from some tables, but not from all tables, are not allowed, and thus, do not change the value of this counter.
RemTablesDrops	The number of times the complete set of information advertised by a particular MSAP can not be entered into tables contained in lldpRemoteSystemsData and lldpExtensions objects because of insufficient resources.
RemTablesAgeouts	The number of times the complete set of information advertised by a particular MSAP is deleted from tables contained in lldpRemoteSystemsData and lldpExtensions objects because the information timeliness interval has expired. This counter is incremented only once when the complete set of information is completely invalidated (aged out) from all related tables. Partial aging, similar to deletion case, is not allowed, and thus, does not change the value of this counter.
FastStartRepeatCount	The number of times the fast start LLDPDU is sent during the activation of the fast start mechanism defined by LLDP-MED.

Configuring LLDP ports

With the Port tab, you can set the optional TLVs to include in the LLPDUs transmitted by each port.

To configure LLDP ports:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.

3 From the Diagnostics tree, double-click **802.1AB**.

4 From the 802.1AB tree, double-click **LLDP**.

5 Select the **Port** tab.

--End--

The following table outlines the parameters of the **LLDP Port** tab.

Table 159
Variable definitions

Variable	Value
PortNum	Port number.
AdminStatus	The administratively desired status of the local LLDP agent: • txOnly: the LLDP agent transmits LLDP frames on this port and does not store any information about the remote systems to which it is connected. • rxOnly: the LLDP agent receives but does not transmit LLDP frames on this port. • txAndRx: the LLDP agent transmits and receives LLDP frames on this port. • disabled: the LLDP agent does not transmit or receive LLDP frames on this port. If the port receives remote systems information which is stored in other tables before AdminStatus is disabled, the information ages out.
NotificationEnable	Controls, for each port, whether notifications from the agent are enabled. • true: indicates that notifications are enabled • false: indicates that notifications are disabled.
TLVsTxEnable	Sets the optional Management TLVs to be included in the transmitted LLDPDUs: • portDesc: Port Description TLV • sysName: System Name TLV • sysDesc: System Description TLV • sysCap: System Capabilities TLV **Note:** The Local Management tab controls Management Address TLV transmission.

Table 159
Variable definitions (cont'd.)

Variable	Value
VLANTxEnable(dot1)	Specifies whether the IEEE 802.1 organizationally defined port VLAN TLV transmission is included in the transmitted LLDPDUs.
TLVsTxEnable(dot3)	Sets the optional IEEE 802.3 organizationally defined TLVs to be included in the transmitted LLDPDUs: • macPhyConfigStatus: MAC/PHY configuration/status TLV • powerViaMDI: Power over MDI TLV • linkAggregation: Link Aggregation TLV • maxFrameSize: Maximum-frame-size TLV.
CapSupported(med)	Identifies which MED system capabilities are supported on the local system.
TLVsTxEnable(med)	Sets the optional organizationally defined TLVs for MED devices to include in the transmitted LLDPDUs: • capabilities: Capabilities TLVs • networkPolicy: Network Policy TLVs • location: Emergency Communications System Location TLVs • extendedPSE: Extended PoE TLVs with PSE capabilities • inventory: Hardware Revision, Firmware Revision, Software Revision, Serial Number, Manufacturer Name, Model Name, and Asset ID TLVs.
NotifyEnable(med)	A value of true enables sending the topology change traps on this port. A value of false disables sending the topology change traps on this port.

TX Stats

This section provides information about the following topics:

- "Displaying the TX Stats tab" (page 309)
- "Graphing LLDP transmit statistics" (page 310)

Displaying the TX Stats tab

With the TX Stats tab, you can view LLDP transmit statistics by port.

To open the TX Stats tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **LLDP**.
5	Select the **TX Stats** tab.

--End--

The following table outlines the parameters of the **LLDP TX Stats** tab.

Table 160
Variable definitions

Variable	Value
PortNum	port number
FramesTotal	the number of LLDP frames transmitted by this LLDP agent on the indicated port

Graphing LLDP transmit statistics

To graph LLDP transmit statistics:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **LLDP**.
5	Select the **TX Stats** tab.
6	Click **Graph**. The TX Stats - Graph dialog box appears.
7	Highlight a data column to graph.
8	Click one of the graph buttons.

--End--

RX Stats

This section provides information about the following topics:

Displaying the RX Stats tab

With the RX Stats tab, you can view LLDP receive statistics by port.

To open the RX Stats tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **LLDP**.
5	Select the **RX Stats** tab.

--End--

The following table outlines the parameters of the **LLDP RX Stats** tab.

Table 161
Variable definitions

Variable	Value
PortNum	Port number.
FramesDiscardedTotal	The number of LLDP frames received on the port and discarded for any reason. This counter provides an indication that LLDP header formatting problems exist with the local LLDP agent in the sending system, or that LLDPDU validation problems exist with the local LLDP agent in the receiving system.
FramesErrors	The number of invalid LLDP frames received on the port, while the LLDP agent is enabled.
FramesTotal	The number of valid LLDP frames received on the port, while the LLDP agent is enabled.
TLVsDiscardedTotal	The number of LLDP TLVs discarded for any reason.

Table 161
Variable definitions (cont'd.)

Variable	Value
TLVsUnrecognizedTotal	The number of LLDP TLVs received on a given port that are not recognized by this LLDP agent on the indicated port. An unrecognized TLV is referred to as the TLV whose type value is in the range of reserved TLV types (000 1001 - 111 1110) in Table 9.1 of IEEE 802.1AB-2004. An unrecognized TLV can be a basic management TLV from a later LLDP version.
AgeoutsTotal	This counter represents the number of age-outs that occurred on a given port. An *age-out* is "the number of times the complete set of information advertised by a particular MSAP is deleted from tables contained in lldpRemoteSystemsData and lldpExtensions objects because the information timeliness interval has expired." This counter is similar to lldpStatsRemTablesAgeouts, except that it is on a for each-port basis. This enables NMS to poll tables associated with the lldpRemoteSystemsData objects and all LLDP extension objects associated with remote systems on the indicated port only. This counter is set to zero during agent initialization. When the admin status for a port changes from disabled to rxOnly, txOnly or txAndRx, the counter associated with the same port is reset to 0. The agent also flushes all remote system information associated with the same port. This counter is incremented only once when the complete set of information is invalidated (aged out) from all related tables on a particular port. Partial aging is not allowed, and thus, does not change the value of this counter.

Graphing LLDP receive statistics

To graph LLDP receive statistics:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **LLDP**.
5	Select the **RX Stats** tab.

6 Click **Graph**.

The RX Stats - Graph dialog box appears.

7 Highlight a data column to graph.

8 Click one of the graph buttons.

--End--

Viewing LLDP local system properties

With the Local System tab, you can view LLDP properties for the local system.

To view LLDP local system properties:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **LLDP**.
5	Select the **Local System** tab.

--End--

The following table outlines the parameters of the **LLDP Local System** tab.

Table 162
Variable definitions

Variable	Value
ChassisIdSubtype	the type of encoding used to identify the local system chassis: • chassisComponent • interfaceAlias • portComponent • macAddress • networkAddress • interfaceName • local

Table 162
Variable definitions (cont'd.)

Variable	Value
ChassisId	chassis ID
SysName	local system name
SysDesc	local system description
SysCapSupported	identifies the system capabilities supported on the local system
SysCapEnabled	identifies the system capabilities that are enabled on the local system
DeviceClass	local MED device class
HardwareRev	the vendor-specific hardware revision string as advertised by the local device
FirmwareRev	the vendor-specific firmware revision string as advertised by the local device
SoftwareRev	the vendor-specific software revision string as advertised by the local device
SerialNum	the vendor-specific serial number as advertised by the local device
MfgName	the vendor-specific manufacturer name as advertised by the local device
ModelName	the vendor-specific model name as advertised by the local device
AssetID	the vendor-specific asset tracking identifier as advertised by the local device
DeviceType	defines the type of Power-via-MDI (Power over Ethernet) advertised by the local device: • pseDevice: indicates that the device is advertised as a Power Sourcing Entity (PSE). • pdDevice: indicates that the device is advertised as a Powered Device (PD) • none: indicates that the device does not support PoE
PSEPowerSource	defines the type of PSE Power Source advertised by the local device: • primary: indicates that the device advertises its power source as primary • backup: indicates that the device advertises its power source as backup

Table 162
Variable definitions (cont'd.)

Variable	Value
PDPowerReq	specifies the value of the power required (in units of 0.1 watts) by a Powered Device (PD)
PDPowerSource	defines the type of power source advertised as in use by the local device: • fromPSE: indicates that the device advertises its power source as received from a PSE • local: indicates that the device advertises its power source as local • localAndPSE: indicates that the device advertises its power source as using both local and PSE power
PDPowerPriority	defines the priority advertised as required by this PD: • critical: indicates that the device advertises its power priority as critical, see RFC 3621 • high: indicates that the device advertises its power priority as high, see RFC 3621 • low: indicates that the device advertises its power priority as low, see RFC 3621

Viewing LLDP local port properties

With the Local Port tab, you can view LLDP port properties for the local system.

