Nortel Ethernet Switch 460/470

Overview — System Configuration

ATTENTION

Clicking on a PDF hyperlink takes you to the appropriate page. If necessary, scroll up or down the page to see the beginning of the referenced section.

NN47210-501 (217105-B)

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	200 - 240 VAC 12 A 50 to 60 Hz

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Revision History

Date Revised	Version	Reason for revision
February 2007	1.01	A new document was created and new features for Release 3.7 software were incorporated.

Contents

Chapter 1
Preface

About this guide

This guide provides information about configuring and managing basic switching features on the Ethernet Switch 460 and Ethernet Switch 470.

Network management tools and interfaces

The following are the management tools and interfaces available with the switch (for basic instructions on these tools, see the *Nortel Ethernet Switch 460/470 Overview — System Configuration (NN47210-501)*:

- Console Interface

  With the Console Interface (CI), you can configure and manage the switch locally or remotely. Access the CI menu and screens locally through a console terminal attached to your Ethernet Switch, remotely through a dial-up modem connection, or in-band through a Telnet session.

- Web-based management

  You can manage the network from the World Wide Web and access the web-based Graphical User Interface (GUI) through the HTML-based browser located on your network. With the GUI, you can configure, monitor, and maintain your network through web browsers and you can download software using the web.

- Java-based Device Manager

  The Device Manager is set of Java-based graphical network management applications that is used to configure and manage Ethernet Switches 460 and 470.

- Command Line Interface (CLI)

  The CLI is used to automate general management and configuration of the Ethernet Switches 460 and 470. Use the CLI through a Telnet connection or through the serial port on the console.

- Any generic Simple Network Management Protocol (SNMP) based network management software.

  You can use any generic SNMP-based network management software to configure and manage Ethernet Switches 460 and 470.

- Telnet

  With telnet, you can access the CLI and CI menu and screens locally using an in-band Telnet session.

- SSH

  Secure Shell (SSH) is a client/server protocol that can provide a secure remote login with encryption of data, user name, and password. For details on SSH connections, see *Security — Configuration (NN47210-500)*.

- Nortel Enterprise Policy Manager

  With the Nortel Enterprise Policy Manager (formerly Optivity Policy Services), you can configure the Ethernet Switches 460 and 470 with a single system.

Before you begin

This guide is intended for network administrators with the following background:

- Basic knowledge of networks, bridging, and IP
- Familiarity with networking concepts and terminology
- Basic knowledge of network topologies

Before using this guide, you must complete the installation procedures discussed in *Nortel Ethernet Switch 460-24T-PWR — Installation* (NN47210-300) or *Nortel Ethernet Switch 470 — Installation* (NN47210-301).

Text conventions

angle brackets (< >)	Indicate that you choose the text to enter based on the description inside the brackets. Do not type the brackets when entering the command. Example: If the command syntax is **`ip default-gateway <XXX.XXX.XXX.XXX>`**, you enter **`ip default-gateway 192.32.10.12`**

braces ({})	Indicate required elements in syntax descriptions where there is more than one option. You must choose only one of the options. Do not type the braces when entering the command. Example: If the command syntax is **`http-server {enable|disable}`** the options are **`enable`** or **`disable`**.
brackets ([ ])	Indicate optional elements in syntax descriptions. Do not type the brackets when entering the command. Example: If the command syntax is **`show ip [bootp]`**, you can enter either **`show ip`** or **`show ip bootp`**.
`plain Courier text`	Indicates command syntax and system output. Example: `TFTP Server IP Address:  192.168.100.15`
vertical line |	Separates choices for command keywords and arguments. Enter only one of the choices. Do not type the vertical line when entering the command. Example: If the command syntax is **`cli password <serial|telnet>`**, you must enter either **`cli password serial`** or **`cli password telnet`**, but not both.
H.H.H.	Enter a MAC address in this format (XXXX.XXXX.XXXX).

Related publications

For more information about managing or using the switches, see the following publications:

- *Nortel Ethernet Switch 460/470 Release Notes — Software Release 3.7* (NN47210-400)
- *Nortel Ethernet Switch 460-24T-PWR — Installation* (NN47210-300)
- *Nortel Ethernet Switch 470 — Installation* (NN47210-301)
- *Security — Configuration (NN47210-500)*
- *Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*
- *Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*
- *Configuration — IP Multicast Routing Protocols (NN47210-504)*
- *Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
- *Installing Gigabit Interface Converters and Small Form Factor Pluggable Interface Converters* (312865-C)

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- open and manage technical support cases

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www.nortel.com/callus

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www.nortel.com/erc

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If you purchased a service contract for your Nortel product from a distributor or authorized reseller, contact the technical support staff for that distributor or reseller.

Chapter 2
About Ethernet Switches 460 and 470

This chapter provides an introduction to Ethernet Switch Release 3.7 software. This version of the software supports the following devices:

- Ethernet Switch 460-24T-PWR
- Ethernet Switch 470-24T
- Ethernet Switch 470-48T
- Ethernet Switch 470-24T-PWR
- Ethernet Switch 470-48T-PWR

This chapter gives you information about the following topics:

Features

This section describes the new features in this document.

Stack Monitor

You can use the Stack Monitor feature to analyze the health of a stack by monitoring the number of active units in the stack.

With stacked switches, Multi Link Trunking (MLT) links are often connected to separate units in a distributed MLT (DMLT). In the event that the connections between switches in the stack fail, a situation can arise where the DMLT links are no longer connected to a stack, but to a combination of units that are no longer connected to each other. From the other end of the DMLT, the trunk links appear to be functioning properly. However, the traffic is no longer flowing across the cascade connections to all units so connectivity problems can occur.

To address this issue, Release 3.7 software supports the Stack Monitor feature. With the Stack Monitor feature, when a stack is broken, the stack and any disconnected units from the stack, send SNMP traps. If the stack or the disconnected units are still connected to the network, they generate log events and send trap messages to the management station to notify the administrator of the event. After the problem is detected, the stack and disconnected units continue to generate log events and send traps at a user-configurable interval until the situation is remedied (or the feature is disabled).

There are no changes to the current operation of the stand alone units or the stack.

Control parameters

You can configure the Stack Monitor by setting the following parameters:

- Stack Monitor enable and disable (default: disabled)
- stack size (range: 2 to 8 units; default: 2)
- trap and event logging interval (range: 30 to 300 seconds; default: 60)

The Stack Monitor settings are saved to NVRAM and distributed to all units within a stack.

When the Stack Monitor is enabled, the feature determines the number of units currently in the stack and automatically sets the correct value for the stack size parameter.

After the feature is enabled, any change to the number of units in the stack triggers the sending of traps.

To ensure that disconnected switches can send traps, Nortel recommends that you set a switch IP address on any units that have MLT links. This ensures that the units have the IP capability to send traps if they become stand-alone units. While this requires additional IP addresses, it provides the most robust operation.

Local ports shutdown while stacking

When a switch is joining a stack, DMLT and dynamic Link Aggregation Groups (LAGs) formed with Link Aggregation Protocol (LACP) can still be created because Link Layer Discovery Protocol Data Units (LACPDUs) continue to be transmitted. This can result in a temporary traffic delay (for a few seconds) until the switch fully joins the stack.

Release 3.7 software resolves this issue by momentarily shutting down the local ports on a switch before the switch joins a stack. Following a reset or power up, if the switch detects power on its stacking cables and is connected to another unit, the switch shuts down all its local ports. When the ports are disabled, the port LEDs blink, similar to ports that are shut down. The ports are reenabled when the unit finishes entering the stack formation or after a 60-second timeout (whichever comes first).

If the unit does not detect power on the stacking ports 20 seconds after it comes up, its ports forward traffic.

For information about configuring Stack Monitor, see:

- "Configuring stack monitor using the CLI" (page 355)
- "Stack Monitor tab" (page 414)

New Unit Quick Configuration

In Software Release 3.7, the New Unit Quick Configuration feature, you can create a default configuration to apply to any new unit entering a stack configuration. You can add new units to the stack without resetting the stack.

To configure and enable this feature using the CLI, see the following commands:

- "quickconfig enable" (page 29)
- "no quickconfig enable" (page 30)
- "default quickconfig" (page 30)
- "quickconfig start-recording" (page 30)
- "show quickconfig" (page 30)

quickconfig enable

This command enables the quick configuration feature on the switch. The syntax for this command is:

```
quickconfig enable
```

The **quickconfig enable** command is used in the global configuration mode.

no quickconfig enable

This command disables the quick configuration feature on the switch.
The syntax for this command is:

```
no quickconfig enable
```

The **no quickconfig enable** command is used in the global configuration mode.

default quickconfig

This command sets the quick configuration feature to the factory default value.
The syntax for this command is:

```
default quickconfig
```

The **default quickconfig** command is used in the global configuration mode.

quickconfig start-recording

This command is used on the stack base unit to record the default configuration that is applied to new units in the stack.
The syntax for this command is:

```
quickconfig start-recording
```

To end the recording process, type a period (.) in the CLI.

The **quickconfig start-recording** command is used in the privileged exec mode.

show quickconfig

This command displays the current configuration of the New Unit Quick Configuration feature.
The syntax for this command is:

```
show quickconfig
```

The **show quickconfig** command is used in the global configuration mode.

CLI command enhancements

The following sections describe additional CLI command enhancements.

shutdown command

The **shutdown** command resets the switch 1 to 60 minutes after saving the configuration. Users are informed that they have between 1 and 10 minutes to unplug the switch; otherwise, the switch is reset. See "shutdown command" (page 136).

The shutdown command is also available from the Console Interface. See Table 29 " Console Interface Main Menu options" (page 105).

reload command

The **reload** CLI command provides a configuration rollback mechanism to prevent loss of connectivity to a switch, typically for remote configurations. You can use the **reload** command to temporarily disable the autosave feature for a specified time period (1 to 60 minutes), allowing you to make a number of configuration changes on remote switches without affecting the current saved configuration.

During the interval in which the autosave feature is disabled by the **reload** command, you must use the **copy config nvram**,**write mem**, or **save config** command to force a manual save of your configurations.

When the reload timer expires, the switch reloads the last saved configuration. To cancel the switch reload before the timer expires, you must enter the **reload cancel** command.

The **reload** command provides you with a safeguard against any misconfigurations when you perform dynamic configuration changes on a remote switch.

The following example describes how you can use the **reload** command to prevent connectivity loss to a remote switch.

Step	Action
1	Enter the CLI command **reload force minutes-to-wait 30**. This instructs the switch to reboot in 30 minutes, loading the configuration from NVRAM. During this 30-minute period, autosave of the configuration to NVRAM is disabled.
2	Execute dynamic switch configuration commands, which take effect immediately. These configurations are not saved to NVRAM.
3	If the configurations cause no problems and switch connectivity is maintained, you can perform the following tasks: a. Save the current running configuration using the **copy config nvram**,**write mem**, or **save config** command.

b. Because the new configuration is working properly, cancel the reload using the **reload cancel** command.

—End—

If you make an error when performing configurations in Step 2 that results in the loss of switch connectivity (for example, an error in the IP address mask, MLT configuration, or VLAN trunking), the **reload** command provides you with a safeguard: when the reload timer expires, the switch reboots to the last saved configuration, and connectivity is reestablished. Therefore, you do not have to travel to the remote site to reconfigure the switch.

For more information, see "reload command" (page 137).

restore factory-default command

The **restore factory-default** command resets the switch or stack back to its default configuration.

The syntax for the **restore factory-default** command is:

```
restore factory-default [-y]
```

where

the [-y] parameter instructs the switch not to prompt for confirmation.

For more information, see "Resetting the switch to the default configuration" (page 327).

show cpu-utilization command

The **show cpu-utilization** command displays utilization statistics of the Nortel Ethernet Switch 460/470 CPU.

For more information, see "show cpu-utilization command" (page 138).

Ping enhancement

Release 3.7 software extends the ping capabilities of the device. Using the CLI, you can now specify additional ping parameters, including the number of Internet Control Message Protocol (ICMP) packets send, 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 more information, see "Pinging" (page 204).

write memory and save config commands

Release 3.7 software provides two additional CLI commands to save the switch configuration to NVRAM. The **`write memory`** and **`save config`** commands function identically to the copy **`config nvram`** command.

For more information, see the following:

- "write memory command" (page 372)
- "save config command" (page 372)

Copper GBIC support

A full-sized GBIC is supported. This GBIC supports 1000BaseT and works only on Ethernet Switch 470 units.

General Features

Ethernet Switch Release 3.6 software provides many useful features.

The following are the general features supported by the switch:

Ethernet

- 10BaseT
- 100BaseT
- 1000BaseT
- 1000BaseGBIC

Layer 2

- 802.1q VLANs
- IGMP Snooping
- 802.1d Spanning Tree
- Nortel Multiple Spanning Tree
- 802.1s Multiple Spanning Tree
- 802.1w Rapid Spanning Tree

QoS

- Filtering
- Flow metering
- Traffic Shaping

Management

- Telnet
- HTTP/HTTPS
- SSH
- SNMP/SNMP V3

Hardware Description

The Nortel Ethernet Switches provide policy-enabled networking features to optimize consistent performance and behavior of network traffic. The Differentiated Services (DiffServ) network architecture offers varied levels of service for different types of data traffic. With DiffServ, you can designate a specific level of performance on a per-packet basis.

This section provides information about the following Ethernet Switches:

- "Ethernet Switch 460-24T-PWR" (page 34)
- "Ethernet Switch 470" (page 48)

Ethernet Switch 460-24T-PWR

This section describes the Ethernet Switch 460-24T-PWR and covers the following topics:

- "General Description" (page 35)
- "Physical Description" (page 35)
- "Front Panel" (page 35)
- "Console port" (page 36)
- "Uplink-Expansion slot" (page 37)
- "MDA compatibility" (page 38)
- "Port Connectors" (page 38)
- "LED display panel" (page 39)
- "Cooling fans" (page 42)
- "Back panel" (page 42)
- Table 5 "Ethernet Switch 460-24T-PWR back panel description" (page 43)
- "Cascade Module slot" (page 47)
- "Up (Cascade A Out) connector" (page 47)

General Description

The Ethernet Switch 460-24T-PWR is an IEEE 802.3af-compliant 24-port 10/100 stackable Ethernet switch.

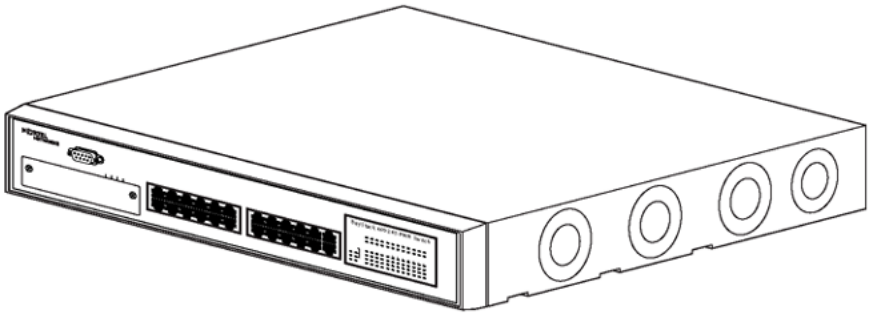
It has a Media Dependent Adapter slot that supports various types of media, including 1000BaseT and GBICs. It also provides support for a redundant power supply unit or an uninterruptible power supply (RPSU/UPS) module.

The Ethernet Switch 460-24T-PWR can detect and power IEEE 802.3af compliant network devices connected on the front ports, such as IP phones, wireless access points, and video devices, among others. The switch automatically supplies the DC voltage required by each connected appliance at the current level required for that particular device.

Physical Description

Figure 1 "Ethernet Switch 460-24T-PWR" (page 35) depicts the front and side views of the Ethernet Switch 460-24T-PWR.

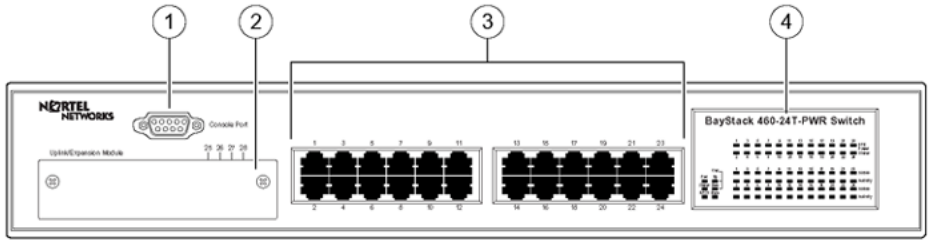
Figure 1
Ethernet Switch 460-24T-PWR



Front Panel

Figure 2 "Ethernet Switch 460-24T 10/100/1000 front panel" (page 36) shows the front panel configuration for the Ethernet Switch 460-24T-PWR. Table 1 " Ethernet Switch 460-24T-PWR 10/100/1000 front panel description" (page 36) describes the front panel components.

Figure 2
Ethernet Switch 460-24T 10/100/1000 front panel



460-24T-PWR Switch

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Table 1
Ethernet Switch 460-24T-PWR 10/100/1000 front panel description

Legend	Description
1	Console port
2	Uplink/expansion slot
3	Port connectors
4	LED display panel

Note: The 24 panel ports are colored red to signify that they can carry power as well as data.

Console port

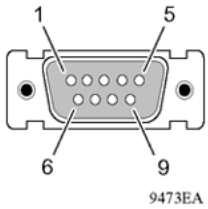
You can use the console port to access the Console Interface (CI) screens and customize your network using the supplied menus and screens.

The console port is a DB-9, RS-232-D male serial port connector. You can use this connector to connect a management station or console/terminal to the Ethernet Switch 460-24T-PWR by using a straight-through DB-9 to DB-9 standard serial port cable. You must use a VT100/ANSI-compatible terminal to provide cursor control and to enable the cursor and functions keys.

See *Nortel Ethernet Switch 460-24T-PWR — Installation* (NN47210-300) for more information.

Table 2 "Console port description" (page 37) describes the components of the console port.

Table 2
Console port description

Connector	Pin number	Signal
	1	Carrier detect (not used)
	2	Transmit data (TXD)
	3	Receive data (RXD)
	4	Data terminal ready (not used)
	5	Signal ground (GND)
	6	Not used
	7	Request to send (not used)
	8	Not used
	9	Ring indicator (not used)

Note: The console port is configured as a data communications equipment (DCE) connector. Ensure that your RS-232 cable pin-outs are configured for DCE connections.

The console port default settings are: 9600 baud with 8 data bits, 1 stop bit, and no parity as the communications format, with flow control set to Enabled.

Console-Serial Cable

To connect to the console port of the Ethernet Switch 460-24T-PWR, use a straight-through serial cable with a DB-9 female connector for the Ethernet Switch unit, and the appropriate connector for your PC.

The console/serial cable to connect from a PC with a male DB-9 serial port to the Ethernet Switch is available to order using the following information:

Description	Order number
Console cable for use with Ethernet Switch and Passport 8300 switches.	AL2011013

Uplink-Expansion slot

You can use the Uplink/Expansion slot to attach optional Media Dependent Adapters (MDA) that support a range of media types.

Table 3 "MDAs supported by Ethernet Switch 460-24T-PWR" (page 38) describes the MDAs supported by the Ethernet Switch 460-24T-PWR.

Table 3
MDAs supported by Ethernet Switch 460-24T-PWR

Description	Order number
450-1SX 1-port 1000BASE-SX Single PHY MDA	AL2033005
450-1SR 1-port 1000BASE-SX Redundant PHY MDA	AL2033006
450-1LX 1-port 1000BASE-LX Single PHY MDA	AL2033007
450-1LR 1-port 1000BASE-LX Redundant PHY MDA	AL2033008
BayStack 450-1 GBIC MDA	AL2033009
BPS2000-4TX 4-port 10/100 MDA	AL2033011
BPS2000-4FX 4-port 100BASE-FX MDA w/mini MT-RJ-type connectors	AL2033012
BPS2000-2FX 2-port 100BASE-FX MDA w/SC-type connectors	AL2033013
BPS2000 1-port 1000BASE-T MDA	AL2033014
BPS2000 2-port 1000BASE-T MDA	AL2033015
BPS2000 2-port SFP GBIC MDA	AL2033016

MDA compatibility

Note: The MDA do not supply power to PoE (Power Over Ethernet) devices. Only unit ports, 1-24 can supply power to PoE devices.

The switch provides support for many Nortel MDAs that use a variety of media, including Gigabit Interface Converters (GBICs) and CWDM.

see *Installing Media Dependent Adapters (MDA)s* (302403) and *Installing Gigabit Interface Converters, SFPs, and CWDM SFP Gigabit Interface Converters* (312865) for more information about installation, technical specifications, connectors, and cabling for the GBIC MDAs. Contact your Nortel representative for a complete listing of compatible MDAs.

Port Connectors

The Ethernet Switch 460-24T-PWR uses 24 10BASE-T/100BASE-TX RJ-45 (8-pin modular) port connectors.

The 10BASE-T/100BASE-TX port connectors are configured as Media Dependent Interface Crossover (MDI-X). These ports connect straight cables to the Network Interface Card (NIC) in a node or server, similar to a conventional Ethernet repeater hub.

If you are connecting to an Ethernet hub or Ethernet switch, use a crossover cable unless an MDI connection exists on the associated port of the attached device.

The Ethernet Switch 460-24T-PWR uses autosensing ports designed to operate at 10 Mbps (megabits per second) or at 100 Mbps, depending on the connecting device.

These ports support the IEEE 802.3u autonegotiation standard, which means that when a port is connected to another device that also supports the IEEE 802.3u standard, the two devices negotiate the best speed and duplex mode.

The 10BASE-T/100BASE-TX switch ports also support half and full-duplex modes of operation.

Note: Autonegotiation is enabled by default on the front panel 10/100BASE-TX ports.

The 10BASE-T/100BASE-TX RJ-45 ports can connect to 10 Mbps or 100 Mbps Ethernet segments or nodes.

Auto-polarity

The Ethernet Switch 460-24T-PWR supports auto-polarity. With autonegotiation enabled, auto-polarity can automatically reverse 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 is reversed due to a wiring error.

LED display panel

Figure 3 "Ethernet Switch 460-24T-PWR LED display panel" (page 40) shows the Ethernet Switch 460-24T-PWR LED display panel. Table 4 "Ethernet Switch 460-24T-PWR System LED descriptions" (page 40) provides a description of the LEDs.

Figure 3
Ethernet Switch 460-24T-PWR LED display panel

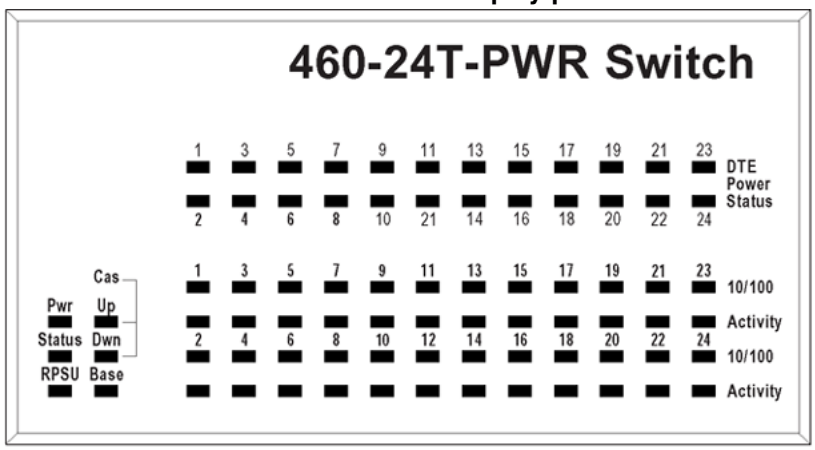


Table 4
Ethernet Switch 460-24T-PWR System LED descriptions

Label	Type	Color	State	Meaning
Pwr	Power status	Green	On	DC power is available to the switch's internal circuitry.
			Off	No AC power to switch or power supply failed.
Status	System status	Green	On	Self-test passed successfully and switch is operational.
			Blinking	A nonfatal error occurred during the self-test (this includes disabled fans).
			Off	The switch failed the self-test.
RPSU	RPSU Status	Green	On	The switch is connected to the RPSU and can receive power if needed.
			Off	The switch is not connected to the RPSU or the RPSU is not on.
Up	Stack Mode	None	Off	The switch is in stand-alone mode.
		Green	On	The switch is connected to the **Up (Cascade A Out)** connector on the *upstream* unit.
		Amber	On	This unit has detected a problem with the switch connected to the **Up (Cascade A Out)** connector. To maintain the integrity of the stack, this unit has bypassed its upstream neighbor and has wrapped the stack backplane onto an alternate path.
		Amber		Incompatible software revision or unable to obtain a unit ID (Renumber Stack Unit table full). The unit is on the ring but cannot participate in

Label	Type	Color	State	Meaning
		or Green		the stack configuration.
Down	Stack Mode	None	Off	The switch is in stand-alone mode.
		Green	On	The switch is connected to the **Down (Cascade A In)** connector on the *downstream* unit.
		Amber	On	This unit has detected a problem with the switch connected to the **Down (Cascade A In)** connector. To maintain the integrity of the stack, this unit has bypassed its upstream neighbor and has wrapped the stack backplane onto an alternate path.
		Amber or Green	Blinking	Incompatible software revision or unable to obtain a unit ID (Renumber Stack Unit table full). The unit is on the ring but cannot participate in the stack configuration.
Base	Base mode	Green	On	The switch is configured as the stack base unit.
			Off	The switch is not configured as the stack base unit (or is in stand-alone mode).
			Blinking	Stack configuration error: indicates that multiple base units or no base units are configured in the stack.
		Amber	On	This unit is operating as the stack configuration's temporary base unit. This condition occurs automatically if the base unit (directly downstream from this unit) fails. If this happens, the following events take place: • The two units directly upstream and directly downstream from the failed unit automatically wrap their cascade connectors and indicate this condition by lighting their **Up** and **Down** LEDs. • If the temporary base unit fails, the next unit directly downstream from this unit becomes the new temporary base unit. This process can continue until there are only two units left in the stack configuration.

Label	Type	Color	State	Meaning
				This automatic failover is a temporary safeguard only. If the stack configuration loses power, the temporary base unit does not power up as the base unit when power is restored. For this reason, you must always assign the temporary base unit as the base unit (set the Unit Select switch to Base) until the failed unit is repaired or replaced.
DTE Power Status	DTE powerstatus		Off	No DTE/PoE device is detected.
		Green	On	DTE/PoE device is detected and power is applied.
		Amber	On	DTE/PoE power fault or short circuit.
			Blinking	DTE/PoE device is detected, but there is insufficient power to turn on the device.
10/100	Link status and speed		Off	The communications link connection is bad or there is no connection to this port.
		Green	On	Valid communications link established at 100 Mbps.
		Amber	On	Valid communications link established at 10 Mbps.
		Green or Amber	Blinking	The corresponding port is management disabled.
Activity	Port activity	Green	Blinking	Indicates network activity for the corresponding port. A high level of network activity can cause the LEDs to appear to be on continuously.

Cooling fans

Four cooling fans are located on one side of the Ethernet Switch 460-24T-PWR to provide cooling for the internal components.

When you install the switch, allow enough space on both sides of the switch for adequate air flow. For more information about installing the switch, see *Nortel Ethernet Switch 460-24T-PWR — Installation* (NN47210-300).

Back panel

Figure 4 "Ethernet Switch 460-24T-PWR back panel" (page 43) shows the back panel of the Ethernet Switch 460-24T-PWR. Table 5 "Ethernet Switch 460-24T-PWR back panel description" (page 43) describes the various parts of the back panel.

Figure 4
Ethernet Switch 460-24T-PWR back panel

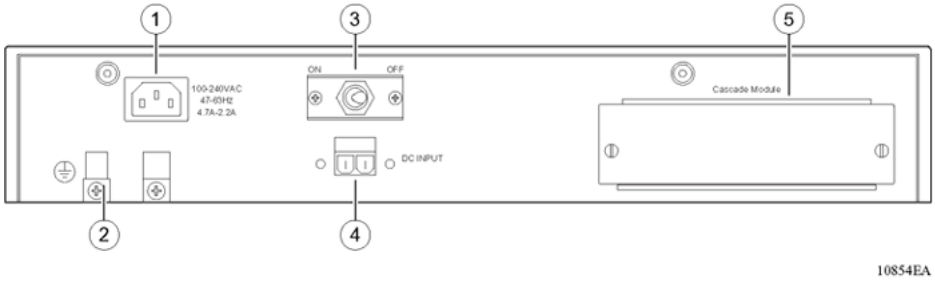


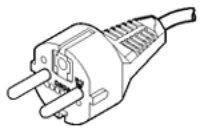
Table 5
Ethernet Switch 460-24T-PWR back panel description

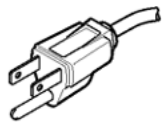
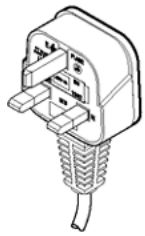
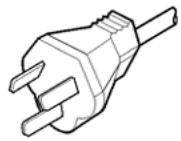
Legend	Description
1	AC Power Receptacle
2	Ground lug
3	DC ON/OFF switch (for optional external power source)
4	DC connector receptacle (for optional external power source)
5	Cascade Module slot

AC power receptacle

The AC power receptacle accepts a variety of AC power cords. Ensure that you have the proper power cord for your region. Any cord used must have a CEE-22 standard V female connector on one end and must meet the IEC 320-030 specifications. Table 6 "International power cord specifications" (page 43) lists specifications for international power cords.

Table 6
International power cord specifications

Country/Plug description	Specifications	Typical plug
Continental Europe: • CEE7 standard VII male plug • Harmonized cord (HAR marking on the outside of the cord jacket to comply with the CENELEC Harmonized Document HD-21)	220 or 230 VAC 50 Hz Single phase	 228FA

Country/Plug description	Specifications	Typical plug
U.S./Canada/Japan: • NEMA5-15P male plug • UL recognized (UL stamped on cord jacket) • CSA certified (CSA label secured to the cord)	100 or 120 VAC 50-60 Hz Single phase	 227FA
United Kingdom: • BS1363 male plug with fuse • Harmonized cord	240 VAC 50 Hz Single phase	 229FA
Australia: • AS3112-1981 Male plug	240 VAC 50 Hz Single phase	 230FA

Ground lug

You can use the ground lug to attach a grounding wire. Attach a 12-gauge wire to this lug and connect it to the chassis ground (on the rack), especially if you are using only an external power source.

DC ON-OFF switch

You can use the DC ON/OFF switch to manually turn off power from the optional external power source to the Ethernet Switch 460-24T-PWR. This switch serves as a safety feature only; if you encounter problems you can immediately switch off the power supply from the external power source by moving this switch to the Off mode.

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

DC connector receptacle

This is the receptacle into which you plug the optional external power source, either an Ethernet Switch Power Supply Unit 10 (PSU) or a Network Energy Source (NES) unit. This receptacle requires a 2-pin cable. This 2-pin cable comes with a NES unit and must be ordered separately for an Ethernet Switch Power Supply Unit 10.

You can use the Ethernet Switch 460-24T-PWR in various configurations. These configurations depend on three interrelated items:

- Physical power source
- DC source type configuration
- DC source configuration

For an optional external power source, you can use either an Ethernet Switch Power Supply Unit 10 or an NES. Contact your Nortel representative for more information about the Ethernet Switch Power Supply Unit 10 or the NES unit.

The DC Connector receptacle provides the following three options to power the switch:

- Internal power source only
- External power source only
- Internal power source plus external power source

The Ethernet Switch 460-24T-PWR supports two external power source options:

- Ethernet Switch Power Supply Unit 10
- NES

External power source

To connect the external power source, perform the following steps:

Step	Action
1	Plug the cord from the Ethernet Switch 460-24T-PWR into the wall outlet.

2 Ensure that the DC ON/OFF switch on the back of the Ethernet Switch 460-24T-PWR is in the OFF position.

3 Using the 2-pin connector, plug the external power source into the DC connector receptacle on the back of the Ethernet Switch 460-24T-PWR.

4 Attach the ground lug to a grounding point.

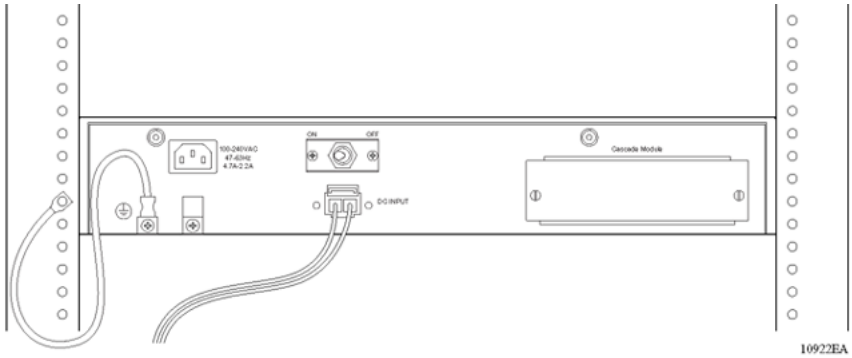
5 Turn the DC ON/OFF switch on the back of the switch to the ON position.

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

—End—

Figure 5 "External power source connected to back of the Ethernet Switch 460-24T-PWR" (page 46) shows an external power source connected to the back of the Ethernet Switch 460-24T-PWR. Note that the grounding wire is connected to the rack and the DC ON/OFF switch is in the ON position.

Figure 5
External power source connected to back of the Ethernet Switch 460-24T-PWR



Whatever the physical power sources you use, you can configure the Ethernet Switch 460-24T-PWR power as *one* of the following:

- power sharing
- uninterruptible power supply (UPS)
- redundant power supply unit (RPSU)

When you have correctly attached an external power source, ensure that your configuration is set for the correct one. Also, check the DC ON/OFF switch on the back of the Ethernet Switch 460-24T-PWR to ensure that it is in the ON position. Finally, check your configuration to ensure that you have chosen the correct DC source type and DC source configuration you want.

Cascade Module slot

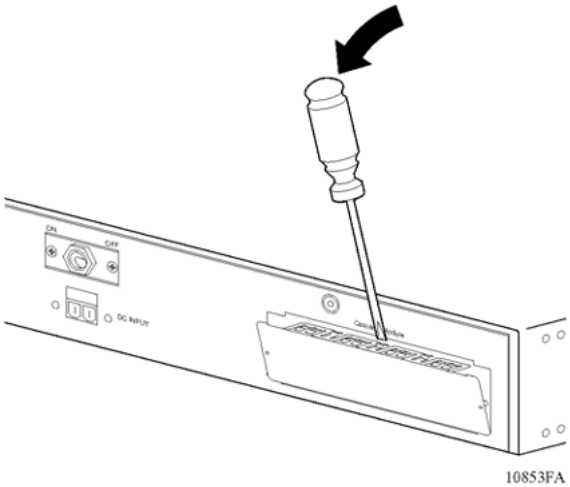
You can use the Cascade Module slot to attach an optional BayStack 400-ST1 Cascade Module to the switch.

You can connect up to eight switches into a redundant stack configuration. Installation instructions are provided with each BayStack 400-ST1 Cascade Module.

For more information, see *Installing the BayStack 400-ST1 Cascade Module* (304433). Use a flathead screwdriver to remove the filler panel that covers the Cascade Module slot.

Figure 6 "Removing the cascade module filler panel" (page 47) shows how to remove a cascade filler panel.

Figure 6
Removing the cascade module filler panel



Up (Cascade A Out) connector

The Up (Cascade A Out) connector provides an attachment point for connecting the Ethernet Switch 460-24T-PWR unit to another unit through the cascade cable. A return cable from the Cascade A Out connector of another unit to the Cascade A In connector of this unit completes the stack connection.

Unit Select switch

The Unit Select switch (up = Base) determines the base unit for the stack configuration. The Unit Select switch status is displayed on the LED display panel of the Ethernet Switch 460-24T-PWR. When the Unit Select switch is in the Base (up) position, all other Unit Select switches in the stack configuration must be set to Off (down).

Down (Cascade A In) connector

The Down (Cascade A In) connector provides an attachment point for accepting a cascade cable connection from an adjacent unit in the stack. A return cable from the Cascade A Out connector of this unit to the Cascade A In connector of the adjacent unit completes the stack connection.

Table 7
Cascade Cable and Cascade Module ordering information

Description	Order number
BayStack 400-SRC Cascade Return Cable (1 meter)	AL2018001
BayStack 400-SSC Spare Cascade Cable (18 inch)	AL2018002
BayStack 400-SRC Cascade Return Cable (3 meter)	AL2018004
BayStack 400-ST1 Cascade Module (includes cascade cable)	AL2033010

Ethernet Switch 470

This section introduces the Ethernet Switch 470-24T, 24T-PWR, 48T, and 48T-PWR and covers the following topics:

General Description

The Ethernet Switch 470 comes in a variety of models:

- The Ethernet Switch 470-24T is a 24-port 10/100/1000 stackable Ethernet switch and the Ethernet Switch 470-48T is a 48-port 10/100/1000 stackable Ethernet switch.

  The Ethernet Switch 470-24T provides 24 10/100BASE-TX RJ-45 (8-pin modular) Ethernet port connectors, while the Ethernet Switch 470-48T provides with 48 10/100BASE-TX RJ-45 (8-pin modular) Ethernet port connectors.

- The Ethernet Switch 470-24T-PWR and Ethernet Switch 470-48T-PWR are 24-port and 48-port 10/100/1000 stackable Ethernet switches that support the IEEE 802.3af standard for Power over Ethernet.

  The Ethernet Switch 470-PWR devices can detect and power IEEE 802.3af-compliant network devices connected on the front-panel RJ-45 ports, such as IP phones, wireless access points, and video devices, among others. The switches automatically supply the DC voltage required by each connected appliance at the current level required for that particular device.

  Like the Ethernet Switch 460-PWR, you can set the maximum power allowed for each port, and you can also set the power priority for each port (low, high, critical). The system uses the port power priority settings to distribute power to the ports depending on the available power budget. When two ports have the same priority and one must be shut down, the port with the higher port number is shut down first.

Each Ethernet Switch 470 model provides two Gigabit Interface Converter (GBIC) slots and provides support for a redundant power supply unit/uninterruptible power supply (RPSU/UPS) module.

Physical Description

Figure 7 "Ethernet Switch 470-24T" (page 50) depicts the front and side views of the Ethernet Switch 470-24T.

Figure 7
Ethernet Switch 470-24T

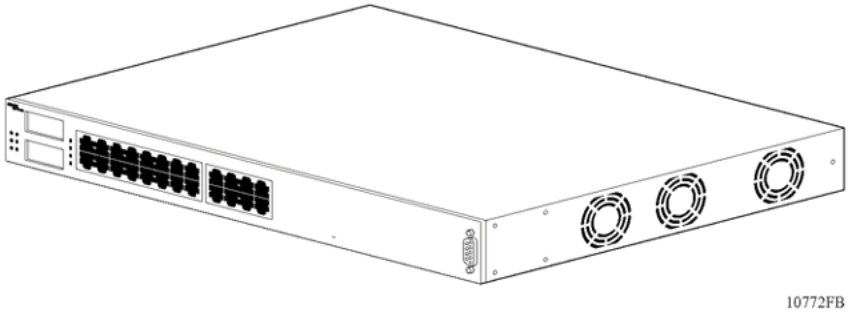
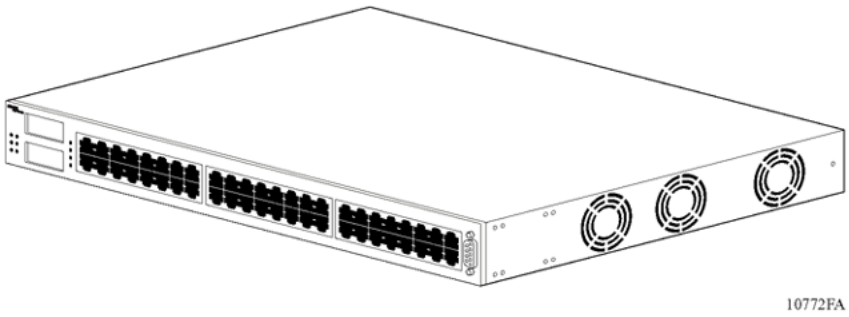


Figure 8 "Ethernet Switch 470-48T" (page 50) depicts the front and side views of the Ethernet Switch 470-48T.

Figure 8
Ethernet Switch 470-48T



Front Panel

Figure 9 "Ethernet Switch 470-24T front panel" (page 50) shows the front panel configuration for the Ethernet Switch 470-24T.Figure 10 "Ethernet Switch 470-48T front panel." (page 51) shows the front panel configuration for the Ethernet Switch 470-48T.Table 8 "Ethernet Switch 470 front panel description" (page 51) describes the front panel components.

Figure 9
Ethernet Switch 470-24T front panel

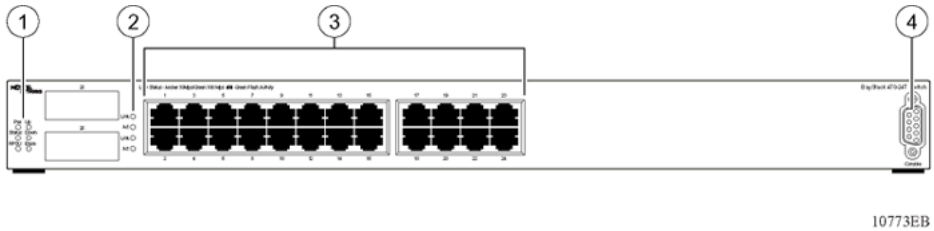


Figure 10
Ethernet Switch 470-48T front panel.

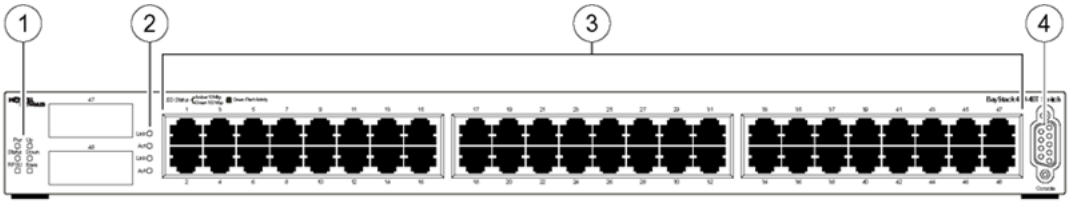


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Table 8
Ethernet Switch 470 front panel description

Legend	Description
1	System LED display panel
2	GBIC slots and LEDs
3	10/100 port connectors and LEDs
4	Console port

System LED display Panel

shows the Ethernet Switch 470 LED display panel.

Figure 11
Ethernet Switch 470 LED display panel

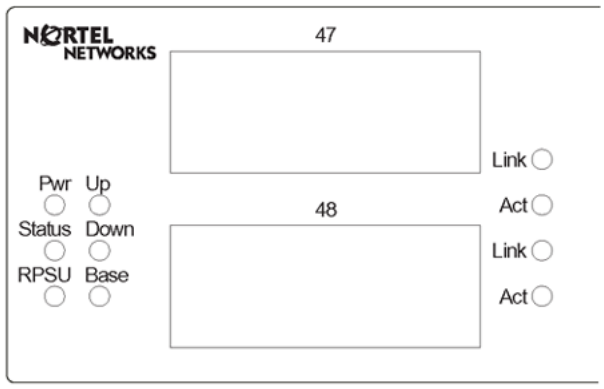

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Table 9 "Ethernet Switch 470 switch LED descriptions" (page 52) provides a description of the Ethernet Switch 470 LEDs.

Table 9
Ethernet Switch 470 switch LED descriptions

Label	Type	Color	State	Meaning
Pwr	Power status	Green	On	DC power is available to the switch internal circuitry.
			Off	No AC power to switch or power supply failed.
Status	System status	Green	On	Self-test passed successfully and switch is operational.
			Blinking	A non-fatal error occurred during the self-test (this includes malfunctioning fans).
			Off	The switch failed the self-test.
RPSU	RPSU Status	Green	On	The switch is connected to the RPSU and can receive power if needed.
			Off	The switch is not connected to the RPSU or RPSU is not on.
Up	Stack Mode	None	Off	The switch is in stand-alone mode.
		Green	On	The switch is connected to the Up **(Cascade A Out)** connector on the *upstream* unit.
		Amber	On	This unit has detected a problem with the switch connected to the **Up (Cascade A Out)** connector. To maintain the integrity of the stack, this unit has bypassed its upstream neighbor and has wrapped the stack backplane onto an alternate path.
		Amber or Green	Blinking	The software version on this unit is incompatible or the software cannot obtain a unit ID because the Renumber Stack Unit table is full. The unit is on the ring but cannot participate in the stack configuration.
Down	Stack Mode	None	Off	The switch is in stand-alone mode.
		Green	On	The switch is connected to the **Down (Cascade A In)** connector on the *downstream* unit.
		Amber	On	This unit has detected a problem with the switch connected to the **Down (Cascade A In)** connector. To maintain the integrity of the stack, this unit has bypassed its upstream neighbor and has wrapped the stack backplane onto an alternate path.
		Amber or Green	Blinking	The software version on this unit is incompatible or the software cannot obtain a unit ID because the Renumber Stack Unit table is full. The unit is on the ring but cannot participate in the stack configuration.

Label	Type	Color	State	Meaning
Base	Base mode	Green	On	The switch is configured as the stack base unit.
			Off	The switch is not configured as the stack base unit (or is in stand-alone mode).
			Blinking	Stack configuration error: indicates that multiple base units or no base units are configured in the stack.
		Amber	On	This unit is operating as the stack configuration's ***temporary base unit***. This condition occurs automatically if the base unit (directly downstream from this unit) fails. If this happens, the following events take place: • The two units directly upstream and directly downstream from the failed unit automatically wrap their cascade connectors and indicate this condition by lighting their **Up** and **Down** LEDs. • If the temporary base unit fails, the next unit directly downstream from this unit becomes the new temporary base unit. This process can continue until there are only two units left in the stack configuration. This automatic failover is a temporary safeguard only. If the stack configuration loses power, the temporary base unit does not power up as the base unit when power is restored. For this reason, you must always assign the temporary base unit as the base unit (set the Unit Select switch to Base) until the failed unit is repaired or replaced.

GBIC slots and LEDs

The Ethernet Switch 470 has two GBIC slots that can accommodate standard-sized GBICs.

Table 10 "GBICs supported by the Ethernet Switch 470" (page 54) describes the GBICs supported by the Ethernet Switch 470.

Table 10
GBICs supported by the Ethernet Switch 470

GBIC	Connector	Order number	Note
1000Base-T	RJ-45 connector	AA1419042	Copper GBIC
1000Base-SX	SC connector	AA1419001	Short wavelength/distance 550 m
1000Base-LX	SC connector	AA1419002	Long wavelength/distance 5 km
1000Base-XD	SC connector	AA1419003	Extended distance 50 km
1000Base-ZX	SC connector	AA1419004	Extended distance 70 km
1000BaseWDM	SC connector	From AA1419017 to AA1419024	1470 nm to 1610 nm (in 20 nm intervals)

Figure 12 "Ethernet Switch 470 LEDs" (page 55) shows the Ethernet Switch 470 GBIC slots and LEDs.Table 11 "Ethernet Switch 470 GBIC slot and LED descriptions" (page 55) provides a description the LEDs.

Figure 12
Ethernet Switch 470 LEDs

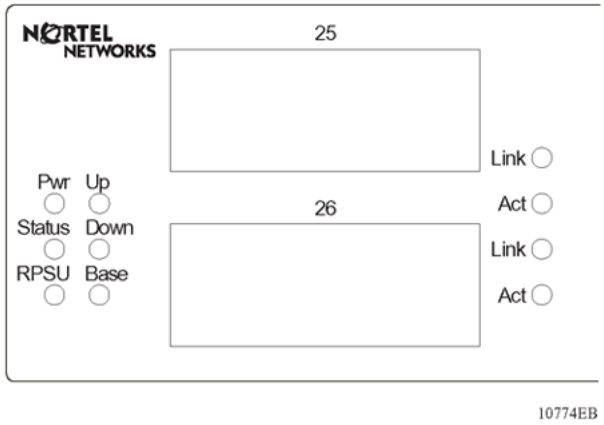


Table 11
Ethernet Switch 470 GBIC slot and LED descriptions

Label	Type	Color	State	Meaning
Link	Link status	Green	On	Valid communications link established.
			Off	The communications link connection is bad or there is no connection to this port.
			Blinking	The corresponding port is management disabled.
Activity	Port activity	Green	Blinking	Indicates network activity for the corresponding port. A high level of network activity can cause the LEDs to appear to be on continuously.

10 100 Port Connectors and LEDs

The following sections describe the 10/100 port connector LEDs on the Ethernet Switch 470.

Ethernet Switch 470 (non-PWR) LEDs

Figure 13 "Ethernet Switch 470 (non-PWR) LEDs" (page 56) shows the LEDs associated with the 10/100 port connectors in an Ethernet Switch 470 (non-PWR). Table 12 "Port LEDs on the Ethernet Switch 470 (non-PWR)" (page 56) provides descriptions of the LEDs on the Ethernet Switch 470 (non-PWR). The table describes LED operations for a switch that has completed its power-on self-tests.

Figure 13
Ethernet Switch 470 (non-PWR) LEDs

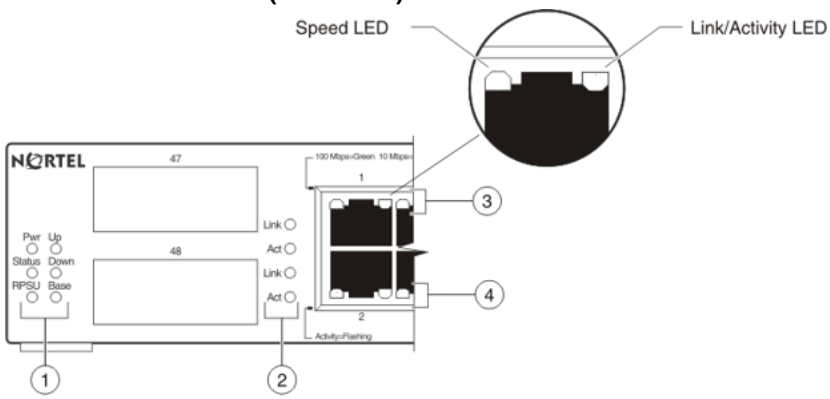
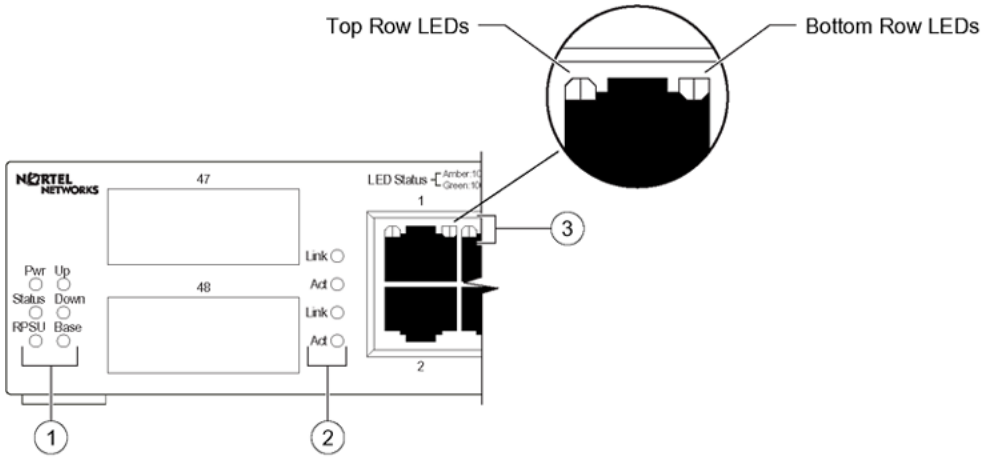


Table 12
Port LEDs on the Ethernet Switch 470 (non-PWR)

Label	Color/Status	Meaning
10/100	Green/steady	This port is set to operate at 100 Mb/s, and the link is good.
	Green blinking	This port was disabled by software.
	Amber/steady	This port is set to operate at 10 Mb/s, and the link is good.
	Amber/blinking	This port was disabled by software.
	Off	The link is bad, or nothing is connected to this port.
Activity	Green/blinking	There is activity on this port. A high level of network activity can cause the LEDs to appear to be on continuously.
	Off	There is no activity on this port.

Figure 14 "Ethernet Switch 470 (non-PWR) LEDs - previous version" (page 57) displays the LEDs on the previous version of the Ethernet Switch 470 (non-PWR), which has all port LEDs situated on the top row of ports. The LED descriptions in Table 9 "Ethernet Switch 470 switch LED descriptions" (page 52), Table 11 "Ethernet Switch 470 GBIC slot and LED descriptions" (page 55), andTable 12 "Port LEDs on the Ethernet Switch 470 (non-PWR)" (page 56) remain applicable to these switches.

Figure 14
Ethernet Switch 470 (non-PWR) LEDs - previous version



1 = Switch LEDs
2 = GBIC Port LEDs
3 = 10/100 Port LEDs

Ethernet Switch 470-PWR port LED indicators

On Ethernet Switch 470-PWR devices, the switch and GBIC LEDs operate in the same manner as those on the Ethernet Switch 470 (non-PWR) (see Table 9 "Ethernet Switch 470 switch LED descriptions" (page 52) and Table 11 "Ethernet Switch 470 GBIC slot and LED descriptions" (page 55)). However, unlike the Ethernet Switch 470 (non-PWR), the 10/100 port LEDs on the Ethernet Switch 470-PWR are used to indicate both Ethernet status (Link and Activity) as well as PoE status.

Figure 15 "Ethernet Switch 470-PWR LEDs" (page 58) displays the LEDs on the Ethernet Switch 470-PWR andTable 13 "Port LEDs on the Ethernet Switch 470-PWR" (page 58)provides detailed descriptions of these port LEDs.

Figure 15
Ethernet Switch 470-PWR LEDs

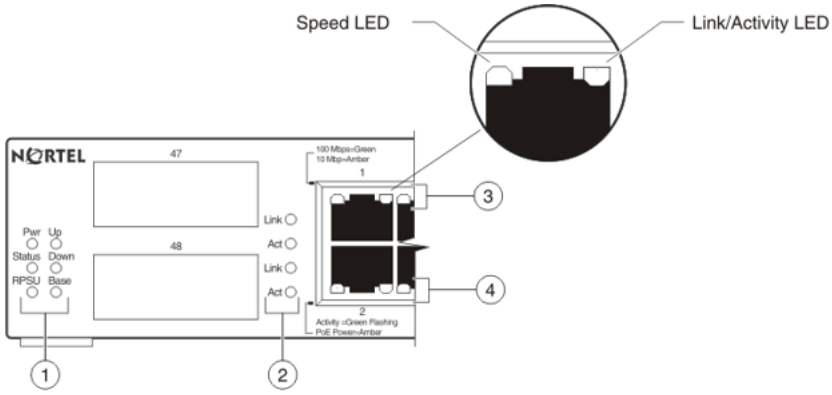


Table 13
Port LEDs on the Ethernet Switch 470-PWR

Label	Color/Status	Meaning
Speed LED	Green/steady	This port is set to operate at 100 Mb/s, and the link is good.
	Green/blinking	This port is disabled for data transmission and reception by software.
	Amber/steady	This port is set to operate at 10 Mb/s, and the link is good.
	Amber/blinking	This port is disabled for data transmission and reception by software.
	Three blinks of amber followed by green	Not enough power in the unit to provide power to this 10 Mb/s port.
	Three blinks of amber followed by green followed by an off period	Not enough power in the unit to provide power to this 10 Mb/s port, and this port is disabled for data transmission and reception by software.
	Three blinks of green followed by amber	Not enough power in the unit to provide power to this 100 Mb/s port.
	Three blinks of green followed by amber followed by an off period	Not enough power in the unit to provide power to this 100 Mb/s port, and this port is disabled for data transmission and reception by software.
	Off	The link is bad, or nothing is connected to this port.

Label	Color/Status	Meaning
Link/Activity LED	Green/steady	Not applicable.
	Green/blinking	Link activity with no PoE supplied to this port. The rate of blinking indicates the level of activity on the link.
	Amber/steady	No link activity but PoE is being supplied to this port.
	Amber/blinking	Not applicable.
	Amber and green/blinking	Link activity with PoE supplied to this port. The rate of blinking indicates the level of activity on the link.
	Off	No activity and no PoE is being supplied to the port.

Auto-MDI, MDI-X

The 10/100BASE-TX port connectors support auto-MDI/MDI-X.

Typical MDI-X ports connect over straight-through cables to the Network Interface Card (NIC) in a node or server, similar to a conventional Ethernet repeater hub. However, with the auto-MDI/MDI-X feature and autonegotiation enabled, you can still use straight-through cables while connecting to an Ethernet hub or switch. If autonegotiation is disabled on a port, the port operates as a standard MDI-X port.

Auto-polarity

The Ethernet Switch 470 supports auto-polarity. With autonegotiation enabled, auto-polarity can automatically reverse 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 is reversed due to a wiring error.

Console port

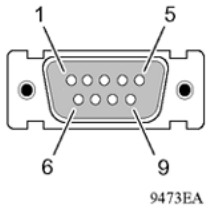
You can use the console port to access the Console Interface (CI) screens and customize your network using the supplied menus and screens.

The console port is a DB-9, RS-232-D male serial port connector.

You can use this connector to connect a management station or console/terminal to the Ethernet Switch unit by using a straight-through DB-9 to DB-9 standard serial port cable.

Table 14 "Console port description" (page 60) describes the pin-out assignments for the console port.

Table 14
Console port description

Connector	Pin number	Signal
	1	Carrier detect (not used)
	2	Transmit data (TXD)
	3	Receive data (RXD)
	4	Data terminal ready (not used)
	5	Signal ground (GND)
	6	Not used
	7	Request to send (not used)
	8	Not used
	9	Ring indicator (not used)

Note: The console port is configured as a Data Communications Equipment (DCE) connector. Ensure that your RS-232 cable pin-outs are configured for DCE connections.

The console port default settings are: 9600 baud with 8 data bits, 1 stop bit, and no parity as the communications format, with flow control set to Enabled.

Console Serial Cable

To connect the console port of the Ethernet Switch unit, use a straight-through serial cable with a DB-9 female connector for the Ethernet Switch unit, and the appropriate connector for your PC. The console/serial cable to connect from a PC with a male DB-9 serial port to the Ethernet Switch is available to order using the following information:

Description	Order number
Console cable for use with Ethernet Switch 460/470.	AL2011013

Cooling fans

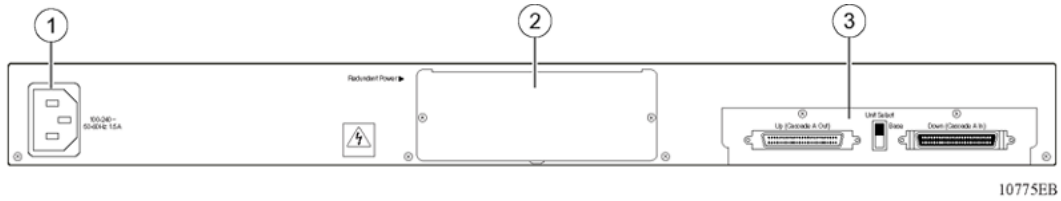
Three cooling fans are located on one side of the Ethernet Switch 470 to provide cooling for the internal components. When you install the switch, ensure you allow enough space on both sides of the switch for adequate air flow.

See *Installing the Ethernet Switch* 470 (NN47210-301) for detailed information.

Back panel

The switch back panel is shown in Figure 16 "Ethernet Switch 470 back panel" (page 61).Table 15 "Ethernet Switch 470 back-panel descriptions" (page 61) provides a description of the components of the back panel.

Figure 16
Ethernet Switch 470 back panel



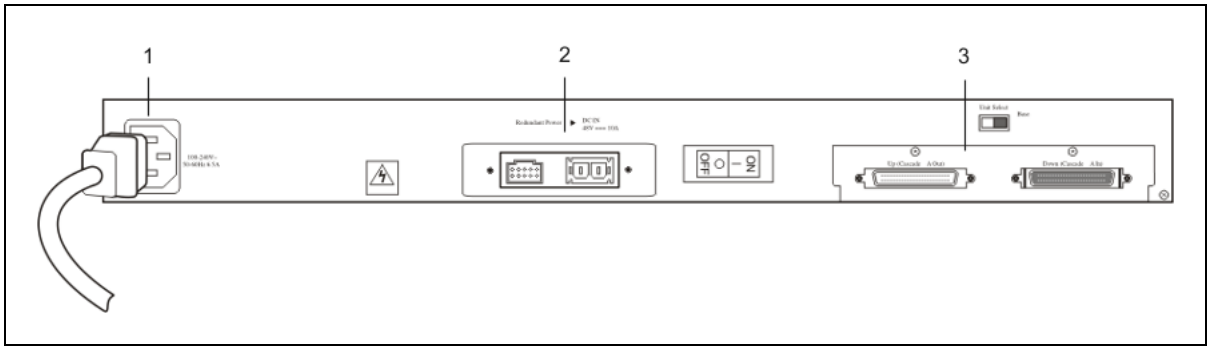


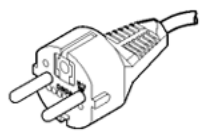
Table 15
Ethernet Switch 470 back-panel descriptions

Legend	Description
1	AC power receptacle
2	UPS/RPSU slot
3	Cascade Module connector

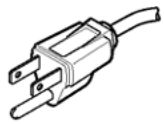
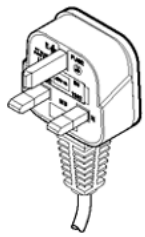
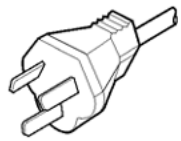
AC power receptacle

The AC power receptacle accepts a variety of AC power cords. Ensure you have the proper power cord for your region. Any cord used must have a CEE-22 standard V female connector on one end and must meet the IEC 320-030 specifications. Table 16 "International power cord specifications" (page 61) lists the specifications for international power cords.

Table 16
International power cord specifications

Country/Plug description	Specifications	Typical plug
Continental Europe: • CEE7 standard VII male plug	220 or 230 VAC 50 Hz Single phase	

228FA

Country/Plug description	Specifications	Typical plug
• Harmonized cord (HAR marking on the outside of the cord jacket to comply with the CENELEC Harmonized Document HD-21)		
U.S./Canada/Japan: • NEMA5-15P male plug • UL recognized (UL stamped on cord jacket) • CSA certified (CSA label secured to the cord)	100 or 120 VAC 50-60 Hz Single phase	 227FA
United Kingdom: • BS1363 male plug with fuse • Harmonized cord	240 VAC 50 Hz Single phase	 229FA
Australia: • AS3112-1981 Male plug	240 VAC 50 Hz Single phase	 230FA

UPS RPSU Slot for Ethernet Switch 470 (non-PWR)

The redundant power supply slot provides a space for the -48 V DC-to-DC converter. You can use the -48 V DC-to-DC converter to connect a backup power supply unit to the Ethernet Switch 470.

Nortel provides an optional redundant power supply unit (RPSU) for this purpose. The Ethernet Switch Power Supply Unit 10 (formerly known as BayStack 10) and Ethernet Routing Switch Redundant Power Supply 15 (RPS 15) are power supply units that provide uninterrupted operation to as many as four Ethernet Switch 470 units, in the event that any of the switch power supplies fail.

The Ethernet Switch Power Supply Unit 10 has a powerful, modular, redundant, and uninterruptible power supply (UPS) functionality in a single chassis. It provides scalable power redundancy and protection to your networking equipment. The modules fit into the right-hand side of the rear of the chassis. The UPS and associated battery pack module fit into the front of the chassis.

For more information about the DC-DC converter for Ethernet Switch 470 (non-PWR) units, see *Installation and Reference for the BayStack 470 100 Watt DC-DC Converter Module* (214475-A). For more information about the Power Supply Unit 10, see the *Installation and Reference for the BayStack 10 Power Supply Unit* (208296-C). For more information about the RPS 15, see *Installing the Nortel Ethernet Routing Switch Redundant Power Supply 15* (217070-A).

RPSU slot for Ethernet Switch 470-PWR

While the Ethernet Switch 470 (non-PWR) is supported by both the Power Supply Unit 10 and RPS 15 units, the Ethernet Switch 470-PWR is only supported by the RPS 15.

To provide DTE power to all 48 ports at 15.4 W per port, the Nortel Ethernet Switch 470-PWR must use power from the RPS 15. Table 17 "Available power on Ethernet Switch 470-24T-PWR and 470-48T-PWR" (page 63)describes the amount of power available to the Ethernet Switch 470-24T-PWR and 470-48T-PWR using different power configurations.

Table 17
Available power on Ethernet Switch 470-24T-PWR and 470-48T-PWR

Input power configuration	Ethernet Switch 470-24T-PWR		Ethernet Switch 470-48T-PWR	
	Max DTE power per switch	Average power per port	Max DTE power per switch	Average power per port
AC input only	370 Watts	15.4 W/port	370 Watts	7.7 W/port

Input power configuration	Ethernet Switch 470-24T-PWR		Ethernet Switch 470-48T-PWR	
	Max DTE power per switch	Average power per port	Max DTE power per switch	Average power per port
RPS 15 input only	370 Watts	15.4 W/port	370 Watts	7.7 W/port
AC + RPS 15 input, non-redundant power-sharing mode	740 Watts	15.4 W/port	740 Watts	15.4W/port

To connect to a backup power supply, the Ethernet Switch 470 (non-PWR) requires a DC-DC converter module. As a result, when you connect the switch to the RPS 15, you must use either the AA0005021 or AA0005020 DC connector cable.

However, the Ethernet Switch 470-PWR provides a built-in DC connector to connect to the power supply unit and therefore does not require the DC-DC converter module. As a result, when you connect the Ethernet Switch 470-PWR to the RPS 15, you must use the AA0005018 DC connector cable (similar to the Ethernet Routing Switch 5520 and 5530 devices).

For information about connecting an RPS 15 to a device using the AA0005018 cable, see *Installing the Nortel Ethernet Routing Switch Redundant Power Supply 15* (217070-A).

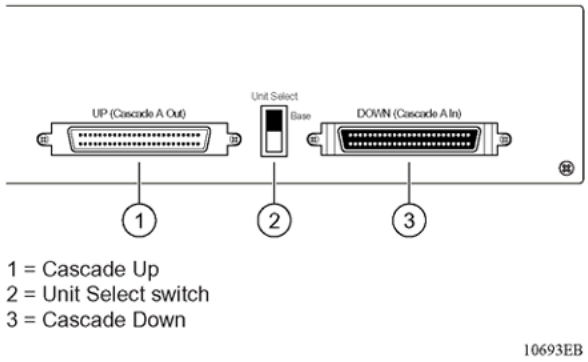
Built-in Cascade Connector

The Ethernet Switch 470 provides a fail-safe stacking environment using built-in Cascade Connectors. You can connect up to eight Ethernet Switches to provide uninterrupted connectivity for up to 384 ports. The entire stack is manageable as a single unit.

When 24 port units are being used, you can connect up to eight Ethernet Switches to provide uninterrupted connectivity for up to 192 ports.

The front panel components of the built-in Cascade Connector are shown in Figure 17 " Built-in Cascade Connector components" (page 65). Component descriptions follow the figure.

Figure 17
Built-in Cascade Connector components



UP (Cascade A Out) connector

The UP (Cascade A Out) connector provides an attachment point for connecting this unit to another unit through the cascade cable. A return cable from the Cascade A Out connector of another unit to the Cascade A In connector of this unit completes the stack connection.

Unit Select switch

The Unit Select switch (up = Base) determines the base unit for the stack configuration. The Unit Select switch status is displayed on the Ethernet Switch 470 LED display panel. When the Unit Select switch is in the Base (up) position, all other Unit Select switches in the stack configuration must be set to Off (down).

Down (Cascade A In) connector

The Down (Cascade A In) connector provides an attachment point for accepting a cascade cable connection from an adjacent unit in the stack. A return cable from the Cascade A Out connector of this unit to the Cascade A In connector of the adjacent unit completes the stack connection.

Replacement Cascade Cables

Table 18 "Replacement cascade cables" (page 65) provides the order numbers for the Replacement Cascade Cables.

Table 18
Replacement cascade cables

Description	Order number
BayStack 400-SRC Cascade Return Cable (1 meter)	AL2018001

Description	Order number
BayStack 400-SSC Spare Cascade Cable (18 inch)	AL2018002
BayStack 400-SRC Cascade Return Cable (3 meter)	AL2018004

SNMP MIB support

The Ethernet Switches 460 and 470 support an SNMP agent with industry-standard Management Information Bases (MIB), as well as private MIB extensions. This ensures compatibility with existing network management tools.

With SNMP management, you can configure SNMP traps to generate automatically on individual ports for conditions, such as an unauthorized access attempt or changes in the operating status of a port.

For more information about the supported SNMP MIBs for Ethernet Switches 460 and 470, see *Security — Configuration (NN47210-500)*.

SNMP trap support

The Ethernet Switches 460 and 470 support an SNMP agent with industry-standard SNMPv1 traps, as well as private SNMPv1 trap extensions.

For information about configuring SNMP, see *Security — Configuration (NN47210-500)*.

Supported standards and RFCs

This section lists the standards and Requests for Comments (RFC) supported by the Ethernet Switches 460 and 470.

Standards

The following IEEE Standards contain information relevant to the Ethernet Switches 460 -24T, 470-24T, and 470-48T:

- IEEE 802.1D (Standard for Spanning Tree Protocol)
- IEEE 802.3 (Ethernet)
- IEEE 802.1Q (VLAN Tagging)
- IEEE 802.1p (Prioritizing)
- IEEE 802.1w (RSTP)
- IEEE 802.1s (MSTP)

- IEEE 802.3af DRA FT (Power) for Ethernet Switches 460-24T-PWR, 470-24T-PWR and 470-48T-PWR

RFCs

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

- IanaIfType.mib (IANAifType MIB)
- RFC 1213.mib (MIB-II)
- RFC 2011.mib (IP MIB)
- RFC 2012.mib (TCP MIB)
- RFC 2013.mib (UDP MIB)
- RFC 2021.mib (RMON2 MIB)
- RFC 2576.mib (SNMP Community MIB)
- RFC 2665.mib (EtherLike MIB)
- RFC 2737.mib (Entity MIB)
- RFC 2819.mib (RMON MIB)
- RFC 2863.mib (IF MIB)
- RFC 2940.mib (COPS Client MIB)
- RFC 3289.mib (Diffserv MIB)
- RFC 3289tc.mib (Diffserv DSCP TC)
- RFC 3291.mib (INET Address MIB)
- RFC 3411.mib (SNMP Framework MIB)
- RFC 3413-tgt.mib (SNMP Target MIB)
- RFC 3413-notif.mib (SNMP Notification MIB)
- RFC 3414.mib (SNMP User-based SM MIB)
- RFC 3415.mib (SNMP View-based ACM MIB)
- RFC 3418.mib (SNMPv2 MIB)
- RFC 3621.mib (Power Ethernet MIB)
- RFC 3826.mib (SNMP USM AES MIB)

Network configuration

This section describes how to use the Ethernet Switch 460 or 470 to connect workstations, personal computers (PC), and servers to each other by connecting these devices directly to the switch, through a shared media hub connected to the switch, or by creating a virtual LAN (VLAN) through the switch.

To determine which version of the Ethernet Switch software is running, use the Console Interface (CI) menus or the Web-based management system:

- CI menus--From the main menu of the console, choose Systems Characteristics menu. The software currently running is displayed in sysDescr.
- Web-based management system--Open the System Information page, which is under Administration on the main menu. The software currently running is displayed in the sysDescription field.

Network configuration examples

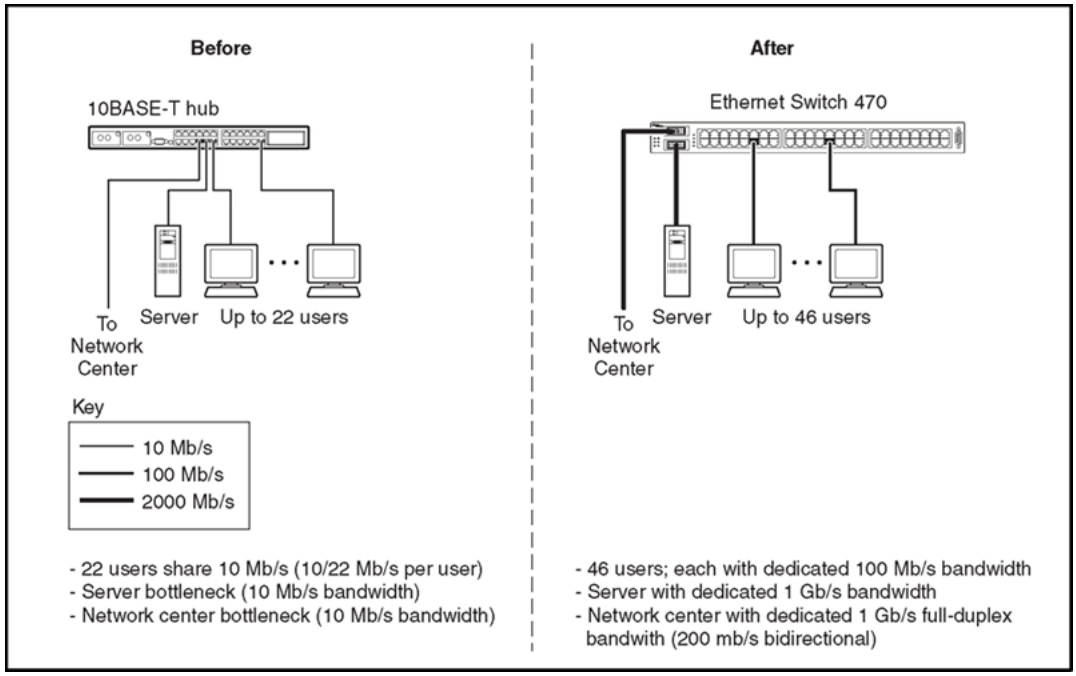
This section provides four network configuration examples using the Ethernet Switches 460 and 470. In these examples, the packet classification feature can be used to prioritize the traffic of the network to ensure uninterrupted traffic of critical applications.

- "Desktop switch application" (page 68)
- "Segment switch application" (page 69)
- "High-density switched workgroup application" (page 70)

Desktop switch application

Figure 18 "Ethernet Switch 470 used as a desktop switch" (page 69) shows an Ethernet Switch 470 used as a desktop switch, where desktop workstations are connected directly to switch ports. This configuration provides dedicated 100 Mb/s connections to the network center, the server, and as many as 46 users.

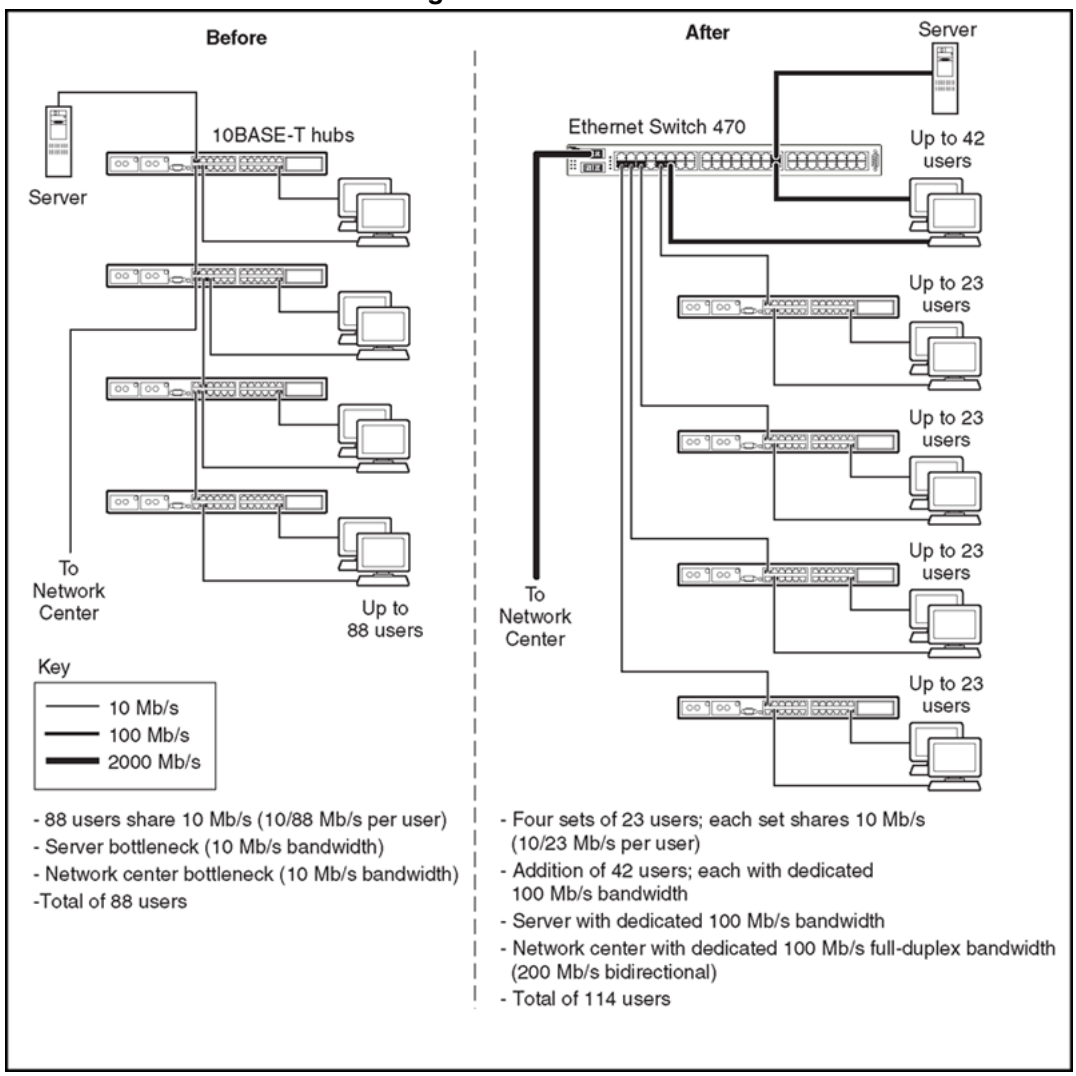
Figure 18
Ethernet Switch 470 used as a desktop switch



Segment switch application

Figure 19 "Ethernet Switch 470 used as a segment switch" (page 70) shows an Ethernet Switch 470 used as a segment switch to alleviate user contention for bandwidth, and to eliminate server and network bottlenecks. Before segmentation, 88 users had a total bandwidth of only 10 Mb/s available. After segmentation, 92 users have 40 Mb/s, four times the previous bandwidth, and 22 dedicated 100 Mb/s connections are added. This configuration can be extended to add more segments without degrading performance.

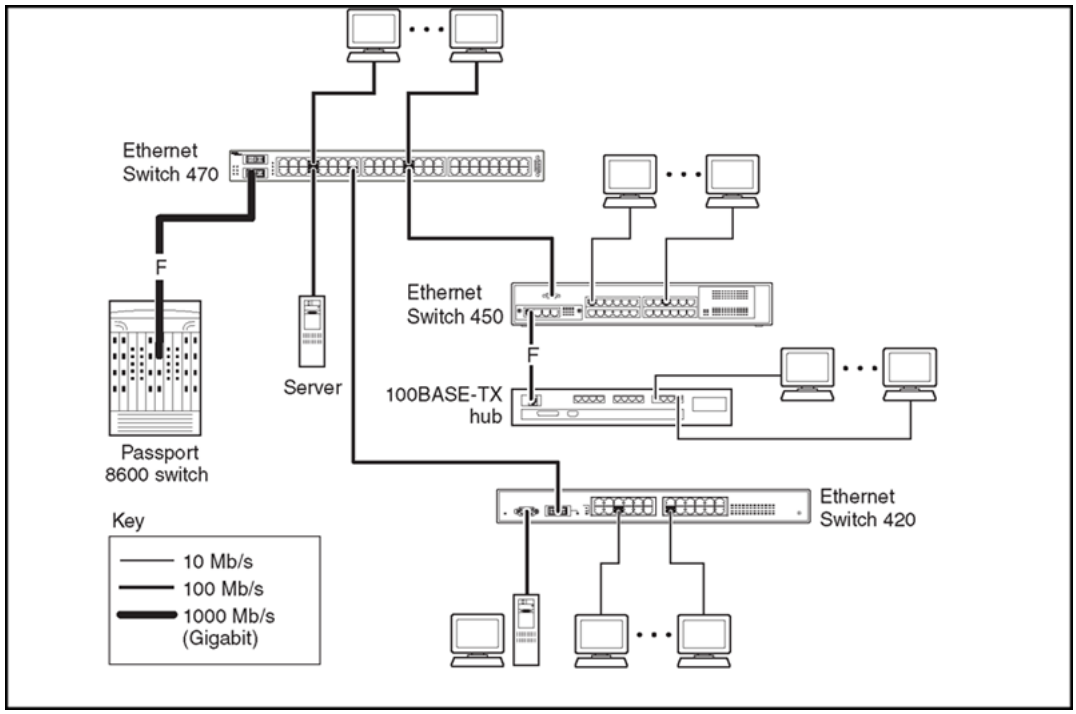
Figure 19
Ethernet Switch 470 used as a segment switch



High-density switched workgroup application

Figure 20 "Configuring power workgroups and a shared media hub" (page 71) shows an example of using an Ethernet Switch 470 with a high-speed (gigabit) connection to a Nortel Passport™ 8600 switch. Ethernet Switches 450 and 420 are also shown in this example of a high-density switched workgroup.

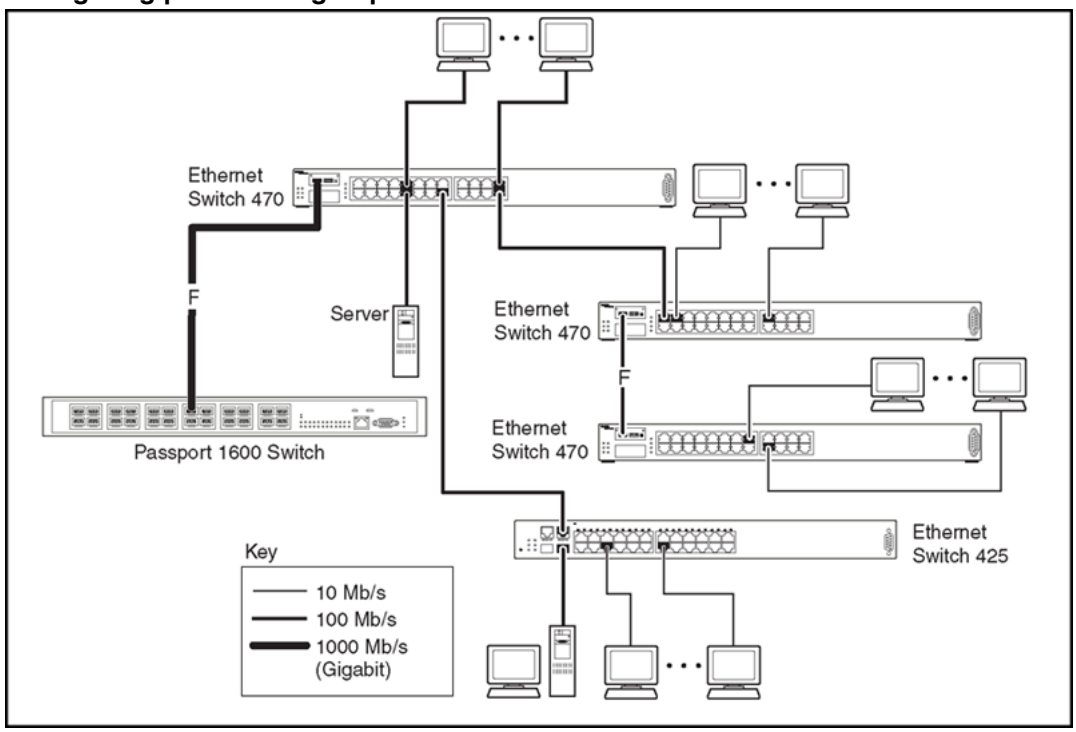
Figure 20
Configuring power workgroups and a shared media hub



As shown in Figure 21 "Configuring power workgroups and a shared media hub" (page 72), the Passport 8600 switch is used as a backbone switch, connecting to an Ethernet Switch 470 with a GBIC for maximum bandwidth. The Ethernet Switch 425 and the other Ethernet Switches 470 have 100 Mb/s connections to the first 470 and a 100 Mb/s server, as well as 10 Mb/s connections to DTE (data terminal equipment).

See the Nortel support web page www.nortel.com/support for online documentation about the Nortel Passport 8600 switch and the Passport 1600 switch, as well as the Ethernet Switches 420, 425, 450, and 470.

Figure 21
Configuring power workgroups and a shared media hub



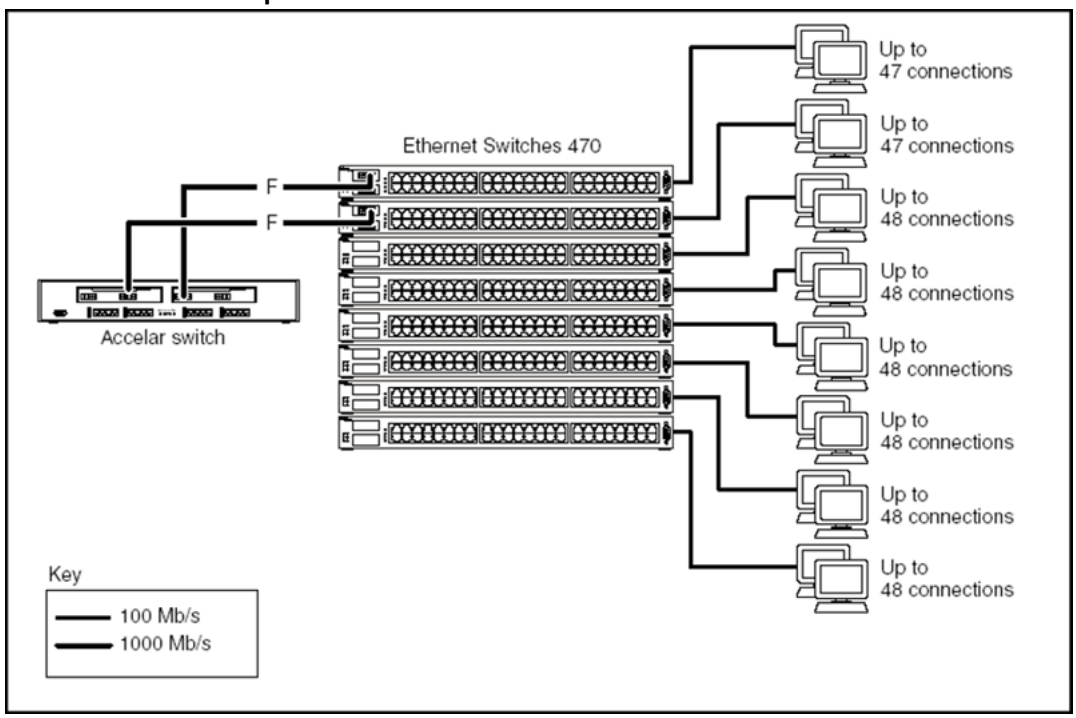
Fail-safe stack application

Figure 22 "Fail-safe stack example for Ethernet Switch 470" (page 73) shows an example of eight Ethernet Switches 470 that are stacked together as a single managed unit. If any single unit in the stack fails, the remaining stack remains operational, without interruption.

The Accelar 1100 switch is used as a backbone switch, connecting to the switches with an optional (1000BASE-SX) GBIC for maximum bandwidth.

For an overview of the fail-safe stacking feature for the Ethernet Switches 460 and 470, see Chapter 9 "Stacking ES 460 and 470 units" (page 247).

Figure 22
Fail-safe stack example for Ethernet Switch 470



Ethernet Switch stack operation

Ethernet Switches provide fail-safe stackability using built-in or optional cascade connectors. You can connect up to eight Ethernet Switches together to provide uninterrupted connectivity for 384. You can manage the entire stack of switches as a single unit.

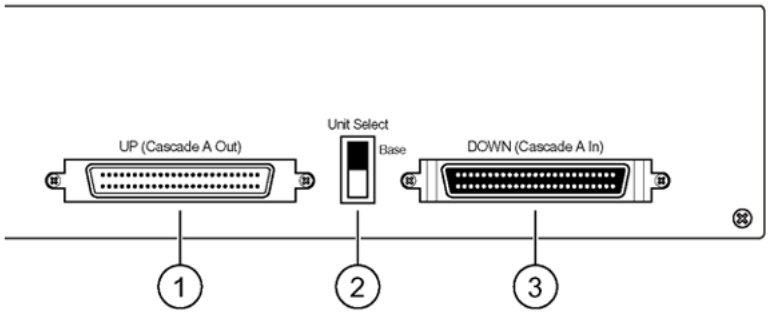
This section discusses the following stacking topics:

- "Built-in Cascade Connector" (page 73)
- "BayStack 400-ST1 Cascade Module" (page 75)
- "Base unit" (page 77)
- "Stack configurations" (page 80)
- "Redundant cascade stacking feature" (page 83)

Built-in Cascade Connector

The front panel components of the built-in Cascade Connector are shown in Figure 23 "Built-in Cascade Connector components" (page 74).

Figure 23
Built-in Cascade Connector components



1 = Cascade Up
2 = Unit Select switch
3 = Cascade Down

10693EB

Cascade A Out connector

Provides an attachment point for connecting this unit to another unit through the cascade cable. A *return* cable from the Cascade A Out connector of another unit to the Cascade A In connector of this unit completes the stack connection (see the example shown in Figure 24 "Connecting cascade cables" (page 75)).

Unit Select switch

The Unit Select switch (up = Base) determines the *base unit* for the stack configuration (see "Base unit" (page 77)). The Unit Select switch status is displayed on the Ethernet Switch LED display panel. When the Unit Select switch is in the Base (up) position, all other Unit Select switches in the stack configuration must be set to Off (down).

Cascade A In connector

Provides an attachment point for accepting a cascade cable connection from an adjacent unit in the stack. A *return* cable from the Cascade A Out connector of this unit to the Cascade A In connector of the adjacent unit completes the stack connection (see the example shown in Figure 24 "Connecting cascade cables" (page 75)).

Figure 24
Connecting cascade cables

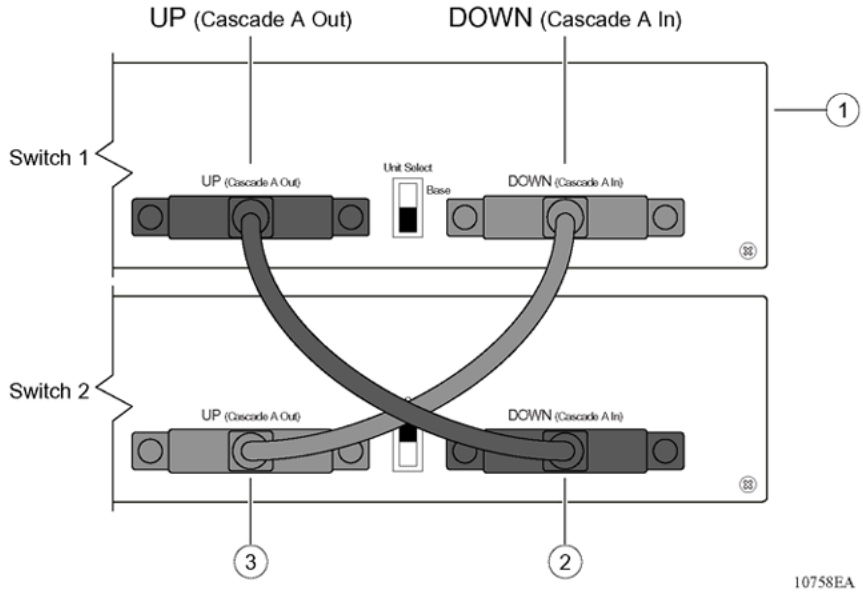


Table 19 " Connecting cascade cable" (page 75) describes legends used in the figure.

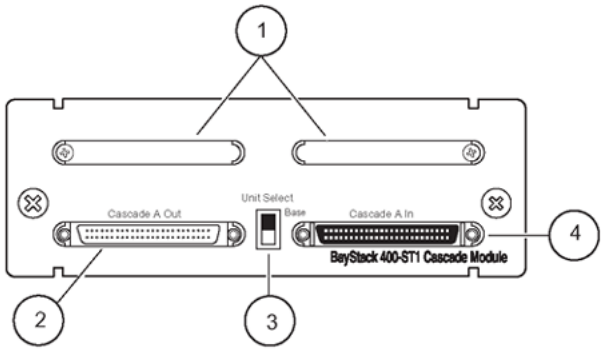
Table 19
Connecting cascade cable

Legend	Description
1	Base unit
2	AL 2018002 cascade cable
3	AL 2018002 cascade cable (used for return)

BayStack 400-ST1 Cascade Module

The front panel components of the BayStack 400-ST1 Cascade Module are shown in Figure 25 "BayStack 400-ST1 Cascade Module front panel components" (page 76). Component descriptions follow the figure.

Figure 25
BayStack 400-ST1 Cascade Module front panel components



1 = Blank connectors (unused)
2 = Cascade A Out connector
3 = Unit Select switch
4 = Cascade A In connector

BS0031B

Cascade A Out connector

Provides an attachment point for connecting this unit to another unit with the cascade cable. A *return* cable from the Cascade A Out connector of another unit to the Cascade A In connector of this unit completes the stack connection (see the example shown in Figure 26 "Connecting cascade cables" (page 77)).

Unit Select switch

The Unit Select switch (up = Base) determines the *base unit* for the stack configuration (see "Base unit" (page 77)). The Unit Select switch status is displayed on the Ethernet Switch LED display panel. When the Unit Select switch is in the Base (up) position, all other Unit Select switches in the stack configuration must be set to Off (down).

Cascade A In connector

Provides an attachment point for accepting a cascade cable connection from an adjacent unit in the stack. A *return* cable from the Cascade A Out connector of this unit to the Cascade A In connector of the adjacent unit completes the stack connection (see the example shown in Figure 26 "Connecting cascade cables" (page 77)).