To view LLDP local port properties:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **LLDP**.
5	Select the **Local System** tab.

--End--

The following table outlines the parameters of the **LLDP Local Port** tab.

Table 163
Variable definitions

Variable	Value
PortNum	Port number.
PortIdSubtype	The type of port identifier encoding used in the associated PortId object. • interfaceAlias • portComponent • macAddress • networkAddress • interfaceName • agentCircuitId • local.
PortId	The string value used to identify the port component associated with a given port in the local system.
PortDesc	The string value used to identify the 802 LAN station port description associated with the local system. If the local agent supports IETF RFC 2863, the PortDesc object has the same value as the ifDescr object.

Viewing LLDP management properites

With the Local Management tab, you can view LLDP management properties for the local system.

To view LLDP management properties:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **LLDP**.
5	Select the **Local Management** tab.

--End--

The following table outlines the parameters of the **LLDP Local Management** tab.

Table 164
Variable definitions

Variable	Value
AddrSubtype	The type of management address identifier encoding used in the associated Addr object.
Addr	The string value used to identify the management address component associated with the local system. This address is used to contact the management entity.
AddrLen	The total length of the management address subtype and the management address fields in LLDPDUs transmitted by the local LLDP agent. The management address length field is needed so that the receiving systems that do not implement SNMP are not required to implement an iana family numbers/address length equivalency table to decode the management address.
AddrIfSubtype	Identifies the numbering method used to define the interface number associated with the remote system. • unknown • ifIndex • systemPortNumber
AddrIfId	The integer value used to identify the interface number of the management address component associated with the local system.
AddrOID	The value used to identify the type of hardware component or protocol entity associated with the management address advertised by the local system agent.
AddrPortsTxEnable	Identifies the ports on which the local system management address TLVs are transmitted in the LLPDUs.

Viewing LLDP remote properties

With the Neighbor tab, you can view LLDP properties for the remote system.

To view LLDP properties for the remote system:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.

4 From the 802.1AB tree, double-click **LLDP**.

5 Select the **Neighbor** tab.

--End--

The following table outlines the parameters of the **LLDP Neighbor** tab.

Table 165
Variable definitions

Variable	Value
TimeMark	The TimeFilter for this entry. See the TimeFilter textual convention in IETF RFC 2021 for details about TimeFilter.
LocalPortNum	Identifies the local port on which the remote system information is received.
Index	An arbitrary local integer value used by this agent to identify a particular MSAP. An agent is encouraged to assign monotonically increasing index values to new entries, starting with one, after each reboot.
ChassisIdSubtype	The type of encoding used to identify the remote system chassis: • chassisComponent • interfaceAlias • portComponent • macAddress • networkAddress • interfaceName • local.
ChassisId	Remote chassis ID.
SysCapSupported	Identifies the system capabilities supported on the remote system.
SysCapEnabled	Identifies the system capabilities that are enabled on the remote system.
SysName	Remote system name.
SysDesc	Remote system description.

Table 165
Variable definitions (cont'd.)

Variable	Value
PortIdSubtype	The type of encoding used to identify the remote port. • interfaceAlias • portComponent • macAddress • networkAddress • interfaceName • agentCircuitId • local
PortId	Remote port ID.
PortDesc	Remote port description.

Viewing LLDP remote management properties

With the Neighbor Mgmt Address tab, you can view LLDP management properties for the remote system.

To open the Neighbor Mgmt Address tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **LLDP**.
5	Select the **Neighbor Mgmt Address** tab.

--End--

The following table outlines the parameters of the **LLDP Neighbor Mgmt Address** tab.

Table 166
Variable definitions

Variable	Value
TimeMark	The TimeFilter for this entry.

Table 166
Variable definitions (cont'd.)

Variable	Value
LocalPortNum	Identifies the local port on which the remote system information is received.
Index	An arbitrary local integer value used by this agent to identify a particular MSAP. An agent is encouraged to assign monotonically increasing index values to new entries, starting with one, after each reboot.
AddrSubtype	The type of encoding used in the associated Addr object.
Addr	The management address associated with the remote system.
AddrIfSubtype	Identifies the numbering method used to define the interface number associated with the remote system. • unknown • ifIndex • systemPortNumber
AddrIfId	The integer value used to identify the interface number of the management address component associated with the remote system.
AddrOID	The value used to identify the type of hardware component or protocol entity associated with the management address advertised by the remote system agent.

Viewing unknown TLVs received

With the Unknown TLV tab, you can view details about unknown TLVs received on the local system.

To view the Unknown TLV tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **LLDP**.

5 Select the **Unknown TLV** tab.

--End--

The following table outlines the parameters of the **LLDP Unknown TLV** tab.

Table 167
Variable definitions

Variable	Value
TimeMark	The TimeFilter for this entry.
LocalPortNum	Identifies the local port on which the remote system information is received.
Index	An arbitrary local integer value used by this agent to identify a particular MSAP. An agent is encouraged to assign monotonically increasing index values to new entries, starting with one, after each reboot.
UnknownTLVType	The value extracted from the type field of the unknown TLV.
UnknownTLVInfo	The value extracted from the value field of the unknown TLV.

Viewing LLDP organizationally-specific properties

With the Organizational Defined Info tab, you can view Organizationally-specific properties for the remote system.

To view LLDP organizationally-specific properties:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **LLDP**.
5	Select the **Organizational Defined Info** tab.

--End--

The following table outlines the parameters of the **LLDP Organizational Defined Info** tab.

Table 168
Variable definitions

Variable	Value
TimeMark	The TimeFilter for this entry.
LocalPortNum	Identifies the local port on which the remote system information is received.
Index	An arbitrary local integer value used by this agent to identify a particular MSAP. An agent is encouraged to assign monotonically increasing index values to new entries, starting with one, after each reboot.
OrgDefInfoOUI	The Organizationally Unique Identifier (OUI), as defined in IEEE 802-2001, is a 24 bit (three octets) globally unique assigned number referenced by various standards, of the information received from the remote system.
OrgDefInfoSubtype	The integer value used to identify the subtype of the organizationally defined information received from the remote system. The subtype value is required to identify different instances of organizationally defined information that cannot be retrieved without a unique identifier that indicates the particular type of information contained in the information string.
OrgDefInfoIndex	This object represents an arbitrary local integer value used by this agent to identify a particular unrecognized organizationally defined information instance, unique only for the OrgDefInfoOUI and lldpRemOrgDefInfoSubtype of the same remote system. An agent is encouraged to assign monotonically increasing index values to new entries, starting with one, after each reboot. It is unlikely that the lldpRemOrgDefInfoIndex will wrap between reboots.
OrdDefInfo	The string value used to identify the organizationally defined information of the remote system. The encoding for this object is the same as that defined for SnmpAdminString TC.

LLDP Port dot1 configuration using Enterprise Device Manager

You can use the LLDP Port dot1 dialog box to configure and view IEEE 802.1 LLDP information. For details, refer to the following tabs:

- “Viewing LLDP VLAN ID properties” (page 323)
- “Viewing LLDP protocol VLAN properties” (page 323)
- “Viewing LLDP VLAN Name properties” (page 324)
- “Viewing LLDP protocol properties” (page 325)

Viewing LLDP VLAN ID properties

With the Local VLAN Id tab, you can view LLDP VLAN ID properties for the local system.

To open the Local VLAN Id tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port dot1**.
5	Select the **Local VLAN Id** tab.

--End--

The following table outlines the parameters of the **Port dot1 Local VLAN Id** tab.

Table 169
Variable definitions

Variable	Value
PortNum	Port number.
VlanId	The local port VLAN ID. A value of zero is used if the system does not know the PVID.

Viewing LLDP protocol VLAN properties

With the Local Protocol VLAN tab, you can view LLDP Protocol VLAN properties for the local system.

To view LLDP protocol VLAN properties:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port dot1**.
5	Select the **Local Protocol VLAN** tab.

--End--

The following table outlines the parameters of the **Port dot1 Local Protocol VLAN** tab.

Table 170
Variable definitions

Variable	Value
PortNum	Port number.
ProtoVlanId	The ID of the port and protocol VLANs associated with the local port. A value of zero is used if the system does not know the protocol VLAN ID (PPVID).
ProtoVlanSuported	Indicates whether the local port supports port and protocol VLANs.
ProtoVlanEnabled	Indicates whether the port and protocol VLANs are enabled on the local port.
ProtoVlanTxEnable	Indicates whether the corresponding local port and protocol VLAN information are transmitted from the port.

Viewing LLDP VLAN Name properties

With the Local VLAN Name tab, you can view LLDP VLAN Name properties for the local system.

To view the Local VLAN Name tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.

4 From the 802.1AB tree, double-click **Port dot1**.

5 Select the **Local VLAN Name** tab.

--End--

The following table outlines the parameters of the **Port dot1 Local VLAN Name** tab.

Table 171
Variable definitions

Variable	Value
PortNum	Port number.
VlanId	The integer value used to identify the IEEE 802.1Q VLAN IDs with which the given port is compatible.
VlanName	The string value used to identify the VLAN name identified by the VLAN ID associated with the given port on the local system. This object contains the value of the dot1QVLANStaticName object (defined in IETF RFC 2674) identified with the given lldpXdot1LocVlanId.
VlanNameTxEnable	Indicates whether the corresponding Local System VLAN name instance is transmitted from the port.

Viewing LLDP protocol properties

With the **Local Protocol** tab, you can view LLDP protocol properties for the local system.

To open the Local Protocol tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port dot1**.
5	Select the **Local Protocol** tab.

--End--

The following table outlines the parameters of the **Port dot1 Local Protocol** tab.

Table 172
Variable definitions

Variable	Value
PortNum	Port number.
ProtocolIndex	An arbitrary local integer value used by this agent to identify a particular protocol identity.
ProtocolId	The octet string value used to identify the protocols associated with the given port of the local system.
ProtocolTxEnable	Indicates whether the corresponding Local System Protocol Identity instance is transmitted on the port.

Viewing LLDP VLAN ID properties

With the Neighbor VLAN Id tab, you can view LLDP VLAN ID properties for the remote system.

To view the Neighbor VLAN Id tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port dot1**.
5	Select the **Neighbor VLAN Id** tab.

--End--

The following table outlines the parameters of the **Port dot1 Neighbor VLAN Id** tab.

Table 173
Variable definitions

Variable	Value
TimeMark	The TimeFilter for this entry.
LocalPortNum	Identifies the local port on which the remote system information is received.

Table 173
Variable definitions (cont'd.)

Variable	Value
Index	An arbitrary local integer value used by this agent to identify a particular MSAP. An agent is encouraged to assign monotonically increasing index values to new entries, starting with one, after each reboot.
VlanId	The port VLAN identifier associated with the remote system. If the remote system does not know the PVID or does not support port-based VLAN operation, the value is zero.

Viewing LLDP Neighbor Protocol VLAN properties

With the Neighbor Protocol VLAN tab, you can view LLDP Protocol VLAN properties for the remote system.

To view the Neighbor Protocol VLAN tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port dot1**.
5	Select the **Neighbor Protocol VLAN** tab.

--End--

The following table outlines the parameters of the **Port dot1 Neighbor Protocol VLAN** tab.

Table 174
Variable definitions

Variable	Value
TimeMark	The TimeFilter for this entry.
LocalPortNum	Identifies the local port on which the remote system information is received.
Index	An arbitrary local integer value used by this agent to identify a particular MSAP. An agent is encouraged to assign monotonically increasing index values to new entries, starting with one, after each reboot.

Table 174
Variable definitions (cont'd.)

Variable	Value
ProtoVlanId	The ID of the port and protocol VLANs associated with the remote port. A value of zero is used if the system does not know the protocol VLAN ID (PPVID).
ProtoVlanSuported	Indicates whether the remote port supports port and protocol VLANs.
ProtoVlanEnabled	Indicates whether the port and protocol VLANs are enabled on the remote port.

Viewing LLDP VLAN Name properties

With the Neighbor VLAN Name tab, you can view LLDP VLAN Name properties for the remote system.

To open the Neighbor VLAN Name tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port dot1**.
5	Select the **Neighbor VLAN Name** tab.

--End--

The following table outlines the parameters of the **Port dot1 Neighbor VLAN Name** tab.

Table 175
PVariable definitions

Vaiable	Value
TimeMark	The TimeFilter for this entry.
LocalPortNum	Identifies the local port on which the remote system information is received.
Index	An arbitrary local integer value used by this agent to identify a particular MSAP. An agent is encouraged to assign monotonically increasing index values to new entries, starting with one, after each reboot.

Table 175
PVariable definitions (cont'd.)

Vaiable	Value
VlanId	The integer value used to identify the IEEE 802.1Q VLAN IDs with which the remote port is compatible.
VlanName	The VLAN name identified by the VLAN ID associated with the remote system.

Viewing LLDP Neighbor Protocol properties

With the Neighbor Protocol tab, you can view LLDP Protocol properties for the remote system.

To view the Neighbor Protocol tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port dot1**.
5	Select the **Neighbor Protocol** tab.

--End--

The following table outlines the parameters of the **Port dot1 Neighbor Protocol** tab.

Table 176
Variable definitions

Variable	Value
TimeMark	The TimeFilter for this entry.
LocalPortNum	Identifies the local port on which the remote system information is received.
Index	An arbitrary local integer value used by this agent to identify a particular MSAP. An agent is encouraged to assign monotonically increasing index values to new entries, starting with one, after each reboot.
ProtocolIndex	This object represents an arbitrary local integer value used by this agent to identify a particular protocol identity.
ProtocolId	Identifies the protocols associated with the remote port.

LLDP Port dot3 configuration using Enterprise Device Manager

You can use the LLDP Port dot3 dialog box to configure and view IEEE 802.3 LLDP information. For details, refer to the following tabs:

Viewing LLDP auto-negotiation properties

With the Local Port Auto-negotiation tab, you can view LLDP auto-negotiation properties for the local system.

To view the Local Port Auto-negotiation tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port dot3**.
5	Select the **Local Port Auto-negotiation** tab.

--End--

The following table outlines the parameters of the **Port dot3 Local Port Auto-negotiation** tab.

Table 177
Variable definitions

Variable	Value
PortNum	Port number.
AutoNegSupported	Indicates whether the local port supports Auto-negotiation.

Table 177
Variable definitions (cont'd.)

Variable	Value
AutoNegEnabled	Indicates whether Auto-negotiation is enabled on the local port.
AutoNegAdvertisedCap	This object contains the value (bitmap) of the ifMauAutoNegCapAdvertisedBits object (defined in IETF RFC 3636) associated with the local port on the system.
OperMauType	A value that indicates the operational MAU type of the given port on the local system.

Viewing LLDP PoE porperties

With the Local PoE tab, you can view LLDP PoE properties for the local system.

To open the Local PoE tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port dot3**.
5	Select the **Local PoE** tab.

--End--

The following table outlines the parameters of the **Port dot3 Local PoE** tab.

Table 178
Variable definitions

Variable	Value
PortNum	Port number.
PowerPortClass	Identifies the port Class of the local port.
PowerMDISupported	Indicates whether MDI power is supported on the local port.
PowerMDIEnabled	Indicates whether MDI power is enabled on the local port.

Table 178
Variable definitions (cont'd.)

Variable	Value
PowerPairControlable	Derived from the value of the pethPsePortPowerPairs ControlAbility object (defined in IETF RFC 3621), this value is used to indicate whether pair selection can be controlled on the local port.
PowerPairs	This object contains the value of the pethPsePortPowe rPairs object (defined in IETF RFC 3621) for the local port: • signal • spare
PowerClass	This object contains the value of the pethPsePortPowe rClassifications object (defined in IETF RFC 3621) for the local port: • class0 • class1 • class2 • class3 • class4

Viewing LLDP link aggregation properties

With the Local Link Aggregate tab, you can view LLDP link aggregation properties for the local system.

To view the Local Link Aggregate tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port dot3**.
5	Select the **Local Link Aggregate** tab.

--End--

The following table outlines the parameters of the **Port dot3 Local Link Aggregate** tab.

Table 179
Variable definitions

Variable	Value
PortNum	Port number.
LinkAggStatus	Specifies the link aggregation capabilities and the current aggregation status of the link.
LinkAggPortId	Contains the IEEE 802.3 aggregated port identifier, aAggPortID (IEEE 802.3-2002, 30.7.2.1.1), derived from the ifNumber of the ifIndex for the port component in link aggregation. If the port is not in a link aggregation state or does not support link aggregation, this value is set to zero.

Viewing LLDP maximum frame size properties

With the Local Max Frame tab, you can view LLDP maximum frame size properties for the local system.

To view the Local Max Frame tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port dot3**.
5	Select the **Local Max Frame** tab.

--End--

The following table outlines the parameters of the **Port dot3 Local Max Frame** tab.

Table 180
Variable definitions

Variable	Value
PortNum	port number
MaxFrameSize	maximum frame size for the port

Viewing LLDP neighbor auto-negotiation properties

With the Neighbor Port Auto-Negotiation tab, you can view LLDP auto-negotiation properties for the remote system.

To view the Neighbor Port Auto-Negotiation tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port dot3**.
5	Select the **Neighbor Port Auto-negotiation** tab.

--End--

The following table outlines the parameters of the **Port dot3 Neighbor Port Auto-negotiation** tab.