Figure 26
Connecting cascade cables

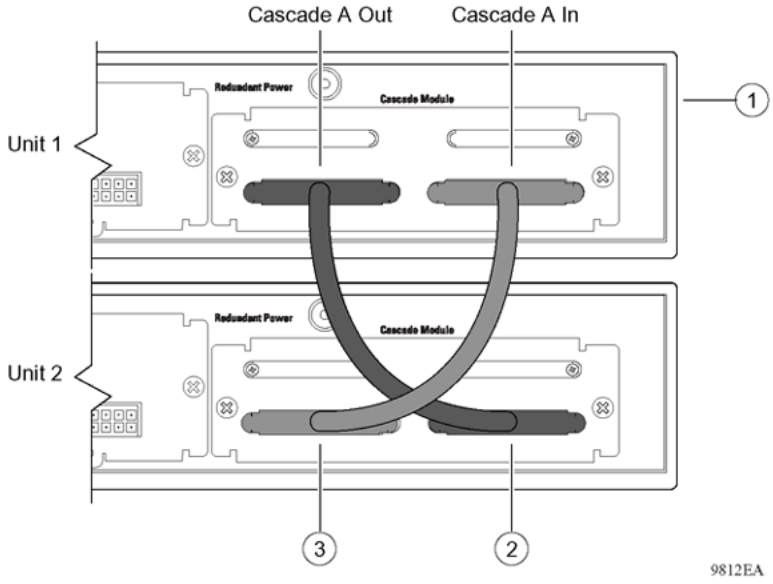


Table 20 "Connecting cascade cables" (page 77) describes the legends used in the figure.

Table 20
Connecting cascade cables

Legend	Description
1	Base unit
2	303978-A cascade cable
3	303978-A cascade cable (used for return)

Base unit

Note: For stacking three or more units (maximum 8 units per stack), order the optional 1 meter (39.27 inch) cascade max-return cable (order number AL2018001).

The base unit is the unique stack unit that you configure with the Unit Select switch on the front panel of the BayStack 400-ST1 Cascade Module. One Ethernet Switch 460 or 470 in the stack must be configured as the base unit; all other units in the stack must have their Unit Select switch set to Off. You can assign any single Ethernet Switch 460 or 470 as the base unit.

The physical ordering of all of the other units in the stack is determined by the position of the base unit within the stack. This is important for management applications that view the physical ordering of the units within the stack.

Some characteristics of the base unit are described in the following sections.

Initial installation

During the initial installation of the stack, the software automatically determines the physical order of all units in the stack according to the position of the base unit within the stack. Thereafter, the individual units maintain their original unit numbering, even if you change the position of one or more units in the stack. (see Chapter 3 "Using the Console Interface" (page 101) for information about renumbering the units using the Console Interface (CI) menus and to Chapter 15 "Administering the switch using Web-based management" (page 459) for information about renumbering the units using the Web-based management system.)

For example, when you initially power up the stack, the base unit becomes unit 1 and the unit that the base unit connects to (with the Cascade A Out cable) becomes unit 2 (and the next unit is unit 3 and so on), until the maximum stack configuration (up to 8 units) is reached. If you change the base unit to another unit in the stack, the new base unit keeps its original unit number in the stack.

Stack MAC address

When the switch is participating in a stack configuration, a stack MAC address is automatically assigned during the stack initialization. The base unit MAC address, with a software offset, is used for the stack MAC address.

For example, if the base unit's MAC address is 00-00-82-99-44-00, and the stack software offset is `1F`, the stack MAC address becomes:

00-00-82-99-44-1F

If another unit in the stack is assigned as the base unit, the MAC address of the *new* base unit (with offset) now applies to the stack configuration. The original stack IP address still applies to the new base unit.

Temporary base unit

If an assigned base unit fails, the next unit in the stack order automatically becomes the new *temporary base unit*. This change is indicated by the base LED on the temporary base unit LED display panel turning on (amber).

This automatic failover is a temporary safeguard only. If the stack configuration loses power, the temporary base unit does not power up as the base unit when power is restored. For this reason, you must always assign the temporary base unit as the base unit (set the Unit Select switch to Base) until the failed unit is repaired or replaced.

> ***Note:*** If you do not reassign the temporary base unit as the new base unit, and the temporary base unit fails, the next unit directly downstream from this unit becomes the new temporary base unit. This process can continue until there are only two units left in the stack configuration.

Identify Unit Numbers

When you choose Identify Unit Numbers from the main menu, the console returns the message:

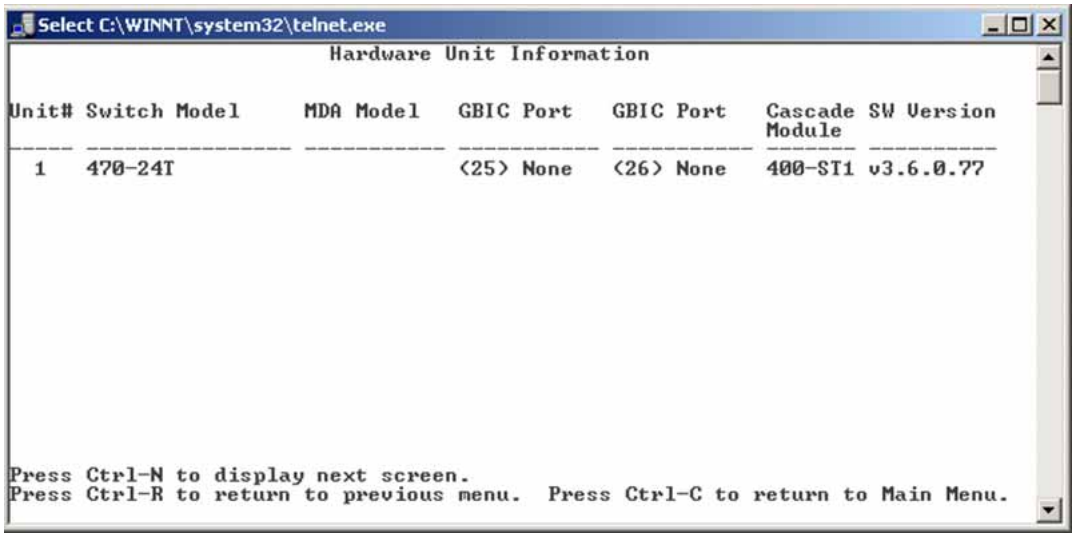
`Port LEDs lit on the front panel of the switch correspond to` its unit number.

Hardware Unit Information screen

The Hardware Unit Information screen (Figure 27 "Hardware unit information screen" (page 79)) lists the switch models. In addition, this screen displays the software version running on the hardware. To open the Hardware Unit Information screen:

- Choose Display Hardware Units (or press h) from the main menu.

Figure 27
Hardware unit information screen



Removing a unit from the stack

If a unit is removed from the stack (therefore operating in stand-alone mode), the following switch configuration settings revert back to the settings configured before the unit became a member of the stack:

- IP address
- Password: console, Web, Telnet, SNMP (including Device Manager)
- Stack operational mode
- SNMP community strings

Stack configurations

As shown in Figure 28 "Stack up configuration example" (page 81), the cascade connectors and cables on the BayStack 400-ST1 Cascade Module front panel provide the ability to stack up to 8 switches. With BPS-2000 MDAs installed in each switch, the stack can accommodate a maximum of 224 switch ports.

Because stack parameters are associated with the base unit (see "Base unit" (page 77)), the physical stack order depends on the base unit's position and whether the stack is configured *stack up* or *stack down*.

Stack up configurations

In Figure 28 "Stack up configuration example" (page 81), data flows from the base unit (unit 1) to the next switch, which is assigned as unit 2, and continues until the last switch in the stack is assigned as unit 8. The physical order of the switches is *from bottom to top* (unit 1 to unit 8).

Figure 28
Stack up configuration example

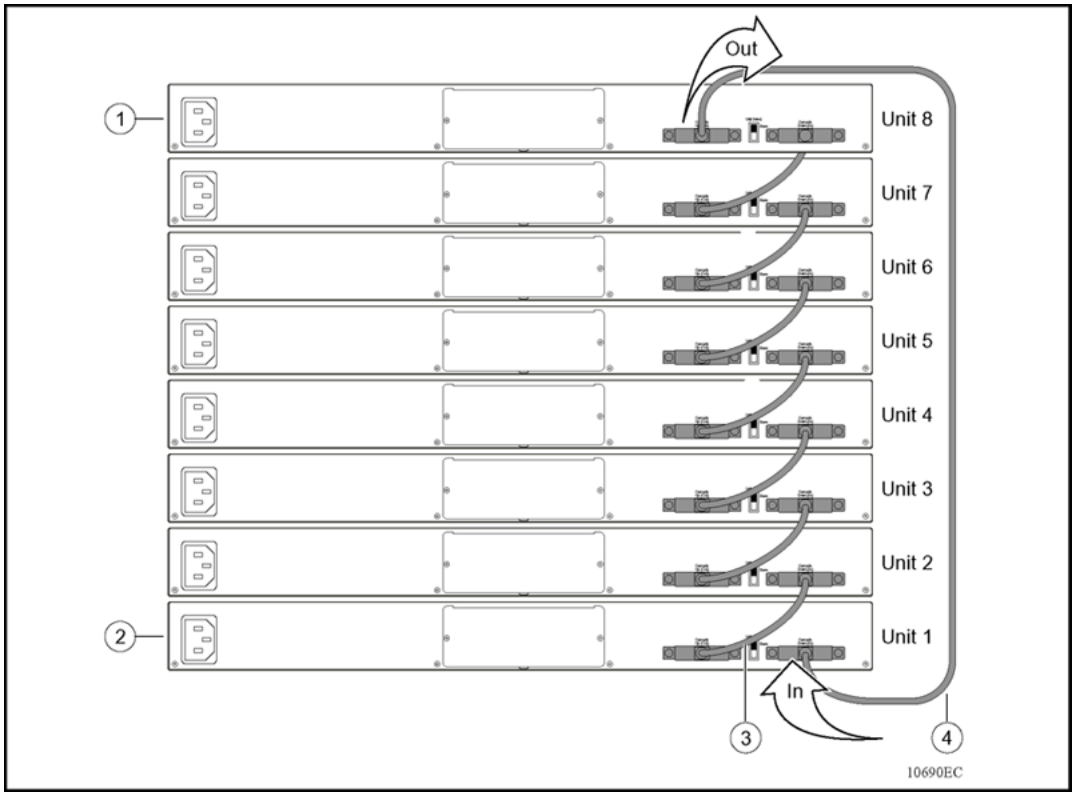


Table 21 " Stack up configuration description" (page 81) describes the stack up configuration illustration references.

Table 21
Stack up configuration description

1	Last unit
2	Base unit
3	Cascade Cable (AL2018001 - 1 foot) Cascade Cable (AL2018002 - 18 inches) - Not shown
4	Cascade Cable (AL2018004 - 3 meters)

Stack down configurations

In Figure 29 "Stack down configuration example" (page 82), data flows from the base unit (unit 1) to the next switch, which is assigned as unit 2, and continues until the last switch in the stack is assigned as unit 8. The physical order of the switches is *from top to bottom* (unit 1 to unit 8).

Figure 29
Stack down configuration example

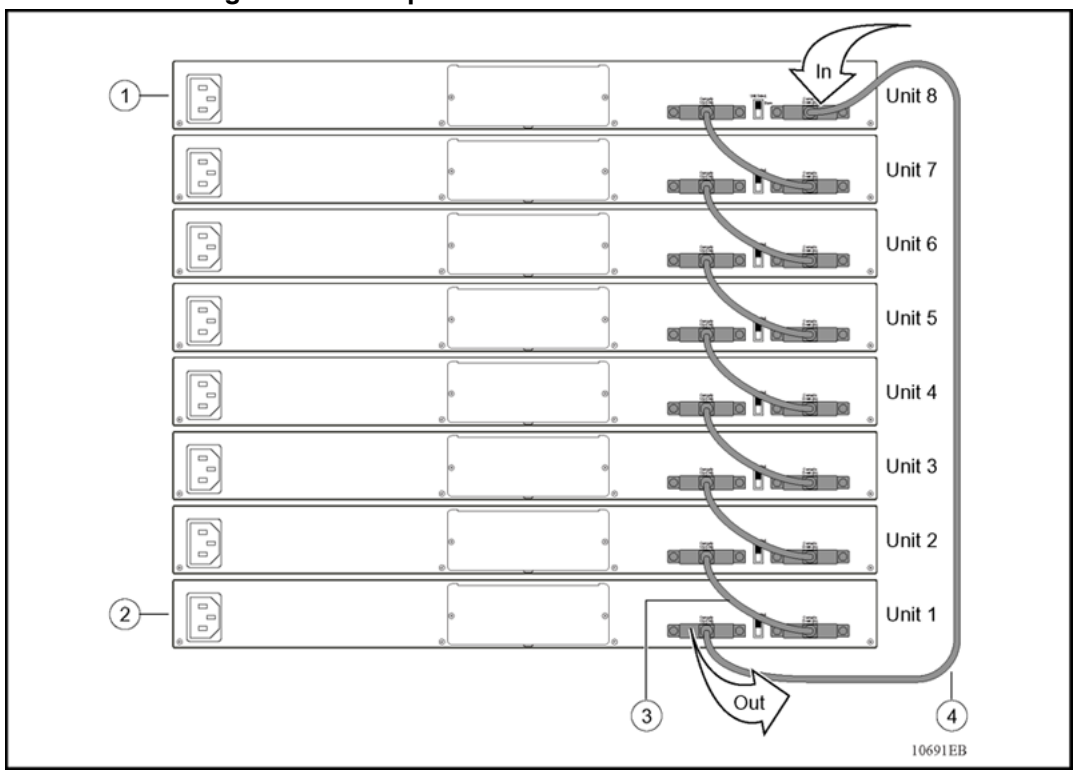


Table 22 "Stack down configuration description" (page 82) describes the stack down configuration illustration references.

Table 22
Stack down configuration description

1	Base unit
2	Last unit
3	Cascade cable (part number 303978-A)
4	Cascade max-return cable (part number 303979-A)

Certain Network Management Station (NMS) applications assume a stack down configuration for the graphical user interface (GUI) that represents the stack (see Figure 29 "Stack down configuration example" (page 82)).

Note: For this reason, Nortel recommends that you always configure the top unit in the stack as the base unit.

In any stack configuration, the following applies:

- You can access and manage the stack using a Telnet connection, the Web-based management interface, or any generic SNMP management tool through any switch port that is part of the stack configuration.
- When stacking three or more switches, use the longer (1-meter) cascade max-return cable (part number 303979-A) to complete the link from the last unit in the stack to the base unit.

Redundant cascade stacking feature

Ethernet Switches 460 and 470 allow you to connect up to eight units into a redundant cascade stack. If any single unit fails or if a cable is accidently disconnected, other units in the stack remain operational, without interruption.

Figure 30 "Redundant cascade stacking feature" (page 84) shows an example of how a stack configuration reacts to a failed or powered-down unit in the stack configuration:

Step	Action
1	As shown in Figure 30 "Redundant cascade stacking feature" (page 84), unit 3 becomes non-operational. This result can be due to a failed unit or simply because the unit was powered down.
2	Unit 2 and unit 4, directly upstream and downstream from unit 3, sense the loss of link signals from unit 3. a. Units 2 and 4 automatically loop their internal stack signals (A and B). b. The Cas Up LED for unit 2 and the Cas Dwn LED for unit 4 turn on (amber) to indicate that the stack signals are looped.
3	The remaining stack units remain connected.
	—End—

Although the example shown in Figure 30 "Redundant cascade stacking feature" (page 84) shows a failed unit causing the stack to loop signals at the points of failure (A and B), the system reacts the same way if a cable is removed.

Figure 30
Redundant cascade stacking feature

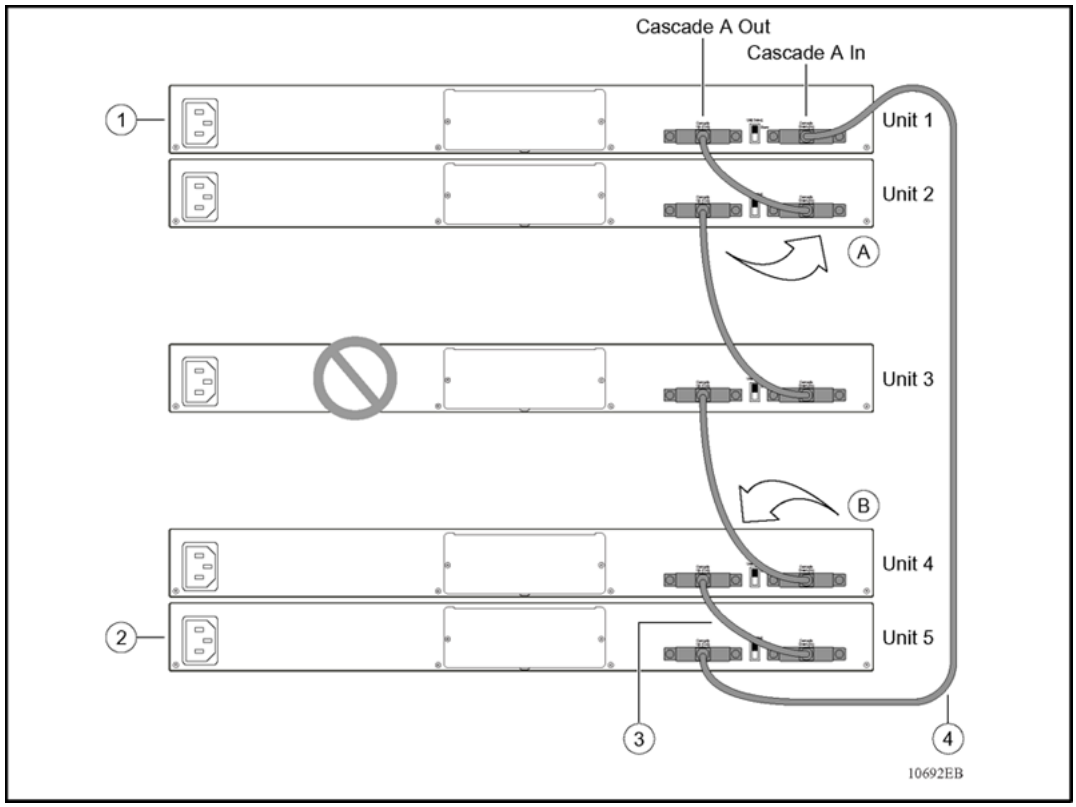


Table 23 " Redundant cascade stacking descriptions" (page 84) describes the redundant cascade stacking illustration references.

Table 23
Redundant cascade stacking descriptions

Legend	Description
1	Base unit
2	Last unit
3	Cascade cable (AL 2018002 - 18 inches)
4	Cascade max-return cable (AL 2018004 - 3 meters)

Faulty unit and cable detection

The stack manager can detect the scenario whereby a unit appears good to its neighboring units (its up and downstream clocks are good), but the data packets it transmits or receives are corrupted or missing. In such a scenario, the stack falls apart and the ring check does not succeed.

This triggers the "Ring Discovery" algorithm whereby units are polled both downstream and upstream individually to isolate the point of failure. When the failure is isolated, the bad unit or cables are wrapped out.

In the case where a cable has bad data pins, the stack ports where the cable is connected are wrapped out. On a unit that has its IN port connected to the bad cable, the system log shows "IN stack port wrapped; check for bad cable or unit" and its downstream LED stays amber.

Similarly, on the unit that has its OUT port connected to the bad cable, the system log shows "OUT stack port wrapped; check for bad cable or unit" and its upstream LED stays amber. When replacing a bad cable with a good one, at least one unit must be rebooted so that the stack manager on the base unit detects a unit coming in and re-runs the stack.

Accessing the system through text-based interfaces

This section describes the following topics:

- "Configuring the Console Port" (page 85)
- "Telnet Access" (page 92)
- "Using remote logging" (page 94)
- "Configuring terminal emulation software" (page 94)

Configuring the Console Port

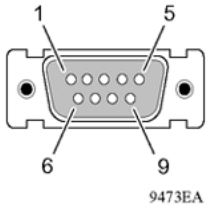
The console or the serial port provides a physical-layer connection by using the standard RS-232 protocol to connect the Ethernet Switch unit to a terminal or Personal Computer (PC). With a connection through the console port, the network manager can gain access to the Console Interface (CI) and Command Line Interface (CLI).

The console port is a DB-9, RS-232-D male serial port connector. You can use this serial port to connect a management station or terminal to the Ethernet Switch unit by using a straight-through DB-9 to DB-9 standard serial port cable.

see Table 24 " Console Port Pin-outs" (page 85) for the pin-out assignments for the console port.

Table 24
Console Port Pin-outs

Connector	Pin number	Signal
	1	Carrier detect (not used)

Connector	Pin number	Signal
	2	Transmit data (TXD)
	3	Receive data (RXD)
	4	Data terminal ready (not used)
	5	Signal ground (GND)
	6	Not used
	7	Request to send (not used)
	8	Not used
	9	Ring indicator (not used)

Note: The console port is configured as a data communications equipment (DCE) connector. Ensure that your RS-232 cable pin-outs are configured for DCE connections.

Console port serial cable requirements

To connect the console port of the Ethernet Switch unit, use a straight-through serial cable with a DB-9 female connector for the Ethernet Switch unit, and the appropriate connector for your PC. The console/serial cable to connect from a PC with a male DB-9 serial port to the Ethernet Switch is available to order using the following information:

Table 25
Console cable ordering information

Description	Order number
Console cable for use with Ethernet Switch 460/470.	AL2011013

Default port configuration settings

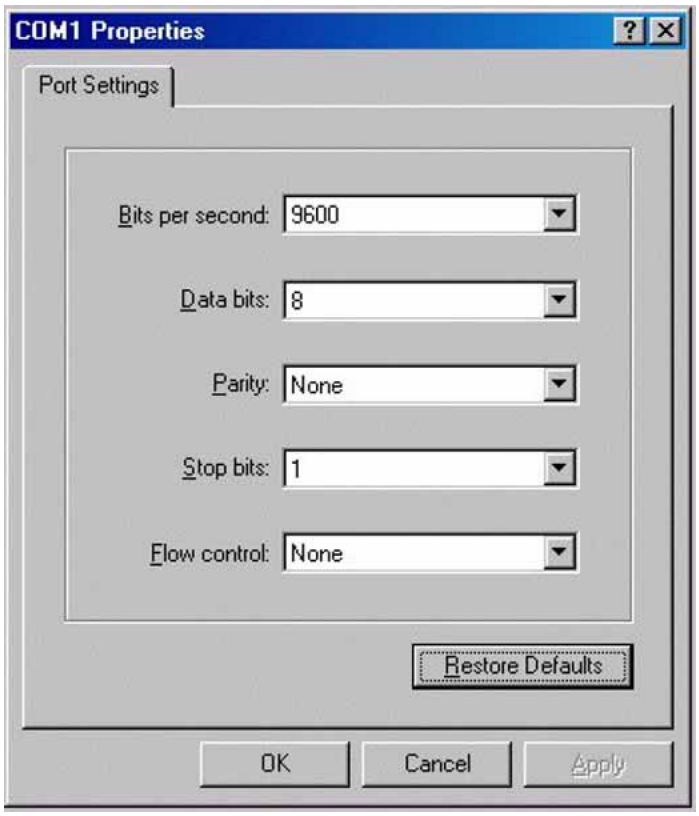
To utilize the serial port, you must have a terminal or PC with terminal emulation software attached to the console port. The default communications settings for the console port are as follows (see Figure 31 "HyperTerminal communication port settings" (page 87)):

- 8 Data Bits
- 1 Stop Bit
- No Parity
- 9600 BPS
- No flow control

While there is no need to set the flow control on the terminal, the text-based interfaces react to the XOFF (CTRL-S) and XON (CTRL-Q) characters. Pressing the XOFF character causes the Ethernet Switch unit to stop sending data to the connected terminal or PC.

Pressing the XON character signals the switch to send characters to the connected device. Pressing XON causes the switch to immediately send characters that are stored in the output buffer, and to resume normal operation.

Figure 31
HyperTerminal communication port settings



Configuring the console port using the user interface

The Console Port Speed parameter is the only console port setting that the network manager can configure. All other console port configuration parameters are fixed and cannot be changed by the user.

Table 26 " Console port parameters interface support matrix" (page 88) indicates whether the user has read (r), read-write (rw), or no access to the parameters through the listed user interface.

Table 26
Console port parameters interface support matrix

Parameter	Default	Menu Interface	CLI	Web	Device Manager
Speed / Bits per second	9600	rw	rw	rw	no
Data bits	8	r	no	r	no
Parity	1	r	no	r	no
Stop bits	None	r	no	r	no
Flow Control	Xon/Xoff	no	no	no	no

Configuring the console port using the Console Interface

You can use the Console/Comm Port Configuration screen, shown in Figure 32 "Console/Comm Port Configuration screen" (page 89), to configure and modify the console port parameters and security features of a switch.

To open the Console/Comm Port Configuration screen, choose Console/Comm Port Configuration from the main menu, or press "o" on the keyboard.

Figure 32
Console/Comm Port Configuration screen

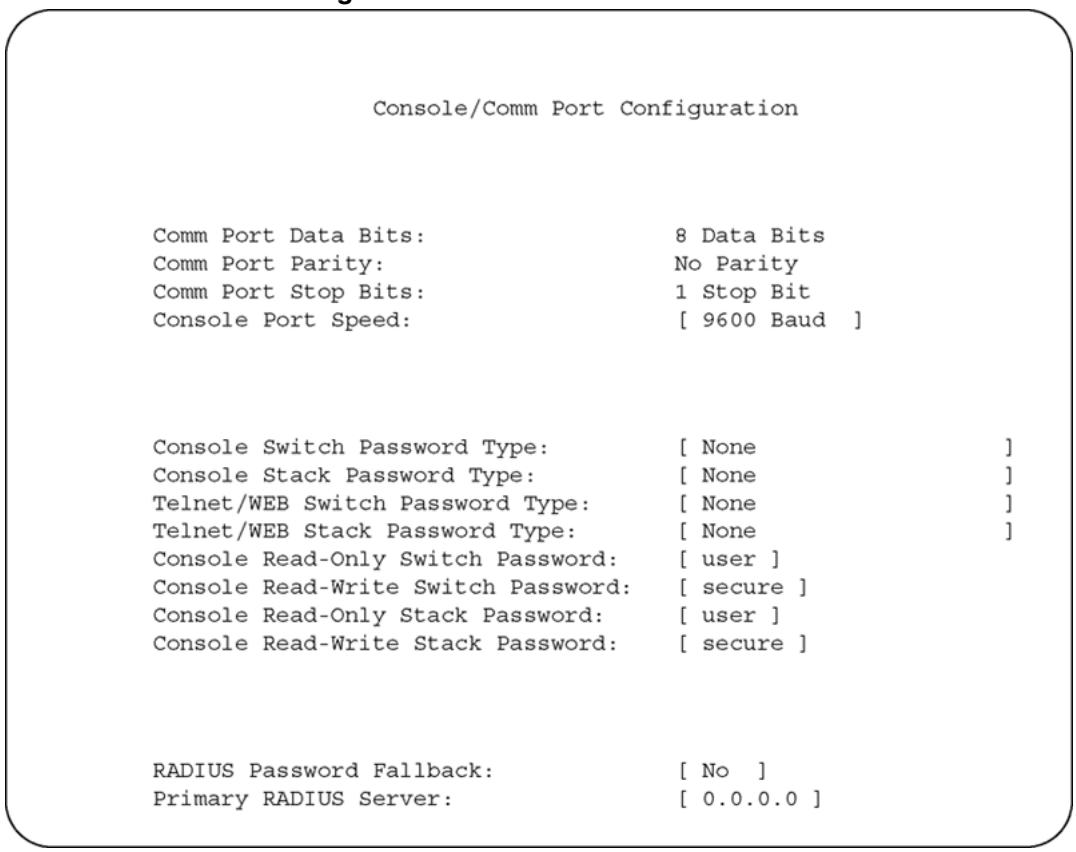


Table 27 " Console/Comm Port Configuration parameters" (page 89) describes the Console/Comm Port Configuration screen fields.

Table 27
Console/Comm Port Configuration parameters

Field	Description
Comm Port Data Bits	A read-only field that indicates the current console/comm port data bit setting.
Comm Port Parity	A read-only field that indicates the current console/comm port parity setting.
Comm Port Stop Bits	A read-only field that indicates the current console/comm port stop bit setting.

<table>
<tr><th>Field</th><th>Description</th></tr>
<tr><td>Console Port Speed</td><td>You can set the console/comm port baud rate to match the baud rate of the console terminal.

Default value: 9600 Baud

Range: 2400 Baud, 4800 Baud, 9600 Baud, 19200 Baud, 38400 Baud</td></tr>
<tr><td></td><td> 
CAUTION
If you choose a baud rate that does not match your console terminal baud rate, you lose communication with the configuration interface when you press [Enter]. If communication is lost, set your console terminal to match the new service port setting.</td></tr>
<tr><td></td><td>ATTENTION
Bei Auswahl einer Baud rate, die nicht mit der Baudrate des Konsolenterminals übereinstimmt, geht die Kommunikation mit der Konsolenschnittstelle verloren, wenn Sie die Eingabetaste drücken. Stellen Sie in diesem Fall das Konsolenterminal so ein, daß es mit der neuen Einstellung der Service-Schnittstelle übereinstimmt.</td></tr>
<tr><td></td><td>ATTENTION
Si vous sélectionnez un débit différent de celui de votre terminal, vous perdrez le contact avec l’interface de votre console dès que vous appuierez sur [Entrée]. Pour restaurer la communication, alignez le débit de votre terminal sur le nouveau débit de votre port de service.</td></tr>
<tr><td></td><td>ATTENTION
Si selecciona una velocidad de transmisión que no coincide con la velocidad de transmisión del terminal de la consola, perderá la comunicación con el interfaz de la consola al pulsar [Intro]. Si se pierde la comunicación, ajuste el terminal de la consola para que coincida con el nuevo valor del puerto de servicio.</td></tr>
</table>

Field	Description
	ATTENTION Nel caso in cui si scelga una velocità di trasmissione non corrispondente a quella del terminale della console, la comunicazione con l'interfaccia della console cadrà premendo il tasto [Invio]. Se la comunicazione cade, impostare il terminale della console in modo tale che corrisponda alla nuova impostazione della porta di servizio.
	 注意: コンソール・ターミナルのボー・レートに合っていないボー・レートを選択すると、[Enter]を押したときに、コンソール・インタフェイスとの通信が途切れてしまいます。この場合には、新しいサービス・ポート設定に合うようにコンソール・ターミナルを設定してください。

Troubleshooting

If you encounter any problems while connecting to the serial port of the device, execute the following steps:

- Check that the Ethernet Switch unit is turned on.
- Check that you are using the correct communications port on your device.
- Check that all cables are tightly connected and that you are using the appropriate straight-through cable.
- Check that your communications software is set up according to the recommended configuration outlined in "Default port configuration settings" (page 86): 8 Data Bits, 1 Stop Bit, No Parity, 9600 bps, No flow control.
- Verify the speed of the port by connecting to the device through a Telnet connection and navigating to the appropriate screen.
- Change the speed setting on the port to match the setting of the serial port on the Ethernet Switch unit. Possible values include: 2400, 4800, 9600, 19200, 38400.
- Verify the integrity of the cable by using it to connect to another device or by checking it with a the receptacle into which you plug.
- Depress the XON (CTRL-Q) key in case you inadvertently suspended operation of the console port by depressing the XOFF (CTRL-S) key.

Usage guidelines

To prevent unauthorized access, ensure that:

- The device connected to the console port is logged out of the system when not in use.
- The console port is configured as a data communications equipment (DCE) connector. Ensure that your RS-232 cable pin-outs are configured appropriately.

Telnet Access

The Ethernet Switch unit provides in-band management access through the Telnet protocol. By default, Telnet access is enabled. The unit allows TCP connections on port 23.

Telnet client support

You can use the Telnet client to Telnet to a host or UNIX machine. One Telnet client session at a time is supported.

Telnet command

With the `telnet` command, you can establish a Telnet session to a remote system using either the system IP address or host name.

Managing Telnet Access

You can use the Ethernet Switch unit to customize Telnet access to the device. The parameters that you can control are:

- Login Timeout
- Login Retries
- Inactivity Timeout
- Event Logging
- Access Control List

IP manager list

You can limit access to the management features of the Ethernet Switch unit by defining the IP addresses that are allowed access to the switch.

The features provided by the IP manager list are:

- Definitions of up to 50 IP addresses and masks that are allowed
- Options to enable or disable access for Telnet, SNMP, and the Web-based management system

Configuring user interface support for Telnet Access using the IP Manager

The IP manager Telnet Access configuration parameters are available through a number of interfaces.

Table 28 "Configuring user Interface support for Telnet access" (page 93) indicates whether the user has read (r), read-write (rw), or no access to the parameter through the listed interface.

Table 28
Configuring user Interface support for Telnet access

Parameter	Default	Menu Interface	CLI	Web	Device Manager
Access	Enabled	rw	rw	rw	no
Event Logging	All	rw	rw	no	no
Inactivity Timeout	15 minutes	rw	rw	no	no
Login Retries	3	rw	rw	no	no
Login Timeout	1 minute	rw	rw	no	no
Use Access Control List	Yes	rw	rw	rw	no

For more information about configuring the IP manager list, see *Security — Configuration (NN47210-500)*.

Troubleshooting

If you encounter any problems while accessing the Ethernet Switch unit through the Telnet protocol, do the following to diagnose the problem:

- Check that you are targeting the correct IP address and that your Telnet program is configured to target TCP port 23.
- Check that the IP address, subnet mask, and default gateway parameters are correctly configured on the Ethernet Switch unit and the management station.
- Ping the target device to ensure your management workstation can reach it.
- Eliminate all Telnet access restrictions to minimize complexity.
- Check that Telnet access is enabled on the Ethernet Switch unit.
- Ensure that the IP address of the management station is allowed to Telnet to the device.

Usage Guidelines

Refer to the following guidelines when configuring Telnet access on the Ethernet Switch unit.

- The Console Interface, CLI, and Web-based interface support up to 50 IP Address/Mask combinations.
- When Telnet access is disabled, the unit allows devices to connect to port 23, and immediately resets the connection.
- If your network uses dynamic IP addresses, it can be better to define a range of IP addresses that are allowed to access the unit instead of defining specific IP addresses.

Using remote logging

The remote logging feature provides an enhanced level of logging by replicating system messages onto a syslog server. System log messages from several switches can be collected at a central location, eliminating the need for the network manager to query each switch individually to interrogate the log files.

You must configure the remote syslog server and set up the unit to log informational messages to this remote server. The UDP packet is sent to port 514 of the configured remote syslog server.

When the IP address is in the system, you can send the syslog messages to the remote syslog server. If a syslog message is generated prior to capturing the IP address of the server, the system stores up to ten messages that are sent after the IP address of the remote server is on the system.

You can configure this feature by:

- enabling remote logging
- specifying the IP address of the remote syslog server
- specifying the severity level of the messages that you want to send to the remote server

For details, see *Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*.

Configuring terminal emulation software

If you are using a PC, you must have terminal emulation software that can send, receive, and interpret the screen formatting and cursor control commands required by the Console Interface and CLI.

The terminal emulation software is required if you are connecting to the device through the serial port or through a Telnet connection.

Set your terminal emulation parameters as follows:

- VT100 Arrows

- VT100 Terminal Emulation
- Backspace set to Del

Other optional terminal emulation configuration parameters are useful. This includes adding a line delay of 1 second, when sending an ASCII text file to the switch through the terminal emulator, and marking the option to "Wrap lines that exceed the terminal width" (see Figure 33 "HyperTerminal ASCII setup configuration panel" (page 95)).

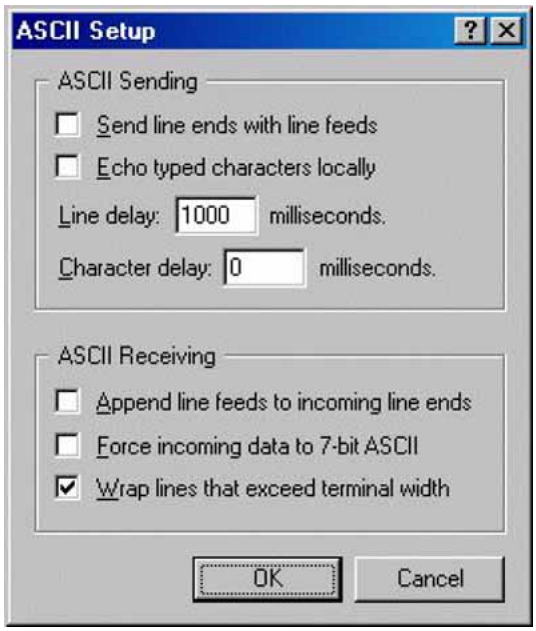
Line Delay

Some CLI commands allow you to make extensive configuration changes with only one command. The system can take some time to execute these commands; so, if you are going to paste a series of commands to the device as an ASCII text file through the terminal emulator, you can be forced to delay between each command in order for the system to process the commands. Note that this restriction does not exist if you use the built-in ASCII Configuration Download feature.

Wrapping lines that exceed terminal width

Some of the output -- particularly from the system log -- can exceed the width of your terminal screen. To see all the text sent to the display device when this condition occurs, you can configure the terminal emulator to automatically wrap the text to the next line by enabling the **Wrap lines that exceed terminal width** option.

Figure 33
HyperTerminal ASCII setup configuration panel



Management Interface Support

The Nortel Ethernet Switches that are shipped directly from the factory are ready to operate in any 10BASE-T or 100BASE-TX standard network.

Before you start working on any switch, you must assign an IP address to the switch. You can set the address by using the console port or BootP, which resides on the switch. You can manage the switch using one of the following network management tools and interfaces:

- "Console Interface" (page 96)
- "Web-based management" (page 96)
- "Device Manager" (page 96)
- "Command Line Interface (CLI)" (page 97)
- "Simple Network Management Protocol" (page 97)
- "Other" (page 97)

Console Interface

You can use the Console Interface (CI) to configure and manage the switch locally or remotely.

You can access the CI menu and screens in one of the following methods:

- locally through a console terminal attached to your switch
- remotely through a dial-up modem connection
- in-band through a Telnet session

For information about the Console Interface, see Chapter 3 "Using the Console Interface" (page 101).

Web-based management

You can manage the network from the Web-based Graphical User Interface (GUI) through an HTML-based browser located on your network.

You can use the GUI to configure, monitor, and maintain your network through Web browsers. You can also download software by using the Web-based management interface.

For information about Web-based management, see Chapter 6 "Using the Web-based management interface" (page 191).

Device Manager

The Device Manager is a set of Java-based graphical network management applications used to configure and manage the Ethernet Switch 460/470.

For more information about the Device Manager, see Chapter 5 "Installing and using Device Manager software" (page 147).

Command Line Interface (CLI)

The CLI is used to automate general management and configuration of the Ethernet Switch. Use the CLI through a Telnet connection or through the serial port on the console.

For more information about the CLI commands, see Chapter 4 "CLI Basics" (page 123).

SSH

Secure Shell (SSH) is a client/server protocol that can provide a secure remote login with encryption of data, user name, and password. For details on SSH connections, see *Security — Configuration (NN47210-500)*.

Simple Network Management Protocol

You can use any generic Simple Network Management Protocol (SNMP)-based network management software to configure and manage an Ethernet Switch unit.

Other

You can also interact with Ethernet Switches using the Nortel Enterprise Policy Manager (formerly Optivity Policy Services).

Link Layer Discovery Protocol (IEEE 802.1AB) Overview

Release 3.7 software supports the Link Layer Discovery Protocol (LLDP) (IEEE 802.1AB), which stations connected to a LAN can use 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:

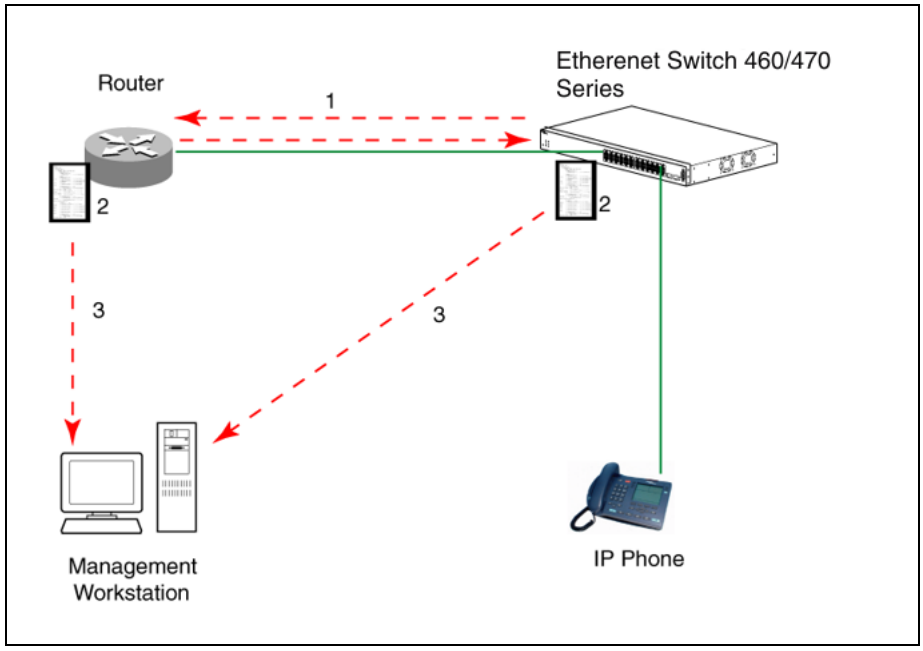
- advertises connectivity and management information about the local station to adjacent stations on the same 802 LAN (802.3 Ethernet with 5500 Series)
- receives network management information from adjacent stations on the same LAN

LLDP can also 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).

Figure 34 "LLDP configuration overview" (page 98) shows an example of how LLDP works in a network.

Figure 34
LLDP configuration overview



1. The Ethernet Switch and LLDP-enabled router advertise chassis and port IDs and system descriptions 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, to receive only, or to both transmit and receive LLDP information. You can configure the state for LLDP reception and transmission using SNMP or CLI 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 the TTL field of the 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 3.7 software supports the basic management TLV set. You can specify which of these optional TLVs to include in the transmitted LLDPDUs for each port.

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 the enabled capabilities, such as end station, bridge, or router)
- Management Address TLV

Transmitting 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.

LLDPDUs are regularly transmitted at a user-configurable transmit interval (tx-interval) or when any of the variables contained in the LLPDU are 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 MIB of the LLDP remote system 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 the network management system.

Chapter 3
Using the Console Interface

You can manage the switch with the following tools:

- Java Device Manager (JDM)
- Web-based management system
- Command Line Interface (CLI)
- Console Interface (CI) menus

For more information about using the JDM, see Chapter 5 "Installing and using Device Manager software" (page 147).

For more information about using the Web-based management system, see Chapter 6 "Using the Web-based management interface" (page 191).

For more information about using the CLI menus, see Chapter 4 "CLI Basics" (page 123).

For information about SNMP, see your network management documentation.

This chapter describes how to configure and manage the Ethernet Switch 460/470 using the menu-driven Console Interface (CI).

> ***Note:*** When you power up or reset the switch, it runs a self-test and displays the Nortel logo banner. Press [Ctrl]-Y to access the 460 or 470 main menu.

This chapter covers the following topics:

To find out which version of the Ethernet Switch 460 or 470 software is running, use the Console Interface (CI) menus or the Web-based management system:

- CI menus--From the main menu of the console, choose Systems Characteristics menu. The software currently running is displayed in sysDescr.
- Web-based management system--Open the System Information page, which is under Administration on the main menu. The software currently running is displayed in the sysDescription field.

Accessing the Console Interface menus and screens

The Console Interface is an easy-to-use menu system that provides you with access to the most frequently used configuration parameters, commands, and utilities.

You can access the CI menus and screens locally through a console terminal attached to your Ethernet Switch 460 or 470, remotely through a dial-up modem connection, or in-band through a Telnet session.

Note: If you have a properly configured BootP server in your network, it detects the IP address; you do not need to configure the IP address.

Using the Console Interface menus and screens

The CI menus and screens provide options that allow you to configure and manage the Ethernet Switch 460 or 470. Help prompts at the bottom of each menu and screen explain how to enter data in the highlighted field, and how to navigate the menus and screens.

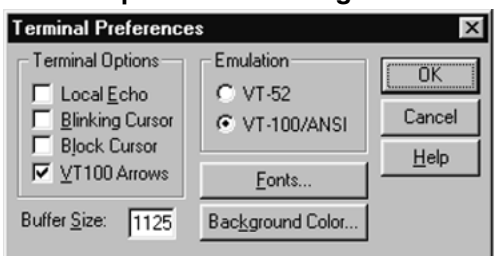
The Console Port default settings are: 9600 baud with eight data bits, one stop bit, and no parity as the communications format, with flow control set to disabled.

Some CI screen options allow you to toggle among several possible values; other options allow you to set or modify a parameter.

Using Telnet to access the CI menus and screens

When you use Telnet to access the CI menus and screens, set the terminal Preferences to VT100 Arrows and VT-100/ANSI and as shown in Figure 35 "Terminal preference settings" (page 103).

Figure 35
Terminal preference settings



Navigating the CI menus and screens

Use the following methods to navigate the CI menus and screens.

To select a menu option:

Step	Action
1	Use the arrow keys to highlight the option name.
2	Press [Enter]. The option takes effect immediately after you press [Enter]. Alternatively, you can press the key corresponding to the underlined letter in the option name. For example, to select the Switch Configuration option in the main menu, press the w key. Note that the text characters are not case-sensitive.

—End—

Note: In some instances, the underscore is not displayed in the option menu. When this is the case, pressing the associated key still selects the appropriate option.

Additional navigation aids follow:

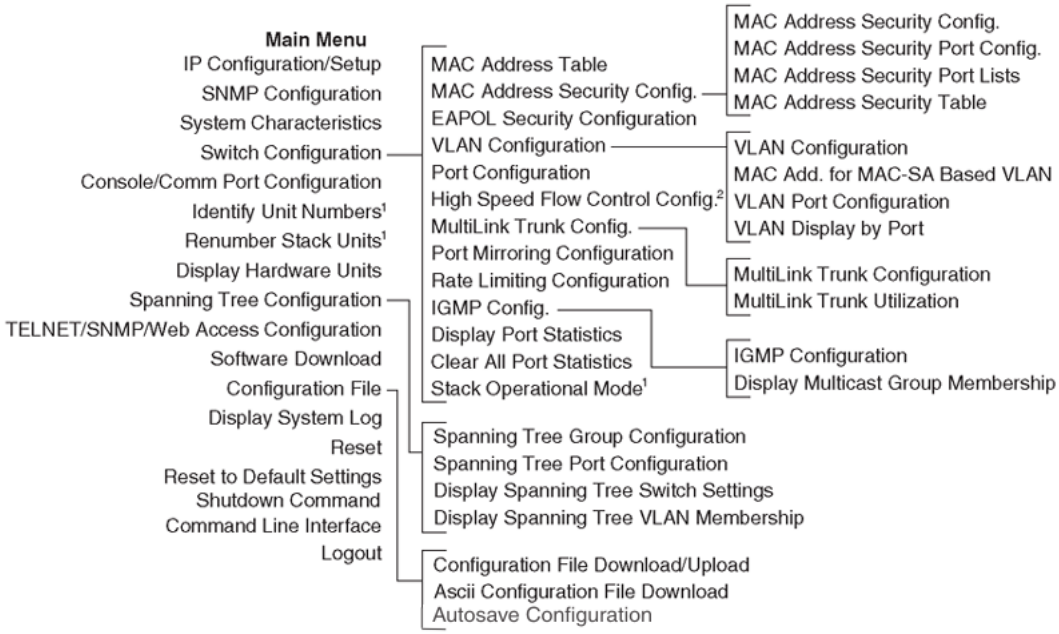
- To toggle between values in a form:
  - — Use the spacebar to highlight the value.
  - — Press [Enter].
- To clear a string field:
  - — Position the cursor in the string field.
  - — Press [Ctrl]-K.
- To return to the previous menu, press [Ctrl]-R.

- To go to the next screen in a series, press [Ctrl]-N.
- To return to the main menu at any time, press [Ctrl]-C.
- Press [Backspace] to delete entered text.
- Options that appear in brackets (for example, [Enabled]) are user-configurable options.

Screen fields and descriptions

shows a map of the CI screens. The remainder of this chapter describes the CI screens and their fields, beginning with the main menu.

Figure 36
Map of Console Interface screen



[1] Only appears when the switch is participating in a stack configuration.
[2] Only appears when a gigabit MDA is installed in one or more units in a stack configuration.

The CI screens for your specific switch model show the correct model name in the main menu screen title, and the correct number of ports and port types in the Port Configuration screen.

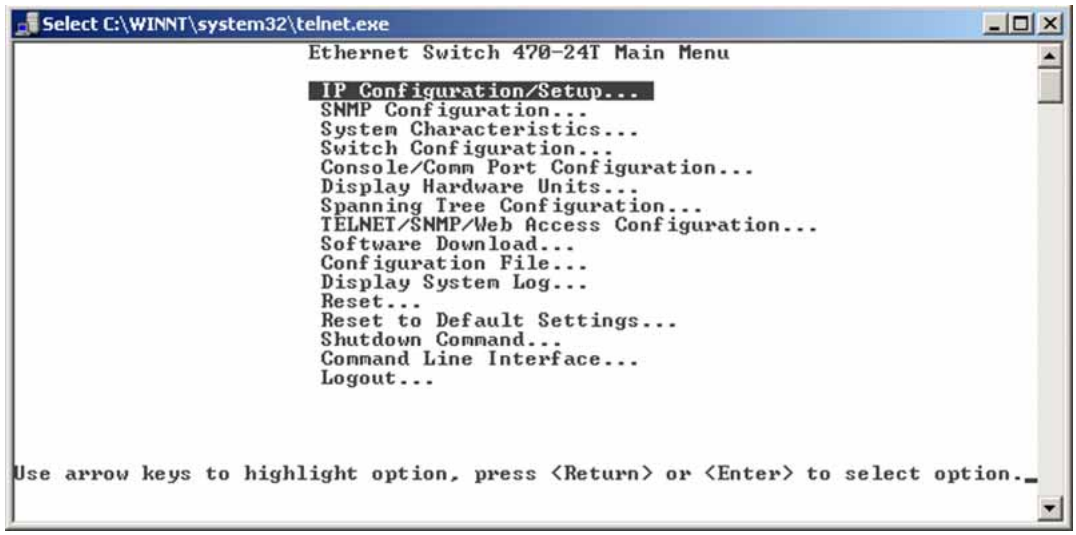
Note: The field values shown in the CI screens in this section are provided as examples only.

Console Interface Main Menu

This section describes the options available from the CI main menu. Figure 37 "Console Interface main menu" (page 105) displays the CI main menu. The CI screens and submenus for these options are described throughout this document.

Note: Some menu options shown in example of main menu and in other examples do not appear on your screen, depending on the switch options installed. However, the full menu options are shown in the screen examples and described in the following sections.

Figure 37
Console Interface main menu



Description of Main Menu Components

Table 29 " Console Interface Main Menu options" (page 105) describes the Console Interface main menu options.

Table 29
Console Interface Main Menu options

Option	Description
IP Configuration/Setup...	Displays the IP Configuration/Setup screen (see Figure 89 "IP configuration screen" (page 202)). You can use the IP Configuration/Setup screen to set or modify IP configuration parameters and to ping other network devices.
SNMP Configuration...	Displays the SNMP Configuration screen (see *Security — Configuration (NN47210-500)*). With this screen, you can set or modify the SNMP read-only community and read-write community strings, enable or disable the authentication trap, set the IP address of trap receivers, and set the trap community strings.

Option	Description
System Characteristics...	Displays the System Characteristics screen (see "Managing System Characteristics" (page 212)). With this screen, you can view switch characteristics, including number of resets, power status, hardware and software version, MAC address, GBIC information, firmware version, date of manufacture, and hardware deviation number. This screen also contains three user-configurable fields: sysContact, sysName, and sysLocation.
Switch Configuration...	Displays the Switch Configuration Menu screen (see "Switch Configuration Menu screen" (page 109)). This menu provides the following configuration options: MAC Address Table, MAC Address-Based Security, EAPOL Security Configuration, VLAN Configuration, Port Configuration, High Speed Flow Control, MultiLink Trunk Configuration, Port Mirroring Configuration, Rate Limiting Configuration, IGMP Configuration, Display Port Statistics, and Clear All Port Statistics.
Console/Comm Port Configuration...	Displays the Console/Comm Port Configuration screen (see "Configuring the Console Port" (page 85)). With this screen, you can configure and modify the console/Comm port parameters, including the console port speed and password settings for the switch.
Identify Unit Numbers	Displays the following message at the bottom of the Main Menu: Port LEDs lit on the front panel of the switch correspond to its unit number.
Renumber Stack Units...	Displays the Renumber Stack Units screen (see Figure 98 "Renumber Stack Units screen" (page 254)). With this screen, you can reset the unit numbers within a stack.
Display Hardware Units	Displays the Display Hardware Unit Information screen (see "Hardware Unit Information screen" (page 79)). This screen displays the switch model and the software version running.
Spanning Tree Configuration...	Displays the Spanning Tree Configuration Menu (see *Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*). This menu provides the following options: Spanning Tree Group Configuration, Spanning Tree Port Configuration, Display Spanning Tree Switch Settings, and Display Spanning Tree VLAN Membership.

Option	Description
TELNET/SNMP/Web Access Configuration...	Displays the TELNET/SNMP/Web Access Configuration screen (see *Security — Configuration (NN47210-500)*). With this screen, you can set your switch to enable a user at a remote console terminal to communicate with the switch as if the console terminal is directly connected to it. You can have up to ten active Telnet sessions running at one time in a switch configuration. You can use the Command Line Interface (CLI), JDM, Web-based management system, or these menus with a Telnet session. With this screen, you can also set the switch to allow up to 50 IP addresses to access the switch using either these management systems or SNMP access
Software Download ...	Displays the Software Download screen (see "Software Management using the Console Interface" (page 220)). With this screen, you can revise the switch software image that is located in non-volatile flash memory (NVRAM).
Configuration File...	Displays the Configuration File Menu screen (see "Configuration Management" (page 224)). This menu provides the following options: Configuration File Download/Upload and ASCII Configuration File Download.
Display System Log	Displays the System Log screen (see "System Log screen" (page 118)).
Reset	Resets the switch with the current configuration settings. This option is followed by a screen prompt that precedes the action. Enter Yes to reset the switch; enter No to abort the option: • When you select this option, the switch resets, runs a self-test, and then displays the Nortel logo screen. Press [Ctrl]-Y to access the Ethernet Switch 460 or 470 main menu.
Reset to Default Settings	Resets the switch to the factory default configuration settings. This option is followed by a screen prompt that precedes the action. Enter Yes to reset the switch to the factory default configuration settings; enter No to abort the option: • When you select this option, the switch resets, runs a self-test, and then displays the Nortel logo screen. Press [Ctrl]-Y to access the switch main menu. ***Note:*** The following items do NOT reset: Reset Count, and Reason for Last Reset.

Option	Description
	 **CAUTION** If you choose the Reset to Default Settings option, all of your configured settings are replaced with factory default settings when you press [Enter]
	ATTENTION **Achtung:** Bei Auswahl des Befehls zur Rücksetzung auf die Standardeinstellungen werden alle von Ihnen konfigurierten Einstellungen durch die werkseitigen Standardeinstellungen ersetzt, wenn Sie die Eingabetaste drücken.
	ATTENTION Si vous restaurez la configuration usine, votre configuration courante sera remplacée par la configuration usine dès que vous appuierez sur [Entrée].
	ATTENTION **Precaución:** Si selecciona el comando Restaurar valores predeterminados, todos los valores de configuración se sustituirán por las valores predeterminados en fábrica al pulsar [Intro].

Option	Description
	ATTENTION **Attenzione:** Nel caso in cui si selezioni la reimpostazione dei valori di default, tutte le impostazioni configurate verranno sostituite dai default di fabbrica premendo il tasto [Invio].
	注意: 「デフォルトの設定にリセット」コマンドを選択すると、現在のコンフィグレーションされた設定は、[Enter]を押したとき、工場出荷時の設定に変更されます。
Shutdown command	Allows the switch to be safely shut down and powered off. When the shutdown command is initiated, the switch saves the current configuration and instructs the user to power off the switch within the specified time period (one to ten minutes); otherwise, the switch is reset. When the command is initiated in the Console Interface, the following message appears: `It is safe to poweroff the switch, it will reset in xxx seconds.`
Command Line Interface	Allows a properly authorized user to initiate a CLI management session. see Chapter 4 "CLI Basics" (page 123), for information about using the CLI.
Logout	Allows a user in a Telnet session or a user working at a password-protected console terminal to terminate the session.

Switch Configuration Menu screen

With the Switch Configuration Menu screen (Figure 38 "Switch Configuration Menu screen" (page 110)), you can set or modify your switch configuration.

Note: The High Speed Flow Control Configuration option appears only when an optional GBIC is installed.

From the main menu, choose Switch Configuration (or press w) to open the Switch Configuration Menu screen (Table 30 "Switch Configuration Menu screen options" (page 110)).

Figure 38
Switch Configuration Menu screen

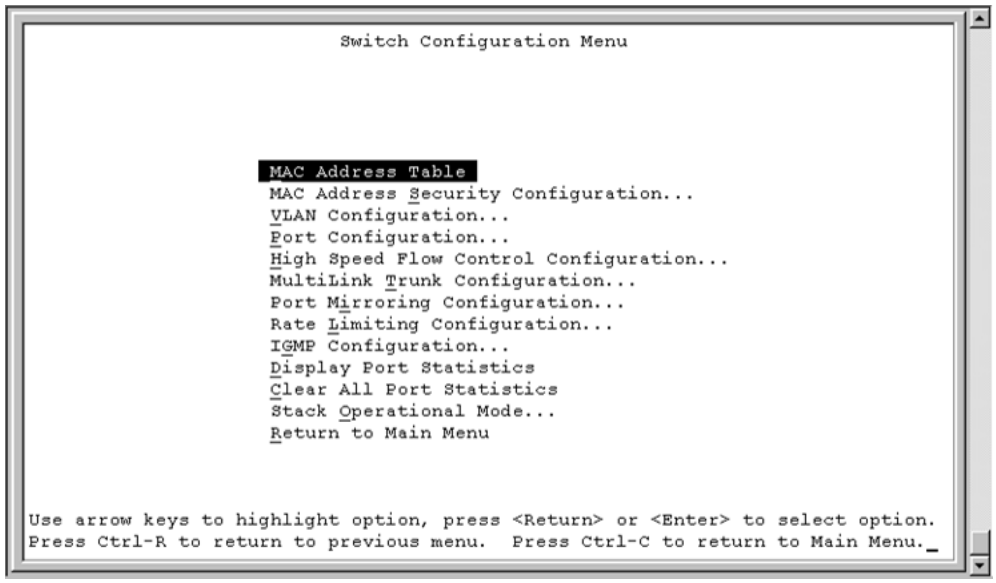


Table 30 "Switch Configuration Menu screen options" (page 110) describes the Switch Configuration Menu screen options.

Table 30
Switch Configuration Menu screen options

Option	Description
MAC Address Table	Displays the MAC Address Table screen (see *Security — Configuration (NN47210-500)*). With this screen, you can view all MAC addresses and the associated ports or trunks that the switch has learned, or to search for a particular MAC address (to see if the switch has learned the address).
MAC Address Security Configuration...	Displays the MAC Address Security Configuration menu (see *Security — Configuration (NN47210-500)*). With this screen, you can set up the MAC address security feature and provides the following options: MAC Address Security Configuration, MAC Address Security Port Configuration, MAC Address Security Port Lists, and MAC Address Security Table. With this menu, you can enable and disable security features on the port and trunk levels.
EAPOL Security Configuration...	Displays the EAPOL Security Configuration menu (see *Security — Configuration (NN47210-500)*). With this screen, you can set up Extensible Authentication Protocol over LAN (EAPOL)-based security.

Option	Description
VLAN Configuration...	Displays the VLAN Configuration Menu (see *Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*). With this menu, you can create and modify VLANs and enable the automatic PVID feature. It provides the following options: VLAN Configuration, MAC Addresses for MAC-SA Based VLAN, VLAN Port Configuration, and VLAN Display by Port.
Port Configuration...	Displays the Port Configuration screen (see " Port Configuration screen" (page 112)). With this screen, you can configure a specific port or ports.
High Speed Flow Control Configuration...	Selectable only when an optional GBIC is installed in the Uplink Module slot. When the GBIC is installed, selecting this option displays the High Speed Flow Control Configuration screen (see "High Speed Flow Control Configuration screen" (page 114))
MultiLink Trunk Configuration...	Displays the MultiLink Trunk Configuration Menu (for details, see *Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*). With this menu, you can create and modify trunks, and to monitor the bandwidth utilization of configured trunks. It provides the following options: MultiLink Trunk Configuration and MultiLink Trunk Utilization.
Port Mirroring Configuration...	Displays the Port Mirroring Configuration screen (see *Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*). With this screen, you can designate a single switch port as a traffic monitor for up to two specified ports or addresses.
Rate Limiting Configuration...	Displays the Rate Limiting Configuration screen (see "Rate Limiting Configuration screen" (page 116)). With this screen, you can limit the forwarding rate of broadcast and multicast packets.
IGMP Configuration...	Displays the IGMP Configuration screen (see *Configuration — IP Multicast Routing Protocols (NN47210-504)*). With this screen, you can optimize multicast traffic by setting up IGMP port memberships that filter multicast on a per port basis.
Display Port Statistics	Displays the Port Statistics screen (see *Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*). With this screen, you can view detailed information about any switch port.

Option	Description
Clear All Port Statistics	Clear all port statistics. This option is followed by screen prompts that present a choice of actions. Choose one of the following: • Yes, to clear all port statistics for all switch ports • No, to abort the option
Stack Operational Mode	Displays the stack operational mode screen, which provides information about the types of switches in your stack. See Chapter 9 "Stacking ES 460 and 470 units" (page 247) for details. • The Pure Stack Mode is the only possible operational mode. The hybrid stack mode is not supported in this release.

Port Configuration screen

Use the Port Configuration screen, to configure specific switch ports or all switch ports, see Figure 39 "Port Configuration screen" (page 113). You can enable or disable the port status of specified switch ports, set the switch ports to autonegotiate for the highest available speed of the connected station, or set the speed for selected switch ports (autonegotiation is not supported on fiber optic ports).

You can disable switch ports that are trunk members; however, the screen prompts you for verification of the request before completing the action. Choosing [Yes] disables the port and removes it from the trunk.

Note: The Autonegotiation fields, the Speed fields, and the Duplex fields are independent of MultiLink Trunking, rate limiting, VLANs, IGMP Snooping, and the STP.

To open the Port Configuration screen, choose Port Configuration (or press p) from the Switch Configuration Menu screen.

Figure 39
Port Configuration screen

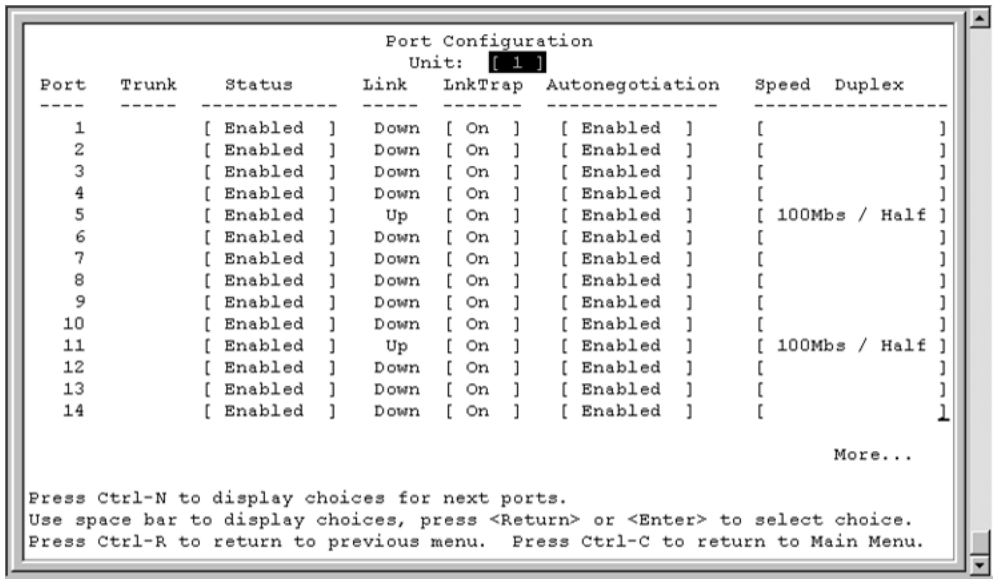


Table 31 "Port Configuration screen fields" (page 113) describes the Port Configuration screen fields.

Table 31
Port Configuration screen fields

Field	Description
Unit	Unit number. ***Note:*** This field does not appear if the switch is not in a stack.
Port	Indicates the switch port numbers that correspond to the field values in that row of the screen (for example, the field values in row 2 apply to switch port 2). The values that you set in the Switch row affect all switch ports.
Trunk	The read-only data displayed in this column indicates the trunks that correspond to the switch ports specified in the Trunk Members fields of the Trunk Configuration screen, see *Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*.
Status	Disable any of the switch ports. You can also use this field to control access to any switch port. Default value Enabled Range Enabled, Disabled

Field	Description
Link	A read-only field that indicates the current link state of the corresponding port, as follows: • Up: The port is connected and operational. • Down: The port is not connected or is not operational.
LnkTrap	Control whether link up and link down traps are sent to the configured trap sink from the switch. Default value On Range On, Off
Autonegotiation	When enabled, sets the corresponding port speed to match the best service provided by the connected station, up to 100 Mb/s in full-duplex mode. ***Note:*** This field is not configurable for GBIC ports. Default value Enabled Range Enabled, Disabled, Smart ***Note:*** Smart mode is only supported on GBIC ports on Ethernet Switches 470-24-PWR and 470-48-PWR.
Speed/Duplex	Manually configure any port to support an Ethernet speed of 10 Mb/s or 100 Mb/s, in half- or full-duplex mode. This field is set (by default) to 100 Mb/s, full-duplex for gigabit ports only. ***Note:*** Use the High Speed Flow Control Configuration screen (next) to set autonegotiation for all gigabit ports. Default value 100Mbs/Half (when Autonegotiation is disabled) Range 10Mbs/Half, 10Mbs/Full, 100Mbs/Half, 100Mbs/Full

High Speed Flow Control Configuration screen

Use the High Speed Flow Control Configuration screen, to set the port parameters for installed GBIC ports, see Figure 40 "High Speed Flow Control Configuration" (page 115). Use this screen to set autonegotiation for all gigabit ports.

Choose High Speed Flow Control Configuration (or press h) from the Switch Configuration Menu screen to open the High Speed Flow Control Configuration screen.

Figure 40
High Speed Flow Control Configuration

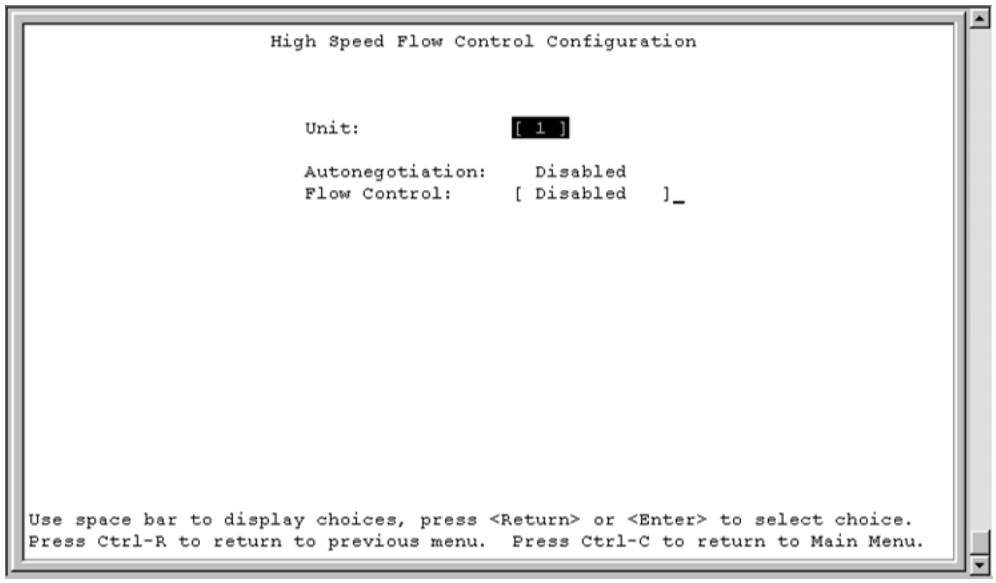


Table 32 " High Speed Flow Control Configuration Screen fields" (page 115) describes the High Speed Flow Control Configuration screen fields.

Table 32
High Speed Flow Control Configuration Screen fields

Field	Description
Unit	Select the unit number (when stacking is configured) to view or configure. To view or configure another unit, type its unit number and press Enter, or press the space bar to toggle the unit numbers (the system only displays a screen for units configured with a Gigabit MDA).
Autonegotiation	When enabled, the port only advertises support for 100 Mb/s operation in full-duplex mode. ***Note:*** Autonegotiation is not supported on GBIC ports on Ethernet Switch 460-PWR and non-PWR versions of Ethernet Switch 470. Default value Disabled Range Enabled, Disabled, Smart ***Note:*** Smart mode is only supported on GBIC ports on Ethernet Switches 470-24-PWR and 470-48-PWR.
Flow Control	Control traffic and avoid congestion on the GBIC port. Two modes are available (see "Choosing a high speed flow control mode" (page 116) for details about the two modes). The Flow Control field cannot be configured unless you set the Autonegotiation field value to Disabled. Default value Disabled Range Disabled, Symmetric, Asymmetric

Field	Description
Preferred Phy	Choose a preferred Phy port; the other Phy port reverts to backup. Default value Right Range Right, Left
Active Phy	Indicates the operational Phy port. Default value: None Range: None, Right, Left

Choosing a high speed flow control mode

With the High Speed Flow Control feature, you can control traffic and avoid congestion on the Gigabit full-duplex link. If the receive port buffer becomes full, the switch issues a flow-control signal to the device at the other end of the link to suspend transmission. When the receive buffer is no longer full, the switch issues a signal to resume the transmission. You can choose Symmetric or Asymmetric flow control mode.

Symmetric mode

With the symmetric mode, both the GBIC port and its link partner can send flow control pause frames to each other.

When a pause frame is received (by either the GBIC port or its link partner), the port suspends transmission of frames for a number of slot times specified in the control frame or until a pause-release control frame is received. Both devices on the link must support this mode when it is selected.

Asymmetric mode

With the asymmetric mode, the link partner can send flow control pause frames to the GBIC port. When a pause frame is received, the receiving port suspends transmission of frames for a number of slot times specified in the control frame or until a pause-release control frame is received.

In this mode, the GBIC port is disabled from transmitting pause frames to its link partner. Use this mode when the GBIC port is connected to a buffered repeater device.

Rate Limiting Configuration screen

With the Rate Limiting Configuration screen, you can limit the forwarding rate of broadcast and multicast packets.

Figure 41 "Rate Limiting Configuration screen" (page 117) shows a sample Rate Limiting Configuration screen.

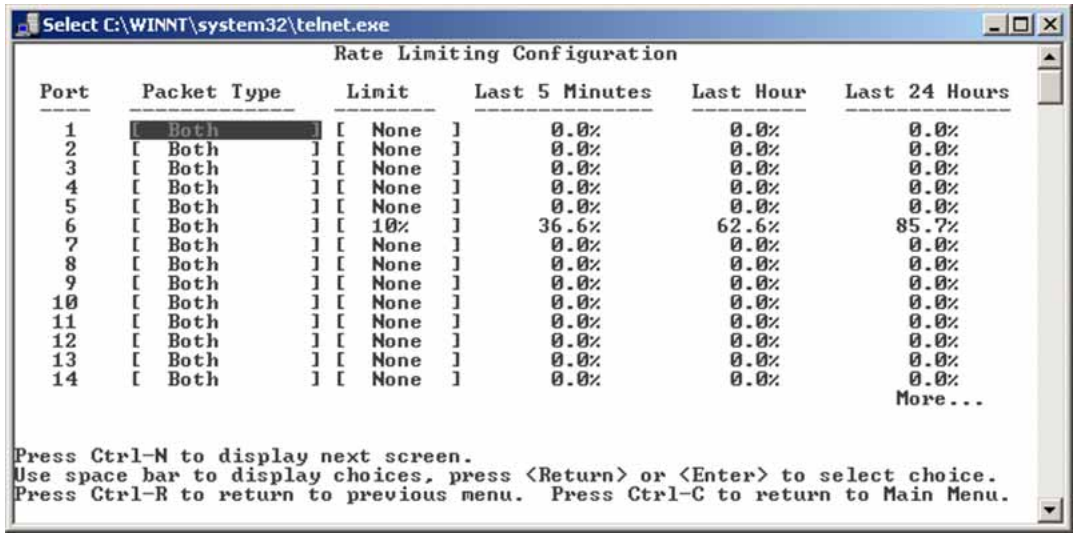
Note: If a port is configured for rate limiting, and it is a MultiLink Trunk member, all trunk member ports implement rate limiting. Also, if a trunk

member implements rate limiting and the port is disabled from rate limiting, all trunk members are disabled from rate limiting.

To open the Rate Limiting Configuration screen:

- Choose Rate Limiting Configuration (or press I) from the Switch Configuration Menu screen.

Figure 41
Rate Limiting Configuration screen



You can use this screen to view the percentage of either packet type (or both packet types) received on each port.

When the volume of either packet type is high, placing severe strain on the network (often referred to as a *storm*), you can set the forwarding rate of those packet types to *not exceed* a specified percentage of the total available bandwidth. The percentage you set refers to the total available bandwidth, not to a percentage of current traffic. Table 33 " Rate Limiting Configuration screen fields" (page 117) describes the Rate Limiting Configuration screen fields.

Table 33
Rate Limiting Configuration screen fields

Field	Description
Port	Indicates the switch port numbers that correspond to the field values in that row of the screen (for example, the field values in row 2 apply to switch port 2). Note that the values applied in the Switch affect all switch ports.
* Rate-limiting is disabled if this field is set to None. You can select and view the percentage of specific packet types present in the network, without inadvertently limiting the forwarding rate.	

Field	Description
Packet Type	Select the packet types for rate-limiting or viewing. Default value Both Range Both, Multicast, Broadcast
Limit	Sets the percentage of port bandwidth allowed for forwarding the packet types specified in the Packet Type field. When the threshold is exceeded, any additional packets (specified in the Packet Type field) are discarded*. Default value None Range None, 10%, 9%, 8%, 7%, 6%, 5%, 4%, 3%, 2%, 1%
Last 5 Minutes	This read-only field indicates the percentage of packets (of the type specified in the Packet Type field) received by the port in the last 5 minutes. This field provides a running average of network activity and is updated every 15 seconds. Note that this field indicates the receiving port's view of network activity, regardless of the rate-limiting setting.
Last Hour	This read-only field indicates the percentage of packets (of the type specified in the Packet Type field) received by the port in the last hour. This field provides a running average of network activity and is updated every 5 minutes. Note that this field indicates the receiving port's view of network activity, regardless of the rate-limiting setting.
Last 24 Hours	This read-only field indicates the percentage of packets (of the type specified in the Packet Type field) received by the port in the last 24 hours. This field provides a running average of network activity and is updated every hour. Note that this field indicates the receiving port's view of network activity, regardless of the rate-limiting setting.
* Rate-limiting is disabled if this field is set to None. You can select and view the percentage of specific packet types present in the network, without inadvertently limiting the forwarding rate.	

System Log screen

The System Log screen (Figure 42 "System Log screen" (page 119)) displays or clears messages obtained from system non-volatile memory or dynamic memory.

System Log messages operate as follows:

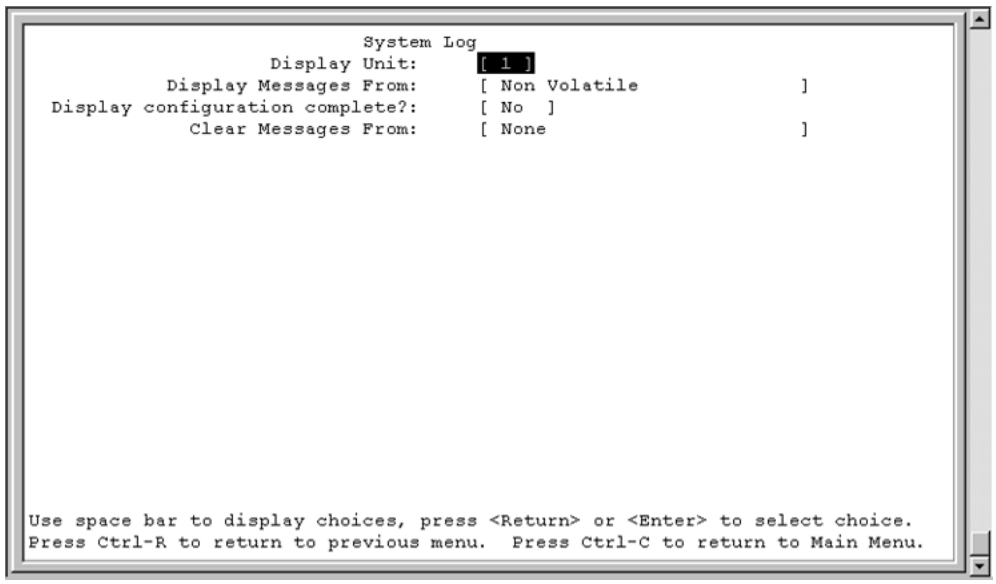
- Non-volatile memory messages are retrievable after a system reset.

- Messages can be viewed while the system is operational.
- All non-volatile and dynamic memory messages are time stamped.
- When you restart your system, the system deletes dynamic memory messages.
- After a reset, the system copies all messages stored in non-volatile memory to dynamic memory. The messages copied to dynamic memory are time stamped to zero (0).

To open the System Log screen:

- Choose Display System Log (or press y) from the main menu.

Figure 42
System Log screen



Displaying most recent log entry first

With this option, you can view the system log with the most recent entry displayed first; the rest of the log entries are listed in reverse chronological order.

Table 34 "System Log screen fields" (page 120) describes the System Log screen fields.

Table 34
System Log screen fields

Field	Description
Display Messages From	Select the memory source your messages are obtained from. Choose Non Volatile, Volatile, or Volatile + Non Volatile. Use the spacebar to toggle between the options. Default Non Volatile RangeNon Volatile, Volatile + Non Volatile
Display configuration complete?	Determine whether the configuration information received from non-volatile or dynamic memory (depending on what is selected in the Display Messages From field) is complete. Use the spacebar to toggle between the options. DefaultNo RangeNo, Yes
Clear Messages From	Clear the information messages from dynamic or non-volatile memory or both. If you clear dynamic messages, existing non-volatile messages are copied into dynamic memory. After a system reset, all existing non-volatile messages are copied to dynamic memory. Use the spacebar to toggle between the options. DefaultNone RangeNone, Non Volatile, Volatile + Non Volatile

Troubleshooting

Do the following if you have problems navigating in or displaying the Console Interface menu system:

- Ensure that your terminal emulation software configuration is consistent with the guidelines presented earlier in this chapter.

Usage guidelines

- In the Console Interface, configure the terminal for 24 rows by 80 columns.

Chapter 4
CLI Basics

The Command Line Interface (CLI) is a management tool that provides methods for configuring, managing, and monitoring the operational functions of the Ethernet Switches 460 and 470. You access the CLI through a direct connection to the switch console port, or remotely using Telnet. For a complete, alphabetical list of CLI commands, see Appendix "CLI Command List" (page 517).

Note: When you power up or reset the switch, it runs a self-test, and then displays the Nortel logo banner on the Console Interface. Press [Ctrl]-Y to access the Ethernet Switch 460 or 470 main menu.

This chapter discusses the following CLI topics:

Accessing the CLI

You access the CI menus using Telnet or a direct connection to the switch from a terminal or personal computer (PC). You can use any terminal or PC with a terminal emulator as the CLI command station. Be sure the terminal has the following features:

- 9600 bits per second (b/s), 8 data bits, 1 stop bit, no parity, no flow control
- Serial terminal-emulation program such as Terminal or Hyperterm for Windows NT* or Hyperterm for Windows* 95 or Windows 98

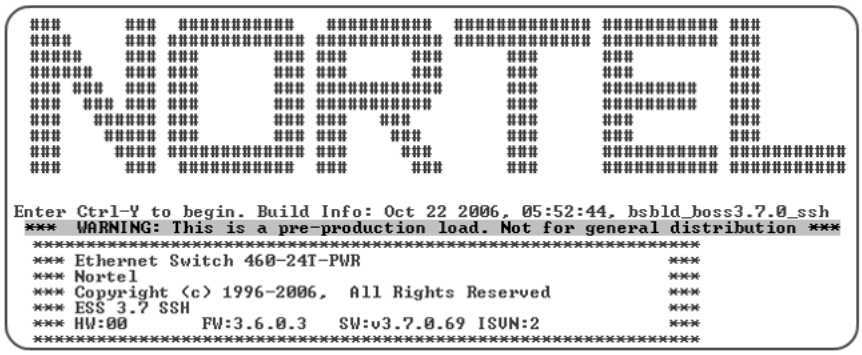
- Cable and connector to match the male DTE connector (DB-9) on the switch console port, with the DCE/DTE switch on the switch management module set to DTE
- Under Terminal Options, VT100 Arrows checked in the Terminal Preferences window, and Block Cursor unchecked; under Emulation, VT-100/ANSI checked

To access the CLI:

Step	Action

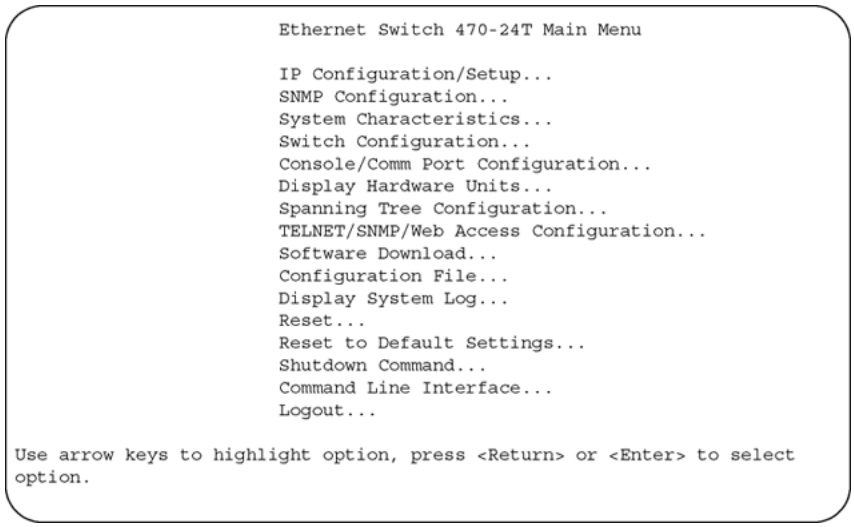
1 When you access the switch, the Nortel banner appears ().

Figure 43
Ethernet Switch banner



2 Press [Ctrl]+Y, and the Main Menu appears on the console screen (Figure 44 "Main Menu for Switch Console Interface" (page 124)) with the top line highlighted.

Figure 44
Main Menu for Switch Console Interface



3 Using the Down Arrow key, scroll down to Command Line Interface, and press [Enter]. The CLI cursor appears as one of the following depending on your switch product number:

```
460-24T-PWR>
470-24T-PWR>
470-48T-PWR>
```

The > sign at the end of the name of the switch indicates that the CLI opens in User EXEC mode. see "CLI command modes" (page 125) to select the command mode you want to use (and are authorized to use).

—End—

CLI command modes

Most CLI commands are available only under a certain command mode. The switch has the following four command modes:

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

The User EXEC mode is the default mode; it is also referred to as exec. This command mode is the initial mode of access upon first powering-up the switch. In this command mode, the user can access only a subset of the CLI commands; however, the commands in this mode are available while the user is in any of the other four modes. The commands in this mode provide basic functionality, such as ping and logout.

Commands in the Privileged EXEC mode are available to all other modes except the User EXEC mode. The commands in this mode allow you to perform basic switch-level management tasks, such as downloading the software image, setting passwords, and booting the switch. The Privileged EXEC mode is also referred to as privileged exec mode.

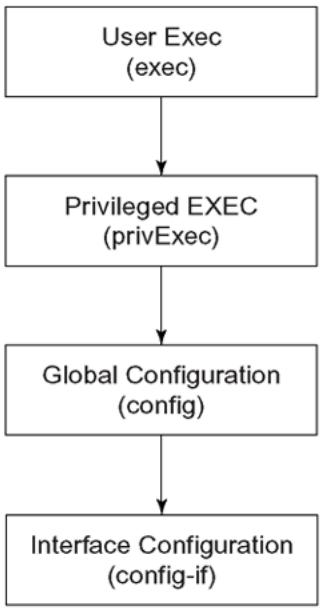
The last two command modes allow you to change the configuration of the switch. Changes made in these command modes are immediately applied to the switch configuration and saved to non-volatile memory (NVRAM).

The Global Configuration commands allow you to set and display general configurations for the switch, such as the IP address, SNMP parameters, Telnet access, and VLANs. The Global Configuration mode is also referred to as config mode.

The Interface Configuration commands allow you to configure parameters for each port, such as speed, duplex mode, and rate limiting. The Interface Configuration mode is also referred to as config-if mode.

Figure 45 "CLI command mode hierarchy" (page 126) provides an illustration of the hierarchy of CLI command modes.

Figure 45
CLI command mode hierarchy



You can see a specific value for each command mode at the prompt line, and you can use specific commands to enter or exit each command mode (Table 35 " Command mode prompts and entrance/exit commands" (page 126)). Additionally, you can only enter command modes from specific modes and only exit to specific command modes.

Table 35
Command mode prompts and entrance/exit commands

Command mode	Prompt	Enter/exit command

User EXEC
(exec)
	`460-24T-PWR>`
	
	`470-24T-PWR>`
	
	`470-48T-PWR>`
		• Default mode, automatically enter
		• `logout or exit` to quit CLI

Command mode	Prompt	Enter/exit command
Privileged EXEC (privileged exec)	**460-24T-PWR#** **470-24T-PWR#** **470-48T-PWR#**	• **enable** to enter from User EXEC mode • **logout or exit** to quit CLI
Global Configuration (config)	**460-24T-PWR(config)#** **470-24T-PWR(config)#** **470-48T-PWR(config)#**	• **configure** to enter from Privileged EXEC mode • **logout** to quit CLI; end or **exit** to exit to Privileged EXEC mode
Interface Configuration (config-if)	**460-24T-PWR(config-if)#** **470-24T-PWR(config-if)#** **470-48T-PWR(config-if)#**	• **interface FastEthernet {<portnum>|all}** to enter from Global Configuration mode • **logout** to quit CLI; end to **exit** to Privileged EXEC mode; exit to exit to Global Configuration mode

The prompt displays the switch name, **460-24T-PWR, 470-24T, or 470-48T** and the current CLI command mode.

See Appendix "CLI Command List" (page 517) for a complete, alphabetical list of all CLI commands.

The initial command mode in CLI depends on your access level when you log in to the switch CI menus:

- With no password protection, you enter the CLI in userExec mode, and use the **enable** command to move to the privileged exec command mode.
- If you log in to the CI menus with read-only access, you enter the CLI in userExec mode and cannot access any other CLI command modes.
- If you log in to the CI menus with read-write access, you enter the CLI in privileged exec mode and can use the appropriate commands to move to the other command modes.

Basic navigation

This section discusses basic navigation within the CLI and between the command modes. The CLI incorporates various shortcut commands and keystrokes to simplify its use. The following topics are covered in this section:

General navigation commands

When you navigate through the CLI, online help is available at all levels. Entering a portion of the command at the prompt, followed by a space and a question mark (**?**), results in a list of all options for that command. see "help command" (page 130) for more information about the specific types of online help.

The system records the last command in a CLI session. However, the last command is not saved across reboots.

Add the word **no** to the beginning of most CLI configuration commands to clear or remove the parameters of the actual command. For example, when you enter the command **ip address stack 192.32.154.126,** you set the IP stack address. However, when you enter **no ip add stack,** the system returns the IP address to zero. See Appendix "CLI Command List" (page 517) for an alphabetical list of **no** commands.

Add the word **default** to the beginning of most CLI configuration commands returns the parameters of the actual command to the factory default values. see Appendix "CLI Command List" (page 517) for an alphabetical list of **default** commands.

When you enter a portion of the command and press the [Tab] key, the system finds the first unambiguous match of a command and displays that command. For example, if you enter **down+[Tab]**, the system displays **download**.

Keystroke navigation

You can change the location of the cursor using the key combinations shown in Table 36 " Keystroke navigation" (page 129).

Table 36
Keystroke navigation

Key combination	Function
[Ctrl]+A	Start of line
[Ctrl]+B	Back 1 character
[Ctrl]+C	Abort command
[Ctrl]+D	Delete the character indicated by the cursor
[Ctrl]+E	End of line
[Ctrl]+F	Forward 1 character
[Ctrl]+H	Delete character left of cursor (Backspace key)
[Ctrl]+I & TAB	Command/parameter completion
[Ctrl]+K	Delete all characters to right of cursor
[Ctrl]+N or [Down arrow]	Next history command
[Ctrl]+P or [Up arrow]	Previous history command
[Ctrl]+R	Redisplay line
[Ctrl]+T	Transpose characters
[Ctrl]+U & [Ctrl]+X	Delete all characters to left of cursor
[Ctrl]+W	Delete word left of cursor
[Ctrl]+z	Exit Global Configuration mode (to Privileged EXEC mode)
[Esc]+c & [Esc]+u	Capitalize character at cursor
[Esc]+l	Change character at cursor to lowercase
[Esc]+b	Move back 1 word
[Esc]+d	Delete 1 word to the right
[Esc]+f	Move 1 word forward

help command

The **help** command is in all command modes and displays a brief message about using the CLI help system. The syntax for the **help** command is:

```
help
```

The **help** command has no parameters or variables.

Figure 46 "help command output in privileged exec mode" (page 130) shows the output from the **help** command.

Figure 46
help command output in privileged exec mode

```
470-24T#help
Context help may be requested at any point in a command by entering
a question mark '?'.  If nothing matches, the help list will be empty
and you must backup until entering a '?' shows the available options.
Two styles of help are provided:
1. Full help is available when you are ready to enter a
   command argument (e.g. 'show ?') and describes each possible
   argument.
2. Partial help is provided when an abbreviated argument is entered
   and you want to know what arguments match the input
   (e.g. 'show pr?'.)

Keystroke navigation:
    [Ctrl]+A Start of line
    [Ctrl]+B Back 1 character
    [Ctrl]+C Abort command
    [Ctrl]+D Delete the character indicated by the cursor
    [Ctrl]+E End of line
    [Ctrl]+F Forward 1 character
    [Ctrl]+H Delete character left of cursor (Backspace key)
    [Ctrl]+I & Command/parameter completion
    [Ctrl]+K & [Ctrl]+R Redisplay line
    [Ctrl]+N or [Down arrow] Next history command
    [Ctrl]+P or [Up arrow] Previous history command
    [Ctrl]+T Transpose characters
    [Ctrl]+U Delete entire line
    [Ctrl]+W Delete word left of cursor
    [Ctrl]+X Delete all characters to left of cursor
    [Ctrl]+z Exit Global Configuration mode (to Privileged EXEC mode)
    [Esc]+c & [Esc]+u Capitalize character at cursor
    [Esc]+l Change character at cursor to lowercase
    [Esc]+b Move back 1 word
    [Esc]+d Delete 1 word to the right
    [Esc]+f Move 1 word forward
```

help commands mode command

The **help commands mode** command displays the list of commands available on the device, either for the current mode of operation or as a complete list of all the commands available on the device.

The **help commands mode** command is in all command modes. The syntax for the **help commands mode** command is:

```
help commands [mode {current | exec | privileged exec |
config | ifconfig}]
```

Table 38 " configure command parameters and variables" (page 134) describes the parameters and variables for the **help commands mode** command.

Table 37
help commands mode command parameters and variables

Parameters and variables	Description
{current| exec | privileged exec | config | ifconfig}	Specifies the command mode: • current: mode from which the command was entered • exec: User Executive mode • privileged exec: Privileged Executive mode • config: Global Configuration mode • ifconfig: Interface Configuration mode ***Note:*** When you enter the command with no additional parameters, the device displays the list of all commands available on the switch.

Figure 47 "help commands mode exec command output" (page 132) shows the sample output for the **help commands mode exec** command.

Figure 47
`help commands mode exec` command output

```
-------------------------------------------
User Executive commands
-------------------------------------------
Command    Description
-------------------------------------------
enable     Turn on privileged commands
exit       Exit from the EXEC and end the current session
help       Description of the interactive help system
logout     Exit from the EXEC
ping       Send echo messages
show       Show running system information
telnet     Telnet to another host
terminal   Set terminal line parameters
-------------------------------------------
```

help modes command

The **`help modes`** command displays information regarding available CLI modes on the switch.

The syntax for the **`help modes`** command is:

`help modes`

The **`help modes`** command has no parameters or variables.

The **`help modes`** command is in all command modes.

Figure 48 "help modes command output" (page 132) shows the output from the **`help modes`** command.

Figure 48
`help modes` command output

```
    Mode                  Short Name      Comments
----------------------    ----------- ----------------------
User Executive            exec         Default mode
Privileged Executive      privExec     Enter using "enable"
Global Configuration      config       Enter using "configure"
Interface Configuration   ifconfig     Enter using "interface"
```

no command

The **no** command is always used as a prefix to a configuration command, and it negates the action performed by that command. The effect of the **no** command is to remove or to clear the configuration controlled by the specified command. Various **no** commands are in the config and config-if command modes.

see Appendix "CLI Command List" (page 517) for an alphabetical listing of all **no** commands.

Note: Not all configuration commands support the **no** prefix command.

default command

The **default** command is always used as a prefix to a configuration command, and it restores the configuration parameters to default values.

see Appendix "CLI Command List" (page 517) for an alphabetical listing of all **default** commands.

Note: Not all commands support the **default** prefix command.

logout command

Use the **logout** command to log off the CLI session and discontinue the connection with the host.
The syntax for the **logout** command is:

```
logout
```

The **logout** command is in all command modes.

The **logout** command has no parameters or variables.

enable command

The **enable** command changes the command mode from User EXEC to privileged exec mode. The syntax for the **enable** command is:

```
enable
```

The **enable** command is in the exec command mode.

The **enable** command has no parameters or variables.

Note: You must have read-write access to the switch to use the **enable** command.

configure command

The **configure** command moves you from the privileged exec command mode to the Global Configuration (config) command mode and identifies the source for the configuration commands. The syntax for the **configure** command is:

```
configure {terminal|network}
```

The **configure** command is in the privileged exec command mode.

Table 38 " configure command parameters and variables" (page 134) describes the parameters and variables for the **configure** command.

Table 38
configure command parameters and variables

Parameters and variables	Description
terminal|network	Specifies the source for the configuration commands for the switch: • **terminal**-- enter config mode to enter configuration commands • **network**-- set up parameters for auto-loading a script at boot-up or for loading and executing a script immediately

interface command

The **interface** command moves you from the config command mode to the Interface Configuration (config-if) command mode. The syntax for the **interface** command is:

```
interface FastEthernet {<portlist>}
```

The **interface** command is in the config command mode.

Table 39 " interface command parameters and variables" (page 135) describes the parameters and variables for the **interface** command.

Table 39
interface command parameters and variables

Parameters and variables	Description
<portlist>	Specifies the portlist you want to be affected by all the commands issued in the config-if command mode.

disable command

The **disable** command returns you to the User EXEC (exec) command mode from the privileged exec command mode. The syntax for the **disable** command is:

```
disable
```

The **disable** command is in the privileged exec command mode.

The **disable** command has no parameters or variables.

end command

The **end** command moves you to the privExec mode from either the Global Configuration (config) mode or the Interface Configuration (config-if) mode.

The syntax for the **end** command is:

```
end
```

The **end** command has no parameters or variables.

exit command

The **exit** command moves you around the command modes:

- In User EXEC (exec) and Privileged EXEC (privileged exec) command modes, **exit**, you can quit the CLI session.
- In Global Configuration (config) mode, **exit** moves you back to the privileged exec command mode.
- In Interface Configuration (config-if) command mode, **exit** moves you back to the config mode.

The syntax for the **exit** command is:

```
exit
```

The **exit** command has no parameters or variables.

shutdown command

With the **shutdown** command, you can safely shut down and power off the switch. After you initiate the **shutdown** command, the switch saves the current configuration and instructs users to power off the switch within the specified time period (1 to 60 minutes); otherwise, the switch performs a reset.

When you initiate the **shutdown** command in the CLI, the following message appears:

```
Shutdown (y/n) ?
```

Enter yes at this prompt to shut down the switch.

The following warning message appears:

```
WARNING: The switch/stack has been set to reboot in <xx>
minutes.  Current configuration has been saved, no further
configuration changes can be saved until reboot occurs or
'shutdown cancel' command is issued.
```

The syntax for the **shutdown** command is:

```
shutdown [force] [minutes-to-wait <1-60>] [cancel]
```

After you initiate the shutdown command, all existing and subsequent console interface sessions display the following message:

```
Stack will reset in <xxxx> seconds.
```

While existing CLI sessions do not receive a warning message, all subsequent CLI sessions display the following message:

```
The shutdown process is in progress.  It is safe to
power off the stack.  Configuration changes will not be
saved.  Shutdown has blocked the flash.  Autoreset in
<xxxx> seconds.
```

Neither Web-based management nor Device Manager receive any shutdown warning messages.

describes the parameters and variables for the shutdown command.

Table 40
shutdown command parameters and variables

Parameters and variables	Description
cancel	Cancel all scheduled switch shutdowns.

Parameters and variables	Description
force	Instructs the switch to skip the shutdown confirmation prompt.
minutes-to-wait <1-60>	Specifies the number of minutes that pass before the switch resets itself. The default wait time is set at 10 minutes.

Note: Any configurations or logons performed on the switch after the shutdown command is initiated are not saved to NVRAM and are lost after the reset.

The shutdown command is in the privileged exec command mode.

reload command

The **reload** command provides you with a configuration rollback mechanism to prevent loss of connectivity to a switch, typically for remote configurations. Use the **reload** command, to temporarily disable the autosave feature for a specified time period (1 to 60 minutes), allowing you to make a number of configuration changes on remote switches without affecting the current saved configuration. During the interval in which the autosave feature is disabled by the **reload** command, you must use the **copy config nvram** command to force a manual save of your configurations.

Initiate the **reload** command before you start the switch configuration commands. After you initiate the command in the CLI, the following message appears:

```
Reload (y/n) ?
```

Enter yes at this prompt to set the switch reload.

The following warning message appears:

```
WARNING: the switch/stack has been set to reload in
<xx> minutes.  Current configuration has NOT been saved.
Configuration must be explicitly saved.
```

When the reload timer expires, the switch resets, reloads the last saved configuration, and re-enables the autosave feature.

The syntax for the reload command is:

reload [force] [[minutes-to-wait <1-60>] [[cancel]

Table 41 "reload command parameters and variables" (page 138) describes the parameters and variables for the **reload** command.

Table 41
reload command parameters and variables

Parameters and variables	Description
cancel	Cancel all scheduled switch reloads.
force	Instructs the switch to skip the reload confirmation prompt.
minutes-to-wait <1-60>	Specifies the number of minutes that pass before the switch reloads itself. The default wait time is set at 10 minutes.

The **reload** command is in the privileged exec command mode.

show cpu-utilization command

The **show cpu-utilization** command displays CPU utilization statistics. The syntax for the **show cpu-utilization** command is:

```
show cpu-utilization
```

The **show cpu-utilization** command is used in the privileged exec command mode.

Numbering ports

The Ethernet Switch 470-24T can operate either in stand-alone mode or in stack mode. The Ethernet Switch 470-24T has 24 10/100 Mb/s ports on the front. Thus, you have a maximum of 26 ports on one Ethernet Switch 470-24T.

The Ethernet Switch 470-48T can operate either in stand-alone mode or in stack mode. The Ethernet Switch 470-48T has 48 10/100 Mb/s ports on the front. Thus, you have a maximum of 48 ports on one Ethernet Switch 470-48T.

The Ethernet Switch 460-24T-PWR can operate either in stand-alone mode or in stack mode. The Ethernet Switch 460-24T-PWR has 24 10/100 Mb/s ports on the front and an uplink slot that you can attach a media dependent adapter (MDA) to. The MDAs available for the uplink can have up to four ports. Thus, you have a maximum of 28 ports on one Ethernet Switch 460-24T-PWR.

Note: The MDAs do not supply power to PoE (Power Over Ethernet) devices. Only unit ports 1 to 24 can supply power to PoE devices.

The CLI uses the variable **<portlist>** when a command specifies one or more ports for the command. The format of the variable **<portlist>** is different if you are working with a stand-alone switch or with a stack.

Note: The variable **portlist** replaces the use of variables **portnum, port-num,** and **all** for ports.

Numbering port in stand-alone mode

In stand-alone mode, use the **<portlist>** variable in the following formats:

- A single port number--an integer between 1 through 26
  - Example: 7 means port 7
- A range of port numbers--a pair of port numbers between 1 and 26 separated by a dash
  - Example: **1-3** means ports 1, 2, and 3
  - Example: **5-24** means all ports from port 5 through port 24
- A list of port numbers and/or port ranges, separated by commas
  - Example: **1,3,7** means ports 1, 3, and 7
  - Example: **1-3,9-11** means ports 1, 2, 3, 9, 10, and 11
  - Example: **1,3-5,9-11,15** means ports 1, 3, 4, 5, 9, 10, 11, and 15
- **none** means no ports (not case-sensitive)
- **all** means all the ports on the stand-alone switch, including any MDA ports (not case-sensitive)

You can also use the unit/port convention discussed in "Numbering port in stacked mode" (page 139) with a stand-alone Ethernet Switch 460-24T-PWR as long as the unit number is always 1.

Numbering port in stacked mode

In stacked mode, the value of the **<portlist>** variable must include the number of the unit within the stack, followed by a forward slash (/) and the desired port numbers. The unit numbers are always integers between 1 and 8, and the port numbers are always integers between 1 and 26. You can also use **none**, to indicate none of the ports in the stack, or **all**, to indicate all of the ports in the stack.

In stacked mode, use the **<portlist>** variable in the following formats:

- A single port number--an integer for the unit, followed by /, and an integer for the port number
  - Example: **1/7** means unit 1 port 7

— Example: `3/24` means unit 3, port 24

- A range of port numbers--an integer for the unit, followed by /, and integers for the port number between 1 and 26 separated by a dash
  - — Example: `1/1-3` means unit 1, ports 1, 2, and 3
  - — Example: `3/5-26` means unit 3, port 5 through port 26
- A unit with no ports specified--an integer for the unit, followed by /, and the word **`none`** (not case-sensitive)
  - — **`3/none`** means unit 3 with no ports
- A unit with all ports specified--an integer for the unit, followed by /, and the word **`all`** (not case-sensitive)
  - — **`3/all`** means unit 3 with all ports
- A list of port numbers, port ranges, and/or units with all ports or no ports--using the unit/port format--separated by commas
  - — Example: `1/1,2/3,3/7` means unit 1 port 1; unit 2, port 3; and unit 3, port 7
  - — Example: `1/1-3,3/9-11` means unit 1, ports 1, 2, 3; and unit 3, ports 9, 10, and 11
  - — Example: `1/1,4/3-5,5/9-11,7/15` means unit 1, port 1; unit 4, ports 3, 4, 5; unit 5, ports 9, 10, 11; and unit 7, port 15
  - — Example: **`1/3,3/ALL,4/NONE`** means unit 1, port 3; unit 3, all ports; and unit 4, no ports
- **`none`** means no ports in the stack (not case-sensitive)
- **`all`** means all the ports in the stack, including all MDA ports (not case-sensitive)

To view the unit numbers in the stack, enter the **`show stack-info`** command (see "show stack-info command" (page 317)). You must be in the privileged exec mode to enter this command.

See "Stacking" (page 247) for more information about numbering units within the stack.

How to comment and run scripts

You can use the CLI interactively, or you can load and execute CLI "scripts." CLI scripts are loaded in one of the following ways:

- By entering the **`configure network`** command.

- By manually loading the script in the console menu.
- By automatically loading the script at boot-up

Managing basic system information

This section shows you how to view basic system information, such as the current software version and the stack mode; you can renumber the units within a stack. The following topics are covered:

- "show sys-info command" (page 141)
- "show stack-info command" (page 143)

see "Stacking" (page 247) for more information about the operation of the stack mode, including unit numbering.

show sys-info command

The **show sys-info** command displays the current system characteristics, which includes Hardware rev, FW rev, date of manufacture (DOM), and Hardware deviation number. The syntax for the **show sys-info** command is:

```
show sys-info
```

The **show sys-info** command is in the privileged exec command mode.

The **show sys-info** command has no parameters or variables.

Figure 49 "show sys-info command output" (page 142) and Figure 50 "show sys-info command output" (page 142) displays sample output from the **show sys-info** command.

Figure 49
`show sys-info` command output

```
460_24T_PWR#show sys-info
Operation Mode:          Switch
MAC Address:             00-09-97-29-1F-00
Reset Count:             1
Last Reset Type:         Software Download
Power Status:            Primary Power
Autotopology:            Enabled
Current Switch Mode:     L2
Next Boot Switch Mode:   L2
Local MDA Type:          None
PoE Module FW:           7013.2
sysDescr:                Ethernet Switch 460 - 24T - PWR
                         HW:00       FW:3.0.0.5    SW:v3.6.0 ISVN:
                         Mfg Date:20021102    HW Dev:
Serial #:                SDNIHR007B
sysObjectID:             1.3.6.1.4.1.45.3.49.1
sysUpTime:               12 days, 07:04:49
sysNtpTime:              SNTP not synchronized.
sysServices:             3
sysContact:
sysName:
sysLocation:
```

Figure 50
`show sys-info` command output

```
470_48T#show sys-info
Operation Mode:          Switch
MAC Address:             00-04-38-D5-9F-C0
Reset Count:             1
Last Reset Type:         Software Download
Power Status:            Primary Power
Autotopology:            Enabled
Current Switch Mode:     L2
Next Boot Switch Mode:   L2
GBIC Port 47:            None
GBIC Port 48:            None
sysDescr:                Ethernet Switch 470 - 48T
                       HW:#0D      FW:3.0.0.5   SW:v3.6.0.00 ISVN:2
                         Mfg Date:20020717    HW Dev:
Serial #:                ACC1000CP
sysObjectID:             1.3.6.1.4.1.45.3.46.1
sysUpTime:               12 days, 08:43:00
sysNtpTime:              SNTP not synchronized.
sysServices:             3
sysContact:
sysName:
sysLocation:
470_48T#
```

To change the system contact, name, or location, refer to the **snmp-server** command.

show stack-info command

The **show stack-info** command displays the current stack information, which includes unit numbers, MDA and cascade attachments, and software version for all units. The syntax for the **show stack-info** command is:

```
show stack-info
```

The **show stack-info** command is in the privileged exec command mode.

The **show stack-info** command has no parameters or variables.

Figure 51 "show stack-info command output" (page 143) displays sample output from the **show stack-info** command.

Figure 51
show stack-info command output

```
460-24T-PWR#show stack-info
Unit #  Switch Model      MDA Model    Cascade MDA  SW Version
------  ----------------  -----------  -----------  ------------
1       460-24T-PWR       None         400-ST1      v3.6.0.00
2       460-24T-PWR       None         400-ST1      v3.6.0.00
```

show system verbose command

The **show system verbose** command displays additional system characteristics, including the status of switch fans, the power status, and the serial number of the switch.

The syntax for the **show system verbose** command is:

```
show system verbose
```

If verbose is omitted from the command, a short summary is displayed, similar to the **show sys-info** command.

The **show system verbose** is in the privileged exec command mode.

Figure 52 "show system verbose command output" (page 144) shows a sample output of the **show system verbose** command.

Figure 52
`show system verbose` command output

```
470_48T (config) # show system verbose

System Information:
            Operation Mode:              Stack
            Size of Stack:               2
            Base Unit:                   1
            MAC Address:                 00-0E-40-5D-49-DF
            Reset Count:                 10
            Last Reset Type:             Power Cycle
            Autotopology:                Enabled
            Current Switch Mode:         L2
            Next Boot Switch Mode:       L2
            sysObjectID:                 1.3.6.1.4.1.45.3.46.1
            sysUpTime:                   0 days, 00:03:50
            sysNtpTime:                  SNTP not synchronized
            sysServices:                 3
            sysContact:
            sysName:
            sysLocation:
Unit #1:    (Base Unit):
            Switch Model:                Ethernet Switch 470-48T
            MDA Model:                   None
            GBIC Port 47:                None
            GBIC Port 48:                None
            Cascade Module:              400-ST1
            Hardware Version:            #05
            Firmware Version:            3.0.0.5
            Software Version:            v3.6.0.0
            Serial Number:               SSGDFL0M01
            Manufacturing Date:          20030907
            Power Status:                Primary
            Fan #1 Status:               Normal
            Fan #2 Status:               Normal
            Fan #3 Status:               Failure
Unit #2:
            Switch Model:                Ethernet Switch 470-48T
            MDA Model:                   None
            GBIC Port 47:                None
            GBIC Port 48:                None
            Cascade Module:              400-ST1
            Hardware Version:            #05
            Firmware Version:            3.0.0.5
            Software Version:            v3.6.0.0
            Serial Number:               SSGDFL0M02
            Manufacturing Date:          20030907
            Power Status:                Primary
            Fan #1 Status:               Normal
            Fan #2 Status:               Normal
            Fan #3 Status:               Failure
```

show tech command

The **`show tech`** command displays detailed system and configuration information for technical support purposes.

The syntax for the **`show tech`** command is:

show tech

The **show tech** command is in the exec command mode.

show interfaces gbic-info command

The **show interfaces gbic-info** command displays hardware specifications for GBICs on the switch.

The syntax for this command is:

show interfaces gbic-info <portlist>

where **<portlist>** specifies the GBIC port or ports to display. Omitting this variable shows the details for all GBICs in the stack.

The **show interfaces gbic-info** command is in all command modes.

Figure 53 "show interfaces gbic-info command output" (page 145) shows a sample output for the **show interfaces gbic-info** command.

Figure 53
show interfaces gbic-info command output

```
UNIT #1
 Port  Number        47
 GBIC   Type         XXXXXXX
 Vendor Name         XXXX
 Vendor OUI          12345
 Vendor Part #       12345
 Vendor Revision     X.X
 Vendor Serial #     12345-12345
 HW Options          XXXXXXX
 Date Code           01012010
 Vendor Data         XXXXXXX
```

Chapter 5
Installing and using Device Manager software

Java Device Manager (JDM) is an SNMP-based graphical user interface (GUI) tool designed to manage single devices. To use JDM (also referred to in this manual as Device Manager), you must have network connectivity to a management station running JDM in one of the supported environments.

The JDM software is provided on the software CD as a self-extracting executable file, and is also available from the Nortel web site. This chapter provides instructions for installing the JDM software in a Windows*, UNIX*, or Linux* environment.

In Ethernet Switch Release 3.6 software, the Java Runtime Environment (JRE) is bundled with the JDM software and does not require a separate installation.

This chapter includes the following topics:

JDM installation precautions

The following warnings apply to Device Manager on all operating environments:

- If you have other Nortel switches in your network, and are running earlier versions of JDM software, you must install the newest version of JDM to access the switches running the latest software.
- Prior to upgrading JDM, either uninstall your previous version of the Device Manager software, or install the new software to a different directory. (You can have multiple versions of Device Manager stored on your PC or UNIX machine, provided that each version is stored in a separate directory.)

Note: Do not install the JDM to a directory where a previous version of Device Manager software already exists.

- The JDM and Ethernet Switch software versions must match for the correct dialog boxes and information to be shown and accessible. See the Release Notes for a complete compatibility list.
- JDM saves the IP addresses that are visited to a settings file. A JDM uninstall operation does not remove this settings file.
  - In a Windows environment, the settings file is *dm.ini*, and is created in the JDM install directory.
  - In a Unix environment, the settings file is *~/.jdm/dm.ini*.
  - In a Linux environment, the settings file is *~/.jdm/dm.ini*.
- The *dm.ini* file containing IP addresses visited from a previous JDM version is automatically used by a new JDM version installed in the same directory. You must manually move or copy the *dm.ini* file from a previous version of JDM to a new JDM installation in a different directory.

Installing JDM on Windows

This section includes the following topics:

Windows minimum requirements

The minimum system requirements for installing JDM on Microsoft*Windows NT*, Windows 95, Windows 98, Windows 2000, or Windows XP are:

- 350 MHz or higher Pentium processor
- 256 MB DRAM
- 300 MB space on hard drive

Removing previous versions of JDM on Windows

Note: Removing previous versions of JDM is an optional process. Multiple versions of JDM can exist on one system, as long as each version is in a separate location.

If you decide to allow previous versions of JDM to remain, you must choose a different folder to use during the installation process.

Remove existing versions of Device Manager software by using the Uninstall DM option that was created in the Windows Start menu during installation.

For example, to remove Device Manager from a Windows XP system using the default program group, choose the following option from the Windows Start menu: All Programs>Nortel>Java Device Manager>Uninstall DM.

If no program group was added to the Windows Start menu during installation, complete the following steps to remove existing Device Manager software:

Step	Action
1	Navigate to the folder where the JDM software is installed.
2	Open the UninstallerData sub-folder.
3	Run the following file: *Uninstall Java Device Manager.exe*. ***Note:*** If more than one version of Device Manager software is installed, ensure you select the correct software to uninstall.

—End—

Installing JDM on Windows from the CD

To access the JDM software from the installation CD:

Step	Action
1	Close all programs.
2	Insert the software CD into your CD-ROM drive.
3	From the Windows Start menu, choose Run. The Run dialog box appears.
4	Use Browse to navigate to the drive where the CD-ROM is located.
5	On the CD-ROM drive, locate the \Windows\Device Manager subdirectory.
6	Double-click the *jdm_xxxx.exe* file. ***Note:*** In the file name, xxxx represents the current version of the JDM software.

—End—

Continue with "Executing the JDM installation software on Windows" (page 151).

Installing JDM on Windows from the web

To obtain the JDM software from the Nortel web site:

Step	Action
1	Go to the following URL: http://www.nortel.com/support
2	Select the correct software support page for your product. From the Product Finder page: a. Select the product family from the first box. b. Select the specific product from the second box. c. Select Software. d. Click Go. The software page appears.
3	Click the Java Device Manager version you want. The Software Detail Information page appears.
4	Click JDM for PC (95/98/NT/2000/XP). A File Download dialog box appears that asks you to either run this program from its current location or to download the JDM software to your system.
5	Click Save. A Save As dialog box appears.
6	Choose the directory to which you want to download the software. The software download is a self-extracting .exe file.
7	Click Save to begin the file transfer. When the file transfer is complete, continue with Step 8.
8	Close all programs.
9	Navigate to the directory on your system where you downloaded the JDM Software.
10	Double-click the *jdm_xxxx.exe* file. ***Note:*** In the file name, xxxx represents the current version of the JDM software.

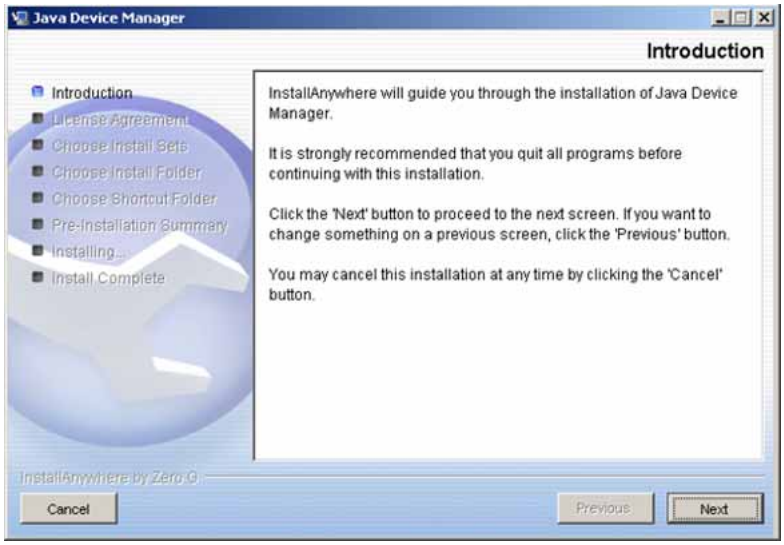
—End—

Continue with "Executing the JDM installation software on Windows" (page 151).

Executing the JDM installation software on Windows

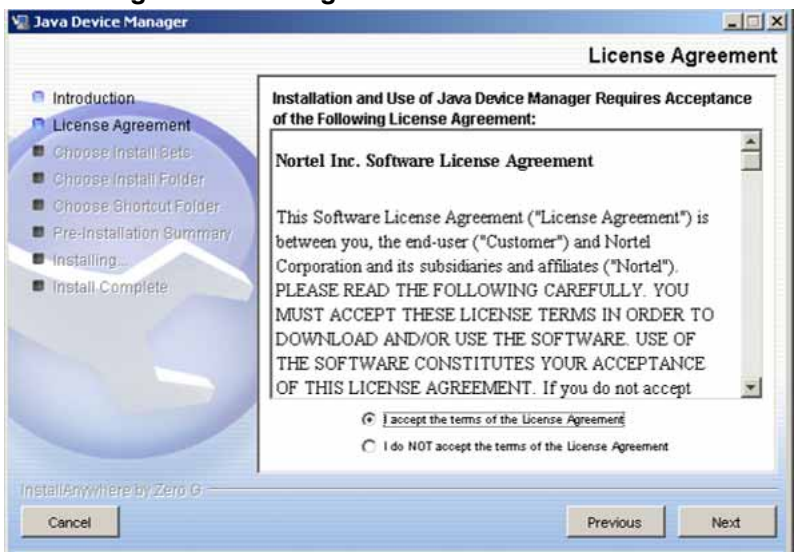
An install screen opens, followed by a Nortel dialog box. When the InstallAnywhere Introduction dialog box appears (Figure 54 "InstallAnywhere Introduction dialog box" (page 151)), you are ready to install the JDM.

Figure 54
InstallAnywhere Introduction dialog box



Step	Action
1	Click Next to begin the installation process. The License Agreement dialog box appears.
2	Click I accept the terms of the License Agreement, as shown in Figure 55 "License Agreement dialog box" (page 152).

Figure 55
License Agreement dialog box



3 Click Next.

The Choose Install Set dialog box appears, as shown in Figure 56 "Choose Install Set dialog box" (page 152).

Figure 56
Choose Install Set dialog box

4 Do one of the following:

- Select Typical installation to install the common set features, as well as online help.

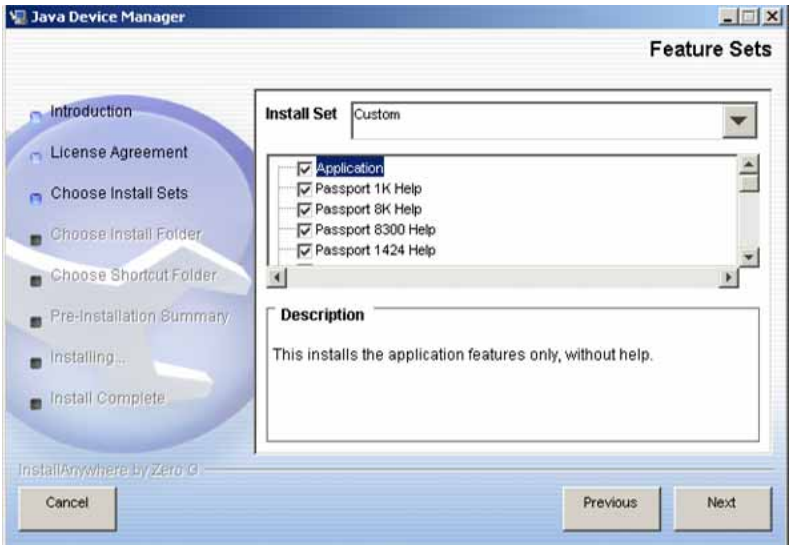
- Select Minimal installation to select minimal features to install (recommended for those with limited disk space).
- Select Help to install only the online help.
- Select Custom installation to customize the features prior to installation.

5 Click Next.

If you did not select Custom installation in Step 4, the Choose Install Folder dialog box appears. Continue with Step 8 on Step 8.

If you selected Custom installation in Step 4, the Feature Sets dialog box appears, as shown in Figure 57 "Feature Sets dialog box" (page 153).

Figure 57
Feature Sets dialog box

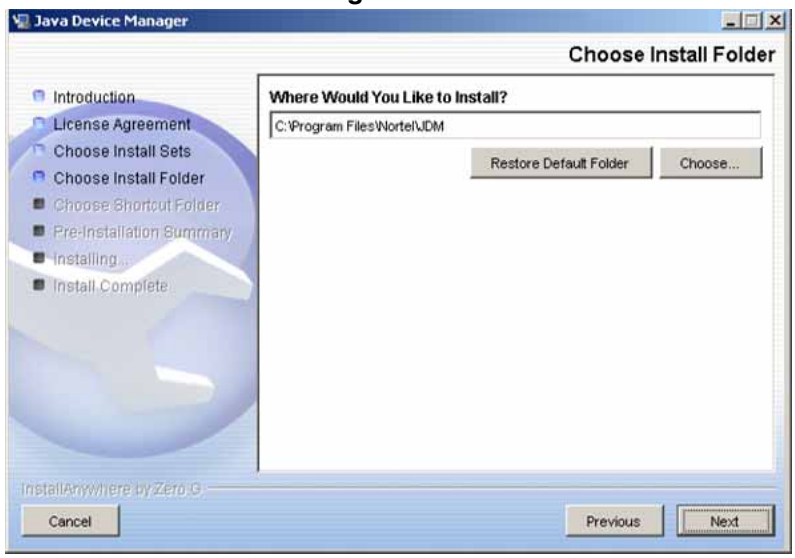


6 Select which features to install from the feature sets list.

7 Click Next.

The Choose Install Folder dialog box appears, as shown in Figure 58 "Choose Install Folder dialog box" (page 154).

Figure 58
Choose Install Folder dialog box



8 Click Restore Default Folder to use the default location for JDM, or click Choose to select a different storage path.

Note: If Device Manager is already installed on your computer, you must choose a storage path that does not conflict with the already existing version.

9 Click Next.

The Choose Shortcut Folder dialog box appears, as shown in Figure 59 "Choose Shortcut Folder dialog box" (page 155).

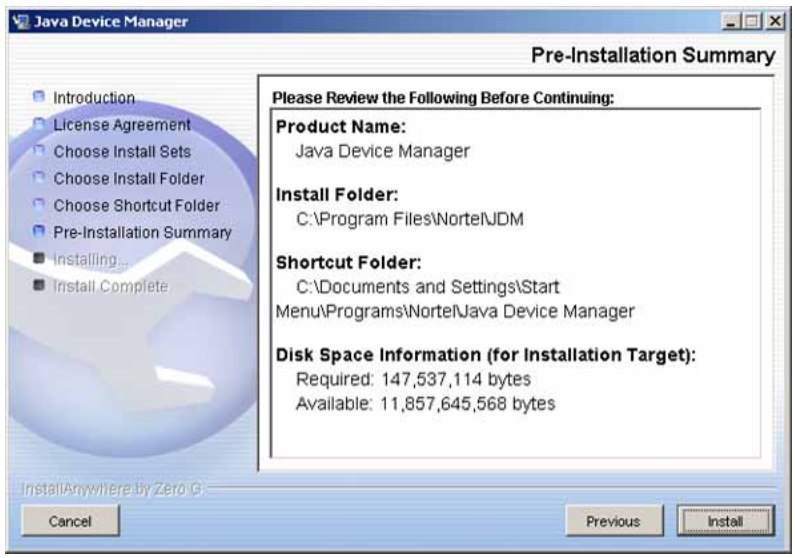
Figure 59
Choose Shortcut Folder dialog box

10 Select the desired shortcut path from the list provided.

11 Click Next.

The Pre-Installation Summary dialog box appears, as shown in Figure 60 "Choose Shortcut Folder dialog box" (page 155). A summary of the choices you have made is displayed for confirmation.

Figure 60
Choose Shortcut Folder dialog box

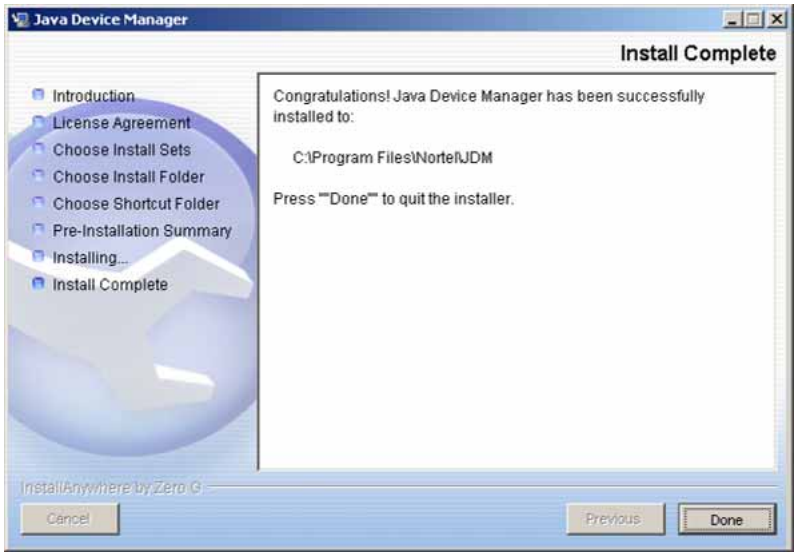


12 Verify the folder, shortcut, and disk space required to install the software. If necessary, click Previous to return to the appropriate dialog box and make changes.

13 Click Install.

The installation process begins. When the installation is complete, the Install Complete dialog box appears, as shown in Figure 61 "Install Complete dialog box" (page 156).

Figure 61
Install Complete dialog box



14 Click Done to exit the installation.

JDM is now installed on your machine. For instructions on starting the Device Manager software, see "Starting Device Manager" (page 164).

—End—

Installing JDM on UNIX or Linux

Note 1: JDM installation procedures are now standardized across all platforms. In addition, the required Java Runtime Environment (JRE) version 1.4.1 is now part of the JDM installation package and does not require a separate installation. The bundled JRE is used with this JDM only, and does not affect other Java applications on the same system.

Note 2: Solaris and HP-UX, certain OS patches are required for JDM/JRE to function properly. Consult SUN or HP to install the appropriate OS patches before launching JDM.

Note 3: UNIX and Linux systems are case-sensitive. Use lower-case to specify file names, and check to ensure that directories are entered correctly.

This section includes the following topics:

Unix minimum requirements

JDM supports two UNIX platforms and one Linux platform:

- a UNIX SPARC* workstation running the Sun* Solaris* 2.7.x (or higher)
- an HP* workstation running the HP-UX* 11.x operating system (or higher)
- a PC running Linux Kernel 2.2 operating system (or higher)

The minimum system requirements for installing JDM on any Unix or Linux platform are:

- 4 MB available in a temporary directory
- 300 MB free in the directory where you want to install the JDM software
- 128 MB DRAM

Installing JDM on Linux from the CD

To install the Device Manager software to a Linux environment from the CD:

Step	Action
1	Close all programs.
2	Insert the software CD into your CD-ROM drive.
3	Navigate to the Linux/JDM subdirectory on the software CD.
4	Run the *jdm_xxxx_linux.sh* file. Continue with "Executing the JDM installation software on UNIX or Linux" (page 160).

—End—

Installing JDM on Solaris from the CD

To install the JDM software to a Solaris environment from the CD:

Step	Action
1	Close all programs.
2	Insert the software CD into your CD-ROM drive.
3	Navigate to the Solaris/JDM subdirectory on the software CD.
4	Run the *dm_xxxx_solaris_sparc.sh* file. Continue with "Executing the JDM installation software on UNIX or Linux" (page 160).

—End—

Installing JDM on HP-UX from the CD

To install the JDM software to a HP-UX environment from the CD, follow these steps with the exact syntax:

Step	Action
1	Close all programs.
2	Insert the software CD into your CD-ROM drive.
3	Navigate to the HP-UX/JDM subdirectory on the software CD.
4	Run the *jdm_xxxx_hpux_pa-risc.sh* file. Continue with "Executing the JDM installation software on UNIX or Linux" (page 160).

—End—

Installing JDM on UNIX or Linux from the web

To install the JDM software to a UNIX (Solaris or HP-UX) environment from the web:

Step	Action
1	Go to the following URL: http://www.nortel.com/support
2	Select the correct software support page for your product.

This requires four steps from the Product Finder page:

a. Select the product family from the first box.

b. Select the specific product from the second box.

c. Select Software.

d. Click Go.

The software page appears.

3 Click the Java Device Manager version you want.

The Software Detail Information page appears.

4 Click the appropriate JDM file for you operating environment.

A File Download dialog box appears that asks you to either run this program from its current location or to download the JDM software to your system.

5 Click Save.

A Save As dialog box appears.

6 Choose the directory, to which you want to download the software. The software download is a self-extracting .sh file.

7 Click Save to begin the file transfer.

When the file transfer is complete, continue with Step 8.

8 Close all programs.

9 Navigate to the directory on your system where you loaded the JDM software.

10 Make the installation file executable.

For the Solaris environment, make the file executable by entering: **`chmod a+x dm_xxxx_solaris_sparc.sh`**

For the HP-UX environment, make the file executable by entering:**`chmod a+x jdm_xxxx_hpux_pa-risc.sh`**

For the Linux environment, make the file executable by entering:**`chmod a+x jdm_xxxx_linux.sh`**

11 Run the installation file.

For the Solaris environment, run the *dm_xxxx_solaris_sparc.sh* file.

For the HP-UX environment, run the *jdm_xxxx_hpux_pa-risc.sh* file.

For the Linux environment, run the *jdm_xxxx_linux.sh* file.

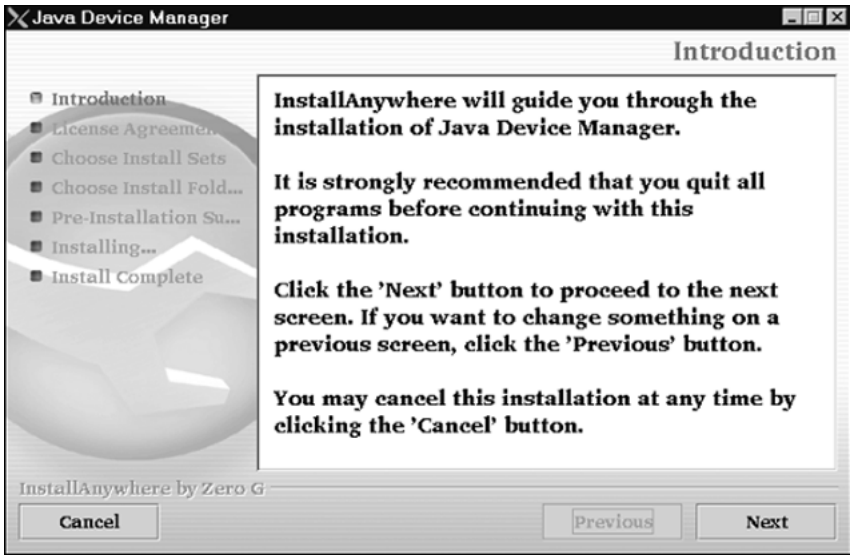
Continue with "Executing the JDM installation software on UNIX or Linux" (page 160).

—End—

Executing the JDM installation software on UNIX or Linux

An install screen opens, followed by a Nortel dialog box. When the InstallAnywhere Introduction dialog box appears (Figure 62 "InstallAnywhere Introduction dialog box" (page 160)), you are ready to complete the JDM installation.

Figure 62
InstallAnywhere Introduction dialog box



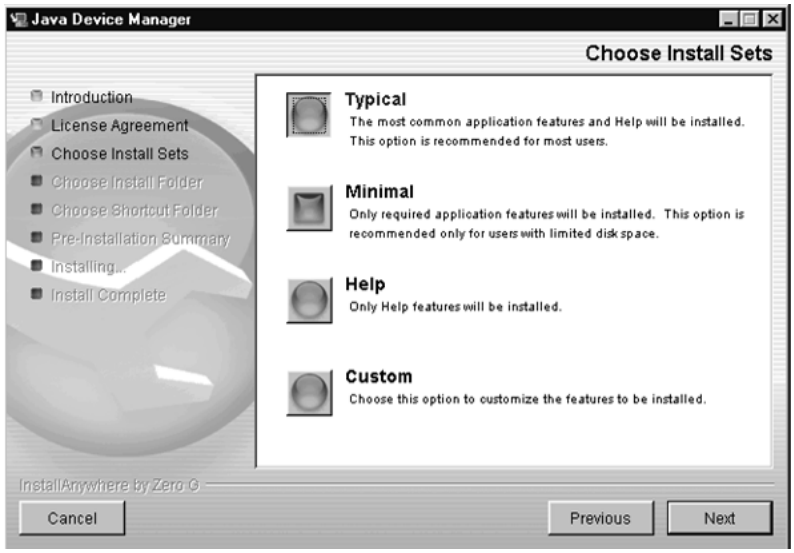
Step	Action
1	Click Next to continue the installation process. The License Agreement dialog box appears.
2	Click I accept the terms of the License Agreement, as shown in Figure 63 "License Agreement dialog box" (page 161).

Figure 63
License Agreement dialog box

3 Click Next.

The Choose Install Set dialog box appears, as shown in Figure 64 "Choose Install Set dialog box" (page 161).

Figure 64
Choose Install Set dialog box



4 Do one of the following:

- Select Typical installation to install the common set features, as well as online help.
- Select Minimal installation to select minimal features to install (recommended for those with limited disk space).

- Select Help to install only the online help.
- Select Custom installation to customize the features prior to installation.

5 Click Next.

If you did not select Custom installation in Step 4, the Choose Install Folder dialog box appears. Continue with Step 8 on Step 8.

If you selected Custom installation in Step 4, the Feature Sets dialog box appears.

6 Select the features to install from the feature sets list.

7 Click Next.

The Choose Install Folder dialog box appears, as shown in Figure 65 "Choose Install Folder dialog box" (page 162).

Figure 65
Choose Install Folder dialog box

8 Click Restore Default Folder to use the default location for JDM, or click Choose to select a storage path.

Note: If Device Manager is already installed on your computer, you must choose a storage path that does not conflict with the already existing version.

9 Click Next.

The Pre-Installation Summary dialog box appears.

10 Verify the folder and disk space required to install the software. If necessary, click Previous to return to the appropriate dialog box and make changes.

11 Click Install.

The installation process begins.

When the installation is complete, the Install Complete dialog box appears, as shown in Figure 66 "Install Complete dialog box" (page 163).

Figure 66
Install Complete dialog box

12 Click Done to exit the installation.

JDM is now installed on your machine. For instructions on starting the Device Manager software, see "Device Manager basics" (page 163).

—End—

Device Manager basics

This section describes basic procedures for using the Device Manager software. The section includes the following information:

- Instructions to start Device Manager, set the Device Manager properties, and open a device (next)
- A summary of the Device Manager user interface features and how to use them ("Device Manager window" (page 171))

- Instructions to view statistics and display graphs ("Working with statistics and graphs" (page 180))
- Instructions to use Device Manager to Telnet to a switch (" Telneting to a switch" (page 186))
- Information about the trap log ("Trap log" (page 187))
- Information about the Web-based management system ("Accessing the Web-based management system" (page 188))
- Information about online Help ("Online help" (page 188))

Starting Device Manager

Note: Before you can manage a switch using Device Manager, you must set an IP address for the switch using the CLI.

To start Device Manager, do one of the following:

- In the Windows* environment, choose All Programs > Nortel > Java Device Manager > DM from the Windows Start menu.
- In a UNIX* environment, verify that the Device Manager installation directory is in your search path and then type: **`JDM`**

An abbreviated Device Manager window appears, as shown in Figure 67 "Device Manager window" (page 164).

Figure 67
Device Manager window

Note: On startup, Device Manager performs a DNS lookup for the machine on which it is running. If the DNS lookup is slow or fails, the initial Device Manager window can take up to 30 seconds to open.

Setting the Device Manager properties

Device Manager uses the Simple Network Management Protocol (SNMP) to configure and manage Ethernet Switches 460 and 470. You can use the Device Manager Properties dialog box to configure important communication parameters in the Polling, SNMP and Application Control fields.

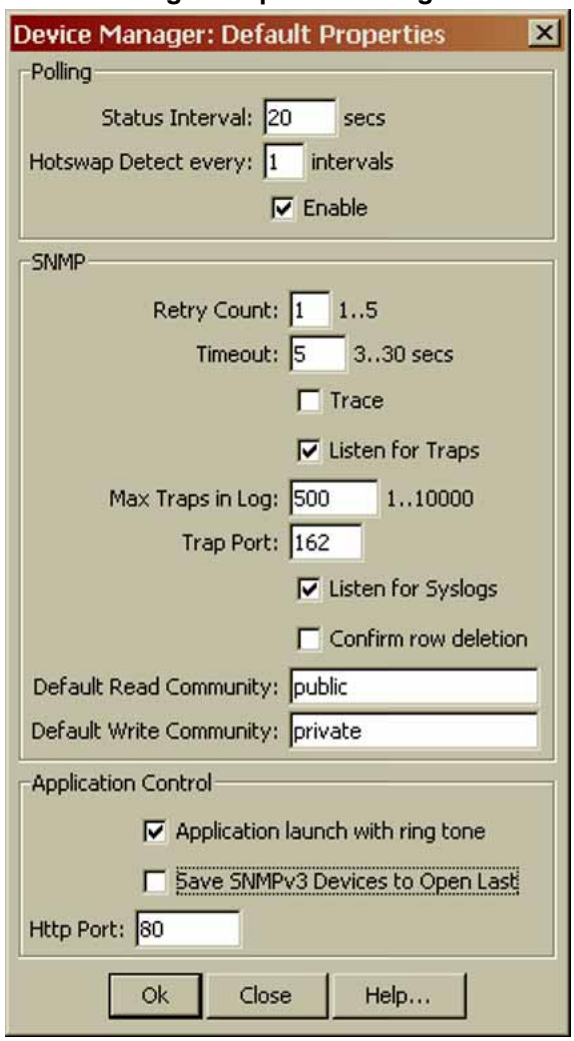
When you set the Device Manager properties before opening a device, the values you apply become the default Device Manager properties and are applied for each subsequent switch that you open.

When you set the Device Manager properties while a device is opened, the properties are applied and saved for that switch only.

To set the Device Manager properties:

Step	Action
1	From the Device Manager menu bar, choose Device > Properties > Current. The Properties dialog box appears().

Figure 68
Device Manager Properties dialog box



2 Select properties you want to change and set their values.

3 Click OK.

—End—

Table 42 " Properties dialog box items" (page 167) describes the Properties dialog box items.

Table 42
Properties dialog box items

Area	Item	Description
Polling	Status Interval	Interval at which statistics and status information is gathered. For a full stack, set this interval to between 120 and 300 seconds.
	Hotswap Detect every	The frequency at which Device Manager polls for hot swap module information. This value is in relation to the Status Interval value. For example, if the Status Interval is set to 120, and the value for Hotswap Detect every is 2, Device Manager polls the hot swap modules every 240 seconds. If less frequent hot swap polling is desired, set this value to poll every 2 or 3 intervals.
	Enable	Enables (true) or disables (false) periodic polling of the device for updated status. If polling is disabled, the chassis status is updated only when you click Refresh on the Chassis tab.
SNMP	Retry Count	Number of times Device Manager sends the same polling request if a response is not returned to Device Manager. You may want to set this field to three or four.
	Timeout	Length of each retry of each polling waiting period. When you access the device through a slow link, you may want to increase the timeout interval and then change the Retransmission Strategy to superlinear.
	Trace	The trace field is used to enable and disable SNMP tracing. When Trace is selected, SNMP protocol data units (PDUs) are displayed in the Device > Log dialog box.
	Listen for Traps	When selected (enabled), Device manager listens for traps from the device.
	Max Traps in Log	The specified number of traps that may exist in the trap log. The default is 500.
	Trap Port	Specifies the UDP port that Device Manager uses to listen for SNMP traps.
	Listen for Syslogs	Enables the Device Manager to listen to the syslog.
	Confirm row deletion	When selected (enabled), Device Manager displays a dialog box for confirmation before deleting a system table row.
	Default Read Community	Displays the default Read Community type. You can edit this field by highlighting the current value and typing over it.

Area	Item	Description
	Default Write Community	Displays the default Write Community type. You can edit this field by highlighting the current value and typing over it.
Application Control	Application launch with ring tone	When selected, a ring tone sound is played as Device Manager opens.
	Save SNMPv3 Devices to Open Last	When selected, you can maintain a list of SNMPv3 switches previously opened.
	Http Port	Port used to communicate between the Web client and the server. You can edit this field by highlighting the current value and typing over it. The default is port 80. ***Note:*** The Http Port values in the Device Manager Default Properties dialog box and the switch Device Manager Properties dialog box, must be the same to be able to access the Web-based management system.

Opening a device

"Opening" a device displays the device view. To open the device view, you must enter community strings that determine the access level granted to the device.

Table 43 " SNMP community string default values" (page 168) shows the default access community strings for the Device Manager software.

Table 43
SNMP community string default values

Access level	Description
Read-only	public
Read-write	private

To display the device view:

Step	Action
1	Do one of the following: • Choose Device > Open. • Choose Device > Open Last, and select an IP address from the list. • Click the folder icon in the Device Manager window.

- Press [Ctrl] + O.

The Open Device dialog box appears(Figure 69 "Open Device dialog box" (page 169)).

Figure 69
Open Device dialog box

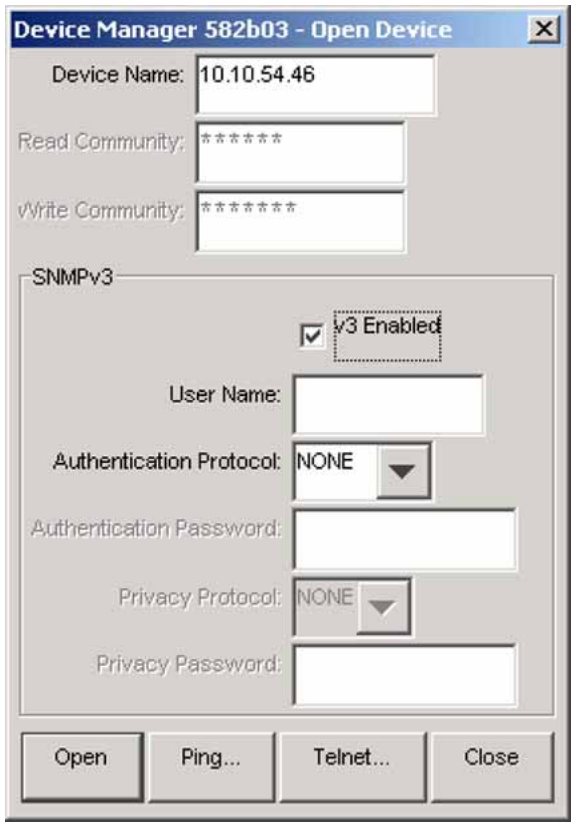


Table 44 " Open Device dialog box fields" (page 169) describes the Open Device dialog box fields.

Table 44
Open Device dialog box fields

Fields	Description
Device Name	Either an IP address or a DNS name for the device, entered by the user.
Read Community	SNMP read community string for the device. Default is **public** (displayed as ******). The entry is case-sensitive.

Fields	Description
Write Community	SNMP write community string for the device. Default is **private** (displayed as *******).The entry is case-sensitive.
v3 Enable	When selected (enabled), Open Device dialog box displays SNMPv3 options.
User Name	Indicates the name of the user
Authentication Protocol	Identifies the authentication protocol used: NONE, MD5 or SHA-96.
Authentication Password	Specifies the current authentication password
Privacy Protocol	Identifies the privacy protocol
Privacy Password	Specifies the current privacy password

2 In the Device Name text box, type the DNS name or IP address of the device.

3 In the Read Community and Write Community text boxes, type the proper community strings

4 Click Open.

Device Manager automatically determines what version of software the selected device is running and displays the appropriate Device Manager dialog boxes.

The Device Manager window appears, displaying a dialog box of the device(Figure 70 "Device view" (page 170))that represents the physical features of the device.

Figure 70
Device view

Note: For additional details on using SNMP with Ethernet Switches 460 and 470, and instructions on how to open a device using SNMPv3, see *Security — Configuration (NN47210-500)*.

—End—

Device Manager window

The Device Manager window(Figure 71 "Parts of the Device Manager window" (page 171))has the following parts:

- Menu bar "Menu bar" (page 171)
- Toolbar "Toolbar" (page 172)
- Device view "Device view" (page 173)
-

Figure 71
Parts of the Device Manager window

Menu bar

Use the menu bar to set up and operate Device Manager(Table 45 " Menu bar commands" (page 171)).

Table 45
Menu bar commands

Command	Description
Device	Open a device, refresh the device view, and set the polling and SNMP properties. You can also open and view the Trap Log, SysLog, and Log and Telnet or open an SSH connection to the device that is currently open.
Edit	Opens edit dialog boxes for the objects selected in the device view. This command also opens dialog boxes for managing files and running diagnostic tests. With this command, you can also set SNTP, SNMP v3 and related configurations.
Graph	Opensstatistics dialog boxes for the selected object.
VLAN	Opens dialog boxes for managing VLANs, Spanning Tree Groups (STGs, RSTP, MSTP), Multi-Link Trunks and LACP.
QoS/COPS	Opens configuration and monitoring dialog boxes for Quality of Service (QoS), or Differentiated Services, and Common Open Policy Services (COPS).

Command	Description
Rmon	Opens RMON configuration and monitoring dialog boxes.
Actions	Open the Home page for the Web-based management session.
Help	Opensonline Help topics for Device Manager and provides a legend for the port colors in the device view.

Toolbar

The toolbar contains buttons that provide quick access to commonly used commands and some additional actions.Table 46 " Toolbar buttons" (page 172) describes the toolbar buttons.

Table 46
Toolbar buttons

Button	Name	Description	Menu bar equivalent
	Open Device	Opens the Open Device dialog box.	Device > Open
	Refresh Device Status	Refreshes the device view information.	Device > Refresh Status
	Trap Log	Opens the trap log.	Device > Trap Log
	Help	Opens online Help in a Web browser.	Help > Device
	Edit Selected	Displays configuration data for the selected chassis object.	Edit > Unit Edit > Chassis Edit > Port
	Graph Selected	Opens statistics and graphing dialog boxes for the selected object.	Graph > Chassis Graph > Port

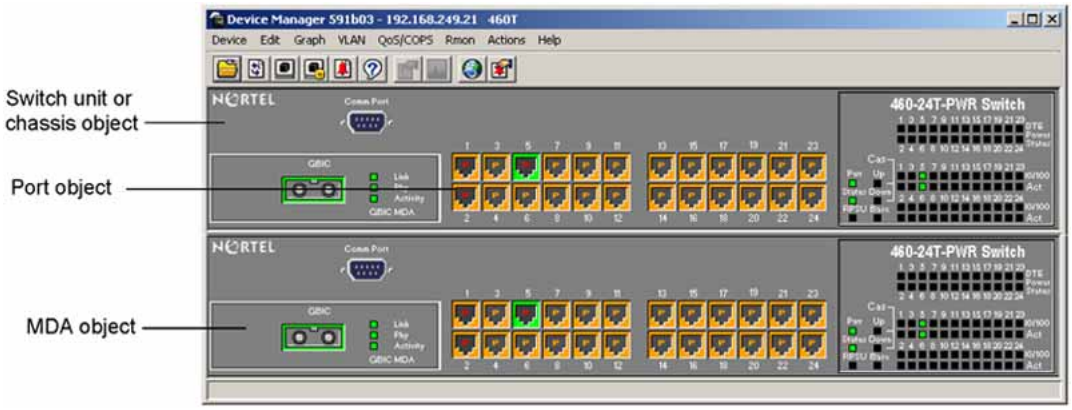
Button	Name	Description	Menu bar equivalent
	Globe	Opens a Web-based management session.	Actions > Open Home Page
	Telnet	Opens a Telnet session.	Device > Telnet
	SSH	Opens an SSH session.	Device > SSH Connection
	Alarm Manager	Opens the Rmon Alarm Manager.	Rmon > Alarm Manager

Device view

You can use the device view to determine at a glance the operating status of the various units and ports in your hardware configuration. You also can use the device view to perform management tasks on specific objects.

Figure 72 "Objects in the device view" (page 173) shows the parts of a typical device view.

Figure 72
Objects in the device view



The device view also displays devices that are down in a stack.

The followingdescribe how you select and use objects in the device view:" Selecting objects" (page 174)

- " Selecting a single object" (page 174)
- "Selecting multiple objects" (page 174)
- "Viewing information about an MDA" (page 175)
- " LEDs and ports" (page 176)

Selecting objects

The types of objects contained in the device view are:

- A stand-alone switch (called a unit in the menus and dialog boxes)
- A switch stack (called a chassis in the menus and dialog boxes)
- A media dependent adapter (MDA) (called a unit in the menus and dialog boxes)
- A port

Selecting a single object

To select a single object:

- Click the edge of the object.

The object is outlined in yellow, indicating that it is selected. Subsequent activities in Device Manager refer to the selected object.

Selecting multiple objects

To select multiple objects of the same type (such as ports or switches of the same type):

- Do one of the following:

- For a block of contiguous ports, drag to select the group of ports.
- For multiple ports, MDAs, or switches in the stack, [Ctrl]+ click on the objects.

To select all the ports in a stand-alone switch or in a switch stack:

- Choose Edit > Select > Ports.

To select all the "units" (switches and MDAs, but not ports):

- Choose Edit > Select > Units.

To select an entire stack:

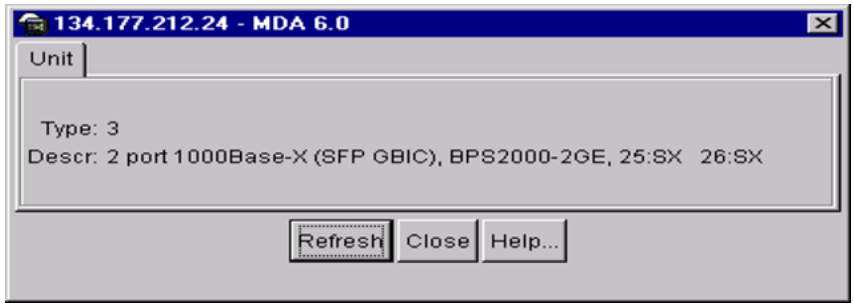
- Choose Edit > Select > Chassis.

Viewing information about an MDA

To view information about an MDA:

Step	Action
1	Select the MDA.
2	Choose Edit > Unit. The Edit > Unit dialog box appears for the MDA. The Edit > Unit dialog box describes the MDA installed in the switch(Figure 73 "MDA dialog box" (page 175)).

Figure 73
MDA dialog box



—End—

Table 48 " MDA and MDA port colors" (page 176) describes the MDA dialog box fields.

Table 47
MDA dialog box fields

Field	Description
Type	Type of component or subcomponent installed in the Ethernet Switch 460-24T-PWR.
Descr	Description of the component or subcomponent installed in the Ethernet Switch 460-24T-PWR. If not available, the value is a zero-length string.

Media dependent adapters and port conventions

The conventions on the graphical representation of the switch are different from the actual switch. The colors in the graphical representation of the MDA and ports are color-coded to provide port status.

describes the colors in the graphical representation of the MDA and its ports.

Table 48
MDA and MDA port colors

Color	Description
Green	Port is operating.
Red	Port was manually disabled.
Orange	Port has no link.
Gray	Port is unmanageable.

A blinking LED on an MDA is not indicated in the graphical representation of the switch.

For a full description of switch LEDs, see the respective switch user manuals.

LEDs and ports

The color of LEDs in the device view is the same as the colors of the LEDs on the physical switch. However, the device view does not show blinking activity of the LEDs.

For a full description of the LEDs for the Ethernet Switches 460 and 470, see Chapter 2 "About Ethernet Switches 460 and 470" (page 27).

The ports on the device view are color coded to show port status.

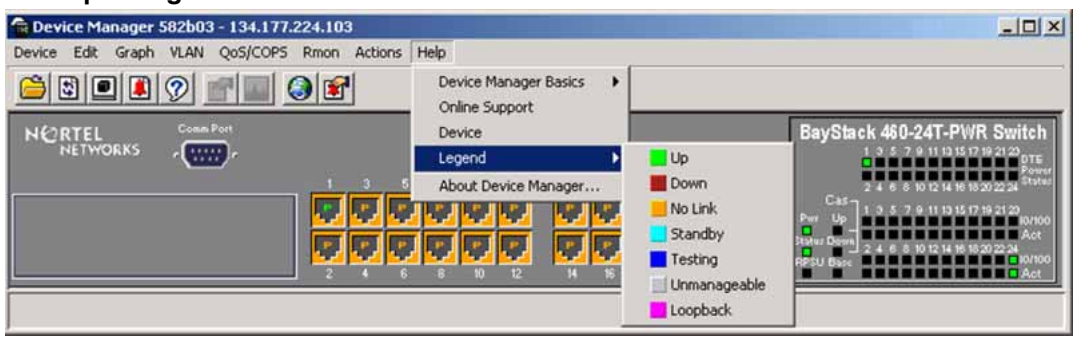
shows the status assigned to each color.

Table 49
Port color codes

Color	Description
Green	Port is operating.
Red	Port was manually disabled.
Orange	Port has no link.
Gray	Port is unmanageable.

In addition, the Help menu provides a legend that identifies the port colors and their meanings.

Figure 74
Color port legend



Shortcut menu

Each object in the device view has a shortcut menu that opens when you right-click a selected object. The Switch shortcut menu provides access to basic hardware information about the switch and to the graphing dialog boxes for the switch.

Figure 75
Switch unit shortcut menu

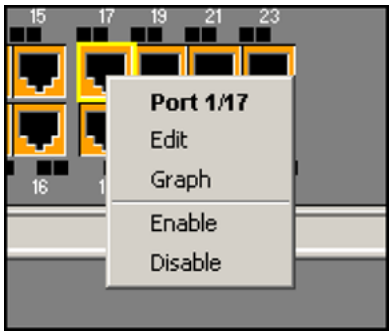
describes the commands on the switch unit shortcut menu.

Table 50
Switch unit shortcut menu commands

Command	Description
Edit	Opens a dialog box that provides basic hardware information about the switch.
Refresh Port Tooltip	Refreshes the port tooltip data of the switch. The port tooltip data contains: Slot/Port, PortName, and PortOperSpeed.
Disable Port Tooltip	Disables the port tooltip function of the switch.

The port shortcut menu provides a faster path for editing and graphing a single port; however, you can access the same options using the menu bar or the toolbar.

Figure 76
Port shortcut menu



describes the commands on the port shortcut menu.

Table 51
Port shortcut menu commands

Command	Descriptions
Edit	Open a dialog box to set operating parameters for the port.
Graph	Opens a dialog box that displays statistics for the port as a graph.
Enable	Administratively brings a port up.
Disable	Administratively shuts down a port. The color of the port changes to red in the device view.

The MDA shortcut menu contains only the Edit command, which opens a read-only dialog box with basic hardware information about the MDA.

Figure 77
MDA shortcut menu

Status bar

The status bar displays error and informational messages from the software application. These messages are not related to the device being managed.

Using the buttons in Device Manager dialog boxes

describes buttons in Device Manager dialog boxes. Not all buttons appear in all dialog boxes.

Table 52
Device Manager buttons

Button	Name	Description
	Insert	Opens a dialog box to create a new entry for a table and then inserts the new entry from the dialog box in the table.
	Copy	Copies selected cells from a table.
	Paste	Pastes copied values to a currently selected table cell.
	Reset Changes	Causes changed (but not applied) fields to revert to their previous values.
	Print Table or Print Graph	Prints a table or graph.
	Stop	Stops the current action (compiling, saving, and so forth). If you are updating or compiling a large data table, the Refresh button changes to a Stop button while this action is taking place. Clicking the Stop button interrupts the polling process.
	Export Data	Exports information to a file you specify. You can import this file into a text editor or spreadsheet for further analysis.

Editing objects

You can edit objects and values in the Device Manager device view in the following ways:

- Select an object and, on the toolbar, click the Edit Selected button.

The edit dialog box appears for that object.

- From a switch or port shortcut menu, choose Edit. The edit dialog box appears for that object.

When you change the value in a box, the changed value is shown in **bold**. However, changes are not applied to the running configuration until you click Apply.

Note: Many dialog boxes contain a Refresh button. After you apply changes to fields, click Refresh to display the new information in the dialog box.

Working with statistics and graphs

Device Manager tracks a wide range of statistics for each switch, the stack (chassis), and each port. You can view and graph statistics for a single object or multiple objects. For information about the statistics tracked for the switch and ports, see "Statistics for single and multiple objects" (page 183) and to the *Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*.

This section describes the types of statistics and graphs available, the graph dialog boxes, and the procedure for creating a graph.

Types of statistics

The data tables in the statistics dialog boxes list the counters, or categories of statistics being gathered, for the specified object. For example, the categories for ports include Interface, Ethernet Errors, Bridge, and Rmon. Each category can be associated with six types of statistics.

You can set the polling intervals for each graph from a pull-down menu offering the following choices: None, 2 seconds, 5 seconds, 10 seconds, 30 seconds, 1 minute, 5 minutes, 30, minutes, or 1 hour.

Table 53 " Types of statistics" (page 180) The following table describes the types of statistics shown in the statistics dialog boxes.

Table 53
Types of statistics

Statistic	Description
AbsoluteValue	The total count since the last time counters were reset. A system reboot resets all counters.

Statistic	Description
Cumulative	The total count since the statistics window was first opened. The elapsed time for the cumulative counter is shown at the bottom of the graph window.
Average/sec	The cumulative count per polling interval.
Minimum/sec	The minimum average for the counter per polling interval.
Maximum/sec	The maximum average for the counter per polling interval.
LastVal/sec	The average for the counter during the previous polling interval.

Types of graphs

With Device Manager, you can create line, area, bar, and pie graphs. Figure 78 "Line graph" (page 181), Figure 79 "Area graph" (page 182), Figure 80 "Bar graph" (page 182), and Figure 81 "Pie graph" (page 183) illustrate the different graph styles, respectively.

Figure 78
Line graph

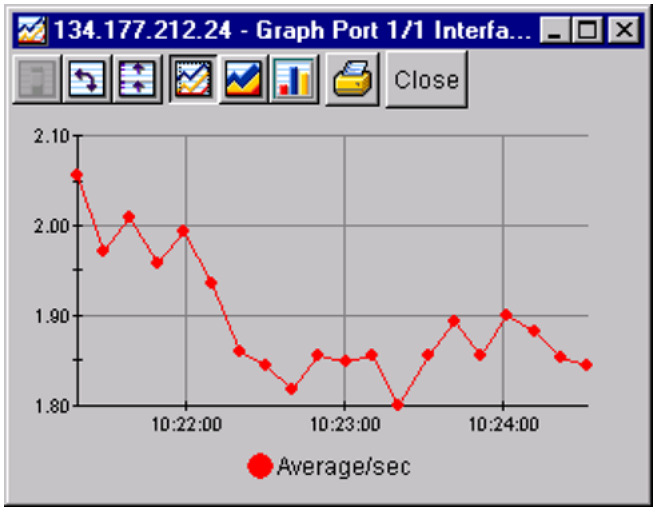


Figure 79
Area graph

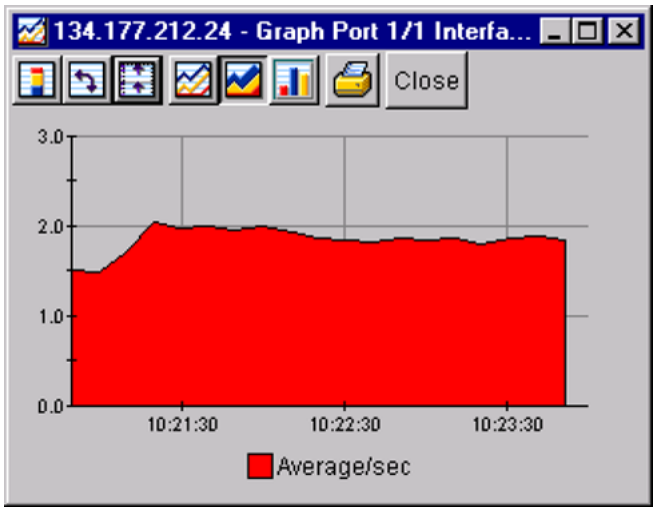


Figure 80
Bar graph

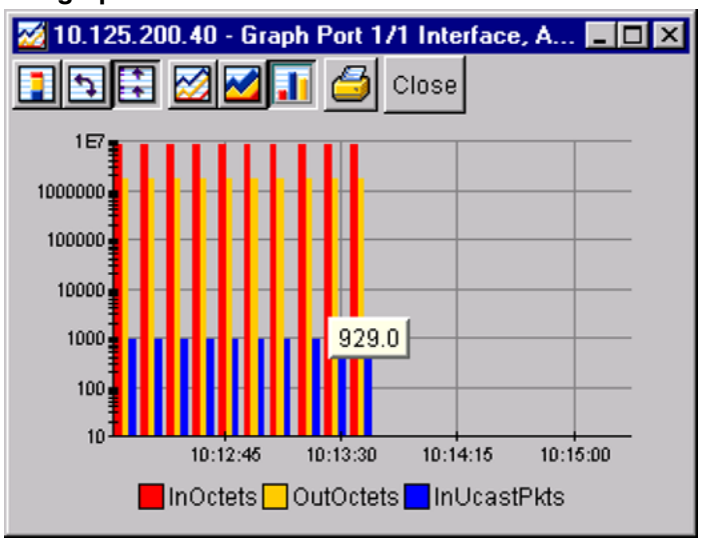
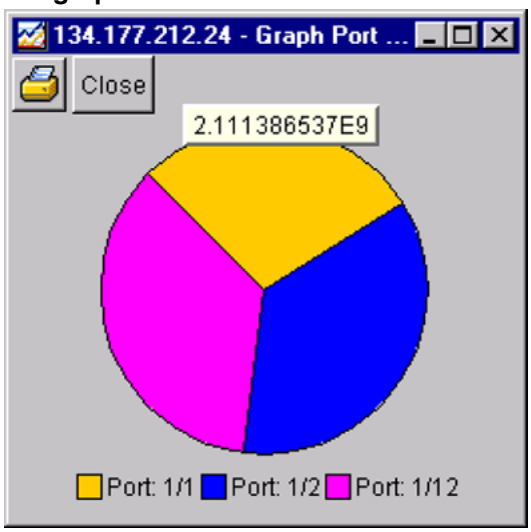


Figure 81
Pie graph

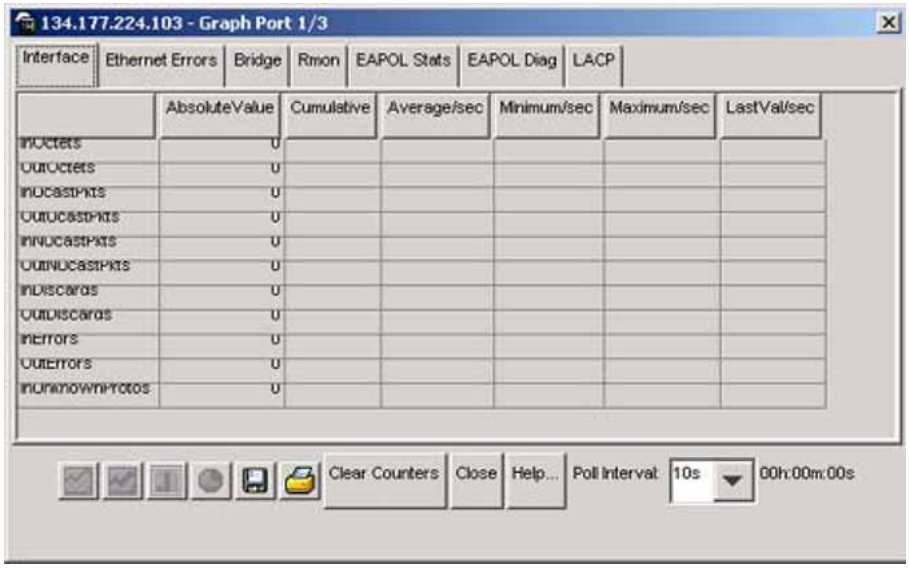


Statistics for single and multiple objects

The statistics dialog box displays statistics for a selected object.

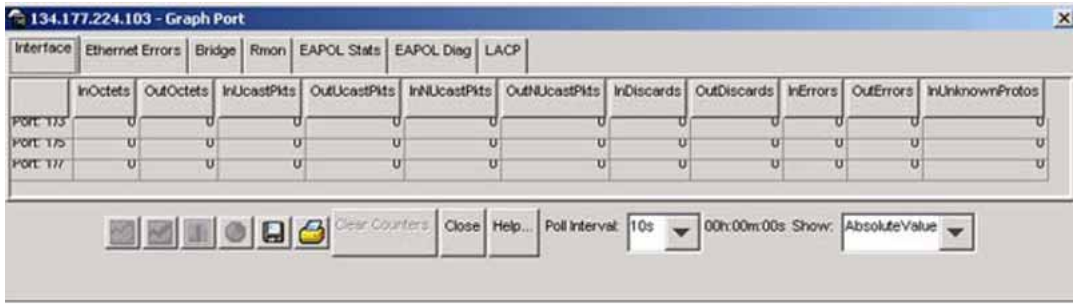
The dialog box for a single object shows all six types of statistics for each counter (Figure 82 "Interface statistics for a single port" (page 183)).

Figure 82
Interface statistics for a single port



The statistics dialog box for multiple objects shows a single type of statistics (Table 53 " Types of statistics" (page 180)) for the selected objects. For example, Figure 83 "Interface statistics for multiple ports" (page 184) shows LastValue statistics for the selected ports.

Figure 83
Interface statistics for multiple ports



To change the type of statistics displayed, select a different type from the show list at the bottom of the dialog box.

The statistics are updated based on the poll interval shown at the bottom of the dialog box. You can select a different polling interval.

Buttons for bar, pie, and line graphs are located at the bottom of a statistics dialog box.

See "Viewing statistics as graphs" (page 184) for instructions on using these buttons.

You can export the statistics to a tab-separated file format and import the file into other applications. To export the information, use the Export Data button below the table.

Viewing statistics as graphs

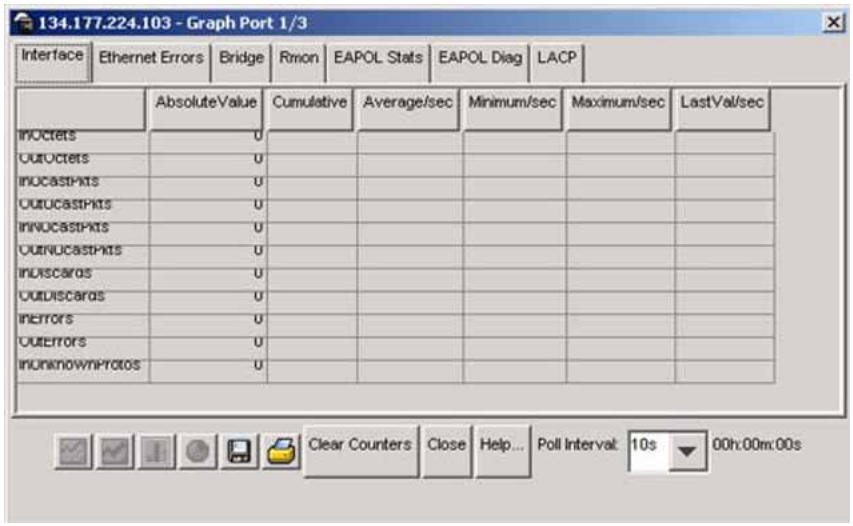
To create a graph for an object:

Step	Action
1	Select the object or objects to be graphed See" Selecting objects" (page 174) for more information.
2	Do one of the following: • On the toolbar, click Graph Selected.

- From the shortcut menu for the object, choose Graph.
- From the main menu, choose Graph > Chassis or Graph > Port.

A statistics dialog box appears with tabs for different categories of statistics for the selected object(Figure 84 "Statistics dialog box for a port" (page 185)).

Figure 84
Statistics dialog box for a port



3 Select a tab for the group of statistics you want to view.

4 On the displayed data table, drag to select the cells you want to graph. (They must be in the same row or column.)

5 Click one of the graph buttons at the bottom of the dialog box

See "Types of graphs" (page 181) for more information.

A graph dialog box appears for the selected graph type.

6 To print a copy of the graph, click Print.

—End—

Buttons at the top of the graph dialog boxes for line, area, and bar graphs allow you to change the orientation of the graph, change the scale, or change the graph type.

describes the buttons in the graph dialog boxes.

Table 54
Graph dialog box buttons

Button	Name	Description
	Stacked	Stacks data quantities instead of displaying them side-by-side.
	Horizontal	Rotates the graph 90 degrees.
	Log Scale	Changes the scale of the x-axis (of an un-rotated graph) from numeric to logarithmic.
	Line Chart	Converts an area graph or bar graph to a line graph.
	Area Chart	Converts a line graph or bar graph to an area graph.
	Bar Chart	Converts a line graph or area graph to a bar graph.
	Pie Chart	Converts a line, bar, or area graph into pie chart.

Telneting to a switch

From Device Manager, you can initiate a Telnet session to the console interface for the switch or stack you are currently accessing.

To Telnet to a switch, do one of the following:

- From the Device Manager main menu, choose Device > Telnet.
- On the toolbar, click the Telnet button.

A Telnet window to the switch opens.

Opening an SSH connection to the switch

From Device Manager, you can initiate a Secure Shell (SSH) connection to the console interface for the switch or stack you are currently accessing.

To open an SSH connection to a switch:

- Do one of the following:
- From the Device Manager main menu, Choose Device > SSH Connection.
- On the toolbar, click the SSH button.

An SSH window to the switch opens.

Note: The SSH connection is established only when the device is SSH capable and enabled. For more information about SSH connections, see *Security — Configuration (NN47210-500)*.

Trap log

You can configure an Ethernet Switch to send SNMP generic traps. When Device Manager is running, any traps received are recorded in the trap log. You set the maximum number of entries in the trap log using the Properties window(Figure 68 "Device Manager Properties dialog box" (page 166)). The default number of trap log entries is 500.

To view the trap log:

- Do one of the following:
- On the toolbar, click the Trap Log button.

- From the Device Manager Main Menu, choose Device > Trap Log.

Note: When you operate Device Manager from a UNIX platform, you must be logged in as root to receive traps.

Using the Export button at the bottom of the screen, you can export the trap log to a separate file that you can save to your system.

Device Manager receives traps on port 162. If this port is being used by another application, you cannot view the trap log until the other application is disabled and Device Manager is restarted.

By default, traps are sent in SNMP V2c format. However, if you are using an older network management system (NMS), one that supports only SNMP V1 traps (HP OpenView), you can specify to send the traps in V1 format.

For more information about traps and trap receivers, see *Security — Configuration (NN47210-500)*.

Accessing the Web-based management system

You can access the Web-based management system for the Ethernet Switch from Device Manager.

To access the Web-based management system:

- From the Main Menu, choose Actions > Open Home Page.

The Web browser opens to the Web-based management system for the switch. For more information about this system, see Chapter 6 "Using the Web-based management interface" (page 191).

Note: For access to the Web-based management system, the Http Port values in the Device Manager Default Properties dialog box and the switch Device Manager Properties dialog box, must be the same.

Online help

Online Help in Device Manager is context-sensitive. You can use a Web browser to display online Help. The Web browser will launch automatically when you click the Help button. If the Help topic you are accessing is not displayed in your browser, exit the existing browser session and click the Help button again.

If, for some reason, the Web browser does not launch, the default locations of the Help files are the directories listed in Table 55 " Help file locations" (page 189).

Table 55
Help file locations

Platform	Default path
Device Manager	<JDM Installation directory> / help /pp8k_basics/dmhelp.html
Device specific help	<JDM Installation directory> /help / falcon /v360.zip.help.html is the home page for the Online Help.

Chapter 6
Using the Web-based management interface

This chapter describes the requirements for using the Web-based management interface, and how to use it as a tool to configure the Ethernet Switches 460 and 470. This chapter covers:

Note: Starting with Release 3.6 software, Secure Socket Layer (SSL) is available to provide security for the Web-based management system. With SSL, you can access the Web-based management using a secure https session. The user must enable SSL for the browser through the Command Line Interface (CLI).

For more information about SSL Web-based management, see *Security — Configuration (NN47210-500)*.

Requirements

To use the Web-based management interface, you need the following items:

- A computer connected to any of the network ports
- One of the following web browsers installed on the computer (check the memory requirements):
  - Microsoft Internet Explorer*, version 4.0 or later (Windows 95/98/NT/XP)
  - Netscape Navigator*, version 4.51 or later (Windows 95/98/NT/XP and Unix)
- The IP address of the Ethernet Switch
- A web browser optimized for 800 by 600 pixel screen size

Note: The web pages of the Web-based management interface can load at different speeds depending on the web browser you use.

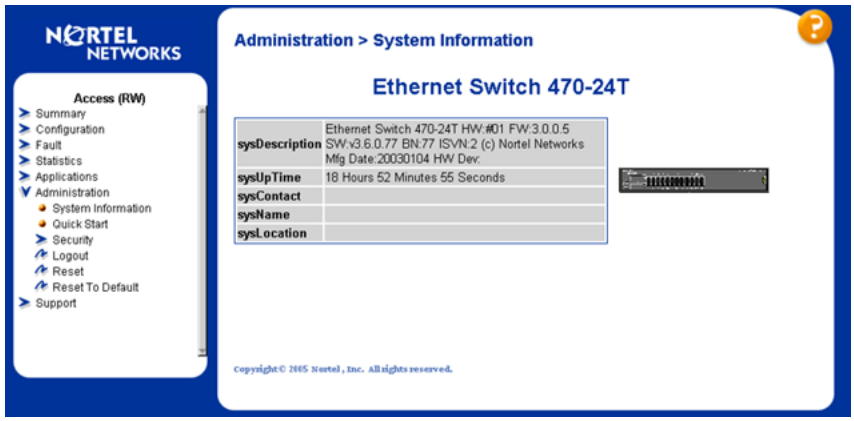
Logging in to the Web-based management interface

Before you log in to the Web-based management interface, use the console interface to verify the VLAN port assignments, and to ensure that your switch CPU and your computer are assigned to the same VLAN. If the devices are not connected to the same VLAN, you cannot access the Web-based management system.

To log in to the Web-based management interface, follow these steps:

Step	Action
1	Start your web browser.
2	In the web address field, enter the IP address for your host switch or stack, for example, http://10.30.31.105, and press [Enter]. The home page appears.

Figure 85
Web-based management interface home page



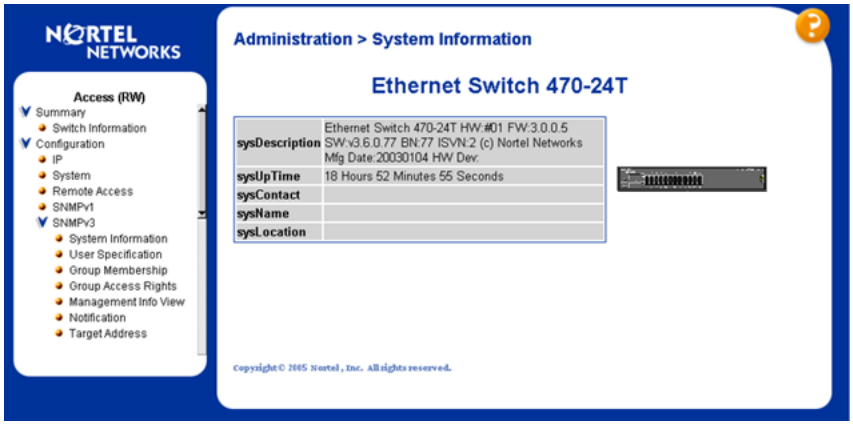
—End—

Network security does not yet exist the first time you access the Web-based management user interface. As the system administrator, you must create access parameters and passwords to protect the integrity of your network configurations.

Web page layout

The switch home page Figure 86 "Web page layout" (page 193) and all successive web pages have a common layout. Each is divided into two sections: the menu and the management page. All web pages are optimized for a 800 × 600 pixel screen size.

Figure 86
Web page layout



Menu

The menu,as shown at left in Figure 86 "Web page layout" (page 193) , contains a list of seven main titles and their corresponding options.

To navigate the Web-based management interface menu, click a menu title, and then click one of its options. When you click an option, the corresponding page appears.

Table 56 "Main headings and options" (page 193) lists the main headings in the Web-based management user interface and their associated options.

Table 56
Main headings and options

Main menu titles	Options
Summary	Stack Information (stack mode only) Switch Information Identify Unit Numbers (stack mode only) Stack Numbering (stack mode only)
*Has additional menus.	

Main menu titles	Options
Configuration	IP System Remote Access SNMPv1 SNMPv3* SNMP Trap MAC Address Table Find MAC Address Port Management High Speed Flow Control Software Download Ascii Config Download Configuration File Console/Comm Port
Fault	RMON Threshold RMON Event Log System Log
Statistics	Port Port Error Summary Interface Ethernet Errors Transparent Bridging RMON Ethernet RMON History
Applications	Port Mirroring Rate Limiting EAPOL Security MAC Address Security* IGMP* VLAN* Multilink Trunk* QoS* Cops* ADAC*
Administration	System Information Quik Start Security* Logout Reset Reset to Default
Support	Help Release Notes Manuals Upgrades
*Has additional menus.	

Navigation buttons or icons are provided in the menu to assist you in navigating the Web-based management interface.

CAUTION
Web browser capabilities, such as page bookmarking, refresh, page forward, and page back, function as they do in any other web site. However, these capabilities do not enhance the functionality of the Web-based management interface. Nortel recommends that you use only the navigation tools provided in the management interface.

Table 57 "Menu icons" (page 195) describes the icons that appear on the menu.

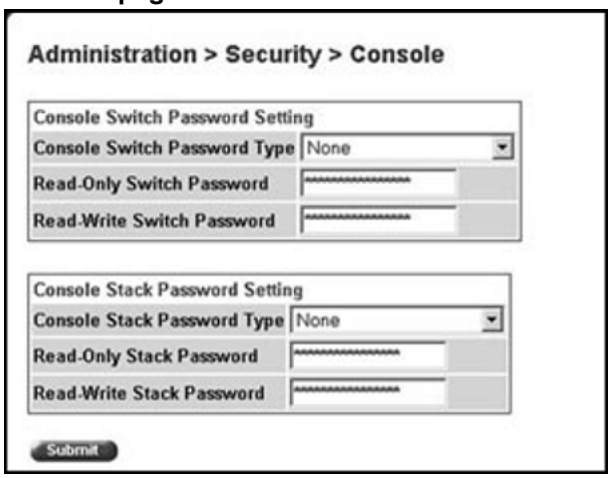
Table 57
Menu icons

Button or icon	Description
	This icon identifies a menu title. Click this icon to display its options.
	This icon identifies a menu title option. Click this icon to display the corresponding page.
	This icon identifies a menu title option with a hyperlink to related pages.
	This icon is linked to an action, for example, logout, reset, or reset to system defaults.
	Clicking on the Nortel logo opens the Nortel corporate home page in a new web browser.

Management page

When you click a menu option, the corresponding management page appears. Figure 87 "Console page" (page 196) shows the page displayed for the Administration > Security > Console option.

Figure 87
Console page



A page is composed of one or more of the following elements:

- Tables and input forms

  The gray cells in a page indicate read-only information, and white cells indicate input fields.

- Check boxes

  You enable or disable a selection by clicking a check box. When a check mark is displayed in the box, that selection is enabled. You disable a selection by clearing the checked box.

- Icons and buttons

  Icons and buttons perform an action related to the displayed page or the switch, such as opening another page or updating the values shown on the current page. As well, some icons initiate an action, such as reformatting the current displayed data as a bar or pie chart.

Table 58 "Page buttons and icons" (page 196) describes the icons that can appear on a page to assist you in navigation.

Table 58
Page buttons and icons

Icon	Name	Description
	Modify	Accesses a modification page for the selected row.

Icon	Name	Description
	View	Accesses a view only statistics page for the selected row.
	Delete	Deletes a row.
	Help	Accesses the Help menu in a new Web browser.
	Item-Specific Help	Accesses the item-specific Help menu in a new Web browser.
		Note: Text within a table that is highlighted blue and underlined is a hyperlink to a related management page.

Chapter 7
System Configuration using the Console Interface

You can use the Console Interface to display and modify the switch configuration while the switch is operating.

This chapter includes information about the system configuration, such as Configuring the switch IP address, downloading and uploading your software, and customizing your system. This chapter covers the following topics:

Configuring the system IP address

There are two ways to configure the IP address of the Ethernet Switch:

- Using a Static IP address
- Using BootP to provide an IP address

The Ethernet Switch unit begins switching as soon as you attach network devices and connect the switch to power. To manage the switch using Telnet or SNMP or to perform TFTP operations, the following IP address parameters must be configured on the device:

- IP Address of the switch or the stack
- IP Subnet mask

- IP Gateway address

Configuring a Static IP Address

The initial static IP address configuration must be performed through the serial or console port of the device. When an IP address is configured and is functional, you can change the IP address configuration through any of the available user interfaces.

Static IP Configuration Requirements

Here are the requirements for configuring a static IP address on the Ethernet Switch:

1. The IP address must not be in use by another system.
2. You must use a serial cable if configuring the static IP address through the console port. If you are configuring the IP address of a stack, make sure that serial cable is connected to the console port of the base unit.
3. If you are configuring the IP address of the switch through an in-band connection that uses the Ethernet network, make sure that the management station is connected to a port that is a member of the management VLAN.

Static IP address user interface configuration support

The Static IP address parameters may be manipulated through all user interfaces.

Table 59 " Static IP address user interface configuration support" (page 200) lists the configuration parameters and the access permissions for the user through the various user interfaces.

Table 59
Static IP address user interface configuration support

Parameter	Default	Menu Interface	CLI	Web	Device Manager
In-Band Stack IP Address	0.0.0.0	rw	rw	rw	rw
In-Band Switch IP Address	0.0.0.0	rw	rw	rw	rw
In-Band Subnet Mask	0.0.0.0	rw	rw	rw	rw
Default Gateway:	0.0.0.0	rw	rw	rw	rw

Configuring a static IP address using the Console Interface

For the initial setup of a stand-alone switch or a stack configuration, you must use the following IP procedures:

Step	Action

1 Connect the terminal to the Console port on the switch.

2 Set the terminal protocol.

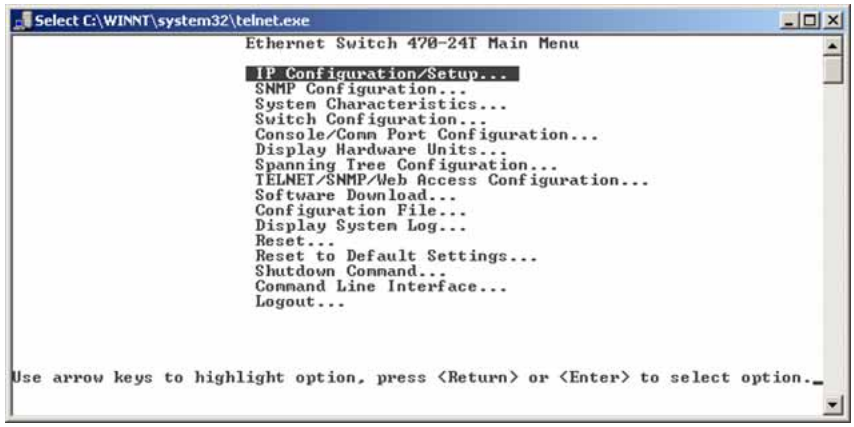
3 Connect the switch to power supply.

4 After the Nortel logo is displayed, press [Ctrl]-Y to display the Main Menu.

> ***Note:*** Initially, the screen displays the Main Menu for a stand-alone switch. But, if the switch is part of a stack configuration, the screen is refreshed within 60 seconds to show the Main Menu for the stack.

5 Select IP Configuration/Setup by choosing IP Configuration/Setup (or pressing i) from the main menu to display the IP Configuration/Setup menu. Figure 88 "Console Interface Main Menu" (page 201) displays the Console Interface Main Menu.

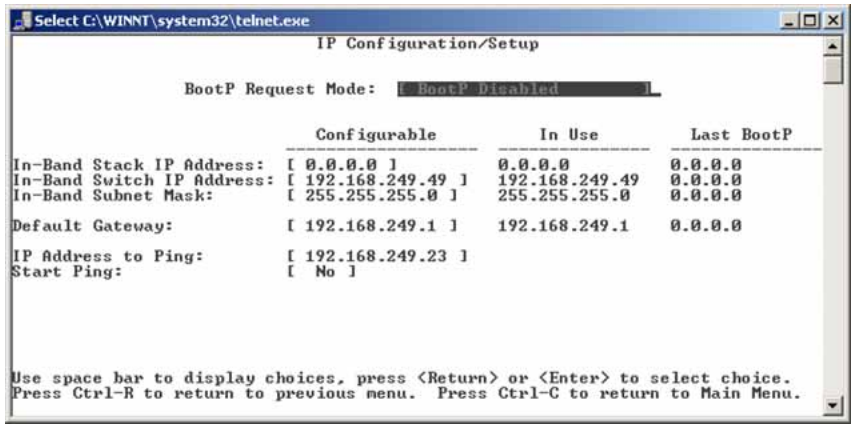
Figure 88
Console Interface Main Menu



6 For a stand-alone switch, in the In-Band Switch IP Address field, enter the IP address of the switch in dotted-decimal notation.

7 For a stack configuration, in the In-Band Stack IP Address field, enter the Stack IP address in dotted decimal notation. Figure 89 "IP configuration screen" (page 202) displays the IP configuration screen.

Figure 89
IP configuration screen



Note: The default management VLAN in Ethernet Switches 460 and 470 is VLAN1. To manage the switch, ensure the network management station is on the management VLAN, or is connected to the management VLAN.

The In-Band Switch IP address field allows this switch to operate as a stand-alone switch. However, this field is not required for the operation of the stack. You cannot enter the same IP address in both the In-Band Stack IP address and In-Band Switch IP address fields.

If the In-Band Subnet Mask field does not display a value, when you enter the IP address in the In-Band IP address field, the switch software provides an in-use default value for the In-Band Subnet Mask field. This value is based on the class of the IP address specified in the In-Band Switch IP address or the IP-Band Stack address fields.

8 In the Default Gateway field, specify the default gateway address.

Note: If you are stacking Ethernet Switches, ensure that you set one switch as the Base Unit.

9 Press Ctrl+C to return to the main menu.

Note: To reset the Ethernet Switch to factory default values, select Reset to Default values on the main menu, and then press Enter key.

—End—

Static IP Address Configuration Parameters

Table 60
IP Configuration/Setup screen fields

Field	Description
Unit	To view or configure an IP address for a specific unit, choose that unit number.
Configurable	Column header for the user-configurable IP configuration fields in this screen.
In Use	Column header for the read-only fields in this screen. The read-only data displayed in this column represents IP configuration that is currently in use.
Last BootP	Column header for the read-only fields in this screen. The read-only data displayed in this column represents IP configuration obtained from the last BootP reply received.
In-Band Stack IP Address	The in-band *stack* IP address field. This field is not required for the operation of the stand-alone switch. Default value 0.0.0.0 (no IP address assigned) Range Four-octet dotted-decimal notation, where each octet is represented as a decimal value, between 0 and 255, separated by a decimal point
In-Band Switch IP Address	The in-band IP address of the switch. . Default value 0.0.0.0 (no IP address assigned) Range Four-octet dotted-decimal notation, where each octet is represented as a decimal value, between 0 and 255, separated by a decimal point When the IP address is entered in the In-Band IP Address field, and the In-Band Subnet Mask field value is not present, the software provides an *in-use* default value for the In-Band Subnet Mask field that is based on the class of the IP address entered in the In-Band IP Address field.
In-Band Subnet Mask	The subnet address mask associated with the in-band IP address shown on the screen (see In-Band Switch IP Address field). Network routers use the subnet mask to determine the network or subnet address portion of a host's IP address. The bits in the IP address that contain the network address (including the subnet) are set to 1 in the address mask, and the bits that contain the host identifier are set to 0. Default value 0.0.0.0 (no subnet mask assigned) Range Four-octet dotted-decimal notation, where each octet is represented as a decimal value, between 0 and 255, separated by a decimal point
Default Gatewa y	The IP address of the default gateway.