Table 181
Variable definitions

Variable	Value
TimeMark	The TimeFilter for this entry.
LocalPortNum	Identifies the local port on which the remote system information is received.
Index	An arbitrary local integer value used by this agent to identify a particular MSAP. An agent is encouraged to assign monotonically increasing index values to new entries, starting with one, after each reboot.
AutoNegSupported	The truth value used to indicate whether the given port (associated with a remote system) supports Auto-negotiation.
AutoNegEnabled	Indicates whether Auto-negotiation is enabled on the remote port.
AutoNegAdvertisedCap	This object contains the value (bitmap) of the ifMauAutoNegCapAdvertisedBits object (defined in IETF RFC 3636) associated with the remote port.
OperMauType	A value that indicates the operational MAU type of the given port on the remote system.

Viewing LLDP neighbor PoE properties

With the Neighbor PoE tab, you can view LLDP PoE properties for the remote system.

To view the Neighbor PoE tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port dot3**.
5	Select the **Neighbor PoE** tab.

--End--

The following table outlines the parameters of the **Port dot3 Neighbor PoE** tab.

Table 182
Variable definitions

Variable	Value
TimeMark	The TimeFilter for this entry.
LocalPortNum	Identifies the local port on which the remote system information is received.
Index	An arbitrary local integer value used by this agent to identify a particular MSAP. An agent is encouraged to assign monotonically increasing index values to new entries, starting with one, after each reboot.
PowerPortClass	Identifies the port Class of the remote port.
PowerMDISupported	Indicates whether MDI power is supported on the remote port.
PowerMDIEnabled	Indicates whether MDI power is enabled on the remote port.
PowerPairControlable	Derived from the value of the pethPsePortPowerPairs ControlAbility object (defined in IETF RFC 3621), this value is used to indicate whether pair selection can be controlled on the remote port.

Table 182
Variable definitions (cont'd.)

Variable	Value
PowerPairs	This object contains the value of the pethPsePortPower Pairs object (defined in IETF RFC 3621) for the remote port. • signal • spare
PowerClass	This object contains the value of the pethPsePortPowe rClassifications object (defined in IETF RFC 3621) for the remote port. • class0 • class1 • class2 • class3 • class4

Viewing LLDP neighbor link aggregation properties

With the Neighbor Link Aggregate tab, you can view LLDP link aggregation properties for the remote system.

To view the Neighbor Link Aggregate tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port dot3**.
5	Select the **Neighbor Link Aggregate** tab.

--End--

The following table outlines the parameters of the **Port dot3 Neighbor Link Aggregate** tab.

Table 183
Variable definitions

Variable	Value
TimeMark	The TimeFilter for this entry.

Table 183
Variable definitions (cont'd.)

Variable	Value
LocalPortNum	Identifies the local port on which the remote system information is received.
Index	An arbitrary local integer value used by this agent to identify a particular MSAP. An agent is encouraged to assign monotonically increasing index values to new entries, starting with one, after each reboot.
LinkAggStatus	Specifies the link aggregation capabilities and the current aggregation status of the remote link.
LinkAggPortId	Contains the IEEE 802.3 aggregated port identifier, aAggPortID (IEEE 802.3-2002, 30.7.2.1.1), derived from the ifNumber of the ifIndex for the port component in link aggregation. If the port is not in a link aggregation state or does not support link aggregation, this value is set to zero.

Viewing LLDP neighbor maximum frame size properties

With the Neighbor Max Frame tab, you can view LLDP maximum frame size properties for the remote system.

To view the Neighbor Max Frame tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port dot3**.
5	Select the **Neighbor Max Frame** tab.

--End--

The following table outlines the parameters of the **Port dot3 Neighbor Max Frame** tab.

Table 184
Variable definitions

Variable	Value
TimeMark	The TimeFilter for this entry.

Table 184
Variable definitions (cont'd.)

Variable	Value
LocalPortNum	Identifies the local port on which the remote system information is received.
Index	An arbitrary local integer value used by this agent to identify a particular MSAP. An agent is encouraged to assign monotonically increasing index values to new entries, starting with one, after each reboot.
MaxFrameSize	Maximum Frame Size for the remote port.

LLDP Port MED configuration using Enterprise Device Manager

You can use the LLDP Port med dialog box to configure and view MED LLDP information. For details, refer to the following tabs:

- "Viewing local policy properties" (page 338)
- "Local Location" (page 339)
- "Viewing LLDP local PoE PSE properties" (page 343)
- "Viewing LLDP neighbor capabilities properties" (page 344)
- "Viewing LLDP neighbor policy properties" (page 345)
- "Viewing LLDP neighbor location properties" (page 347)
- "Viewing LLDP neighbor PoE properties" (page 349)
- "Viewing LLDP neighbor PoE PSE properties" (page 350)
- "Viewing LLDP neighbor PoE PD properties" (page 351)
- "Viewing LLDP neighbor inventory properties" (page 352)

Viewing local policy properties

With the Local Policy tab, you can view LLDP policy properties for the local system.

To open the Local Policy tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port MED**.

5 Select the **Local Policy** tab.

6 Click **Insert**.
The **Insert Local Policy** dialog box appears.

7 Enter the parameters according to the Variable definitions table.

8 Click **Insert**.

--End--

The following table outlines the parameters of the **Port MED Local Policy** tab.

Table 185
Variable definitions

Variable	Value
PortNum	Port number.
PolicyAppType	Voice or voice-signaling application type.
PolicyVlanID	An extension of the VLAN Identifier for the port, as defined in IEEE 802.1P-1998. A value of 1 through 4094 is used to define a valid PVID. A value of 0 is used if the device is using priority tagged frames, meaning that only the 802.1p priority level is significant and the default VID of the ingress port is being used instead. A value of 4095 is reserved for implementation use.
PolicyPriority	Indicates the value of the 802.1p priority which is associated with the local port.
PolicyDscp	This object contains the value of the Differentiated Service Code Point (DSCP) as defined in IETF RFC 2474 and RFC 2475 that is associated with the given port on the local system.
PolicyTagged	A value of true indicates that the application is using a tagged VLAN. A value of false indicates that for the specific application, the device is using an untagged VLAN or does not support a port based VLAN operation. In this case, both the VLAN ID and the Layer 2 priority fields are ignored, and only the DSCP value has relevance.

Local Location

This section contains information about the following topics:

- “Viewing local location properties” (page 340)
- “Viewing coordinate-based location details” (page 340)
- “Viewing civic address location details” (page 342)

Viewing local location properties

With the Local Location tab, you can view LLDP location properties for the local system.

To open the Local Location tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port MED**.
5	Select the **Local Location** tab.

--End--

The following table outlines the parameters of the **Port MED Local Location** tab.

Table 186
Variable definitions

Variable	Value
PortNum	Port number.
LocationSubtype	The location subtype advertised by the remote device: • unknown • coordinateBased • civicAddress • elin
LocationInfo	The location information. The parsing of this information is dependent on the value LocationSubtype.

Viewing coordinate-based location details

You can select and view or configure details for coordinate-based locations listed on the Local Location tab.

To view or configure details for coordinate-based locations:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port MED**.
5	Select the **Local Location** tab.
6	Select a location with the **LocationSubtype** listed as **coordinateBased**. The Location Detail button is activated.
7	Click the **Location Detail** button to view or configure the local detailed location information. The **Insert Local Location** dialog box appears.
8	Enter the parameters according to the Variable definitions table.
9	Click **Ok**.

--End--

The following table outlines the parameters of the **Port MED Coordinate Based Location** dialog box.

Table 187
Variable definitions

Variable	Value
Latitude	Specifies the latitude in degrees, and its relation to the equator (North or South).
Longitude	Specifies the longitude in degrees, and its relation to the prime meridian (East or West).
Altitude	Specifies the altitude, and the units of measurement used (meters or floors).
Map Datum	Specifies the reference datum. The format can be one of the following: • WGS84: World Geodesic System 1984, Prime Meridian Name: Greenwich • NAD83/NAVD88 North American Datum 1983/ North American Vertical Datum of 1988 • NAD83/MLLW: North American Datum 1983/ Mean Lower Low Water •

Viewing civic address location details

You can select and view or configure details for civic address locations listed on the Local Location tab.

Prerequisites

- Open one of the supported Web browsers.
- Access the switch.
- Click the Configuration arrowhead to open the navigation tree.

To view and configure details for civic address locations:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port MED**.
5	Select the **Local Location** tab.
6	Select a location with the **LocationSubtype** listed as **civicAddress** The Location Detail button is activated.
7	Click the **Location Detail** button. The Civic Address Location dialog box opens.
8	Enter details and click **OK**.
9	Click **Close**.

--End--

The following table outlines the parameters of the **Port MED Civic Address Location** dialog box.

Table 188
Variable definitions

Variable	Value
Country Code	Country code (2 upper case letters)
State	National subdivisions (state, canton, region)
County	County, parish, gun (JP), district (IN)
City	City, township, shi (JP)

Table 188
Variable definitions (cont'd.)

Variable	Value
City District	City division, city district, ward
Block (Neighborhood, block)	Neighborhood, block
Street	Street
Leading street direction	Leading street direction
Trailing street suffix	Trailing street suffix
Street suffix	Street suffix
House number	House number
House number suffix	House number suffix
Landmark or vanity address	Landmark or vanity address
Additional Location info	Additional location information
Name (Residence and office occupant)	Residence and office occupant
Postal/Zip code	Postal/Zip code
Building (structure)	Building (structure)
Apartment (suite)	Unit number (apartment, suite)
Floor	Floor
Room number	Room number
Place type	Office
Postal community name	Postal community name
Post office box P.O.Box	Post office box
Additional Code	Additional code

Viewing LLDP local PoE PSE properties

With the Local PoE PSE tab, you can view LLDP PoE PSE properties for the local system.

To view the Local PoE PSE tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port MED**.
5	Select the **Local PoE PSE** tab.

--End--

The following table outlines the parameters of the **Port MED Local PoE PSE** tab.

Table 189
Variable definitions

Variable	Value
PortNum	Port number.
PSEPortPowerAvailable	This object contains the value of the power available (in units of 0.1 watts) from the PSE through this port.
PSEPortPDPriority	Indicates the PD power priority that is advertised on this PSE port: • unknown: priority is not configured or known by the PD • critical: the device advertises its power priority as critical, see RFC 3621 • high: the device advertises its power priority as high, see RFC 3621 • low: the device advertises its power priority as low, see RFC 3621

Viewing LLDP neighbor capabilities properties

With the Neighbor Capabilities tab, you can view LLDP capabilities properties for the remote system.

To view the Neighbor Capabilities tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.

2 From the Edit tree, double-click **Diagnostics**.

3 From the Diagnostics tree, double-click **802.1AB**.

4 From the 802.1AB tree, double-click **Port MED**.

5 Select the **Neighbor Capabilities** tab.

--End--

The following table outlines the parameters of the **Port MED Neighbor Capabilities** tab.

Table 190
Variable definitions

Variable	Value
TimeMark	The TimeFilter for this entry.
LocalPortNum	Identifies the local port on which the remote system information is received.
Index	An arbitrary local integer value used by this agent to identify a particular MSAP. An agent is encouraged to assign monotonically increasing index values to new entries, starting with one, after each reboot.
CapSupported	Identifies the MED system capabilities supported on the remote system.
CapCurrent	Identifies the MED system capabilities that are enabled on the remote system.
DeviceClass	Remote MED device class.

Viewing LLDP neighbor policy properties

With the Neighbor Policy tab, you can view LLDP policy properties for the remote system.

To view the Neighbor Policy tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port MED**.

5 Select the **Neighbor Policy** tab.

--End--

The following table outlines the parameters of the **Port MED Neighbor Policy** tab.

Table 191
Variable definitions

Variable	Value
TimeMark	The TimeFilter for this entry.
LocalPortNum	Identifies the local port on which the remote system information is received.
Index	An arbitrary local integer value used by this agent to identify a particular MSAP. An agent is encouraged to assign monotonically increasing index values to new entries, starting with one, after each reboot.
PolicyVlanID	An extension of the VLAN Identifier for the port, as defined in IEEE 802.1P-1998. A value of 1 through 4094 is used to define a valid PVID. A value of 0 is used if the device is using priority tagged frames, meaning that only the 802.1p priority level is significant and that the default VID of the ingress port is being used instead. A value of 4095 is reserved for implementation use.
PolicyPriority	Indicates the value of the 802.1p priority which is associated with the remote system connected to the port.
PolicyDscp	This object contains the value of the Differentiated Service Code Point (DSCP) as defined in IETF RFC 2474 and RFC 2475 that is associated with the remote system connected to the port.
PolicyUnknown	A value of true indicates that the network policy for the specified application type is currently unknown. In this case, the VLAN ID, the Layer 2 priority, and the DSCP value fields are ignored. A value of false indicates that this network policy is defined.
PolicyTagged	A value of true indicates that the application is using a tagged VLAN. A value of false indicates that for the specific application, the device is using an untagged VLAN or does not support a port based VLAN operation. In this case, both the VLAN ID and the Layer 2 priority fields are ignored, and only the DSCP value has relevance.

Neighbor Location

This section contains information about the following topics:

Viewing LLDP neighbor location properties

With the Neighbor Location tab, you can view LLDP location properties for the remote system.

To view the Neighbor Location tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port MED**.
5	Select the **Neighbor Location** tab.

--End--

The following table outlines the parameters of the **Port MED Neighbor Location** tab.

Table 192
Variable definitions

Variable	Value
TimeMark	The TimeFilter for this entry.
LocalPortNum	Identifies the local port on which the remote system information is received.
Index	An arbitrary local integer value used by this agent to identify a particular MSAP. An agent is encouraged to assign monotonically increasing index values to new entries, starting with one, after each reboot.

Table 192
Variable definitions (cont'd.)

Variable	Value
LocationSubtype	The location subtype advertised by the remote device: • unknown • coordinateBased • civicAddress • elin
LocationInfo	The location information advertised by the remote device. The parsing of this information is dependent on the location subtype.

Viewing coordinate-based location details

From the Neighbor Location tab, you can select coordinate-based locations and view details for the remote system.

To view coordinate-based location details:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port MED**.
5	Select the **Neighbor Location** tab.
6	Select a location with the **LocationSubtype** listed as **coordinateBased** The Location Details button is activated.
7	Click the **Location Details** button. The Coordinate Based Location window displays the selected location details.
8	Click **Close**.

--End--

Viewing civic address location details

From the Neighbor Location tab, you can select civic address locations and view details for the remote system.

To view civic address location details:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port MED**.
5	Select the **Neighbor Location** tab.
6	Select a location with the **LocationSubtype** listed as **civicAddress** The Location Details button is activated.
7	Click the **Location Details** button. The Civic Address Location window displays the selected location details.
8	Click **Close**.

--End--

Viewing LLDP neighbor PoE properties

With the Neighbor PoE tab, you can view LLDP PoE properties for the remote system.

To view the Neighbor PoE tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port MED**.
5	Select the **Neighbor PoE** tab.

--End--

The following table outlines the parameters of the **Port MED Neighbor PoE** tab.

Table 193
Variable definitions

Variable	Value
TimeMark	The TimeFilter for this entry.
LocalPortNum	Identifies the local port on which the remote system information is received.
Index	An arbitrary local integer value used by this agent to identify a particular MSAP. An agent is encouraged to assign monotonically increasing index values to new entries, starting with one, after each reboot.
PoEDeviceType	The type of PoE device.

Viewing LLDP neighbor PoE PSE properties

With the Neighbor PoE PSE tab, you can view LLDP PoE PSE properties for the remote system.

To view the Neighbor PoE PSE tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port MED**.
5	Select the **Neighbor PoE PSE** tab.

--End--

The following table outlines the parameters of the **Port MEDNeighbor PoE PSE** tab.

Table 194
Variable definitions

Variable	Value
TimeMark	The TimeFilter for this entry.
LocalPortNum	Identifies the local port on which the remote system information is received.
Index	An arbitrary local integer value used by this agent to identify a particular MSAP. An agent is encouraged to assign monotonically increasing index values to new entries, starting with one, after each reboot.

Table 194
Variable definitions (cont'd.)

Variable	Value
PSEPowerAvailable	Specifies the power available (in units of 0.1 watts) from the PSE connected remotely to this port.
PSEPowerSource	Defines the type of PSE Power Source advertised by the remote device. • primary: indicates that the device advertises its power source as primary. • backup: indicates that the device advertises its power source as backup.
PSEPowerPriority	Specifies the priority advertised by the PSE connected remotely to the port: • critical: indicates that the device advertises its power priority as critical, see RFC 3621. • high: indicates that the device advertises its power priority as high, see RFC 3621. • low: indicates that the device advertises its power priority as low, see RFC 3621.

Viewing LLDP neighbor PoE PD properties

With the Neighbor PoE PD tab, you can view LLDP PoE PD properties for the remote system.

To view the Neighbor PoE PD tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **Diagnostics**.
3	From the Diagnostics tree, double-click **802.1AB**.
4	From the 802.1AB tree, double-click **Port MED**.
5	Select the **Neighbor PoE PD** tab.

--End--

The following table outlines the parameters of the **Port MED Neighbor PoE PD** tab.

Table 195
Variable definitions

Variable	Value
TimeMark	The TimeFilter for this entry.
LocalPortNum	Identifies the local port on which the remote system information is received.
Index	An arbitrary local integer value used by this agent to identify a particular MSAP. An agent is encouraged to assign monotonically increasing index values to new entries, starting with one, after each reboot.
PDPowerReq	Specifies the value of the power required (in units of 0.1 watts) by a Powered Device (PD) connected remotely to the port.
PDPowerSource	Defines the type of Power Source advertised as being used by the remote device: • fromPSE: indicates that the device advertises its power source as received from a PSE. • local: indicates that the device advertises its power source as local. • localAndPSE: indicates that the device advertises its power source as using both local and PSE power.
PDPowerPriority	Defines the priority advertised as being required by the PD connected remotely to the port: • critical: indicates that the device advertises its power priority as critical, see RFC 3621. • high: indicates that the device advertises its power priority as high, see RFC 3621. • low: indicates that the device advertises its power priority as low, see RFC 3621.