Field	Description	
	Default value	0.0.0.0 (no IP address assigned)
	Range	Four-octet dotted-decimal notation, where each octet is represented as a decimal value, between 0 and 255, separated by a decimal point

Pinging

You can ping from an Ethernet Switch 460 or 470. This makes network management much easier. The ping command tests the network connection to another network device. The command sends an Internet Control Message Protocol (ICMP) packet from the switch to the target device. You must set the local IP address before issuing the ping command.

For more information about the CLI commands, see Chapter 4 "CLI Basics" (page 123).

Troubleshooting

Do the following if you have problems while configuring the IP address parameters on the switch:

- Check is all the IP address parameters are correct.
- Use the PING function on the switch to PING itself.
- Use the PING function on the switch to PING the default gateway.
- Check if the IP address is in use on another device.

Note: The Ping command tests the network connection to another network device. The command sends an Internet Control Message Protocol (ICMP) packet from the switch to the target device. The local IP address must be set before issuing the ping command. For more information about the CLI commands, see Chapter 4 "CLI Basics" (page 123).

Usage guidelines

- A switch IP address can be configured for devices in a stack. That address cannot be active unless the unit disassociates from the rest of the stack.
- When the two units in a stack of two units disassociate with one another, neither unit uses the stack IP address. Both units use the switch IP address that is configured for each unit.

Configuring an IP address using BootP

With the BootP or Boot Protocol, the network manager can administer the IP addresses of network devices from a central location. Along with the IP address, the BootP protocol identifies the default gateway, subnet mask and other configuration parameters that may be managed by the BootP server.

The implementation of BootP on Ethernet Switches can operate in the following modes:

- BootP Always
- BootP or Last Address
- BootP When Needed
- BootP Disabled

You can retrieve the ASCII configuration file name and configuration server address using BootP.

The Ethernet Switch has a unique 48-bit hardware address, or MAC addressthat is printed on a label on the back panel. You use this MAC address when you configure the network BootP server to recognize the Ethernet Switch BootP requests.

With a properly configured BootP server, the switch can automatically learn its assigned IP address, subnet mask, and the IP address of the default router (default gateway).

BootP Configuration Requirements

To use the BootP protocol, you need a BootP server that adheres to the IETF standard RFC 951.

That BootP server must be accessible through the Management VLAN. If the BootP server is not located on the same subnet as the Ethernet Switch, but is located on another IP subnet, there must be a router on the local subnet (the subnet with which the Ethernet Switch is associated) that provides BootP Relay functionality as defined in RFC 1532.

BootP User Interface Configuration Support

The BootP parameters may be manipulated through all user interfaces. The following table indicates whether the user has read (r), read-write (rw), or no access to the parameter through the listed user interface.

Table 61
BootP Configuration User Interface Support

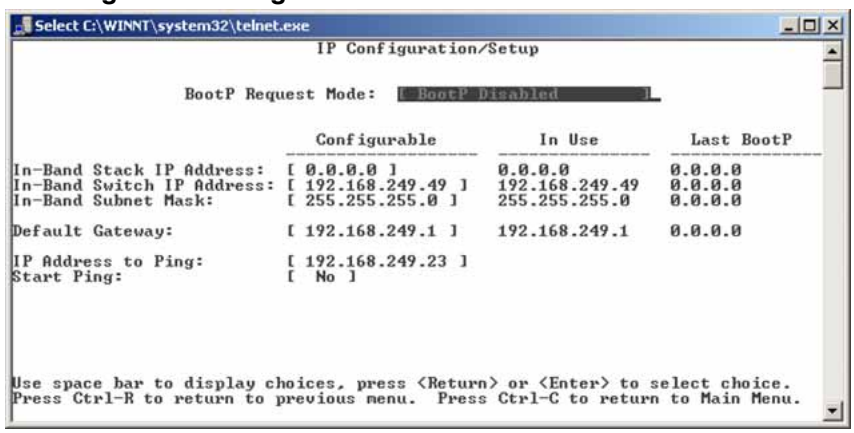
Parameter	Default	Menu Interface	CLI	Web	Device Manager
BootP Always		rw	rw	rw	rw
BootP When Needed	default setting	rw	rw	rw	rw
BootP Or Last Address		rw	rw	rw	rw
BootP Disable		rw	rw	rw	rw

Configuring BootP using the Console Interface

Use the following procedure to configure the BootP parameters on the Ethernet Switch:

Step	Action
1	Connect to the device through the serial port or through a Telnet connection.
2	After the Nortel logo is displayed, press [Ctrl]-Y to display the Main Menu.
3	Select IP Configuration/Setup by choosing IP Configuration/Setup (or pressing i) from the main menu to display the IP Configuration/Setup menu. Figure 90 "IP configuration using the Console Interface" (page 207) displays the IP configuration using the Console Interface.

Figure 90
IP configuration using the Console Interface



4 Highlight the BootP Request Mode field.

5 Cycle through the various BootP parameters by pressing the spacebar.

6 Press the Enter key to activate the appropriate selection.

Note: The read-only fields in this screen are updated based on the BootP mode specified in the BootP Request Mode field. (See "Configuring an IP address using BootP" (page 205) for more information.)

—End—

BootP configuration Parameters

BootP When Needed When you select this parameter, the switch can request an IP address, if one has not already been set from the console terminal. This mode is the default mode. When selected, this mode operates as follows:

- When the IP data is entered from the console terminal, the data becomes the in-use address of the switch and BootP requests are not broadcast. The switch can be managed using this in-band IP address.
- When the in-band IP address is not set from the console terminal, the switch broadcasts BootP requests until it receives a BootP reply containing an IP address. If the switch does not receive a BootP reply that contains an IP address, the switch cannot be managed in-band.

  If an IP address is *not* currently in use, these actions take effect immediately. If an IP address *is* currently in use, these actions take effect only after the switch is reset or power cycled.

Note: If an IP address is assigned to the device and the BootP process times out, the BootP mode remains 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.

BootP Always Selecting this parameter requires the switch to obtain its IP address from the BootP server. If a static IP address is defined, it is ignored. When this option selected, the switch operates as follows:

- The switch continues to broadcast BootP requests, regardless of whether an in-band IP address is set from the console terminal.
- If the switch receives a BootP reply that contains an in-band IP address, the switch uses this new in-band IP address.
- If the switch does not receive a BootP reply, the switch cannot be managed using the in-band IP address set from the console terminal.

If an IP address is *not* currently in use, these actions take effect immediately. If an IP address *is* currently in use, these actions take effect only after the switch is reset or power cycled.

BootP Disabled When this parameter is selected, the switch does not use BootP. The switch operates in the following manner:

- The switch does not broadcast BootP requests, regardless of whether an IP address is set from the console terminal.
- The switch can be managed only by using the in-band switch IP address set from the console terminal.

These actions take effect after the switch is reset or power cycled, even if an IP address is not currently in use.

BootP or Last Address When you select this parameter the switch can use the last IP address received from the BootP server if the BootP server becomes unreachable. When selected, this mode operates as follows:

- When the IP data is entered from the console terminal, the data becomes the in-band address of the switch and BootP requests are not broadcast. The switch can be managed using this in-band IP address.
- When the in-band IP address is not set from the console terminal, the switch broadcasts BootP requests until it receives a BootP reply containing an in-band IP address. If the switch does not receive a BootP reply that contains an in-band IP address within 10 minutes, the switch

uses the last in-band IP address it received from a BootP server. This IP information is displayed in the Last BootP column.

If an IP address is *not* currently in use, these actions take effect immediately. If an IP address *is* currently in use, these actions take effect only after the switch is reset or power cycled.

Troubleshooting

Execute the following steps to diagnose your system if it has issues obtaining an IP address using the BootP protocol:

- Check if the BootP server is accessible to the switch through the management VLAN.
- Check if the BootP server is configured with the proper MAC address of the device.
- Review the last BootP settings on the Console Interface.
- Place a packet analyzer on the network to investigate the problem.

Usage guidelines

Sample bootptab file This section provides a sample BootP configuration file. The BootP server searches for this file, called bootptab (or BOOTPTAB.TXT, depending on your operating system), which contains the site-specific information (including IP addresses) needed to perform the software download and configuration. You can modify this sample BootP configuration file or create one of your own. A sample BootP configuration file follows:

```
# The following is a sample of a BootP configuration file
that was extracted
# from a Nortel Networks EZ LAN network management
application.  Note that
# other BootP daemons can use a configuration file with a
different format.
#
# Before using your switch BootP facility, you must customize
your BootP
# configuration file with the appropriate data.
#
# Blank lines and lines beginning with '#' are ignored.
#
# Legend:
#
# first field -- hostname
# ht -- hardware type
# ha -- host hardware address
# tc -- template host (points to similar host entry)
# ip -- host IP address
```

```
# hd -- bootfile home directory
# bf -- bootfile
# EZ dt -- device type
# EZ fv -- firmware version
# EZ av -- agent version
# cs - TFTP server address for ASCII config file (optional)
#
# Fields are separated with a pipe (|) symbol.  Forward
slashes (/) are
# required to indicate that an entry is continued to the next
line.#
#
Caution
#
# Omitting a Forward slash (/) when the entry is continued
to the next
# line, can cause the interruption of the booting process or
the
# incorrect image file to download.  Always include forward
slashes
# where needed.
#
# Important Note:
#
# If a leading zero (0) is used in the IP address it is
calculated as an
# octal number.  If the leading character is "x" (upper or
lower case),
# it is calculated as a hexadecimal number.  For example, if
an IP address
# with a base 10 number of 45 is written as .045 in the
BOOTPTAB.TXT file,
# the Bootp protocol assigns .037 to the client.
#
# Global entries are defined that specify the parameters used
by every device.
# Note that hardware type (ht) is specified first in the
global entry.
#
# The following global entry is defined for an Ethernet
device.  Note that this
# is where a client's subnet mask (sm) and default gateway
(gw) are defined.
#
global1|/
|ht=ethernet|/
|hd=c:\opt\images|/
|sm=255.255.255.0|/
|gw=192.0.1.0|
#
```

```
# The following sample entry describes a BootP client:
bay1|ht=ethernet|ha=0060fd000000|ip=192.0.0.1|hd=c:\ezlan\ima
ges|bf=Baystack470.txt
# Where:
# host name:  bay1
# hardware type:  Ethernet
# MAC address:  00-60-FD-00-00-00
# IP address:  192.0.0.0
# home directory of boot file:  c:\ezlan\images
# ASCII config file:  Baystack470.txt
# When ASCII configuration download is configured to perform
auto configuration
# on reset using BootP, the filename must be specified using
the 'bf' keyword.
# If the ASCII configuration file is not resident on the
BootP server, the
# server address can be specified using the 'cs' keyword.
```

Supported keywords The following keywords are supported in the bootptab file:

- ht -- hardware type
- hd -- home directory
- sm -- subnet mask
- gw -- gateways
- ha -- hardware address
- ip -- host IP address
- bf -- boot file
- cs -- configuration server

IP-BootP configuration retention on downgrade

When downgrading a unit with Release 3.0.3 software and later, the system defaults all configurations, except for the following:

- Stack operation mode
- IP configuration
- BootP mode

Previous releases of Ethernet Switch software retained the Stack Operational Mode only on software downgrade. With this change, a remotely accessed switch can maintain its accessibility after downgrade and does not require the user to re-enter this basic information, which remains unchanged after a downgrade.

Managing System Characteristics

You can use the system to view or configure system information such as:

- Base Unit
- Firmware Revision
- Hardware Deviation
- Hardware Revision
- ISVN
- Last Reset Type
- Local GBIC Type
- MAC Address
- Manufacturing Date
- Operation Mode
- Power Status
- Reset Count
- Serial Number
- Size of Stack
- Software Revision
- sysContact
- sysDescr
- sysLocation
- sysName
- sysObjectID
- sysServices
- sysUpTime

These parameters provide general system information.

System Characteristics Configuration Requirements

The only requirement to configure these system parameters is a connection to the device through the network or the serial port.

System Characteristics User Interface Support

The System Characteristics parameters may be manipulated through all user interfaces. Table 62 " System Characteristics User Interface Support" (page 213) indicates whether the user has read (r), read-write (rw), or no access to the parameter through the listed user interface.

Table 62
System Characteristics User Interface Support

Parameter	Default	Menu Interface	CLI	Web	Device Manager
Base Unit	na	r	r	no	r
Firmware Revision	na	r	r	r	r
Hardware Deviation	na	r	r	r	no
Hardware Revision	na	r	r	r	r
ISVN	2	r	r	r	r
Last Reset Type	na	r	r	no	no
Local GBIC / MDA Type	none	r	r	r	r
MAC Address	na	r	r	r	r
Manufacture Date	na	r	r	r	no
Operation Mode	na	r	r	r	r
PoE Module Firmware	na	no	r	r	no
Power Status	primary power	r	r	r	r
Reset Count	1	r	r	no	no
Serial number	na	no	r	r	r

Parameter	Default	Menu Interface	CLI	Web	Device Manager
Size of Stack	na	r	r	r	r
Software Revision	na	r	r	r	r
sysContact	blank string	rw	rw	rw	rw
sysDescr	hw / sw versions	r	r	r	r
sysLocation	blank string	rw	rw	rw	rw
sysName	blank string	rw	rw	rw	rw
sysObjectID	Device OID	r	r	r	no
sysServices	3	r	r	no	no
sysUpTime	na	r	r	r	r

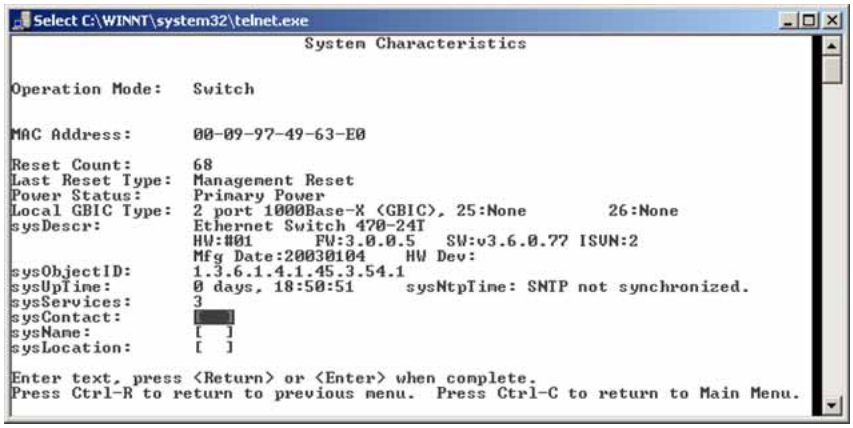
Managing system characteristics using the Console Interface

Use the following procedure to manage the System Characteristics screen using the Console Interface on the Ethernet Switch:

Step	Action
1	Connect to the device through the serial port or through a Telnet connection.
2	After the Nortel logo is displayed, press [Ctrl]-Y to display the Main Menu.
3	Select the System Characteristics from the main menu. Figure 91 "Console Interface System Characteristics screen" (page 215) displays the Console Interface System Characteristics screen.

—End—

Figure 91
Console Interface System Characteristics screen



Configuration Parameters

The fields on the Console Interface System Characteristics are described in Table 63 " Fields in the Console Interface system characteristics" (page 215).

Table 63
Fields in the Console Interface system characteristics

Field	Description
Operation Mode	Read-only field that indicates the operation mode of the unit, for example: • When the unit is part of a stack configuration, the (read-only) field indicates the unit is operational in a stack, and lists the current unit number of this switch. • When the unit is *not* part of a stack configuration (operating stand-alone), the read-only field indicates the unit is operating as a switch. When in this operation mode, the Size of Stack and Base Unit fields do not appear.
Size of Stack	This read-only field only appears when the switch is participating in a stack configuration. This field indicates the number of units configured in the stack configuration (1 to 8 units maximum).
Base Unit	This read-only field only appears when the switch is participating in a stack configuration. This field indicates the unit number of the switch that is currently operating as the base unit.
MAC Address	Contains the MAC address of the switch or, when the switch is participating in a stack configuration, the MAC address of the stack configuration.

Field	Description
Reset Count	This read-only field indicates the number of resets since the operational firmware was first loaded on the switch. Default value 1. Range 0 to 232 -1 (4,294,967,295)
Last Reset Type	This read-only field identifies the last type of reset. Possible values include: • Power Cycle • Software Download • Management Reset • Management Factory Reset
Power Status	This read-only field indicates the current power source (primary, RPSU, or both). Possible values include: • Primary Power • Redundant Power • Primary and Redundant Power
Local MDA / GBIC Type	This read-only field indicates the MDA or GBIC type that is configured in this unit.
Inter-Switch Version Number (ISVN)	See the Release Notes for possible restrictions surrounding the ISVN versions required in a stack.
sysDescr	A read-only field that specifies hardware and software versions.
sysObjectID	A read-only field that provides a unique identification of the switch, which contains the vendor's private enterprise number.
sysUpTime	A read-only field that shows the length of time since the last reset. Note that this field is updated when the screen is redisplayed.
sysServices	A read-only field that indicates the switch's physical and data link layer functionality.

Field	Description
sysContact	The name and phone number of the person responsible for the switch. Range: Any ASCII string of up to 56 printable characters.
sysName	A name that uniquely identifies the switch. Range: Any ASCII string of up to 56 printable characters.
sysLocation	The physical location of the switch. Range: Any ASCII string of up to 56 printable.

Troubleshooting

If you face any problems while configuring any of these parameters, follow these procedures:

- Check if have exceeded the number of characters allowed by the user interface.
- Ensure you have only used printable characters in any of the strings.

Usage Guidelines

The various user interfaces allow different lengths for the following SNMP variables: sysDesc, sysLocation, and sysContact.

The following is a list of variable lengths allowed by the various user interfaces:

- CLI allows 126 characters
- Menu Interface allows 56 characters
- Device manager allows 256 characters through the Edit -> Chassis menu
- Device manager allows 32 characters through the Edit -> Chassis -> Base
- Unit Info (or Stack Info) menu
- ACG only generates strings of 63 characters in length

Not all the information that is available in the sysDescr field on the System Characteristics screen is available on all interfaces.

Table 64 " SysDescr field interface support" (page 218) displays the parameters in the SysDescr field that are available in the various interfaces.

Table 64
SysDescr field interface support

Parameter	Menu Interface	CLI	Web Interface	Device Manager
Product Name	•	•	•	•
Hardware revision	•	•	•	•
Firmware revision	•	•	•	•
Software revision	•	•	•	•
Hardware deviation	•	•	•	
Manufacturing date	•	•	•	

Note: You can use only Device Manager to retrieve the serial number for all units in a stack.

Software Management

Downloading software

The Ethernet Switch uses non-volatile memory to store the switch software image. You can use non-volatile memory to update the software image with a newer version without changing the switch hardware. An in-band connection between the switch and the TFTP load host is required to download the software image. The Ethernet Switch supports the following three types of software:

- Runtime Image
- Boot Image (also referred to as the Diagnostic Image and Firmware Image)
- Power-over-Ethernet (PoE) Image

The following section outlines the tools and methods supported by the Ethernet Switch to download different software onto your system.

Software can be downloaded to the switch by the following methods:

- Immediate Download
- Runtime Image

- Boot Image
- Power-over-Ethernet (PoE) Image
- Download if Newer
- Download without resetting
- Runtime Image

Immediate Download You may use any of the user interfaces to initiate an immediate download of any of the software components onto the system.

Download Image if newer The system has the ability to download the runtime image only if the image is newer than the version that is currently loaded on the switch. When this feature is enabled, the system checks to see if there is a newer version of software available on the TFTP server whenever it reboots.

Download without resetting With the Download without resetting feature, you can upgrade the Runtime image or Diagnostic image without resetting the unit.

> ***Note:*** After downloading the image without resetting, the Web-based management interface is not available until the switch or stack is rebooted.

This feature is only available through the Console Interface or the CLI.

Feature Requirements

To download the software image, you need a properly configured Trivial File Transfer Protocol (TFTP) server in your network, and an IP address for the switch.

Software Management User Interface Support

Table 65 " Interfaces that support Ethernet Switch software download" (page 220) lists the interfaces that support the downloading of software into the Ethernet Switch.

Table 65
Interfaces that support Ethernet Switch software download

Parameter	Menu Interface	CLI	Web Interface	Device Manager	Parameter
Download Runtime Image	blank	rw	rw	rw	rw
Download Boot / Firmware Image	blank	rw	rw	rw	rw
Download PoE Image	blank	none	rw	none	none
Download image if newer	rw	rw	rw	rw	rw
Download image without resetting	rw	none	rw	none	none

Software Management using the Console Interface

You can use the Software Download screen to revise the Ethernet Switch software image located in non-volatile flash memory.

To open the Software Download screen:

Step	Action
1	Choose Software Download (or press f) from the main menu. The Software Download screen appears as depicted in Figure 92 "Console Interface Software Download screen" (page 221) .

CAUTION
Do not interrupt power to the device during the software download process. If the power is interrupted, the firmware image can become corrupted.

ATTENTION

Achtung:
Unterbrechen Sie die Stromzufuhr zum Gerät nicht, während die Software heruntergeladen wird. Bei Unterbrechung der Stromzufuhr kann das Firmware-Image beschädigt werden.

ATTENTION

Ne pas couper l'alimentation de l'appareil pendant le chargement du logiciel. En cas d'interruption, le programme résident peut être endommagé.

ATTENTION

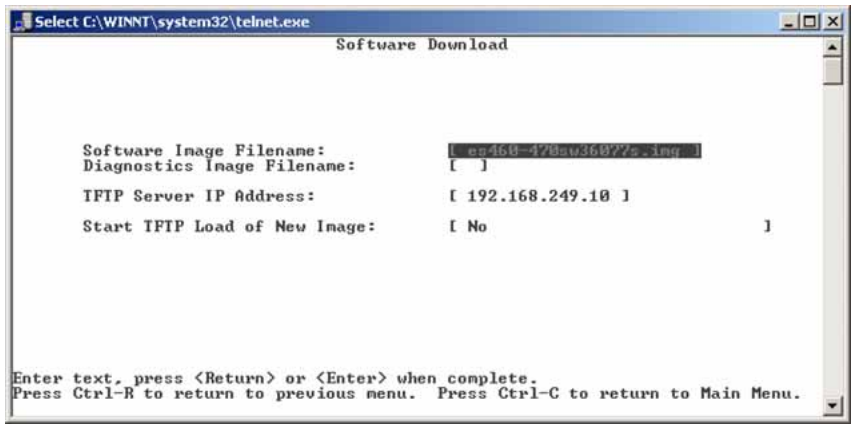
Precaución:
No interrumpa la alimentación del dispositivo durante el proceso de descarga del software. Si lo hace, puede alterar la imagen de la programación (firmware).

ATTENTION

Attenzione:
Non interrompere l'alimentazione elettrica al dispositivo durante il processo di scaricamento del software. In caso di interruzione, l'immagine firmware potrebbe danneggiarsi.

注意：ソフトウェアをダウンロードしているとき、ディバイスへの電源を切らないでください。電源を切ると、ファームウェアのイメージを損う恐れがあります。

Figure 92
Console Interface Software Download screen



You can monitor the software download process by observing the LEDs.

2 Enter the name of the file that you wish to download from your TFTP server in the appropriate field. With the Console Interface, you can download the runtime image or the firmware image from the server.

3 Enter the IP address of the TFTP server in the TFTP Server IP Address field.

4 Select the appropriate option from the Start TFTP Load of New Image by cycling through the various parameters and pressing enter to initiate the download.

5 The unit reboots after the download.

Note 1: The Console Interface and CLI both provide the option to download an image file without rebooting.

Note 2: If your station cannot ping the TFTP server during the downloading process, you may receive the following message:

```
Image is Invalid
```

The problem is that the TFTP server is not reachable, rather than any problems with the image.

—End—

LED Indications during the download process

The software download process is automatically completed without user intervention. The process erases the contents of flash memory and replaces it with a new software image. Be careful not to interrupt the download process until after it runs to completion (the process can take up to 10 minutes, depending on network conditions).

During the download process, the switch is not operational. You can monitor the progress of the download process by observing the LED indications.

Console Interface Software Download Configuration Parameters

The following configuration parameters are available through the Console Interface.

Table 66 " Software Download screen fields" (page 223) describes the configuration parameters available through the Console Interface.

Table 66
Software Download screen fields

Field	Description
Software Image Filename	The Ethernet Switch software image load file name. Default value Zero-length string Range An ASCII string of up to 30 printable characters
Diagnostics Filename	The Ethernet Switch diagnostics file name. Default value Zero-length string Range An ASCII string of up to 30 printable characters
TFTP Server IP Address	The IP address of your TFTP load host. Default value 0.0.0.0 (no IP address assigned) Range Four-octet dotted-decimal notation, where each octet is represented as a decimal value, separated by a decimal point
Start TFTP Load of New Image	Specifies whether to start the download of the switch software image (default is No). Use the spacebar to toggle the selection to the one you want. Press [Enter] to initiate the software download process.
	Note: The software download process can take up to 60 seconds to complete (or more if the load host path is congested or there is a high volume of network traffic).
	To ensure that the download process is not interrupted, do not power down the switch for approximately 10 minutes. Default value No Range No, Software Image, Diagnostics, Software Image If Newer, Download image without reset, Download diag without reset.

Troubleshooting

If you encounter any problems while downloading software to the switch, take the following steps:

- Check that the Ethernet Switch is logically connected to the TFTP server by pinging the TFTP server.
- Check that the TFTP server is running on the management station.

- Check that the target download file is available on the TFTP server in the correct directory.

Configuration Management

With the Configuration Management feature, you can store and retrieve the configuration parameters of an Ethernet Switch or stack to a TFTP server. This feature supports two different methods for managing the system configuration files:

- Binary configuration file management
- ASCII configuration file management

Managing Binary Configuration Files

The Ethernet Switch stores its configuration information about the system flash in a format that can be easily read by the operating system. When configured in a stack, each Ethernet Switch maintains its own switch parameters. This includes port speed, VLAN attachment and PVID information. All of this data cannot be saved to the Base Unit. The Base Unit stores Trunk information, both MLT and DMLT.

When you upload a backup of the configuration file to a TFTP server, the switch converts the configuration information in flash memory into a single file that can easily be stored on a TFTP server. In the case of a stack of switches, the system concatenates the configuration file from each of the units in the stack and uploads a single aggregate binary configuration file to the TFTP server.

Enable or disable autosave

By default, every 60 seconds the Ethernet Switch checks whether a configuration change has occurred or a log message is written to nonvolatile storage. If one of these two events occurred, the system automatically saves its configuration and the nonvolatile log to flash memory. Also, the system automatically saves the configuration file if a user invokes a system reset command.

Note: Do not power off the switch within 60 seconds of changing any configuration parameters. Doing so causes loss of changes in the configuration parameters.

You can enable or disable the autosave feature. You can specify that the configuration changes be saved to flash memory, when the autosave feature is disabled.

Note: You can use the CLI command `copy config nvram` to force a manual save of the configuration when autosave is disabled.

You must use CLI to enable or disable autosave; the default value is enabled.

Forcing Immediate Configuration Save

You can use the Ethernet Switch to force an immediate save of the configuration files to non-volatile random access memory (NVRAM). When this feature is used, the system checks to see if any changes were made to the system configuration since the last configuration save. If a change was made, the updated configuration file is written to NVRAM.

This feature is only available through the CLI.

Managing Binary Configuration Files

To manage binary configuration files, you must have a TFTP server with read / write access to the directory of the TFTP server, to upload a binary configuration file.

Managing Binary Configuration Files User Interface Support

You can manage the binary configuration file through any of the following interfaces:

Table 67 " User interface support" (page 225) lists the various user interfaces supporting the management of binary configuration files.

Table 67
User interface support

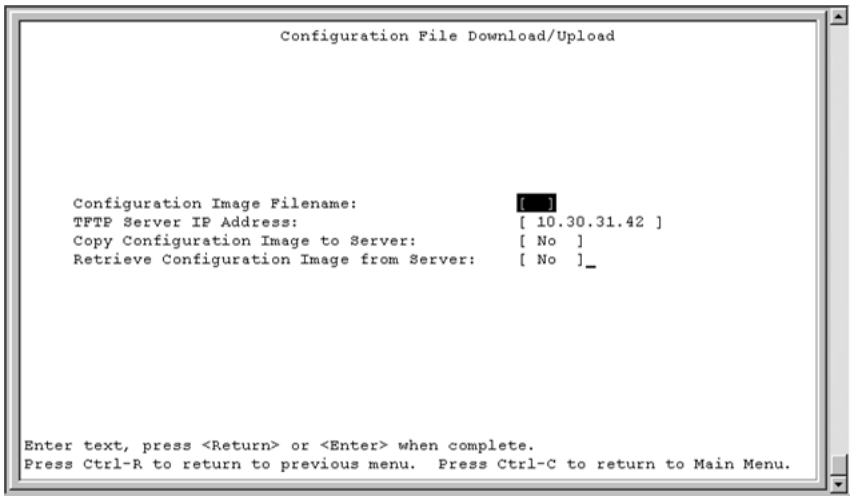
Parameter	Default	Menu Interface	CLI	Web Interface	Device Manager
Backup Binary Con figuration	na	rw	rw	rw	rw
Restore Binary Con figuration	na	rw	rw	rw	rw
Enable / Disable Autosave	enabled	no	rw	no	no
Force Immediate Configurati on Save	na	no	rw	no	no

Binary Configuration File Management Console Interface Support

You can use the Configuration File Menu screen to upload and download the configuration parameters of an Ethernet Switch to a TFTP server.

Figure 93 "Configuration file download/upload screen" (page 226) shows the Configuration File Download/Upload screen for the Console Interface.

Figure 93
Configuration file download/upload screen



These options allow you to store your switch configuration parameters on a TFTP server. You can retrieve the configuration parameters of a stand-alone switch, and use the retrieved parameters to automatically configure a replacement switch. You must set up the file on your TFTP server, and set the filename read-write permission to enabled before you can save the configuration parameters

Table 68 " Configuration File Download/Upload screen fields" (page 226) describes the fields on the Console Interface configuration upload/download screen.

Table 68
Configuration File Download/Upload screen fields

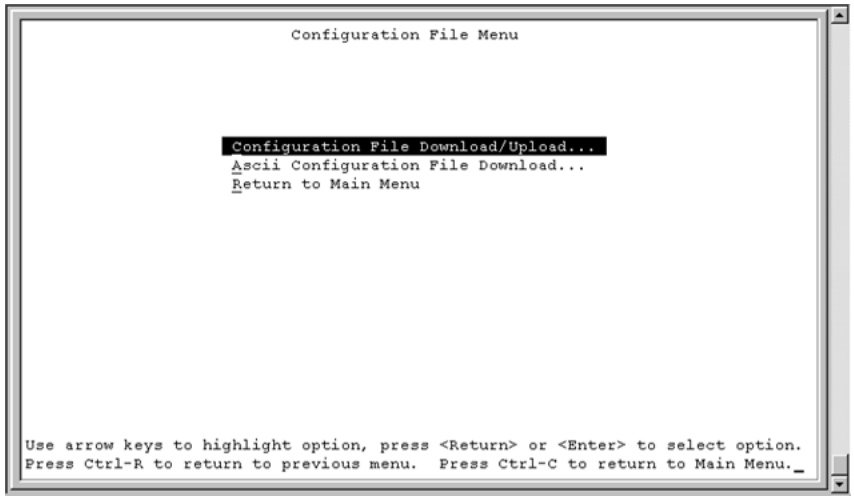
Field	Description
Configuration Image Filename	The file name you have chosen for the configuration file. Choose a meaningful file name, with which you can identify the file for retrieval when required. The file must already exist on your TFTP server and must be read-write enabled. Default value Zero-length string Range An ASCII string of up to 30 printable characters

Field	Description
TFTP Server IP Address	The IP address of your TFTP load host. Default value 0.0.0.0 (no IP address assigned) Range Four-octet dotted-decimal notation, where each octet is represented as a decimal value, separated by a decimal point
Copy Configuration Image to Server	Specifies whether to copy the presently configured switch parameters to the specified TFTP server (default is No). Use the spacebar to toggle the selection to Yes. Press [Enter] to initiate the process. Default value No Range Yes, No
Retrieve Configuration Image from Server	Specifies whether to retrieve the stored switch configuration parameters from the specified TFTP server (default is No). If you choose Yes, the download process begins immediately and, when completed, causes the switch to reset with the new configuration parameters. Use the spacebar to toggle the selection to Yes. Press [Enter] to initiate the process. Default value No Range Yes, No
Target Unit for Retrieve	Specifies the binary configuration file corresponding to a particular unit number to download to a stand-alone unit. Range 1-8

Creating a Backup Binary Configuration File Follow this procedure to upload a Binary Configuration using the Console Interface:

Step	Action
1	Choose Configuration File Menu from the main menu. Figure 94 "Configuration file menu" (page 228) depicts the Configuration file menu.

Figure 94
Configuration file menu



2 Choose Configuration File Download/Upload from the Configuration File Menu.

3 Enter the name of the backup binary configuration file that you are going to create on the TFTP server in the Configuration Image Filename Field.

4 Enter the IP address of the TFTP server in the TFTP Server IP Address Field.

5 Cycle through the options in the Copy Configuration Image to Server field by pressing the space bar; and select Yes.

6 Press the Enter key to activate the upload of the configuration

—End—

Restoring a Backup Binary Configuration File Follow this procedure to restore a backup binary configuration file from a TFTP server:

Step	Action
1	Choose Configuration File Menu from the main menu.
2	Choose Configuration File Download/Upload from the Configuration File Menu.
3	Enter the name of the backup binary configuration file that you are going to retrieve from the TFTP server in the Configuration Image Filename Field.

4 Enter the IP address of the TFTP server in the TFTP Server IP Address Field.

5 If you are retrieving the file for a unit in a stack, cycle through the options in the Target Unit for Retrieval Field, and select the number of the unit whose configuration you wish to retrieve.

6 Cycle through the options in the Retrieve Configuration Image from Server field by pressing the space bar; and select Yes.

7 Press the Enter key to retrieve the configuration file.

8 When you press the Enter key, the software:

- Contacts the TFTP server
- If the file is for a unit in a stack, retrieves the configuration file for the entire stack and extracts the target unit's configuration
- Writes the configuration to flash
- Resets and performs reconfiguration of the unit

—End—

Troubleshooting

If you encounter any problems while downloading the software, take the following steps:

- Check that the Ethernet Switch is logically connected to the TFTP server by pinging the TFTP server.
- Check that the TFTP server is running on the management station.
- If you are downloading a binary configuration file, ensure that the target download file is available on the TFTP server in the correct directory.
- If you are uploading a binary configuration file, ensure that you have read-write privileges on the target server.

Usage Guidelines

- Although most configuration parameters are saved to the configuration file, certain parameters are not saved. The following parameters are not saved in the binary configuration file:
  - In-Band Switch IP Address
  - In-Band Subnet Mask
  - Default Gateway
  - Console Read-Only Switch Password

— Console Read-Write Switch Password

— Configuration Image Filename

— TFTP Server IP Address

- The Configuration File feature can be used only to copy stand-alone switch configuration parameters to other stand-alone switches.
- A configuration file obtained from a stand-alone switch can be used only to configure other stand-alone switches that have the same firmware revision and model type as the donor stand-alone switch.
- When configuration changes are written to non-volatile memory, a trap (bsnConfigurationSavedToNvram) is sent to the trap receiver, indicating that a change has occurred to the configuration of the device. This trap also appears as an event in the volatile system log.

Managing ASCII Configuration Files

You can use the Ethernet Switch to manage your system configuration using standard text files and create a series of CLI commands to upload to the Ethernet Switch. With the ASCII Configuration Generator feature, you can display the current configuration as a series of CLI commands.

Configuring the Switch using ASCII Configuration Files

Ethernet Switches can download a user-editable ASCII configuration file from a TFTP server. You can load the ASCII configuration file automatically at boot time or on demand using the management systems (console menus or CLI). When downloaded, the configuration file automatically configures the switch according to the Command Line Interface (CLI) commands in the file.

With this feature, you can generate command configuration files that can be used on several switches with minor modifications. Use a text editor to edit the ASCII configuration; the command format is the same as that of the CLI.

ASCII Configuration Generator

You can use the ASCII Configuration Generator (ACG) to display or save the configuration settings of the switch to an external ASCII configuration file consisting of a series of CLI commands. This editable ASCII configuration file can be uploaded to a switch from an external file server.

Note: You must reset the switch to the factory default settings before uploading the ACG-generated ASCII configuration file. Resetting the switch to factory default settings causes loss of connectivity and loss of the current configuration of the switch.

The ASCII configuration file contains configuration settings for the following network management applications:

- COPS
- Core applications (system information, topology, and so on)
- Custom Banner
- Default Command Interface
- EAPOL
- IP Configuration
- IP Manager
- MAC-Based Security
- Multilink Trunking
- Spanning Tree
- Port configuration
- Port Mirroring
- QoS
- Quality of Service (QoS)
- RMON
- Stack Info
- System Logging
- VLAN configuration
- RMON

The ACG is available only from the Command Line Interface (CLI).

ASCII Configuration File Management

To take full advantage of the ASCII Configuration tools, you need to have a TFTP server available on the network and a text editor to customize the text-based configuration files.

ASCII Configuration File Management User Interface Support

Table 69 " User interface support for ASCII Configuration file" (page 232) identifies the support available on the various user interfaces

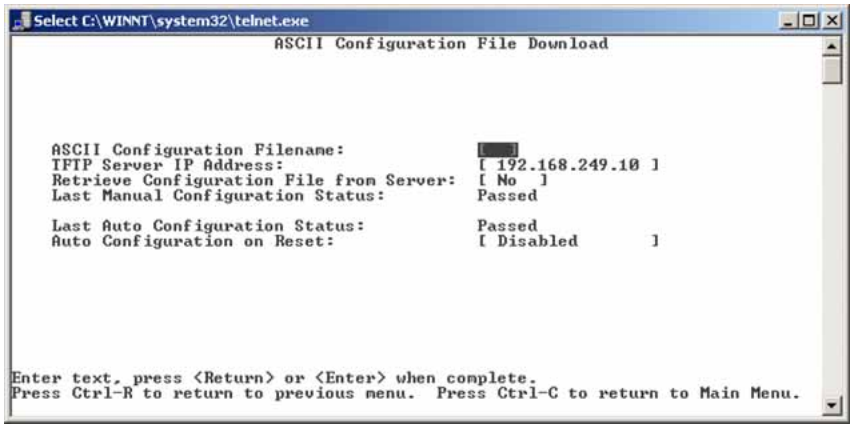
Table 69
User interface support for ASCII Configuration file

Parameter	Default	Menu Interface	CLI	Web Interface	Device Manager
ASCII Configuration Filename	blank	rw	rw	no	rw
TFTP Server IP Address	0.0.0.0	rw	rw	rw	rw
Last Manual Configuration Status	Passed	r	r	no	r
Last Auto Configuration Status	Passed	r	r	no	r
Auto Configuration on Reset using local filename	Disabled	rw	rw	no	rw
Auto Configuration on Reset using BootP filename	Disabled	rw	rw	no	rw
Retrieve Configuration File from Server	No	rw	rw	no	rw
Send ASCII Config file to TFTP Server	No	no	rw	no	rw
Display ASCII Config file on screen	No	no	rw	no	no

Using the Console Interface

With the Console Interface, you can upload and retrieve an ASCII configuration file to and from a TFTP to configure the system. Figure 95 "ASCII configuration file download screen" (page 233) depicts the ASCII configuration file download screen.

Figure 95
ASCII configuration file download screen



ASCII Configuration File Download Console Interface field descriptions

Table 70 " ASCII Configuration File Download screen fields" (page 233) describes the various fields that appear on the Console Interface ASCII Configuration File Download screen.

Table 70
ASCII Configuration File Download screen fields

Field	Description
ASCII Configuration Filename	Enter the file name you have chosen for the ASCII configuration file. Choose a meaningful file name to identify the file for retrieval when required. The file must already exist on your TFTP server and must be read-write enabled. Default value — Zero-length string Range — An ASCII string of up to 30 printable characters
TFTP Server IP Address	The IP address of your TFTP load host. Default value — 0.0.0.0 (no IP address assigned) Range — Four-octet dotted-decimal notation, where each octet is represented as a decimal value, separated by a decimal point

Field	Description
Retrieve Configuration File from Server	Specifies whether to retrieve the stored switch ASCII configuration file from the specified TFTP server (default is No). If you choose Yes, the download process begins immediately and, when completed, causes the switch to be configured according to the CLI commands in the file. Use the spacebar to toggle the selection to Yes. Press [Enter] to initiate the process. Default value No Range Yes, No
Last Manual Configuration Status	The system displays if the last manual configuration passed or failed. Default value Passed Range Passed, Failed
Last Auto Configuration Status	The system displays if the last automatic configuration passed or failed. Default value Passed Range Passed, Failed
Auto Configuration on Reset	Choose to Disabled, Use Configured, or Use BootP: • Disabled--Auto configuration on reset is disabled. • Use Configured--Use manually configured ASCII configuration filename and TFTP server address for auto configuration on reset. • Use BootP--Retrieve ASCII configuration filename, and optionally server address, using BootP, when BootP is enabled, and perform auto configuration on reset using these parameters. ***Note:*** see "Sample bootptab file " (page 209) for a sample BootP configuration file. Default value Disabled Range Disabled, Use Configured, Use BootP

Retrieving an ASCII Configuration file from the TFTP server You can use the ASCII Configuration File Download screen to download an ASCII configuration file containing CLI commands from a TFTP server to configure the switch.

Step	Action
1	Choose Configuration File Menu from the main menu

2 Choose ASCII Configuration File Download from the Configuration File Menu to open the ASCII Configuration File Download screen.

3 Enter the name of the file you wish to retrieve from the TFTP server in the ASCII Configuration Filename field.

4 Enter the TFTP Server IP Address in the TFTP Server IP Address field.

5 Cycle through the options in the Retrieve Configuration file from Server field and select Yes.

6 Press the Enter key to initiate the file transfer

—End—

Retrieving an ASCII Configuration file from the TFTP server on reset

You can configure the device to retrieve an ASCII configuration file upon system startup. The system retrieves the filename that is currently configured in flash or it can obtain the name of the target ASCII configuration from the BootP server.

Step	Action
1	Choose Configuration File Menu from the main menu
2	Choose ASCII Configuration File Download from the Configuration File Menu to open the ASCII Configuration File Download screen.
3	Enter the TFTP Server IP Address in the TFTP Server IP Address field.
4	Enter the name of the file you wish to retrieve from the TFTP server in the ASCII Configuration Filename field. If you wish for the system to obtain the filename from the BootP sever, you do not need to fill out this field. You must configure your BootP to supply the filename.
5	Cycle through the options in the Auto Configuration on Reset field and select Use configured if you wish to use the filename entered on the switch. If you wish to have the BootP server provide the filename, select the Use BootP option.
6	Press the Enter key to store the configuration in flash.
7	Reset your switch to verify that the configuration works.

—End—

Usage guidelines

- The maximum size for an ASCII configuration file is 100 KBs; larger configuration files must be split into multiple files.

Enabling and disabling autosave

Use the Autosave Configuration screen to enable and disable the autosave feature on the switch or stack. See Figure 96 "Autosave Configuration screen" (page 236).

Choose one of the following methods to access the Autosave Configuration screen:

- From the Configuration File Menu, select Autosave Configuration.
- from the Configuration File Menu, type **s** .

Figure 96
Autosave Configuration screen

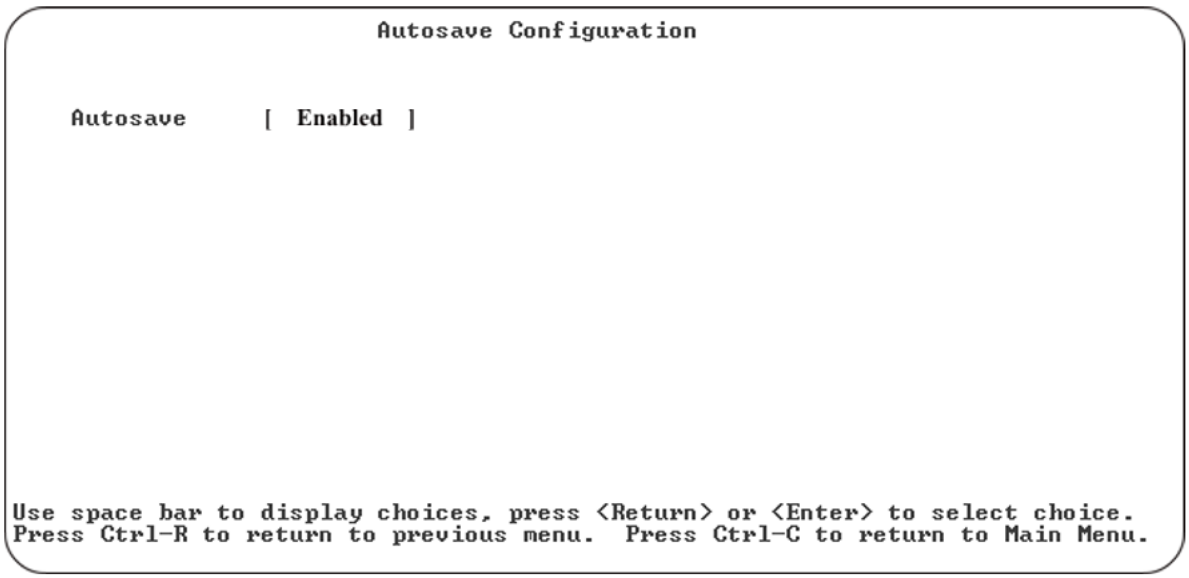


Table 71 "Autosave Configuration screen fields" (page 236) describes the fields available in the Autosave Configuration screen.

Table 71
Autosave Configuration screen fields

Field	Description
Autosave	Enables or disables the autosave feature.

Using SNTP

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 may be overloaded or currently inoperable.

The system retries connecting with the NTP server a maximum of 3 times, with 5 minutes between each retry. If the connection fails after the 3 attempts, the system waits for the next synchronization time (the default is 24 hours) and begins the process again.

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

If SNTP is enabled (the default value is disabled), the system synchronizes with the configured NTP server at boot-up and at user-configurable periods thereafter (the default sync 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 connecting to the secondary NTP server only if the primary NTP server is unresponsive.

For instructions on configuring SNTP using the CLI, see "Setting time on network elements using Simple Network Time Protocol (SNTP)" (page 362). For instructions on configuring SNTP using Device Manager, see "Working with SNTP" (page 441).

Setting the local time zone

SNTP uses Universal Coordinated Time (UTC) for all time synchronizations so it is not affected by different time zones. For the switch to report the correct time for your local time zone and daylight savings time, you must use the following commands:

- "clock time-zone" (page 367)
- "no clock time-zone" (page 368)
- "clock summer-time" (page 368)
- "no clock summer-time" (page 369)
- "show clock time-zone" (page 369)
- "show clock summer-time" (page 369)

Using DNS to ping and Telnet

Using the DNS client, you can ping or Telnet to a host server or to a host by name.

To use this feature, you must configure at least one domain name server; you may also configure a default domain name. If you configure a default domain name, that name is appended to host names that do not contain a dot. The default domain name and addresses are saved in NVRAM.

The host names for ping and Telnet cannot be longer than 63 alphanumeric characters, and the default DNS domain name cannot be longer than 255 characters.

You can use the CLI to configure the DNS client. For more information, see Chapter 4 "CLI Basics" (page 123).

Changing HTTP port number

Beginning with Release 3.1 software, you can configure the HTTP port. This feature provides enhanced security and network access.

The default HTTP port typically used to communicate between the Web client and the server is port 80. With this feature, you can change the HTTP port.

You can modify the HTTP port while the switch is running. The HTTP port value is saved in NVRAM, and is saved across reboots of the switch.

Configuring with CLI

You configure the HTTP port number using the following CLI commands:

- show http-port command
- http-port command
- default http-port

For details on these CLI commands, see *Security — Configuration (NN47210-500)*.

Diagnosing and correcting problems

Before you perform the problem-solving steps in this section, cycle the power to the switch (disconnect and reconnect the AC power cord) and then verify that the switch follows the normal power-up sequence.

WARNING
To avoid bodily injury from hazardous electrical current, never remove the top cover of the device. There are no user-serviceable components inside.

ATTENTION

Warnung:
Um Verletzungsgefahr durch einen elektrischen Stromschlag auszuschließen, nehmen Sie niemals die obere Abdeckung vom Gerät ab. Im Geräteinnern befinden sich keine Komponenten, die vom Benutzer gewartet werden können.

ATTENTION

Avertissement:
Pour éviter tout risque d'électrocution, ne jamais retirer le capot de l'appareil. Cet appareil ne contient aucune pièce accessible par l'utilisateur.

ATTENTION

Avertencia:
A fin de evitar daños personales por corrientes eléctricas peligrosas, no desmonte nunca la cubierta superior de este dispositivo. Los componentes internos no son reparables por el usuario.

ATTENTION

Avviso:
Per evitare lesioni fisiche dovute a scariche pericolose di corrente, non rimuovere mai il coperchio superiore del dispositivo. I componenti interni non possono essere manipolati dall'utente.

警告：危険な電流から身体を保護するために、ディバイスの上部カバーを決して取り外さないでください。内部には、ユーザが扱うコンポーネントはありません。

Normal power-up sequence

In a normal power-up sequence, the LEDs appear as follows:

Step	Action
1	After power is applied to the switch, the Pwr (Power) LED turns on within 5 seconds.
2	The switch initiates a self-test, during which the port LEDs display various patterns to indicate the progress of the self-test.
3	Upon successful completion of the self-test (within 10 seconds after power is applied), the Status LED turns on.

4 The remaining port LEDs indicate their operational status, as described in Table 72 " Corrective actions" (page 240).

—End—

Table 72
Corrective actions

Symptom	Probable cause	Corrective action
All LEDs are off.	The switch is not receiving AC power.	Verify that the AC power cord is fastened securely at both ends and that power is available at the AC power outlet.
	The fans are not operating or the airflow is blocked, causing the unit to overheat.	Verify that there is sufficient space for adequate airflow on both sides of the switch.
		Note: Operating temperature for the switch must not exceed 40°C (104°F). Do not place the switch in areas where it can be exposed to direct sunlight or near warm air exhausts or heaters.
The Activity LED for a connected port is off or does not blink (and you have reason to believe that traffic is present).	The switch is experiencing a port connection problem. The switch's link partner is not autonegotiating properly.	See "Port connection problems" (page 241)" next.
The Status LED is off.	A fatal error was detected by the self-test.	Cycle the power to the switch (disconnect and then reconnect the AC power cord). If the problem persists, replace the switch.
The Status LED is blinking.	A nonfatal error occurred during the self-test.	Cycle the power to the switch (disconnect and then reconnect the AC power cord). If the problem persists, contact the Nortel Technical Solutions Center.

Port connection problems

You can usually trace port connection problems to either a poor cable connection or an improper connection of the port cables at either end of the link. To remedy these types of problems, make sure that the cable connections are secure and that the cables connect to the correct ports at both ends of the link.

Port connection problems are also traceable to the autonegotiation mode or the port interface.

Autonegotiation modes

Port connection problems can occur when a port (or station) is connected to another port (or station) that is not operating in a compatible mode (for example, connecting a full-duplex port on one station to a half-duplex port on another station).

Note: You cannot *enable* autonegotiation using GBIC ports.

The Ethernet Switch negotiates port speeds according to the IEEE 802.3u autonegotiating standard. The switch adjusts (autonegotiates) its port speed and duplex mode to match the best service provided by the connected station, up to 100 Mb/s in full-duplex mode as follows:

- If the connected station uses a form of autonegotiation that is not compatible with the IEEE 802.3u autonegotiating standard, the switch cannot negotiate a compatible mode for correct operation.
- If the Autonegotiation feature is not present or not enabled at the connected station, the switch may not be able to determine the correct duplex modes.

In both situations, the switch autosenses the speed of the connected station and, by default, reverts to half-duplex mode. If the connected station is operating in full-duplex mode, it cannot communicate with the switch.

To correct the mode mismatch problem

Step	Action
1	Use the Port Configuration screen to disable autonegotiation for the suspect port (see " Port Configuration screen" (page 112)).
2	Manually set the Speed/Duplex field to match the speed/duplex mode of the connected station. You may have to try several settings before you find the correct speed/duplex mode of the connected station.

—End—

If the problem persists

Step	Action
1	Disable the Autonegotiation feature at the connected station.
2	Manually set the speed/duplex mode of the connected station to the same speed/duplex mode you manually set for the switch port. ***Note:*** Nortel recommends that you manually set the switch port to the desired speed/duplex mode when you connect to any of the following Nortel products: • Ethernet Switch 450 product family • Ethernet Switch 410 product family

—End—

Chapter 8
Ethernet Port Management

This chapter discusses the following topics:

Autosensing and Autonegotiation

The Ethernet Switches 460 and 470 are autosensing and autonegotiating devices:

- The term *autosense* refers to a port's ability to *sense* the speed of an attached device.
- The term *autonegotiation* refers to a standardized protocol (IEEE 802.3u) that exists between two IEEE 802.3u-capable devices. With Autonegotiation, the switch can select the best of both 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 802.3u autonegotiation standard. In this case, because the switch cannot sense the duplex mode of the attached device, the switch reverts to half-duplex mode.

When autonegotiation-capable devices are attached to the Ethernet Switches, the ports negotiate down from 100 Mbps speed and full-duplex mode, until the attached device acknowledges a supported speed and duplex mode.

Note: Autonegotiation is enabled by default on the front panel 10/100BASE-TX ports.

Custom Autonegotiation Advertisements

With Custom Autonegotiation Advertisements (CANA), you can customize the capabilities that you advertise. For example, if a port is capable of 10/100/1000 full duplex operation, the port can be configured to only advertise 10 half-duplex capabilities.

You can use CANA to control the capabilities that are advertised by the Ethernet Switches as part of the autonegotiation process. In the current software releases, autonegotiation can either be enabled or disabled.

When autonegotiation is disabled, the hardware is configured for a single (fixed) speed and duplex value. When autonegotiation is enabled, the advertisement made by the product is a constant value based upon all speed and duplex modes supported by the hardware.

When autonegotiating, the switch selects the highest common operating mode supported between the switch and its link partner.

In certain situations, it is useful to autonegotiate a specific speed and duplex value. In these situations, the switch can allow for attachment at an operating mode other than its highest supported value.

For example, if the switch advertises only a 100 Mbps full-duplex capability on a specific link, the link goes active only if the neighboring device is also capable of autonegotiating a 100 Mbps full-duplex capability. This prevents mismatched speed/duplex modes if customers disable autonegotiation on the neighboring device.

Note: Autonegotiation is not supported on GBIC ports on Ethernet Switch 460-PWR and non-PWR versions of Ethernet Switch 470.

CANA is available through the Command Line Interface (CLI) (see " Enabling Custom Autonegotiation Advertisements (CANA)" (page 386)) and the Device Manager (JDM) (see "Configuring a single port using the Interface tab" (page 450)).

Note: The CANA feature is available only for built-in 10/100 Ethernet ports.

When custom autonegotiation advertisements is in use on a port, autonegotiation is displayed as custom in the Console Interface and Web-based management interface.

Autonegotiation smart mode

Smart mode is an intelligent mode, in which GBIC ports on the 470 PWR can detect if the other end of the link can support gigabit autonegotiation.

If the far end can support auto-negotiation, the port enables gigabit autonegotiation functionality. If the far end cannot support autonegotiation, the port disables gigabit autonegotiation functionality.

Autonegotiation smart mode is also supported on single port MDA on the Ethernet Switch 460-24T-PWR.

Copper GBIC support

A new full-sized GBIC is supported. This GBIC supports 1000BaseT and works only on Ethernet Switch 470 units. For more information, see "GBIC compatibility matrix" (page 245).

GBIC compatibility matrix

Table 73 "GBIC compatibility matrix" (page 245) lists the Gigabit Interface Converters (GBIC) supported by Release 3.6 software.

Table 73
GBIC compatibility matrix

GBIC	Standard or SFP	Order number	Comment
1000Base-T Copper	Standard (RJ-45 connector)	AA1419042	Ethernet Switch 470 Only
1000Base-SX	Standard (SC connector)	AA1419001	
1000Base-LX	Standard (SC connector)	AA1419002	
1000Base-XD	Standard (SC connector)	AA1419003	Extended distance 50km
1000Base-ZX	Standard (SC connector)	AA1419004	Extended distance 70km
1000BaseWDM	Standard (SC connector)	From AA1419017 to AA1419024	1470nm-1610nm (in 20nm intervals)
1000Base-SX	SFP (LC connector)	AA1419013	
1000Base-SX	SFP (MT-RJ connector)	AA1419014	
1000Base-LX	SFP (LC connector)	AA1419015	
1000Base-CWDM (40km)	SFP (LC connector)	From AA1419025 to AA1419032	1470nm - 1610nm (in 20nm intervals)
1000Base-CWDM (70km)	SFP (LC connector)	From AA1419033 to AA1419040	1470nm - 1610nm (in 20nm intervals)

Single Fiber Fault Detection (SFFD)

When a partial fiber break occurs, data is lost on one side of a link. Single Fiber Fault Detection (SFFD) detects this error condition, and causes the port that is losing data to go down. This stops the loss of data. The Single Fiber Fault Detection feature is enabled on a port-by-port basis for Ethernet Switches 470-24T and 470-48T GBIC ports. At present, you can access this feature through the CLI. Single Fiber Fault Detection (SFFD) has the following requirements and limitations:

- SFFD must be implemented on both sides of a link. For example: Passport 8600 and Ethernet Switch 470.
- SFFD must be enabled on a per-port basis.
- By default, SFFD is disabled on all ports.
- SFFD takes about 50 seconds to detect a fault.
- After a link is repaired, the link recovers automatically.

Flow control

You can use Flow Control to control traffic and avoid congestion on the GBIC port. Flow Control field cannot be configured unless you set the Autonegotiation field value to Disabled. The default Value is Disabled and the range is Disabled, Symmetric, Asymmetric.

For more information see the High Speed Flow Control Configuration screen in the *Nortel Ethernet Switch 460/470 Overview — System Configuration (NN47210-501)*.

Far End Fault Indication (FEFI)

When a fiber optic transmission link to a remote device fails, the remote device indicates the failure, and the port is disabled. To use FEFI, you must enable autonegotiation on the port.

Chapter 9
Stacking ES 460 and 470 units

Ethernet Switches 460 and 470 can be stacked up to eight units high.

Note: The hybrid stack mode is not supported in Release 3.7 software. All stacks must contain only Ethernet Switches 460-24T-PWR, Ethernet Switches 470-24T, and Ethernet Switches 470-48T.

This section discusses the following topics:

Stacking

Release 3.7 does not support interleaving switch types within the stack.

Note: All switches in a stack must have the same version of software installed before joining a stack. For Release 3.7 software, all Ethernet Switch 470 and Ethernet Switch 460 units must be running Release 3.7 software. You can have a maximum of eight units in a stack.

You must use either the Console Interface (CI) menus or the CLI to configure the IP addresses for each unit within a stack. You need an IP address to use the Web-based management system or Java Device Manager (JDM). Subsequently, you can change the IP address configuration from the Web-based management system or JDM, but you lose access until you restart the Web-based management system or JDM with the new IP address.

Contiguous units

In a stack, the same types of switches must be stacked contiguously in the following order:

- all Ethernet Switch 460-24T-PWR units
- all Ethernet Switch 470-24T-PWR units
- all Ethernet Switch 470-48T-PWR units

Any one of the switches in the stack can function as a base unit in a stack; however, if an Ethernet Switch 470-48T is in the stack, it must be the base unit.

Base unit for a stack

In order of preference, one of the following switches can function as a base unit in a stack:

- If an Ethernet Switch 470-48T unit is in the stack, it must be the base unit.
- Otherwise, if an Ethernet Switch 470-24T unit is in the stack, it must be the base unit.
- If no Ethernet Switch 470 units are in the stack, the Ethernet Switch 460-24T PWR can be the base unit.

When stacking the switches, keep in mind the base unit restrictions. Also remember to plan which unit becomes the temporary base unit in the event of a base unit failure.

Configuring basic stacking

For a stack to operate correctly, you must perform the following steps:

Step	Action
1	Power down all the units.
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 the base position.

4 Ensure all cascade modules are properly seated.

5 Ensure all the cascade cables are properly connected and screwed into the unit.

6 Power up the stack.

—End—

Stack operational mode

The Stack Operational Mode screen, as depicted in Figure 97 "Stacking operational mode screen" (page 249), displays the current configuration mode for the stack configuration.

When the stack is reset on the Ethernet Switch 460-24T, the operational mode settings do not revert to the default settings.

For the Ethernet Switch 470-24T, you must reset the stack for changes to the stack operation mode to take effect.

When you reset the stack on the Ethernet Switch 470-48T, the operational mode settings revert to the default settings.

Figure 97
Stacking operational mode screen

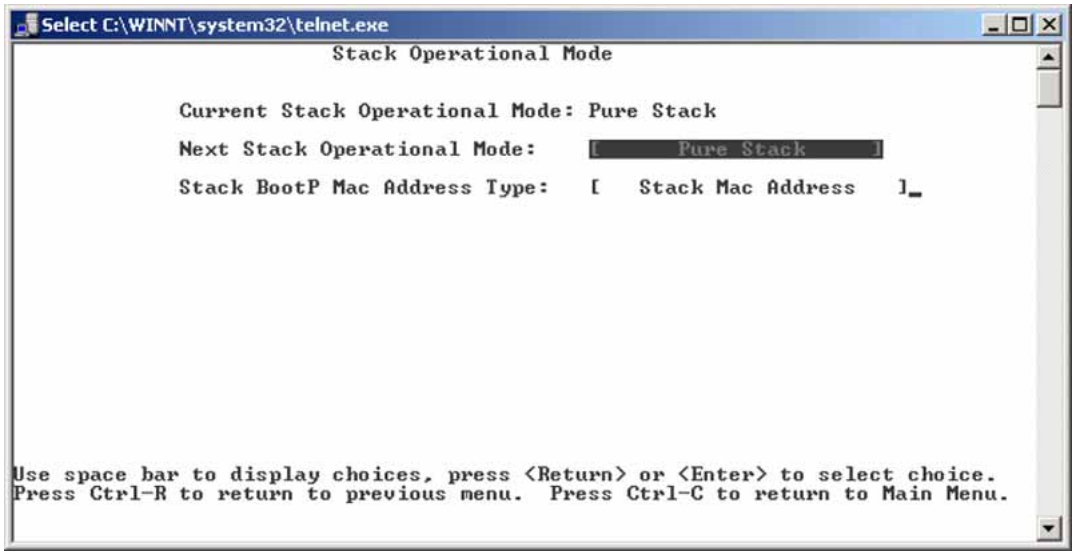


Table 74 "Stack Operational Mode screen fields" (page 250) describes the Stack Operational Mode screen fields.

Table 74
Stack Operational Mode screen fields

Field	Description
Current Stack Operational Mode	A read-only field that indicates the current mode of your stack. Default: Pure Stack Range: Pure Stack. In the current software release, this is the only supported stack mode. (hybrid stack mode is not supported in the current release.)
Stack BootP Mac Address Type	Set the location for the BootP MAC address. (The Base Unit Mac Address option is available only with Ethernet Switch 470 stack options.) Default: Stack Mac Address Range: Stack Mac Address, Base Unit Mac Address

Merging a switch into a stack

Nortel recommends that you initially start up the switch you are going to add to the stack in stand-alone mode and perform preliminary IP configuration tasks before you add it to an existing stack.

Adding a new unit does not change the designated base unit. If you want to change the designated base unit when you add a new unit to the stack, you must change the base unit manually.

Step	Action
1	Turn off power to all units in the stack by unplugging the power cords from each unit. a. On the unit that was the base unit, use the Unit Select switch to deselect it as the base unit. b. On the unit that you want to be the new base unit, use the Unit Select switch to select it as the base unit. c. Redo the cabling so that all of the units work as one stack.
2	Power up the newly joined units by plugging in the power cords.

—End—

It can take a few minutes for the entire stack to display on the console. All units appear as their new numbers within the newly formed stack.

Joining stacks

You can join two stacks without renumbering units in either stacks.

Note: You cannot join Ethernet Switches 460 and 470 with other switch types. For example, you cannot join an Ethernet Switch 460 stack with an Ethernet Switch 450 stack.

To join two existing stacks:

Step	Action
1	Designate one stack as the stack to join the other stack.
2	Reset the stack joining the other stack, to factory defaults.
3	Turn off power to all units in the stack joining the other stack by unplugging the power cords from each unit. a. On the unit that was the base unit for this stack, use the Unit Select switch to deselect it as the base unit. b. Redo the cabling so that all of the units can work as one stack.
4	Power up the newly joined units by plugging in the power cords.

—End—

It can take a few minutes for the entire stack to display on the console. All units appear as their new numbers within the newly formed stack.

Automatic failover

The automatic failover is a temporary safeguard only. When you lose the base unit of a stack, one of the other units in the stack takes over as the base unit. If the stack as a whole loses power or is reset, the temporary base unit does not power up as the base unit when the power is restored.

For this reason, always explicitly reassign the temporary base unit to act as the base unit (set the Unit Select switch to Base) until the failed unit is repaired or replaced. When a failure of the base unit is discovered, set the Unit Select switch on the temporary base unit to Base.

Note 1: If you do not reassign the temporary base unit as the new base unit and the temporary base unit fails, the next unit in the stack becomes the new temporary base unit. This process can continue until only two units are left in the stack configuration.

Note 2: Software download is not available when the temporary base unit is active.

Upgrading software in a stack

As a result of the stacking software compatibility requirements, all units in the stack must run the same software release.

Using the base unit, you can download the software to all units in the stack. To download, or upgrade, software in a stack:

Step	Action
1	Download the operational software image.
2	Download the diagnostics image. ***Note:*** After you begin the upgrading process, do not interrupt power to the stack.

—End—

Unit replacement in a stack

You can use two methods to replace a unit in a stack:

- " Manual unit replacement" (page 252)
- "Auto unit replacement" (page 260)

Manual unit replacement

You can use the unit replacement feature to retrieve the configuration of a single unit from the configuration file of a stack.

If a unit in a stack fails, you can use this feature to prepare a replacement unit for insertion in the stack. You can retrieve the configuration file of the failed unit while the replacement unit is in stand-alone mode. After you retrieve the configuration file of the failed unit, you can add the replacement unit to the stack.

You do not have to reboot the stack after you add the replacement unit to the stack.

System requirements

To use the unit replacement feature, you must ensure that you have the following items:

- Recent binary configuration file
- TFTP server
- Switch identically configured to the failed unit

Interface support

Table 75 "Interfaces supported by the unit replacement feature" (page 253) describes the interfaces supported by the unit replacement feature.

Table 75
Interfaces supported by the unit replacement feature

Parameter	Default	Menu interface	CLI	Web interface	Device Manager
Download unit configuration file from stack configuration file	none	rw	rw	rw	rw

Using unit replacement

The unit replacement feature requires you to complete three separate and distinct steps:

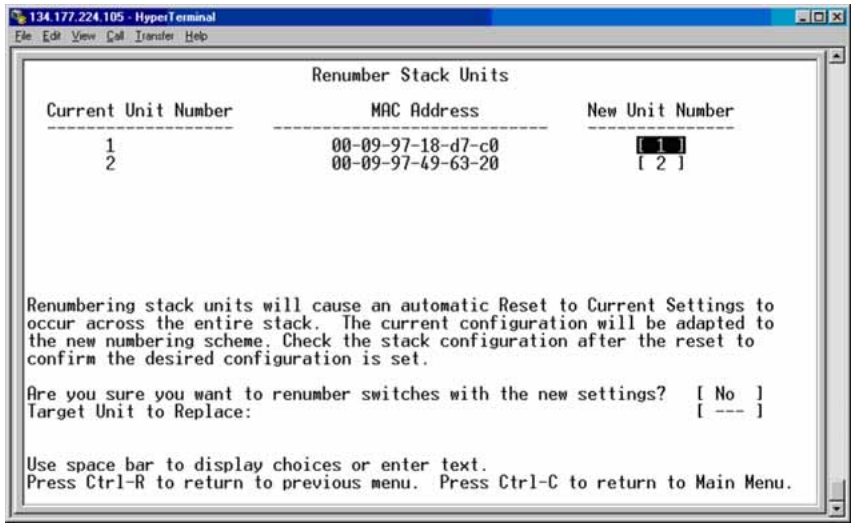
Step	Action
1	Back up the configuration of the stack before a unit failure occurs. When a unit in the stack fails, you cannot retrieve the configuration of the device. Ensure that your network recovery plan includes having a current binary configuration file available on a TFTP server.
2	Configure a stand-alone unit as a replacement for the failed unit. With the exception of the hardware revision level of the device, the replacement unit must be an exact replica of the failed unit. It must be configured with the same MDA, software revision, firmware revision, and GBICs as the failed unit.
3	Insert the replacement unit into the stack.

—End—

Preparing the stack for the replacement unit Follow this procedure to prepare the stack for the new unit:

Step	Action
1	Remove the failed unit from the stack.
2	Remove the failed unit entry from the stack by going to the Main Menu and selecting the **Renumber Stack Units** option. Figure 98 "Renumber Stack Units screen" (page 254) displays the Renumbering Stack Units screen.

Figure 98
Renumber Stack Units screen



3	Select the field **Target Unit to Replace**.
4	Cycle through the options by pressing the spacebar.
5	Press the **Enter** key when the number of the unit you want to replace appears.
6	Insert the new unit into the stack by reconnecting all cables and adding power to the switch. The new unit joins the stack and appears as if it were the old unit without resetting the stack.

—End—

Usage guidelines

When using the unit replacement feature:

- You must have an existing binary configuration file. If you do not have an existing binary file, you have no source from which to recover the configuration of the failed unit.

- You cannot specify a target unit number unless that unit is present in the configuration file.
- The replacement unit resets following the download of the failed unit configuration file.
- You can download the failed unit configuration file only to a stand-alone unit.

Inserting or replacing units in a stack

This section provides you with the procedures to successfully replace a failed unit in a stack configuration, while preserving configuration information. You must perform the following four steps:

- Prepare the new replacement unit for insertion into the stack.
- Insert the replacement unit into the stack.
- Download the configuration to the stack.
- Recable the networking ports on the replacement unit.

When you prepare your replacement unit for insertion into a stack, the replacement unit must have the identical configuration of the unit that it is replacing to work properly in the stack. The following steps ensure that the unit integrates successfully into the stack.

Replacing a failed base unit

Step	Action
1	Ensure that the software and firmware versions on the replacement unit match the software and firmware versions of the unit that was removed from the stack. This step assumes that you did not upgrade the software on the stack after the failed unit was removed.
2	Ensure that the hardware configuration of the replacement unit is the same as that of the failed unit. This means that you must move the MDAs, GBIC, and other modules from the failed unit to the replacement unit.
3	Set the configuration of the replacement unit to the default values. This ensures that no legacy configuration is present on the device to hinder the integration of the replacement unit into the stack.
4	Ensure that the Stack Operational Mode is set correctly on the replacement unit; otherwise the replacement unit cannot join the stack.

5 Ensure that the Base Unit Selector Switch is not activated on the replacement unit.

You do not want the replacement unit to immediately take over the role of the base unit when it is inserted into the stack. If the replacement unit assumes base unit responsibilities, it overwrites the existing configuration with the configuration in its memory (which was previously defaulted).

6 On the stack with the failed unit, place the Base Unit Selector Switch on the temporary base unit in the base unit position.

This ensures that the temporary base unit remains the base unit throughout the unit replacement process. At the end of this process, you receive instruction on how to make the replacement unit the new base unit.

—End—

Replacing a failed non-base unit

Step	Action

1 Ensure that the software and firmware versions on the replacement unit match the software and firmware versions of the unit that was removed from the stack.

This step assumes that you did not upgrade the software on the stack after the failed unit was removed.

2 Ensure that the hardware configuration of the replacement unit is the same as that of the failed unit.

This means that you must move the MDAs, GBIC, and other modules from the failed unit to the replacement unit.

3 Set the replacement unit configuration to default values to ensure that no legacy configuration is present on the device to hinder the integration of the replacement unit into the stack.

—End—

After you complete these steps, your device is ready to be inserted into the stack at the location previously occupied by the failed unit.

Inserting the replacement unit into the stack

Step	Action
1	Insert the replacement unit into the space previously occupied by the failed unit. Ensure that all physical mounting devices, screws, and rack mounts are secure.
2	Attach the stacking cables to the back of the unit. Do not cable any network connections at this time.
3	Apply power to the device.
4	Ensure that the unit number of the replacement unit is the same as that of the failed unit.

—End—

Downloading the configuration to the stack

After the replacement unit is physically integrated into the stack and is powered on, download the configuration from a Trivial File Transfer Protocol (TFTP) server to the entire stack. The binary configuration file for a stack contains information about each unit in the stack. The configuration information for each unit is associated with the unit by the unit number. When the configuration file is downloaded, it overwrites the configuration of each unit, including the replacement unit, and reboots the stack.

This procedure makes two assumptions: you have a TFTP server and know how to use it, and you have a binary stack configuration file that was created before the unit failed.

Step	Action
1	Save your existing configuration, but do not overwrite any existing configuration files in case your configuration file is corrupt or fails to load onto the stack.
2	Download your prefailure configuration file to the stack. The stack reboots automatically when the configuration file downloads. ***Note:*** This process uses the binary configuration file to apply the configuration of the settings from the failed unit to the replacement unit. You can also restore the unit configuration by uploading an ASCII configuration file to the unit. An ASCII configuration upload does not initiate an automatic reboot of the stack. See "Configuration Management" (page 224) for details.

—End—

Recabling the network connections

Step	Action
1	Verify the configuration of the replacement unit. Ensure that the Spanning Tree Protocol (STP), MultiLink Trunking (MLT), and other settings are correct. For example, you can check the following MLT settings: • Trunk members have the same PVID. • Trunk members are on the same VLANs. • Trunk members have the same tagging. • Trunk members filter tagged frames the same way. • Trunk members filter untagged frames the same way. • Trunk members rate limiting the same way. • Trunk members have the same spanning tree mode of operation. • Trunk members have identical IGMP participation. Static router ports and mode of operation must agree on all trunk ports.
2	Recable all networking connections.
3	If the failed unit had a switch IP address configured, configure the replacement unit to match the previous configuration.

—End—

Replacing a failed base unit

You can make the replacement unit the base unit if the failed unit was the system base unit. To do so, follow this procedure:

Step	Action
1	Set the Base Unit Selector Switch on the replacement unit to the base unit position.
2	Set the Base Unit Selector Switch on all other units in the stack to the non-base unit position.
3	Reset the stack to activate the new base unit.

—End—

Troubleshooting hints

If you encounter problems with the unit replacement or with a newly installed stack configuration, start troubleshooting by verifying the following items:

- Ensure that the TFTP server is accessible to the Ethernet Switch.
- Ensure that the configuration file contains the configuration of the target unit.
- Ensure that the replacement unit is configured identically to the failed unit. It must be the same model number with the same MDA configuration.
- Ensure that one switch is designated as the base unit.
- Ensure that all other units in the stack have the Base Unit Selector Switch set to Off.
- Ensure that all units in the stack are running Release 3.7 software.

When the stack is powered up, ensure that the Cas Up and Cas Dwn (cascade) and Base LEDs are green (steady, not blinking).

Configuring Unit Replacement using the CLI

You can replace a unit in the stack using the following commands:

- "Copy tftp config unit command" (page 259)
- "stack replace unit command" (page 260)

Copy tftp config unit command

The **`copy tftp config unit`** command downloads the configuration of the unit you want to replace to a replacement unit. Use this command in stand-alone mode. The syntax for the **`copy tftp config unit`** command is:

```
copy tftp config unit <unit #>
```

The **`copy tftp config unit`** command is in the privileged exec command mode.

Table 76 "copy tftp config unit command parameters and variables" (page 260) describes the parameters and variables for the **copy tftp config unit** command.

Table 76
copy tftp config unit command parameters and variables

Parameters and variables	Description
<unit #>	Enter the number of the unit you want to replace.

stack replace unit command

The **stack replace unit** command prepares the stack to receive the replacement unit. Use this command in stack mode. The syntax for the **stack replace unit** command is:

```
stack replace unit <1-8>
```

The **stack replace unit** command is in the privileged exec command mode.

Table 77 "stack replace unit command parameters and variables" (page 260) describes the parameters and variables for the **stack replace unit** command.

Table 77
stack replace unit command parameters and variables

Parameters and variables	Description
<1-8>	Enter the number of the replacement unit.

Auto unit replacement

This section contains information about the following topics:

- "AUR overview" (page 260)
- "AUR function" (page 261)
- "Configuring AUR using the CLI" (page 268)

AUR overview

Use the Auto Unit Replacement (AUR) feature to replace a unit from a stack, while retaining the configuration of the unit. This feature requires the stack power to be on during the unit replacement.

The AUR feature retains the configuration (CFG) image of a unit in a stack during a unit replacement. The retained CFG image from the old unit is restored to the new unit. Because retained CFG images are kept in the DRAM of the stack, the stack power must be kept on during the procedure.

Other information related to this feature:

- The new unit must have the same hardware configuration as the old unit, including the same number of ports. If you add a new unit with a different hardware configuration, the previous configuration of the new unit is lost. It is overwritten with the restored configuration from the stack.
- This feature can be disabled or enabled at any time using the CLI. The default mode is ENABLE.
- Customer log messages are provided.

Note: The AUR feature cannot be enabled for a stand-alone switch. As a result, AUR cannot function properly if you remove one unit from a stack of only two switches. In this case, the CFG image of the removed unit is not retained.

AUR function

The CFG mirror image is a mirror of a CFG image (in flash memory) of a unit in a stack. The mirror image does not reside in the same unit as the CFG image. The unit that contains the CFG image is called the Associated Unit (AU) of the CFG mirror image. The MAC address of the AU is called the Associated Mac Address (AMA) of the CFG mirror image.

An active CFG mirror image is a CFG mirror image with its AU in the stack. An inactive CFG mirror image is a CFG mirror image for which the associated AU is removed from the stack. When a CFG mirror image becomes inactive, it is copied to another unit.

The stack always keeps two copies of an inactive CFG mirror image in the stack in case one unit is removed—the other unit can still provide the backup inactive CFG mirror image.

For additional details about the AUR functions, see the following sections:

- "CFG mirror image process" (page 261)
- "Restoring a CFG image" (page 266)
- "Synchronizing the CFG mirror images with CFG images" (page 268)

CFG mirror image process

Specific events trigger the CFG mirror image process. For details about each trigger, see the following sections:

- "Power cycle" (page 262)
- "Add a unit" (page 263)

- "Removing an NBU" (page 264)
- "Removing a BU" (page 265)

Power cycle

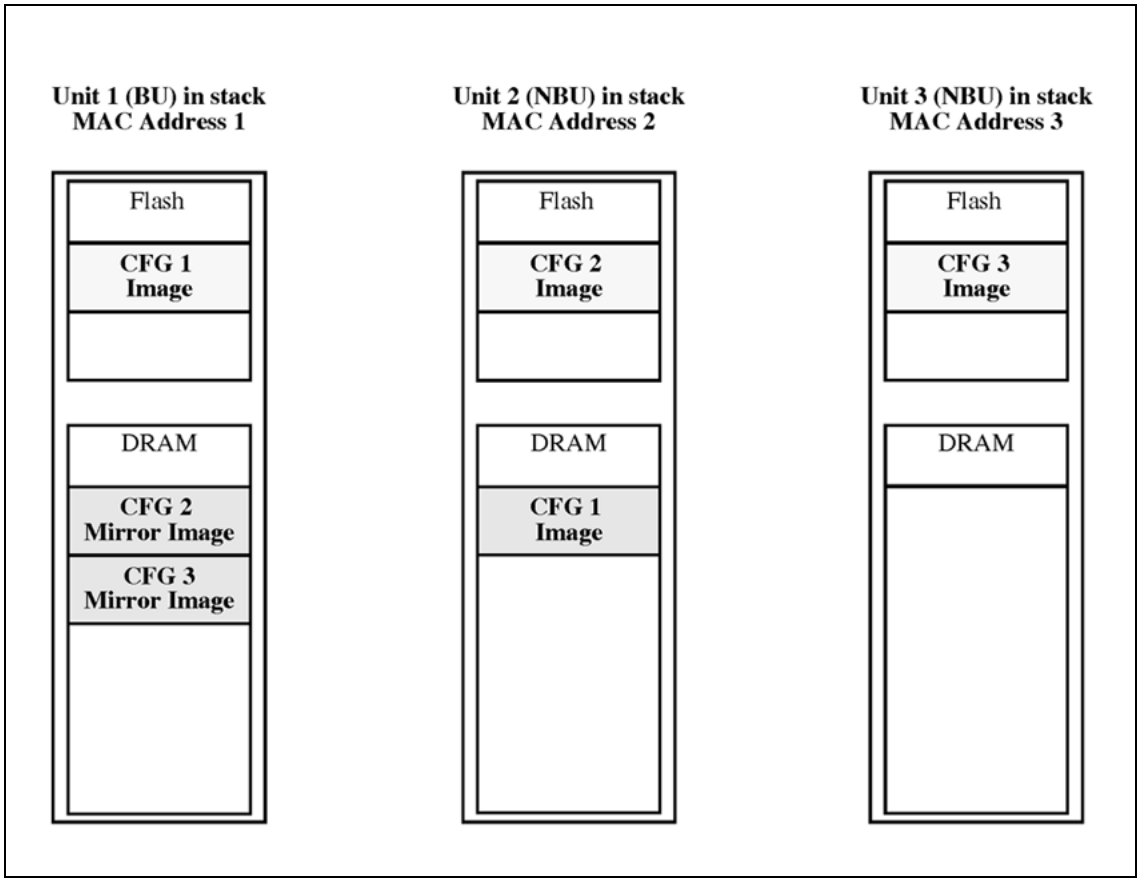
After a power cycle, the system mirrors all the CFG images in a stack.

Note: After a reboot, the system requires between 5 and 10 minutes to mirror the CFG images from all units in the stack. When the process is complete, the system displays the following log message: `All units mirrored for the first time`. This message indicates that you can safely begin replacing units.

Figure 99 "CFG mirror process in stack" (page 263) illustrates the CFG mirror images in a three-unit stack after the stack is powered on. Unit 1 is the base unit (BU) and all other units are non-base unit (NBU).

- Unit 1 (BU) contains mirror images for unit 2 (CFG 2) and unit 3 (CFG 3).
- Unit 2 (NBU) is the temporary base unit. It contains a mirror image of unit 1 (CFG 1), in case the BU (unit 1) is removed from the stack.
- All three mirror images (CFG 1, CFG 2, and CFG 3) are active.
- Unit 2 is the Associated Unit of the CFG 2 mirror image.
- Mac Address 2 is the Associated Mac Address (AMA) of the CFG 2 mirror image.

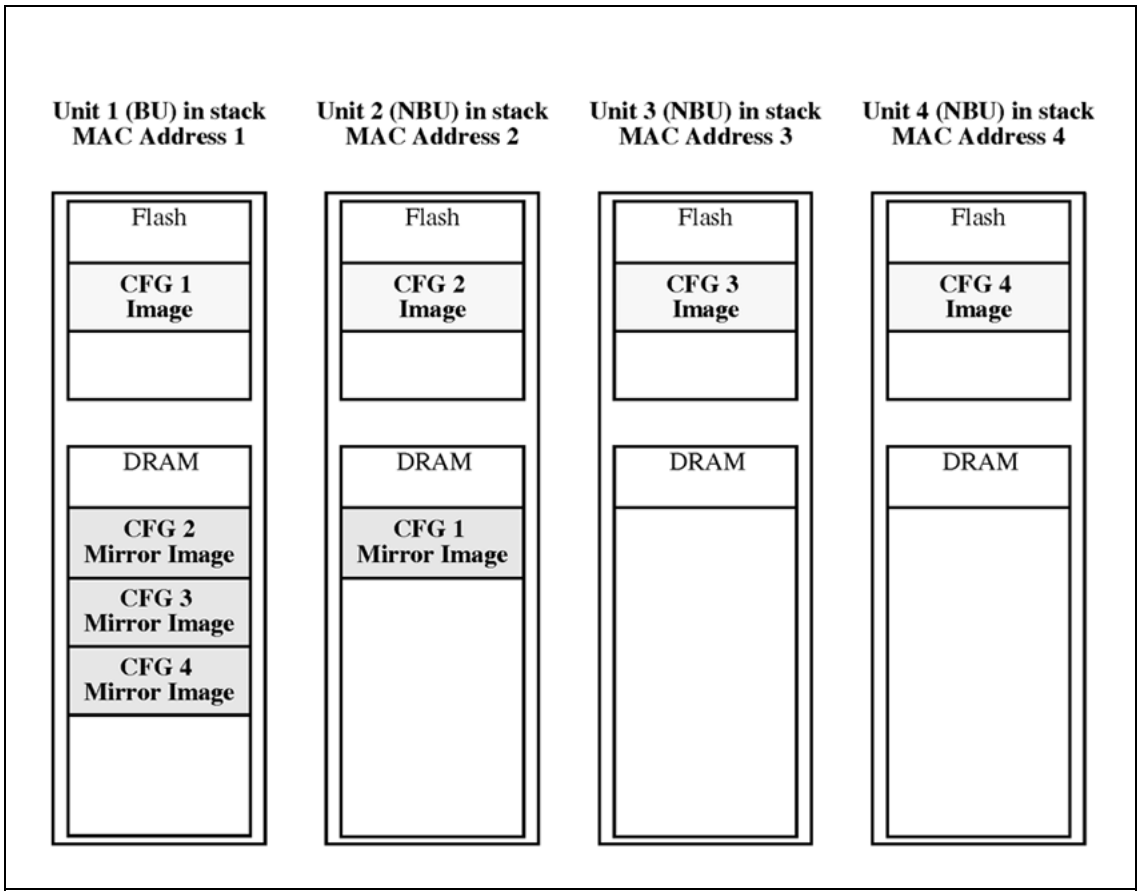
Figure 99
CFG mirror process in stack



Add a unit

In a stack that has no inactive CFG mirror images, adding a new unit causes the CFG image of the new unit to be mirrored in the stack. For example, in Figure 100 "CFG mirror images in the stack after adding unit 4" (page 264), after adding unit 4 to the stack, the CFG 4 mirror image is created in the BU (unit 1).

Figure 100
CFG mirror images in the stack after adding unit 4



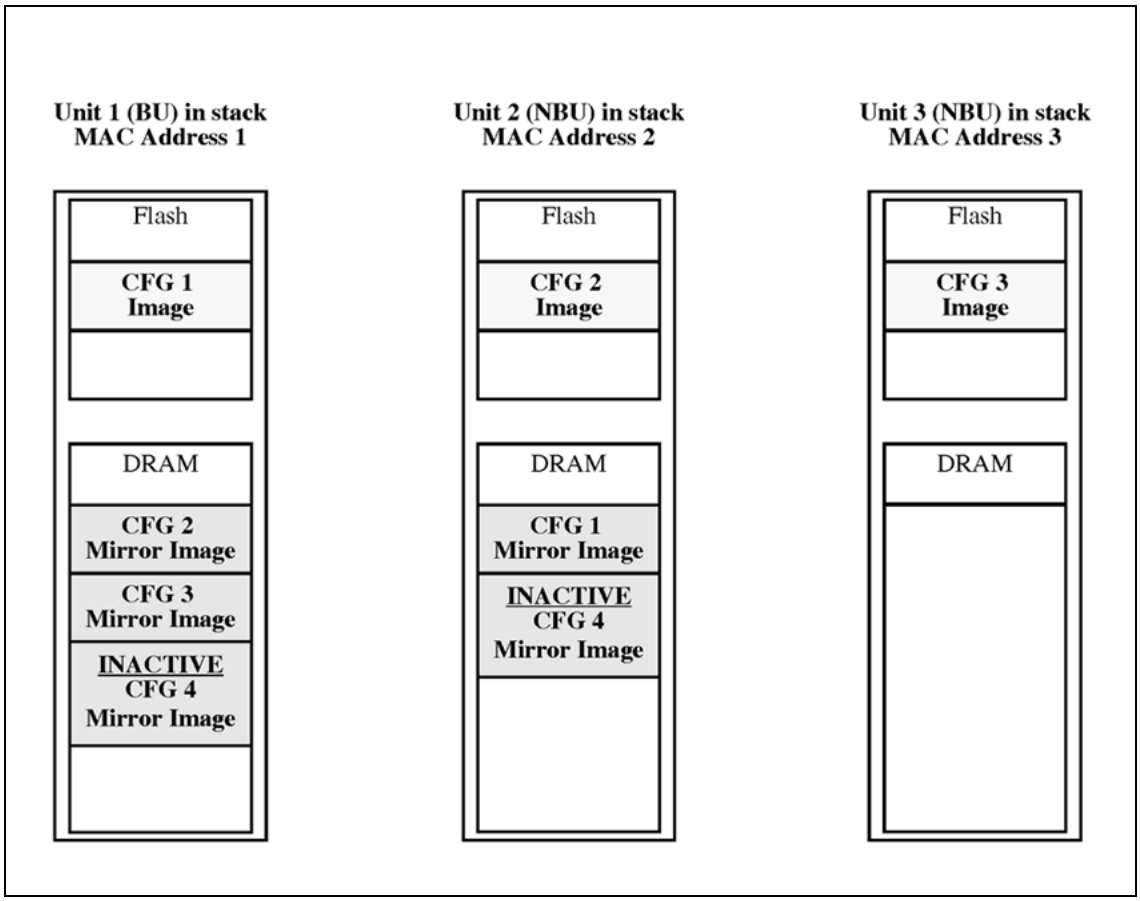
Removing an NBU

When you remove an NBU from a stack, the related CFG mirror image in the stack becomes inactive.

The AUR feature ensures that the stack always has two copies of an inactive CFG mirror image. These two copies must not reside in the same unit in the stack.

For example, after removing unit 4 from the stack shown in Figure 100 "CFG mirror images in the stack after adding unit 4" (page 264), the CFG 4 mirror image becomes inactive, see Figure 101 "CFG mirror images after removing unit 4" (page 265). Another copy of the inactive CFG 4 mirror image is also created in unit 2.

Figure 101
CFG mirror images after removing unit 4

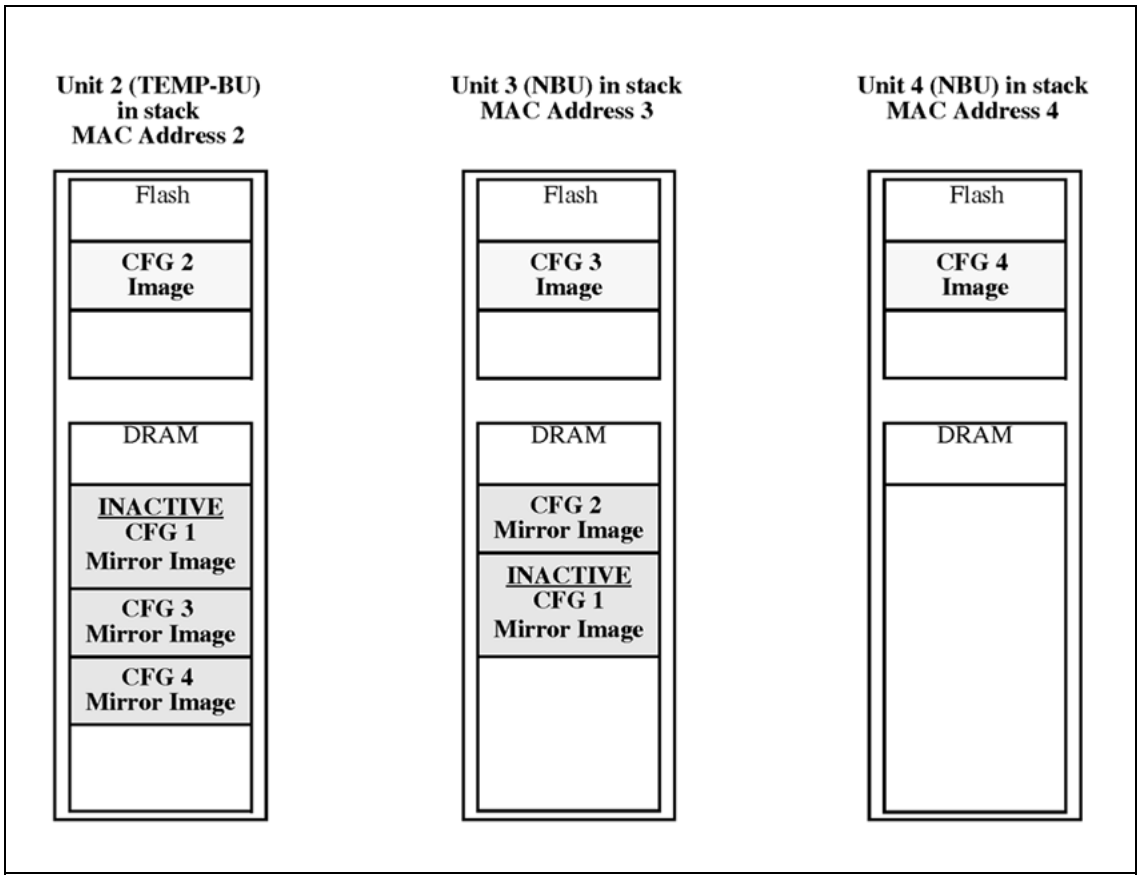


Removing a BU

When you remove a BU, the TEMP-BU assumes the role of the BU. Because all the CFG mirror images of the NBUs reside in the removed BU, the TEMP-BU mirrors all the CFG images of the NBUs in the stack.

After removing the BU from the stack shown in Figure 100 "CFG mirror images in the stack after adding unit 4" (page 264), the TEMP-BU (unit 2) must mirror all the CFG images in the stack, see Figure 102 "CFG mirror images in the stack after removing the BU (unit 1)" (page 266). The AUR feature also ensures that the stack always has two copies of an inactive CFG mirror image.

Figure 102
CFG mirror images in the stack after removing the BU (unit 1)



As shown in Figure 102 "CFG mirror images in the stack after removing the BU (unit 1)" (page 266):

- Unit 2 becomes the TEMP-BU.
- The CFG 1 mirror image (residing in unit 2) becomes inactive.
- A second copy of the inactive CFG 1 mirror image is created in unit 3.
- The TEMP-BU (unit 2) contains all CFG mirror images of the stack NBUs.
- The CFG 2 mirror image is created in unit 3. Unit 3 becomes the next TEMP-BU, in case the current TEMP-BU is removed.