Viewing LLDP neighbor inventory properties

With the Neighbor Inventory tab, you can view LLDP Inventory properties for the remote system.

To view the Neighbor Inventory tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.

2 From the Edit tree, double-click **Diagnostics**.

3 From the Diagnostics tree, double-click **802.1AB**.

4 From the 802.1AB tree, double-click **Port MED**.

5 Select the **Neighbor inventory** tab.

--End--

The following table outlines the parameters of the **Port MED Neighbor Inventory** tab.

Table 196
Variable definitions

Variable	Value
TimeMark	The TimeFilter for this entry.
LocalPortNum	Identifies the local port on which the remote system information is received.
Index	An arbitrary local integer value used by this agent to identify a particular MSAP. An agent is encouraged to assign monotonically increasing index values to new entries, starting with one, after each reboot.
HardwareRev	The vendor-specific hardware revision string as advertised by the remote device.
FirmwareRev	The vendor-specific firmware revision string as advertised by the remote device.
SoftwareRev	The vendor-specific software revision string as advertised by the remote device.
SerialNum	The vendor-specific serial number as advertised by the remote device.
MfgName	The vendor-specific manufacturer name as advertised by the remote device.
ModelName	The vendor-specific model name as advertised by the remote device.
AssetID	The vendor-specific asset tracking identifier as advertised by the remote device.

LLDP MED policy management using Enterprises Device Manager

Use the information in this section to view, create, and edit LLDP MED policies for the switch.

Navigation

- "Viewing LLDP MED policies" (page 354)
- "Creating LLDP MED policies" (page 355)
- "Editing LLDP MED policies" (page 357)
- "Deleting LLDP MED policies" (page 359)

Viewing LLDP MED policies

Use this procedure to view LLDP MED policy properties for the local system.

Procedure steps

Step	Action
1	Open one of the supported browsers.
2	Enter the IP address of the switch to open an EDM session.
3	From the navigation tree, double-click **Edit**.
4	In the Edit tree, double-click **Diagnostics**.
5	In the Diagnostic tree, double-click **802.1AB**.
6	In the 802.1AB tree, double-click **Port MED**.
7	In the work area, click the **Local Policy** tab.

--End--

Use the data in the following table to help you understand the LLDP MED local policy display.

Table 197
Variable definitions

Field	Description
PortNum	Indicates the port number
PolicyAppType	Shows the policy application type.

Table 197
Variable definitions (cont'd.)

Field	Description
PolicyVlanID	Indicates the extension of the VLAN Identifier for the port, as defined in IEEE 802.1P-1998. A value of 1 through 4094 is used to define a valid PVID. A value of 0 is used if the device is using priority tagged frames, meaning that only the 802.1p priority level is significant and the default VID of the ingress port is being used instead. A value of 4095 is reserved for implementation use.
PolicyPriority	Indicates the value of the 802.1p priority which is associated with the local port.
PolicyDscp	Contains the value of the Differentiated Service Code Point (DSCP) as defined in IETF RFC 2474 and RFC 2475 that is associated with the given port on the local system.
PolicyTagged	Indicates whether the application is using a tagged VLAN, untagged VLAN, or does not support a port based VLAN operation.

Creating LLDP MED policies

Use this procedure to create a new LLDP MED policy for the local system.

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	In the Edit tree, double-click **Diagnostics**.
3	In the Diagnostic tree, double-click **802.1AB**.
4	In the 802.1AB tree, double-click **Port MED**.
5	In the work area, click the **Local Policy** tab.
6	Click **Insert** .
7	To select a port to create a policy for, click the **PortNum** elipsis.
8	Click **Ok** .
9	In the **PolicyAppType** section, select one or both boxes.

10 To select a VLAN identifier for the selected port, click the **PolicyVlanID** elipsis.

11 Click **Ok** .

12 Double-click the **PolicyPriority** box.

13 Type a priority value.

14 Double-click the **PolicyDscp** box.

15 Type a DSCP value.

16 To use a tagged VLAN, click the **PolicyTagged** box.

OR

To use an untagged VLAN, clear the **PolicyTagged** box.

17 Click **Insert** .

--End--

Use the data in the following table to create a new LLDP MED policy for the local system.

Table 198
Variable definitions

Field	Description
PortNum	Specifies the port on which to configure LLDP MED policies.
PolicyAppType	Specifies the policy application type. • voice—selects the voice network policy • voiceSignaling—selects the voice signaling network policy
PolicyVlanID	Specifies the VLAN identifier for the selected port or ports. Values range from 1–4094. If you select priority tagged frames, the system recognizes only the 802.1p priority level and uses a value of 0 for the VLAN ID of the ingress port.
PolicyPriority	Specifies the value of the 802.1p priority that applies to the selected switch port or ports. Values range from 0–7.

Table 198
Variable definitions (cont'd.)

Field	Description
PolicyDscp	Specifies the value of the Differentiated Service Code Point (DSCP) as defined in IETF RFC 2474 and RFC 2475 that is associated with the selected switch port or ports. Values range from 0–63.
PolicyTagged	Specifies the type of VLAN tagging to apply on the selected switch port or ports. • when selected—uses a tagged VLAN • when cleared—uses an untagged VLAN or does not support port-based VLANs. If you select untagged, the system ignores the VLAN ID and priority values, and recognizes only the DSCP value.

Editing LLDP MED policies

Use this procedure to edit a previously configured LLDP MED policy for the local system.

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	In the Edit tree, double-click **Diagnostics**.
3	In the Diagnostic tree, double-click **802.1AB**.
4	In the 802.1AB tree, double-click **Port MED**.
5	To select a policy to edit, click the PortNum.
6	In the policy row, double-click the cell in the**PolicyVlanID** column.
7	Select a VLAN from the list.
8	Click **Ok** .
9	In the policy row, double-click the cell in the**PolicyPriority** column.
10	Edit the policy priority value.

11 In the policy row, double-click the cell in the**PolicyDscp** column.

12 Edit the policy DSCP value.

13 In the policy row, double-click the cell in the**PolicyTagged** column.

14 Select a value from the list.

15 On the toolbar, click **Apply** .

--End--

Use the data in the following table to edit a previously configured LLDP MED policy for the local system.

Table 199
Variable definitions

Field	Description
PortNum	Indicates the port on which to configure LLDP MED policies. This is a read-only cell.
PolicyAppType	Indicates the policy application type. This is a read-only cell. • voice— voice network policy • voiceSignaling— voice signaling network policy
PolicyVlanID	Specifies the VLAN identifier for the selected port or ports. Values range from 1–4094. If you select priority tagged frames, the system recognizes only the 802.1p priority level and uses a value of 0 for the VLAN ID of the ingress port.
PolicyPriority	Specifies the value of the 802.1p priority that applies to the selected switch port or ports. Values range from 0–7.

Table 199
Variable definitions (cont'd.)

Field	Description
PolicyDscp	Specifies the value of the Differentiated Service Code Point (DSCP) as defined in IETF RFC 2474 and RFC 2475 that is associated with the selected switch port or ports. Values range from 0–63.
PolicyTagged	Specifies the type of VLAN tagging to apply on the selected switch port or ports. • true—uses a tagged VLAN • false—uses an untagged VLAN or does not support port-based VLANs. If you select untagged, the system ignores the VLAN ID and priority values, and recognizes only the DSCP value.

Deleting LLDP MED policies

Use this procedure to delete a LLDP MED policy.

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	In the Edit tree, double-click **Diagnostics**.
3	In the Diagnostic tree, double-click **802.1AB**.
4	In the 802.1AB tree, double-click **Port MED**.
5	In the work area, click the **Local Policy** tab.
6	To select a policy to delete, click the PortNum.
7	On the toolbar, click **Delete** .

--End--

SNTP configuration using Enterprise Device Manager

The SNTP/Clock screen contains the parameters for configuring Simple Network Time Protocol (SNTP).

This section provides information about the following topics:

Displaying the Simple Network Time Protocol tab

To open the Simple Network Time Protocol tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **SNTP/Clock**.
3	Select the **Simple Network Time Protocol** tab.
4	Enter the fields as indicated by the table.
5	Click **Refresh**.

--End--

The following table outlines the parameters of the **Simple Network Time Protocol** tab.

Table 200
Variable definitions

Variable	Value
PrimaryServerInet AddressType	The IP address type (IPv4 or IPv6) of the primary SNTP server.
PrimaryServerInet Address	The IP address of the primary SNTP server.
SecondaryServerInet AddressType	The IP address type (IPv4 or IPv6) of the secondary SNTP server.
SecondaryServerInet Address	The IP address of the secondary SNTP server.

Table 200
Variable definitions (cont'd.)