Restoring a CFG image

You restore a CFG image to overwrite the CFG image of a new unit in a stack with an inactive mirror image stored in the stack.

Note: You can restore a CFG image to a new unit only if the following conditions are met:

- The AUR feature is enabled.
- At least one inactive CFG mirror image is in the stack.
- The MAC address of the new unit is different from all the AMAs of the inactive CFG mirror images in the stack.

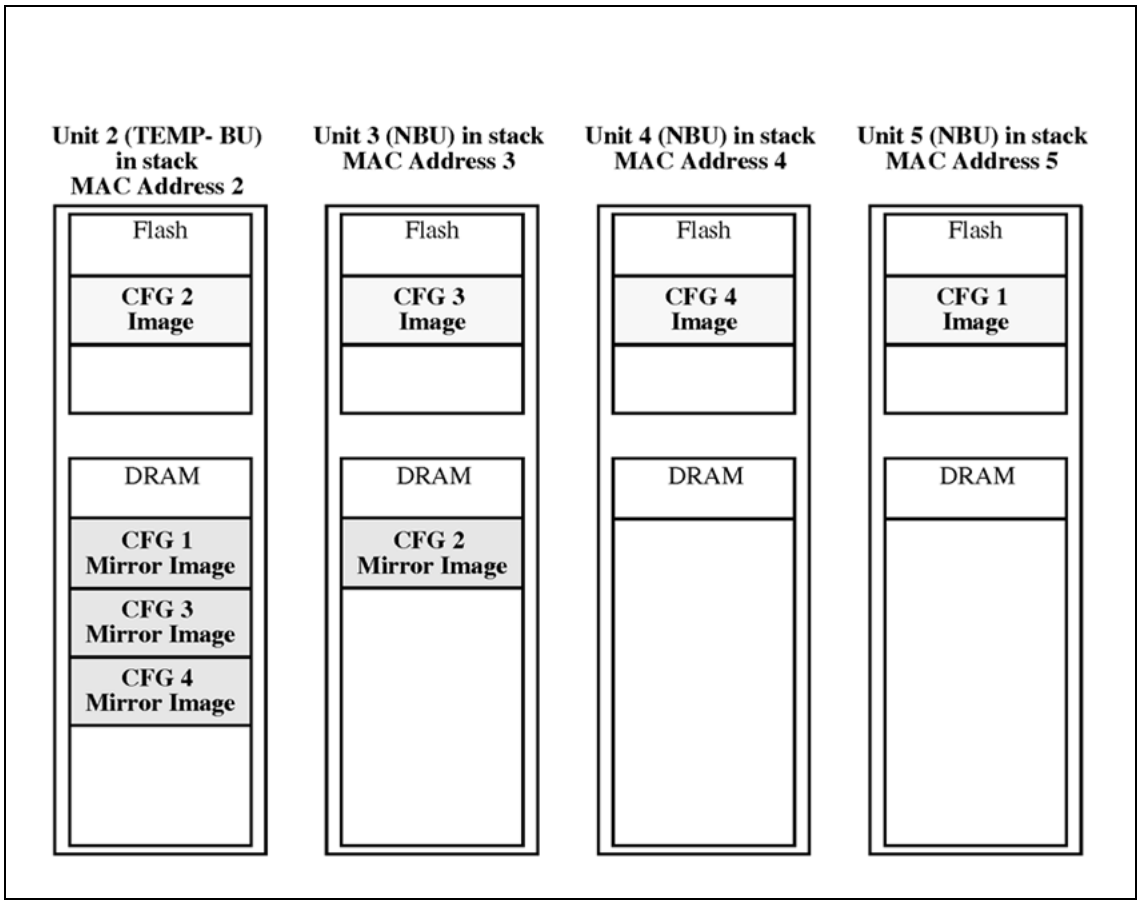
After you add a new unit to a stack, the image restore process consists of the following steps:

1. If the stack contains more than one inactive CFG mirror image, the last one to become inactive is selected for restoring (last out, first in).
2. The inactive CFG mirror image in the stack is sent to the new unit. The inactive CFG mirror image becomes active.
3. The new unit saves the received CFG image to its flash memory.
4. The new unit resets itself.

For example, if unit 5 (MAC Address 5) is added to the stack shown in Figure 102 "CFG mirror images in the stack after removing the BU (unit 1)" (page 266), the following occurs. See Figure 103 "CFG mirror images in the stack after adding unit 5" (page 268):

- The inactive CFG 1 mirror image is copied to the CFG 5 image. Unit 5 now has the configuration of unit 1, which is no longer in the stack.
- The inactive CFG 1 mirror image in unit 2 becomes active.
- The inactive CFG 1 mirror image in unit 3 is removed.
- The MAC address 5 of unit 5 becomes the new AMA of the CFG 1 mirror image.

Figure 103
CFG mirror images in the stack after adding unit 5



Synchronizing the CFG mirror images with CFG images

A CFG mirror image is updated whenever a CFG flash syncronization occurs in the AU.

Configuring AUR using the CLI

You can configure the Auto Unit Replacement (AUR) feature with the following CLI commands:

- "show stack auto-unit-replacement command" (page 268)
- "stack auto-unit-replacement enable command" (page 269)
- "no stack auto-unit-replacement enable command" (page 269)
- "default stack auto-unit-replacement enable command" (page 270)

show stack auto-unit-replacement command

The `show stack auto-unit-replacement` command displays the current AUR settings and if AUR is ready for a unit replacement.

ATTENTION

You must use the **show stack auto-unit-replacement** command to confirm that AUR is ready before you replace a unit.

The syntax for this command is:

```
show stack auto-unit-replacement
```

The **show stack auto-unit-replacement** command is in all command modes.

The **show stack auto-unit replacement** command has no parameters or variables.

Figure 104 "show stack auto-unit-replacement command output" (page 269) displays sample output for the **show stack auto-unit-replacement** command.

Figure 104
show stack auto-unit-replacement command output

```
460-24T-PWR#show stack auto-unit-replacement
Auto Unit Replacement:  Enabled
This unit is ready for replacement
460-24T-PWR#
```

stack auto-unit-replacement enable command

The **stack auto-unit-replacement enable** command enables AUR on the switch.

The syntax for this command is:

```
stack auto-unit-replacement enable
```

The **stack auto-unit-replacement enable** command is in the config mode.

The **stack auto-unit-replacement enable** command has no parameters or variables.

no stack auto-unit-replacement enable command

The **no stack auto-unit-replacement enable** command disables AUR on the switch.

The syntax for this command is:

```
no stack auto-unit-replacement enable
```

The **no stack auto-unit-replacement enable** command is in the config mode.

The **no stack auto-unit-replacement enable** command has no parameters or variables.

default stack auto-unit-replacement enable command

The **default stack auto-unit-replacement enable** command restores the default AUR settings.

The syntax for this command is:

```
default stack auto-unit-replacement enable
```

The **default stack auto-unit-replacement enable** command is in the config mode.

The **default stack auto-unit-replacement enable** command has no parameters or variables..

Configuring Auto Unit Replacement using Device Manager

You can also enable or disable auto unit replacement using Device Manager, under the System tab (Edit > Chassis > System). See "System tab" (page 401) for details.

Chapter 10
Power over Ethernet for Ethernet Switches 460-PWR and 470-PWR

Ethernet Switches 460-PWR and 470-PWR provide IEEE 802.3af-compliant power over the front-panel RJ-45 ports. These switches provide power discovery, power management, and statistics on power use on a per port and per switch basis. You can use Ethernet Switches 460-PWR and 470-PWR to provide power to network appliances, such as IP telephones, wireless access points, and video devices.

The major PoE feature differences between the Ethernet Switch 460-PWR and Ethernet Switch 470-PWR switches are as follows:

- The Ethernet Switch 470-PWR supports neither the NES nor the RPS 10 power supplies; it supports only the RPS 15 power supply.

WARNING
Do not connect the Ethernet Switch 470-PWR to either the NES or the RPS 10 power supplies; doing so can cause a critical failure on the Ethernet Switch 470-PWR.

- The Ethernet Switch 470-PWR supplies data terminal equipment (DTE) power only on signal pins (1-2, 3-6).
- The Ethernet Switch 460-PWR and Ethernet Switch 470-PWR each support a specific PoE firmware image. The appropriate firmware is pre-loaded on the devices prior to shipping. For details, see Nortel Ethernet Switch 460/470 Release Notes — Software Release 3.7 (NN47210-400).
- The Ethernet Switch 470-PWR displays the port power classification classes. Classification is a way 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 are classified according to their power requirements. The meaning of the classification

labels is defined in the IEEE 802.3af specification. Refer to the following table for a summary of the classification labels.

Table 78
IEEE 802.3af PSE and Powered Device Power Classifications

Class	Usage	Minimum Power Levels Output at the PSE	Maximum Power Levels at the Powered Device
0	Default	15.4 W	0.44 to 12.95 W
1	Optional	4.0 W	0.44 to 3.84 W
2*	Optional	7.0 W	3.84 to 6.49 W
3	Optional	15.4 W	6.49 to 12.95 W
4	Reserved for future use	Treat as Class 0	Reserved for future use: A class 4 signature cannot be provided by a compliant powered device.
Note: *Class 2 devices are sometimes displayed as Class 1 devices.			

While the 470-PWR supports 802.3af Power Classes as previously detailed, the switch uses real-time power usage measurements to calculate the amount of power available to PoE devices. This approach provides an improved level of power metering for customer applications.

- Setting the PoE limit on an Ethernet Switch 470-PWR port to 16W actually sets the limit to 15400 milliwatts (the limit from IEEE 802.3af); for Ethernet Switch 460-PWR, the 16W actually represents 16000 milliwatts.

  Note: Depending on the power source configuration you enable, the Ethernet Switch 470-PWR displays one of the following values for the available DTE power:

  - 390 Watt
  - 402 Watt
  - 772 Watt

  While the switch displays a higher value, the actual DTE power available is limited by the number of PoE ports on the switch. For example, on 24-port devices, the maximum available DTE power is 370 Watts, and on 48-port devices, the maximum available DTE power is 740 Watts.

The management interfaces for the Ethernet Switch 470-PWR take these differences into account and, as a result, they display differently from the Ethernet Switch 460-PWR management interfaces.

You configure the Power over Ethernet (PoE) parameters using the Command Line Interface (CLI), the Web-based management system, or Device Manager (JDM).

This chapter contains the following topics:

Diagnosing and correcting PoE problems

This section discusses some common problems in using the PoE features of Ethernet Switches 460-PWR and 470-PWR. This section discusses the following topics:

Status codes on PoE ports

You may see an error displayed for a port running PoE. If these errors appear, they are in the port status section of the PoE displays in the CLI and the Web-based management system. The following are the messages that display and their explanations:

- Searching--port detecting IP device requesting power
- Delivering power--port delivering requested power to device
- Disabled--port power state disabled
- Invalid PD--port detecting device that is not valid to request power
- Deny low priority--power disabled from port because of port setting and demands on power budget
- Overload--power disabled from port because port is overloaded
- Test--port in testing mode, which is set using SNMP
- Error--an unspecified error condition

Configuring PoE switch parameters using the CLI

You can configure and display power parameters for Ethernet Switches 460-PWR and 470-PWR using the CLI. Most CLI commands that are used to configure the Ethernet Switch 460-PWR are also applicable for the Ethernet Switch 470-PWR.

This section covers the following CLI commands:

Note: The **`poe poe-dc-source-type`** and **`poe poe-dc-source-conf`** commands are not applicable to Ethernet Switch 470-PWR, because the only valid power source available for this switch is the RPS 15.
Nor does the **`poe poe-power-pairs`** command apply to Ethernet Switch 470-PWR, because the only available power pairs option for this switch is signal.

poe poe-dc-source-type command

With the **`poe poe-dc-source-type`** command, you can set the type of external DC power source you are using with the switch. The syntax for the **`poe poe-dc-source-type`** command is:

```
poe poe-dc-source-type [unit <1-8>] {RPS10 | nes}
```

The **`poe poe-dc-source-type`** command is in the config mode.

Table 79 "poe poe-dc-source-type command parameters and variables" (page 274) describes the parameters and variables for the **`poe poe-dc-source-type`** command.

Table 79
`poe poe-dc-source-type` **command parameters and variables**

Parameters and variables	Description
`unit <1-8>`	Enter the unit number that you want to configure for an external power source. ***Note:*** If you omit this parameter and you are working from the console port, this command sets your connected unit. If you omit this parameter and you are working through Telnet, this command sets the base unit.

Parameters and variables	Description
	To specify a unit, you must enter `unit #`. If you enter the #alone, you get an error.
`RPS10 | nes`	Sets the type of external DC power source you are using: • `RPS10`--sets the external DC power source as the Ethernet Switch Power Supply Unit 10 • `nes`--sets the external DC power source as the Intergy* Network Energy Source (NES) from Invensys Energy Systems ***Note:*** The default setting is `RPS10`. You set this parameter whether or not you are physically attached to an external power source.

poe poe-dc-source-conf command

With the `poe poe-dc-source-conf` command, you can configure the type of power sharing you want to use on the Ethernet Switch 460-24T-PWR. The syntax for the `poe poe-dc-source-conf` command is:

```
poe poe-dc-source-conf [unit <1-8>] {powersharing | rpsu | ups}
```

The `poe poe-dc-source-conf` command is in the config mode.

Table 80 "poe poe-dc-source-conf command parameters and variables" (page 275) describes the parameters and variables for the `poe poe-dc-source-conf` command.

Table 80
`poe poe-dc-source-conf` command parameters and variables

Parameters and variables	Description
`unit <1-8>`	Enter the unit number for which you want to configure the power-sharing option. ***Note:*** If you omit this parameter and you are working from the console port, this command sets your connected unit. If you omit this parameter and you are working through Telnet, this command sets the base unit.

Parameters and variables	Description
	To specify a unit, you must enter `unit #`. If you enter the `#` alone, you get an error.
`powersharing | rpsu | ups`	Sets the type of powersharing for the Ethernet Switch 460-24T-PWR: • `powersharing` • `rpsu` • `ups` ***Note:*** The default setting is `powersharing`. You set this parameter whether or not you are physically attached to an external power source.

poe poe-pd-detect-type command

The `poe poe-pd-detect-type` command sets the method the Ethernet Switch 460-24T-PWR uses to detect the power devices connected to the front ports. The syntax for the `poe poe-pd-detect-type` command is:

```
poe poe-pd-detect-type [unit <1-8>]
{802dot3af | 802dot3af_and_legacy}
```

The `poe poe-pd-detect-type` command is in the config mode.

Note: You must ensure that this setting is the correct one for the IP appliance you use with the switch. This setting applies to the entire switch, not port-by-port. You must ensure that this setting is configured correctly for *all* the IP appliances on a specified switch.

Table 81 "poe poe-pd-detect-type command parameters and variables" (page 276) describes the parameters and variables for the `poe poe-pd-detect-type` command.

Table 81
`poe poe-pd-detect-type` command parameters and variables

Parameters and variables	Description
`unit <1-8>`	Enter the unit number for which you want to configure the power option detection.

Parameters and variables	Description
	Note: If you omit this parameter and you are working from the console port, this command sets your connected unit. If you omit this parameter and you are working through Telnet, this command sets the base unit. To specify a unit, you must enter **`unit #`**. If you enter the **`#`** alone, you get an error.
`802dot3af | 802dot3af_and_legacy`	Sets the detection method the switch use to detect power needs of devices connected to front ports: • **`802dot3af`** • **`802dot3af_and_legacy`** ***Note:*** The default setting is 802dot3af. Ensure that the power detection method you choose for the Ethernet Switch 460-24T-PWR matches that used by the IP devices you are powering.

poe poe-power-pairs command

The **`poe poe-power-pairs`** command sets the RJ-45 connector pins on the front port that you use to deliver power to the device. The syntax for the **`poe poe-power-pairs`** command is:

```
poe poe-power-pairs [unit <1-8>] {spare | signal}
```

The **`poe poe-power-pairs`** command is in the config mode.

Note: You must ensure that this setting is the correct one for the IP appliance you use with the switch. This setting applies to the entire switch, not port-by-port. You must ensure that this setting is configured correctly for *all* the IP appliances you on a specified switch.

Table 82 "poe poe-power-pairs command parameters and variables" (page 277) describes the parameters and variables for the **`poe poe-power-pairs`** command.

Table 82
`poe poe-power-pairs` **command parameters and variables**

Parameters and variables	Description
`unit <1-8>`	Enter the unit number for which you want to configure the power pairs.

Parameters and variables	Description
	Note: If you omit this parameter and you are working from the console port, this command sets your connected unit. If you omit this parameter and you are working through Telnet, this command sets the base unit. To specify a unit, you must enter **`unit #`**. If you enter the **`#`** alone, you get an error.
`spare` | **`signal`**	Sets the type of external DC power source you are using: • **`spare`**--sets power-carrying pins to the spare set • **`signal`**--sets power-carrying pins to the signal set The default value is spare. See"Features" (page 28) for complete information about power pairs. ***Note:*** Ensure that the power pair you choose for the Ethernet Switch 460-24T-PWR matches the power pair used by the IP devices you are powering. Each unit uses the same power pairs; you cannot configure this on each port.

poe poe-power-usage-threshold command

With the **`poe poe-power-usage-threshold`** command, you can set a percentage usage threshold above which the system sends a trap for each Ethernet Switch 460-24T-PWR. The syntax for the **`poe poe-power-usage-threshold`** command is:

```
poe poe-power-usage-threshold [unit <1-8>] <1-99>
```

The **`poe poe-power-usage-threshold`** command is in the config mode.

Table 83 "poe poe-power-usage-threshold command parameters" (page 279) describes the parameters and variables for the **poe poe-power-usage-threshold** command.

Table 83
poe poe-power-usage-threshold command parameters

Parameters and variables	Description
unit <1-8>	Enter the unit number for which you want to configure the trap generation. ***Note:*** If you omit this parameter and you are working from the console port, this command sets your connected unit. If you omit this parameter and you are working through Telnet, this command sets the base unit. To specify a unit, you must enter **unit #**. If you enter the **#** alone, you receive an error.
<1-99>	Enter the percentage of total available power you want the switch to use prior to sending a trap. ***Note:*** The default setting is 80%.

poe poe-trap command

The **poe poe-trap** command enables the traps for the PoE functions on the Ethernet Switch 460-24T-PWR. The syntax for the **poe poe-trap** command is:

```
poe poe-trap [unit <1-8>]
```

The **poe poe-trap** command is in the config mode.

Table 84 "poe poe-trap command parameters and variables" (page 279) describes the parameters and variables for the **poe poe-trap** command.

Table 84
poe poe-trap command parameters and variables

Parameters and variables	Description
unit <1-8>	Enter the unit number for which you want to enable traps.

Parameters and variables	Description
	Note: If you omit this parameter and you are working from the console port, this command sets your connected unit. If you omit this parameter and you are working through Telnet, this command sets the base unit. To specify a unit, you must enter **`unit #`**. If you enter the **#** alone, you receive an error.

no poe-trap command

The **`no poe-trap`** command disables the traps for the PoE functions on the Ethernet Switch 460-24T-PWR. The syntax for the **`no poe-trap`** command is:

```
no poe-trap [unit <1-8>]
```

The **`no poe-trap`** command is in the config mode.

Table 85 "no poe-trap command parameters and variables" (page 280) describes the parameters and variables for the **`no poe-trap`** command.

Table 85
`no poe-trap` **command parameters and variables**

Parameters and variables	Description
`unit <1-8>`	Enter the unit number for which you want to disable traps. ***Note:*** If you omit this parameter and you are working from the console port, this command sets your connected unit. If you omit this parameter and you are working through Telnet, this command sets the base unit. To specify a unit, you must enter **`unit #`**. If you enter the **#** alone, you receive an error.

Configuring PoE port parameters using the CLI

You can configure power parameters for each port on the Ethernet Switches 460-PWR and 470-PWR using the CLI. You enable the power and set the power limit and power priority on each port.

This section covers the following CLI commands:

- "no poe-shutdown command" (page 281)

no poe-shutdown command

The **no poe-shutdown** command enables power to the port. The syntax for the **no poe-shutdown** command is:

```
no poe-shutdown [port <portlist>]
```

The **no poe-shutdown** command is in the config-if mode.

Table 86 "no poe-shutdown command parameters and variables" (page 281) describes the parameters and variables for the **no poe-shutdown** command.

Table 86
no poe-shutdown command parameters and variables

Parameters and variables	Description
port <portlist>	Enter the port numbers on which you want to enable power. The default value is enabled. ***Note:*** If you omit this parameter, the system uses the port entered with the **interface FastEthernet** command.

poe poe-shutdown command

The **poe poe-shutdown** command disables power to the port. The syntax for the **poe poe-shutdown** command is:

```
poe poe-shutdown [port <portlist>]
```

The **poe poe-shutdown** command is in the config-if mode.

Table 87 "poe poe-shutdown command parameters and variables" (page 282) describes the parameters and variables for the **poe poe-shutdown** command.

Table 87
poe poe-shutdown command parameters and variables

Parameters and variables	Description
port <portlist>	Enter the port numbers on which you want to disable power. The default value is enabled. ***Note:*** If you omit this parameter, the system uses the port entered with the **interface FastEthernet** command.

poe poe-priority command

With the **poe poe-priority** command, you can set the power priority for each port to low, high, or critical. The system uses the port power priority settings to distribute power to the ports depending on the available power budget. The syntax for the **poe poe-priority** command is:

```
poe poe-priority [port <portlist>] {low | high | critical}
```

The **poe poe-priority** command is in the config-if mode.

Table 88 "poe poe-priority command parameters and variables" (page 282) describes the parameters and variables for the **poe poe-priority** command.

Table 88
poe poe-priority command parameters and variables

Parameters and variables	Description
port <portlist>	Enter the port numbers on which you want to disable power. ***Note:*** If you omit this parameter, the system uses the port entered with the **interface FastEthernet** command.
low | high |	Sets the port priority as:

Parameters and variables	Description
`critical`	• `low` • `high` • `critical` ***Note:*** The default setting is low. When two ports have the same priority and one must be shut down, the port with the higher port number is shut down first.

poe poe-limit command

The **`poe poe-limit`** command sets the maximum power allowed to a port. The syntax for the **`poe poe-limit`** command is:

```
poe poe-limit [port <portlist>] <3-16>
```

The **`poe poe-limit`** command is in the config-if mode.

Table 89 "poe poe-limit command parameters and variables" (page 283) describes the parameters and variables for the **`poe poe-limit`** command.

Table 89
`poe poe-limit` **command parameters and variables**

Parameters and variables	Description
`<3-16>`	Enter the maximum number of watts you want to allow to the specified port. The range is 3W to 16W; the default value is 16W.
`port`	Enter the port number you want to disable power on. ***Note:*** If you omit this parameter, the system uses the port entered with the **`interface FastEthernet`** command.

Displaying PoE configuration using the CLI

You display the status for the PoE configuration on the Ethernet Switches 460-PWR and 470-PWR using the following CLI commands:

- "show poe-main-status command" (page 284)
- "show poe-port-status command" (page 285)

- "show poe-power-measurement command" (page 286)

show poe-main-status command

The **show poe-main-status** command displays the current PoE configuration of the Ethernet Switch 460-24T-PWR, and per port PoE settings. The syntax for the **show poe-main-status** command is:

```
show poe-main-status [unit <1-8>]
```

The **show poe-main-status** command is in the exec command mode.

Table 90 "show poe-main-status command parameters and variables" (page 284) describes the parameters and variables for the **show poe-main-status** command.

Table 90
show poe-main-status command parameters and variables

Parameters and variables	Description
unit <1-8>	Enter the unit number for which you want to display the power statistics. ***Note:*** If you omit this parameter and you are working from the console port, this command sets your connected unit. If you omit this parameter and you are working through Telnet, this command sets the base unit. To specify a unit, you must enter **unit #**. If you enter the **#** alone, you receive an error.

displays sample output from the **show poe-main-status** command.

Figure 105
show poe-main-status command output

```
460-24T-PWR>show poe-main-status
PoE Main Status - Unit# 1
-------------------------------------------------
Available DTE Power         : 200 Watts
DTE Power Status            : Normal
DTE Power Consumption       : 0 Watts
DTE Power Usage Threshold   : 80 %
Power Pairs                 : Spare
Traps Control Status        : Enable
PD Detect Type              : 802.3af and Legacy
Power Source Present        : AC Only
DC Source Type              : RPS 10
DC Source Configuration     : Power Sharing
```

Note: The Power Source Present listing displays the current power source for the switch: AC Only, DC Only, or AC and DC.

show poe-port-status command

The **`show poe-port-status`** command displays the status, power status, power limit, and port priority of each port.

Note: With Ethernet Switch 470-PWR, the show **`poe-port-status`** command also displays the classification status for each port.

The syntax for the **`show poe-port-status`** command is:

```
show poe-port-status [port <portlist>]
```

The **`show poe-port-status`** command is in the exec command mode.

The DTE Power Status displays error messages if the port is not providing power. The following messages can appear:

- Searching--port detecting IP device requesting power
- Delivering power--port delivering requested power to device
- Invalid PD--port detecting device that is not valid to request power
- Deny low priority--power disabled from port because of port setting and demands on power budget
- Overload--power disabled from port because port is overloaded
- Test--port in testing mode
- Error--none of the other conditions apply

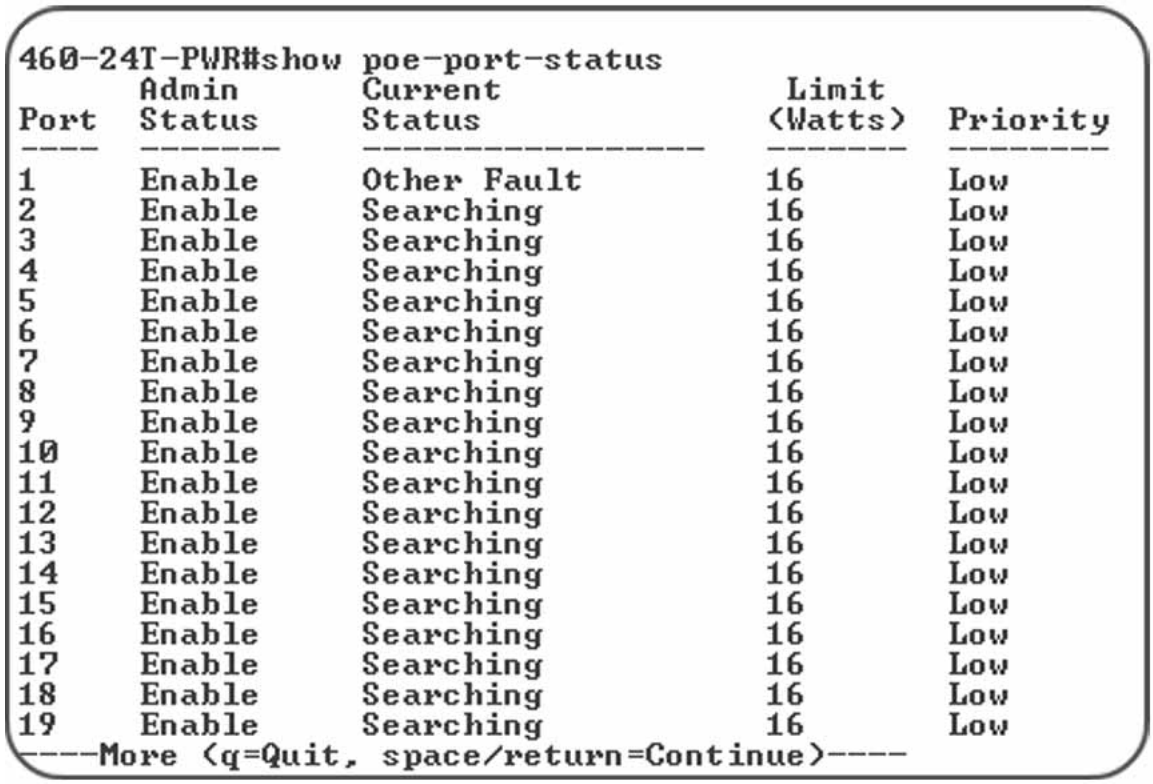
Table 91 "show poe-port-status command parameters and variables" (page 285) describes the parameters and variables for the **`show poe-port-status`** command.

Table 91
`show poe-port-status` **command parameters and variables**

Parameters and variables	Description
`port <portlist>`	Enter the ports for which you want to display the status. ***Note:*** If you omit this parameter, the system displays all ports.

displays sample output from the **`show poe-port-status`** command.

Figure 106
show poe-port-status command output



```
460-24T-PWR#show poe-port-status
        Admin       Current                  Limit
Port    Status      Status                   (Watts)   Priority
----    --------    ------------------       --------  ---------
1       Enable      Other Fault              16        Low
2       Enable      Searching                16        Low
3       Enable      Searching                16        Low
4       Enable      Searching                16        Low
5       Enable      Searching                16        Low
6       Enable      Searching                16        Low
7       Enable      Searching                16        Low
8       Enable      Searching                16        Low
9       Enable      Searching                16        Low
10      Enable      Searching                16        Low
11      Enable      Searching                16        Low
12      Enable      Searching                16        Low
13      Enable      Searching                16        Low
14      Enable      Searching                16        Low
15      Enable      Searching                16        Low
16      Enable      Searching                16        Low
17      Enable      Searching                16        Low
18      Enable      Searching                16        Low
19      Enable      Searching                16        Low
----More (q=Quit, space/return=Continue)----
```

show poe-power-measurement command

The **show poe-power-measurement** command displays the voltage, current and power values for each powered device connected to each port. The syntax for the **show poe-power-measurement** command is:

```
show poe-power-measurement [port <portlist>]
```

The **show poe-power-measurement** command is in the exec command mode.

Table 92 "show poe-power-measurement command parameters" (page 287) shows the variables and parameters for the **show poe-power-measurement** command.

Table 92
show poe-power-measurement command parameters

Parameters and variables	Description
port <portlist>	Enter the ports for which you want to display the power measurements. ***Note:*** If you omit this parameter, the system displays all ports.

Figure 107 " show poe-power-measurement command output" (page 287) displays sample output from the **show poe-power-measurement** command.

Figure 107
show poe-power-measurement command output

```
460-24T-PWR>show poe-power-measurement
Unit/Port   Volt(V)   Current(mA)    Power(Watt)
---------   -------   -----------    ---------------
1/1         0.0       0              0.000
1/2         0.0       0              0.000
1/3         0.0       0              0.000
1/4         0.0       0              0.000
1/5         0.0       0              0.000
1/6         0.0       0              0.000
1/7         0.0       0              0.000
1/8         0.0       0              0.000
1/9         0.0       0              0.000
-More--
```

Configuring PoE using Web-based management

You can display and configure Power over Ethernet (PoE) parameters using the Web-based management system.

The Web-based management interface for the Ethernet Switch 470-PWR PoE appears slightly different from the Ethernet Switch 460-PWR PoE Web-based management interface.

For details, see the following sections:

- "Displaying and configuring power management for the Ethernet Switch 460/470-PWR devices" (page 288)

- "Displaying and configuring power management for the Ethernet Switch 460/470-PWR ports" (page 293)

Displaying and configuring power management for the Ethernet Switch 460/470-PWR devices

To display and configure power settings for the entire switch:

Step	Action
1	From the main menu, choose Configuration > Power Management > Global Power Mgmt. The Global Power Management page appears. See Figure 108 "460-PWR Global Power Management page" (page 288) or Figure 109 "470-PWR Global Power Management page" (page 291).

Figure 108
460-PWR Global Power Management page

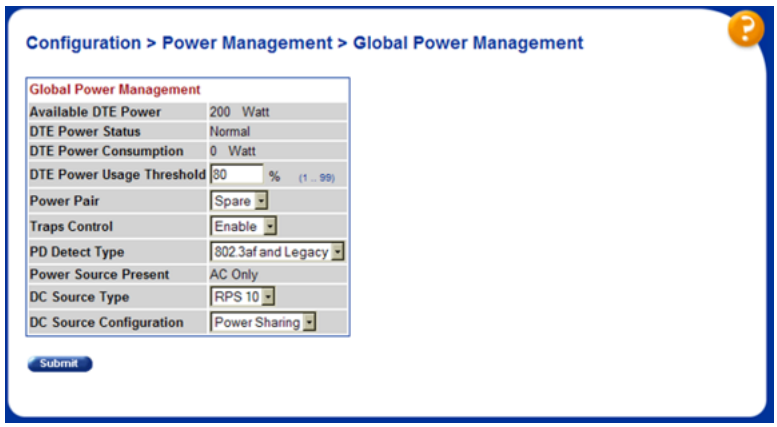


Table 93 "460-PWR Global Power Management page items" (page 288) describes the items on the 460-PWR Global Power Management page.

Table 93
460-PWR Global Power Management page items

Item	Description
Available DTE Power	Displays the amount of power available to powered devices from the switch. Depending on the power sources you use and the power configuration you enable, you see one of the following values: • 75 Watt • 200 Watt

Item	Description
	• 235 Watt • 370 Watt
DTE Power Status	Displays the status of the PoE feature. It displays: • Normal--all power functioning correctly • Error--PoE failed
DTE Power Consumption	Displays total power use on all devices currently drawing power.
DTE Power Usage Threshold	Enter the percentage of total power consumption on the switch necessary to trigger a trap. The default value is 80%.
Power Pair	Choose the power pair (of the RJ-45 pin connectors) you want to supply the power: • spare • signal The default value is spare. ***Note:*** Ensure that the power pair you choose for the Ethernet Switch matches the power pair used by the IP devices you are powering. Each unit uses the same power pairs; you cannot configure power pairs on each port.
Traps Control	Choose to enable or disable trap from agent.
PD Detect Type	Choose the type of power detection you want for the switch: • 802.3af • 802.3af and legacy The default is 802.3af. ***Note:*** Ensure that the power detection method you choose for the Ethernet Switch matches that used by the IP devices you are powering.

Item	Description
Power Source Present	This display-only field displays the current power supply for the switch: • AC Only--using only the internal power source of the switch • DC Only--using only an optional external DC power source for the switch • AC and DC--using the internal power source and an optional external DC power source for the switch
DC Source Type	Choose the optional external power source you are using: • RPS 10--Ethernet Switch Power Supply Unit 10 • NES--Intergy* Network Energy Source (NES) from Invensys Energy Systems The default value is RPS 10. ***Note:*** You set this parameter whether or not you are physically attached to an external power source.
DC Source Configuration	Choose the DC configuration you are using: • Power Sharing • UPS • RPSU The default value is Power Sharing. ***Note:*** You set this parameter whether or not you are physically attached to an external power source.

Figure 109
470-PWR Global Power Management page

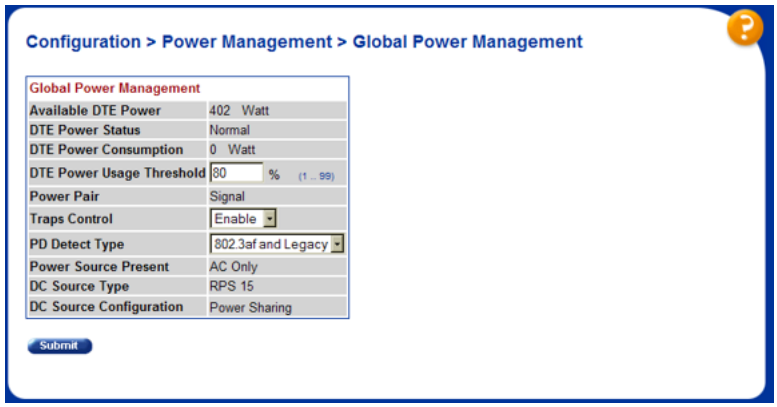


Table 94 "470-PWR Global Power Management page items" (page 291) describes the items on the 470-PWR Global Power Management page.

Table 94
470-PWR Global Power Management page items

Item	Description
Available DTE Power	Displays the amount of power available to powered devices from the switch. Depending on the power sources you use and the power configuration you enable, you see one of the following values: • 390 Watt • 402 Watt • 772 Watt ***Note:*** While the switch displays higher available DTE power, the actual DTE power available is limited by the number of PoE ports on the switch. For example, on 24-port devices, the maximum available DTE power is 370 Watts, and on 48-port devices, the maximum available DTE power is 740 Watts.
DTE Power Status	Displays the status of the PoE feature: • Normal—all power functioning correctly • Error—PoE failed
DTE Power Consumption	Displays total power use on all devices currently drawing power.

Item	Description
DTE Power Usage Threshold	Enter the percentage of total power consumption on the switch necessary to trigger a trap. The default value is 80%.
Power Pair	Displays the power pair of the RJ-45 pin connectors that supplies the power. The only available option for Ethernet Switch 470-PWR is Signal. ***Note:*** Ensure that the power pair used by the IP devices you are powering matches the power pair for the Ethernet Switch 470-PWR.
Traps Control	Choose to enable or disable trap from agent.
PD Detect Type	Choose the type of power detection you want for the switch: • 802.3af • 802.3af and legacy The default is 802.3af. ***Note:*** Ensure that the power detection method you choose for the Ethernet Switch matches that used by the IP devices you are powering.
Power Source Present	This display-only field displays the current power supply for the switch: • AC Only--using only the internal power source of the switch • DC Only--using only an optional external DC power source for the switch • AC and DC--using the internal power source and an optional external DC power source for the switch

Item	Description
DC Source Type	Displays the optional external power source you are using. ***Note:*** The only available option for Ethernet Switch 470-PWR is RPS 15.
DC Source Configuration	Displays the switch DC configuration. ***Note:*** The only available option for Ethernet Switch 470-PWR is Power Sharing.

2 Type the information, or make a selection from the list.

3 Click Submit.

—End—

Displaying and configuring power management for the Ethernet Switch 460/470-PWR ports

To configure power management settings for each port:

Step	Action
1	From the main menu, choose Configuration > Power Management > Port Property. The Port Property page appears. See Figure 110 "460-PWR Port Property page" (page 294) or Figure 111 "470-PWR Port Property page" (page 295).

Figure 110
460-PWR Port Property page

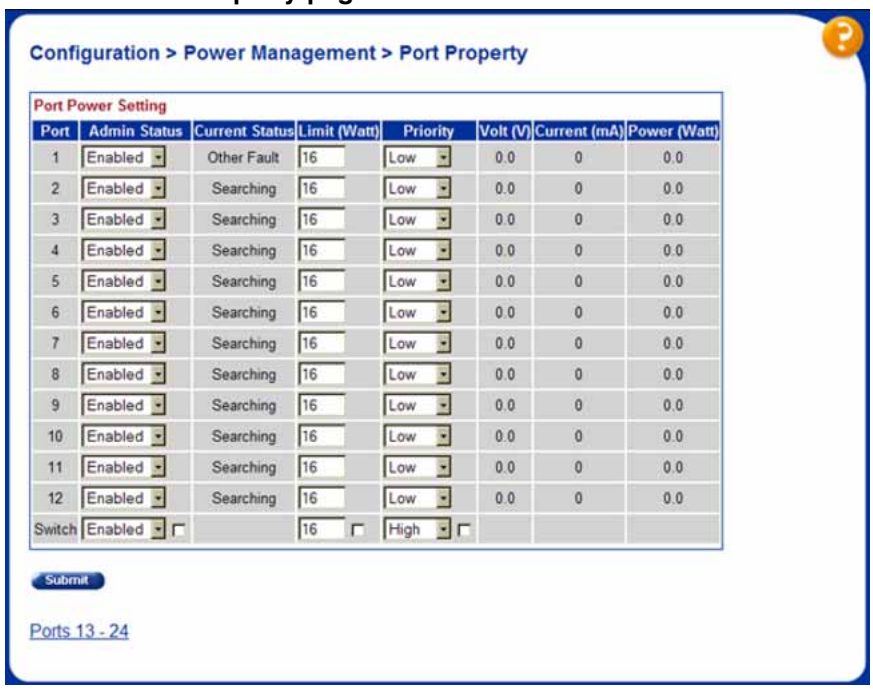


Table 95 "460-PWR Port Property page items" (page 294) describes the items on the 460-PWR Port Property page.

Table 95
460-PWR Port Property page items

Item	Description
Admin. Status	Choose to enable or disable power on selected port. The default value is Enabled.
Current Status	Displays the current status of the port: • Searching--port detecting IP device requesting power • Delivering power--port delivering requested power to device • Disabled--port power state disabled • Invalid PD--port detecting device that is not a valid power device to request power • Deny low priority--power disabled from port because of port setting and demands on power budget (available DTE power exceeded). • Overload--power disabled from port because port overloaded • Test--port in testing mode, which is set using SNMP

Item	Description
	• Error--none of the other conditions apply
Limit (Watt)	Sets the maximum amount of power supplied to that port. The range is 3W to 20W. The default value is 16W.
Priority	Priority is used to determine which port(s) shut down when the total power of the Ethernet Switch 460-24T-PWR exceeds the power budget for that switch (or available DTE power). The lower priority ports are shut down in favor of higher priority ports. The range is low, high, and critical. The default value is low. ***Note:*** When two ports have the same priority and one must be shut down, the port with the higher port number is shut down first.
Volt (V)	Displays the measured voltage supplied by the port.
Current (mA)	Displays the measured current supplied by the port.
Power (Watt)	Displays the measured power supplied by the port.

Figure 111
470-PWR Port Property page

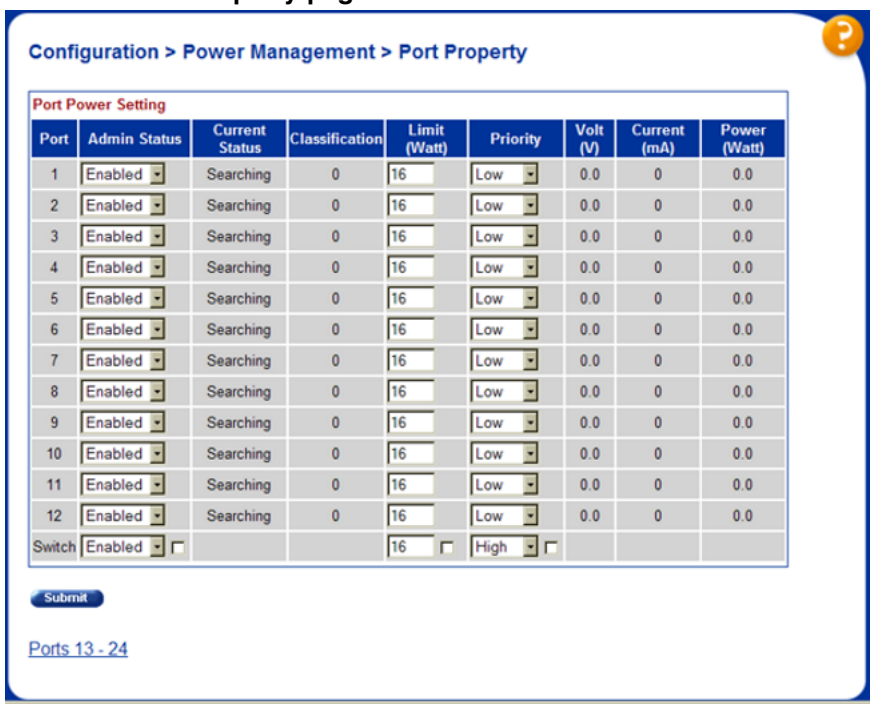


Table 96 "470-PWR Port Property page items" (page 296) describes the items on the 470-PWR Port Property page.

Table 96
470-PWR Port Property page items

Item	Description
Admin. Status	Choose to enable or disable power on selected port. The default value is Enabled.
Current Status	Displays the current status of the power-device detecting function on the port: • Disabled—detecting function is disabled • Searching—detecting function is enabled and the system is searching for a valid powered device on this port • Delivering power— detection found a valid powered device and the port is delivering power • Fault—power-specific fault detected on the port • Test—detecting function is in test mode, which is set using SNMP • Other fault—detecting function is idle due to fault ***Note:*** Nortel recommends against using the test operational status.
Classification	Classification is a way 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 are classified according to their power requirements. The meaning of the classification labels is defined in the IEEE 802.3af specification. This parameter is valid only while a device is being powered.
Limit (Watt)	Sets the maximum amount of power supplied to that port. The range is 3W to 20W. The default value is 16W.

Item	Description
Priority	Priority is used to determine which port(s) shut down when the total power of the Ethernet Switch 470-PWR exceeds the power budget for that switch (or available DTE power). The lower priority ports are shut down in favor of higher priority ports. The range is low, high, and critical. The default value is low. ***Note:*** When two ports have the same priority and one must be shut down, the port with the higher port number is shut down first.
Volt (V)	Displays the measured voltage supplied by the port.
Current (mA)	Displays the measured current supplied by the port.
Power (Watt)	Displays the measured power supplied by the port.

2 Type the information, or make a selection from the list.

3 Click Submit.

—End—

Editing and viewing switch PoE configurations using Device Manager

Note: You must view and edit the switch-wide PoE parameters for each Ethernet Switch 460-PWR or 470-PWR one by one. If you select more than one unit, you cannot view or edit the PoE power parameters; the PoE tab and DC source tabs do not appear.

You can use Device Manager to view and edit the Power over Ethernet (PoE) parameters that apply to the whole switch. You can also use Device Manager to set PoE parameters on individual ports.

One PoE-related tab that is not described in this section is the Power Supply tab. This tab is accessible through the Chassis dialog box, and it displays the status of the internal power supply (see"Power Supply tab" (page 409)).

The following sections provide a description of the PoE tabs, and details about each item on the tab:

- "PoE tab for a single unit" (page 298)

PoE tab for a single unit

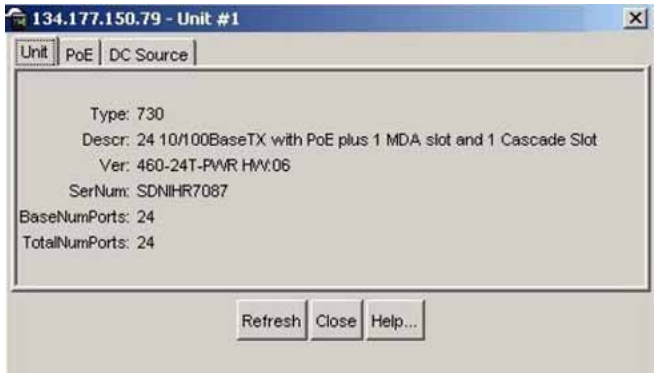
To set the power usage threshold, the power pairs you want to use, and the power detection method you want to use, select a *single* unit.

Note: You can view and set these parameters only by selecting a *single* unit. If you select more than one unit, you do not see the PoE tab and you cannot set any of the PoE parameters.

To open the PoE tab for a *single* unit:

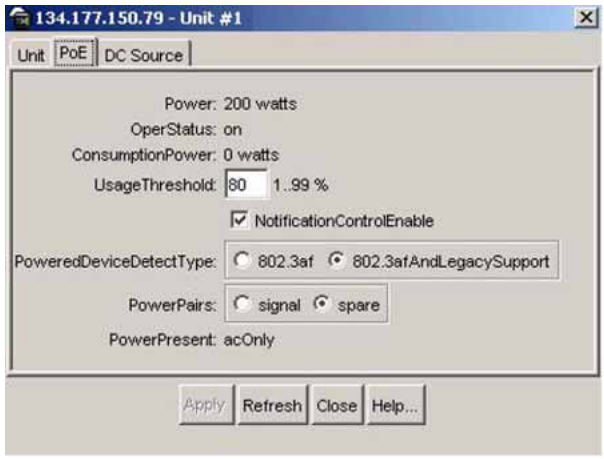
Step	Action
1	Select a *single* unit.
2	From the shortcut menu, choose Edit > Unit. The Unit dialog box appears with the Unit tab displayed Figure 112 "Edit Unit dialog box--Unit tab for a single unit" (page 298).
3	Click the PoE tab.

Figure 112
Edit Unit dialog box--Unit tab for a single unit



The PoE tab appears (Figure 113 "Edit Unit dialog box--PoE tab for a single unit" (page 299)).

Figure 113
Edit Unit dialog box--PoE tab for a single unit



—End—

- "PoE tab items" (page 299)

Table 97 "PoE tab items for a single unit" (page 299) describes the PoE tab items for a single unit.

Table 97
PoE tab items for a single unit

Item	Description
Power	Displays the total power available to the switch.
OperStatus	Displays the power state of the switch: • on • off • faulty
Consumption Power	Displays the power being used by the switch.
* Indicates fields that are unique to, or provide different options for, the 470-PWR.	

Item	Description
UsageThreshold	Set a percentage of the total power usage of the switch above which the system sends a trap. ***Note:*** You must enable the traps (see NotificationControlEnable) to receive a power usage trap.
NotificationControlEnable	Enable or disable sending traps if the switch power usage exceeds the percentage set in the UsageThreshold field.
PowerDeviceDetectType	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 The default setting is 802.3af and legacy. ***Note:*** Ensure that this setting matches the setting for the detection method used by the powered devices on this switch.
PowerPairs*	Set the RJ-45 pin pairs that Ethernet Switch 460-PWR uses to send power to the ports on the switch: • signal • spare ***Note:*** The default setting is spare. Ensure that this setting matches the setting for the power pairs on the powered devices you use on this switch. The only available setting for the Ethernet Switch 470-PWR is signal. Ensure that this setting matches the setting for the power pairs on the powered devices you use on this switch.
PowerPresent	This read-only field displays the current power supply for the switch: acOnly--only the internal power source of the switch dcOnly--only an optional external DC power source for the switch

	ac and cd--the internal power source and an optional external DC power source for the switch
* Indicates fields that are unique to, or provide different options for, the 470-PWR.	

DC Source tab for a single unit

Note: You can view and set DC source parameters only by selecting a *single* unit. If you select more than one unit, you do not see the PoE tab or the DC Source tab, and you cannot set any of the PoE parameters. The Power Supply under Edit > Chassis also provides information about the DC source type, or redundant power supply (see "Power Supply tab" (page 409) .

The DC Source tab displays the presence or absence of an optional external power source, either the Ethernet Switch Power Supply Unit 10 or the Intergy* Network Energy Source (NES) from Invensys Energy Systems. Additionally, you configure the DC source type and the DC source configuration using this dialog box.

Note: You *always* configure the DC source type and the DC source configuration whether or not you use an optional external DC power source.

To open the DC Source tab for a *single* unit:

Step	Action
1	Select a *single* unit.
2	From the shortcut menu, choose Edit > Unit. The Unit dialog box appears with the Unit tab displayed (Figure 112 "Edit Unit dialog box--Unit tab for a single unit" (page 298)).
3	Click the DC Source tab. The DC Source tab appears (Figure 114 "Edit Unit dialog box--DC Source tab for a single unit" (page 302)).

Figure 114
Edit Unit dialog box--DC Source tab for a single unit

—End—

Table 98 "DC Source tab fields for a single unit" (page 302) describes the DC Source tab fields for a single unit.

Table 98
DC Source tab fields for a single unit

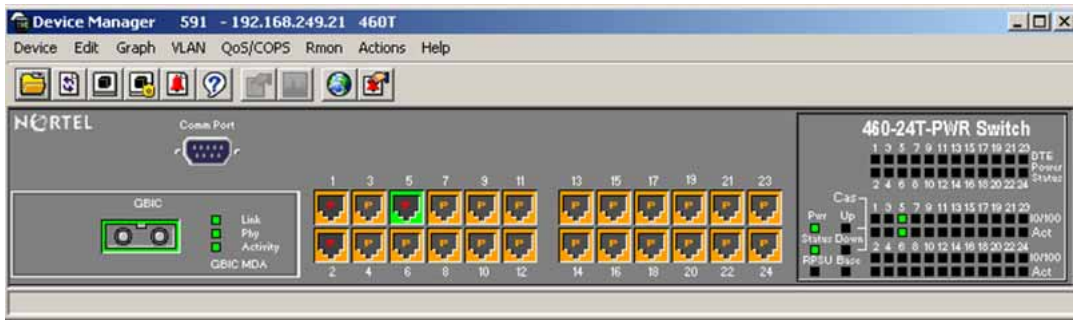
Field	Description
Type*	Configure the type of external power source Ethernet Switch 460-PWR is using: • RPS 10--Ethernet Switch Power Supply Unit 10 • nes--NES unit ***Note:*** The default setting is RPS 10. You configure this field whether or not you are physically using an external power source. You must configure the DC source type under all circumstances. The only available setting for Ethernet Switch 470-PWR, is RPS 15.
SourceConfig*	Configure the DC source configuration for Ethernet Switch 460-PWR: • ups • rpsu • powerSharing
* Indicates fields that are unique to, or provide different options for, the 470-PWR.	

Field	Description
	Note: The default setting is powerSharing. You configure this field whether or not you are physically using an external power source. You must specify the DC source configuration under all circumstances. The only available setting for Ethernet Switch 470-PWR, is powerSharing.
* Indicates fields that are unique to, or provide different options for, the 470-PWR.	

Device Manager display for PoE ports

The Device Manager displays PoE ports differently than non-PoE port (see Figure 115 "460-24T-PWR with PoE ports" (page 303)).

Figure 115
460-24T-PWR with PoE ports



The port coloring scheme for the data aspect is the same for PoE ports as for all other ports. The difference for the PoE ports is the addition of the power aspect (colored p).

Table 99 "Port power color codes" (page 303) shows the status assigned to each color.

Table 99
Port power color codes

Color	Description
Green P	Specifies that the port is currently delivering power.
Red P	Specifies that the power and detection mechanism for the port is disabled.

Color	Description
Orange P	Specifies that the power and detection mechanism for the port is enabled. However the port is not currently delivering power.
White/Gray P	Specifies that the power and detection mechanism for the port is unknown.

Note: The coloring scheme for data aspect and the power aspect are independent of each other. With this GUI enhancement, you can view the initial status for both data and power aspect for the port.

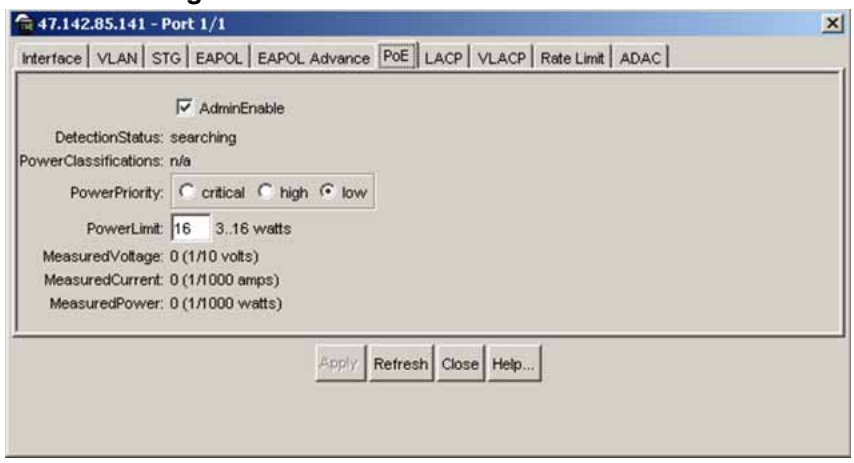
PoE tab for a single port

You can use the PoE tab to configure PoE power settings for a single port.

To view the PoE tab:

Step	Action
1	Select the port you want to edit.
2	Do one of the following: • Double-click the selected port. • From the shortcut menu, choose Edit. • From the Device Manager main menu, choose Edit > Port. • On the toolbar, click Edit. The Port dialog box for a single port opens (Figure 187 "Edit Port dialog box -- Interface tab" (page 451)) with the Interface tab displayed.
3	Click the PoE tab. The PoE tab appears (Figure 116 "Edit Port dialog box -- PoE tab" (page 305)).

Figure 116
Edit Port dialog box -- PoE tab



—End—

PoE tab items

Table 100 "PoE tab items for a single port" (page 305) describes the PoE tab items.

Table 100
PoE tab items for a single port

Item	Description
AdminEnable	Enable or disable PoE on this port. By default, PoE is enabled.
Detection Status*	Displays the operational status of the power-device detecting function on the 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
* Indicates fields that are unique to, or provide different options for, the 470-PWR.	

Item	Description
	• fault--power-specific fault detected on port • invalidPD--detecting function found an invalid powered device • denyLowPrioriy--port disabled by management system to supply power to higher-priority ports • test--detecting device in test mode • otherFault—detecting function is idle due to fault ***Note:*** Nortel recommends against using the test operational status.
PowerClassifications *	Classification is a way 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 are classified according to their power requirements. The meaning of the classification labels is defined in the IEEE 802.3af specification. This parameter is valid only while a device is being powered. ***Note:*** This parameter is not applicable on Ethernet Switch 460-PWR for this release.
PowerPriority	Set the power priority for the specified port to: • critical • high • low The default value is low. ***Note:*** When two ports have the same priority and one must be shut down, the port with the higher port number is shut down first.
PowerLimit	DTE Power limit per port, in watts.
MeasuredVoltage	Measured port voltage, in 1/10 volts. When the port is not supplying power, the value is 0.
* Indicates fields that are unique to, or provide different options for, the 470-PWR.	

Item	Description
MeasuredCurrent	Measured port current, in 1/1000 amps.
MeasuredPower	Measured port power, in 1/1000 watts. This value cannot exceed 1000 times the current value of the PowerLimit field.
* Indicates fields that are unique to, or provide different options for, the 470-PWR.	

PoE tab for multiple ports

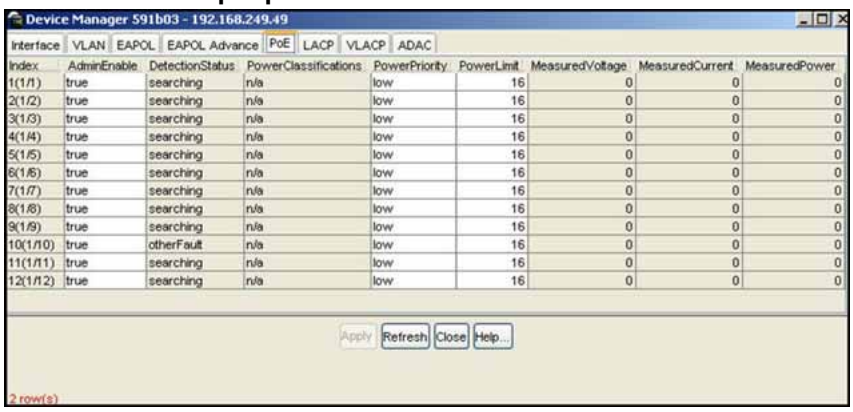
When you select multiple ports, the PoE tab shows the PoE settings for the selected ports.

To view or edit the PoE tab for multiple ports:

Step	Action
1	Select the ports that you want to edit. [Ctrl] + left-click the ports that you want to configure. A yellow outline appears around the selected ports.
2	Do one of the following: • From the shortcut menu, choose Edit. • From the Device Manager main menu, choose Edit > Port. • On the toolbar, click Edit. The Port dialog box for multiple ports (Figure 189 "Port dialog box -- Port Interface tab" (page 456)) opens with the Interface tab displayed.
3	Click the PoE tab. The PoE tab appears (Figure 117 "PoE tab for multiple ports" (page 308)).

—End—

Figure 117
PoE tab for multiple ports



PoE tab fields for multiple ports

Table 101 "PoE tab fields for multiple ports" (page 308) describes the PoE tab fields for multiple ports.

Table 101
PoE tab fields for multiple ports

Field	Description
Index	Displays the unique value assigned to each interface.
AdminEnable	Enable or disable PoE on this port. By default, PoE is enabled.
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
* Indicates fields that are unique to, or provide different options for, the 470-PWR.	

Field	Description
	• denyLowPrioriy--port disabled by management system to supply power to higher-priority ports • test--detecting device in test mode • otherFault—detecting function is idle due to fault ***Note:*** Nortel recommends against using the test operational status.
PowerClassifications *	Classification is a way 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 are classified according to their power requirements. The meaning of the classification labels is defined in the IEEE 802.3af specification. This parameter is valid only while a device is being powered. ***Note:*** This parameter is not applicable on Ethernet Switch 460-PWR for this release.
PowerPriority	Set the power priority for the specified port to: • critical • high • low The default value is low. ***Note:*** When two ports have the same priority and one must be shut down, the port with the higher port number is shut down first.
PowerLimit	DTE Power limit per port, in watts.
MeasuredVoltage	Measured port voltage, in 1/10 volts. When the port is not supplying power, the value is 0.
MeasuredCurrent	Measured port current, in 1/1000 amps.
MeasuredPower	Measured port power, in 1/1000 watts. This value cannot exceed 1000 times the current value of the PowerLimit field.
* Indicates fields that are unique to, or provide different options for, the 470-PWR.	

Chapter 11
System configuration using the CLI

In the switch, the Command Line Interface (CLI) commands allow you to display and modify the switch configuration while the switch is operating.

This chapter includes information about the system configuration, such as Configuring the switch IP address, downloading and uploading your software, and customizing your system. This chapter covers the following topics:

Setting the default management system

With the **cmd-interface** command, you can set the default management interface when you use the console port or Telnet.

The syntax for the **cmd-interface** command is:

```
cmd-interface [cli | menu]
```

The **cmd-interface** command is in the privileged exec command mode.

Configuring the switch IP address, subnet mask, and default gateway

IP notation

You enter IP addresses and subnet masks in one of the following two ways in the CLI. You can always enter an IP address in dotted decimal notation (XXX.XXX.XXX.XXX), specifying both the IP address and the subnet mask in dotted-decimal notation.

Assigning and clearing IP addresses

Using the CLI, you can assign IP addresses and gateway addresses, clear these addresses, and view configured IP addresses. This section covers these topics:

ip address command

The **ip address** command sets the IP address and subnet mask for the switch or a stack. The syntax for the **ip address** command is:

```
ip address [switch | stack | unit] <XXX.XXX.XXX.XXX> [netmask
<XXX.XXX.XXX.XXX>]
```

The **ip address** command is in the config command mode.

If you do not enter either the stack or switch parameter, the system automatically modifies the stack IP address when in stack mode, and modifies the switch IP address when in stand-alone mode.

Table 102 "ip address command parameters and variables" (page 313) describes the parameters and variables for the **ip address** command.

Table 102
ip address command parameters and variables

Parameters and variables	Description
switch | stack | unit	Sets the switch, stack, or other unit IP address and netmask.
XXX.XXX.XXX.XXX	Enter IP address in dotted decimal notation; netmask is optional.
netmask	Sets the IP subnet mask for the switch or stack.

Note: When you change the IP address or subnet mask, you can lose connection to Telnet and the Web-based management interface.

no ip address command

The **no ip address** command clears the IP address and subnet mask. This command sets the IP address and subnet mask for a switch to all zeros (0). The syntax for the **no ip address** command is:

```
no ip address {switch | stack | unit}
```

The **no ip address** command is in the config command mode.

Table 103 "no ip address command parameters and variables" (page 313) describes the parameters and variables for the **no ip address** command.

Table 103
no ip address command parameters and variables

Parameters and variables	Description
switch | stack | unit	Zeros out the IP address and subnet mask for the switch, stack, or other unit in the stack.

Note: When you change the IP address or subnet mask, you may lose connection to Telnet and the Web. You also disable any new Telnet connection, and you must connect to the serial console port to configure a new IP address.

ip default-gateway command

The **ip default-gateway** command sets the IP default gateway address for a switch or a stack to use. The syntax for the **ip default-gateway** command is:

```
ip default-gateway <XXX.XXX.XXX.XXX>
```

The **ip default-gateway** command is in the config command mode.

Table 104 "ip default-gateway command parameters and variables" (page 314) describes the parameters and variables for the **ip default-gateway** command.

Table 104
ip default-gateway command parameters and variables

Parameters and variables	Description
XXX.XXX.XXX.XXX	Enter the dotted-decimal IP address of the default IP gateway.

Note: When you change the IP gateway, you may lose connection to Telnet and the Web.

no ip default-gateway command

The **no ip default-gateway** command sets the IP default gateway address to zeros (0). The syntax for the **no ip default-gateway** command is:

```
no ip default-gateway
```

The **no ip default-gateway** command is in the config command mode.

The **no ip default-gateway** command has no parameters or variables.

Note: When you change the IP gateway address, you may lose connection to Telnet and the Web. You also may disable any new Telnet connection be required to connect to the serial console port to configure a new IP gateway address.

show ip command

The **show ip** command displays the IP configurations, specifically BootP mode, stack address, switch address, subnet mask, and gateway address. This command displays the parameters for what is configured, what is in use, and the last BootP. The syntax for the **show ip** command is:

```
show ip [bootp] [default-gateway] [address [switch | stack]]
```

The **show ip** command is in the exec command mode. If you do not enter any parameters, this command displays all the IP-related configuration information.

Table 105 "show ip command parameters and variables" (page 315) describes the parameters and variables for the **show ip** command.

Table 105
show ip command parameters and variables

Parameters and variables	Description
bootp	Displays BootP-related IP information.
default-gateway	Displays the IP address of the default gateway.
address	Displays the current IP address.
stack | switch | unit	Specifies current IP address of the switch or stack.

Figure 118 "show ip command output" (page 315) displays a sample output of the **show ip** command.

Figure 118
show ip command output

```
470_24T#show ip
BootP Mode: BootP Disabled

                     Configured        In Use        Last BootP
                   --------------- --------------- ---------------
Stack IP Address:  10.20.30.41     10.20.30.41     0.0.0.0
Switch IP Address: 10.30.31.200                    0.0.0.0
Subnet Mask:       255.255.255.0   255.255.255.0   0.0.0.0
Default Gateway:   10.20.30.1      10.20.30.1      0.0.0.0
```

Assigning and clearing IP addresses for specific units

You can assign IP addresses for a specific units within a stack. This section covers these topics:

- "ip address unit command" (page 315)
- "no ip address unit command" (page 316)
- "default ip address unit command" (page 316)

ip address unit command

The **ip address unit** command sets the IP address and subnet mask for a specific stand-alone unit or a specific unit in a stack. The syntax for the **ip address unit** command is:

```
ip address unit <1-8> A.B.C.D
```

The **ip address unit** command is in the config command mode.

Table 106 "ip address unit command parameters and variables" (page 316) describes the parameters and variables for the **ip address unit** command.

Table 106
ip address unit command parameters and variables

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

Note: When you change the IP address or subnet mask, you may lose connection to Telnet and the Web.

no ip address unit command

The **no ip address unit** command sets the IP address for the specified unit to all zeros(0). The syntax for the **no ip address unit** command is:

```
no ip address unit <1-8>
```

The **no ip address unit** command is in the config command mode.

Table 107 "no ip address unit command parameters and variables" (page 316) describes the parameters and variables for the **no ip address unit** command.

Table 107
no ip address unit command parameters and variables

Parameters and variables	Description
<1-8>	Zeros out the IP address for the specified unit.

Note: When you change the IP address or subnet mask, you may lose connection to Telnet and the Web. You also disable any new Telnet connection, and you must connect to the serial console port to configure a new IP address.

default ip address unit command

The **default ip address unit** command sets the IP address for the specified unit to all zeros (0). The syntax for the **default ip address unit** command is:

```
default ip address unit <1-8>
```

The **default ip address unit** command is in the config command mode.

Table 108 " default ip address unit command parameters and variables" (page 317) describes the parameters and variables for the **default ip address unit** command.

Table 108
default ip address unit command parameters and variables

Parameters and variables	Description
unit <1-8>	Zeros out the IP address for the specified unit.

Note: When you change the IP gateway, you may lose connection to Telnet and the Web.

show stack-info command

The **show stack-info** command displays the current stack information, which includes unit numbers, cascade attachments, and software version for all units. The syntax for the **show stack-info** command is:

```
show stack-info
```

The **show stack-info** command is in the privileged exec command mode.

The **show stack-info** command has no parameters or variables.

Figure 119 "show stack-info command output" (page 317) displays sample output from the **show stack-info command.**

Figure 119
show stack-info command output

```
470-24T#show stack-info
Unit# Switch Model      MDA Model  GBIC Port   GBIC Port   Cascade  SW Version
                                                            Module
----- ---------------- ---------- ---------- ---------- ------- ----------
1     470-24T                     (25) None   (26) None   400-ST1   v3.6.0.77
```

See Chapter 9 "Stacking ES 460 and 470 units" (page 247) for more information about stack operation.

Renumber unit command

The **renumber unit** command changes the unit number of each switch. The syntax for the **renumber unit** command is:

```
renumber unit
```

The **renumber unit** command is in the config command mode.

The **renumber unit** command has no parameters or variables.

Note: This command does not take effect until you reset the stack.

Configuring LLDP using the CLI

You can enable and configure LLDP using the CLI. For more information about LLDP, see "Link Layer Discovery Protocol (IEEE 802.1AB) Overview" (page 97). This section covers the following commands:

lldp command

The **lldp** command sets the LLDP transmission parameters. The syntax for the **lldp** command is:

```
lldp [tx-interval <5-32768>] [tx-hold-multiplier
<2-10>] [reinit-delay <1-10>] [tx-delay <1-8192>]
[notification-interval <5-3600>]
```

The **lldp** command is in the config command mode.

Table 109 "lldp command parameters and variables" (page 319) describes the parameters and variables for the **lldp** command.

Table 109
lldp command parameters and variables

Parameters and variables	Description
tx-interval <5-32768>	Sets the interval between successive transmission cycles.
tx-hold-multiplier <2-10>	Set the multiplier for the tx-interval used to compute the Time to Live value for the TTL TLV.
reinit-delay <1-10>	Set 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>	Set the interval between successive transmissions of LLDP notifications.

lldp port command

The **lldp port** command sets the LLDP port parameters. The syntax for the **lldp port** command is:

```
lldp port <portlist> [config notification] [status {rxOnly | txAndRx | txOnly}]
```

The **lldp port** command is in the config-if command mode.

Table 110 "lldp port command parameters and variables" (page 319) describes the parameters and variables for the **lldp port** command.

Table 110
lldp port command parameters and variables

Parameters and variables	Description
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 I txAndRx I 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

The **lldp tx-tlv** command sets the optional management TLVs to include in the transmitted LLDPDUs. The syntax for the **lldp tx-tlv** command is:

```
lldp tx-tlv [port <portlist>] [port-desc] [sys-name]
[sys-desc] [sys-cap] [local-mgmt-addr]
```

The **lldp tx-tlv** command is in the config-if command mode.

Table 111 "lldp tx-tlv command parameters and variables" (page 320) describes the parameters and variables for the **lldp tx-tlv** command.

Table 111
lldp tx-tlv command parameters and variables

Parameters and variables	Description
port <portlist>	specifies the ports affected by the command
port-desc	port description TLV
sys-name	system name TLV
sys-desc	system description TLV
sys-cap	system capabilities TLV
local-mgmt-addr	local management address TLV

default lldp command

The **default lldp** command sets the LLDP transmission parameters to their default values. The syntax for the **default lldp** command is:

```
default lldp [tx-interval ] [tx-hold-multiplier ]
[reinit-delay] [tx-delay] [notification-interval]
```

If no parameters are specified, the **default lldp** sets all parameters to their default parameters.

The **default lldp** command is in the config command mode.

Table 112 "default lldp command parameters and variables" (page 320) describes the parameters and variables for the **default lldp** command.

Table 112
default lldp command parameters and variables

Parameters and variables	**Description**
tx-interval	sets the retransmit interval to the default value (30)

Parameters and variables	Description
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)

default lldp port command

The **default lldp port** command sets the port parameters to their default values. The syntax for the **default lldp port** command is:

```
default lldp port <portlist> [config-notification] [status]
```

The **default lldp port** command is in the config-if command mode.

Table 113 "default lldp port command parameters and variables" (page 321) describes the parameters and variables for the **default lldp port** command.

Table 113
default lldp port command parameters and variables

Parameters and variables	Description
port <portlist>	specifies the ports affected by the command
config-notification	sets 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

The **default lldp tx-tlv** command sets the LLDP Management TLVs to their default values. The syntax for the **default lldp tx-tlv** command is:

```
default lldp tx-tlv [port <portlist>][port-desc] [sys-name]
[sys-desc] [sys-cap] [local-mgmt-addr]
```

The **default lldp tx-tlv** command is in the config-if command mode.

Table 114 "default lldp tx-tlv command parameters and variables" (page 322) describes the parameters and variables for the **default lldp tx-tlv** command.

Table 114
default lldp tx-tlv command parameters and variables

Parameters and variables	Description
port <portlist>	Specify 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)

no lldp port command

The **no lldp port** command disables LLDP features on the port. The syntax for the **no lldp port** command is:

```
no lldp [port <portlist>] [config-notification] [status]
[tx-tlv]
```

The **no lldp port** command is in the config-if command mode.

no lldp tx-tlv command

The **no lldp tx-tlv** command specifies the optional Management TLVs not to include in the transmitted LLDPDUs. The syntax for the **no lldp tx-tlv** command is:

```
no lldp tx-tlv [port <portlist>] [port-desc] [sys-name]
[sys-desc] [sys-cap] [local-mgmt-addr]
```

The **no lldp tx-tlv** command is in the config-if command mode.

show lldp command

The **show lldp** command displays the LLDP parameters. The syntax for the **show lldp** command is:

```
show lldp [local-sys-data {detail}] [mgmt-sys-data]
[rx-stats] [tx-stats] [stats] [pdu-tlv-size] [tx-tlv]
[neighbor {detail}]
[neighbor-mgmt-addr]
```

The **show lldp** command is in the exec command mode.

Table 115 "show lldp command parameters" (page 323) describes the **show lldp** command parameters and variables.

Table 115
show lldp command parameters

Parameters and variables	Description
local-sys-data [detail]	Displays the properties of the optional management TLVs: detail: displays all TLV properties on the local switch.
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.
neighbor [detail]	Displays the neighbor TLVs: detail: displays all TLVs
[neighbor-mgmt-addr]	Displays the LLDP neighbor management address.

show lldp port command

The **show lldp port** command displays the LLDP port parameters. The syntax for the **show lldp port** command is:

```
show lldp port <portlist> [rx-stats] [tx-stats] [pdu-tlv-s
ize] [tx-tlv]
[neighbor {detail}] [neighbor-mgmt-addr]
[local-sys-data {detail}]
```

The **show lldp port** command is in the exec command mode.

Table 116 "show lldp port command parameters" (page 324) describes the **`show lldp port`** command parameters and variables.

Table 116
show lldp port command parameters

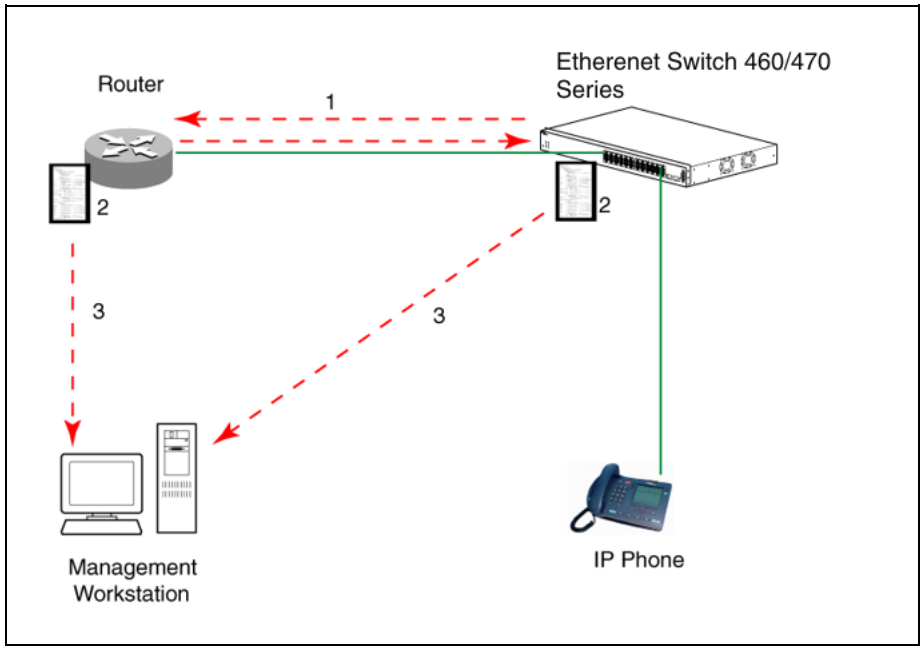
Parameters and variables	Description
rx-stats	Displays the LLDP receive statistics for the local port.
tx-stats	Displays the LLDP transmit statistics for the local port.
pdu-tlv-size	Displays the different TLV sizes and the number of TLVs in an LLDPDU.
tx-tlv	Displays which TLVs are transmitted from the local port in LLDPDUs.
neighbor [detail]	Displays the port neighbor TLVs: detail: displays all TLVs.
[neighbor-mgmt-addr]	Displays the port neighbor LLDP management address.
local-sys-data [detail]	Displays the properties of the optional management TLVs: detail: displays all TLV properties on the local switch.

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.

Figure 120 "LLDP configuration example" (page 325) shows an example of LLDP configuration. For this example, the router is connected to the Ethernet Switch 460/470 Series port 1 and the IP Phone uses port 13.

Figure 120
LLDP configuration example



To configure the preceding example, you must perform the following tasks:

Step	Action
1	Modify the default LLDP Tx interval from the default 30-second value to 60 seconds. 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 to update the peer neighbor tables.
2	Enable the Port Description TLV for transmission. The port description TLV contains the description of the LLPD sending port.
3	Enable the System Name TLV for transmission. The system name TLV contains the name of the LLDP device.
4	Enable the System Description TLV for transmission. The system description TLV contains the description of the LLDP device.
5	Enable the System Capabilities TLV for transmission. The system capabilities TLV contains the capabilities of the LLDP device.

6 Enable the Management Address TLV for transmission.

The management address TLV contains the management address of the LLDP device.

—End—

Note: LLDP does not currently support ACG.

Detailed configuration commands

The following section describes the detailed CLI commands required to complete the configuration shown in Figure 120 "LLDP configuration example" (page 325).

Modifying the default LLDP Tx interval Enter one configuration command on each line. End the configuration with CNTL/Z.

```
460-24T-PWR>enable
460-24T-PWR#configure terminal
460-24T-PWR(config)#lldp tx-interval 60
```

Checking the new LLDP global settings

```
460-24T-PWR(config)#show lldp

----------------------------------------
TxInterval:60
TxHoldMultiplier:4
RxInitDelay:2
TxDelay:2
NotificationInterval:5
```

Enabling all LLDP Core TLVs for transmission on the router and IP Phone ports

```
460-24T-PWR(config)#interface fastEthernet 1,13
460-24T-PWR(config-if)#lldp tx-tlv port 1,13 port-desc
460-24T-PWR(config-if)#lldp tx-tlv port 1,13 sys-name
460-24T-PWR(config-if)#lldp tx-tlv port 1,13 sys-desc
460-24T-PWR(config-if)#lldp tx-tlv port 1,13 sys-cap
460-24T-PWR(config-if)#lldp tx-tlv port 1,13 local-mgmt-addr
```

Checking the LLDP settings of the router and IP Phone ports

```
460-24T-PWR(config-if)#show lldp port 1,13 tx-tlv

--------------------------------------------------------------------------------
lldp port tlvs
--------------------------------------------------------------------------------
PortDesc SysName  SysDesc  SysCap   MgmtAddr
```

```
--------------------------------------------------------------------------
1       true      true      true      true      true
13      true      true      true      true      true
```

Pinging

You can ping from Ethernet Switches 460 and 470. This ability greatly enhances the ease of network management. The ping command tests the network connection to another network device. The command sends an Internet Control Message Protocol (ICMP) packet from the switch to the target device. The local IP address must be set before issuing the ping command.

For more information about the CLI commands, see "ping command" (page 328).

Resetting the switch to the default configuration

The **`restore factory-default`** command resets the switch or stack to its default configuration.

The syntax for the **`restore factory-default`** command is:

`restore factory-default [ -y ]`

where

`The [ -y ] parameter instructs the switch not to prompt for confirmation.`
`If the [ -y ] parameter is not included in the command, the following message appears:`

```
Warning the switch/stack will be reset to factory default
configuration
Do you wish to continue (y/n) ?
Enter y to restore the switch to default.
```

The **`restore factory-default`** command is in the privileged exec command mode.

Using DNS to ping and Telnet

Using the DNS client, you can ping or Telnet to a host server or to a host by name. To use this feature, you must configure at least one domain name server; you can also configure a default domain name. If you configure a default domain name, that name is appended to host names that do not contain a dot. The default domain name and addresses are saved in NVRAM.

The host names for ping and Telnet cannot be longer than 63 alphanumeric characters, and the default DNS domain name cannot be longer than 255 characters. This section covers these commands:

show ip dns command

The **show ip dns** command displays the DNS domain name, as well as any configured DNS servers. The syntax for the **show ip dns** command is:

```
show ip dns
```

The **show ip dns** command is in the exec command mode.

The **show ip dns** command has no parameters or variables.

Figure 121 "show ip dns command output" (page 328) displays sample output from the **show ip dns** command.

Figure 121
show ip dns command output

```
470-48T#show ip dns
DNS Default Domain name: us.nortel.com
DNS Servers
- - - - - - -
47.82.2.10
0.0.0.0
0.0.0.0
470-48T#
```

ping command

The **ping** command tests the network connection to another network device. The command sends an Internet Control Message Protocol (ICMP) packet from the switch to the target device. You must set the local IP address before issuing the **ping** command.

You can ping a host using either its IP address or host name.

The syntax for the **ping** command is:

```
ping <XXX.XXX.XXX.XXX> [datasize <64-4096>] [{count <1-9999>}
| continuous] [{timeout | -t} <1-120>] [interval <1-60>]
[debug]
```

The **ping** command is in the exec command mode.

Table 117 "ping command parameters and variables" (page 329) describes the parameters and variables for the **ping** command.

Table 117
ping command parameters and variables

Parameters and variables	Description
XXX.XXX.XXX.XXX or Hostname	Specifies: • the IP address of the target device in dotted-decimal notation • the host name of the device to ping The host name can be a simple name, such as fred; in this case the DNS domain name, if set, is appended. Or the host name can be a full host name, such as fred.ca.nortel.com.
datasize <64-4096>	Specifies the size of the ICMP packet. The data size range is from 64 to 4096 bytes.
{count <1-9999>} l continuous	Sets the number of ICMP packets. The continuous mode sets the ping running until the user interrupts it by entering Ctrl+C.
{timeout l -t} <1-120>	Set the timeout using either the timeout or -t parameter followed by the number of seconds the switch must wait before timing out.
interval <1-60>	Specifies the number of seconds between transmitted packets.
debug	Provides additional output information such as ICMP sequence number and trip time.

If the device receives the packet, it sends a ping reply. When the switch receives the reply, it displays a message indicating that the specified IP address is active. If no reply is received, a message indicates that the address is not responding.

Figure 122 "ping command responses" (page 330) displays sample **ping** command responses.

Figure 122
`ping` command responses

```
460-24T-PWR>ping 192.167.120.1
Host is reachable
460-24T-PWR>
```

```
460-24T-PWR>ping 192.167.120.1 datasize 64 count 5 -t 10 interval 2 debug
PING 192.167.120.1: 56(64) data bytes
Reply from 192.167.120.1: 64 bytes icmp_seq=1 time<10 ms
Reply from 192.167.120.1: 64 bytes icmp_seq=2 time<10 ms
Reply from 192.167.120.1: 64 bytes icmp_seq=3 time<10 ms
Reply from 192.167.120.1: 64 bytes icmp_seq=4 time<10 ms
Reply from 192.167.120.1: 64 bytes icmp_seq=5 time<10 ms
----192.167.120.1 PING Statistics----
5 packets transmitted, 5 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 1/1/1
Host is reachable
460-24T-PWR>
```

This command has no default value.

ip name-server command

The **`ip name-server`** command adds one or more DNS servers' IP addresses. The syntax for the **`ip name-server`** command is:

```
ip name-server <A.B.C.D>
```

The **`ip name-server`** command is in the config command mode.

Note: You can add up to 3 servers; adding one at a time.

Table 118 "ip name-server command parameters and variables" (page 330) describes the parameters and variables for the **`ip name-server`** command.

Table 118
ip name-server command parameters and variables

Parameters and variables	Description
<A.B.C.D>	Enter the IP address of a DNS server.

The default value is 0.0.0.0.

no ip name-server command

The **`no ip name-server`** command removes one or more DNS servers' IP addresses. The syntax for the **`no ip name-server`** command is:

```
no ip name-server <A.B.C.D>
```

The **`no ip name-server`** command is in the config command mode.

Table 119 "no ip name-server command parameters and variables" (page 331) describes the parameters and variables for the **no ip name-server** command.

Table 119
no ip name-server command parameters and variables

Parameters and variables	Description
<A.B.C.D>	Enter the IP address of a DNS server.

The default value is 0.0.0.0.

ip domain-name command

The **ip domain-name** command sets the system's DNS domain name. The syntax for the **ip domain-name** command is:

```
ip domain-name [<LINE>]
```

The **ip domain-name** command is in the config command mode.

Table 120 "ip domain-name command parameters and variables" (page 331) describes the parameters and variables for the **ip domain-name** command.

Table 120
ip domain-name command parameters and variables

Parameters and variables	Description
<LINE>	Enter a DNS domain name.

The default value for this command is an empty string.

no ip domain-name command

The **no ip domain-name** command clears the system's DNS domain name (sets it to an empty string). The syntax for the **no ip domain-name** command is:

```
no ip domain-name
```

The **no ip domain-name** command is in the config command mode.

The **no ip domain-name** command has no parameters or variables.

default ip domain-name command

The **default ip domain-name** command clears the system's DNS domain name (set it to an empty string). The syntax for the **default ip domain-name** command is:

```
default ip domain-name
```

The **default ip domain-name** command is in the config command mode.

The **default ip domain-name** command has no parameters or variables.

Configuring the switch with a BootP-Dynamic IP Configuration

The Ethernet Switches 460 and 470 have a unique 48-bit hardware address, or MAC addressthat is printed on a label on the back panel. Use this MAC address when you configure the network BootP server to recognize BootP requests from an Ethernet Switch. With a properly configured BootP server, the switch can automatically learn its assigned IP address, subnet mask, and the IP address of the default router (default gateway).

IP-BootP configuration retention on downgrade

When downgrading a unit with Release 3.0.3 software and later, the system defaults all configurations, except for the following:

- Stack operation mode
- IP configuration
- BootP mode

Previous releases of Ethernet Switch software retained the Stack Operational Mode only on software downgrade. With this change, a remotely accessed switch can maintain its accessibility after downgrade and does not require the user to re-enter this basic information, which remains unchanged after a downgrade.

Configuration Management

You can use the Configuration File Menu screen to upload and download the configuration parameters of an Ethernet Switch to a TFTP server. You can also download an ASCII configuration file from a TFTP server.

Binary upload and binary download

The Configuration File upload/download are of two types:

- Binary config file upload/download
- ASCII config file upload/download

These options allow you to store your switch configuration parameters on a TFTP server. You can retrieve the configuration parameters of a stand-alone switch, and use the retrieved parameters to automatically configure a replacement switch. You must set up the file on your TFTP server and set the filename read-write permission to enabled before you can save the configuration parameters.

Automatically loading an ASCII configuration file

This section discusses how to download a configuration file when the system boots. You use standard CLI commands to modify the configuration file you want to download. This section covers these commands:

- "configure network command" (page 333)
- "show config-network command" (page 334)

configure network command

With the **configure network** command, you can load and execute a script immediately and to configure parameters to automatically download a configuration file when you reboot the switch or stack. The syntax for the **configure network** command is:

```
configure network [load-on-boot
{disable | use-bootp | use-config}] [filename <WORD>]
[address
<XXX.XXX.XXX.XXX>]
```

The **configure network** command is in the exec mode.

Note: When you enter the **configure network** command with no parameters, the system prompts you for the script file name and TFTP server address and then downloads the script.

Table 121 "configure network command parameters and variables" (page 333) describes the parameters and variables for the **configure network** command.

Table 121
configure network command parameters and variables

Parameters and variables	Description
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

Parameters and variables	Description
	• **use-boot**--specifies using the BootP file as the automatically loaded config file • **use-config**--specifies using the ASCII configuration file as the automatically loaded config file ***Note:*** If you omit this parameter, the system immediately downloads and runs the ASCII config file.
filename <WORD>	Specifies the file name. ***Note:*** If you omit this parameter and do not specify BootP, the system uses the configured file name.
address <XXX.XXX.XXX.XXX>	Specifies the TFTP server from which to load the file. Enter the IP address in dotted-decimal notation. ***Note:*** If you omit this parameter and do not specify BootP, the system uses the configured address.

Note: When you specify the file name or address, these parameters are changed at the next reboot, even if you do not specify load-on-boot.

show config-network command

The **show config-network** command displays information regarding the automatic loading of the configuration file, including the current status of this feature, the file name, the TFTP server address, and the status of the previous automatic configuration command. The syntax for the **show config-network** command is:

```
show config-network
```

The **show config-network** command is in the privileged exec mode.

The **show config-network** command has no parameters or variables.

The output for the **show config-network** command is shown in Figure 123 "show config-network command" (page 335),

Figure 123
`show config-network` command

```
470-24T(config)#show config-network
Auto-Load Configuration On Boot:  Disabled
Configuration Filename:
TFTP Server IP Address:  192.168.100.15
Last Auto Configuration Status:  Passed
```

ASCII Configuration Generator (ACG)

You can use the ACG application to save switch provisioning information to an external file and download this information to a switch from an external file server.

Note: The external file server must support TFTP.

You can use ACG to:

- Display the current configuration on the CLI.
- Store the current configuration in an external file.
- Load configuration from an external fileLoad configuration at boot time

This section covers the ACG commands available and includes:

- "show running-config" (page 335)
- "copy running-config" (page 336)
- "configure network" (page 337)
- "configure network load-on-boot" (page 338)

show running-config

The **`show running-config`** command displays the current switch configuration information. The syntax for the **`show running-config`** command is:

```
show running-config
```

The **`show running-config`** command is in the privileged exec command mode.

Note: The **`show running-config`** command is available, but its use is restricted, when a user has read-only access.

The **`show running-config`** command has no parameters or variables.

Figure 124 "show running-config command output" (page 336) displays a sample output of the **`show running-config`** command.

Figure 124
`show running-config` command output

```
470-24T#show running-config
enable
config t
mac-address-table aging-time 300
autotopology
snmp-server authentication-trap enable
snmp-server contact "SysAdmin"
snmp-server name "470"
snmp-server location "Lab"
snmp-server community "public" ro
snmp-server community "private" rw
--More--
```

copy running-config

The **`copy running-config`** command copies the current switch configuration as an ASCII file on the TFTP server. The syntax for the **`copy running-config`** command is:

```
copy running-config tftp [address <A.B.C.D>] filename <WORD>
```

Note: The **`copy config`** command copies a binary configuration file to the TFTP server. To store the configuration as an ASCII file, you must use the **`copy running-config`** command.

The **`copy running-config`** command is in the privileged exec command mode.

Table 122 "copy running-config command parameters and variables" (page 336) describes the parameters and variables for the **`copy running-config`** command.

Table 122
copy running-config command parameters and variables

Parameters and variables	Description
address <A.B.C.D>	Specifies the TFTP server IP address; enter in dotted-decimal notation.
filename <WORD>	Specifies the name of the existing ASCII configuration file on the TFTP server. This file must be read-write enabled.

Figure 125 "copy running-config command output" (page 337) displays a sample output of the **`copy running-config`** command.

Figure 125
`copy running-config` command output

```
470-24T#copy running-config tftp address 134.177.118.56
filename config.txt
%Contacting TFTP host: 134.177.118.56.
%ACG Configuration file successfully written.
470-24T#
```

configure network

The **`configure network`** command loads configuration from an external file on to the switch. The syntax for the **`configure network`** command is:

`configure network [address <A.B.C.D>] [filename <WORD>]`

The **`configure network`** command is in the PrivExec mode, Global configuration mode, and Interface configuration mode.

Table 123 "configure network command parameters and variables" (page 337) describes the parameters and variables for the **`configure network`** command.

Table 123
configure network command parameters and variables

Parameters and variables	Description
address <A.B.C.D>	Specifies the TFTP server IP address; enter in dotted-decimal notation.
filename <WORD>	Enter the name of the ASCII configuration file you want to copy from the TFTP server.

Figure 126 "configure network command output" (page 338) displays a sample output of the **`configure network`** command.

Figure 126
`configure network` command output

```
470-24T#configure network address 134.177.118.56 filename config.txt
Downloading Config File [|]
470-24T#enable
Downloaded file successfully, executing . . .
470-24T#config t
Enter configuration commands, one per line.  End with CNTL/Z.
470-24T(config)#mac-address-table aging-time 300
470-24T(config)#autotopology
470-24T(config)#snmp-server authentication-trap enable
470-24T(config)#snmp-server contact "HCS lab"
470-24T(config)#snmp-server community "public" ro
470-24T(config)#snmp-server community "private" rw
470-24T(config)#ip bootp server disable
470-24T(config)#ip default-gateway 134.177.150.1
470-24T(config)#ip address 134.177.150.79
470-24T(config)#ip address netmask 255.255.255.0
470-24T(config)#no auto-pvid
% AutoPVID already disabled.
470-24T(config)#vlan mgmt 1
470-24T(config)#vlan name 1 "VLAN #1"
470-24T(config)#vlan members remove 1 ALL
470-24T(config)#vlan members 1 ALL
470-24T(config)#vlan members 2 1-12
470-24T(config)#$ed-frame disable filter-untagged-frame disable priority
0
470-24T(config)#$ enable proxy enable robust-value 2 query-interval 125
470-24T(config)#$ enable proxy enable robust-value 2 query-interval 125
470-24T(config)#vlan mgmt 1
470-24T(config)#spanning-tree priority 8000
470-24T(config)#spanning-tree hello-time 2
470-24T(config)#spanning-tree max-age 20
470-24T(config)#spanning-tree forward-time 15
470-24T(config)#interface FastEthernet ALL
470-24T(config-if)#spanning-tree port 1-24 learning normal
470-24T(config-if)#exit
470-24T(config)#no mlt
470-24T(config)#mlt 1 name "Trunk #1"
470-24T(config)#mlt 2 name "Trunk #2"
470-24T(config)#mlt 3 name "Trunk #3"
470-24T(config)#mlt 4 name "Trunk #4"
470-24T(config)#mlt 5 name "Trunk #5"
470-24T(config)#mlt 6 name "Trunk #6"
470-24T(config)#interface FastEthernet ALL
470-24T(config-if)#no shutdown port 1-24
470-24T(config-if)#snmp trap link-status port 1-24 enable
470-24T(config-if)#speed port 1-24 auto
470-24T(config-if)#duplex port 1-24 auto
470-24T(config-if)#exit
```

configure network load-on-boot

The **`configure network load-on-boot`** command is used to configure the switch to automatically download a configuration file when you reboot the switch. The syntax for the **`configure network load-on-boot`** command is:

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

The **configure network load-on-boot** command is in the PrivExec mode, Global configuration mode, and Interface configuration mode.

Table 124 "configure network load-on-boot command parameters" (page 339) describes the parameters and variables for the **configure network load-on-boot** command.

Table 124
configure network load-on-boot command parameters

Parameters and variables	Description
{disable | use-bootp | use-config}	Specifies the settings for automatically loading a configuration file when the system boots: • disable--disables the automatic loading of the configuration file • use-bootp--specifies using the BootP file as the automatically loaded configuration file • use-config--specifies using the ASCII configuration file as the automatically loaded configuration file
address <A.B.C.D>	Specifies the TFTP server IP address; enter in dotted-decimal notation.
filename <WORD>	Enter the name of the ASCII configuration file you want to copy from the TFTP server.

Figure 127 "configure network load-on-boot command output" (page 339) displays a sample output of the **configure network load-on-boot** command.

Figure 127
configure network load-on-boot command output

```
470-24T#configure network load-on-boot use-config address
134.177.118.56 filename config.txt
470-24T#
```

Downloading and uploading your software

You can download the switch software image that is located in non-volatile flash memory. To download the switch software image, a properly configured Trivial File Transfer Protocol (TFTP) server must be present in your network, and the Ethernet Switch must have an IP address. To learn how to configure the switch IP address, see "Assigning and clearing IP addresses" (page 312).

CAUTION
Do not interrupt power to the device during the software download process. A power interruption can corrupt the firmware image.

You also download the Power over Ethernet (PoE) image using the CLI.

This section covers the following topics:

- "download command" (page 340)
- "Observing LED indications" (page 341)
- "Upgrading software in an Ethernet Switch stack" (page 343)

download command

The **download** command upgrades the software for the switch. You can upgrade the software image, the diagnostics image, and/or the PoE image. If you upgrade to a stack configuration, the entire stack is upgraded, and the new image is loaded onto every unit of the stack.

Note: The default downloading process without this command, is that the unit resets after downloading.

The syntax for the **download** command is:

```
download [address <ip>] {image <image-name> | image-
if-newer <image-name> | diag <filename>}[no-reset]
[poe_module_image]
```

The **download** command is in the privileged exec command mode.

Table 125 "download command parameters and variables" (page 340) describes the parameters and variables for the **download** command.

Table 125
download command parameters and variables

Parameters and variables	Description
address <ip>	Specifies the TFTP server you want to use. ***Note:*** If this parameter is omitted, the system goes to the server specified by the **tftp-server** command.
image <image-name>	Enter the name of the software image you want to download.

Parameters and variables	Description
image-if-newer <image-name>	Enter the name of the software image you want to download if newer than the current running image.
diag <filename>	Enter the name of the diagnostics image you want to download.
no-reset	Download the specified software without resetting the unit.
poe_module_image	PoE image file name.

The software download process is automatically completed without user intervention. The process erases the contents of flash memory and replaces it with a new software image. Do not attempt any switch configurations or otherwise interrupt the download process until after it runs to completion (the process can take up to 10 minutes, depending on network conditions).

When the download process is complete, the switch automatically resets (unless you specify no-reset) and the new software image initiates a self-test. The system returns a message after successfully downloading a new image. Figure 128 "download message" (page 341) displays a sample output of the download command.

Figure 128
download message

```
Download Image [/]
Saving Image [-]
Finishing Upgrading Image
```

You can monitor the progress of the download process by observing the LED indications.

Observing LED indications

Note: When you upgrade the software in a stack, all the BU LEDs on all switch units can light or blink. Disregard these lights.

Table 126 "LED Indications during the software download process" (page 342) describes the LED indications during the software download process for the Ethernet Switch 470-24T.

Table 126
LED Indications during the software download process

Phase	Description	LED Indications
1	The switch downloads the new software image.	**100 Mb/s port status LEDs ports 1 to 24:** The LEDs blink in succession from both ends and criss-cross at the center of the switch.
2	The switch erases the flash memory.	**100 Mb/s LEDs ports 1 and 24 stay lit.**
3	The switch programs the new software image into the flash memory.	**Same as phase 1.**
4	The switch resets automatically.	After the reset is complete, the new software image initiates the switch self-test, which comprises various diagnostic routines and subtests. The LEDs display various patterns to indicate that the subtests are in progress.

Table 127 "LED Indications during the software download process" (page 342) describes the LED indications during the software download process for the Ethernet Switch 460-24T-PWR.

Table 127
LED Indications during the software download process

Phase	Description	LED Indications
1	The switch downloads the new software image.	**100 Mb/s port status LEDs (ports 18 to 24 only):** The LEDs begin to turn on in succession beginning with port 24, which indicates the progress of the download process. When LEDs 18 to 24 are all on, the switch has received the new software image successfully.
2	The switch erases the flash memory.	**100 Mb/s port status LEDs (ports 1 to 12 only):** The LEDs begin to turn on in succession beginning with port 1, which indicates that various sectors of the switches flash memory are being erased. When LEDs 1 to 12 are all on, the switches flash memory was erased.

Phase	Description	LED Indications
3	The switch programs the new software image into the flash memory.	**100 Mb/s port status LEDs (ports 1 to 8 only):** The LEDs begin to turn on in succession beginning with port 1, which indicates that the new software image is being programmed into the switches flash memory. When LEDs 1 to 8 are all on, the new software image was programmed successfully into the switches flash memory.
4	The switch resets automatically.	After the reset is complete, the new software image initiates the switch self-test, which comprises various diagnostic routines and subtests. The LEDs display various patterns to indicate that the subtests are in progress.

Table 128 "LED Indications during the software download process" (page 343) describes the LED indications during the software download process for the Ethernet Switch 470-48T.

Table 128
LED Indications during the software download process

Phase	Description	LED Indications
1	The switch downloads the new software image.	**100 Mb/s port status LEDs ports 1 to 48:** The LEDs blink in succession from both ends and criss-cross at the center of the switch.
2	The switch erases the flash memory.	**100 Mb/s LEDs ports 1 and 48 stay lit.**
3	The switch programs the new software image into the flash memory.	**Same as phase 1.**
4	The switch resets automatically.	After the reset is complete, the new software image initiates the switch self-test, which comprises various diagnostic routines and subtests. The LEDs display various patterns to indicate that the subtests are in progress.

Upgrading software in an Ethernet Switch stack

With Ethernet Switch software, you must download software for the stack using the base unit.

Any one of the switches in the stack can function as a base unit in a stack; however, if an Ethernet Switch 470-48T is in the stack, it must be the base unit. Otherwise, if an Ethernet Switch 470-24T unit is in the stack, it must

be the base unit. If neither an Ethernet Switch 470-48T or an Ethernet Switch 470-24T is in the stack, an Ethernet Switch 460-24T-PWR can be the base unit.

Note: The hybrid stack mode is not supported in Release 3.6 software. All stacks must contain only Ethernet Switches 460-24T-PWR, Ethernet Switches 470-24T, and Ethernet Switches 470-48T.

To download, or upgrade, software in an Ethernet Switch stack:

1. Enter **`download [address <ip>] image <3.6_image.img>`**.

   The system resets and opens to the Nortel banner.

2. Enter **`download [address <ip>] diag <3.6_diags.bin>`**.

   The system resets and opens to the Nortel banner.

Customizing your system

You can customize your system using the following CLI commands. This section covers:

- "Setting the terminal" (page 344)
- "Displaying system information" (page 346)
- "Setting boot parameters" (page 348)
- "Setting TFTP parameters" (page 351)
- "Customizing the opening banner" (page 353)
- "Setting the default management system" (page 312)

Setting the terminal

You can view the terminal settings, set them to default settings, or customize the terminal settings. This section covers:

- "show terminal command" (page 344)
- "terminal command" (page 345)
- "show cli command" (page 345)

show terminal command

The **`show terminal`** command displays the current serial port information, which includes connection speed, as well as the terminal width and length in number of characters. The syntax for the **`show terminal`** command is:

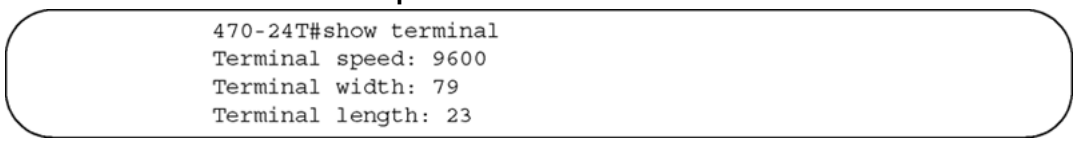
```
show terminal
```

The **`show terminal`** command is in the exec command mode.

The **`show terminal`** command has no parameters or variables.

Figure 129 "show terminal command output" (page 345) displays the output from the **show terminal** command.

Figure 129
show terminal command output



terminal command

The **terminal command** configures the settings for the terminal. These settings are transmit and receive speeds, terminal length, and terminal width. The syntax of the **terminal** command is:

```
terminal speed {2400 | 4800 | 9600 | 19200 | 38400} |
length <1-132> | width <1-132>
```

The **terminal command** is in the exec mode.

Table 129 "terminal command parameters and variables" (page 345) describes the parameters and variables for the **terminal** command.

Table 129
terminal command parameters and variables

Parameters and variables	Description
speed {2400 | 4800 | 9600 | 19200 | 38400}	Sets the transmit and receive baud rates for the terminal. You can set the speed at one of the five options shown; default is 9600.
length	Sets the length of the terminal display in characters; default is 24.
width	Sets the width of the terminal display in characters; default is 79.

show cli command

The **show cli** command displays the current CLI settings. The syntax for the **show cli** command is:

```
show cli [info | password]
```

The **show cli** command is in the exec command mode.

Table 130 "show cli command parameters and variables" (page 346) describes the parameters and variables for the **show cli** command.

Table 130
show cli command parameters and variables

Parameters and variables	Description
info	Displays general CLI settings.
mode	Display information about current CLI mode.
password	Displays CLI usernames and passwords.

Figure 130 "show cli command output" (page 346) displays the output from the **show cli** command.

Figure 130
show cli command output

```
470-24T#show cli info
Inactivity Timeout:  15 minute(s)
Login Timeout:  1 minute(s)
Login Retries:  3
More:
Screen Lines:
470-24T#show cli password
         Switch
Access Login     Password
------ --------- ------------------
RWA    RWA       secure
RW     RW        secure
RO     RO        user

          Stack
Access Login     Password
------ --------- ------------------
RWA    RWA       secure
RW     RW        secure
RO     RO        user
```

Displaying system information

The **show sys-info** command displays the current system characteristics, which includes HW rev, FW rev, date of manufacture (DOM), and Hardware deviation number. The syntax for the **show sys-info** command is:

show sys-info

The **show sys-info** command is in the privileged exec command mode.

The **show sys-info** command has no parameters or variables.

Figure 131 "show sys-info command output" (page 347) and Figure 132 "show sys-info command output" (page 348) displays sample output from the **show sys-info** command.

Figure 131
show sys-info command output

```
460_24T_PWR#show sys-info
Operation Mode:          Switch
MAC Address:             00-09-97-29-1F-00
Reset Count:             1
Last Reset Type:         Software Download
Power Status:            Primary Power
Autotopology:            Enabled
Current Switch Mode:     L2
Next Boot Switch Mode:   L2
Local MDA Type:          None
PoE Module FW:           7013.2
sysDescr:                Ethernet Switch 460 - 24T - PWR
                         HW:00       FW:3.0.0.5    SW:v3.6.0.0
ISVN:2
                         Mfg Date:20021102     HW Dev:
Serial #:                SDNIHR007B
sysObjectID:             1.3.6.1.4.1.45.3.49.1
sysUpTime:               12 days, 07:04:49
sysNtpTime:              SNTP not synchronized.
sysServices:             3
sysContact:
sysName:
sysLocation:
460_24T_PWR#show sys-info
```

Figure 132
`show sys-info` command output

```
470-48T#show sys-info
Operation Mode:          Switch
MAC Address:             00-04-38-D5-9F-C0
Reset Count:             1
Last Reset Type:         Software Download
Power Status:            Primary Power
Autotopology:            Enabled
Current Switch Mode:     L2
Next Boot Switch Mode:   L2
GBIC Port 47:            None
GBIC Port 48:            None
sysDescr:                Ethernet Switch 470 - 48T
                         HW:#0D      FW:3.0.0.5    SW:v3.6.0.0
ISVN:2
                         Mfg Date:20020717     HW Dev:
Serial #:                ACC1000CP
sysObjectID:             1.3.6.1.4.1.45.3.46.1
sysUpTime:               12 days, 08:43:00
sysNtpTime:              SNTP not synchronized.
sysServices:             3
sysContact:
sysName:
sysLocation:
470-48T#
```

To change the system contact, name, or location, refer to the **`snmp-server`** command.

Setting boot parameters

You can reboot the switch or stack and configure BootP. The topics covered in this section are:

boot command

The **`boot`** command performs a soft-boot of the switch. The syntax for the **`boot`** command is:

```
boot [default] [unit <unitno>]
```

The **`boot`** command is in the privileged exec command mode.

Table 131 "boot command parameters and variables" (page 349) describes the parameters and variables for the **boot** command.

Table 131
boot command parameters and variables

Parameters and variables	Description
default	Restores switch to factory-default settings after rebooting.
unit <unitno>	Specifies which unit of the stack to be rebooted. This command is available only in stack mode. Enter the unit number of the switch you want to reboot.

Note: When you reset to factory defaults, the switch retains the last reset count, and reason for last reset; these parameters are not changed to factory defaults.

ip bootp server command

The **ip bootp server** command configures BootP on the current instance of the switch or server. You use this command if you want to change the value of BootP from the default value, which is BootP when needed. The syntax for the **ip bootp server** command is:

```
ip bootp server {last | needed | disable | always}
```

The **ip bootp server** command is in the config command mode.

Table 132 "ip bootp server command parameters and variables" (page 349) describes the parameters and variables for the **ip bootp server** command.

Table 132
ip bootp server command parameters and variables

Parameters and variables	Description
last l needed l disable l always	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.

stack bootp-mac-addr-type command

With the **stack bootp-mac-addr-type** command, you can choose which MAC address is used for BootP operation when running in a stack. The syntax for the **stack bootp-mac-address-type** command is:

```
stack bootp-mac-addr-type {base-unit | stack}
```

The **stack bootp-mac-addr-type** command is in the config command mode.

Table 133 "stack boot-mac-addr-type command parameters and variables" (page 350) describes the parameters and variables for the **stack boot-mac-addr-type** command.

Table 133
stack boot-mac-addr-type command parameters and variables

Parameters and variables	Description
base-unit | stack	Specifies location of BootP MAC address: • **base-unit**--use the base unit MAC address for BootP • **stack**--use the stack MAC address for BootP

no ip bootp server command

The **no ip bootp server** command disables the BootP server. The syntax for the **no ip bootp server** command is:

```
no ip bootp server
```

The **no ip bootp server** command is in the config command mode.

The **no ip bootp server** command has no parameters or variables.

default ip bootp server command

The **default ip bootp server** command disables the BootP server. The syntax for the **default ip bootp server** command is:

```
default ip bootp server
```

The **default ip bootp server** command is in the config command mode.

The **default ip bootp server** command has no parameters or variables.

Setting TFTP parameters

You can display the IP address of the TFTP server, assign an IP address you want to use for a TFTP server, copy a configuration file to the TFTP server, or copy a configuration file from the TFTP server to the switch to use to configure the switch. This section covers:

show tftp-server command

The **show tftp-server** command displays the IP address of the server used for all TFTP-related transfers. The syntax for the **show tftp-server** command is:

```
show tftp-server
```

The **show tftp-server** command is in the privileged exec command mode.

The **show tftp-server** command has no parameters or variables.

Figure 133 "show tftp-server command output" (page 351) displays a sample output of the **show tftp-server command**.

Figure 133
show tftp-server command output

```
470-24T#show tftp-server
TFTP Server IP address : 192.168.100.15
```

tftp-server command

The **tftp-server** command assigns the address for the switch to use for TFTP services. The syntax for the **tftp-server** command is:

```
tftp-server <XXX.XXX.XXX.XXX>
```

The **tftp-server** command is in the config command mode.

Table 134 "tftp-server command parameters and variables" (page 352) describes the parameters and variables for the **tftp-server** command.

Table 134
tftp-server command parameters and variables

Parameters and variables	Description
XXX.XXX.XXX.XXX	Enter the dotted-decimal IP address of the server you want to use for TFTP services.

no tftp-server command

The **no tftp-server** command clears the TFTP server IP address to **0.0.0.0.** The syntax of the **no tftp-server** command is:

```
no tftp-server
```

The **no tftp-server** command is in the config command mode.

The **no tftp-server** command has no parameters or variables.

copy config tftp command

The **copy config tftp** command copies the current configuration file onto the TFTP server. The syntax for the **copy config tftp** command is:

```
copy config tftp [address <XXX.XXX.XXX.XXX>] filename <WORD>
```

The **copy config tftp** command is in the privileged exec command mode.

Table 135 "copy config tftp command parameters and variables" (page 352) describes the parameters and variables for the **copy config tftp** command.

Table 135
copy config tftp command parameters and variables

Parameters and variables	Description
[address <XXX.XXX.XXX.XXX>]	Specifies the TFTP server IP address; enter in dotted-decimal notation.
filename <WORD>	Specifies that you want to copy the configuration file onto the TFTP server. Enter the name you want the configuration file to have on the TFTP server.

Customizing the opening banner

You can customize the opening banner that appears when you either connect to the switch console port, or Telnet to the switch. You can customize the word NORTEL, written in asterisks, when the screen is opened the first time. You cannot customize the portion that displays "Enter Ctrl-Y to begin" (Figure 134 "Portion of opening banner you cannot customize" (page 353)).

Figure 134
Portion of opening banner you *cannot* customize

```
Enter Ctrl-Y to begin.

************************************************************
* Ethernet Switch 470 - 24T                                *
* Nortel                                                   *
* Copyright (c) 1996-2005, All Rights Reserved             *
* BoSS 3.6                                                 *
* Ver:  HW:#0A      FW:3.0.0.4    SW:v3.6.0.0 ISVN:2       *
************************************************************
```

banner cannot exceed 11215 bytes, or 15 rows x 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.

You must create the custom banner one line at a time using the Command Line Interface (CLI). Additionally, you can download the customer banner using the ASCII configuration file.

The following topics describe the CLI commands you use to customize the display banner:

- "show banner command" (page 353)
- "banner command for displaying banner" (page 354)
- "banner command for creating banner" (page 355)
- "no banner command" (page 355)

show banner command

The **`show banner`** command displays the banner. The syntax for the **`show banner`** command is:

```
show banner [static | custom]
```

The **`show banner`** command is in the privileged exec command mode.

Table 136 "show banner command parameters and variables" (page 354) describes the parameters and variables for the show banner command.

Table 136
`show banner` command parameters and variables

Parameters and variables	Description
`static | custom`	Displays which banner is currently set to display • `static` • `custom`

Figure 135 "show banner command output" (page 354) displays a sample output of the show banner command.

Figure 135
`show banner` command output

```
470-24T#show banner
Current banner setting: CUSTOM
```

banner command for displaying banner

The **`banner`** command for displaying banner specifies the banner displayed at startup; either static or custom. The syntax for the **`banner`** command for displaying banner is:

```
banner [static | custom]
```

The **`banner`** command for displaying banner is in global config command mode.

Table 137 "banner command for displaying banner parameters and variables" (page 354) describes the parameters and variables for the **`banner`** command.

Table 137
`banner` command for displaying banner parameters and variables

Parameters and variables	Description
`static | custom`	Sets the display banner as: • `static` • `custom`
`disabled`	Do not use banner display.

banner command for creating banner

With the **banner** command for creating banner, you can create a custom banner. The syntax for the **banner** command for creating banner is:

```
banner <line number> <text>
```

The **banner** command for creating banner is in the privileged exec command mode.

Table 138 "banner command for creating banner parameters and variables" (page 355) describes the parameters and variables for the **banner** command.

Table 138
banner command for creating banner parameters and variables

Parameters and variables	Description
<line number>	Enter the banner line number you are setting. The range is 1 to 19.
<text>	Enter the character string you want to display. The range is 1 to 80.

no banner command

With the **no banner** command you can clear all lines of a previously stored custom banner. The syntax for the no **banner** command is:

```
no banner
```

The **no banner** command is in the privileged exec command mode.

Configuring stack monitor using the CLI

You can use the CLI to configure the Stack Monitor feature.
For details, see the following sections:

- "show stack-monitor command" (page 355)
- "stack-monitor command" (page 356)
- "default stack-monitor command" (page 356)
- "no stack-monitor command" (page 357)

show stack-monitor command

The **show stack-monitor** command displays the status of the Stack Monitor feature.

The syntax for the **show stack-monitor** command is:

```
show stack-monitor
```

The **show stack-monitor** command is in the privileged exec command mode.

Figure 136 "show stack-monitor command output" (page 356) displays a sample output of the **show stack-monitor** command.

Figure 136
show stack-monitor command output

```
460-24T-PWR#show stack-monitor
Status: disabled
Stack size: 2
Trap interval: 60
460-24T-PWR#
```

stack-monitor command

The **stack-monitor** command enables the Stack Monitor feature.

The syntax for the **stack-monitor** command is:

stack-monitor [enable] [stack-size <2-8>] [trap-interval <30-300>]

The **stack-monitor** command is in the global config command mode.

Table 139 "stack-monitor command parameters and variables" (page 356) describes the parameters and variables for the **stack-monitor** command.

Table 139
stack-monitor command parameters and variables

Parameters and variables	Description
enable	Enables stack monitoring.
stack-size <2-8>	Sets the size of the stack to monitor. Valid range is 2 to 8.
trap-interval <30-300>	Sets the interval between traps, in seconds. Valid range is 30 to 300.

default stack-monitor command

The **default stack-monitor** command sets the Stack Monitor parameters to their default values.

The syntax for the **default stack-monitor** command is:

stack-monitor [enable] [stack-size] [trap-interval]

The **default stack-monitor** command is in the global config command mode.

Table 140 "default stack-monitor command parameters and variables" (page 357) describes the parameters and variables for the **default stack-monitor** command.

Table 140
default stack-monitor command parameters and variables

Parameters and variables	Description
enable	Sets the Stack Monitor feature to disabled (the default state for the feature).
stack-size	Sets the size of the stack to monitor to the default value: 2.
trap-interval	Sets the interval between traps to the default value: 60 seconds.
Note: If you do not specify a parameter for this command, all Stack Monitor parameters are set to their default values.	

no stack-monitor command

The **no stack-monitor** command disables the Stack Monitor feature.

The syntax for the **stack-monitor** command is:

```
no stack-monitor
```

or

```
no stack-monitor enable
```

The **stack-monitor** command is in the global config command mode.

The **stack-monitor** command has no parameters or variables.

Displaying the ARP table

The **show arp-table** command displays the Address Resolution Protocol (ARP) table of the device. The syntax for the **show arp-table** command is:

```
show arp-table
```

The **show arp-table** command is in the exec command mode.

The **show arp-table** command has no parameters or variables.

Figure 137 "show arp-table command output" (page 358) displays a sample output of the **show arp-table** command.

Figure 137
`show arp-table` command output

```
470-24T#show arp-table
Port IP Address      MAC Address
---- --------------- -----------------
24   10.30.40.1      00:00:A2:0B:3D:45
```

Displaying interfaces

You can view the status of all interfaces on the switch, including MultiLink Trunk membership, link status, autonegotiation, and speed.

show interfaces command

The **`show interfaces`** command displays the current configuration and status of all interfaces. The syntax for the **`show interfaces`** command is:

```
show interfaces [names] [<portlist>]
```

The **`show interfaces`** command is in the exec command mode.

Table 141 "show interfaces command parameters and variables" (page 358) describes the parameters and variables for the **`show interfaces`** command.

Table 141
show interfaces command parameters and variables

Parameters and variables	Description
`names <portlist>`	Displays the interface names; enter specific ports if you want to see only those.
`gbic-info`	Display gbic details.

Figure 138 "show interfaces names command output" (page 358) displays a sample output of the **`show interfaces names`** command.

Figure 138
`show interfaces` names command output

```
470-24T>show interfaces names 1-3
Port Name
---- ------------------------------------------------------------------
1    LabBldg4
2    Testing
3    Floor1Bldg2
```

Figure 139 "show interfaces command output" (page 359) displays a sample output of the **`show interfaces`** command without the names variable.

Figure 139
`show interfaces` command output

```
470-24T#show interfaces
              Status                      Auto                        Flow
Port Trunk Admin   Oper Link LinkTrap Negotiation Speed    Duplex Control
---- ----- ------- ---- ---- -------- ----------- -------- ------ -------
1          Enable  Down Down Enabled  Enabled
2          Enable  Down Down Enabled  Enabled
3          Enable  Down Down Enabled  Enabled
4          Enable  Down Down Enabled  Enabled
5          Enable  Down Down Enabled  Enabled
6          Enable  Down Down Enabled  Enabled
7          Enable  Down Down Enabled  Enabled
8          Enable  Down Down Enabled  Enabled
9          Enable  Down Down Enabled  Enabled
10         Enable  Down Down Enabled  Enabled
11         Enable  Down Down Enabled  Enabled
12         Enable  Down Down Enabled  Enabled
13         Enable  Down Down Enabled  Enabled
14         Enable  Up   Up   Enabled  Enabled     10M
15         Enable  Down Down Enabled  Enabled
16         Enable  Down Down Enabled  Enabled
17         Enable  Down Down Enabled  Enabled
18         Enable  Down Down Enabled  Enabled
19         Enable  Down Down Enabled  Enabled
--More--
```

show cmd-interface command

The **`show cmd-interface`** command displays the current default interface. The syntax for the **`show cmd-interface`** command is:

`show cmd-interface`

Figure 140 "show cmd-interface command output" (page 359) displays a sample output of the **`show cmd-interface`** command.

Figure 140
`show cmd-interface` command output

```
-- ------------------------------------------------------------------
460_24T_PWR#show cmd-interface
Default interface: Menu
460_24T_PWR#
```

Displaying unit uptime

You can display the uptime for each unit in a stack. Unit stack uptime collects the stack uptime for each unit in a stack and reports this information when requested. You can determine how long each unit was connected to the stack. You must use the Command Line Interface (CLI) command system to display the unit uptimes.

The **show stac k-info uptime** command displays the uptime for all units in the stack.

The syntax for the **show stack-info uptime** command is:

```
show stack-info uptime
```

The **show stack-info uptime** command is in the privileged exec command mode.

The **show stack-info uptime** command has no parameters or variables.

Figure 141 "show stack-info uptime command output" (page 360) displays sample output from the **show stack-info uptime** command.

Figure 141
show stack-info uptime command output

```
470_24T#show stack-info uptime
Unit# Switch Model      Unit UpTime
----- ---------------- --------------------
1           470-24T 4 days, 21:38:46
2           470-24T 4 days, 21:38:46
3           470-24T 4 days, 21:38:46
4           470-24T 4 days, 21:38:46
5           470-24T 4 days, 21:38:44
6           470-24T 4 days, 21:38:46
```

Enabling and disabling autosave

You can enable or disable the autosave feature of your unit. Autosave automatically saves your configuration information across reboots. This section covers these commands:

- "show autosave command" (page 360)
- "autosave enable command" (page 361)
- "no autosave enable command" (page 361)
- "default autosave enable command" (page 361)

Note: You can use the CLI command **copy config** nvram to force a manual save of the configuration when autosave is disabled.

show autosave command

The **show autosave** command displays the status of the autosave feature, either enabled or disabled. The syntax for the **show autosave** command is:

```
show autosave
```

The **show autosave** command is in the privileged exec command mode.

The **show autosave** command has no parameters or variables.

Figure 142 "show autosave command output" (page 361) displays sample output from the **show autosave** command.

Figure 142
show autosave command output

```
470-48T#show autosave
Auto Save:  Enabled
```

autosave enable command

The **autosave enable** command enables the autosave feature. The syntax for the **autosave enable** command is:

```
autosave enable
```

The **autosave enable** command is in the config command mode.

The **autosave enable** command has no parameters or variables.

no autosave enable command

The **no autosave enable** command disables the autosave feature. The syntax for the **no autosave enable** command is:

```
no autosave enable
```

The **no autosave enable** command is in the config command mode.

The **no autosave enable** command has no parameters or variables.

default autosave enable command

The **default autosave enable** command defaults the autosave feature to the default value of enabled. The syntax for the **default autosave enable** command is:

```
default autosave enable
```

The **default autosave enable** command is in the config command mode.

The **default autosave enable** command has no parameters or variables.

Setting time on network elements using Simple Network Time Protocol (SNTP)

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.

You use the CLI to configure the SNTP feature, ensuring that you complete the following steps:

Step	Action
1	Set the primary and secondary NTP server.
2	Enable SNTP.
3	Display the UTC time.

—End—

Optionally, to ensure the synchronization happens immediately, force a synchronization.

Note: If you have trouble using this feature, try various NTP servers. Some NTP servers can be either overloaded or currently inoperable.

show sntp command

The **`show sntp`** command displays the SNTP information, as well as the configured NTP servers. The syntax for the **`show sntp`** command is:

```
show sntp
```

The **`show sntp`** command is in the privileged exec command mode.

The **show sntp** command has no parameters or variables.

Figure 143 "show sntp command output" (page 363) displays sample output from the **show sntp** command.

Figure 143
show sntp command output

```
470-48T#show sntp
SNTP Status:                    Enabled
Primary server address:         47.82.2.10
Secondary server address:       47.81.2.10
Sync interval:                  24 hours
Last sync source:               47.82.2.10
Primary server sync failures:   0
Secondary server sync failures: 0
Last sync time:                 2003-10-27 19:32:17 GMT
Next sync time:                 2003-10-28 19:32:17 GMT
Current time:                   2003-10-27 19:47:35 GMT
```

show sys-info command

The **show sys-info** command displays the current system characteristics.

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

The syntax for the **show sys-info** command is:

```
show sys-info
```

The **show sys-info** command is in the privileged exec command mode.

The **show sys-info** command has no parameters or variables.

Figure 144 "show sys-info command output" (page 364) displays sample output from the **show sys-info** command.

Figure 144
`show sys-info` command output

```
470-48T#show sys-info
Operation Mode:          Switch
MAC Address:             00-04-38-D5-9F-C0
Reset Count:             1
Last Reset Type:         Software Download
Power Status:            Primary Power
Autotopology:            Enabled
Current Switch Mode:     L2
Next Boot Switch Mode:   L2
GBIC Port 47:            None
GBIC Port 48:            None
sysDescr:                Ethernet Switch 470 - 48T
                         HW:#0D      FW:3.0.0.5    SW:v3.6.0.0
ISVN:2
                         Mfg Date:20020717     HW Dev:
Serial #:                ACC1000CP
sysObjectID:             1.3.6.1.4.1.45.3.46.1
sysUpTime:               12 days, 08:43:00
sysNtpTime:              SNTP not synchronized.
sysServices:             3
sysContact:
sysName:
sysLocation:
470-48T#
```

sntp enable command

Note: The default setting for SNTP is disabled.

The **`sntp enable`** command enables SNTP. The syntax for the **`sntp enable`** command is:

```
sntp enable
```

The **`sntp enable`** command is in the config command mode.

The **`sntp enable`** command has no parameters or variables.

no sntp enable command

The **`no sntp enable`** command disables SNTP. The syntax for the **`no sntp enable`** command is:

```
no sntp enable
```

The **`no sntp enable`** command is in the config command mode.

The **`no sntp enable`** command has no parameters or variables.

sntp server primary address command

The **sntp server primary address** command specifies the IP addresses of the primary NTP server. The syntax for the **sntp server primary address** command is:

```
sntp server primary address <A.B.C.D>
```

The **sntp server primary address** command is in the config command mode.

Table 142 "sntp server primary address command parameters and variables" (page 365) describes the parameters and variables for the **sntp server primary address** command.

Table 142
sntp server primary address command parameters and variables

Parameters and variables	Description
<A.B.C.D>	Enter the IP address of the primary NTP server.

The default is 0.0.0.0.

sntp server secondary address command

The **sntp server secondary address** command specifies the IP addresses of the secondary NTP server. The syntax for the **sntp server secondary address** command is:

```
sntp server secondary address <A.B.C.D>
```

The **sntp server secondary address** command is in the config command mode.

Table 143 "sntp server secondary address command parameters and variables" (page 365) describes the parameters and variables for the **sntp server secondary address** command.

Table 143
sntp server secondary address command parameters and variables

Parameters and variables	Description
<A.B.C.D>	Enter the IP address of the secondary NTP server.

The default is 0.0.0.0.

no sntp server command

The **no sntp server** command clears the NTP server IP addresses. The syntax for the **no sntp server** command is:

```
no sntp server <primary | secondary>
```

The **no sntp server** command is in the config command mode.

Table 144 "no sntp server command parameters and variables" (page 366) describes the parameters and variables for the **no sntp server** command.

Table 144
no sntp server command parameters and variables

Parameters and variables	Description
<primary | secondary>	Enter the NTP server you want to clear: • primary--clears the IP address for the primary NTP server • secondary--clears the IP address for the secondary NTP server

sntp sync-now command

The **sntp sync-now** command forces a manual synchronization with the NTP server.

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

The syntax for the **sntp sync-now** command is:

```
sntp sync-now
```

The **sntp sync-now** command is in the config command mode.

The **no sntp sync-now** command has no parameters or variables.

sntp sync-interval command

The **sntp sync-interval** command specifies recurring synchronization with the NTP server in hours relative to initial synchronization. The syntax for the **sntp sync-interval** command is:

```
sntp sync-interval <0-168>
```

The **sntp sync-interval** command is in the config command mode.

Table 145 "sntp sync-interval command parameters and variables" (page 367) describes the parameters and variables for the **sntp sync-interval** command.

Table 145
sntp sync-interval command parameters and variables

Parameters and variables	Description
<0-168>	Enter the number of hours you want for periodic synchronization with the NTP server. ***Note:*** 0 is boot-time only, and 168 is once a week; the default value is 24 hours.

Setting the local time zone

SNTP uses Universal Coordinated Time (UTC) for all time synchronizations so it is not affected by different time zones. For the switch to report the correct time for your local time zone and daylight savings time, you must use the following commands:

- "clock time-zone" (page 367)
- "no clock time-zone" (page 368)
- "clock summer-time" (page 368)
- "no clock summer-time" (page 369)
- "show clock time-zone" (page 369)
- "show clock summer-time" (page 369)

clock time-zone

The **clock time-zone** command sets the local time zone relative to Universal Coordinated Time (UTC). The syntax for the clock time-zone command is:

```
clock time-zone <zone> <hours> <minutes>
```

The **clock time-zone** command is in the config command mode.

Table 146 "clock time-zone command parameters and variables" (page 368) describes the parameters and variables for the clock time-zone command.

Table 146
clock time-zone command parameters and variables

Parameters and variables	Description
zone	Time zone acronym to display when showing system time. (Range: up to four characters)
hours	Difference in hours from UTC. (Valid range: –12 to +12)
minutes	Optional difference in minutes from UTC. (0,15 ,30, or 45)

no clock time-zone

The **no clock time-zone** command disables the clock time zone feature. The syntax for the **no clock time-zone** command is:

```
no clock time-zone
```

The **no clock time-zone** command is in the config command mode.

The **no clock time-zone** command has no parameters or variables.

clock summer-time

The **clock summer-time** command sets the daylight savings time with start and end dates. The syntax for the **clock summer-time** command is:

```
clock summer-time <zone> [date {<day> <month> <year> <hh:mm>}
{<day> <month> <year> <hh:mm>}] [<offset>]
```

The **clock summer-time** command is in the config command mode.

Table 147 "clock summer-time command parameters and variables" (page 368) describes the parameters and variables for the **clock summer-time** command.

Table 147
clock summer-time command parameters and variables

Parameters and variables	Description
zone	The acronym to display when summer time is in effect. If unspecified, default to the time zone acronym. (Range: up to four characters)

Parameters and variables	Description
date {<day> <month> <year> <hh:mm>} {<day> <month> <year> <hh:mm>}	The first date specifies when summer time starts and the second date specifies when summer time ends. • day: day of the month (Range: 1 to 31) • month: month (Range: first three letters by name) • hh:mm: time in military format, in hours and minutes ***Note:*** <day> <month> parameters can also be entered in the order <month> <day>.
offset	Number of minutes to add during summer time (Range: –840 to +840).

no clock summer-time

The **no clock summer-time** command disables the daylight savings time feature. The syntax for the **no clock summer-time** command is:

```
no clock summer-time
```

The **no clock summer-time** command is in the config command mode.

The **no clock summer-time** command has no parameters or variables.

show clock time-zone

The **show clock time-zone** command displays the local time zone settings. The syntax for the **show clock time-zone** command is:

```
show clock time-zone
```

The **show clock time-zone** command is in the config command mode.

The **show clock time-zone** command has no parameters or variables.

Figure 145 "show clock time-zone command output" (page 369) displays sample output from the **show clock time-zone**.

Figure 145
show clock time-zone command output

```
460-24T-PWR(config)#show clock time-zone
Time Zone offset from UTC is 00:00
```

show clock summer-time

The **show clock summer-time** command displays the daylight savings time settings. The syntax for the **show clock summer-time** command is:

show clock summer-time

The **show clock summer-time** command is in the config command mode.

The **show clock summer-time** command has no parameters or variables.

Figure 146 "show clock summer-time command output" (page 370) displays sample output from the **show clock summer-time** command.

Figure 146
show clock summer-time command output

```
460-24T-PWR(config)#show clock summer-time
Summer time is set to:
start: 1 April 2006 at 12:00
end: 1 October 2006 at 12:00
Offset: 60 minutes. Timezone will be 'DST'
```

Enabling traffic separation

You can separate traffic on the network so that IP packets are forwarded to a predefined CDN port using the traffic separation mode. Enabling this feature also ensures that both control and data PPoE packets are forwarded to a predefined ISP port.

To enable traffic separation, use the following command:

switch mode <l2-switch | traffic-separation>

The **config switch mode** command is in the global config command mode.

Table 148 "config switch mode command parameters and variables" (page 370) describes the parameters and variables for the **config switch mode** command.

Table 148
config switch mode command parameters and variables

Parameters and values	Description
<l2-switch | traffic-separation>	Enter traffic-separation to enable the traffic separation feature.

Default traffic-separation restrict

This command sets the mode for traffic separation restrict to Layer3 restriction, The user is not allowed to create new L3 policies. This command is similar to the **traffic-separation restrict** command.

This command can be executed in the Global Configuration mode and there are no parameters associated with this command.

No traffic-separation restrict

This command sets the mode for traffic separation restrict, to no restriction. The user is allowed to create all types of L3 policies. There are no restrictions on creation of policies.

This command can be executed in the Global Configuration mode and has no associated parameters.

show traffic-separation

This command displays the current traffic separation settings, including the traffic separation restrict mode. Figure 147 "show traffic restriction command output" (page 371) shows the output of this command.

Figure 147
`show traffic restriction` command output

```
Traffic Separation:  Enabled
CDN Port Number:  47
ISP Port Number:    48
Policy Config Restriction Mode:  L3
```

Saving the configuration to NVRAM

You can save your configuration parameters to Non-Volatile RAM (NVRAM) using the CLI. This section covers the following topic:

- "copy config nvram" (page 371)
- "write memory command" (page 372)
- "save config command" (page 372)

copy config nvram

The **`copy config nvram`** copies the current configuration to NVRAM. The syntax for the **`copy config nvram`** command is:

```
copy config nvram
```

The **`copy config nvram`** command is in the privileged exec command mode.

The **`copy config nvram`** command has no parameters or variables.

Note: The system automatically issues the **`copy config nvram`** command periodically.

write memory command

The **write memory** command copies the current configuration to NVRAM. The syntax for the **write memory** command is:

```
write memory
```

The **write memory** command is in the exec command mode.

The **write memory** command has no parameters or variables.

save config command

The **save config** command copies the current configuration to NVRAM. The syntax for the **save config** command is:

```
save config
```

The **save config** command is in the exec command mode.

The **save config** command has no parameters or variables.

Trap notification when configuration changes are saved to NVRAM

When configuration changes are written to non-volatile memory, a trap (bsnConfigurationSavedToNvram) is sent to the trap receiver indicating that a change has occurred to the configuration of the device. This trap also appears as an event in the volatile system log.

For each stand-alone and stack configuration, you must configure a trap destination. Use the following CLI commands:

```
snmp-server community trap notify-view snmpv1Objs command
snmp-server host <a.b.c.d> v1 trap command
```

Enabling Autotopology

This section includes information about enabling autotopology on the switch.

You can enable the Optivity* Autotopology* protocol using the CLI. Seewww.nortel.com/support URL for information about Autotopology. (The product family for Optivity and Autotopology is Data and Internet.) This section covers the following commands:

- "autotopology command" (page 373)
- "no autotopology command" (page 373)
- "default autotopology command" (page 373)
- "show autotopology settings" (page 373)
- "show autotopology nmm-table" (page 374)

autotopology command

The **autotopology** command enables the Autotopology protocol. The syntax for the **autotopology** command is:

```
autotopology
```

The **autotopology** command is in the config command mode.

The **autotopology** command has no parameters or variables.

no autotopology command

The **no autotopology** command disables the Autotopology protocol. The syntax for the **no autotopology** command is:

```
no autotopology
```

The **no autotopology** command is in the config command mode.

The **no autotopology** command has no parameters or variables.

default autotopology command

The **default autotopology** command enables the Autotopology protocol. The syntax for the **default autotopology** command is:

```
default autotopology
```

The **default autotopology** command is in the config command mode.

The **default autotopology** command has no parameters or variables.

show autotopology settings

The **show autotopology settings** command displays information about the Autotopology configuration. The syntax for the **show autotopology settings** command is:

```
show autotopology settings
```

The **show autotopology** settings command is in the privileged exec mode.

The **show autotopology** settings command has no parameters or variables. Figure 148 "show autotopology settings command output" (page 374) displays a sample output of the **show autotopology settings** command.

Figure 148
`show autotopology settings` command output

```
470-24T#show autotopology settings
Autotopology:  Enabled
Last NMM Table Change:  4578
Maximum NMM Table Entries:  100
Current NMM Table Entries:  1
```

show autotopology nmm-table

The **`show autotopology nmm-table`** command displays information about the network management module (NMM) table. The syntax for the **`show autotopology nmm-table`** command is:

`show autotopology nmm-table`

The **`show autotopology nmm-table`** command is in the privileged exec mode.

The **`show autotopology nmm-table`** command has no parameters or variables.

Figure 149 "show autotopology nmm-table command output" (page 374) displays a sample output of the **`show autotopology nmm-table`** command.

Figure 149
`show autotopology nmm-table` command output

```
470-48T#show autotopology nmm-table
LSlot                                                                  RSlot
LPort IP Addr          Seg ID  MAC Addr     Chassis Type     BT LS   CS   RPort
----- --------------- -------- ------------ ---------------- -- --- ---- ---
 0/ 0 134.177.150.80  0x000000 000438D59FC1     470-24T      12 Yes HTBT   NA
 1/ 1 134.177.150.6   0x000108 000F6A7DC121     470-48T      12 Yes HTBT   1/ 8
 1/ 1 134.177.150.79  0x000101 000997291F01     460-24T-PWR  12 Yes HTBT
1/ 1
470-48T#
```

Chapter 12
Ethernet port management using the CLI

This chapter describes how to enable a port, name a port, enable rate limit and display the status for the Power over Ethernet (PoE) configuration. This chapter covers the following topics:

See Chapter 10 "Power over Ethernet for Ethernet Switches 460-PWR and 470-PWR" (page 271) for more information about the PoE feature.

Note: For information about downloading the PoE image, see "download command" (page 340).

Enabling or disabling a port

You can enable or disable a port using the CLI. This section covers the following commands:

shutdown port command

The **`shutdown port`** command disables the port. The syntax for the **`shutdown port`** command is:

```
shutdown [port <portlist>]
```

The **`shutdown port`** command is in the config-if command mode.

Table 149 "shutdown port command parameters and variables" (page 376) describes the parameters and variables for the **shutdown port** command.

Table 149
shutdown port command parameters and variables

Parameters and variables	Description
port <portlist>	Specifies the port numbers to shut down or disable. Enter the port numbers you want to disable. ***Note:*** If you omit this parameter, the system uses the port number specified with the **interface** command.

no shutdown command

The **no shutdown** command enables the port. The syntax for the **no shutdown** command is:

```
no shutdown [port <portlist>]
```

The **no shutdown** command is in the config-if command mode.

Table 150 "no shutdown command parameters and variables" (page 376) describes the parameters and variables for the **no shutdown** command.

Table 150
no shutdown command parameters and variables

Parameters and variables	Description
port <portlist>	Specifies the port numbers to enable. Enter the port numbers you want to enable. ***Note:*** If you omit this parameter, the system uses the port number specified with the **interface** command.

Naming ports

You can name a port using the CLI. This section covers the following commands:

- "name command" (page 377)
- "no name command" (page 377)
- "default name command" (page 377)

name command

With the **name** command you can name ports or to change the name. The syntax for the **name** command is:

```
name [port <portlist>] <LINE>
```

The **name** command is in the config-if command mode.

Table 151 "name command parameters and variables" (page 377) describes the parameters and variables for the **name** command.

Table 151
name command parameters and variables

Parameters and variables	Description
port <portlist>	Specifies the port numbers to name. ***Note:*** If you omit this parameter, the system uses the port number you specified in the **interface** command.
<LINE>	Enter up to 26 alphanumeric characters.

no name command

The **no name** command clears the port names; it resets the field to an empty string. The syntax for the **no name** command is:

```
no name [port <portlist>]
```

The **no name** command is in the config-if command mode.

Table 152 "no name command parameters and variables" (page 377) describes the parameters and variables for the **no name** command.

Table 152
no name command parameters and variables

Parameters and variables	Description
port <portlist>	Specifies the port numbers to clear of names. ***Note:*** If you omit this parameter, the system uses the port number specified with the **interface** command.

default name command

The **default name** command clears the port names; it resets the field to an empty string. The syntax for the **default name** command is:

```
default name [port <portlist>]
```

The **default name** command is in the config-if command mode.

Table 153 "default name command parameters and variables" (page 378) describes the parameters and variables for the **default** name command.

Table 153
default name command parameters and variables

Parameters and variables	Description
port <portlist>	Specifies the port numbers to clear of names. ***Note:*** If you omit this parameter, the system uses the port number specified with the **interface** command.

Setting port speed

You can set the speed and duplex mode for a port. This section covers:

- "speed command" (page 378)
- "default speed command" (page 379)
- "duplex command" (page 379)
- "default duplex command" (page 380)

speed command

The **speed** command sets the speed of the port. The syntax for the **speed** command is:

```
speed [port <portlist>] {10 | 100 | 1000 | auto}
```

The **speed** command is in the config-if command mode.

Note: You cannot *enable* autonegotiation on fiber optic ports.

Table 154 "speed command parameters and variables" (page 378) describes the parameters and variables for the **speed** command.

Table 154
speed command parameters and variables

Parameters and variables	Description
port <portlist>	Specifies the port numbers to configure the speed. Enter the port numbers you want to configure.

Parameters and variables	Description
	Note: If you omit this parameter, the system uses the port number specified with the **`interface`** command.
`10 | 100 | 1000 | auto`	Sets speed to: • **`10`**--10 Mb/s • **`100`**--100 Mb/s • **`1000`**--1000 Mb/s or 1 GB/s • **`auto`**--autonegotiation

Note: When you set the port speed for autonegotiation, ensure that the other side of the link is also set for autonegotiation.

default speed command

The **`default speed`** command sets the speed of the port to the factory default speed. The syntax for the **`default speed`** command is:

```
default speed [port <portlist>]
```

The **`default speed`** command is in the config-if command mode.

Table 155 "default speed command parameters and variables" (page 379) describes the parameters and variables for the **`default speed`** command.

Table 155
`default speed` **command parameters and variables**

Parameters and variables	Description
`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 specified with the **`interface`** command.

duplex command

The **`duplex`** command specifies the duplex operation for a port. The syntax for the **`duplex`** command is:

```
duplex [port <portlist>] {full | half | auto}
```

The **`duplex`** command is in the config-if command mode.

Note: You cannot *enable* autonegotiation on fiber optic ports.

Table 156 "duplex command parameters and variables" (page 380) describes the parameters and variables for the **duplex** command.

Table 156
duplex command parameters and variables

Parameters and variables	Description
port <portlist>	Specifies the port number to configure the duplex mode. Enter the port number you want to configure, or **all** to configure all ports simultaneously. ***Note:*** If you omit this parameter, the system uses the port number specified with the **interface** command.
full | half | auto	Sets duplex to: • **full**--full-duplex mode • **half**--half-duplex mode • **auto**--autonegotiation

Note: When you set the duplex mode for autonegotiation, ensure that the other side of the link is also set for autonegotiation.

default duplex command

The **default duplex** command sets the duplex operation for a port to the factory default duplex value. The syntax for the **default duplex** command is:

```
default duplex [port <portlist>]
```

The **default duplex** command is in the config-if command mode.

Table 157 "default duplex command parameters and variables" (page 380) describes the parameters and variables for the **default duplex** command.

Table 157
default duplex command parameters and variables

Parameters and variables	Description
port	Specifies the port numbers to reset the duplex mode to

Parameters and variables	Description
<portlist>	factory default values. Enter the port numbers you want to configure, or all to configure all ports simultaneously. The default value is autonegotiation. ***Note:*** If you omit this parameter, the system uses the port number specified with the interface command.

Note: You cannot *enable* autonegotiation on fiber optic ports.

Enabling flow control

If you use a Gigabit Interface Connector (GBIC) with the switch, you control traffic on this port using the **flowcontrol** command. This section covers the following commands:

- "flowcontrol command" (page 381)
- "no flowcontrol command" (page 382)
- "default flowcontrol command" (page 382)

flowcontrol command

The **flowcontrol** command is used only on Gigabit Interface Connector ports and controls the traffic rates during congestion. The syntax for the **flowcontrol** command is:

```
flowcontrol [port <portlist>]
{asymmetric | symmetric | auto | disable}
```

The **flowcontrol** command is in the config-if mode.

Table 158 "flowcontrol command parameters and variables" (page 381) describes the parameters and variables for the **flowcontrol** command.

Table 158
flowcontrol command parameters and variables

Parameters and variables	Description
port <portlist>	Specifies the port numbers to configure for flow control. ***Note:*** If you omit this parameter, the system uses the port number specified with the interface command.
asymmetric |	Sets the mode for flow control:

Parameters and variables	Description
`symmetric | auto | disable`	• **`asymmetric`**--enables the local port to perform flow control on the remote port • **`symmetric`**--enables the local port to perform flow control • **`auto`**--sets the port to automatically determine the flow control mode (default) • **`disable`**--disables flow control on the port

no flowcontrol command

The **`no flowcontrol`** command is used only on Gigabit Ethernet ports and disables flow control. The syntax for the **`no flowcontrol command`** is:

```
no flowcontrol [port <portlist>]
```

The **`no flowcontrol`** command is in the config-if mode.

Table 159 "no flowcontrol command parameters and variables" (page 382) describes the parameters and variables for the **`no flowcontrol`** command.

Table 159
`no flowcontrol` **command parameters and variables**

Parameters and variables	Description
`port <portlist>`	Specifies the port numbers to disable flow control. ***Note:*** If you omit this parameter, the system uses the port number specified with the **`interface`** command.

default flowcontrol command

The **`default flowcontrol`** command is used only on Gigabit Ethernet ports and sets the flow control to auto, which automatically detects the flow control. The syntax for the **`default flowcontrol`** command is:

```
default flowcontrol [port <portlist>]
```

The **`default flowcontrol`** command is in the config-if mode.

Table 160 "default flowcontrol command parameters and variables" (page 383) describes the parameters and variables for the **default flowcontrol** command.

Table 160
default flowcontrol command parameters and variables

Parameters and variables	Description
port <portlist>	Specifies the port numbers to default to auto flow control. ***Note:*** If you omit this parameter, the system uses the port number specified with the **interface** command.

Enabling rate limiting

You can limit the percentage of multicast traffic, or broadcast traffic, or both using the CLI.

This section covers:

- "show rate-limit command" (page 383)
- "rate-limit command" (page 384)
- "no rate-limit command" (page 385)
- "default rate-limit command" (page 385)

show rate-limit command

The **show rate-limit** command displays the rate limiting settings and statistics. The syntax for the **show rate-limit** command is:

```
show rate-limit
```

The **show rate-limit** command is in the privileged exec command mode.

The **show rate-limit** command has no parameters or variables.

Figure 150 "show rate-limit command output" (page 384) displays sample output from the **show rate-limit** command.

Figure 150
`show rate-limit` command output

```
470-24T #show rate-limit
Port   Packet Type  Limit   Last 5 Minutes  Last Hour  Last 24 Hours
----   -----------  -----   --------------  ---------  -------------
1      Both         None          0.0%         0.0%         0.0%
2      Both         None          0.0%         0.0%         0.0%
3      Both         None          0.0%         0.0%         0.0%
4      Both         None          0.0%         0.0%         0.0%
5      Both         None          0.0%         0.0%         0.0%
6      Both         None          0.0%         0.0%         0.0%
7      Both         None          0.0%         0.0%         0.0%
8      Both         None          0.0%         0.0%         0.0%
9      Both         None          0.0%         0.0%         0.0%
10     Both         None          0.0%         0.0%         0.0%
11     Both         None          0.0%         0.0%         0.0%
12     Both         None          0.0%         0.0%         0.0%
13     Both         None          0.0%         0.0%         0.0%
14     Both         None         80.6%        66.6%        69.6%
15     Both         None          0.0%         0.0%         0.0%
16     Both         None          0.0%         0.0%         0.0%
17     Both         None          0.0%         0.0%         0.0%
18     Both         None          0.0%         0.0%         0.0%
19     Both         None          0.0%         0.0%         0.0%
20     Both         None          0.0%         0.0%         0.0%
--More--
```

rate-limit command

The **`rate-limit`** command configures rate limiting on the port. The syntax for the **`rate-limit`** command is:

```
rate-limit [port <portlist>]
{multicast <pct> | broadcast <pct> | both <pct>}
```

The **`rate-limit`** command is in the config-if command mode.

Table 161 "rate-limit command parameters and variables" (page 384) describes the parameters and variables for the **`rate-limit`** command.

Table 161
`rate-limit` command parameters and variables

Parameters and values	Description
`port <portlist>`	Specifies the port numbers to configure for rate limiting. Enter the port numbers you want to configure.

Parameters and values	Description
	Note: If you omit this parameter, the system uses the port number specified with the **interface** command.
multicast <pct> | **broadcast** <pct> | **both** <pct>	Applies rate limiting to the type of traffic. Enter an integer between 1 and 10 to set the rate limiting percentage: • **multicast**--applies rate limiting to multicast packets • **broadcast**--applies rate limiting to broadcast packets • **both**--applies rate limiting to both multicast and broadcast packets

no rate-limit command

The **no rate-limit** command disables rate limiting on the port. The syntax for the **no rate-limit** command is:

```
no rate-limit [port <portlist>]
```

The **no rate-limit** command is in the config-if command mode.

Table 162 "no rate-limit command parameters and variables" (page 385) describes the parameters and variables for the no **rate-limit** command.

Table 162
no rate-limit command parameters and variables

Parameters and variables	Description
port <port list>	Specifies the port numbers to disable from 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

The **default rate-limit** command restores the rate limiting value for the specified port to the default setting. The syntax for the **default rate-limit** command is:

```
default rate-limit [port <portlist>]
```

The **default rate-limit** command is in the config-if command mode.

Table 163 "default rate-limit command parameters and variables" (page 386) describes the parameters and variables for the **default rate-limit** command.

Table 163
default rate-limit command parameters and variables

Parameters and variables	Description
port <portlist>	Specifies the port numbers to reset rate limiting to factory default. Enter the port numbers on which you want to set rate limiting to default. ***Note:*** If you omit this parameter, the system uses the port number specified with the **interface** command.

Enabling Custom Autonegotiation Advertisements (CANA)

You can control the capabilities that are advertised by the Ethernet Switch as part of the autonegotiation process using the Custom Autonegotiation Advertisements (CANA) feature. When autonegotiation is disabled, the hardware is configured for a single (fixed) speed and duplex value. When autonegotiation is enabled, the advertisement made by the switch is a constant value, based upon all speed and duplex modes supported by the hardware. When autonegotiating, the switch selects the highest common operating mode supported between it and its link partner.

This section covers:

- "show auto-negotiation-advertisements command" (page 386)
- "show auto-negotiation-capabilities command" (page 387)
- "auto-negotiation-advertisements command" (page 388)
- "no auto-negotiation-advertisements command" (page 389)
- "default auto-negotiation-advertisements command" (page 389)

show auto-negotiation-advertisements command

The **show auto-negotiation-advertisements** command displays the current autonegotiation advertisements. The syntax for the **show auto-negotiation-advertisements** command is:

```
show auto-negotiation-advertisements [port <portlist>]
```

The **show auto-negotiation-advertisements** command is in the userExec command mode.

Table 164 "show auto-negotiation-advertisements command" (page 387) describes the parameters and variables for the **show auto-negotiation-advertisements** command.

Table 164
show auto-negotiation-advertisements command

Parameters and values	Description
port <portlist>	Enter ports for which you want to display the current autonegotiation advertisements.

Figure 151 " show auto-negotiation-advertisements command output" (page 387) displays sample output from the **show auto-negotiation-advertisements** command.

Figure 151
show auto-negotiation-advertisements command output

```
460_24T_PWR#show auto-negotiation-advertisements port 4,8,10
Port Autonegotiation Advertised Capabilities ---------------------
-------------------------------
4    10Full 10Half 100Full 100Half
8    10Full 10Half 100Full 100Half
10   10Full 10Half 100Full 100Half
```

show auto-negotiation-capabilities command

The **show auto-negotiation-capabilities** command displays the hardware advertisement capabilities for the switch. The syntax for the **show auto-negotiation-capabilities** command is:

show auto-negotiation-capabilities [port <portlist>]

The **show auto-negotiation-capabilities** command is in the userExec command mode.

Table 165 "show auto-negotiation-capabilities command" (page 387) describes the parameters and variables for the **show auto-negotiation-capabilities** command.

Table 165
show auto-negotiation-capabilities command

Parameters and values	Description
port <portlist>	Enter ports for which you want to display the autonegotiation capabilities .

Figure 152 "show auto-negotiation-capabilities command output" (page 388) displays sample output from the **show auto-negotiation-capabilities** command.

Figure 152
show auto-negotiation-capabilities command output

```
460_24T_PWR#show auto-negotiation-capabilities port 5,6,10
Port Autonegotiation Capabilities
---- ------------------------------------------------------------------
5    10Full 10Half 100Full 100Half
6    10Full 10Half 100Full 100Half
10   10Full 10Half 100Full 100Half
460_24T_PWR#
```

auto-negotiation-advertisements command

The **auto-negotiation-advertisements** command configures advertisements for the switch.

The syntax for the **auto-negotiation-advertisements** command is:

```
auto-negotiation-advertisements [port <portlist>] [10-full]
[10-half] [100-full] [100-half] [1000-full] [1000-half]
[asymm-pause-frame] [none] [pause-frame]
```

The **auto-negotiation-advertisements** command is in the interface configuration command mode.

Table 166 "auto-negotiation-advertisements command" (page 388) describes the parameters and variables for the **auto-negotiation-advertisements** command.

Table 166
auto-negotiation-advertisements command

Parameters and values	Description
port <portlist>	Enter ports for which you want to configure advertisements.
[10-full] [10-half] [100-full] [100-half] [1000-full] [1000-half] [asymm-pause-frame] [none] [pause-frame]	These are speed-duplex-pause settings. Any combination of these settings is allowed, but parameters must be given in the order shown.

no auto-negotiation-advertisements command

The **no auto-negotiation-advertisements** command clears all advertisements for the switch. This command is used for testing. The syntax for the **no auto-negotiation-advertisements** command is:

```
no auto-negotiation-advertisements [port <portlist>]
```

Note: The use of this command affects traffic and brings down the link.

The **no auto-negotiation-advertisements** command is in the interface configuration command mode.

Table 167 "no auto-negotiation-advertisements command" (page 389) describes the parameters and variables for the **no auto-negotiation-advertisements** command.

Table 167
no auto-negotiation-advertisements command

Parameters and values	Description
port <portlist>	Enter ports for which you want to clear all advertisements.

default auto-negotiation-advertisements command

The **default auto-negotiation-advertisements** command sets default advertisements for the switch.
The syntax for the **default auto-negotiation-advertisements** command is:

```
default auto-negotiation-advertisements [port <portlist>]
```

The **default auto-negotiation-advertisements** command is in the interface configuration command mode.

Table 168 "default auto-negotiation-advertisements command" (page 389) describes the parameters and variables for the **default auto-negotiation-advertisements** command.

Table 168
default auto-negotiation-advertisements command

Parameters and values	Description
port <portlist>	Enter ports for which you want to set default advertisements.

smart-autoneg command

The **smart-autoneg** command enables the autonegotiation smart mode feature on a port or interface.

The syntax for the **smart-autoneg** command is:

```
smart-autoneg [port <portlist>] [enable]
```

The **smart-autoneg** command is in the interface configuration command mode.

Note: Smart mode is only supported on GBIC ports on Ethernet Switches 470-24-PWR and 470-48-PWR.

Table 169 "smart-autoneg command parameters and variables" (page 390) describes the parameters and variables for the **smart-autoneg** command.

Table 169
smart-autoneg command parameters and variables

Parameters and values	Description
`port <portlist>`	Enter ports for which you want to set default advertisements.
`enable`	Enables the autonegotiation smart mode feature on the selected port.

no smart-autoneg command

The **no smart-autoneg** command enables the autonegotiation smart mode feature on a port or interface.

The syntax for the **no smart-autoneg** command is:

```
no smart-autoneg [port <portlist>] [enable]
```

The **no smart-autoneg** command is in the interface configuration command mode.

Table 170 "no smart-autoneg command parameters and variables" (page 390) describes the parameters and variables for the **no smart-autoneg** command.

Table 170
no smart-autoneg command parameters and variables

Parameters and values	Description
`port <portlist>`	Enter ports for which you want to set default advertisements.
`enable`	Enables the autonegotiation smart mode feature on the selected port.

Configuring FEFI

When a fiber optic transmission link to a remote device fails, the remote device indicates the failure and the port is disabled. To use Far End Fault Indication (FEFI), the user must enable autonegotiation on the port.

Configuring SFFD

When a partial fiber break occurs, data is lost on one side of a link. Single Fiber Fault Detection (SFFD) detects this error condition, and causes the port that is losing data to go down. This stops the loss of data.

The Single Fiber Fault Detection feature is enabled on a port-by-port basis for the Ethernet Switch GBIC ports. At present, you can access this feature through the CLI.

Single Fiber Fault Detection (SFFD) has the following requirements and limitations:

- SFFD must be implemented on both sides of a link. For example: Passport 8600 and Ethernet Switch 470-24T.
- SFFD must be enabled on a per-port basis.
- By default, SFFD is disabled on all ports.
- SFFD takes about 50 seconds to detect a fault.
- After a link is repaired, the link recovers automatically.

This section lists the CLI commands that are used on the Ethernet Switch products to support the SFFD feature:

- "show sffd command" (page 391)
- "sffd enable command" (page 392)
- "no sffd enable command" (page 393)
- "default sffd enable command" (page 393)

show sffd command

The **show sffd** command displays the SFFD configuration information for all ports with the SFFD feature. The display also indicates whether the SFFD feature is enabled or disabled. The syntax of the **show sffd** command is:

```
show sffd
```

The **show sffd** command is in all command modes.

The **show sffd** command has no parameters or variables.

Figure 153 "show sffd command output" (page 392) displays the **show sffd** command output.

Figure 153
`show sffd` command output

```
 470-48T#show sffd
Port  SFFD Mode
----  ---------
47    Disabled
470-48T#
```

sffd enable command

The **`sffd enable`** command enables the SFFD feature on specified ports, and is available only in the CLI. The syntax of the **`sffd enable`** command is:

```
sffd [port <portlist>] enable
```

The **`sffd enable`** command is in the config-if command mode.

Table 171 "sffd enable command parameters and variables" (page 392) describes the parameters and variables for the **`sffd enable`** command.

Table 171
`sffd enable` command parameters and variables

Parameters and variables	Description
`port <portlist>`	Specifies the port numbers to enable the SFFD feature. The portlist can be separated by commas or dashes. For example: 2/16, 3/16, or 2/26 - 2/27. ***Note:*** If you omit this parameter, the system uses the port number specified with the **`interface`** command.

Figure 154 "sffd enable command output" (page 392) displays sample output from the **`sffd enable`** command.

Figure 154
`sffd enable command output`

```
470-48T(config-if)#sffd enable
470-48T(config-if)#show sffd
Port  SFFD Mode
----  ---------
47    Enabled
470-48T(config-if)#
```

no sffd enable command

The no **sffd enable** command disables the SFFD feature on specified ports, and is available only in the CLI. The syntax of the **no sffd enable** command is:

```
no sffd [port <portlist>] enable
```

The **no sffd enable** command is in the config-if command mode.

Table 172 "no sffd enable command parameters and variables" (page 393) describes the parameters and variables for the **no sffd enable** command.

Table 172
no sffd enable command parameters and variables

Parameters and variables	Description
port <portlist>	Specifies the port numbers to disable the SFFD feature. The portlist can be separated by commas or dashes. For example: 2/16, 3/16, or 2/26 - 2/27. ***Note:*** If you omit this parameter, the system uses the port number specified with the **interface** command.

default sffd enable command

The **default sffd enable** command changes the SFFD feature on specified ports to the factory default setting. The factory default setting is disabled. The syntax of the **default sffd enable** command is:

```
default sffd [port <portlist>] enable
```

The **default sffd enable** command is in the config-if command mode.

Table 173 "default sffd enable command parameters and variables" (page 393) describes the parameters and variables for the **default sffd enable** command.

Table 173
default sffd enable command parameters and variables

Parameters and variables	Description
port <portlist>	Specifies the port numbers to change the SFFD feature to the factory default of disabled. The portlist can be separated by commas or dashes. For example: 2/16, 3/16, or 2/26 - 2/27.

	Note: If you omit this parameter, the system uses the port number specified with the **`interface`** command.

Chapter 13
Configuring the switch using Device Manager

This chapter describes how you can use Device Manager to configure your switch.

This chapter contains the following topics:

Viewing Unit information

You can view unit information by using the Unit dialog box.

To open the Unit dialog box:

1. Select the unit by clicking in the Device View area of the switch.
2. From the Device Manager main menu, choose Edit > Unit.

The Unit dialog box (Figure 155 "Unit dialog box" (page 396)) opens with the unit tab displayed.

Figure 155
Unit dialog box

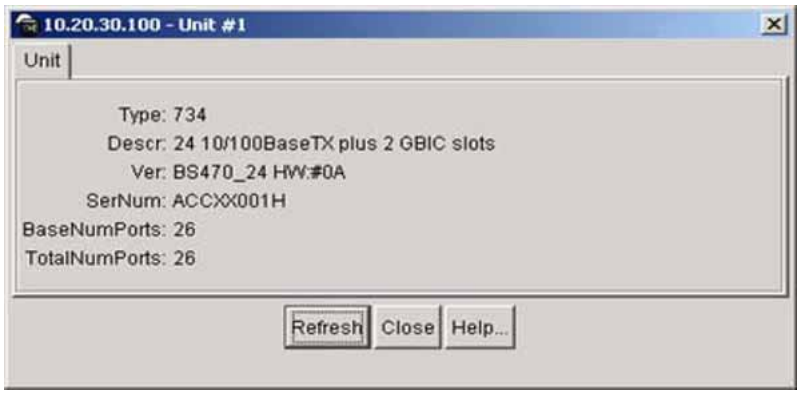


Table 174 "Unit tab items" (page 396) describes the Unit tab items.

Table 174
Unit tab items

Item	Description
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.

Unit dialog box for multiple units

When you select multiple units simultaneously, the Unit tab displays information about the switches you are using.

To open the Unit tab for multiple units:

1. Select the units you want to edit.

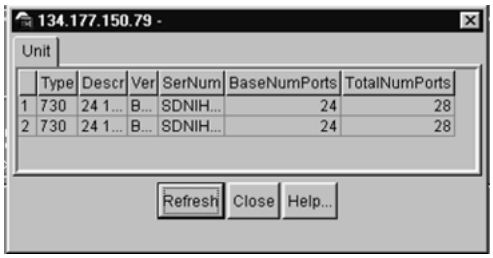
   Press [Ctrl] + left click the units you want to view. A yellow outline appears around the selected units.

2. Do one of the following:

   - From the shortcut menu, choose Edit.
   - From the Device Manager main menu, choose Edit > Unit.
   - Double-click on the selected units.
   - On the toolbar, click Edit.

The Unit dialog box appears with the Unit tab for multiple units displayed (Figure 156 "Edit Unit dialog box--Unit tab for multiple units" (page 397)).

Figure 156
Edit Unit dialog box--Unit tab for multiple units



Viewing switch IP information

You can view the switch IP information using the IP dialog box. This section describes the tabs available under the IP dialog box, and includes the following topics:

- "Globals tab" (page 397)
- "Addresses tab" (page 398)
- "ARP tab" (page 399)
- "Addresses tab" (page 398)
- "ARP tab" (page 399)

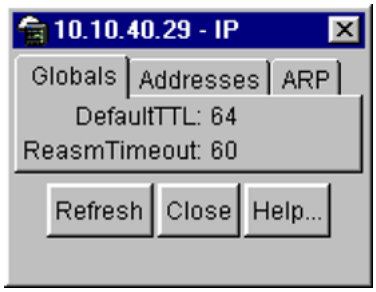
Globals tab

From the Device Manager main menu, choose Edit > IP, to open the Globals tab.

•

The IP dialog box appears (Figure 157 "Globals tab" (page 398)) with the Globals tab displayed.

Figure 157
Globals tab



Globals tab items

The following table describes the Globals tab items.

Table 175
Globals tab items

Item and MIB association	Description
DefaultTTL	Default value inserted into the Time to Live field of the IP header of datagrams originated at this entity, whenever a TTL value is not supplied by the transport layer protocol. Default value is 16.
ReasmTimeout	Maximum number of seconds that received fragments are held while they are awaiting reassembly at this entity. Default value is 5.

Addresses tab

The Addresses tab shows the IP address information for the device.

To open the Addresses tab:

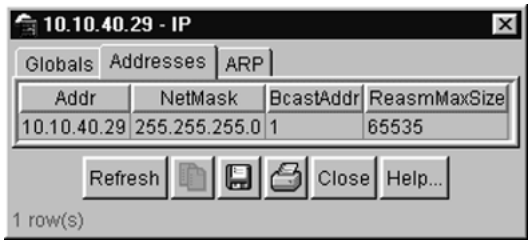
1. From the Device Manager main menu, choose Edit > IP.

   The IP dialog box appears with the Globals tab displayed Figure 157 "Globals tab" (page 398).

2. Click the Addresses tab.

   The Addresses tab appears (Figure 158 "Edit IP dialog box -- IP Address tab" (page 399)).

Figure 158
Edit IP dialog box -- IP Address tab



- "Addresses tab items" (page 399)

Addresses tab items

The following table Table 176 "IP Addresses tab items" (page 399) describes the IP Address tab items.

Table 176
IP Addresses tab items

Item	Description
Addr	The device IP address.
NetMask	The subnet mask address.
BcastAddr	The IP broadcast address used.
ReasmMaxSize	The size of the largest IP datagram that this entity can reassemble from incoming IP fragmented datagrams received on this interface.

ARP tab

The Address Resolution Protocol (ARP) tab shows the MAC addresses and the associated IP addresses for the switch.

To open the ARP tab:

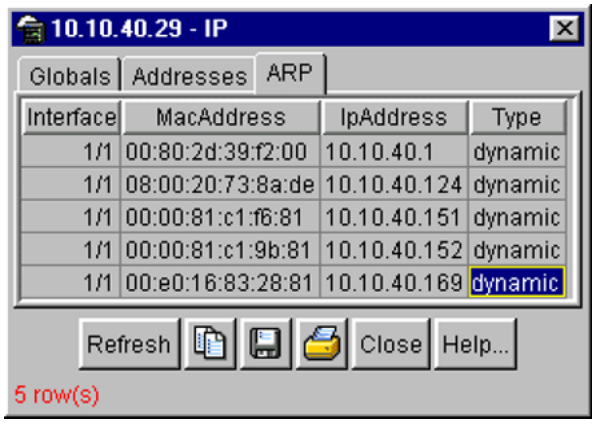
1. From the Device Manager main menu, choose Edit > IP.

   The IP dialog box appears with the Globals tab displayed (Figure 157 "Globals tab" (page 398)).

2. Click the ARP tab.

   The ARP tab appears (Figure 159 "Edit IP dialog box -- ARP tab" (page 400)).

Figure 159
Edit IP dialog box -- ARP tab



ARP tab items

The following table Table 177 "ARP tab items" (page 400) describes the ARP tab items.

Table 177
ARP tab items

Item	Description
Interface	The device unit number.
MacAddress	The unique hardware address of the device.
IpAddress	The Internet Protocol address of the device used to represent a point of attachment in a TCP/IP internetwork.
Type	The type of mapping.

Editing the chassis configuration

You can edit a chassis configuration from the Edit Chassis dialog box ().

To open the Chassis dialog box:

1. Select the chassis.
2. Do *one* of the following:
   - From the shortcut menu, choose Edit.
   - From the Device Manager main menu, choose Edit > Chassis.
   - On the toolbar, click Edit.

The following sections provide a description of the tabs in the Edit > Chassis dialog box and details about each item on the tab:

System tab

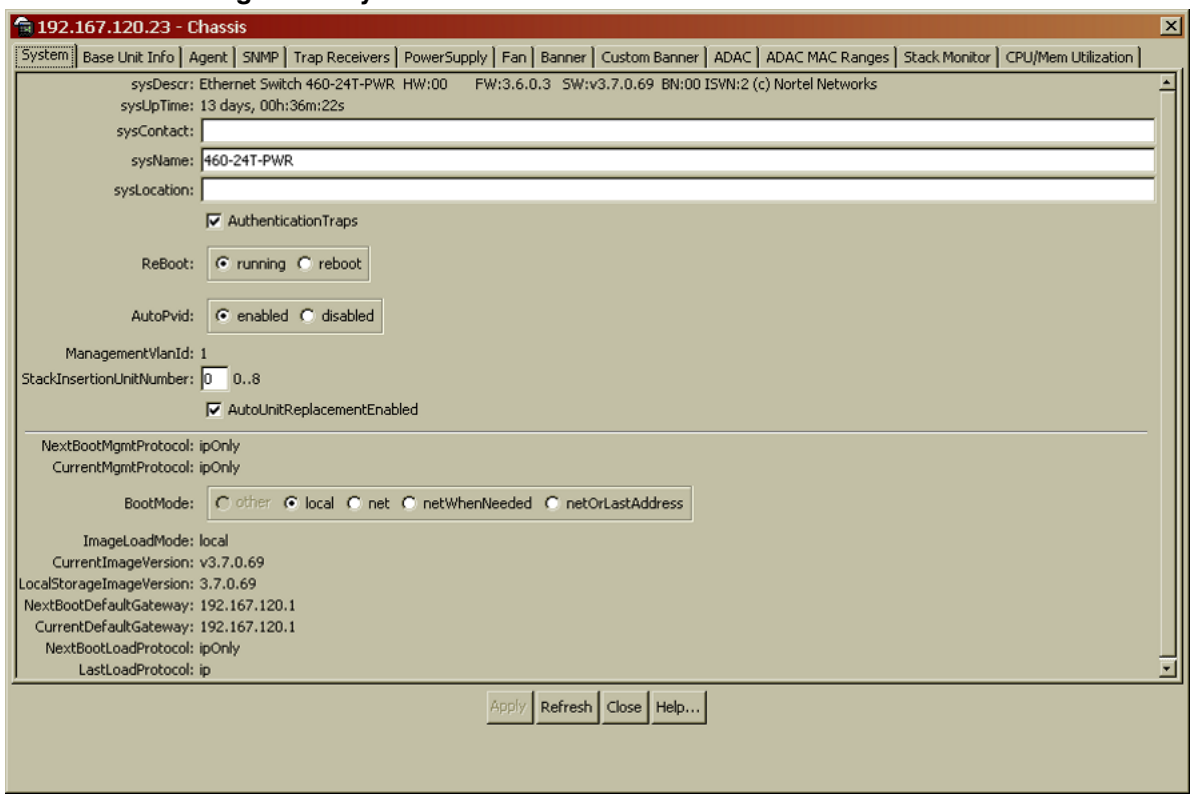
Use the System tab to specify, among other things, tracking information for a device and device descriptions.

To open the System tab:

1. Select the chassis.
2. From the shortcut menu, choose Edit > Chassis.

   The Chassis dialog box appears with the System tab displayed ().

Figure 160
Edit Chassis dialog box -- System tab



Note: The chassis keeps track of the elapsed time and calculates the time and date using the system clock of the Device Manager machine as a reference.

System tab items

The following table Table 178 "System tab items" (page 402) describes the System tab items.

Table 178
System tab items

Item	Description
sysDescr	A description of the device.
sysUpTime	The time since the system was last booted.
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.

Item	Description
AuthenticationTraps	Click 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. 
Reboot	Action object to reboot the agent. Reset -- initiates a hardware reset. The agent does best efforts 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.
AutoPvid	Click enabled or disabled. When you select enabled, Port VLAN ID (PVID) is automatically assigned.
ManagementVlanId	The current management VLAN ID.
StackInsertionUnitNumber	The unit number assigned to the switch when it is inserted into a stack.
AutoUnitReplacementEnabled	Enables or disables the auto unit replacement feature. (See "Auto unit replacement" (page 260).)
StackInsertionNumber	Number of switches used to form the stack.
NextBootMgmtProtocol	The transport protocol(s) to use after the next boot of the agent.
CurrentMgmtProtocol	The current transport protocol(s) that the agent supports.
BootMode	The source from which to load the initial protocol configuration information to boot the switch the next time: • local (from the switch) • net (use BootP over the network) • netWhenNeeded (use BootP only when needed) • netOrLastAddress (use BootP or the last known address)

Item	Description
ImageLoadMode	The source from which to load the agent image at the next boot.
CurrentImageVersion	The version number of the agent image that is currently used on the switch.
LocalStorageImageVersion	The version number of the agent image that is stored in flash memory on the switch.
NextBootDefaultGateway	The IP address of the default gateway for the agent to use after the next time the switch is booted.
CurrentDefaultGateway	The IP address of the default gateway that is currently in use.
NextBootLoadProtocol	The transport protocol to be used by the agent to load the configuration information and the image at the next boot.
LastLoadProtocol	The transport protocol last used to load the image and configuration information about the switch.

Base Unit Info tab

The Base Unit Info tab provides read-only information about the operating status of the hardware. You can enable or reset the switch and enter information about the switch's location.

To open the Base Unit Info tab:

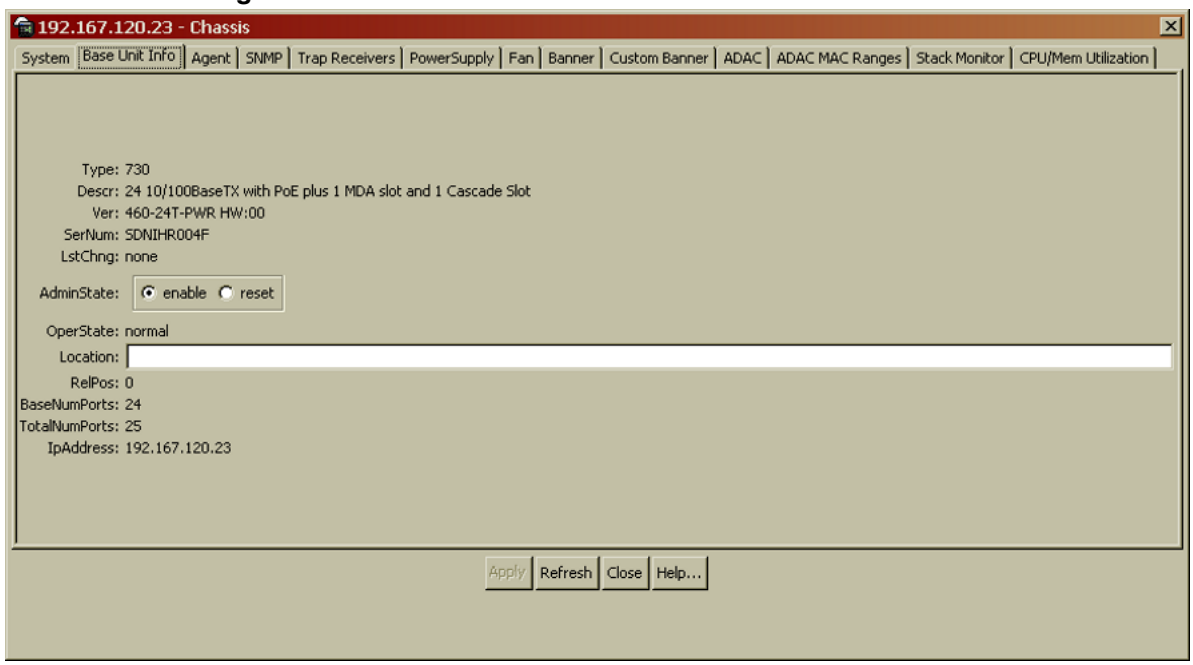
1. Select the chassis.
2. From the shortcut menu, choose Edit > Chassis.

   The Chassis dialog box appears with the System tab displayed ().
3. Click the Base Unit Info tab.

   The Base Unit Info tab appears ().

   Note: In a stack environment, if the base unit number does not begin with the number one, the information does not display. Use the Console Interface and the Web-based management interface to change your base unit number.

Figure 161
Edit Chassis dialog box -- Base Unit Info tab



Base unit information tab items

The following table Table 179 "Base Unit Info tab items" (page 405) describes the Base Unit Info tab items.

Table 179
Base Unit Info tab items

Item	Description
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.

Item	Description
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.
IpAddress	The base unit IP address.

Stack Info tab

Like the Base Unit Info tab, the Stack Info tab provides read-only information about the operating status of the *stacked* switches. You can enable or disable the switch, and enter information about the switch location. This tab is enabled for a stack of switches.

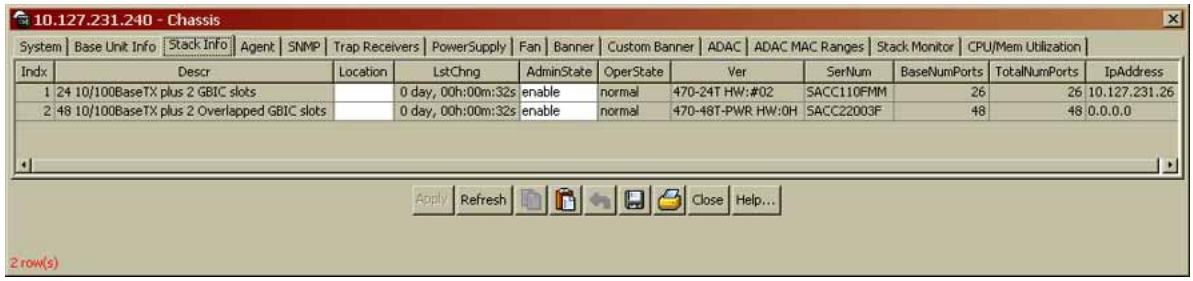
To open the Stack Info tab:

1. Select the chassis.
2. From the shortcut menu, choose Edit > Chassis.

   The Chassis dialog box appears with the System tab displayed ().
3. Click the Stack Info tab.

   The Stack Info tab appears ().

Figure 162
Edit Chassis dialog box -- Stack Info tab



Stack Info tab fields

The following table Table 180 "Stack Info tab fields" (page 406) describes the Stack Info tab fields.

Table 180
Stack Info tab fields

Field	Description
Descr	A description of the component or subcomponent. If not available, the value is a zero length string.

Field	Description
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 object 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. 2. If this object 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 has not occurred since the cold/warm start of the agent, 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: 1. disable--disables operation 2. enable--enables operation 3. reset--resets component 4. test--starts self test of component, with the result to be normal, warning, nonFatalErr, or fatalErr in object s5ChasComOperState The allowable (and meaningful) values are determined by the component type.

Field	Description
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.
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.

Agent tab

The Agent tab provides information about the addresses that the agent software uses to identify the switch.

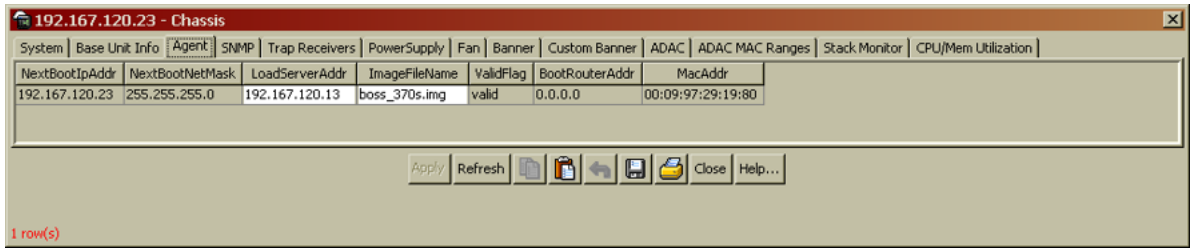
To open the Agent tab:

1. Select the chassis.
2. From the shortcut menu, choose Edit > Chassis.

   The Chassis dialog box appears () with the System tab displayed.
3. Click the Agent tab.

   The Agent tab appears ().

Figure 163
Edit Chassis dialog box -- Agent tab



Agent tab fields

The following table Table 181 "Agent tab fields" (page 409) describes the Agent tab fields.

Table 181
Agent tab fields

Item	Description
NextBootpAddr	The IP address of the BootP server to be used the next time the switch is booted. This is a read-only field.
NextBootNetMask	The subnet mask to be used the next time the switch is booted; read. This is a read-only field
LoadServerAddr	The IP address of the server, from which the device loads the image file.
ImageFileName	The name of the image file.
ValidFlag	Indicates if the configuration and/or image file(s) were downloaded from this interface and if the file names have not been changed. This is a read-only field
BootRouterAddr	The IP address of the boot router for the configuration file and/or the image file. This is a read-only field
MacAddr	The switch's MAC address. This is a read-only field

Power Supply tab

The Power Supply tab provides read-only information about the operating status of the power supplies to the switch. See "Editing and viewing switch PoE configurations using Device Manager" (page 297) for more information about the Power over Ethernet (PoE) external DC power source.

To open the PowerSupply tab:

Step	Action
1	Select the chassis.
2	From the shortcut menu, choose Edit > Chassis.

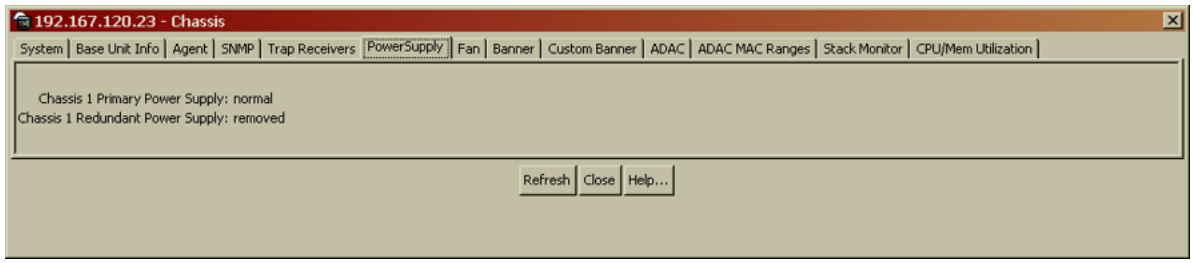
The Chassis dialog box appears () with the System tab displayed.

3 Click the PowerSupply tab.

The PowerSupply tab appears .

—End—

Figure 164
Edit Chassis dialog box -- Power Supply tab



- "Power supply tab fields" (page 410)

Power supply tab fields

Table 182 "Power Supply tab fields" (page 410) describes the Power Supply tab fields.

Table 182
Power Supply tab fields

Field	Description
Desc	The power supply type: • Primary Power Supply--This is the internal power source for the switch. • Redundant Power Supply--This is the external power source, or DC source, for the switch. (See"DC Source tab for a single unit" (page 301) for more information about the external power source.)
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.

Field	Description
	• 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.

- "System tab" (page 401)
- "Base Unit Info tab" (page 404)
- "Stack Info tab" (page 406)
- "Agent tab" (page 408)
- "Fan tab" (page 411)
- "Configuring banner control" (page 413)
- "Custom Banner tab" (page 413)

Fan tab

The Fan tab provides read-only information about the operating status of the switch fans.

To open the Fan tab:

Step	Action
1	From the menu bar, choose Edit > Chassis. The Chassis dialog box appears () with the System tab displayed.
2	Click the Fan tab. The Fan tab appears ().

—End—

Figure 165
Edit Chassis dialog box -- Fan tab

- "Fan tab fields" (page 412)

Fan tab fields

Table 183 "Fan tab fields" (page 412) describes the Fan tab fields.

Table 183
Fan tab fields

Field	Description
Desc	The fan type.
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. • 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 must be configured. The allowable values are determined by the component type.

- "System tab" (page 401)
- "Base Unit Info tab" (page 404)
- "Agent tab" (page 408)

- "Power Supply tab" (page 409)

Configuring banner control

The Banner tab in Device Manager controls the CLI banner display for the Nortel Ethernet Switch 460/470.

Perform the steps in this procedure to configure the banner control.

Step	Action
1	From the Device Manager main menu, select **Edit > Chassis** .
2	Select the **Banner** tab; see Figure 166 "Edit Chassis -- Banner tab" (page 413).

Figure 166
Edit Chassis -- Banner tab

—End—

Table 184 "Banner tab items" (page 413) describes the Banner tab items.

Table 184
Banner tab items

Field	Description
BannerControl	Specifies the banner to display as soon as you connect to a Nortel Ethernet Switch 460/470 Series device. BannerControl has the following three options: • Static: this option displays the predefined static banner. • Custom: this option displays the previously set custom banner . • Disabled: this option prevents the display of any banners.

Custom Banner tab

The Custom Banner tab in Device Manager customizes the CLI banner display for the Nortel Ethernet Switch 460/470.

Perform the steps in this procedure to customize the banner display.

Step	Action
1	From the Device Manager main menu, select **Edit > Chassis** .
2	Select the **Custom Banner** tab; see Figure 167 "Edit Chassis -- Custom Banner tab" (page 414).

Figure 167
Edit Chassis -- Custom Banner tab

—End—

Table 185 "Custom Banner tab fields" (page 414) describes the Custom Banner tab fields.

Table 185
Custom Banner tab fields

Field	Description
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 1 line of a 15-line banner. If the line contains nonprintable ASCII characters, the line is rejected and an error message is returned.

Stack Monitor tab

Perform the steps in this procedure to open the Stack Monitor tab.

Step	Action
1	Select the chassis.

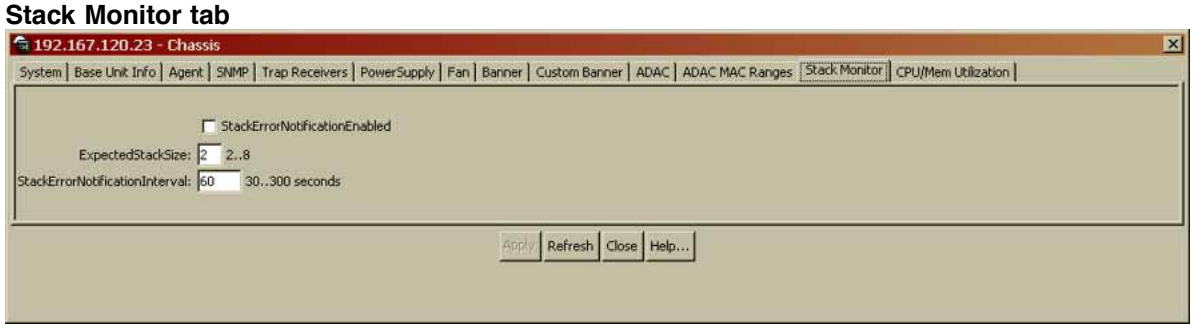
2 From the shortcut menu, select **Edit > Chassis** .

The Chassis dialog box appears with the System tab displayed.

3 Click the **Stack Monitor** tab.

The Stack Monitor tab appears. See Figure 168 "Stack Monitor tab" (page 415).

Figure 168
Stack Monitor tab



—End—

Table 186 "Stack Monitor tab fields" (page 415) describes the Stack Monitor tab fields.

Table 186
Stack Monitor tab fields

Field	Description
StackErrorNotificationEnabled	Enables or disables the Stack Monitoring feature.
ExpectedStackSize	Sets the size of the stack to monitor. Valid range is 2 to 8.
StackErrorNotificationInterval	Sets the interval between traps, in seconds. Valid range is 30 to 300.

Configuring LLDP using Device Manager

"Viewing and configuring LLDP global and transmit properties" (page 415) contains instructions for configuring and viewing LLDP information using Device Manager:

Viewing and configuring LLDP global and transmit properties

Use the following tabs to configure and view 802.1AB global and transmit properties for local and neighbor systems:

- "Globals tab" (page 416)

Globals tab

With the Globals tab, you can configure 802.1AB transmit properties and view remote table statistics.

Use the following procedure to open the Globals tab:

Step	Action
1	From the **Device Manager** menu bar, select **Edit > Diagnostics > 802.1AB/LLDP** . The LLDP dialog box appears with the Globals tab displayed. See Figure 169 "LLDP Globals tab" (page 416).