Variable	Value
State	Controls whether the device uses the Simple Network Time Protocol to synchronize the device clock to the Coordinated Universal Time. If the value is disabled, the device does not synchronize its clock using SNTP. If the value is unicast, the device synchronizes shortly after boot time when network access becomes available, and periodically thereafter.
SynchInterval	Controls the frequency, in hours, with which the device attempts to synchronize with the NTP servers.
ManualSynch Request	Specifies that the device must immediately attempt to synchronize with the NTP servers.
LastSynch Time	Specifies the UTC when the device last synchronized with an NTP server.
LastSyncSourceInet AddressType	Specifies the IP source address type (IPv4 or IPv6) of the NTP server with which this device last synchronized.
LastSyncSourceInet Address	Specifies the IP source address of the NTP server with which this device last synchronized.
NextSynch Time	Specifies the UTC at which the next synchronization is scheduled.
PrimaryServer SynchFailures	Specifies the number of times the switch failed to synchronize with the primary server address. However, synchronization with the secondary server address can still occur.
SecondaryServer SynchFailures	Specifies the number of times the switch failed to synchronize with the secondary server address.
CurrentTime	Specifies the UTC for the switch.

Setting the local time zone

To set the local time zone:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **SNTP/Clock**.
3	Select the **Time Zone** tab.
4	Type the time zone offset in the **TimeZone** box.
5	Type a time zone acronym in the **TimeZoneAcronym** box.

6 Click **Apply**.

--End--

The following table outlines the parameters of the **Time Zone** tab.

Table 201
Variable definitions

Variable	Value
TimeZone	Specifies the time zone of the switch, measured as an offset in 15-minute increments from Greenwich mean Time (GMT).
TimeZoneAcronym	Enter the acronym for your time zone: example, EST for Eastern Time Zone in North America.

Configuring daylight savings time

To set daylight saving start and end time:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **SNTP/Clock**.
3	Select the **Daylight Saving Time** tab.
4	Type the number of minutes to shift the clock in the **Offset** box.
5	Type the time zone acronym for the change in the **TimeZoneAcronym** box.
6	Select the **StartYear**, **StartMonth**, **StartDate**, **StartHour** and type the **StartMinutes** (if applicable) to define when to switch the clock to daylight saving time.
7	Select the **EndYear**, **EndMonth**, **EndDate**, **EndHour** and type the **EndMinutes** (if applicable) to define when to switch the clock back to normal time. If you want to keep the same daylight saving time changeover dates, you can set the **EndYear** to a year in the future.
8	Click **Enabled** to enable daylight savings time.
9	Click **Apply**.

--End--

The following table outlines the parameters of the **Daylight Saving Time** tab.

Table 202
Variable definitions

Variable	Value
Offset	Specifies the time in minutes by which you want to change the time when daylight savings begins and ends.
TimeZoneAcronym	Specifies a time zone acronym.
StartYear	Specifies the year from when you want to start the daylight savings time.
StartMonth	Specifies the month of each year from when you want to start the daylight savings time.
StartDay	Specifies the day of the particular month from when you want to start the daylight savings time.
StartHour	Specifies the hour of the particular day from when you want to start the daylight savings time.
StartMinutes	Specifies the minutes of the particular hour from when you want to start the daylight savings time.
EndYear	Specifies the year when to end the daylight savings time.
EndMonth	Specifies the month of each year when to end the daylight savings time.
EndDay	Specifies the day of the particular month when to end the daylight savings time.
EndHour	Specifies the hour of the particular day when to end the daylight savings time.
Enabled	Enables or disables day light saving time.

Displaying the Summer Time Recurring tab

To set summer time recurring:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Edit**.
2	From the Edit tree, double-click **SNTP/Clock**.
3	Select the **Summer Time Recurring** tab.

--End--

The following table outlines the parameters of the **Summer Time Recurring** tab.

Table 203
Variable definitions

Variable	Value
RecurringStartMonth	Specifies the month of each year you want recurring daylight savings time to start.
ReucrringStartWeek	Specifies the week of the month you want recurring daylight savings time to start.
RecurringStartDay	Specifies the day of the particular month you want recurring daylight savings time to start.
RecurringStartHour	Specifies the hour of the particular day you want recurring daylight savings time to start.
RecurringStartMinute	Specifies the minutes of the particular hour you want recurring daylight savings time to start.
RecurringEndMonth	Specifies the month of each year you want recurring daylight savings time to end.
RecurringEndWeek	Specifies the week of the month you want recurring daylight savings time to end.
RecurringEndDay	Specifies the day of the particular month you want recurring daylight savings time to end.
RecurringEndHour	Specifies the hour of the particular day you want recurring daylight savings time to end.
RecurringEndMinute	Specifies the minutes of the particular hour you want recurring daylight savings time to end.
RecurringOffset	Specifies the time in minutes by which you want to change the time when recurring daylight savings begins and ends. The offset is added to the current time when daylight saving time begins and subtracted from the current time when daylight saving time ends.

Power over Ethernet configuration with Enterprise Device Manager

You can view and configure Power over Ethernet (PoE) for a unit or a port with Enterprise Device Manager.

Navigation

- “Viewing global PoE properties for a unit” (page 364)
- “Viewing PoE properties for a port” (page 365)

Viewing global PoE properties for a unit

To view the Globals - PoE Units tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Power Management**.
2	From the Power Management tree, double-click **PoE**.
3	Select the **Globals - PoE Units** tab.

--End--

The following table outlines the parameters of the **Globals - PoE Units** tab.

Table 204
Variable definitions

Variable	Value
Unit	Specifies the unit number in the stack.
Power(watts)	Specifies the power in Watts.
OperStatus	Specifies whether PoE is enabled
ConsumptionPower(watts)	Specifies the power consumption in Watts.
UsageThreshold%	Specifies the usage threshold expressed as a percentage for comparing the measured power and initiating an alarm if the threshold is exceeded.
NotificationControlEnable	Controls, on a per-group basis, whether or not notifications from the agent are enabled. The value true(1) means that notifications are enabled; the value false(2) means that they are not.
PoweredDeviceDetectType	Specifies the mechanism used to detect powered ethernet devices attached to a powered ethernet port. This object should only be instantiated for values of ifIndex that represent ports that support powered ethernet.

For more information, see “Displaying the PoE tab for a single unit” (page 239).

Viewing PoE properties for a port

To view the PoE Ports tab:

Procedure steps

Step	Action
1	From the navigation tree, double-click **Power Management**.

2 From the Power Management tree, double-click **PoE**.

3 Select the **PoE Ports** tab.

--End--

The following table outlines the parameters of the **PoE Ports** tab.

Table 205
Variable definitions

Variable	Value
Unit	Indicates the switch position in a stack.
Port	Indicates the switch port number.
AdminEnable	Use this function to enable or disable Power over Ethernet on this port. PoE is enabled by default.
PowerPairs	This is a read-only field that displays the status of the RJ-45 pin pairs that the switch uses to send power to the ports on the switch.
DetectionStatus	Displays the operational status of the power-device detecting mode on the specified port as follows: • disabled, detecting function disabled • searching, detecting function is enabled and the system is searching for a valid powered device and the port is delivering power • fault, power-specific fault detected on port • test, detecting device in test mode • otherFault **ATTENTION** Nortel recommends against using the test operational status.
PowerClassifications	You can use classifications to tag different terminals on the Power over LAN network according to their power consumption. Devices such as IP telephones, WLAN access points, and others can be classified according to their power requirements.
PowerPriority	You can set the power priority for the specified port to: • critical • high • low
PowerLimit(watts)	Specifies the maximum power that the switch can supply to a port. The default value is 16W.
Voltage(volts)	Indicates the voltage, measured in Volts.

Table 205
Variable definitions (cont'd.)

Variable	Value
Current(amps)	Indicates the current, measured in Amps.
Power(watts)	Indicates the power, measured in Watts.

For more information, see "Viewing the PoE power settings" (page 256).

IPv6 configuration using Enterprise Device Manager

To open the IPv6 dialog box:

Procedure steps

Step	Action
1	From the navigation tree, double-click **IPv6**.
2	From the IPv6 tree, double-click **IPv6**.

--End--

This section contains information about the following topics:

- "Configuring IPv6 global properties" (page 367)
- "Displaying the ICMP Stats tab" (page 368)
- "Displaying the ICMP Msg Stats tab" (page 369)

Configuring IPv6 global properties

To configure IPv6 global properties:

Procedure steps

Step	Action
1	From the navigation tree, double-click **IPv6**.
2	From the IPv6 tree, double-click **IPv6**.
3	Select the **Globals** tab.
4	Enter the global properties in the boxes.
5	Click **Apply** to save the changes.
6	Click **Refresh** to display updated information.

--End--

The following table outlines the parameters of the **Globals** tab.