Figure 169
LLDP Globals tab

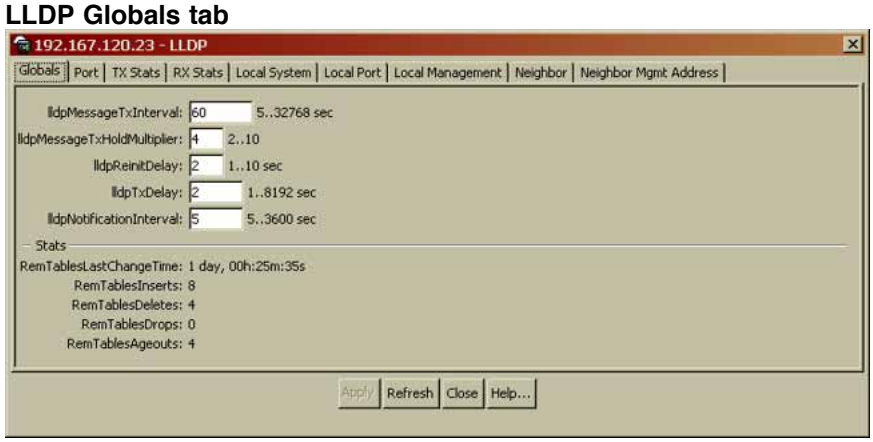


Table 187 "LLDP Globals tab fields" (page 417) describes the Globals tab fields.

Table 187
LLDP Globals tab fields

Field	Description
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.
lldpTxDelay	The lldpTxDelay indicates the delay (in seconds) between successive LLDP frame transmissions initiated by value or status changes in the MIB of local LLDP systems . 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

Field	Description
	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 lldpStatsRemTablesDrops counter is incremented once.

Field	Description
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 cannot 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 the deletion case, is not allowed, and thus, does not change the value of this counter.

—End—

- "System tab" (page 401)
- "Base Unit Info tab" (page 404)
- "Agent tab" (page 408)
- "Power Supply tab" (page 409)

Opening the port tab

With the Port tab, you can set the optional TLVs to include in the LLPDUs transmitted by each port.

Use the following procedure to open the Port tab:

Step	Action
1	From the **Device Manager** menu bar, select **Edit > Diagnostics > 802.1AB/LLDP** . The LLDP dialog box appears with the Globals tab displayed. See Figure 169 "LLDP Globals tab" (page 416).
2	Click the **Port** tab. The **Port** tab appears, as shown in Figure 170 "LLDP Port tab" (page 420) .

Figure 170
LLDP Port tab

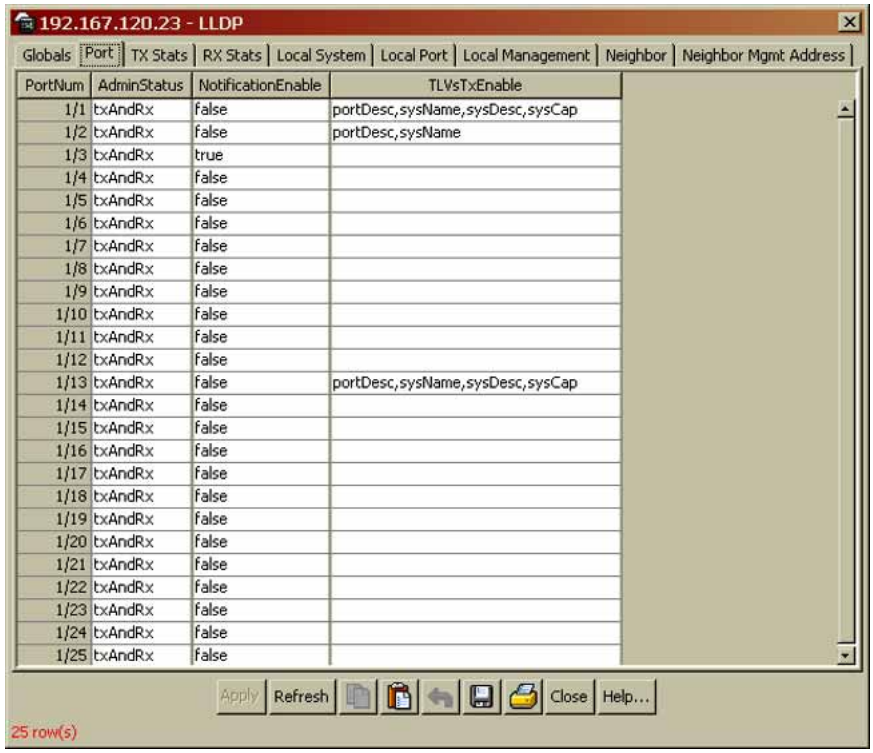


Table 188 "LLDP Port tab fields" (page 420) describes the Port tab fields.

Table 188
LLDP Port tab fields

Field	Description
PortNum	Port number.

Field	Description
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 system information, which is stored in other tables before AdminStatus is disabled, the information ages out.
NotificationEnable	Controls, on a per-port basis, 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.

—End—

TX Stats tab

With the TX Stats tab, you can view LLDP transmit statistics by port.

Use the following procedure to open the TX Stats tab:

Step	Action
1	From the **Device Manager** menu bar, select **Edit > Diagnostics > 802.1AB/LLDP** . The LLDP dialog box appears with the Globals tab displayed. See Figure 169 "LLDP Globals tab" (page 416).
2	Click the **TX Stats** tab. The **TX Stats** tab appears. See Figure 171 "TX Stats tab" (page 422).

Figure 171
TX Stats tab

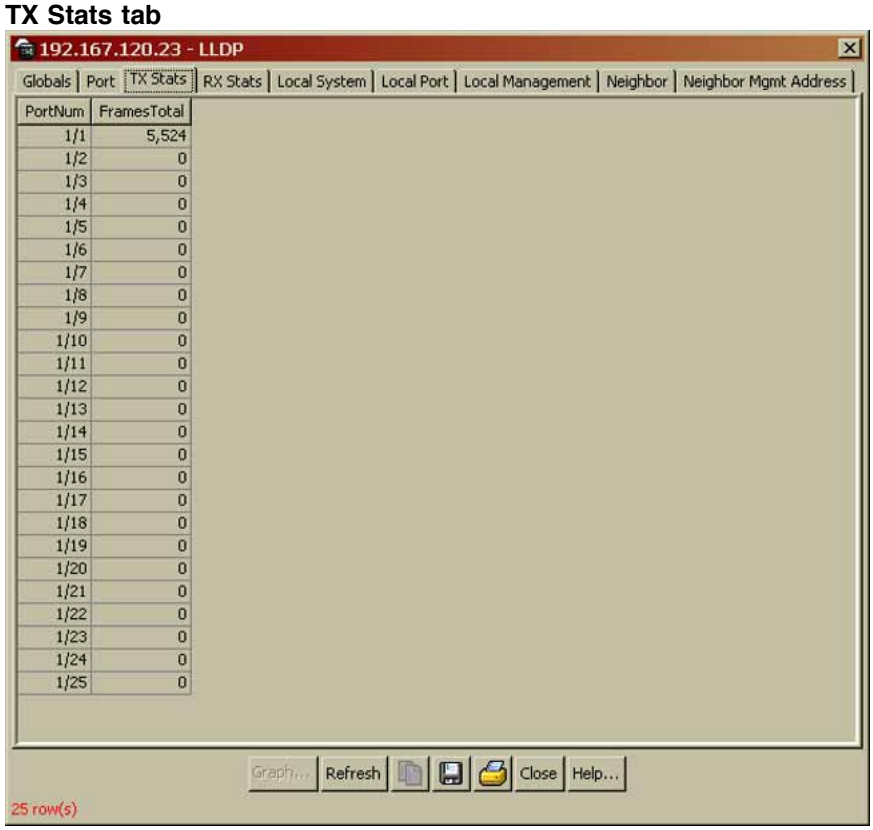


Table 189 "TX Stats tab fields" (page 423) describes the TX Stats tab fields.

Table 189
TX Stats tab fields

Field	Description
PortNum	Port number.
FramesTotal	The number of LLDP frames transmitted by this LLDP agent on the indicated port.

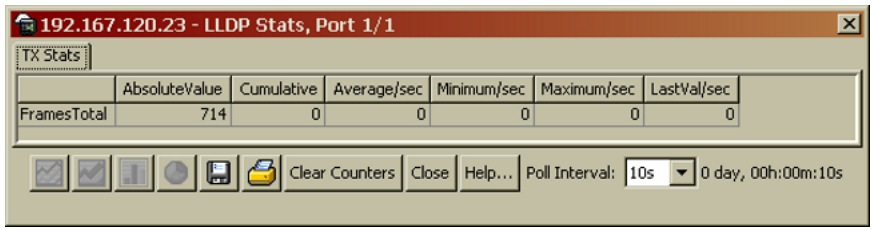
—End—

Graphing LLDP transmit statistics

Use the following procedure to graph LLDP transmit statistics:

Step	Action
1	From the **TX Stats** tab, select a port. See Figure 171 "TX Stats tab" (page 422).
2	Click **Graph**. The Figure 172 "TX Stats - Graph dialog box" (page 423) appears.
3	Select a data column to graph.
4	Click one of the graph buttons.

Figure 172
TX Stats - Graph dialog box



—End—

RX Stats tab

With the RX Stats tab, you can view LLDP receive statistics by port.

Use the following procedure to open the RX Stats tab:

Step	Action

1 From the **Device Manager** menu bar, select **Edit > Diagnostics > 802.1AB/LLDP**.

The LLDP dialog box appears with the Globals tab displayed. See Figure 169 "LLDP Globals tab" (page 416).

2 Click the **RX Stats** tab.

The **RX Stats** appears. See Figure 173 "RX Stats tab" (page 424).

Figure 173
RX Stats tab

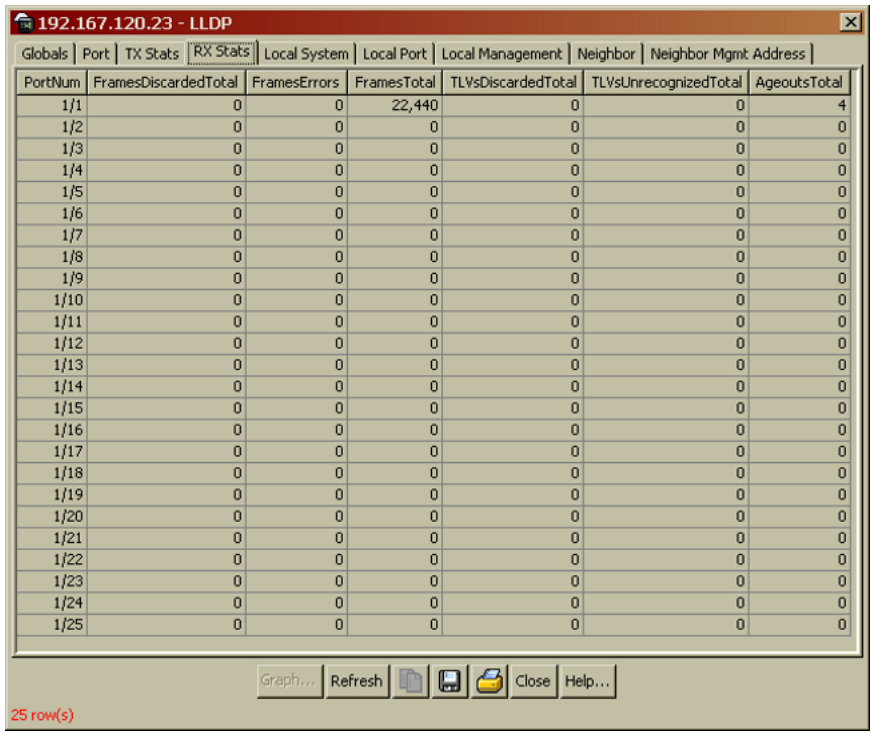


Table 190 "RX Stats tab fields" (page 424) describes the RX Stats tab fields.

Table 190
RX Stats tab fields

Field	Description
PortNum	Port number.

Field	Description
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.
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 a 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 per-port basis. This enables NMS to poll tables associated with the lldpRemoteSystemsData objects and all LLDP extension objects

Field	Description
	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.

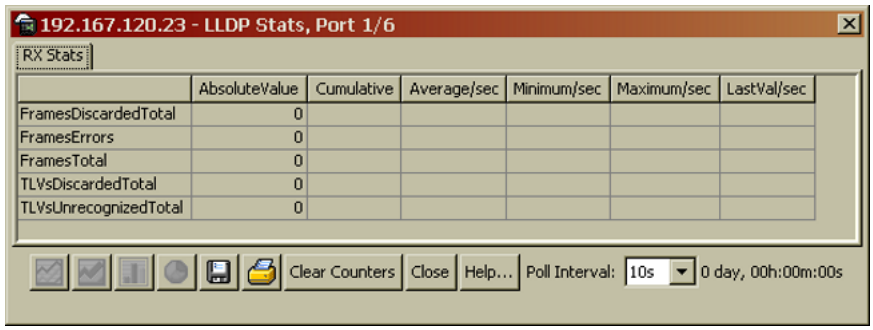
—End—

Graphing LLDP receive statistics

Use the following procedure to graph LLDP receive statistics:

Step	Action
1	From the **RX Stats** tab, select a port . See Figure 173 "RX Stats tab" (page 424).
2	Click **Graph**. The **RX Stats tab - graph dialog box** appears. See Figure 174 "RX Stats tab - graph dialog box" (page 426).

Figure 174
RX Stats tab - graph dialog box



3 Select a data column to graph.

4 Click one of the graph buttons.

—End—

Local System tab

With the Local System tab, you can view LLDP properties for the local system.

Use the following procedure to open the Local System tab:

Step	Action
1	From the **Device Manager** menu bar, select **Edit > Diagnostics > 802.1AB/LLDP**. The LLDP dialog box appears with the Globals tab displayed. See Figure 169 "LLDP Globals tab" (page 416)
2	Select **Local System**. The **Local System** tab appears. See Figure 175 "Local System tab" (page 427).

Figure 175
Local System tab

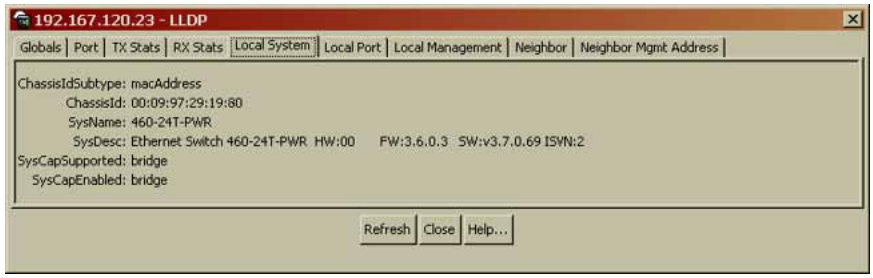


Table 191 "Local System tab fields" (page 428) describes the Local System tab fields.

Table 191
Local System tab fields

Field	Description
ChassisIdSubtype	The type of encoding used to identify the local system chassis: • chassisComponent • interfaceAlias • portComponent • macAddress • networkAddress • interfaceName • local
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.

—End—

Local Port tab

With the Local Port tab, you can view LLDP port properties for the local system.

Use the following procedure to open the Local Port tab:

Step	Action
1	From the **Device Manager** menu bar, select **Edit > Diagnostics > 802.1AB/LLDP**. The LLDP dialog box appears with the Globals tab displayed. See Figure 169 "LLDP Globals tab" (page 416).
2	Click the **Local Port** tab.

The **Local Port** tab appears. See Figure 176 "Local Port tab" (page 429).

Figure 176
Local Port tab

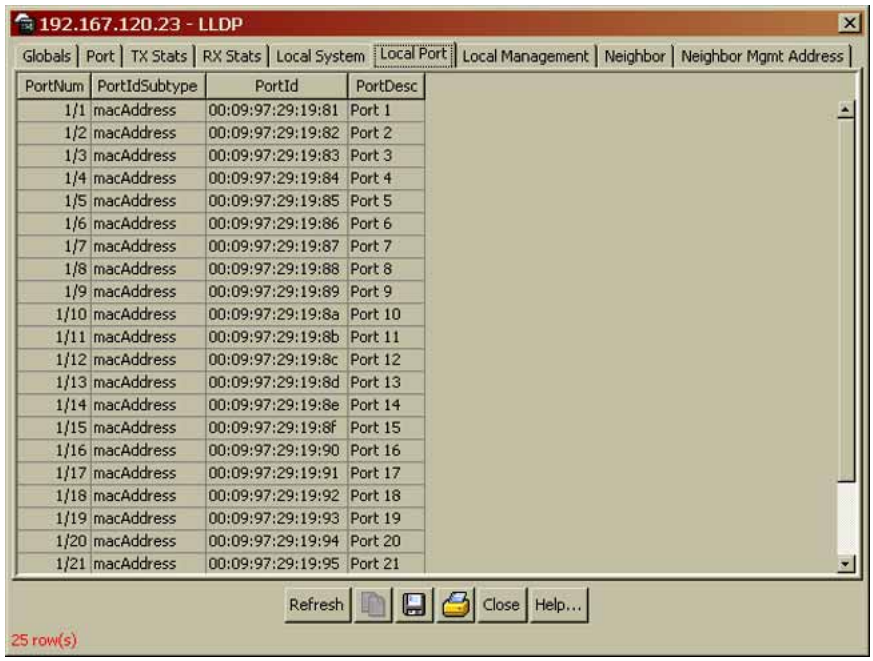


Table 192 "Local Port tab fields" (page 429) describes the Local Port tab fields.

Table 192
Local Port tab fields

Field	Description
PortNum	Port number.
PortIdSubtype	The type of port identifier encoding used in the associated PortId object. • interfaceAlias • portComponent • macAddress • networkAddress • interfaceName • agentCircuitId • local.

Field	Description
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.

—End—

Local Management tab

With the Local Management tab, you can view LLDP management properties for the local system.

Use the following procedure to open the Local Management tab:

Step	Action
1	From the **Device Manager** menu bar, select **Edit > Diagnostics > 802.1AB/LLDP**. The LLDP dialog box appears with the Globals tab displayed. See Figure 169 "LLDP Globals tab" (page 416).
2	Click the **Local Management** tab. The **Local Management** tab appears. See Figure 177 "Local Management tab" (page 430).

Figure 177
Local Management tab

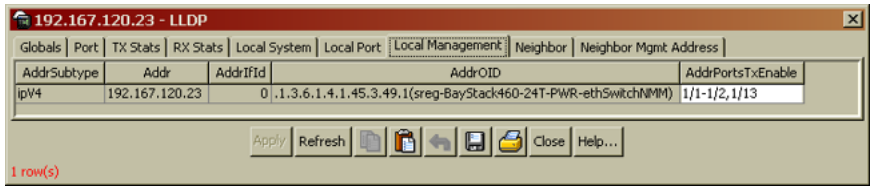


Table 193 "Local Management tab fields" (page 431) describes the Local Management tab fields.

Table 193
Local Management tab fields

Field	Description
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.
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.

—End—

Neighbor tab

With the Neighbor tab, you can view LLDP properties for the remote system.

Use the following procedure to open the Neighbor tab:

Step	Action
1	From the **Device Manager** menu bar, select **Edit > Diagnostics > 802.1AB/LLDP**. The LLDP dialog box appears with the Globals tab displayed. See Figure 169 "LLDP Globals tab" (page 416).
2	Click the **Neighbor** tab. The **Neighbor** tab appears. See Figure 178 "Neighbor tab" (page 432).

Figure 178
Neighbor tab

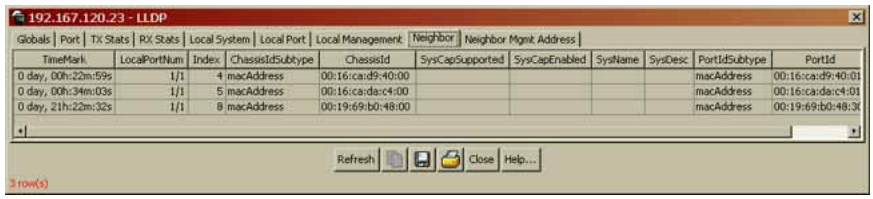


Table 194 "Neighbor tab fields" (page 432) describes the Neighbor tab fields.

Table 194
Neighbor tab fields

Field	Description
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.

Field	Description
SysCapEnabled	Identifies the system capabilities that are enabled on the remote system.
SysName	Remote system name.
SysDesc	Remote system description.
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.

—End—

Neighbor Mgmt Address tab

With the Neighbor Mgmt Address tab, you can view LLDP management properties for the remote system.

Use the following procedure to open the Neighbor Mgmt Address tab:

Step	Action
1	From the **Device Manager** menu bar, select **Edit > Diagnostics > 802.1AB/LLDP**. The LLDP dialog box appears with the Globals tab displayed. See Figure 169 "LLDP Globals tab" (page 416).
2	Click the **Neighbor Mgmt Address** tab. The Figure 179 "Neighbor Mgmt Address tab" (page 434) appears.

Figure 179
Neighbor Mgmt Address tab

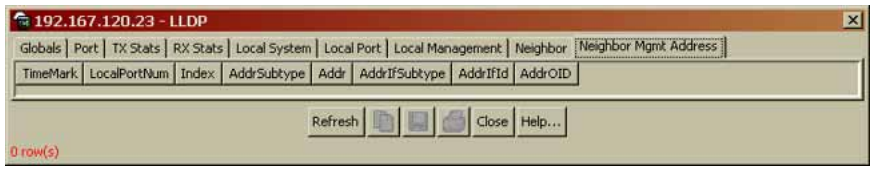


Table 195 "Neighbor Mgmt Address tab fields" (page 434) describes the Neighbor Mgmt Address tab fields.

Table 195
Neighbor Mgmt Address tab fields

Field	Description
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.
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

Field	Description
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.

—End—

Working with configuration files

Use the FileSystem dialog box to view information and upload or download the configuration and image files.

The following sections describe how to use the:

- "FileSystem dialog box" (page 435)
- "ASCII Config File dialog box" (page 437)

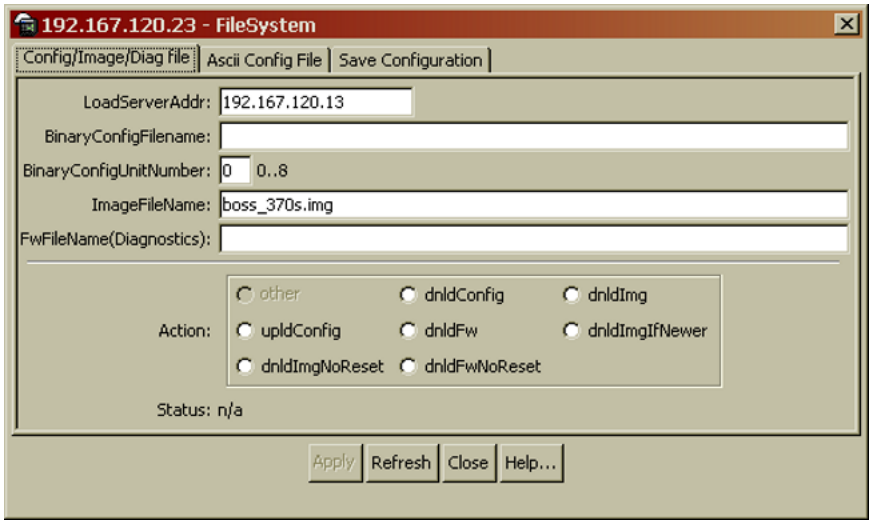
FileSystem dialog box

From the Device Manager main menu, choose Edit > File System, to open the Edit FileSystem dialog box.

The FileSystem dialog box appears with the Config/Image/Diag file tab displayed (Figure 180 "Edit FileSystem dialog box--Config/Image/Diag file tab" (page 436)).

Update only one item at a time. Click Apply after each change.

Figure 180
Edit FileSystem dialog box--Config/Image/Diag file tab



- "FileSystem dialog box items" (page 436)

FileSystem dialog box items

Table 196 "FileSystem dialog box items" (page 436) describes the FileSystem dialog box items.

Table 196
FileSystem dialog box items

Item	Description
LoadServerAddr	The IP address of the load server for the configuration file and/or the image file. If not used, the value is 0.0.0.0.
ConfigFileName	Name of the configuration file currently associated with the interface. When not used, the value is a zero length string.
BinaryConfigUnitNumber	This field specifies the unit number in the Binary Configuration file from where information is extracted and used to configure the stand-alone unit. The extraction of the Binary Configuration file information is required when the switch is operating in a stand-alone mode and the Binary Configuration file was created in a stack mode.
ImageFileName	Name of the image file(s) currently associated with the interface. When the object is not used, the value is a zero length string.

Item	Description
FwFileName(Diag)	Name of the diagnostics file currently associated with the interface. When the object is not used, the value is a zero length string.
Action	Select whether to download or upload a binary config file, image file, or diagnostics file, download the image only if it is newer than the image stored on local NV storage, or download without resetting. In read operation, if there is no action taken since the boot up, it returns with a value of other. Otherwise, it returns the latest action, such as: • other • dnldConfig • dnldImg • upldConfig • dnldFw • dnldImgIfNewer • dnldImgNoReset • dnldFwNoReset The config file contains the current MIB object values of the device.
Status	This object is used to get the status of the latest action as shown by s5AgInfoFileAction. The values that can be read are: • other -- if no action taken since the boot up • inProgress -- the operation is in progress • success -- the operation succeeds. • fail -- the operation failed.

"ASCII Config File dialog box" (page 437)

ASCII Config File dialog box

To select the ASCII config file download options:

Step	Action
1	From the Device Manager menu bar, choose Edit > File System.

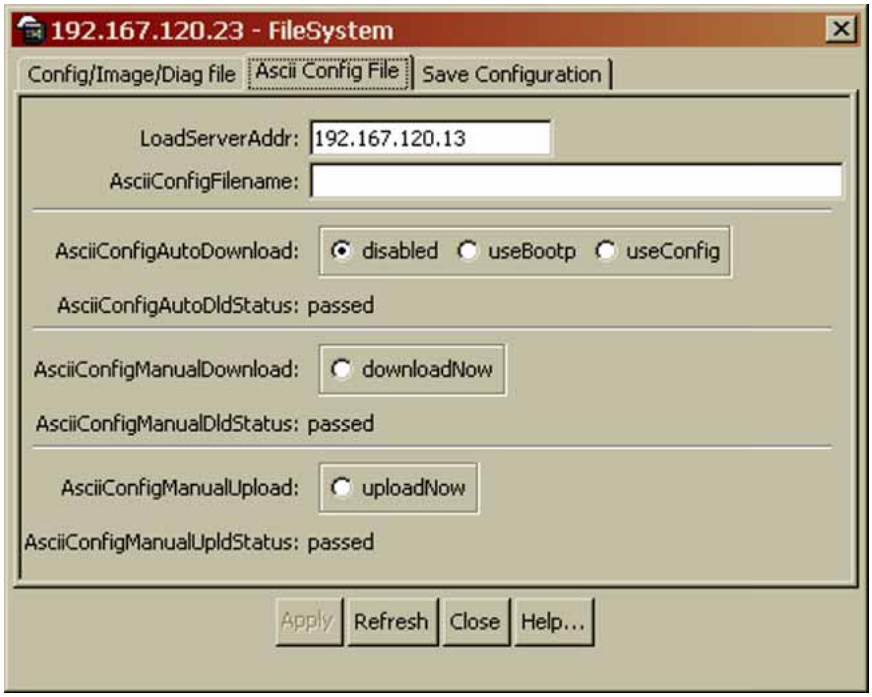
The FileSystem dialog box appears with the Config/Image/Diag file tab displayed.

2 Click the Ascii Config File tab.

The Ascii Config File tab appears (Figure 181 "Edit File System dialog box--Ascii Config File tab" (page 438)).

—End—

Figure 181
Edit File System dialog box--Ascii Config File tab



- "Ascii Config File tab fields" (page 438)

Ascii Config File tab fields

The following table Table 197 "Ascii Config File tab fields" (page 438) describes the Ascii Config File tab fields.

Table 197
Ascii Config File tab fields

Field	Description
LoadServerAddr	Set the server address.
AsciiConfigFilename	Set the ASCII config filename.

Field	Description
AsciiConfigAutoDownload	The current ASCII config file download setting, which can be one of the following: • disabled • useBootp • useConfig If set to disabled, the device does not automatically download the ASCII config file.
AsciiConfigAutoDldStatus	Displays the status of the automatic ASCII config file download. The values that can be read are: • passed--successfully downloaded. • inProgress -- the operation is in progress • fail -- the operation failed.
AsciiConfigManualDownload	Download the ASCII configuration file immediately.
AsciiConfigManualDownloadStatus	Displays the progress of the immediate downloading of the ASCII configuration file: • passed • InProgress • failed
AsciiConfigManualUpload	Upload the ASCII configuration file immediately.
AsciiConfigManualUploadStatus	Displays the progress of the immediate uploading of the ASCII configuration file: • passed • InProgress • failed

- "Editing the chassis configuration" (page 400)

Saving configuration files using Device Manager

This section describes how to save configuration files on the Nortel Ethernet Switch 460/470 series, using Device Manager.

You can use the following methods to save configuration files:

- "Autosaving switch configuration files using Device Manager" (page 440)
- "Saving the current configuration file manually using Device Manager" (page 441)

Autosaving switch configuration files using Device Manager

Perform the steps in this procedure to configure the switch to automatically save configuration files using Device Manager.

Step	Action
1	From the **JDM** menu, select **Edit > File System**. The FileSystem dialog box appears with the Config/Image/Diag file tab displayed.
2	Click the **Save Configuration** tab. See Figure 182 "Save Configuration tab" (page 440).

Figure 182
Save Configuration tab

3	Select the **AutosaveToNvramEnabled** check box.
4	Click **Apply**.

—End—

Saving the current configuration file manually using Device Manager

Perform the steps in this procedure to manually save the current configuration file using Device Manager.

Step	Action
1	From the **JDM** menu, select **Edit > File System**. The FileSystem dialog box appears with the Config/Image/Diag file tab displayed.
2	Click the **Save Configuration tab**. See Figure 182 "Save Configuration tab" (page 440).
3	In the Action field, select **copyConfigToNvramIn**.
4	Click **Apply**.
5	Click **Refresh**.
6	Check the **Status** field to confirm that the configuration file is saved successfully.

—End—

Table 198 "Save configuration tab fields" (page 441) describes the Save configuration tab fields.

Table 198
Save configuration tab fields

Fields	Description
AutosaveToNvramEnabled	Automatically saves the switch configuration file to NVRAM at specific intervals.
copyConfigToNvramIn	Saves the current switch configuration file to NVRAM when selected.
Status	Indicates that the switch configuration file is successfully saved to NVRAM.

Working with SNTP

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.

The system retries connecting with the NTP server a maximum of 3 times, with 5 minutes between each retry. If the connection fails after the 3 attempts, the system waits for the next synchronization time (the default is 24 hours) and begins the process again.

Using SNTP provides a real-time timestamp for the software, shown as Greenwich Mean Time (GMT). If SNTP is enabled (the default value is disabled), the system synchronizes with the configured NTP server at boot-up and at user-configurable periods thereafter (the default sync 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.

SNTP

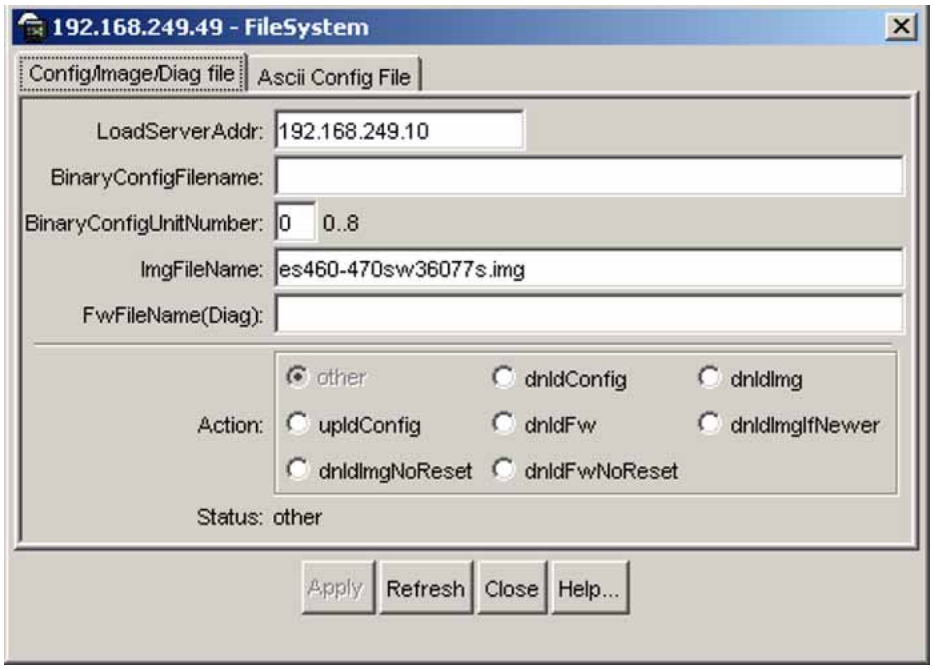
The SNTP dialog box contains the parameters for Simple Network Time Protocol (SNTP).

To open the SNTP dialog box:

- From the Main Menu, choose Edit > SNTP.

The SNTP dialog box appears (Figure 183 "Simple Network Time Protocol dialog box" (page 442)).

Figure 183
Simple Network Time Protocol dialog box



- "SNTP tab fields" (page 443)

SNTP tab fields

Table 199 "SNTP dialog box fields" (page 443) describes the SNTP tab fields.

Table 199
SNTP dialog box fields

Field	Description
PrimaryServer Address	The IP address of the primary SNTP server.
SecondaryServer Address	The IP address of the secondary SNTP server.
State	Controls whether the device uses the Simple Network Time Protocol (SNTP), to synchronize the device clock to the Coordinated Universal Time (UTC). 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 that the device attempts to synchronize with the NTP servers
ManualSynchRequest	Specifies that the device immediately attempts to synchronize with the NTP servers.
LastSynchTime	Specifies the Coordinated Universal Time (UTC) when the device last synchronized with an NTP server.
LastSynchSource	Specifies the IP source address of the NTP server, with which this device last synchronized.
NextSynchTime	Specifies the Coordinated Universal Time (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 current Coordinated Universal Time (UTC) of the switch.

Viewing topology information using Device Manager

This section describes diagnostic information available in Device Manager on the following tabs:

- "Topology tab" (page 444)
- "Topology Table tab" (page 445)

See also

- "Topology tab" (page 444)
- "Topology Table tab" (page 445)

Topology tab

To view topology information:

- From the Device Manager menu bar, select Edit > Diagnostics > Topology.

  The Topology dialog box appears with the Topology tab displayed. See .

Figure 184
Topology dialog box -- Topology tab

- "Topology tab items" (page 445)

Topology tab items

Table 200 "Topology tab items" (page 445) describes the Topology tab items.

Table 200
Topology tab items

Items	Description
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, the value is zero.
NmmMaxNum	The maximum number of entries in the NMM topology table.
NmmCurNum	The current number of entries in the NMM topology table.

"Topology Table tab" (page 445)

Topology Table tab

To view more topology information:

Step	Action
1	From the Device Manager menu bar, choose Edit > Diagnostics > Topology. The Topology dialog box appears with the Topology tab displayed.
2	Click the Topology Table tab. The Topology Table tab appears. See Figure 185 "Topology dialog box -- Topology Table tab" (page 446).

—End—

Figure 185
Topology dialog box -- Topology Table tab

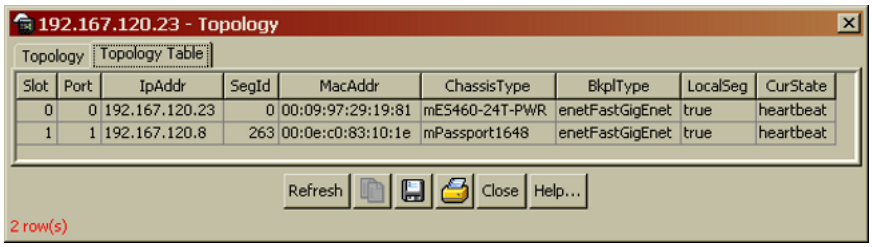


Table 201 "Topology Table tab fields" (page 446) describes the Topology Table tab fields.

Table 201
Topology Table tab fields

Field	Description
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	The segment identifier of the segment, from which the remote agent sent the topology message. This value is extracted from the message.
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.
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.

- "Topology tab" (page 444)

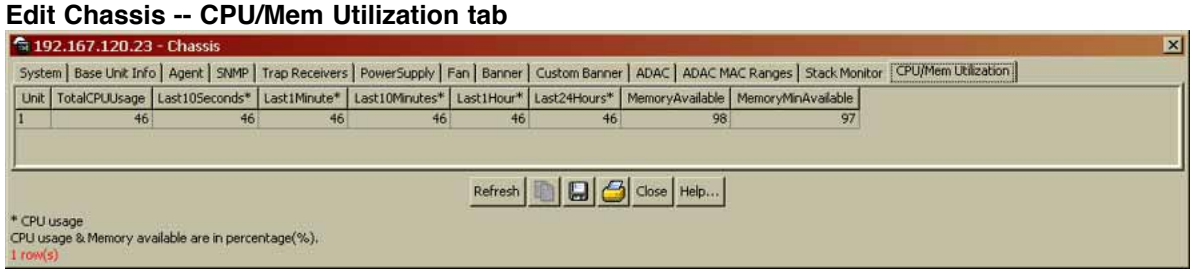
Viewing CPU utilization

You can view the CPU utilization statistics of the Nortel Networks Ethernet Switch 460/470 using the Figure 186 "Edit Chassis -- CPU/Mem Utilization tab" (page 447).

Use this procedure to display CPU utilization statistics.

Step	Action
1	Select **Edit > Chassis > CPU/Mem Utilization** from the Device Manager main menu. See Figure 186 "Edit Chassis -- CPU/Mem Utilization tab" (page 447).

Figure 186
Edit Chassis -- CPU/Mem Utilization tab



—End—

Table 202 "CPU/Mem Utilization tab fields" (page 447) describes the CPU/Mem Utilization tab fields.

Table 202
CPU/Mem Utilization tab fields

Fields	Description
Unit	Number of the unit.
TotalCPUUsage	Total percentage of CPU usage.
Last10Seconds	Percentage of CPU usage in the last 10 seconds.
Last1Minute	Percentage of CPU usage in the last minute.
Last10Minutes	Percentage of CPU usage in the last 10 minutes.
Last1Hour	Percentage of CPU usage in the last hour.
Last24Hours	Percentage of CPU usage in the last 24 hours.
Memory Available	Total system memory available.
MemoryMinAvailable	Minimum system memory available.

Chapter 14
Configuring ports using Device Manager

This chapter describe s how you use Device Manager to configure ports on Ethernet Switches 460 and 470.

The windows displayed when you configure a single port have a different appearance than those displayed when you configure multiple ports. However, the options available for configuring either a single port or multiple ports are similar.

See the following sections for more information about configuring and graphing ports:

- "Viewing and editing a single port configuration" (page 449)
- Table 121 "configure network command parameters and variables" (page 333)

Viewing and editing a single port configuration

To view or edit the configuration of a single or multiple ports:

Step	Action
1	To select the port or ports you want to edit, do one of the following: • From the shortcut menu, choose **Edit**. • From the Device Manager main menu, select **Edit > Port**. • Double-click on the selected port. • On the toolbar, click the **Edit** button. ***Note:*** When you edit a single port, tabs that are not applicable are not available for you to select.

When you edit multiple ports, some tabs are not available, and some tabs are available even though the options are not applicable. When the option does not apply for a given port, NoSuchObject is displayed.

—End—

The following sections provide a description of the tabs in the Edit Port dialog box and details about each field on the tab.

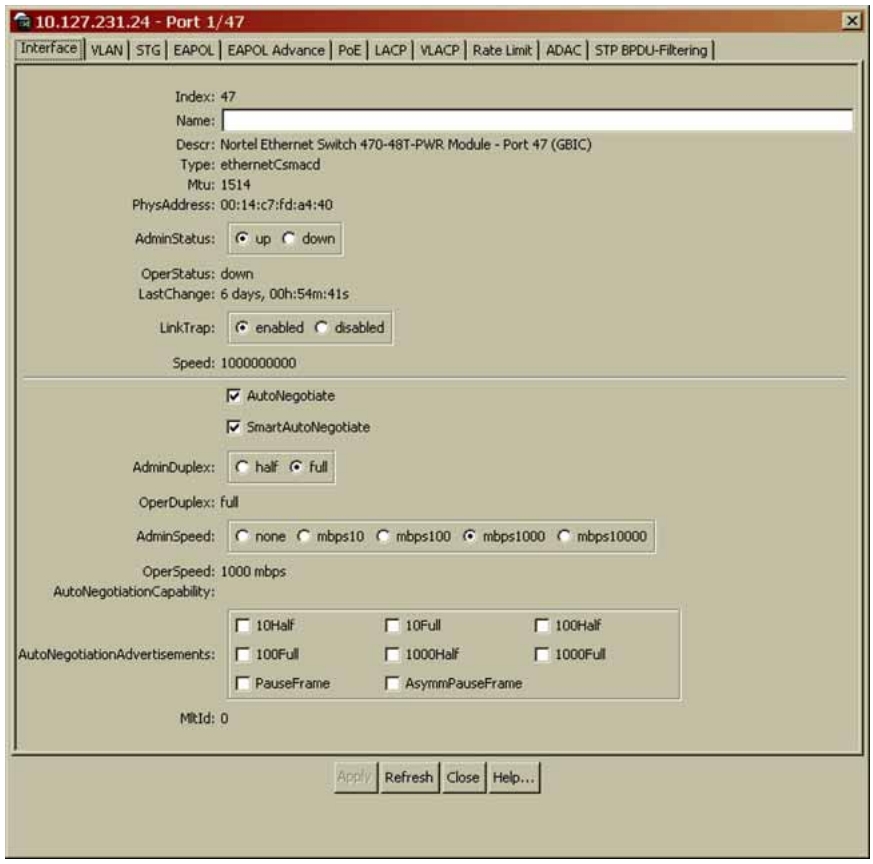
Configuring a single port using the Interface tab

The Interface tab shows the basic configuration and status of a single port.

To view the Interface tab:

Step	Action
1	Select the port you want to edit.
2	Do one of the following: • Double-click on the selected port • From the shortcut menu, choose **Edit**. • From the Device Manager main menu, select **Edit > Port**. • On the toolbar, click **Edit** button. The Port dialog box for a single port opens with the Interface tab displayed. See Figure 187 "Edit Port dialog box -- Interface tab" (page 451).

Figure 187
Edit Port dialog box -- Interface tab



Note: 10/100BASE-TX ports may not autonegotiate correctly with older 10/100BASE-TX equipment. In some cases, the older devices can be upgraded with new firmware or driver revisions. If an upgrade does not allow autonegotiation to correctly identify the link speed and duplex settings, you can manually configure the settings for the link in question.

Check the Nortel Web site (www.nortel.com/support) for the latest compatibility information.

—End—

Table 203 "Interface tab items for a single port" (page 452) describes the Interface tab items for a single port.

Table 203
Interface tab items for a single port

Field	Description
Index	A unique value assigned to each interface. The value ranges between 12 and 255.
Name	Enter a name for the port. This name is shown in the Port Tooltip window.
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.
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, OperStatus are up, if the interface is ready to transmit and receive network traffic. If AdminStatus is down, OperStatus are down. It remains in the down state only if a fault prevents it from going to the up state. The testing state indicates that no operational packets can be passed.

Field	Description
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	Enables and disables the link up/down traps.
Speed	The current speed of the port.
AutoNegotiate	Indicates whether this port is enabled for autonegotiation. ***Note:*** Autonegotiation is not supported on GBIC ports on Ethernet Switch 460-PWR and non-PWR versions of Ethernet Switch 470.
SmartAutoNegotiate	Indicates whether autonegotiation smart mode is enabled on this port. ***Note:*** SmartAutoNegotiate applies only to ports 25 and 26 on the Ethernet Switch 470-24T-PWR and only to ports 47 and 48 on the Ethernet Switch 470-48T-PWR.
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 speed of the port.
OperSpeed	The current operating speed of the port.
AutoNegotiationCapability	Displays the current autonegotiation advertisements capability. See "Custom Autonegotiation Advertisements" (page 244).
AutoNegotiationAdvertisements	Sets the autonegotiation advertisements. Any combination of speed-duplex settings is allowed from among those displayed in the AutoNegotiationCapability field.
MltId	The multilink trunk, to which the port is assigned (if any).

Rate Limit tab for a single port

The Rate Limit tab shows the Rate Limit configuration and status for a single port.

To view the Rate Limit tab:

Step	Action
1	Select the port you want to edit.
2	Do one of the following: • Double-click on the selected port • From the shortcut menu, select **Edit**. • From the Device Manager main menu, choose **Edit > Port**. • On the toolbar, click **Edit** button. The Port dialog box for a single port opens with the Interface tab displayed. See Figure 187 "Edit Port dialog box -- Interface tab" (page 451).
3	Click the **Rate Limit** tab. The **Rate Limit** tab appears. See Figure 188 "Edit Port dialog box -- Rate Limit tab" (page 454)..

—End—

Figure 188
Edit Port dialog box -- Rate Limit tab

Table 204 "Rate Limit tab items for a single port" (page 454) describes the Rate Limit tab items for a single port.

Table 204
Rate Limit tab items for a single port

Field	Description
TrafficType	Specifies the two types of traffic that can be set with rate limiting broadcast and multicast.

Field	Description
AllowedRate	Sets the rate limiting percentage. Available options are 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).

Viewing and editing multiple port configurations

To view or edit the configurations of multiple ports:

Step	Action
1	Select the ports you want to edit. Press [Ctrl] + left click the ports you want to view or configure. A yellow outline appears around the selected ports.
2	Do one of the following: • From the shortcut menu, choose Edit. • From the Device Manager main menu, choose Edit > Port. • Double-click on the selected port. • On the toolbar, click Edit.  ***Note:*** When you edit multiple ports, some tabs are not available, and some tabs are available even though the options are not applicable. When the option does not apply for a given port, NoSuchObject is displayed.

—End—

Interface tab for multiple ports

The Interface tab shows the basic configuration and status of the selected ports.

To view or edit the Interface tab for multiple ports:

Step	Action
1	Select the ports that you want to edit.

[Ctrl] + left-click the ports that you want to configure. A yellow outline appears around the selected ports.

2 Do one of the following:

- From the shortcut menu, choose Edit.
- From the Device Manager main menu, choose Edit > Port.
- On the toolbar, click Edit.

—End—

The Port dialog box for multiple ports opens with the Interface tab (Figure 189 "Port dialog box -- Port Interface tab" (page 456)) displayed.

Figure 189
Port dialog box -- Port Interface tab

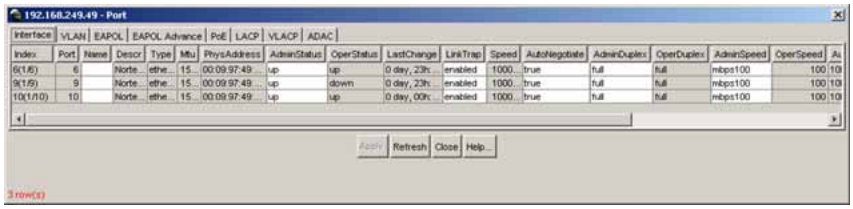


Table 205 "Port Interface tab fields for multiple ports" (page 456) describes the Port Interface tab fields.

Table 205
Port Interface tab fields for multiple ports

Field	Description
Index	A unique value assigned to each interface.
Port	Number of unit and port number.
Name	Enter a character string to name the port.
Descr	Type of switch and number of ports.
Type	Media type for this interface.
Mtu	Size of the largest packet, in octetsthat can be sent or received on the interface.
PhysAddress	MAC address assigned to a particular interface.

Field	Description
AdminStatus	Set administrative state of the interface from the pull-down menu, 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	Current operational state of the interface, which can be one of the following: • up • down • testing If AdminStatus is up, OperStatus are up, if the interface is ready to transmit and receive network traffic. If AdminStatus is down, OperStatus are down. It remains in the down state 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	Value of 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	Enables and disables the link up/down traps.
Speed	The estimated bandwidth of the interface in bits per second (bps). For interfaces that do not vary in bandwidth or have no way to estimate the bandwidth, this object should contain the nominal bandwidth. If the bandwidth of the interface is greater than the maximum value reported by the object, the object displays its maximum value (4,294,967,295). For a sub-layer that has no concept of bandwidth, the object is zero.
AutoNegotiate	Set autonegotiation on the port from the pull-down menu.
AdminDuplex	Set the administrative duplex mode of the port from the pull-down menu (half or full).
OperDuplex	Indicate current duplex value of the port.

Field	Description
AdminSpeed	Set the speed of a port: none, mbps10, and mbps100, mbps1000. ***Note:*** The system returns an error if you attempt to set ports 1 to 24 for 1000 Mbps.
OperSpeed	The current operating speed of the port.
MltId	The MultiLink Trunk, to which the port is assigned (if any).
AutoNegotiationCapability	Displays the current autonegotiation advertisements capability. (See "Custom Autonegotiation Advertisements" (page 244).)
AutoNegotiation Advertisements	Sets the autonegotiation advertisements. Any combination of speed-duplex settings is allowed from among those displayed in the AutoNegotiationCapability field.
IsPortShared	Specifies whether a port is shared. Multiple ports that are logically represented as a single port are shared. Only one shared port can be active at a time.
PortActiveComponent	Specifies the physical port components that are active for a shared port.

Chapter 15 Administering the switch using Web-based management

The administrative options available to you using Web-based management are:

- "Viewing general information" (page 459)
- "Logging on to the management interface" (page 461)
- "Resetting the switch" (page 463)
- "Resetting the switch to system defaults" (page 464)
- "Logging out of the management interface" (page 465)
- "Viewing summary information" (page 465)

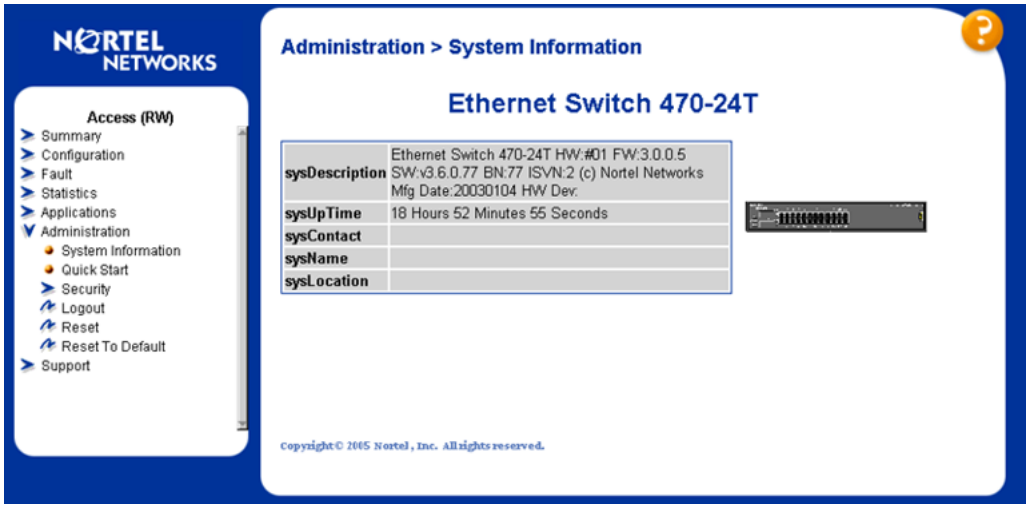
Note: Starting with Release 3.6 software, Secure Socket Layer (SSL) is available to provide security for the Web-based management system. With SSL, you can access the Web-based management using a secure https session. You must enable SSL for the browser through the Command Line Interface (CLI).

For more information about SSL Web-based management, refer to *Security — Configuration (NN47210-500)*.

Viewing general information

The viewing general information page, as shown in Figure 190 "General Information." (page 460), contains an image of the switch or an image of your entire stack configuration, information about the host device (or stack), and, if provided, the contact person or manager for the switch. The System Information page is also the Web-based management interface home page.

Figure 190
General Information.



Viewing system information

To view system information:

- From the main menu, choose Administration > System Information.

The System Information page appears Figure 191 "System Information home page on Ethernet Switch 470-24T" (page 460)

Note: You create or modify existing system information parameters on the System page.

Figure 191
System Information home page on Ethernet Switch 470-24T

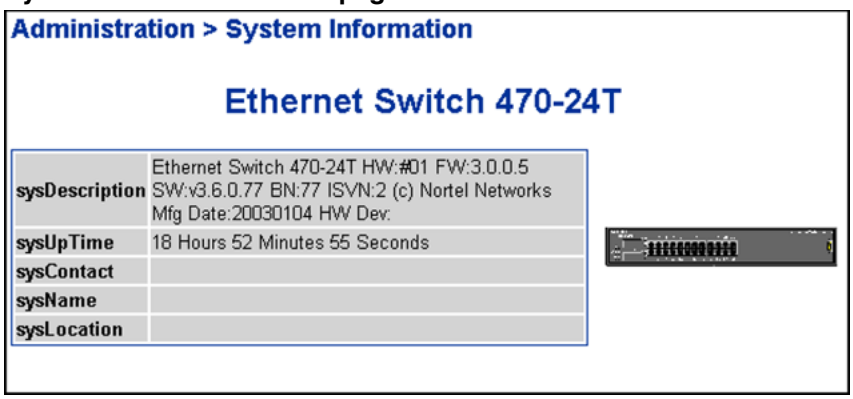


Table 206 "System information page" (page 461) describes the items on the System Information page.

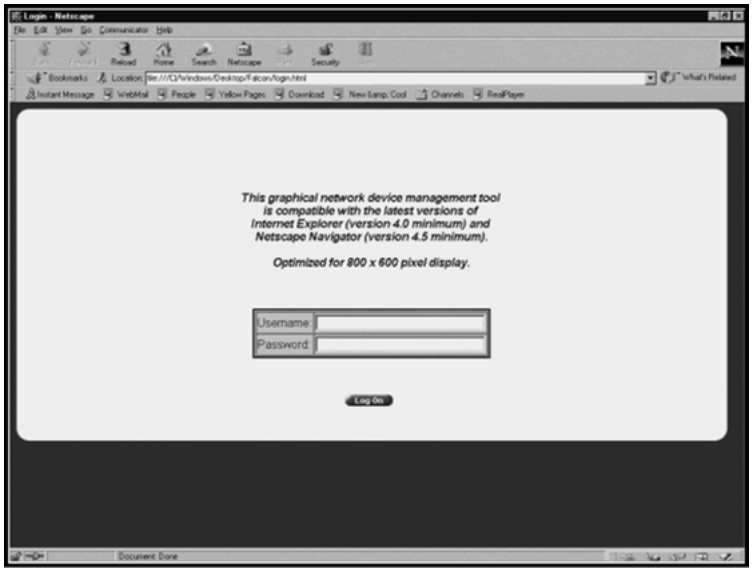
Table 206
System information page

Item	Range	Description
System Description		The factory set description of the hardware and software versions.
System Object ID		The character string that the vendor created to uniquely identify this device.
System Up Time		The elapsed time since the last network management portion of the system was last re-initialized. ***Note:*** This field is updated only when the screen is redisplayed.
System Name	0..255	A character string used to create a name to identify the switch, for example Finance Group.
System Location	0..255	A character string used to create a name for the switch location, for example, First Floor.
System Contact	0..255	A character string used to specify the name of a person to contact about switch operation, for example, mcarlson@company.com ***Note:*** To operate correctly with the Web interface, the system contact must be an e-mail address.

Logging on to the management interface

When switch and stack passwords and RADIUS authentication settings are integrated into the Web-based management user interface, anyone who attempts to use the application is presented with a log on page (Figure 192 "Web-based management interface log on page" (page 462)).

Figure 192
Web-based management interface log on page



To log on to the Web-based management interface:

1. In the Username text box, type **RO** for read-only access, or **RW** for read-write access.

   Note: RW and RO must be entered in uppercase.

2. In the Password text box, type your password.
3. Click Log On.

   The System Information home page appears (see Figure 191 "System Information home page on Ethernet Switch 470-24T" (page 460)).

With Web-based management access enabled, the switch can support up to four concurrent Web-based management users. Two predefined user levels are available, and each user level has a corresponding username and password.

Table 207 "User levels and access levels" (page 463) shows the predefined user levels available and the access levels within the Web-based management user interface.

Table 207
User levels and access levels

User level	Username for each level	Password for each user level	Access Level
Read-only	RO	user	Read only
Read-write	RW	secure	Full read-write access

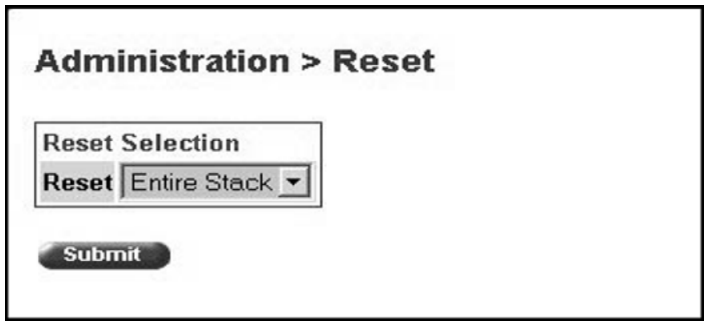
Resetting the switch

You can reset a stand-alone switch, a specific unit in a stack configuration, or an entire stack without erasing any configured switch parameters. While resetting, the switch initiates a self-test that comprises various diagnostic routines and subtests. The LEDs display various patterns to indicate that the subtests are in progress.

To reset the switch without making changes (since your last Submit request):

Step	Action
1	From the main menu, choose Administration > Reset. The Reset page appears (Figure 193 "Reset page" (page 463)).

Figure 193
Reset page



2	From the list, choose to reset the switch or the entire stack.
3	Click Submit. ***Note 1:*** When you are working on a single (non-stacked) switch, the system returns the message: `Are you sure your want to reset the switch?` Click OK, and the switch resets.

Note 2: If you have not configured system password security, a reset returns you to the home page, as shown in Figure 86 "Web page layout" (page 193). If you have configured system password security, a reset returns you to a log on page, as shown in Figure 192 "Web-based management interface log on page" (page 462).

—End—

Resetting the switch to system defaults

You can reset a stand-alone switch, a specific unit in a stack configuration, or an entire stack to system defaults. This replaces all configured switch parameters with the factory default values.

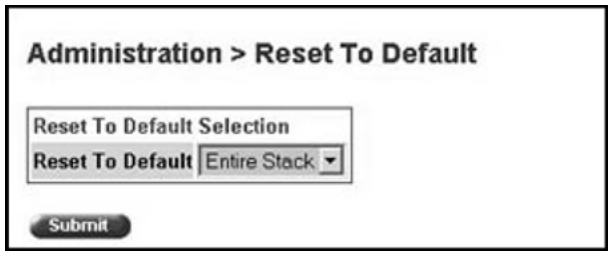
CAUTION
If you choose to reset to default settings, all configured settings are replaced with factory default settings when you click Submit (Stack Operational Mode is not reset to factory default). Resetting to default settings also causes loss of connection to the web until a new IP address is assigned. For more information about factory default settings, see Appendix "Default Settings" (page 509).

During the reset process, the switch initiates a self-test that comprises various diagnostic routines and subtests. The LEDs display various patterns to indicate that the subtests are in progress.

To reset the switch to system defaults:

Step	Action
1	From the main menu, choose Administration > Reset to Default. The Reset to Default page appears (Figure 194 "Reset to Default page" (page 464)).

Figure 194
Reset to Default page



2 From the list, choose to reset the switch only to system defaults, or the entire stack.

3 Click Submit.

Note 1: When you are working on a single (nonstacked) switch, the system returns the message:

```
Are you sure your want to reset the switch?
```

When you press OK, the switch resets.

Note 2: If you have not configured system password security, a reset returns you to the home page, as shown in Figure 86 "Web page layout" (page 193). If you have configured system password security, a reset returns you to a log on page, as shown in Figure 192 "Web-based management interface log on page" (page 462).

—End—

Logging out of the management interface

To log out of the Web-based management interface:

Step	Action
1	From the main menu, choose Administration > Logout. A message appears prompting you to confirm your request.
2	Do one of the following: • Click OK to log out of the Web-based management interface. • Click Cancel to return to the Web-based management interface home page.

—End—

Viewing summary information

The summary information options are:

- "Viewing stack information" (page 466)
- "Viewing summary switch information" (page 467)
- "Changing stack numbering" (page 470)
- "Identifying unit numbers" (page 472)

Viewing stack information

You can use Web-based management to view a summary of your stack framework, including the current version of the running software and the IP address of the Web-based management interface.

Note: The Web-based management user interface automatically detects the operational mode of your system. If the system is in stand-alone mode, the Stack Information page is not an option listed in the menu.

To view stack information:

Step	Action
1	From the main menu, choose Summary > Stack Information.

The Stack Information page appears (see Figure 195 "Stack Information page" (page 466)).

Figure 195
Stack Information page

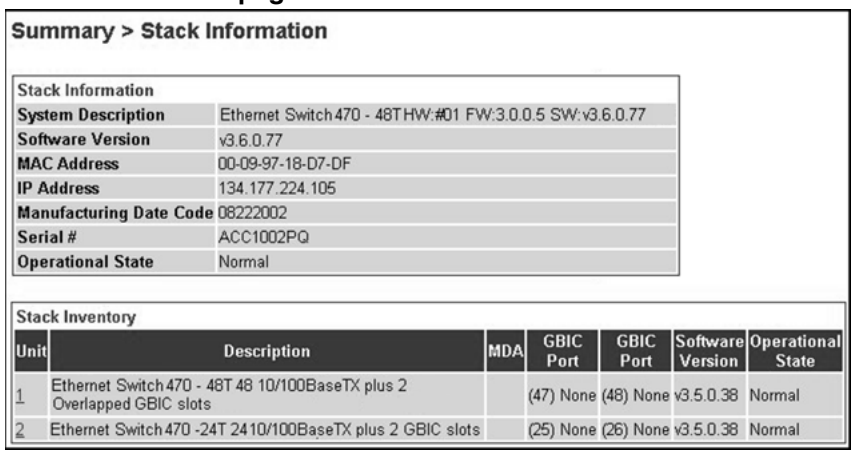


Table 208 "Stack Information page fields" (page 466) describes the fields on the Stack Information and Stack Inventory sections of the Stack Information page.

Table 208
Stack Information page fields

Section	Fields	Description
Stack Information	System Description	The name created in the configuration process to identify the stack.
	Software Version	The version of the running software.
	MAC Address	The MAC address of the stack.
	IP Address	The IP address of the stack.

Section	Fields	Description
	Manufacturing Date Code	The date of manufacture of the board in ASCII format: YYYYMMDD.
	Serial #	The serial number of the base unit.
	Operational State	The current operational state of the device. The operational states are: Other, Not Available, Removed, Disabled, Normal, Reset in Progress, Testing, Warning, Non Fatal Errors, Fatal Error, and Not Configured
Stack Inventory	Unit	The unit number assigned to the device by the network manager. For more information about stack numbering, see "Changing stack numbering" (page 470).
	Description	The description of the device or its subcomponent.
	MDA	Not applicable
	GBIC Port	The shared GBIC port adapter connected to port 25/47 of the switch.
	GBIC Port	The shared GBIC port adapter connected to port 26/48 of the switch.
	Software Version	The current running software version.
	Operational State	The current operational state of the stack. The operational states are: Other, Not Available, Removed, Disabled, Normal, Reset in Progress, Testing, Warning, Non Fatal Errors, Fatal Error, and Not Configured.

2 In the upper-left corner of the Stack Information page, click the number of the device you want to view.

The Stack Information page is updated with information about the selected switch.

—End—

Viewing summary switch information

You can view summary information about the switch, for example, the unit number and its corresponding physical description and serial number.

To view summary switch information:

Step	Action
1	From the main menu, choose Summary > Switch Information. The Switch Information page appears (Figure 196 "Switch Information page" (page 468)).

Figure 196
Switch Information page

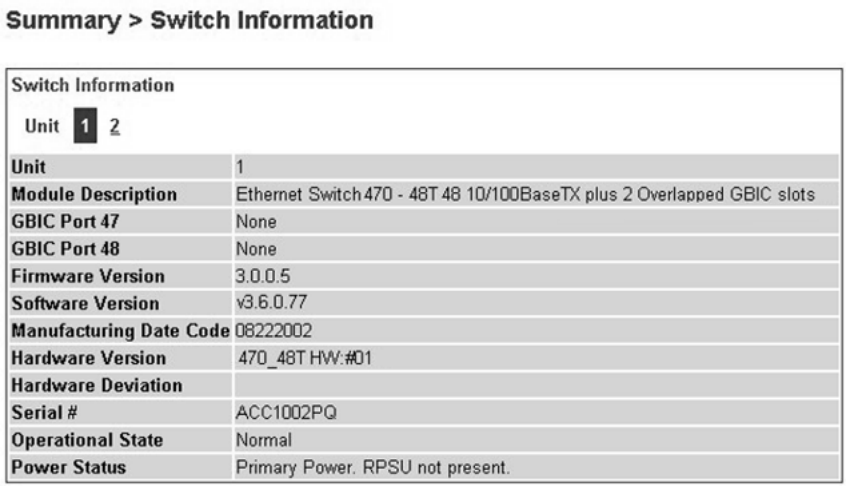


Table 209 "Switch Information page fields" (page 468) describes the fields on the Switch Information page.

Table 209
Switch Information page fields

Item	Description
Unit	Select the number of the device, on which to view summary information. The page is updated with information about the selected switch.
Module Description	The factory set description of the switch.
GBIC Port 25/47	The factory set description of the GBIC shared port 25/47. For additional hardware information about installed GBICs, click the GBIC hyperlink.
GBIC Port 26/48	The factory set description of the GBIC shared port 26/48. For additional hardware information about installed GBICs, click the GBIC hyperlink.
Software Version	The version of the running software.
Manufacturing Date Code	The date of manufacture of the board in ASCII format.
Serial Number	The serial number of the switch.
Operational State	The current operational state of the device. The operational states are: Other, Not Available, Removed, Disabled, Normal, Reset in Progress, Testing, Warning, Non Fatal Errors, Fatal Error, and Not Configured.
MAC Address	The MAC address of the device.

Item	Description
IP Address	The IP address of the device.
Power Status	The current power status of the device: • Primary Power: RPSU not present • Primary Power: RPSU present • Redundant Power: Primary power failed • Unavailable

2 In the upper-left corner of the Switch Information page, click the number of the device you want to view.

The Switch Information page is updated with information about the selected switch.

Note: Firmware version, hardware version and hardware deviation are shown when system is in the stack mode, but not shown in stand-alone mode.

—End—

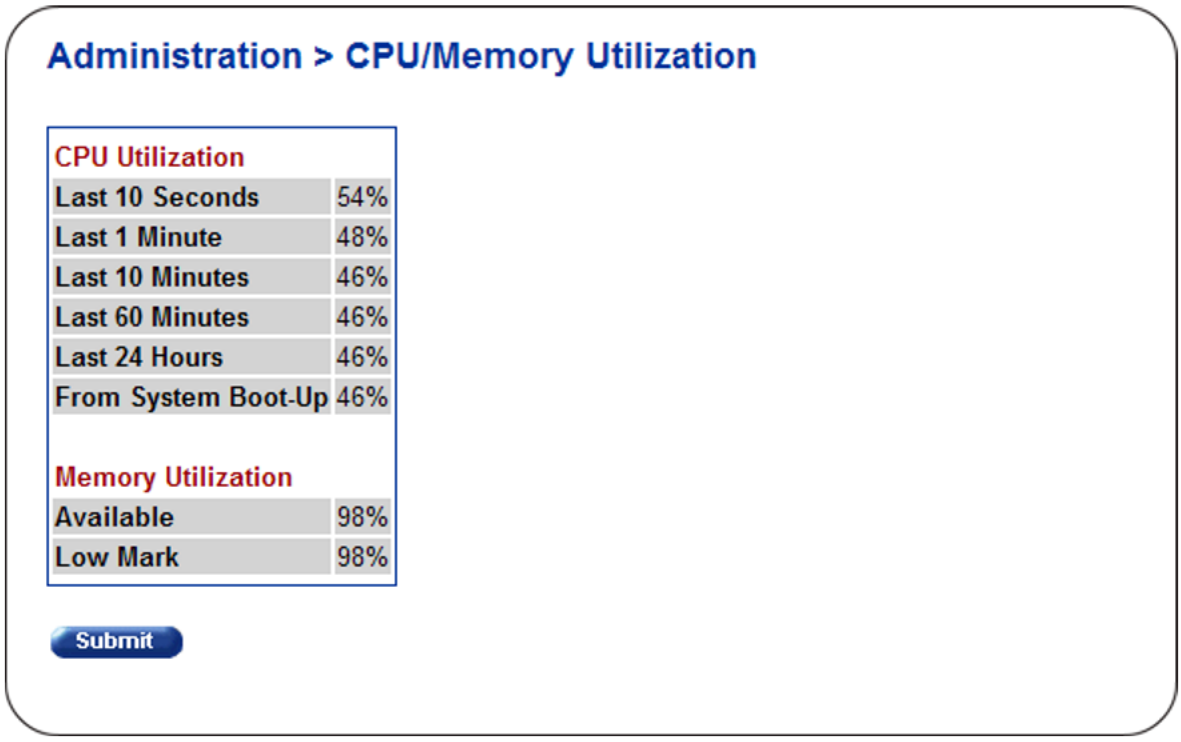
Viewing CPU utilization

On the CPU/Memory Utilization page, you can view the CPU utilization statistics of the Nortel Ethernet Switch 460/470.

Use the following procedure to open the CPU/Memory Utilization page:

Step	Action
1	From the main menu, select **Administration > CPU/Memory Utilization**.

Figure 197
CPU/Memory Utilization page



—End—

Changing stack numbering

If your system is set to "stack" operational mode, you can view existing stack numbering information and renumber the devices in your stack framework.

Note: The unit number does not affect the base unit designation.

To view or renumber devices within the stack framework:

Step	Action
1	From the main menu, choose Summary > Stack Numbering. The Stack Numbering Setting page appears (Figure 198 "Stack Numbering Setting page" (page 471)).

Figure 198
Stack Numbering Setting page

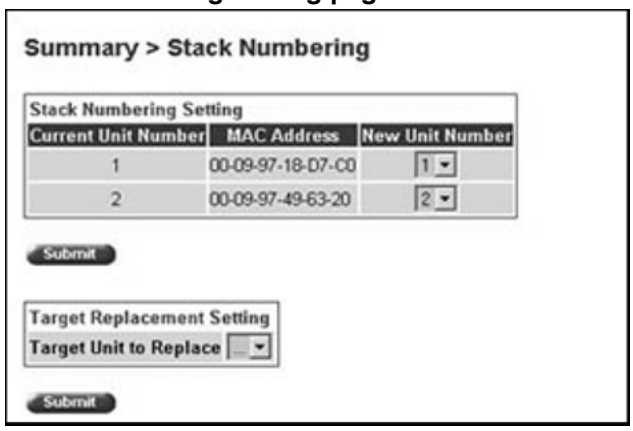


Table 210 "Stack Numbering Setting page fields" (page 471) describes the fields on the Stack Numbering Setting page.

Table 210
Stack Numbering Setting page fields

Item	Range	Description
Current Unit Number	1..8	Unit number previously assigned to the Ethernet Switch. The entries in this column are displayed in order of their current physical cabling with respect to the base unit, and can show nonconsecutive unit numbering if one or more units were previously moved or modified. The entries can also include unit numbers of units that are no longer participating in the stack (not currently active).
MAC Address	XX.XX.XX.XX.XX.XX	MAC address of the corresponding unit listed in the Current Unit Number field.
New Unit Number	1..8, None	Choose a new number to assign to your selected Ethernet Switch. ***Note:*** If you leave the field blank, the system automatically selects the next available number.

2 Choose the new number to assign to your switch.

3 Click Submit.

A message opens prompting you to confirm your request.

4 Do one of the following:

- Click OK to renumber the stack.

- Click Cancel to return to the Stack Numbering page without making changes.

—End—

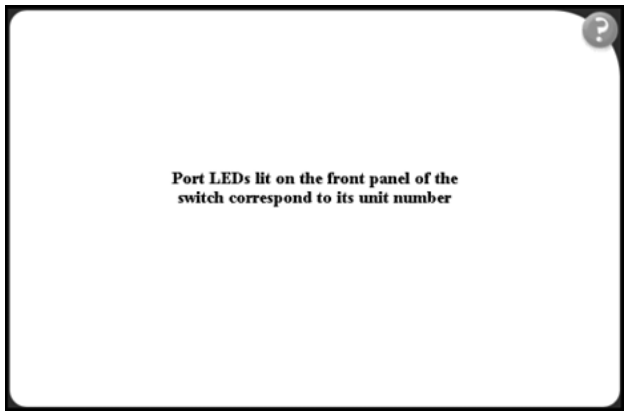
Identifying unit numbers

You can identify the unit numbers of the switches participating in a stack configuration by viewing the LEDs on the front panel of each switch.

To identify unit numbers in your configuration:

Step	Action
1	From the main menu, choose Summary > Identify Unit Numbers. The Identify Unit Numbers page appears (Figure 199 "Identify Unit Numbers page" (page 472)).

Figure 199
Identify Unit Numbers page



Step	Action
2	To continue viewing summary information or to start the configuration process, choose another option from the main menu.

—End—

Chapter 16 Configuring the switch using Web-based management

The switch configuration options available to you are:

Configuring BootP, IP, and gateway settings

You can configure the BootP mode settings, create and modify your in-band stack and in-band switch IP addresses and in-band subnet mask parameters, and configure the IP address of your default gateway. You can also configure IP addresses for individual units in a stack.

Note: Settings take effect immediately after you click Submit.

To configure BootP, IP, and gateway settings:

Step	Action
1	From the main menu, choose Configuration > IP.

The IP page appears (see Figure 200 "IP page for a single unit" (page 474) for the display for a single unit and Figure 201 "IP page for a stack" (page 474) for the display in a stack).

Figure 200
IP page for a single unit

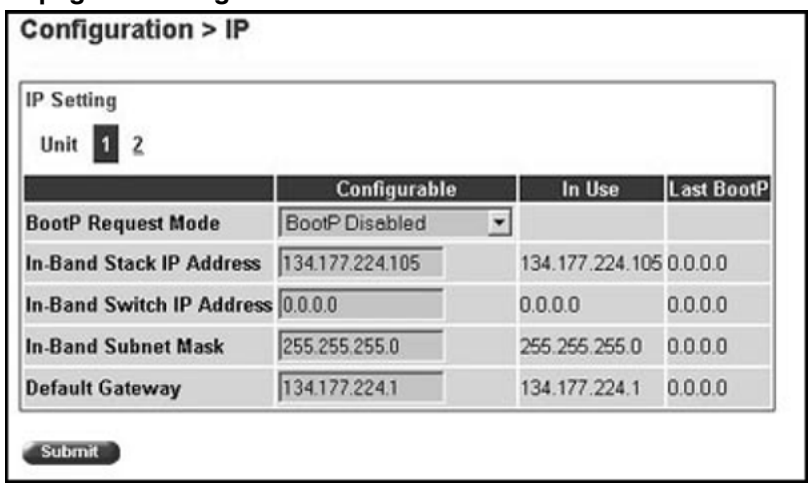
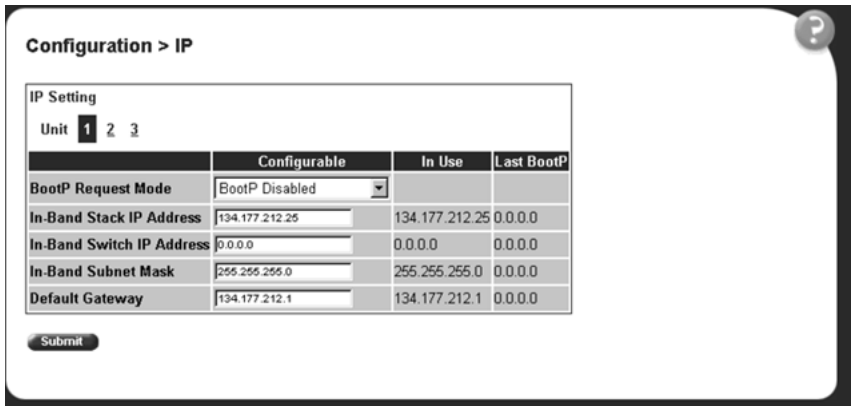


Figure 201
IP page for a stack



Note: To change the IP information for a specific unit in a stack, choose that unit, and enter the desired IP information into the In-Band Switch IP address field.

Table 211 "IP page items" (page 475) describes the items on the IP page.

Table 211
IP page items

Section	Item	Range	Description
Boot Mode Setting	BootP Request Mode	BootP When Needed	Choose this mode for the switch to send a BootP request when the IP address stored in non-volatile memory is the same as the factory default value. If this IP address differs from the factory default value, the switch uses the stored network parameters. If the switch cannot find a BootP server, it attempts to search for the BootP server five more times. If the switch fails to connect with the BootP server sets the BootP request mode to the default factory settings.
		BootP Always	Choose this mode for the switch to ignore any stored network parameters, and send a BootP request every time the switch boots. If the BootP request fails, the switch boots with the factory default IP configuration. This setting disables remote management if no BootP server is set up for the switch, but the switch can boot normally.
		BootP Disabled	Choose this mode for the switch to use the IP configuration parameters stored in non-volatile memory each time the switch boots. If a BootP configuration is in progress when you issue this command, the BootP configuration stops.
		BootP or Last Address	Choose this mode to inform the switch, at each startup, to obtain its IP configuration using BootP. If the BootP request fails, the switch uses the network parameters stored in its non-volatile memory. ***Note:*** Valid parameters obtained in using BootP always replace current information stored in the non-volatile memory.
		Note: Whenever the switch is broadcasting BootP requests, the BootP process times out if a reply is not received within (approximately) 7 minutes. When the process times out, the BootP request mode automatically changes to BootP Disabled mode. To restart the BootP process, change the BootP request mode to any of the three following modes: BootP When Needed, BootP Always, or to BootP or Last Address.	

Section	Item	Range	Description
IP Setting	In-Band Stack IP Address	XXX.XXX.XXX.XXX	Type a new stack IP address in the appropriate format.
	In-Band Switch IP Address	XXX.XXX.XXX.XXX	Type a new switch IP address in the appropriate format. ***Note:*** When the IP address is entered in the In-Band IP Address field, and the In-Band Subnet Mask field value is not present, the software provides an in-use default value for the In-Band Subnet Mask field. This field is based on the class of the IP address entered in the In-Band IP Address field.
	In-Band Subnet Mast	XXX.XXX.XXX.XXX	Type a new subnet mask in the appropriate format.
	In-Use		The column header for the read-only fields in this screen. The data displayed in this column represents data that is currently in use.
	Last BootP		The column header for the read-only fields in this screen. The read-only data displayed in this column represents data obtained from the last BootP reply received.
Gateway Setting	Default Gateway	XXX.XXX.XXX.XXX	Type an IP address for the default gateway in the appropriate format.

2 Specify the required information in the text boxes, or select from list box.

3 Click Submit.

—End—

Modifying system settings

You can create or modify the system name, system location, and network manager contact information.

Note: The configurable parameters on the System page are displayed in a read only-format on the Web-based management user interface System Information home page (see Figure 86 "Web page layout" (page 193)).

To configure system settings:

Step	Action

1 From the main menu, choose Configuration > System.

The System page appears (Figure 202 "System page" (page 477)).

Figure 202
System page

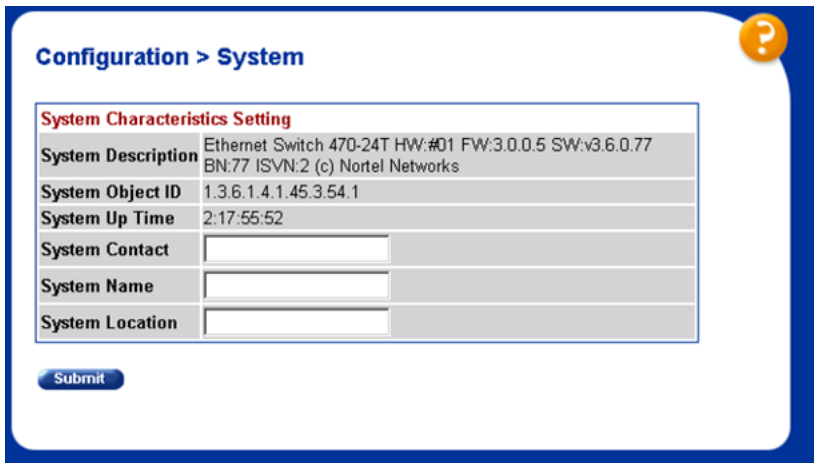


Table 212 "System page elements" (page 477) describes the items on the System page.

Table 212
System page elements

Item	Range	Description
System Description		The factory set description of the hardware and software versions.
System Object ID		The character string that the vendor created to uniquely identify this device.
System Up Time		The elapsed time since the last network management portion of the system was last re-initialized. ***Note:*** This field is updated only when the screen is redisplayed.
System Contact	0..255	A character string used to specify the name of a person to contact about switch operation, for example, mcarlson@company.com ***Note:*** To operate correctly with the Web interface, the system contact must be an e-mail address.

Item	Range	Description
System Name	0..255	A character string used to create a name to identify the switch, for example Finance Group.
System Location	0..255	A character string used to create a name for the switch location, for example, First Floor.

2 Specify the required information in the text boxes.

3 Click Submit.

—End—

Configuring port autonegotiation, speed, duplex, status, and alias

You can configure a specific switch port or all switch ports to autonegotiate for the highest available speed of the connected station or you can set the speed for selected switch ports. Autonegotiation is not supported on fiber optic ports.

You can name each port, or assign an alias to it, using 27 alphanumeric characters.

To configure a switch port's alias, status, autonegotiation and speed/duplex:

Step	Action
1	From the main menu, choose Configuration > Port Management. The Port Management page appears (Figure 203 " Port Management page" (page 479)).

Figure 203
Port Management page

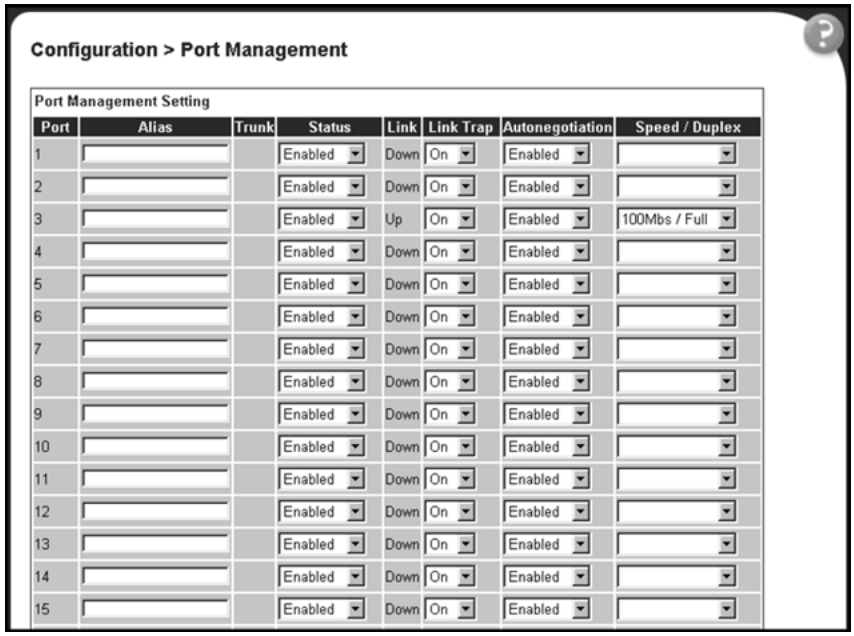


Table 213 "Port Management page items" (page 479) describes the items on the Port Management page.

Table 213
Port Management page items

Item	Range	Description
Port		The switch port number of the corresponding row. To select the switch row, click the check box to the right. The values that you set in each switch row affect all switch ports and, when the switch is part of a stack, the values that set in the stack row affect all ports in the entire stack (except the GBIC ports or fiber optic ports when installed). For information about setting high speed flow control, see step-4.
Alias	27 alphanumeric characters	Displays the name, or alias, you assigned the port. To assign a name or to change the name, enter up to 26 alphanumeric characters.
Trunk		The trunk group that the switch port belongs to as specified in the Trunk Member fields on the MultiLink Trunk page. For more information, see *Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*.

Item	Range	Description
Status	(1) Enabled (2) Disabled	Choose to enable or disable the port. You can also use this field to control access to any switch port. The default setting is Enabled.
Link		The current link state of the corresponding port as follows: • Up: The port is connected and operational • Down: The port is not connected or is not operational.
Link/Trap	(1) On (2) Off	Choose to control whether link up/down traps are sent to the configured trap sink from the switch. The default setting is On.
Autonegotiation	(1) Enabled (2) Disabled	Choose to enable or disable the autonegotiation feature. Choosing to enable autonegotiation sets the corresponding port speed to match the best service provided by the connected station, up to 100Mb/s in full-duplex mode. ***Note 1:*** Autonegotiation is not supported on GBIC ports on Ethernet Switch 460-PWR and non-PWR versions of Ethernet Switch 470. ***Note 2:*** This field is disabled for all fiber optic ports. Use the High Speed Flow Control Configuration screen (next) to set autonegotiation for all gigabit ports. The default setting is Enabled.
Speed / Duplex	(1) 10Mbs / Half (2) 10Mbs / Full (3) 100Mbs / Half (4) 100Mbs / Full (5) 1000Mbs / Full	Choose the Ethernet speed you want the port to support. ***Note:*** Fiber optic ports can only be set to 100 Mb/s/Half or 100 Mb/s/Full. Use the High Speed Flow Control Configuration screen (next) to set autonegotiation for all gigabit ports.

Item	Range	Description
		The default setting is 100Mbs/Half when autonegotiation is disabled and 1000 Mb/s full-duplex for gigabit ports only.

2 In the upper-left hand corner, click the unit number of the Ethernet Switch to manage.

The page is updated with the information for the selected switch.

3 In the port row of your choice, select from the lists.

4 Click Submit.

—End—

Configuring high-speed flow control

You can use the High-Speed Flow Control page to set switch port parameters and set autonegotiation for all gigabit ports.

Perform the steps in this procedure to set switch port parameters and set autonegotiation for all gigabit ports:

Step	Action

1 From the main menu, select **Configuration > High Speed Flow Control**.

The High Speed Flow Control page appears. See Figure 204 "High Speed Flow Control page" (page 481).

Figure 204
High Speed Flow Control page

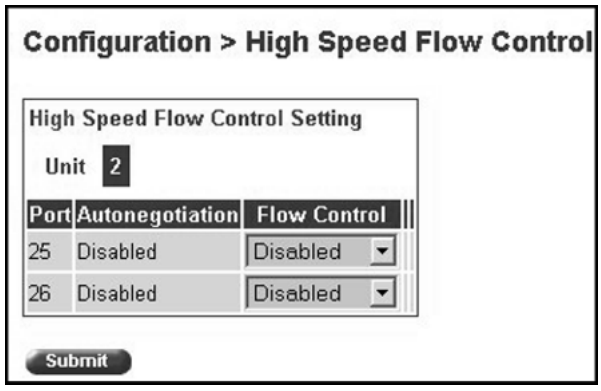


Table 214 "High Speed Flow Control page items" (page 482) describes the items on the High Speed Flow Control page.

Table 214
High Speed Flow Control page items

Item	Range	Description
Autonegotiation	(1) Enabled (2) Disabled (3) Smart	Choose to enable or disable the autonegotiation feature. ***Note 1:*** Autonegotiation is not supported on GBIC ports on Ethernet Switch 460-PWR and non-PWR versions of Ethernet Switch 470. ***Note 2:*** Smart mode is only supported on GBIC ports on Ethernet Switches 470-24-PWR and 470-48-PWR.
Flow Control	(1) Enabled (2) Symmetric (3) Asymmetric	Choose your flow control preference to control traffic and avoid congestion on the GBIC port. ***Note:*** This field is disabled for 470-PWR GBIC ports.
Preferred Phy	(1) Left (2) Right	Choose the preferred physical port. The port not selected automatically reverts to a backup physical port.
Active Phy		The current operating physical port. The physical port options are left or right.

2 In the upper-left corner, click the unit number of the GBIC to configure.

3 Select an option from the available lists.

4 Click **Submit**.

—End—

Downloading switch images

You can download the Ethernet Switch software image that is located in non-volatile flash memory. To download the software image, a properly configured Trivial File Transfer Protocol (TFTP) server must be present in your network, and the switch must have an IP address. To learn how to configure the switch IP address, see "Configuring BootP, IP, and gateway settings" (page 473).

CAUTION
Do not interrupt power to the device during the software download process. A power interruption can corrupt the firmware image.

To download a switch image:

Step	Action
1	From the main menu, choose Configuration > Software Download.

The Software Download page appears (Figure 205 "Software Download page" (page 483)).

Figure 205
Software Download page

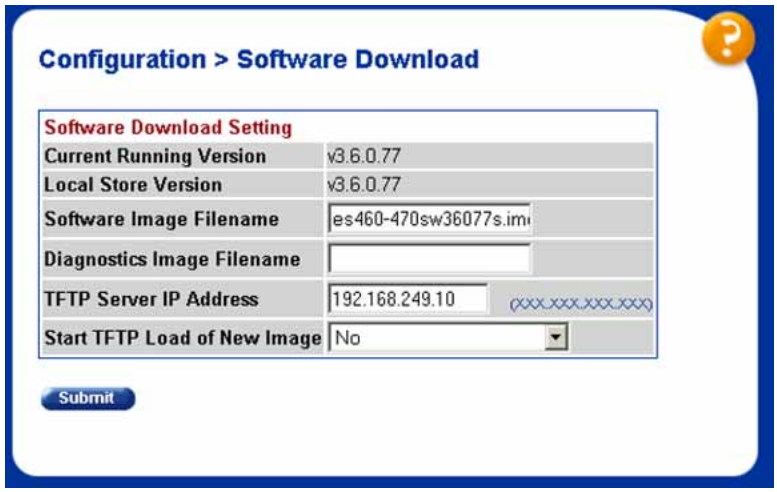


Table 215 "Software Download page items" (page 483) describes the items on the Software Download page.

Table 215
Software Download page items

Item	Range	Description
Current Running Version		The version of the current running software.
Local Store Version		The local version of the software in the flash memory.
Software Image Filename	1..30	Type the software image load filename.
Diagnostics Filename	1..30	Type the diagnostics filename.

Item	Range	Description
TFTP Server IP Address	XXX.XXX.XXX.XXX	Type the IP address of your TFTP load host.
Start TFTP Load of New Image	(1) No (2) Software Image (3) Diagnostics (4) Software Image If Newer	Choose the software image to load.

2 Type information in the text boxes, or select from a list.

3 Click Submit.

—End—

The software download process is automatically completed without user intervention. The process erases the contents of flash memory and replaces it with a new software image. Take care not to interrupt the download process until after it runs to completion (the process can take up to 10 minutes, depending on network conditions).

When the download process is complete, the switch automatically resets and the new software image initiates a self-test.

Storing and retrieving a switch configuration file from a TFTP server

You can store switch configuration parameters on a Trivial File Transfer Protocol (TFTP) server. You can retrieve the configuration parameters of a switch and use the retrieved parameters to automatically configure a replacement switch.

To store a switch configuration, you must set up the file on your TFTP server and set the filename read-write permission to enabled.

To download the switch configuration file, a properly configured TFTP server must be present in your network, and the Ethernet Switch must have an IP address. To learn how to configure the switch or stack IP address, see "Configuring BootP, IP, and gateway settings" (page 473).

To store or retrieve a switch configuration file:

Step	Action
1	From the main menu, choose Configuration > Configuration File. The Configuration File Download/Upload page appears (Figure 206 "Configuration File Download/Upload page" (page 485)).

Figure 206
Configuration File Download/Upload page

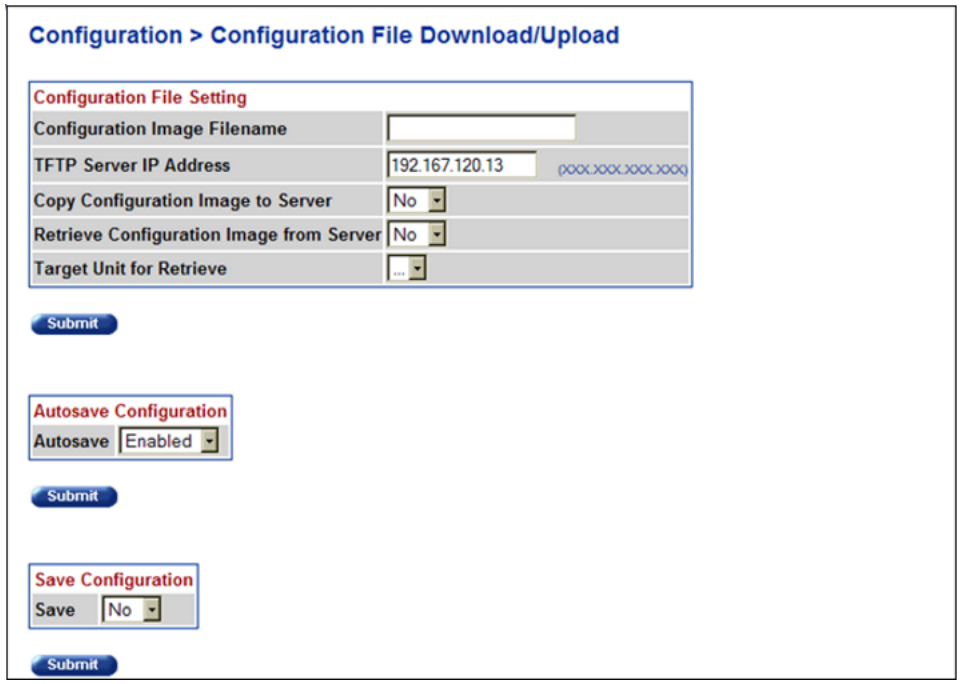


Table 216 "Configuration File Setting items" (page 485) describes the items on the Configuration File page.

Table 216
Configuration File Setting items

Item	Range	Description
Configuration Image Filename	1..32	Type the configuration file name.
TFTP Server IP Address	XXX.XXX.XXX.XXX	Type the IP address of the TFTP load host.
Copy Configuration Image to Server	(1) Yes (2) No	Choose whether or not to copy the configuration image to the server.
Retrieve Configuration Image from Server	(1) Yes (2) No	Choose whether or not to retrieve the configuration image from a server. If you choose Yes, the download process begins immediately and, when completed, causes the switch or stack to reset with the new configuration parameters.

2 Type information in the text boxes, or select from a list.

3 Click Submit.

—End—

Table 217 "Requirements for storing or retrieving configuration parameters on a TFTP server" (page 486) describes the requirements for storing or retrieving configuration parameters on a TFTP server.

Table 217
Requirements for storing or retrieving configuration parameters on a TFTP server

Requirements
• The Configuration File feature can be used only to copy *stand-alone switch configuration parameters to other stand-alone switches* or to copy *stack configuration parameters to other stack configurations*. For example, you cannot duplicate the configuration parameters of a unit in a *stack* configuration and use it to configure a *stand-alone* switch.
• A configuration file obtained from a stand-alone switch can only be used to configure other stand-alone switches with the same firmware revision and model type as the donor stand-alone switch.
• A configuration file obtained from a stack unit can be used only to configure other stacks that have the same number of switches, firmware version, model types, and physical IDs as the stack the donor stack unit resides in.
• Reconfigured stacks are configured according to the unit order number of the donor unit. For example, the configuration file parameters from a donor unit with physical ID *x* are used to reconfigure the unit with physical ID *x*.
• The configuration file also duplicates any settings that exist for any GBIC that is installed in the donor switch. If you use the configuration file to configure another switch that has the same GBIC model installed, the configuration file settings also apply to and override the existing GBIC settings.

Table 218 "Parameters not saved to the configuration file" (page 486) describes the parameters that are not saved to the configuration file.

Table 218
Parameters not saved to the configuration file

These parameters are not saved:	Used in this screen:	See page:
In-Band Stack IP Address	IP Configuration/Setup	"Configuring BootP, IP, and gateway settings" (page 473)
In-Band Switch IP Address		

These parameters are not saved:	Used in this screen:	See page:
In-Band Subnet Mask		
Default Gateway		
Configuration Image Filename	Configuration File Download/Upload	"Storing and retrieving a switch configuration file from a TFTP server" (page 484)
TFTP Server IP Address		
Console Read-Only Switch Password	Console/Comm Port Configuration	"Configuring port communication speed" (page 488)
Console Read-Write Switch Password		
Console Read-Only Stack Password		
Console Read-Write Stack Password		

Saving configuration files using Web-based management

This section describes how to save configuration files on the Nortel Ethernet Switch 460/470 series, using Web-based management.

You can use the following methods to save configuration files:

- "Autosaving switch configuration files using Web-based management" (page 487)
- "Saving the current configuration file manually using Web-based management" (page 488)

Autosaving switch configuration files using Web-based management

Perform the steps in this procedure to configure the switch to automatically save configuration files.

Step	Action
1	From the main menu, select **Configuration > Configuration File**. The Configuration File Download/Upload page appears. See Figure 206 "Configuration File Download/Upload page" (page 485).
2	In the Autosave Configuration box, select **Enabled**.
3	Click **Submit**.

—End—

Saving the current configuration file manually using Web-based management

Perform the steps in this procedure to manually save the current configuration file.

Step	Action
1	From the main menu, choose **Configuration > Configuration File**. The Configuration File Download/Upload page appears. See Figure 206 "Configuration File Download/Upload page" (page 485).
2	Select **Yes** in the Save Configuration box.
3	Click **Submit**.

—End—

Configuring port communication speed

You can view the current console/communication port settings and configure the console port baud rate to match the baud rate of the console terminal.

To view current console/communication port settings and configure console port speed:

Step	Action
1	From the main menu, choose Configuration > Console/Comm Port. The Console/Communication Port page appears (Figure 207 "Console/Communication Port page" (page 488)).

Figure 207
Console/Communication Port page

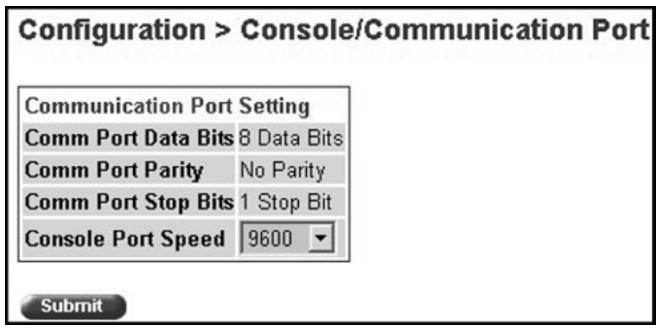


Table 219 "Console/Communication Port Setting page items" (page 489) describes the items on the Console/Communication Port page.

Table 219
Console/Communication Port Setting page items

Item	Range	Description
Comm Port Data Bits		The current console communication port data bit setting.
Comm Port Parity		The current console communication port parity setting.
Comm Port Stop Bits		The current console communication port stop bit setting.
Console Port Speed	2400 4800 9600 19200 38400	Choose the console port speed baud rate. ***Note:*** The default setting is 9600.
		CAUTION If you choose a baud rate that does not match your console terminal baud rate, you lose communication with the configuration interface when you click Submit.

2 Select from the list.

3 Click Submit.

—End—

Configuring rate limiting

You can view the current forwarding rate of broadcast and multicast packets, and configure the Ethernet Switches 460 and 470 to limit the forwarding rate of broadcast and multicast packets on each interface. When you configure rate limiting, you set the percentage of port bandwidth allowed for a packet type. When the threshold is exceeded, additional packets are discarded.

Note: If a port is configured for rate limiting, and it is a MultiLink trunk member, all trunk member ports implement rate limiting. If the port becomes disabled, all trunk members become disabled.

To configure rate limiting:

Step	Action

1 From the main menu, choose Application > Rate Limiting.

The Rate Limiting page appears (Figure 208 "Rate Limiting page" (page 490)).

Figure 208
Rate Limiting page

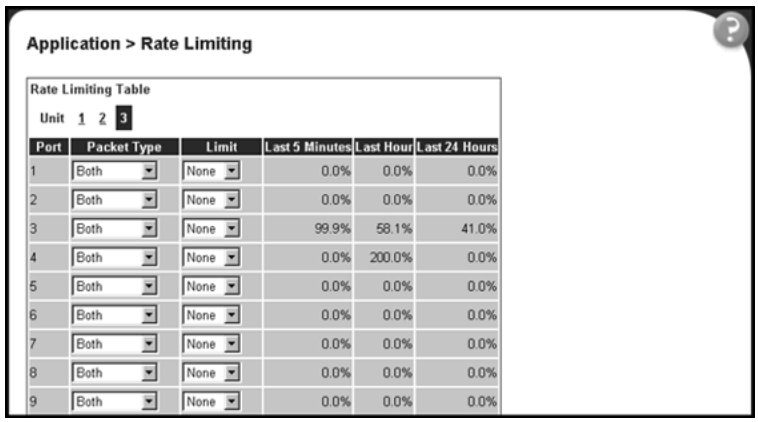


Table 220 "Rate Limiting page items" (page 490) describes the items on the Rate Limiting page.

Table 220
Rate Limiting page items

Item	Range	Description
Port	1..26	The selected unit's port number. The normal port range is 1 to 48.
Packet Type	(1) Multicast (2) Broadcast (3) Both	Choose the packet type to view on the table. The default setting is Both.
Limit	None, 1-10%	Choose the percentage, if any, of bandwidth allowed for forwarding the packet type specified in the Packet Type field. When the threshold is exceeded, any additional packets are discarded. ***Note:*** Rate limiting is disabled if this field is set to none. You can select and view the percentage of specific packet types present in the network, without inadvertently limiting the forwarding rate. The default setting is None.

Item	Range	Description
Last 5 Minutes	0..100%	The percentage of packets received by the port in the last five minutes. This field provides a running average of network activity and is updated every 15 seconds.
Last Hour	0..100%	The percentage of packets received by the port in the last hour. This field provides a running average of network activity and is updated every five minutes.
Last 24 Hours	0..100%	The percentage of packets received by the port in the last 24 hours. This field provides a running average of network activity and is updated every hour.
		Note: The Last 5 Minutes, Last Hour, and Last 24 Hours fields indicate the receiving port's view of network activity regardless of the rate limiting setting.
		Note: When the volume of broadcast and multicast packets is high, placing severe strain on the network (often referred to as a "storm"), you can set the forwarding rate of those packet types to not exceed a specified percentage of the total available bandwidth.

2 In the upper-left hand corner, click on the unit number of the device to monitor.

3 Type information in the text boxes, or select from a list.

4 Click Submit.

Note: To avoid broadcast storms (when the volume of a particular packet type is extreme, placing severe strain on the network), set the forwarding rate of the packet type to not exceed a lower percentage of the total available bandwidth.

—End—

Configuring 802.1AB

This section describes how to configure 802.1AB using Web-based management.

LLDP Configuration page

On the LLDP Configuration page, you can configure LLDP transmit properties.

Use the following procedure to open the LLDP Configuration page:

Step	Action
1	From the main menu, select **Application > 802.1AB > LLDP Configuration**.

Figure 209
LLDP Configuration page

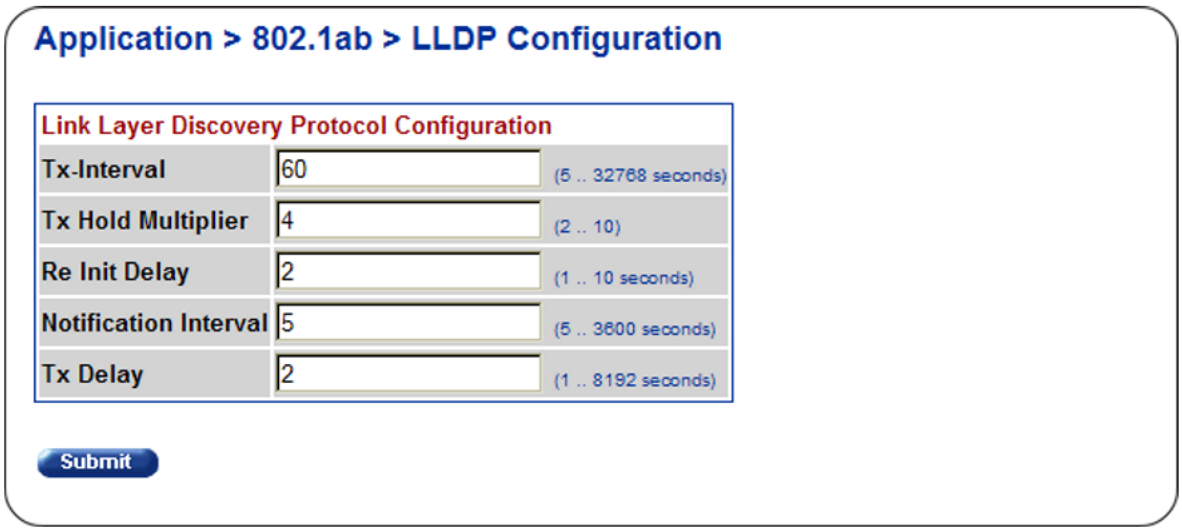


Table 221 "LLDP Configuration page items" (page 492) describes the items on the LLDP Configuration page.

Table 221
LLDP Configuration page items

Field	Description
Tx-Interval	The interval (in seconds), at which LLDP frames are transmitted on behalf of this LLDP agent.
Tx Hold Multiplier	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, (Tx-Interval *Tx Hold Multiplier)] For example, if the value of Tx-Interval is 30, and the value of Tx Hold Multiplier is 4, the value 120 is encoded in the TTL field in the LLDP header.

Field	Description
Re Init Delay	The delay (in seconds) from when the LLDP Port AdminStatus of a particular port is disabled until reinitialization begins.
Notification Interval	This object controls the transmission of LLDP notifications. The agent must not generate more than one Rem Tables Change 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 Remote Systems Data 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 Stats Rem Table Last Change Time to detect any missed Rem Tables Change 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.
Tx Delay	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 Tx Delay is set by the following formula: 1 <= Tx Delay <= (0.25 * Tx-Interval)

2 Specify the required information in the text boxes.

3 Click **Submit**.

—End—

LLDP Local System Data page

On the LLDP Local System Data page, you can view the current Link Layer Discovery Protocol configuration and port system data.

Use the following procedure to open the LLDP Local System Data page:

Step	Action
1	From the main menu, select **Application > 802.1AB > LLDP Local System Data**.

Figure 210
LLDP Local System Data page

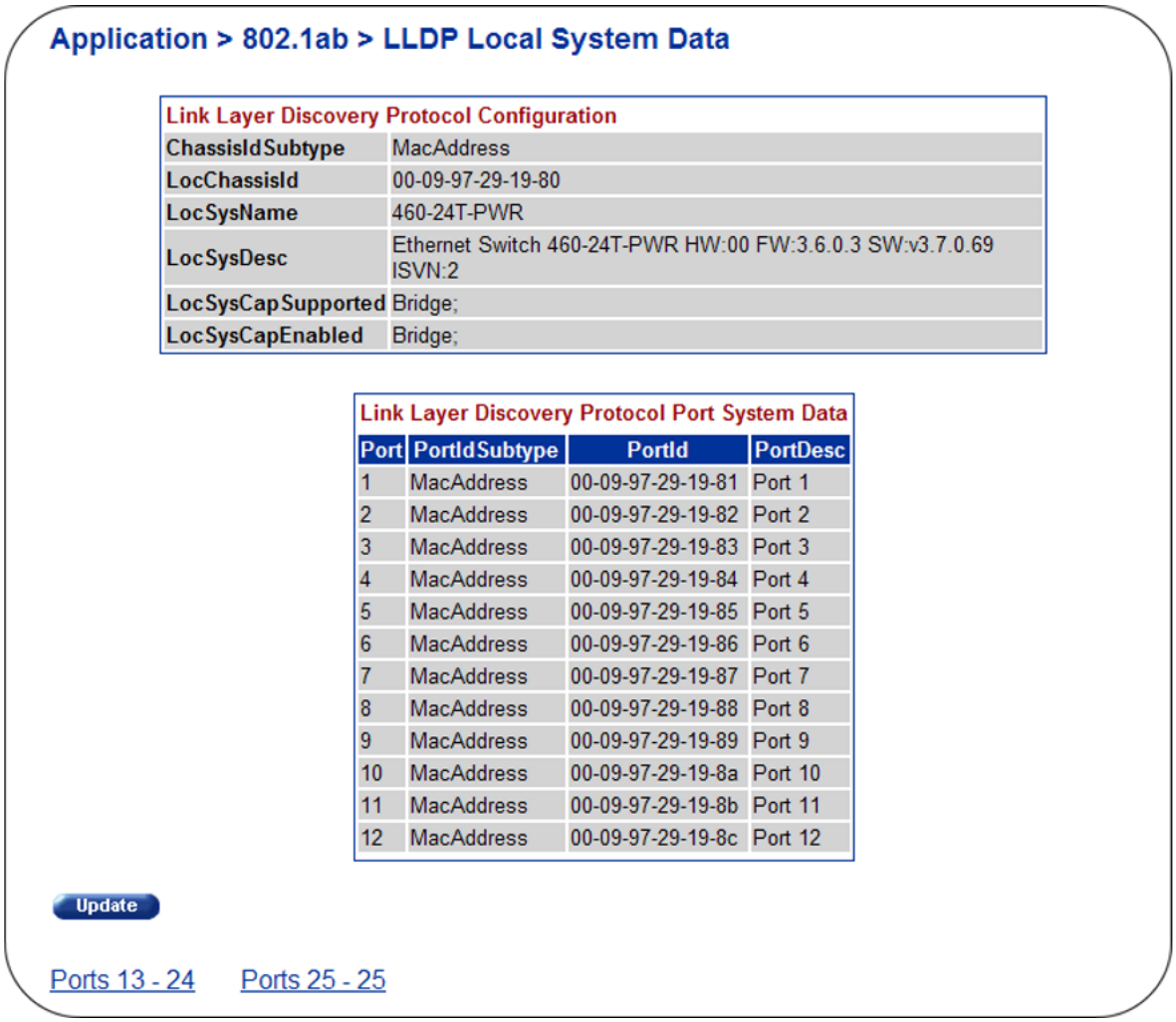


Table 222 "Link Layer Discovery Protocol Configuration page items" (page 495) describes the items on the Link Layer Discovery Protocol Configuration page.

Table 222
Link Layer Discovery Protocol Configuration page items

Field	Description
ChassisIdSubtype	The type of encoding used to identify the local system chassis: • chassisComponent • interfaceAlias • portComponent • macAddress • networkAddress • interfaceName • local
LocChassisId	Local chassis ID.
LocSysName	Local system name.
LocSysDesc	Local system description.
LocSysCapSupported	Identifies the system capabilities supported on the local system.
LocSysCapEnabled	Identifies the system capabilities that are enabled on the local system.

Table 223 "Link Layer Discovery Protocol Port System Data page items" (page 495) describes the items on the Link Layer Discovery Protocol Port System Data page.

Table 223
Link Layer Discovery Protocol Port System Data page items

Field	Description
Port	Port number.

Field	Description
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.

2 Click **Update** to refresh the data.

—End—

LLDP Local Management page

On the LLDP Local Management page, you can view LLDP management properties for the local system and configure link layer discovery protocol.

Use the following procedure to open the LLDP Local Management page:

Step	Action
1	From the main menu, select **Application > 802.1AB > LLDP Local Management**.

Figure 211
LLDP Local Management page

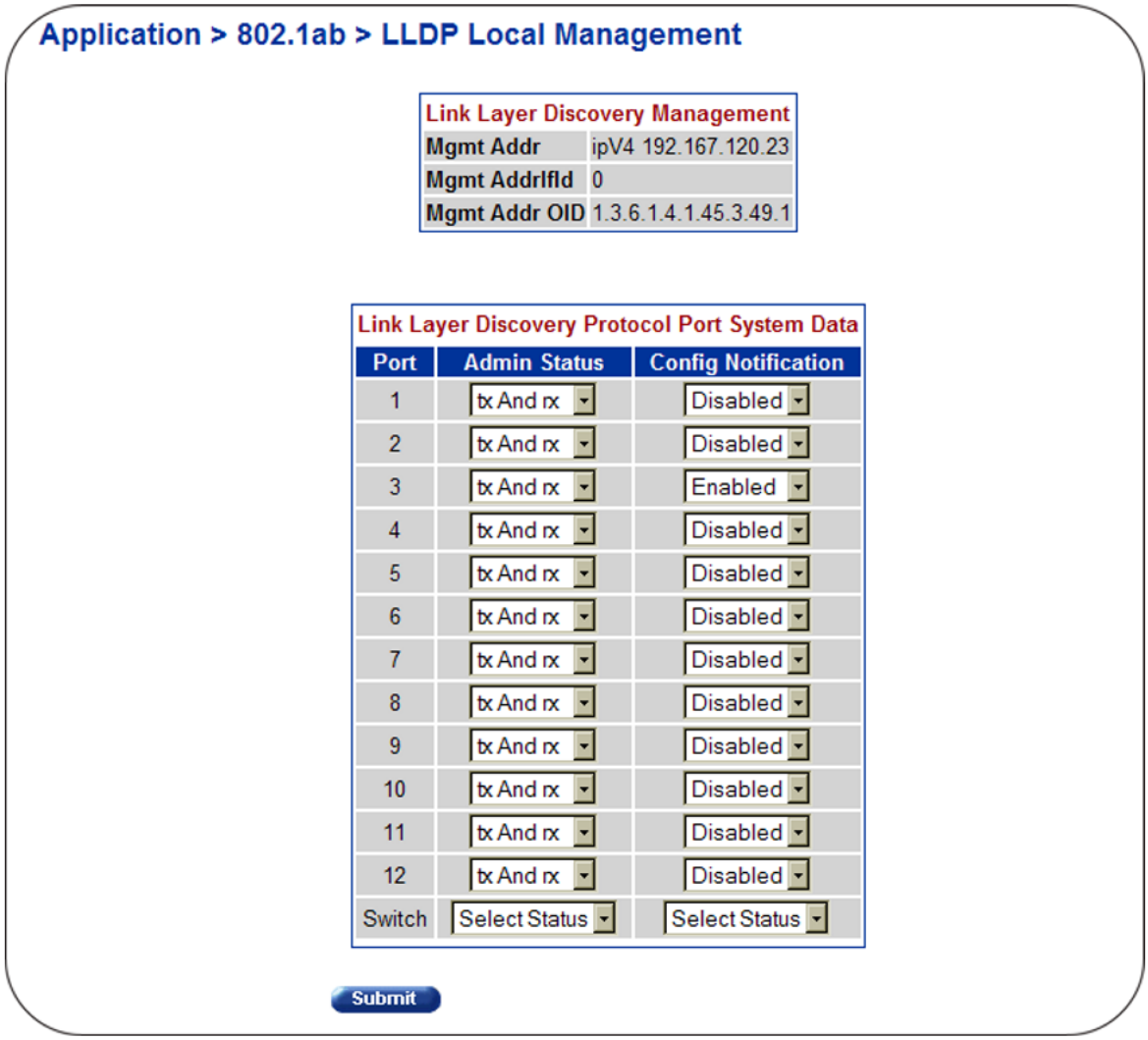


Table 224 "Link Layer Discovery Management page items" (page 497) describes the items on the Link Layer Discovery Management page.

Table 224
Link Layer Discovery Management page items

Field	Description
Mgmt 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.

Field	Description
Mgmt AddrIfId	The integer value used to identify the interface number of the management address component associated with the local system.
Mgmt 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.

Table 225 "Link Layer Discovery Protocol Port System Data page items" (page 498) describes the items on the Link Layer Discovery Protocol Port System Data page.

Table 225
Link Layer Discovery Protocol Port System Data page items

Field	Descriptions
Port	Port number.
Admin Status	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 information from remote systems that is stored in other tables before AdminStatus is disabled, the information ages out.
Config Notification	Controls, on a per-port basis, whether notifications from the agent are enabled: • enabled • disabled

2 Specify the required information in the text boxes.

3 Click **Submit**.

—End—

LLDP Tx - TLV page

On the LLDP Tx - TLV page, you can configure link layer discovery protocol Tx - TLV parameters.

Use the following procedure to open the LLDP Tx - TLV page:

Step	Action
1	From the main menu, select **Application > 802.1AB > LLDP Tx - TLV**.

Figure 212
LLDP Tx - TLV page

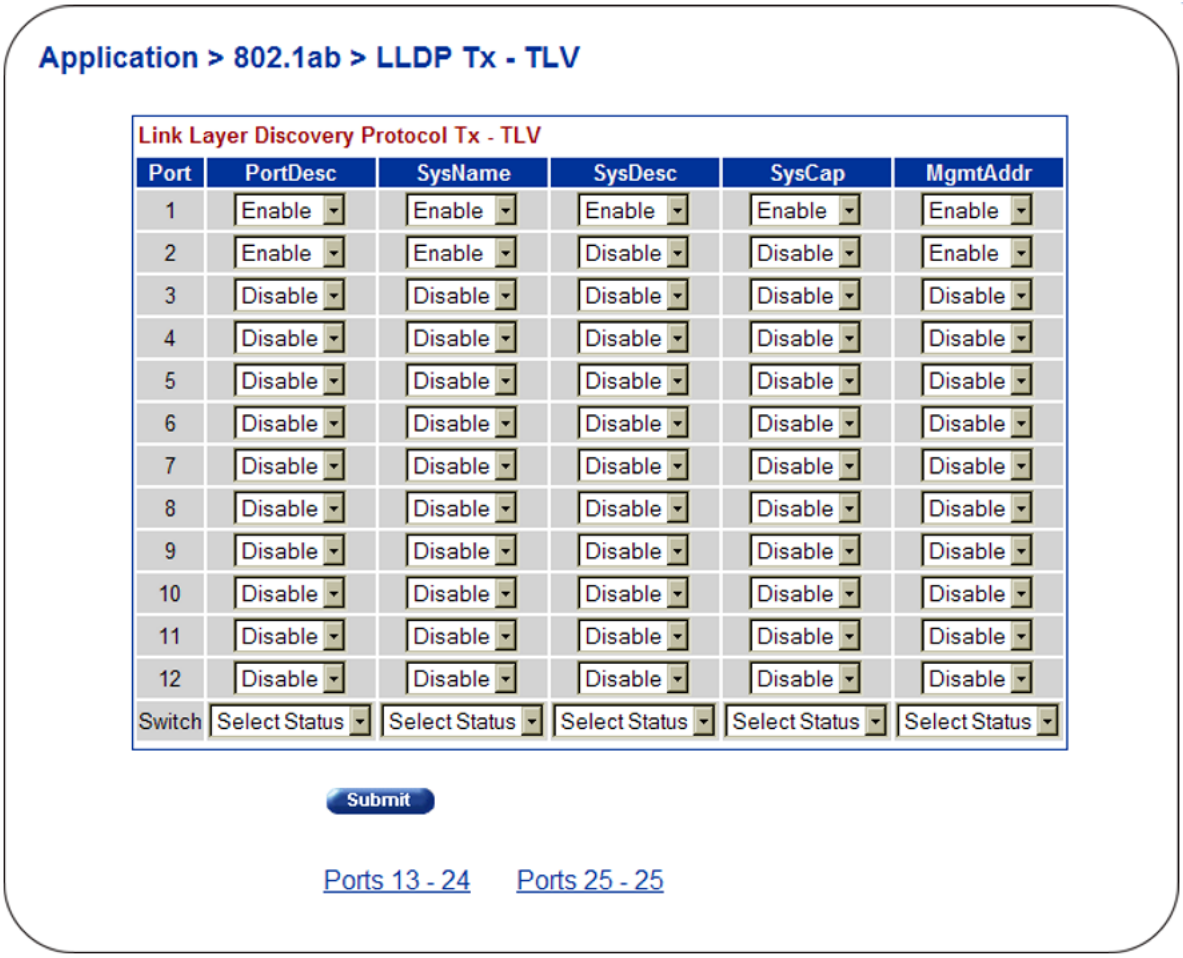


Table 226 "Link Layer Discovery Protocol Tx - TLV page items" (page 500) describes the items on the Link Layer Discovery Protocol Tx - TLV page.

Table 226
Link Layer Discovery Protocol Tx - TLV page items

Field	Description
Port	Port number.
PortDesc	Port description TLV.
SysName	System name TLV.
SysDesc	System description TLV.
SysCap	System capabilities TLV.
MgmtAddr	Local management address TLV.

2 Specify the required information in the text boxes.

3 Click **Submit**.

—End—

LLDP Rx - Tx Statistics page

On the LLDP Rx - Tx Statistics page, you can view general TLV statistics and link layer discovery protocol port system data.

Use the following procedure to open the LLDP Rx - Tx Statistics page:

Step	Action
1	From the main menu, select **Application > 802.1AB > LLDP Rx - Tx Statistics**.

Figure 213
LLDP Rx - Tx Statistics page

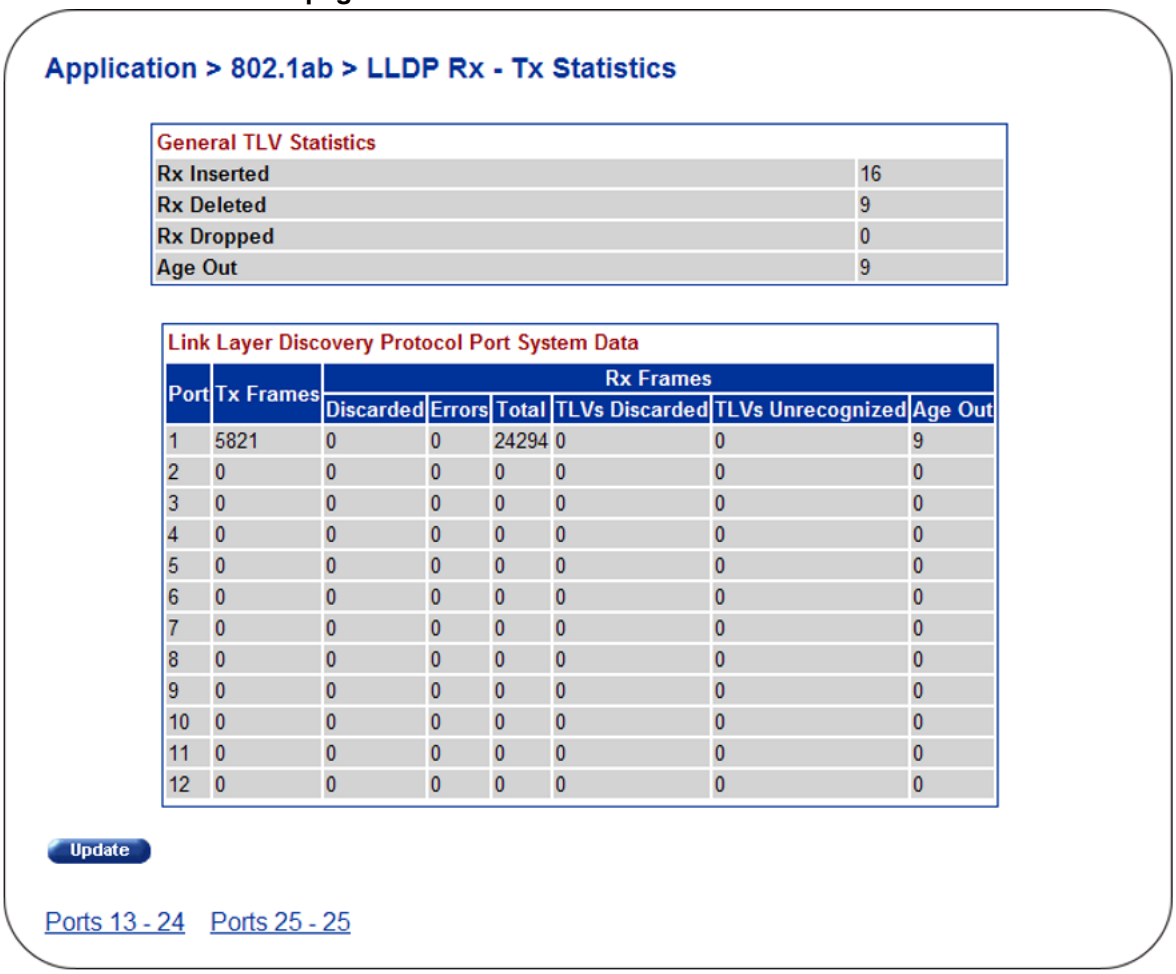


Table 227 "General TLV Statistics page items" (page 501) describes the items on the General TLV Statistics page.

Table 227
General TLV Statistics page items

Field	Description
Rx Inserted	Number of Rx frames inserted.
Rx Deleted	Number of Rx frames deleted.
Rx Dropped	Number of Rx frames dropped.
Age Out	Total number of system age-outs.

Table 228 "Link Layer Discovery Protocol Port System Data page items" (page 502) describes the items on the Link Layer Discovery Protocol Port System Data page.

Table 228
Link Layer Discovery Protocol Port System Data page items

Field	Description
Port	Port number.
Tx Frames	The number of LLDP frames transmitted by this LLDP agent on the indicated port.
Rx Frames	
Discarded	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.
Errors	The number of invalid LLDP frames received on the port while the LLDP agent is enabled.
Total	The number of valid LLDP frames received on the port while the LLDP agent is enabled.
TLVs Discarded	The number of LLDP TLVs discarded for any reason.
TLVs Unrecognized	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 a 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.
Age Out	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 Remote Systems Data and Extensions objects because the information timeliness interval has expired. This counter is similar to Stats Rem Tables Ageouts, except that it is on a per-port basis.

Field	Description
	This enables NMS to poll tables associated with the Remote Systems Data 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.

2 Click **Update** to refresh the page data.

—End—

LLDP Neighbor page

On the LLDP Neighbor page, you can view LLDP properties for the remote system.

Use the following procedure to open the LLDP Rx - Tx Statistics page:

Step	Action
1	From the main menu, select **Application > 802.1AB > LLDP Neighbor**.

Figure 214
LLDP Neighbor page

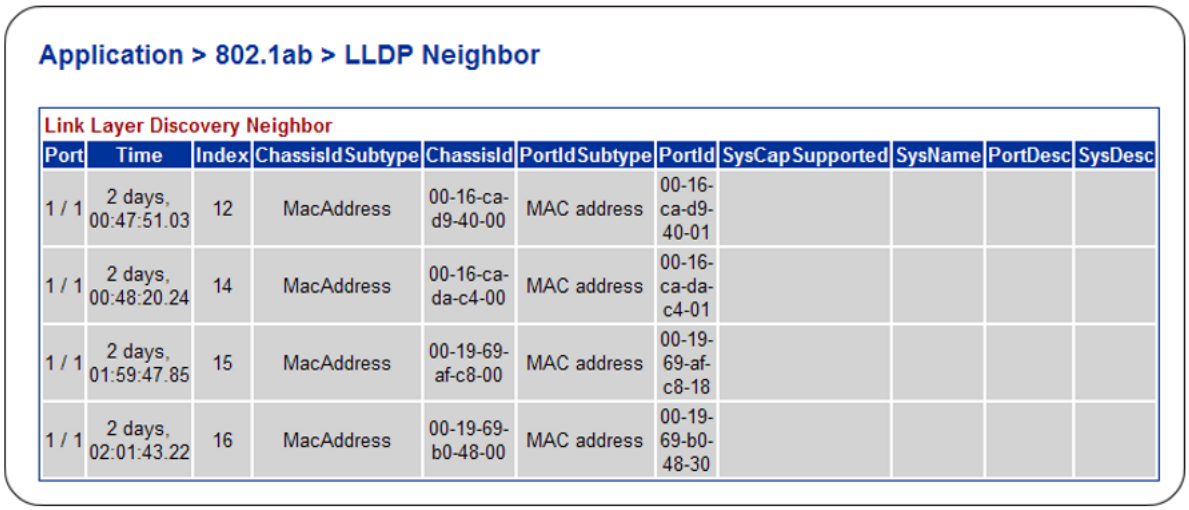


Table 229 "Link Layer Discovery Neighbor page items" (page 504) describes the items on the Link Layer Discovery Neighbor page.

Table 229
Link Layer Discovery Neighbor page items

Field	Description
Port	Identifies the local port, on which the remote system information is received.
Time	The Time Filter for this entry. See the Time Filter textual convention in IETF RFC 2021 for details about Time Filter.
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

Field	Description
	• local.
ChassisId	Remote chassis ID.
PortIdSubtype	The type of encoding used to identify the remote port: • interfaceAlias • portComponent • macAddress • networkAddress • interfaceName • agentCircuitId • local
PortId	Remote port ID.
SysCapSupported	Identifies the system capabilities supported on the remote system.
SysName	Remote system name.
PortDesc	Remote port description.
SysDesc	Remote system description.

—End—

LLDP Neighbor Management page

On the LLDP Neighbor Management page, you can view LLDP management properties for the remote system.

Use the following procedure to open the LLDP Neighbor Management page:

Step	Action
1	From the main menu, select **Application > 802.1AB > LLDP Neighbor Management**.

Figure 215
LLDP Neighbor Management page

Table 230 "Link Layer Discovery Protocol Neighbor Management page items" (page 506) describes the items on the Link Layer Discovery Protocol Neighbor Management page.

Table 230
Link Layer Discovery Protocol Neighbor Management page items

Field	Description
Port	Identifies the local port, on which the remote system information is received.
Time	The Time Filter for this entry.
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.

Field	Description
PortIdSubtype	The type of encoding used to identify the remote port: • interfaceAlias • portComponent • macAddress • networkAddress • interfaceName • agentCircuitId • local
PortId	Remote port ID.
Mgmt Addr	The management address associated with the remote system.
MgmtIf	The integer value used to identify the interface number of the management address component associated with the remote system.
Mgmt Addr OID	The value used to identify the type of hardware component or protocol entity associated with the management address advertised by the remote system agent.

—End—

Appendix A Default Settings

Table 231 "Factory default Ethernet Switch 470 settings" (page 509) lists the factory default settings for the Ethernet Switch 470 according to the Console Interface (CI) screens and fields for the settings.

Table 231
Factory default Ethernet Switch 470 settings

Field	Default setting	Refer to the following:
Unit	1	Figure 89 "IP configuration screen" (page 202)
BootP Request Mode	BootP When Needed	
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	SNMP Configuration screen (see *Security — Configuration (NN47210-500)*)
Read-Write Community String	private	
Trap IP Address	0.0.0.0 (no IP address assigned)	
Community String	Zero-length string	
Authentication Trap	Enabled	
Link Up/Down Trap	Enabled	
sysContact	Zero-length string	Figure 91 "Console Interface System Characteristics screen" (page 215)
sysName	Zero-length string	
sysLocation	Zero-length string	

Field	Default setting	Refer to the following:
Aging Time	300 seconds	"MAC Address Table screen" (see *Security — Configuration (NN47210-500)*)
Find an Address	00-00-00-00-00-00 (no MAC address assigned)	
Port Mirroring Address A:	00-00-00-00-00-00 (no MAC address assigned)	
Port Mirroring Address B:	00-00-00-00-00-00 (no MAC address assigned)	
MAC Address Security	Disabled	"MAC Address Security Configuration Menu screen" (see *Security — Configuration (NN47210-500)*)
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	MAC Address Security Port Configuration screen (see *Security — Configuration (NN47210-500)*)
Security	Disabled	
Port List	blank field	MAC Address Security Port Lists screens (see *Security — Configuration (NN47210-500)*)
Find an Address	blank field	MAC Address Security Table screens (see *Security — Configuration (NN47210-500)*)
MAC Address	- - - - - - (no address assigned)	
Allowed Source	- (blank field)	
MAC-SA based VLAN	The least active MAC-SA based VLAN is displayed.	MAC Address Configuration for MAC-SA-Based VLAN screen (see *Security — Configuration (NN47210-500)*)
Display/Create MAC Address	00-00-00-00-00-00	

Field	Default setting	Refer to the following:
Create VLAN	1	VLAN Configuration screen (see *Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*)
Delete VLAN	blank field	
VLAN Name	VLAN # (VLAN number)	
Management VLAN	Yes, VLAN #1	
IVL/SVL	IVL	
VLAN Type	Port-based	
Protocol ID (PID)	None	
User-Defined PID	0x0000	
VLAN State	Inactive	
Subnet Addr	0.0.0.0.	
Subnet Mask	0.0.0.0.	
Port Membership	U (all ports assigned as untagged members of VLAN 1)	
Unit	1	VLAN Port Configuration screen (see *Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*)
Port	1	
Filter Tagged Frames	No	
Filter Untagged Frames	No	
Filter Unregistered Frames	No	
Port Name	Unit 1, Port 1	
PVID	1	
Port Priority	0	
Tagging	Untagged Access	
AutoPVID	Disabled	
Unit	1	VLAN Display by Port screen (see *Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*)
Port	1	
PVID	1 (read only)	
Port Name	Unit 1, Port 1 (read only)	
Unit	1	" Port Configuration screen" (page 112)
Status	Enabled (for all ports)	Figure 41 "Rate Limiting Configuration screen" (page 117)
Autonegotiation	Enabled (for all ports)	
Speed/Duplex	100Mbs/Half (when Autonegotiation is Disabled)	

Field	Default setting	Refer to the following:
Trunk	1 to 6 (depending on configuration status)	MultiLink Trunk Configuration Menu screen (see *Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*)
Trunk Members (Unit/Port)	Blank field	
STP Learning	Normal	
Trunk Mode	Basic	
Trunk Status	Disabled	
Trunk Name	Trunk #1 to Trunk #6	
Traffic Type	Rx and Tx	MultiLink Trunk Utilization screen (see *Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*)
Monitoring Mode	Disabled	Port Mirroring Configuration screen (see *Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*)
Monitor/Unit Port	Zero-length string	
Unit/Port X	Zero-length string	
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)	
Packet Type	Both	Figure 41 "Rate Limiting Configuration screen" (page 117)
Limit	None	
VLAN	1	IGMP Configuration screen (see *Configuration — IP Multicast Routing Protocols (NN47210-504)*)
Snooping	Enabled	
Proxy	Enabled	
Robust Value	2	
Query Time	125 seconds	
Set Router Ports	Version 1	
Static Router Ports	- (for all ports)	
Unit	1	Port statistics screen (see *Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*)
Port	1	

Field	Default setting	Refer to the following:
Console Port Speed	9600 Baud	"Configuring the Console Port" (page 85)
Console Switch Password	Not Required	
Console Stack Password	Not Required	
Console Read-Only Switch Password	user	
Console Read-Write Switch Password	secure	
Console Read-Only Stack Password	user	
Console Read-Write Stack Password	secure	
Group	1	Spanning Tree Group Configuration screen (see *Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*)
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 1-16, respectively	
STP Group	1	Spanning Tree Port Configuration screen (see *Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*)
Participation	Normal Learning	
Priority	128	
Path Cost	10 or 100	
STP Group	1	Spanning Tree Switch Settings screen (see *Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*)

Field	Default setting	Refer to the following:
STP Group	1	Spanning Tree VLAN Membership screen (see *Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*)
TELNET Access	Enabled	TELNET/SNMP/Web Access Configuration screen (see *Security — Configuration (NN47210-500)*)
Login Timeout	1 minute	
Login Retries	3	
Inactivity Timeout	15 minutes	
Event Logging	All	
Allowed Source IP Address (50 user-configurable fields)	First field: 0.0.0.0 (no IP address assigned)	
	Remaining nine 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 nine fields: 255.255.255.255 (any address is allowed)	
Image Filename	Zero-length string	"Software Management" (page 218)
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	Figure 93 "Configuration file download/upload screen" (page 226)
TFTP Server IP Address	0.0.0.0 (no IP address assigned)	
Copy Configuration Image to Server	No	
Retrieve Configuration Image from Server	No	
ASCII Configuration Filename	Zero-length string	Figure 95 "ASCII configuration file download screen" (page 233)
TFTP Server IP Address	0.0.0.0 (no IP address assigned)	
Retrieve Configuration file from Server	No	
Last Manual Configuration Status	Passed	
Last Auto Configuration Status	Passed	
Auto Configuration on Reset	Disabled	

Table 232 "Factory default Ethernet Switch 460-24T-PWR settings" (page 515) lists the additional factory default settings for the Ethernet Switch 460-24T-PWR.

Table 232
Factory default Ethernet Switch 460-24T-PWR settings

Field	Default setting	Refer to the following:
Port Power Admin. Status	Enabled	Chapter 10 "Power over Ethernet for Ethernet Switches 460-PWR and 470-PWR" (page 271)
Power Usage Threshold	80%	
Power Pair	Spare	
Power Traps Control	Enabled	
Port Power Limit	Power Level = 16W Resolution = 1W Range = 3W to 20W	
Port Power Priority	Low	
Device Power Detection Mode	802.3af	
DC Source Type	Ethernet Switch Power Supply Unit 10	
DC Source Configuration	Power-sharing	

Appendix B
CLI Command List

This appendix provides the complete Command Line Interface (CLI) command list in alphabetical order, with associated references for further explanations.

Note: The information in this list is presented for reference only and is not to be considered an exact representation.

Table 233
CLI command list

Command	See:
`adac [enable] [op-mode` <*untagged-frames-basic* | *untagged-frames-advanced* | tagged-frames>] [traps enable] [voice-vlan <1-4094>] [uplink-port <slot/port>] [call-server-port <slot/port>]	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`adac mac-range-table low-end <MACaddress> high-end <MACaddress>`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`adac [port <port-list>] [tagged-frames-tagging {no-change | tag-all | tag-pvid-only | untag-pvid-only}] [tagged-frames-pvid {<1-4094> | no-change}]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`adac port <port-list> enable`	
`auto-negotiation-advertisements [port <portlist>] [10-full] [10-half] [100-full] [100-half] [1000-full] [1000-half] [asymm-pause-frame] [pause-frame]`	"auto-negotiation-advertisements command" (page 388)
`auto-pvid`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*

Command	See:
`autotopology`	"autotopology command" (page 373)
`boot [default] [unit <unitno>]`	"boot command" (page 348)
`clear logging [nv]`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*
`clear-stats [port<portlist>]`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*
`cli-password {switch | stack} {ro | rw} <WORD> <WORD>` `cli-password {switch | stack} {serial | telnet} {none | local | radius}`	*Security — Configuration (NN47210-500)*
`config radius auth-info-attr-value <value>`	*Configuration — IP Multicast Routing Protocols (NN47210-504)*
`config radius mcast-addr-attr-value <value>`	*Configuration — IP Multicast Routing Protocols (NN47210-504)*
`config switch mode <l2 | traffic-separation>`	"Enabling traffic separation" (page 370)
`configure {terminal | network}`	"configure command" (page 134)

`configure network [load-on-boot {disable | use-bootp | use-config}]`
`configure network [filename <WORD>]`
`configure network [address <XXX.XXX.XXX.XXX>]`
	"configure network" (page 337)

`configure network [address <A.B.C.D>] [filename <WORD>]`	"configure network" (page 337)
`configure network load-on-boot {disable | use-bootp | use-config} [address <A.B.C.D>] filename <WORD>`	"configure network load-on-boot" (page 338)
`cops retry`	*Configuration — Quality of Service and IP Filtering (NN47210-502)*
`cops server`	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*

Command	See:
`copy config nvram`	"copy config nvram" (page 371)
`copy config tftp [address <XXX.XXX.XXX.XXX>] filename <WORD>`	"copy config tftp command" (page 352)
`copy running-config tftp [address <A.B.C.D>] filename <WORD>`	"copy running-config" (page 336)
`copy tftp config [address <XXX.XXX.XXX.XXX>] filename <WORD>`	"copy config tftp command" (page 352)
`copy tftp config unit <unit #>`	"copy config tftp command" (page 352)
`default adac [enable] [op-mode] [traps enable] [voice-vlan] [uplink-port] [call-server-port]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`default adac mac-range-table`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`default adac [port <port-list>] [tagged-frames-tagging] [tagged-frames-pvid]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`default adac [port <port-list>] enable`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`default auto-negotiation-advertisements [port <portlist>]`	"default auto-negotiation-advertisements command" (page 389)
`default autotopology`	"default autotopology command" (page 373)
`default cops retry`	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*
`default cops server`	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*
`default duplex [port <portlist>]`	"default duplex command" (page 380)

Command	See:
`default eapol guest-vlan`	*Security — Configuration (NN47210-500)*
`default eapol multihost [port <portlist> [enable] [eap-macmax] [non-eap-mac-max] [non-eap-mac] [allow-non-eap-enable] [radius-non-eap-enable] [auto-non-eap-mhsa-enable]`	*Security — Configuration (NN47210-500)*
`default eapol multihost auto-non-eap-mhsa-enable`	*Security — Configuration (NN47210-500)*
`default eapol multihost eap-mac-max`	*Security — Configuration (NN47210-500)*
`default flowcontrol [port <portlist>]`	"default flowcontrol command" (page 382)
`default http-port`	*Security — Configuration (NN47210-500)*
`default ip address unit <1-8>`	"default ip address unit command" (page 316)
`default ip bootp server`	"default ip bootp server command" (page 350)
`default lacp aggregation [port <portlist>] enable`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`default lacp mode [port <portlist>]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`default lacp priority [port <portlist>]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`default lacp timeout-time [port <portlist>]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`default lacp system-priority`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`default logging`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*

Command	See:
`default logging remote level`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*
`default mac-address-table aging-time`	*Security — Configuration (NN47210-500)*
`default name [port <portlist>]`	"default name command" (page 377)
`default quickconfig`	"default quickconfig" (page 30)
`default rate-limit [port <portlist>]`	"default rate-limit command" (page 385)
`default set logging`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*
`default snmp trap link-status [port <portlist>]`	*Security — Configuration (NN47210-500)*
`default snmp-server authentication-trap`	*Security — Configuration (NN47210-500)*
`default snmp-server community [ro | rw]`	*Security — Configuration (NN47210-500)*
`default snmp-server contact`	*Security — Configuration (NN47210-500)*
`default snmp-server host`	*Security — Configuration (NN47210-500)*
`default snmp-server location <text>`	*Security — Configuration (NN47210-500)*
`default snmp-server name <text>`	*Security — Configuration (NN47210-500)*
`default snmp trap link-status [port <portlist>]`	*Security — Configuration (NN47210-500)*
`default spanning-tree bpdu-filtering [port <portlist>] [enable] [timeout]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`default spanning-tree [stp <1-16>] [forward-time] [hello-time] [max-age] [priority] [tagged-bpdu]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*

Command	See:
`default spanning-tree [port <portlist>] [stp <1-16>] [learning] [cost] [priority]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`default spanning-tree vlan <vlan-id> (used with PVST+)`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`default speed [port <portlist>]`	"default speed command" (page 379)
`default ssh [dsa-auth | dsa-key | max-sessions | pass-auth | port | t imeout]`	*Security — Configuration (NN47210-500)*
`default stack auto-unit-replacement enable`	"default stack auto-unit-replacement enable command" (page 270)
`default telnet-access`	*Security — Configuration (NN47210-500)*
`default vlan igmp {<1-4094> | unknown-mcast-no-flood}`	*Configuration — IP Multicast Routing Protocols (NN47210-504)*
`default vlan mgmt <1-4094>`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`default vlan configcontrol`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`disable`	"disable command" (page 135)
`download [address <ip>] {image <image-name> | image-if-newer <image name> | diag <filename>} [no-reset]`	"download command" (page 340)
`duplex [port <portlist>] {full | half | auto}`	"duplex command" (page 379)

Command	See:
`eapol [{enable | disable}] [port <portlist>] [init] [status authorized | unauthorized | auto] [traffic-control in-out | in] [re-authentication enable | disable] [re-authentication-interval <num>] [re-authenticate] [quiet-interval <num>] [transmit-interval <num>] [supplicant-timeout <num>] [server-timeout <num>] [max-request <num>]`	*Security — Configuration (NN47210-500)*
`eapol guest-vlan <portlist> vid <1-4094>`	*Security — Configuration (NN47210-500)*
`eapol multihost allow-non-eap-enable`	*Security — Configuration (NN47210-500)*
`eapol multihost auto-non-eap-mhsa-enable`	*Security — Configuration (NN47210-500)*
`eapol multihost [port <portlist>] allow-non-eap-enable`	*Security — Configuration (NN47210-500)*
`eapol multihost [port <portlist>] enable`	*Security — Configuration (NN47210-500)*
`eapol multihost [port <portlist>]`	*Security — Configuration (NN47210-500)*
`eapol multihost <port> enable`	*Security — Configuration (NN47210-500)*
`eapol multihost <port> enable [eap-mac-max <1-32>]`	*Security — Configuration (NN47210-500)*
`eapol multihost [port <portlist>] non-eap-mac-max <value>`	*Security — Configuration (NN47210-500)*
`eapol multihost non-eap-mac-max [port <portlist>] <H.H.H>`	*Security — Configuration (NN47210-500)*
`eapol multihost radius-non-eap-enable`	*Security — Configuration (NN47210-500)*
`eapol multihost [port <portlist>] radius-non-eap-enable`	*Security — Configuration (NN47210-500)*
`eapol user-based-policies enable`	*Security — Configuration (NN47210-500)*
`enable`	"enable command" (page 133)
`end`	"end command" (page 135)
`exit`	"exit command" (page 135)

Command	See:
`flowcontrol [port <portlist>] {asymmetric | symmetrid | auto | disable}`	"flowcontrol command" (page 381)
`help`	"help command" (page 130)
`help commands [mode {current | exec | privileged exec | config | ifconfig}]`	"help commands mode command" (page 130)
`help modes`	"help modes command" (page 132)
`http-port <1024-65535>`	*Security — Configuration (NN47210-500)*
`interface FastEthernet {<portlist>}`	"interface command" (page 134)
`ip address[stack | switch] <XXX.XXX.XXX.XXX> [netmask <XXX.XXX.XXX.XXX>]`	"ip address command" (page 312)
`ip address unit <1-8> A.B.C.D`	"ip address unit command" (page 315)
`ip bootp server {last | needed | disable | always}`	"ip bootp server command" (page 349)
`ip default-gateway <XXX.XXX.XXX.XXX>`	"ip default-gateway command" (page 314)
`ipmgr {source-ip <1-50> <XXX.XXX.XXX.XXX> [mask <XXX.XXX.XXX.XXX>]}`	*Security — Configuration (NN47210-500)*
`ipmgr {telnet | snmp | http} {[source-ip <1-50> <XXX.XXX.XXX.XXX>] [mask <XXX.XXX.XXX.XXX>]}`	*Security — Configuration (NN47210-500)*
`lacp aggregation [port <portlist>] enable`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`lacp key [port <portlist>] <1-4095>`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`lacp mode [port <portlist>] {off | passive | active}`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`lacp priority [port <portlist>] <0-255>`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*

Command	See:
`lacp system-priority [0-65535]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`lacp timeout-time [port <portlist>] {short | long}`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`logging remote address <A.B.C.D>`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*
`logging remote level {critical | informational | serious }`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*
`logout`	"logout command" (page 133)
`mac-address-table aging-time <time>`	*Security — Configuration (NN47210-500)*
`mac-security [disable | enable] [filtering {enable | disable}] [intrusion-detect {enable | disable | forever}] [intrusion-timer <1-65535>] [learning-ports <portlist>] [learning {enable | disable}] [snmp-lock {enable | disable}] [snmp-trap {enable | disable}]`	*Security — Configuration (NN47210-500)*
`mac-security auto-learning <portlist> [enable | disable] [max-addrs <1-25>]`	*Security — Configuration (NN47210-500)*
`mac-security auto-learning aging time <0-65535>`	*Security — Configuration (NN47210-500)*
`mac-security [port <portlist>] {disable | enable | learning}`	*Security — Configuration (NN47210-500)*
`mac-security mac-address-table address <H.H.H.> {port <portlist> | security-list <1-32>}`	*Security — Configuration (NN47210-500)*
`mac-security security-list <1-32>` `mac-security security-list <portlist>`	*Security — Configuration (NN47210-500)*
`mac-security mac-da-filter`	*Security — Configuration (NN47210-500)*

Command	See:
`mlt <id> [name <trunkname>] [enable | disable] [member <portlist>] [learning {disable | fast | normal} ]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`mlt shutdown-ports-on-disable enable`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`mlt spanning-tree <1-6> [stp <stp id>, ALL>] [learning {disable | normal | fast}]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`name [port <portlist>] <LINE>`	"name command" (page 377)
`no adac [enable] [traps enable] [voice-vlan] [uplink-port] [call-server-port]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`no adac mac-range-table low-end <MACaddress> high-end <MACaddress>`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`no adac port <port-list> enable`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`no auto-negotiation-advertisements [port <portlist>]`	"no auto-negotiation-advertisements command" (page 389)
`no auto-pvid`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`no autotopology`	"no autotopology command" (page 373)
`no cops server`	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*
`no eapol guest-vlan [enable]`	*Security — Configuration (NN47210-500)*
`no eapol multihost auto-non-eap-mhsa-enable`	*Security — Configuration (NN47210-500)*

Command	See:
`no eapol multihost <port> enable`	*Security — Configuration (NN47210-500)*
`no eapol multihost [port <portlist>] enable`	*Security — Configuration (NN47210-500)*
`no flowcontrol [port <portlist>]`	"no flowcontrol command" (page 382)
`no ip address {stack | switch}`	"no ip address command" (page 313)
`no ip address unit <1-8>`	"no ip address unit command" (page 316)
`no ip bootp server`	"no ip bootp server command" (page 350)
`no ip default-gateway`	"no ip default-gateway command" (page 314)
`no ipmgr {telnet | snmp | http}`	*Security — Configuration (NN47210-500)*
`no ipmgr {source IP [<1-50>]}`	*Security — Configuration (NN47210-500)*
`no lacp aggregation [port <portlist>] enable`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`no logging remote address`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*
`no logging remote level`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*
`no mac-security`	*Security — Configuration (NN47210-500)*
`no mac-security mac-address-table {address <H.H.H> | port <portlist> | security-list <1-32>]`	*Security — Configuration (NN47210-500)*
`no mac-security security-list <1-32>`	*Security — Configuration (NN47210-500)*
`no mlt [<id>]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*

Command	See:
`no mlt shutdown-ports-on-disable enable`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`no name [port <portlist>]`	"no name command" (page 377)
`no password security`	*Security — Configuration (NN47210-500)*
`no port-mirroring`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*
`no quickconfig enable`	"no quickconfig enable" (page 30)
`no radius-server`	*Security — Configuration (NN47210-500)*
`no rate-limit [port <portlist>]`	"no rate-limit command" (page 385)
`no remote logging enable`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*
`no rmon alarm [1...65535]`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*
`no rmon event [1...65535]`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*
`no rmon history [1...65535]`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*
`no rmon stats [1...65535]`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*
`no set logging`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*

Command	See:
`no shutdown [port <portlist>]`	"no shutdown command" (page 376)
`no snmp-server [authentication-trap | community [ro | rw] contact | host [<host-ip> <community-string>] [location | name]`	*Security — Configuration (NN47210-500)*
`no snmp-server host <host-ip> {v1|v2c|v3}`	*Security — Configuration (NN47210-500)*
`no snmp-server user <username>`	*Security — Configuration (NN47210-500)*
`no snmp-server view <viewname>`	*Security — Configuration (NN47210-500)*
`no snmp trap link-status [port <portlist>]`	*Security — Configuration (NN47210-500)*
`no sntp enable`	"no sntp enable command" (page 364)
`no sntp server <primary | secondary>`	"no sntp server command" (page 366)
`no ssh [dsa-auth | dsa-key | pass-auth]`	*Security — Configuration (NN47210-500)*
`no ssh secure`	*Security — Configuration (NN47210-500)*
`no ssl`	*Security — Configuration (NN47210-500)*
`no spanning-tree bpdu-filtering [port <portlist>] [enable]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`no spanning-tree [port <portlist>] [stp <1-16>]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`no spanning-tree vlan <vlan-id> (used with PVST+)`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`no stack auto-unit-replacement enable`	"no stack auto-unit-replacement enable command" (page 269)
`no telnet-access [source-ip [<1-50>]]`	*Security — Configuration (NN47210-500)*

Command	See:
`no tftp-server`	"no tftp-server command" (page 352)
`no vlacp enable`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`no vlacp macaddress`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`no vlan <1-4094>` `no vlan mac-address <1-4094> address <H.H.H.>`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`no web-server`	*Security — Configuration (NN47210-500)*
`password aging-time day <aging-value>`	*Security — Configuration (NN47210-500)*
`password security`	*Security — Configuration (NN47210-500)*
`ping <XXX.XXX.XXX.XXX>`	"ping command" (page 328)
`poe poe-dc-source-conf [unit <1-8>] {powersharing | rpsu | ups}`	Figure 95 "ASCII configuration file download screen" (page 233)
`poe poe-dc-source-type [unit <1-8>] {RPS10 | nes}>`	"poe poe-dc-source-type command" (page 274)
`poe poe-pd-detect-type [unit <1-8>] {802dot3af | 802dot3af_and_legacy}`	"poe poe-pd-detect-type command" (page 276)
`poe poe-limit [unit <1-8>] <3-16>`	"poe poe-limit command" (page 283)
`poe poe-power-pairs [unit <1-8>] {spare | signal}`	"poe poe-power-pairs command" (page 277)
`poe poe-power-usage-threshold [unit <1-8>] <1-99>`	"poe poe-power-usage-threshold command" (page 278)
`poe poe-priority [port <portlist>] {low | high | critical}`	"poe poe-priority command" (page 282)
`poe poe-shutdown [port <portlist>]`	"poe poe-shutdown command" (page 281)

Command	See:
`poe poe-trap [unit <1-8>]`	"poe poe-trap command" (page 279)

`port-mirroring mode disable`
 	
`port-mirroring mode Xrx monitor-port <portlist> mirror-port X <portlist>`
 	
`port-mirroring mode XrxOrXtx monitor-port <portlist> mirror-port X <portlist> mirror-port-Y <portlist>`
 	
`port-mirroring mode XrxOrYtx monitor-port <portlist> mirror-port X <portlist> mirror-port-Y <portlist>`
 	
`port-mirroring mode XrxYtx monitor-port <portlist> mirror-port X <portlist> mirror-port-Y <portlist>`
 	
`port-mirroring mode XrxYtxOrYrxXtx monitor-port <portlist> mirror-port X <portlist> mirror-port-Y <portlist>`
 	
`port-mirroring mode Asrc monitor-port <portlist> mirror-MAC-A <macaddr>`
 	
`port-mirroring mode Adst monitor-port <portlist> mirror-MAC-A <macaddr>`
 	
`port-mirroring mode AsrcOrAdst monitor-port <portlist> mirror-MAC-A <macaddr>`
 	
`port-mirroring mode AsrcBdst monitor-port <portlist> mirror-MAC-A <macaddr> mirror-MAC-B <macaddr>`
 	
`port-mirroring mode AsrcBdstOrBsrcAdst monitor-port <portlist> mirror-MAC-A <macaddr> mirror-MAC-B <macaddr>`
	Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)

Command	See:
qos action <actid> name <actname> qos action <actid> drop-action {enable | disable} qos action <actid> update-dscsp <dscp> qos action <actid> update-1p {<ieee1p> | default | use-egress-map} qos action <actid> set-drop-prec {loss-sensitive | not-loss-sensitive | default | use-egress-map}	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*
qos egressmap	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*
qos if-assign	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*
qos if-assign-list	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*
qos if-assign-list name <tag> {add | del} [portlist <portlist>]	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*
qos if-assign name <tag> {add | del} [port <portlist>]	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*
qos if-group	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*
qos if-group name <tag> {create <ifclass> | delete}	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*

Command	See:
`qos ingressmap`	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*
`qos ingressmap 1p <ieee1p> ds <dscp>`	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*

`qos ip-filter <fid> {create src-ip <src-ip-info>}`
 	
`qos ip-filter <fid> {create dst-ip <dst-ip-info>}`
 	
`qos ip-filter <fid> {create ds-field <dscp>}`
 	
`qos ip-filter <fid> {create protocol <protocoltype>}`
 	
`qos ip-filter <fid> {create src-port <port>}`
 	
`qos ip-filter <fid> {create dst-port <port>}`
 	
`qos ip-filter <fid> {delete}`
	Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)

`qos ip-filter-set <fgid> {create set <setid> [name <setname>] filter-id <fid> filter-prec <prec>}`
 	
`qos ip-filter-set <fgid> {delete}`
	Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)

`qos l2-filter <fid> {create ethertype <etype>}`
 	
`qos l2-filter <fid> {create vlan <vidlist>}`
 	
`qos l2-filter <fid> {create vlantag <vtag>}`
 	
`qos l2-filter <fid> {create priority<ieee1p-seq>}`
 	
`qos l2-filter <fid> {create dsfield <dscp>}`
 	
`qos l2-filter <fid> {create protocol`
	Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)

Command	See:
<protocoltype>} qos l2-filter <fid> {create src-port <min> src-port <max>} qos l2-filter <fid> {create dst-port <min> dst-port <max>} qos l2-filter <fid> {delete}	
qos l2-filter-set <fgid> {create set <setid> [name <setname>] filter-id <fid> filter-prec <prec>} qos l2-filter-set <fgid> {delete}	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*
qos meter <metid> {create [name <metname>] committed-rate <rate> max-burst-rate <burstrate> [max-burst-duration <burstdur>] | delete}	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*
qos policy	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*
qos queue-set	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*
qos shaper	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*
qosagent class-restrictions	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*
qosagent packet-reordering	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*
qosagent police-statistics {enable | disable}	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*

Command	See:
`qosagent reset-default`	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*
`qosagent server-control`	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*
`quickconfig enable`	"quickconfig enable" (page 29)
`quickconfig start-recording`	"quickconfig start-recording" (page 30)
`radius-server host <address> [secondary-host <address>] port <num> key <string> timeout <1-60>`	*Security — Configuration (NN47210-500)*
`radius-server password fallback`	*Security — Configuration (NN47210-500)*
`rate-limit [port <portlist>] {multicast <pct> | broadcast <pct> | both <pct>}`	"rate-limit command" (page 384)
`reload`	"reload command" (page 137)
`remote logging enable`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*
`renumber unit`	"Renumber unit command" (page 318)
`restore factory-default`	"restore factory-default command" (page 32)
`rmon alarm <1-65535> <WORD> <1-2147483647> [absolute | delta] rising-threshold <-2147483647-2147483648> [<1-65535>] falling-threshold <-2147483647-2147483648> [<1-65535>] [owner <LINE>]`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*
`rmon event <1-65535> [log] [trap] [description <LINE>] [owner <LINE>]`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*
`rmon history <1-65535> <LINE> <1-65535> <1-3600> [owner <LINE>]`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*

Command	See:
`rmon stats <1-65535> <LINE> [owner <LINE>]`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*
save config	"save config command" (page 372)
`set logging [enable | disable] [level critical | serious | informational] [nv-level critical | serious | informational | none]`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*
`show adac`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show adac interface <interface-type> <slot/port>`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show adac mac-range-table`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show arp-table command`	"Displaying the ARP table" (page 357)
`show audit log [asccfg | serial | ssh | telnet]`	*Security — Configuration (NN47210-500)*
`show auto-negotiation-advertisements [port <portlist>]`	"show auto-negotiation-advertisements command" (page 386)
`show auto-negotiation-capabilities [port <portlist>]`	"show auto-negotiation-capabilities command" (page 387)
`show autotopology settings`	"show autotopology settings" (page 373)
`show autotopology nmm-table`	"show autotopology nmm-table" (page 374)
`show config-network`	"show config-network command" (page 334)
`show cops`	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*

Command	See:
`show cops retry`	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*
`show cops server`	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*
`show cops stats`	*Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)*
`show cpu-utilization`	"show cpu-utilization command" (page 138)
`show eapol [port <portlist>]`	*Security — Configuration (NN47210-500)*
`show eapol guest-vlan`	*Security — Configuration (NN47210-500)*
`show eapol guest-vlan interface <portlist>`	*Security — Configuration (NN47210-500)*
`show eapol multihost`	*Security — Configuration (NN47210-500)*
`show eapol multihost status`	*Security — Configuration (NN47210-500)*
`show eapol multihost interface <portlist>`	*Security — Configuration (NN47210-500)*
`show eapol multihost non-eap-mac interface <portlist>`	*Security — Configuration (NN47210-500)*
`show eapol multihost non-eap-mac status <portlist>`	*Security — Configuration (NN47210-500)*
`show http-port`	*Security — Configuration (NN47210-500)*
`show interfaces [names] [<portlist>]`	"show interfaces command" (page 358)
`show interfaces gbic-info <portlist>`	"show interfaces gbic-info command" (page 145)
`show ip [bootp] [default-gateway] [address [stack | switch]]`	"show ip command" (page 314)
`show ipmgr`	*Security — Configuration (NN47210-500)*

Command	See:
`show lacp debug member [portlist]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show lacp port [<portlist>]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show lacp stats [port <portlist>]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show lacp system`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*

`show logging [critical]`
`show logging [serious]`
`show logging [informational]`
	Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)

`show mac-address-table [aging-time]` `show mac-address-table [vid <1-4094>] [address <H.H.H.>]`	*Security — Configuration (NN47210-500)*
`show mac-security {config | mac-address-table [addr <macaddr>] | port | security-lists}`	*Security — Configuration (NN47210-500)*
`show mac-security mac-da-filter`	*Security — Configuration (NN47210-500)*
`show shutdown-ports-on-disable`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show mlt spanning-tree <1-6>`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show mlt [utilization <1-6>]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*

Command	See:
`show password aging-time day`	*Security — Configuration (NN47210-500)*
`show password security`	*Security — Configuration (NN47210-500)*
`show poe-main-status [unit <1-8>]`	Table 150 "no shutdown command parameters and variables" (page 376)
`show poe-port-status [ports <portlist>]`	"show poe-port-status command" (page 285)
`show poe-power-measurement [ports <portlist>]`	"show poe-power-measurement command" (page 286)
`show port-mirroring`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*
`show port-statistics [port <portlist>]`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*

`show qos if-assign-list`
`show qos interface-assignments`
`show qos interface-groups`
`show qos egressmap`
`show qos ingressmap`
`show qos ip-filters`
`show qos ip-filter-sets`
`show qos l2-filters`
`show qos l2-filter-sets`
`show qos actions`
`show qos meters`
	Nortel Ethernet Switch 460/470 Configuration — Quality of Service and IP Filtering (NN47210-502)

Command	See:
`show qos shapers`	
`show qos policies`	
`show qos queue-sets`	
`show qos queue-set-assignments`	
`show qos agent`	
`show qos statistics`	
`show quickconfig`	"show quickconfig" (page 30)
`show radius-server`	*Security — Configuration (NN47210-500)*
`show rate-limit`	"show rate-limit command" (page 383)
`show rmon alarm`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*
`show rmon event`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*
`show rmon history`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*
`show rmon stats`	*Nortel Ethernet Switch 460/470 Configuration — System Monitoring (NN47210-503)*
`show running-config`	"show running-config" (page 335)
`show snmp-server {community|host|user|view}`	*Security — Configuration (NN47210-500)*
`show sntp`	"show sntp command" (page 362)

Command	See:
`show spanning-tree bpdu-filtering [<interface-type>] [port <portlist>]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show spanning-tree cost-calc-mode`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show spanning-tree port-mode`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show spanning-tree {stp <1-16>] {config | port}`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show spanning-tree rstp info`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show spanning-tree rstp statistics`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show spanning-tree rstp status`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show spanning-tree rstp port info`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show spanning-tree rstp port statistics`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show spanning-tree rstp port status`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show spanning-tree mstp info`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*

Command	See:
`show spanning-tree mstp region`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show spanning-tree mstp statist`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show spanning-tree mstp statu`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show spanning-tree mstp port info [<portlist>]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show spanning-tree mstp port statistics [<portlist>]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show spanning-tree mstp msti info <1 - 15>`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show spanning-tree mstp msti statistics <1-15>`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show spanning-tree mstp msti port info <1-15> [<portlist>]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show spanning-tree mstp msti port statistics <1-15> [<portlist>]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show spanning-tree config vlan <vlan-id> (used with PVST+)`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show spanning-tree op-mode`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*

Command	See:
`show spanning-tree port vlan <vlan-id> [<port-list>] (used with PVST+)`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`ssh dsa-key-gen [<512-1024>]`	*Security — Configuration (NN47210-500)*
`show ssh global`	*Security — Configuration (NN47210-500)*
`show ssh session`	*Security — Configuration (NN47210-500)*
`show ssh download-auth-key`	*Security — Configuration (NN47210-500)*
`show ssl`	*Security — Configuration (NN47210-500)*
`show ssl certificate`	*Security — Configuration (NN47210-500)*
`show stack auto-unit-replacement`	Figure 159 "Edit IP dialog box -- ARP tab" (page 400)
`show-stack-info`	"show stack-info command" (page 143)
`show stack-oper-mode`	"stack replace unit command" (page 260)
`show sys-info`	"show sys-info command" (page 141)
`show system verbose`	"show system verbose command" (page 143)
`show tech`	"show tech command" (page 144)
`show telnet-access`	*Security — Configuration (NN47210-500)*
`show terminal`	"show terminal command" (page 344)
`show tftp-server`	"show tftp-server command" (page 351)
`show vlacp`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*

Command	See:
`show vlacp interface <slot/port>`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show vlan igmp <1-4094> | unknown-mcast-no-flood`	*Configuration — IP Multicast Routing Protocols (NN47210-504)*
`show vlan interface info [<portlist>]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show vlan interface vids [<portlist>]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show vlan mac-address <1-4094> [<H.H.H.>]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`show vlan multicast membership <1-4094>`	*Configuration — IP Multicast Routing Protocols (NN47210-504)*
`show vlan configcontrol`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`shutdown`	"shutdown command" (page 136)
`shutdown [port <portlist>]`	"shutdown port command" (page 375)
`snmp trap link-status [port <portlist>]`	*Security — Configuration (NN47210-500)*
`snmp-server {{enable | disable} | authentication-trap | community <community-string> [ro | rw] contact <text> | host <host-ip> <community-string> | location <text> | name <text>}`	*Security — Configuration (NN47210-500)*
`snmp-server bootstrap <minimum-secure> | <semi-secure> | <very-secure>`	*Security — Configuration (NN47210-500)*

Command	See:
`snmp-server community <community-string> {read-view <view-name>|write-view <view-name>|notify-view <view-name>}`	*Security — Configuration (NN47210-500)*
`snmp-server host <host-ip> [port <1-65535>] {v1 <community -string>| v2c <community -string>| v3 {auth|no-auth|auth-priv} <username>}`	*Security — Configuration (NN47210-500)*
`snmp-server user <username> [read-view <view-name>] [write-view <view-name>] [notify-view <view-name>] [{md5|sha} <password>] [read-view <view-name>] [write-view <view-name>] [notify-view <view-name>] [{3des|aes|des} <password> [read-view <view-name>] [write-view <view-name>] [notify-view <view-name>]`	*Security — Configuration (NN47210-500)*
`snmp-server view <viewname> <OID> [<OID>] [<OID>] [<OID>] [<OID>] [<OID>] [<OID>] [<OID>] [<OID>] [<OID>]`	*Security — Configuration (NN47210-500)*
`snmp trap link-status [port <portlist>]`	*Security — Configuration (NN47210-500)*
`sntp enable`	"sntp enable command" (page 364)
`sntp server primary address <A.B.C.D>`	"sntp server primary address command" (page 365)
`sntp server secondary address <A.B.C.D>`	"sntp server secondary address command" (page 365)
`sntp sync-interval <0-168>`	"sntp sync-interval command" (page 366)
`sntp sync-now`	"sntp sync-now command" (page 366)
`spanning-tree bpdu-filtering [port <portlist>] [enable] [timeout {0 | <10-65535>}]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`spanning-tree cost-calc-mode {dot1d | dot1t}`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*

Command	See:
spanning-tree [stp <1-16>] [forward-time <4-30>] [hello-time <1-10>] [max-age <6-40>] [priority <0000 | 1000 | 2000 | ... | F000>] [tagged-bpdu {enable | disable}] [tagged-bpdu-vid <1-4094>] [multicast-address <H.H.H.>]	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
spanning- tree mstp [max-hop <600 - 4000>] [max-instance <1 - 65>] [forward-time <4 - 30>] [hello-time <1 - 10>] * not available in software [max-age <6 - 40>] [pathcost-type { bits16 | bits32 }] [priority { 0000 | 10000 | 20000 | ...| F0000 }] [tx-holdcount <1 - 10>] [version { stp-compatible | rstp | mstp }]	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
spanning- tree mstp [port <portlist>] [cost <1 - 200000000>] [edge-port { false | true }] [hello-time <1 - 10>] [learning { disable | enable }] [p2p { auto | force-false | force-true }] [priority { 00 | 10 | ...| F0 }] [protocol-migration { false | true }]	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
spanning- tree mstp region [config-id-sel <0 - 255>] [region-name <1 - 32 chars>] [region-version <0 - 65535>]	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
spanning- tree mstp msti<1-15>[forward-time <4 - 30>] * not available in software [hello-time <1 - 10>] * not available in software [max-hop <600 - 4000>] * not available in software [priority { 0000 | 1000 | ...| F000 }] [add-vlan <vid>] [remove-vlan <vid>]	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*

Command	See:
spanning- tree mstp msti <1-15> [port <portlist>] [cost <1 - 200000000>] [learning { disable | enable }] [priority { 00 | 10 | ... | F0 }]	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
spanning-tree op-mode <*pvst* | *stpg* | *rstp* | *mstp*>	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
spanning-tree [port <portlist>] [stp <1-16>] [learning {disable | normal | fast}] [cost <1-65535>] [priority <00 | 10 | 20 | ... | F0>]	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
spanning-tree [stp <1-16>] [forward-time <4-30>] [hello-time <1-10>] [max-age <6-40>] [priority <0-65535>] [tagged-bpdu {enable | disable}] [tagged-bpdu-vid <1-4094>]	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
spanning-tree [port <portlist>] [stp <1-16>] [learning {disable | normal | fast}] [cost <1-65535>] [priority <0-255>]	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
spanning-tree port-mode {auto | normal}	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
spanning- tree rstp [forward-time <4 - 30>] [hello-time <1 - 10>] [max-age <6 - 40>] [pathcost-type { bits16 | bits32 }] [priority { 0000 | 10000 | 20000 | ... | F0000 }] [tx-holdcount <1 - 10>] [version { stp-compatible | rstp }]	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*

Command	See:
spanning- tree rstp [port <portlist>] [cost <1 - 200000000>] **[edge-port { false | true }]** **[learning { disable | enable }]** **[p2p { auto | force-false | force-true }]** **[priority { 00 | 10 | ... | F0 }]** **[protocol-migration { false | true }]**	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
spanning-tree [stp <1-16>] remove-vlan <1-4094>	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
spanning-tree stp <2-16> create	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
spanning-tree stp <2-16> delete	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
spanning-tree stp <2-16> disable	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
spanning-tree stp <2-16> enable	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
spanning-tree vlan *<vlan-id>* [enable] [forward-time *<4-30secs>*] [hello-time *<1-10secs>*] [max-age *<6-40secs>*] [priority *<value>*] **(used with PVST+)**	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
spanning-tree vlan *<vlan-id>* [port *<port-list>*] [cost *<cost>*] [learning *<disable* | *normal* | *fast>*] [priority *<value>*] **(used with PVST+)**	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
speed [port <portlist>] {10 | 100 | 1000 | auto}	"speed command" (page 378)
ssh	*Security — Configuration (NN47210-500)*

Command	See:
`ssh download-auth-key [address <XXX.XXX.XXX.XXX>] [key-name <file>]`	*Security — Configuration (NN47210-500)*
`ssh dsa-auth`	*Security — Configuration (NN47210-500)*
`ssh dsa-key [<512-1024>]`	*Security — Configuration (NN47210-500)*
`ssh max-sessions <0-2>`	*Security — Configuration (NN47210-500)*
`ssh pass-auth`	*Security — Configuration (NN47210-500)*
`ssh port <1-65535>`	*Security — Configuration (NN47210-500)*
`ssh secure`	*Security — Configuration (NN47210-500)*
`ssh time-out <1-120>`	*Security — Configuration (NN47210-500)*
`ssl`	*Security — Configuration (NN47210-500)*
`ssl certificate`	*Security — Configuration (NN47210-500)*
`ssl reset`	*Security — Configuration (NN47210-500)*
`stack auto-unit-replacement enable`	"stack auto-unit-replacement enable command" (page 269)
`stack bootp-mac-addr-type {base-unit | stack}`	"stack bootp-mac-addr-type command" (page 350)
`stack replace unit <1-8>`	"stack replace unit command" (page 260)

`telnet-access [enable | disable] [login-timeout <1-10>] [retry <1-100>] [inactive-timeout <0-60>]`
 	
`[logging {none | access | failures | all}]`
 	
`[source-ip <1-50> <XXX.XXX.XXX.XXX> [mask <XXX.XXX.XXX.XXX>]]`
	Security — Configuration (NN47210-500)

`telnet-access retry <number>`	*Security — Configuration (NN47210-500)*
`terminal {2400 | 4800 | 9600 | 19200 | 38400} | length <1-132> | width <1-132>`	"terminal command" (page 345)

Command	See:
`tftp-server <XXX.XXX.XXX.XXX>`	"tftp-server command" (page 351)
`vlacp enable`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`vlacp macaddress <macaddress>`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`vlacp <port-type> <slot/port> [enable | disable] [timeout <long/short>] [fast-periodic-time <integer>] [slow-periodic-time <integer>] [timeout-scale <integer> ] [funcmac-addr <mac>] [ethertype <integer>]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`vlan configcontrol <vcc_option>`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*

`vlan create <1-4094> type macsa`
 	
`vlan create <1-4094> type port`
 	
`vlan create <1-4094> type protocol-AppltkEther2Snap`
 	
`vlan create <1-4094> type protocol-decEther2`
 	
`vlan create <1-4094> type protocol-decOtherEther2`
 	
`vlan create <1-4094> type protocol-ipEther2`
 	
`vlan create <1-4094> type protocol-ipv6Ether2`
 	
`vlan create <1-4094> type protocol-ipx802.2`
 	
`vlan create <1-4094> type protocol-ipx802.3`
 	
`vlan create <1-4094> type protocol-ipxEther2`
	Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)

Command	See:
`vlan create <1-4094> type protocol-ipxSnap`	
`vlan create <1-4094> type protocol-Netbios`	
`vlan create <1-4094> type protocol-RarpEther2`	
`vlan create <1-4094> type protocol-sna802.2`	
`vlan create <1-4094> type protocol-snaEther2`	
`vlan create <1-4094> type protocol-Userdef <4096-65534>`	
`vlan create <1-4094> type protocol-vinesEther2`	
`vlan create <1-4094> type protocol-xnsEther2`	
`vlan create <1-4094> name <line> type macsa`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`vlan create <1-4094> name <line> type port`	
`vlan create <1-4094> name <line> type protocol-ApltkEther2Snap`	
`vlan create <1-4094> name <line> type protocol-decEther2`	
`vlan create <1-4094> name <line> type protocol-decOtherEther2`	
`vlan create <1-4094> name <line> type protocol-ipEther2`	
`vlan create <1-4094> name <line> type protocol-ipv6Ether2`	
`vlan create <1-4094> name <line> type protocol-ipx802.2`	
`vlan create <1-4094> name <line> type protocol-ipx802.3`	

Command	See:
`vlan create <1-4094> name <line> type protocol-ipxEther2`	
`vlan create <1-4094> name <line> type protocol-ipxSnap`	
`vlan create <1-4094> name <line> type protocol-Netbios`	
`vlan create <1-4094> name <line> type protocol-RarpEther2`	
`vlan create <1-4094> name <line> type protocol-sna802.2`	
`vlan create <1-4094> name <line> type protocol-snaEther2`	
`vlan create <1-4094> name <line> type protocol-Userdef <1-4094>`	
`vlan create <1-4094> name <line> type protocol-vinesEther2`	
`vlan create <1-4094> name <line> type protocol-xnsEther2`	
`vlan create <1-4094> type macsa learning IVL`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`vlan create <1-4094> type port learning IVL`	
`vlan create <1-4094> type protocol-AplTkEther2Snap learning IVL`	
`vlan create <1-4094> type protocol-decEther2 learning IVL`	
`vlan create <1-4094> type protocol-decOtherEther2 learning IVL`	
`vlan create <1-4094> type protocol-ipEther2`	

Command	See:
learning IVL	
vlan create <1-4094> type protocol-ipv6Ether2 learning IVL	
vlan create <1-4094> type protocol-ipx802.2 learning IVL	
vlan create <1-4094> type protocol-ipx802.3 learning IVL	
vlan create <1-4094> type protocol-ipxEther2 learning IVL	
vlan create <1-4094> type protocol-ipxSnap learning IVL	
vlan create <1-4094> type protocol-Netbios learning IVL	
vlan create <1-4094> type protocol-RarpEther2 learning IVL	
vlan create <1-4094> type protocol-sna802.2 learning IVL	
vlan create <1-4094> type protocol-snaEther2 learning IVL	
vlan create <1-4094> type protocol-Userdef <4096-65534> learning IVL	
vlan create <1-4094> type protocol-vinesEther2 learning IVL	
vlan create <1-4094> type protocol-xnsEther2 learning IVL	

Command	See:
`vlan create <1-4094> type macsa learning SVL`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`vlan create <1-4094> type port learning SVL`	
`vlan create <1-4094> type protocol-ApltkEther2Snap learning SVL`	
`vlan create <1-4094> type protocol-decEther2 learning SVL`	
`vlan create <1-4094> type protocol-decOtherEther2 learning SVL`	
`vlan create <1-4094> type protocol-ipEther2 learning SVL`	
`vlan create <1-4094> type protocol-ipv6Ether2 learning SVL`	
`vlan create <1-4094> type protocol-ipx802.2 learning SVL`	
`vlan create <1-4094> type protocol-ipx802.3 learning SVL`	
`vlan create <1-4094> type protocol-ipxEther2 learning SVL`	
`vlan create <1-4094> type protocol-ipxSnap learning SVL`	
`vlan create <1-4094> type protocol-Netbios learning SVL`	
`vlan create <1-4094> type protocol-RarpEther2 learning SVL`	
`vlan create <1-4094> type protocol-sna802.2 learning SVL`	
`vlan create <1-4094> type protocol-snaEther2 learning SVL`	

Command	See:

`vlan create <1-4094> type protocol-Userdef <4096-65534> learning SVL`
 	
`vlan create <1-4094> type protocol-vinesEther2 learning SVL`
 	
`vlan create <1-4094> type protocol-xnsEther2 learning SVL`	

`vlan create <1-4094> name <line> type macsa learning IVL`
 	
`vlan create <1-4094> name <line> type port learning IVL`
 	
`vlan create <1-4094> name <line> type protocol-AplktEther2Snap learning IVL`
 	
`vlan create <1-4094> name <line> type protocol-decEther2 learning IVL`
 	
`vlan create <1-4094> name <line> type protocol-decOtherEther2 learning IVL`
 	
`vlan create <1-4094> name <line> type protocol-ipEther2 learning IVL`
 	
`vlan create <1-4094> name <line> type protocol-ipv6Ether2 learning IVL`
 	
`vlan create <1-4094> name <line> type protocol-ipx802.2 learning IVL`
 	
`vlan create <1-4094> name <line> type protocol-ipx802.3 learning IVL`
 	
`vlan create <1-4094> name <line> type protocol-ipxEther2 learning IVL`
 	
`vlan create <1-4094> name <line> type protocol-ipxSnap learning IVL`
	Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)

Command	See:

`vlan create <1-4094> name <line> type protocol-Netbios learning IVL`
 	
`vlan create <1-4094> name <line> type protocol-RarpEther2 learning IVL`
 	
`vlan create <1-4094> name <line> type protocol-sna802.2 learning IVL`
 	
`vlan create <1-4094> name <line> type protocol-snaEther2 learning IVL`
 	
`vlan create <1-4094> name <line> type protocol-Userdef <4096-65534> learning IVL`
 	
`vlan create <1-4094> name <line> type protocol-vinesEther2 learning IVL`
 	
`vlan create <1-4094> name <line> type protocol-xnsEther2 learning IVL`	

`vlan create <1-4094> name <line> type macsa learning SVL`
 	
`vlan create <1-4094> name <line> type port learning SVL`
 	
`vlan create <1-4094> name <line> type protocol-AplTkEther2Snap learning SVL`
 	
`vlan create <1-4094> name <line> type protocol-decEther2 learning SVL`
 	
`vlan create <1-4094> name <line> type protocol-decOtherEther2 learning SVL`
 	
`vlan create <1-4094> name <line> type protocol-ipEther2 learning SVL`
 	
`vlan create <1-4094> name <line> type protocol-ipv6Ether2 learning SVL`
 	
`vlan create <1-4094> name <line> type protocol-ipx802.2 learning SVL`
	Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)

Command	See:

`vlan create <1-4094> name <line> type protocol-ipx802.3 learning SVL`
 	
`vlan create <1-4094> name <line> type protocol-ipxEther2 learning SVL`
 	
`vlan create <1-4094> name <line> type protocol-ipxSnap learning SVL`
 	
`vlan create <1-4094> name <line> type protocol-Netbios learning SVL`
 	
`vlan create <1-4094> name <line> type protocol-RarpEther2 learning SVL`
 	
`vlan create <1-4094> name <line> type protocol-sna802.2 learning SVL`
 	
`vlan create <1-4094> name <line> type protocol-snaEther2 learning SVL`
 	
`vlan create <1-4094> name <line> type protocol-Userdef <1-4094> learning SVL`
 	
`vlan create <1-4094> name <line> type protocol-vinesEther2 learning SVL`
 	
`vlan create <1-4094> name <line> type protocol-xnsEther2 learning SVL`	

`vlan delete <1-4094>`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*

`vlan igmp <1-4094> [snooping {enable | disable}] [proxy {enable | disable}]`
 	
`[robust-value <value>] [query-interval <time>] [v1-members <portlist>]`
 	
`[v2-members <portlist>] [unknown-mcast-no-flood {enable | disable }]`
	Configuration — IP Multicast Routing Protocols (NN47210-504)

Command	See:
`vlan mac-address <1-4094> address <H.H.H.>`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*

`vlan members <1-4094> <portlist>`
 	
`vlan members add <1-4094> <portlist>`
 	
`vlan members remove <1-4094> <portlist>`
	Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)

`vlan mgmt <1-4094>`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`vlan name <1-4094> <line>`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`vlan ports [<portlist>] [tagging {enable | disable}] [pvid <1-4094>] [filter-tagged-frame {enable | disable}] [filter-untagged-frame {enable | disable}] [filter-unregistered-frames {enable | disable}] [priority <0-7>] [name <line>]`	*Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47210-505)*
`web-server {enable | disable}`	*Security — Configuration (NN47210-500)*
write memory	"write memory command" (page 372)

Appendix C
Technical specifications

This appendix provides technical specifications for the Ethernet Switch 460-24T-PWR, the Ethernet Switch 470-24T, and the Ethernet Switch 470-48T.

Environmental

Table 234 "Environmental specifications" (page 559) lists environmental specifications.

Table 234
Environmental specifications

Parameter	Operating specification	Storage specification
Temperature	0° to 40°C (32° to 104°F)	-25° to 70°C (-13° to 158°F)
Humidity	85% maximum relative humidity, noncondensing	95% maximum relative humidity, noncondensing
Altitude	3024 m (10,000 ft)	3024 m (10,000 ft)

Electrical

Table 235 "Electrical parameters" (page 559) lists power electrical parameters for the Ethernet Switch 460-24T-PWR, Ethernet Switch 470-24T, and Ethernet Switch 470-48T.

Table 235
Electrical parameters

Parameter	Ethernet Switch 460-24T-PWR	Ethernet Switch 470-24T and Ethernet Switch 470-48T
Input Voltage	100 to 240 VAC @ 47 to 63 Hz	100 to 240 VAC @ 47 to 63 Hz
Input Power Consumption	400 W maximum	90 W maximum
Input Volt Amperes Rating	440 VA maximum	2000 VA maximum

Parameter	Ethernet Switch 460-24T-PWR	Ethernet Switch 470-24T and Ethernet Switch 470-48T
Input current	4.5 A @ 100 VAC 2.5 A @ 240 VAC	1.5 A @ 100 VAC 0.75 A @ 240 VAC
Maximum thermal output	500 BTU/hr	324 BTU/hr

Power specifications

AC power specifications

	Ethernet Switch 460-24T-PWR	Ethernet Switch 470-24T and Ethernet Switch 470-48T
Input current:	4.5 to 2.25 A	1.5 to 0.75 A
Input voltage (rms):	100 to 240 VAC at 47 to 63 Hz	100 to 240 VAC at 47 to 63 Hz
Input power consumption:	400 W	90 W
Thermal rating:	500 BTU/hr maximum	324 BTU/hr maximum

DC power specifications (applies to Ethernet Switch 460-24T-PWR only)

The DC power specifications vary depending on configuration and if you are interoperating with an optional external power source (Ethernet Switch Power Supply Unit 10 or the NES unit).

Internal power source (no PoE power):	335 BTU/hr maximum
Internal power source (200W PoE power):	500 BTU/hr maximum
External power source (200W PoE power):	430 BTU/hr maximum
Internal and external power source (370W PoE power):	650 BTU/hr maximum

Ethernet Switch Power Supply Unit 10 (applies to Ethernet Switch 460-24T-PWR only)

Input current:	4.2 A maximum
Input voltage:	-48 VDC

NES unit (applies to Ethernet Switch 460-24T-PWR only)

Input current:	8 A maximum
Input voltage:	-54 VDC

Physical dimensions

Table 236 "Physical dimensions" (page 561) lists physical dimensions.

Table 236
Physical dimensions

Parameter	Ethernet Switch 460-24T-PWR	Ethernet Switch 470-24T Ethernet Switch 470-48T
Height	7.04 cm (2.77 in.)	4.32 cm (1.70 in.)
Width	43.82 cm (17.25 in.)	43.82 cm (17.25 in.)
Depth	38.35 cm (15.1 in)	35.31 cm (13.9 in)
Weight	5.8 kg (12.76 lb.)	6.7 kg (14.7 lb.)

Performance specifications

Table 237 "Performance specifications" (page 561) lists performance specifications.

Table 237
Performance specifications

Parameter	Specifications
Frame Forward Rate (64-byte packets)	Up to 3.2 million packets per second (pps) maximum, learned unicast traffic
Port Forwar ding/Filtering Performance(64-byte packets)	• For 10 Mb/s: 14,880 pps maximum • For 100 Mb/s: 148,810 pps maximum
Address Database Size	16,000 entries at line rate (32,000 entries without flooding)
Addressing	48-bit MAC address
Frame Length	64 to 1518 bytes (IEEE 802.1Q Untagged) 64 to 1522 bytes (IEEE 802.1Q Tagged)

Data rate

The data rate is 10 Mb/s Manchester encoded or 100 Mb/s 4B/5B encoded.

Interface options

The Ethernet Switch 460-24T-PWR has 10BASE-T/100BASE-TX switch ports with RJ-45 (8-pin modular) connectors for MDA-X interfaces.

The Ethernet Switch 470-24T and Ethernet Switch 470-48T have 10BASE-T/100BASE-TX switch ports with RJ-45 (8-pin modular) connectors for GBICs.

Refer to *Installing Media Dependent Adapters (MDAs)* and *Installing Gigabit Interface Converters and Small Form Factor Pluggable Interface Converters* for information about the interface connectors on available uplink modules.

Regulatory Certifications

The following certifications were completed to the latest Standard in effect at the time of release. Additional National Certifications may be applicable and are available through Nortel or their representative in specific countries.

Safety Regulatory Certifications

The safety regulatory certifications follow:

- IEC60950 International Safety; CB Report/Certificate
- All Member National Differences applied
- UL 60950 United States Safety Licensed
- CSA 22.2, No. 60950 Canada Safety Licensed
- EN 60950 German/European Union Safety Licensed
- NOM-019 Mexico Safety Licensed
- Electromagnetic Compliance Certifications:

Electromagnetic Compliance Certifications

The Ethernet Switch 460-24T-PWR, Ethernet Switch 470-24T, and Ethernet Switch 470-48T meet the following electromagnetic compliance certifications:

- CISPR22/CISPR24, Class A, International EMC Certification
- EN55022/EN55024, Class A, European Union EMC Certification Including additional testing of EN 61000-3-2 and EN 61000-3-3
- FCC CFR47, Part 15 Class A, United States EMC Certification
- ICES-003, Class A, Canada EMC Certification
- AS/NZ 3548, Class A, Australia/New Zealand EMC Certification
- VCCI, Class A, Japan EMC Certification

Declaration of Conformity

The Declaration of Conformity for the Ethernet Switch 460-24T-PWR, Ethernet Switch 470-24T, and Ethernet Switch 470-48T complies with ISO/IEC Guide 22 and EN45014. The declaration identifies the product models, the Nortel Networks name and address, and the specifications recognized by the European community.

As stated in the Declaration of Conformity, the Ethernet Switch 460-24T-PWR, Ethernet Switch 470-24T, and Ethernet Switch 470-48T comply with the provisions of Council Directives89/336/EEC and 73/23/EEC.

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Nortel Ethernet Switch 460/470

Overview — System Configuration

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