Table 206
Variable definitions

Variable	Value
AdminEnabled	Check this box to enable the administration function.
OperEnabled	True or false
Forwarding	notForwarding or Forwarding
DefaultHopLimit	Default number of hops: 30
IcmpNetUnreach	Enables or disables the ICMP net unreach feature.
IcmpRedirectMsg	True or false
IcmpErrorInterval	Time to wait before sending an ICMP error message. A value of 0 means the system does not send an ICMP error message. Value: 0 to 2147483647 ms
IcmpErrorQuota	Default value: 1
MulticastAdminStatus	True or false

Displaying the ICMP Stats tab

To display the IPv6 interface ICMP statistics:

Procedure steps

Step	Action
1	From the navigation tree, double-click **IPv6**.
2	From the IPv6 tree, double-click **IPv6**.
3	Select the **ICMP Stats** tab.
4	Click **Clear Counters** to reset the statistics.
5	Set the Poll interval.

--End--

The following table outlines the parameters for the **ICMP Stats** window.

Table 207
Variable definitions

Variable	Value
InMsgs	Number of ICMP messages received.
InErrors	Number of ICMP error messages received.
OutMsgs	Number of ICMP messages sent.
OutErrors	Number of ICMP error messages sent.
Poll Interval	Sets polling interval. Value: 2 to 60 s.

Displaying the ICMP Msg Stats tab

To display the IPv6 interface ICMP message statistics:

Procedure steps

Step	Action
1	From the navigation tree, double-click **IPv6**.
2	From the IPv6 tree, double-click **IPv6**.
3	Select the **ICMP Msg Stats** tab.
4	Click **Refresh** to update the ICMP message statistics.

--End--

The following table outlines the parameters for the **ICMP Msg Stats** window.

Table 208
Variable definitions

Variable	Value
Type	Type of packet received or sent.
InPkts	Number of packets received.
OutPkts	Number of packets sent.

Viewing SFP GBIC ports

The details of an SFP GBIC port are only available if the port is active.

To view the SFP GBIC ports:

Step	Action
1	From the **Device Physical View**, click a unit.
2	From the navigation tree, double-click **Edit**.
3	In the Edit tree, double click **Chassis**.
4	In the Chassis tree, double-click **Ports**.

--End--

Configuration reference

Factory default configuration

When a newly installed switch is initially accessed or a switch is reset to factory defaults, the switch is in a factory default configuration. This factory default configuration is the base configuration from which the switch configuration is built.

Table 209 "Factory default configuration settings" (page 371) outlines the factory default configuration settings present in a switch in a factory default state.

Table 209
Factory default configuration settings

Setting	Factory Default Configuration Value
Unit Select switch	non-Base
Unit	1
BootP Request Mode	BootP When Needed
In-Band Stack IP Address	0.0.0.0 (no IP address assigned)
In-Band Switch IP Address	0.0.0.0 (no IP address assigned)
In-Band Subnet Mask	0.0.0.0 (no subnet mask assigned)
Default Gateway	0.0.0.0 (no IP address assigned)
Read-Only Community String	public
Read-Write Community String	private
Trap IP Address	0.0.0.0 (no IP address assigned)
Community String	Zero-length string
Authentication Trap	Enabled
Autotopology	Enabled
sysContact	Zero-length string

Table 209
Factory default configuration settings (cont'd.)

Setting	Factory Default Configuration Value
sysName	Zero-length string
sysLocation	Zero-length string
Aging Time Find an Address Select VLAN ID [1]	300 seconds 00-00-00-00-00-00 (no MAC address assigned)
MAC Address Security	Disabled
MAC Address Security SNMP-Locked	Disabled
Partition Port on Intrusion Detected:	Disabled
Partition Time	0 seconds (the value 0 indicates forever)
DA Filtering on Intrusion Detected:	Disabled
Generate SNMP Trap on Intrusion	Disabled
Clear by Ports	NONE
Learn by Ports	NONE
Current Learning Mode	Not Learning
Trunk	blank field
Security	Disabled
Port List	blank field
Find an Address	blank field
MAC Address	00-00 00-00 -00-00
Allowed Source	- (blank field)
Display/Create MAC Address	00-00-00-00-00-00
Create VLAN	1
Delete VLAN	blank field
VLAN Name	VLAN #
Management VLAN	Yes (VLAN #1)
VLAN Type	Port-based
Protocol ID (PID)	None
User-Defined PID	0x0000

Table 209
Factory default configuration settings (cont'd.)

Setting	Factory Default Configuration Value
VLAN State	Active (VLAN # 1)
Port Membership	All ports assigned as members of VLAN 1
Unit	1
Port	1
Filter Untagged Frames	No
Filter Unregistered Frames	Yes
Port Name	Unit 1, Port 1
PVID	1
Port Priority	0
Tagging	Untag All
AutoPVID	Enabled
Unit	1
Port	1
PVID	1 (read only)
Port Name	Unit 1, Port 1 (read only)
Unit	1
Status	Enabled (for all ports)
Linktrap	On
Autonegotiation	Enabled (for all ports)
Speed/Duplex	(Refer to Autonegotiation)
Trunk	1 to 32 (depending on configuration status)
Trunk Members (Unit/Port)	Blank field
STP Learning	Normal
Trunk Mode	Basic
Trunk Status	Disabled
Trunk Name	Trunk #1 to Trunk #32
Traffic Type	Rx and Tx
Port	1
Monitoring Mode	Disabled
Monitor/Unit Port	Zero-length string
Unit/Port X	Zero-length string

Table 209
Factory default configuration settings (cont'd.)

Setting	Factory Default Configuration Value
Unit/Port Y	Zero-length string
Address A	00-00-00-00-00-00 (no MAC address assigned)
Address B	00-00-00-00-00-00 (no MAC address assigned)
Rate Limit Packet Type	Both
Limit	None
VLAN	1
Snooping	Disabled
Proxy	Disabled
Robust Value	2
Query Time	125 seconds
Set Router Ports	Version 1
Static Router Ports	- (for all ports)
Multicast Group Membership screen	
Unit	1
Port	1
Console Port Speed	9600 Baud
Console Switch Password type	None
Console Stack Password type	None
Telnet Stack Password type	None
Telnet Switch Password type	None
Console Read-Only Switch Password	Passwords are user for non-SSH software images and userpasswd for SSH software images.
Console Read-Write Switch Password	Passwords are secure for non-SSH software images and securepasswd for SSH software images.
Console Read-Only Stack Password	Passwords are user for non-SSH software images and userpasswd for SSH software images.
Console Read-Write Stack Password	Passwords are secure for non-SSH software images and securepasswd for SSH software images.
Radius password/server	secret

Table 209
Factory default configuration settings (cont'd.)

Setting	Factory Default Configuration Value
New Unit Number	Current stack order
Renumber units with new setting?	No
Group	1
Bridge Priority	8000
Bridge Hello Time	2 seconds
Bridge Maximum Age Time	20 seconds
Bridge Forward Delay	15 seconds
Add VLAN Membership	1
Tagged BPDU on tagged port	• STP Group 1--No • Other STP Groups--Yes
STP Group State	• STP Group 1--Active • Other STP Groups--InActive
VID used for tagged BPDU	4001-4008 for STGs 1-8, respectively
STP Group	1
Participation	Normal Learning
Priority	128
Path Cost	1
STP Group	1
STP Group	1
TELNET Access/SNMP	By default, SNMP access is disabled in the SSH image and enabled in the non-SSH image. Telnet is enabled by default in both SSH and non-SSH images. Use list: Yes
Login Timeout	1 minute
Login Retries	3
Inactivity Timeout	15 minutes
Event Logging	All

Table 209
Factory default configuration settings (cont'd.)

Setting	Factory Default Configuration Value
Allowed Source IP Address (50 user-configurable fields)	First field: 0.0.0.0 (no IP address assigned)
	Remaining 49 fields: 255.255.255.255 (any address is allowed)
Allowed Source Mask (50 user-configurable fields)	First field: 0.0.0.0 (no IP address assigned)
	Remaining 49 fields: 255.255.255.255 (any address is allowed)
Allowed Source IPv6 Address and Allowed Prefix Length (50 user-configurable fields)	First field: ::/0 (no IPv6 address assigned)
	Remaining 49 fields: ffff:ffff:ffff:ffff:ffff:ffff:ffff:ffff/128 (any IPv6 address is allowed)
Image Filename	Zero-length string
Diagnostics image filename	Zero-length string
TFTP Server IP Address	0.0.0.0 (no IP address assigned)
Start TFTP Load of New Image	No
Configuration Image Filename	Zero-length string
Copy Configuration Image to Server	No
Retrieve Configuration Image from Server	No
ASCII Configuration Filename	Zero-length string
Retrieve Configuration file from Server	No
Auto Configuration on Reset	Disabled
EAPOL Security Configuration	Disabled

Table 209
Factory default configuration settings (cont'd.)

Setting	Factory Default Configuration Value
High Speed Flow Control Configuration	
VLAN Configuration Control	Strict
Agent Auto Unit Replacement	Enabled

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Nortel Ethernet Routing Switch 5000 Series

Configuration — System

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