



Nortel Ethernet Routing Switch 2500 Series

Overview — System Configuration

NN47215-500 (323162-B)

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New in this release

The following sections detail what's new in *Overview — System Configuration* (NN47215-500) for Release 4.1:

- Features
- Other changes

Features

For information about changes that are feature related, see the following sections:

- ["Stacking capabilities" \(page 39\)](#)
- ["Stacking functionality delivery" \(page 40\)](#)
- ["Stack configurations" \(page 49\)](#)
- ["Auto Unit Replacement" \(page 54\)](#)

Other changes

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

- Information on the new fields **StackInsertionUnitNumber** and **AutoUnitReplacementEnabled** are updated for the **System** tab under **Configuring the switch using Device Manager** chapter. For more information, see ["System tab" \(page 259\)](#)
- Changed the screen for **License File** tab. For more information, see ["Copying the license file using the Java Device Manager" \(page 42\)](#)
- Information on the new tabs **Time Zone** and **Daylight Saving Time** are updated with new procedure and screens. For more information, see ["Configuring local time zone using the device manager" \(page 278\)](#)
- ["Configuring daylight savings time using the device manager" \(page 278\)](#)

Introduction

This guide provides information about configuring and managing basic switching features on the Nortel Ethernet Routing Switch 2500 Series.

This guide describes the features of the following Nortel switches.

- Nortel Ethernet Routing Switch 2526T
- Nortel Ethernet Routing Switch 2526T-PWR
- Nortel Ethernet Routing Switch 2550T
- Nortel Ethernet Routing Switch 2550T-PWR

The term "Ethernet Routing Switch 2500 Series" is used in this document to describe the features common to the switches mentioned above.

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

The Ethernet Routing Switch 2500 Series operates in the Standalone Mode and Stacking Mode in this product release.

Before you begin

This guide is intended for network administrators who have the following background:

- basic knowledge of networks, switching, Ethernet bridging, and IP routing
- familiarity with networking concepts and terminology
- basic knowledge of network topologies

Text conventions

This guide uses the following 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
`ping <ip_address>`, you enter
`ping 192.32.10.12`

bold body text Indicates objects such as window names, dialog box names, and icons, as well as user interface objects such as buttons, tabs, and menu items.

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
`show ip {alerts|routes}`, you must enter either
`show ip alerts` or `show ip routes`, but not both.

brackets ([]) Indicate optional elements in syntax descriptions. Do not type the brackets when entering the command.

Example: If the command syntax is
`show ip interfaces [-alerts]`, you can enter either
`show ip interfaces` or
`show ip interfaces -alerts`.

italic text Indicates variables in command syntax descriptions. Also indicates new terms and book titles. Where a variable is two or more words, the words are connected by an underscore.

Example: If the command syntax is
`show at <valid_route>`,
`valid_route` is one variable and you substitute one value for it.

plain Courier text Indicates command syntax and system output, for example, prompts and system messages.

Example: Set Trap Monitor Filters

separator (>)	Shows menu paths. Example: Protocols > IP identifies the IP command on the Protocols menu.
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 <code>show ip {alerts routes}</code> , you enter either <code>show ip alerts</code> or <code>show ip routes</code> , but not both.

Related publications

For more information about using the Ethernet Routing Switch 2500, see the following publications:

- *Nortel Ethernet Routing Switch 2500 Series Release Notes*
Nortel Ethernet Routing Switch 2500 Series Release Notes — Software Release 4.0 (NN47215-400)

Documents important changes about the software and hardware that are not covered in other related publications.

- *Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)*

Describes how to configure Virtual Local Area Networks (VLAN), Spanning Tree Protocol (STP), and MultiLink Trunk (MLT) features for the Nortel Ethernet Routing Switch 2500.

- *Nortel Ethernet Routing Switch 2500 Series Configuration — Quality of Service (NN47215-504)*

Describes how to configure and manage Quality of Service and IP Filtering features for the Nortel Ethernet Routing Switch 2500.

- *Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)*

Describes how to configure and manage security for the Nortel Ethernet Routing Switch 2500.

- *Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)*

Describes how to configure system logging and network monitoring, and how to display system statistics for the Nortel Ethernet Routing Switch 2500.

- *Nortel Ethernet Routing Switch 2500 Series Configuration — IP Multicast (NN47215-503)*

Describes how to configure IP Multicast Routing Protocol features for the Nortel Ethernet Routing Switch 2500.

How to get help

This section explains how to get help for Nortel products and services.

Getting help from the Nortel web site

The best way to get technical support for Nortel products is from the Nortel Technical Support web site:

www.nortel.com/support

This site provides quick access to software, documentation, bulletins, and tools to address issues with Nortel products. More specifically, the site enables you to:

- download software, documentation, and product bulletins
- search the Technical Support web site and the Nortel Knowledge Base for answers to technical issues
- sign up for automatic notification of new software and documentation for Nortel equipment
- open and manage technical support cases

Getting help through a Nortel distributor or reseller

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.

Getting help over the phone from a Nortel Solutions Center

If you do not find the information you require on the Nortel Technical Support web site, and have a Nortel support contract, you can also get help over the phone from a Nortel Solutions Center.

In North America, call 1-800-4NORTEL (1-800-466-7835).

Outside North America, go to the following web site to obtain the phone number for your region:

www.nortel.com/callus

Getting help from a specialist by using an Express Routing Code

An Express Routing Code (ERC) is available for many Nortel products and services. When you use an ERC, your call is routed to a technical support person who specializes in supporting that product or service. To locate the ERC for your product or service, go to:

www.nortel.com/erc

Ethernet Routing Switch 2500 Series hardware

The Ethernet Routing Switch 2500 Series provides wire-speed switching for high-performance, low-cost connections to full-duplex, and half-duplex 10/100/1000 Mb/s Ethernet Local Area Networks (LAN).

Ethernet Routing Switch 2500 Series software release 4.1 supports the following devices:

- Ethernet Routing Switch 2526T
- Ethernet Routing Switch 2526T-PWR
- Ethernet Routing Switch 2550T
- Ethernet Routing Switch 2550T-PWR

This chapter describes the hardware features and components of the Ethernet Routing Switch 2500 Series devices. It includes information about the following topics:

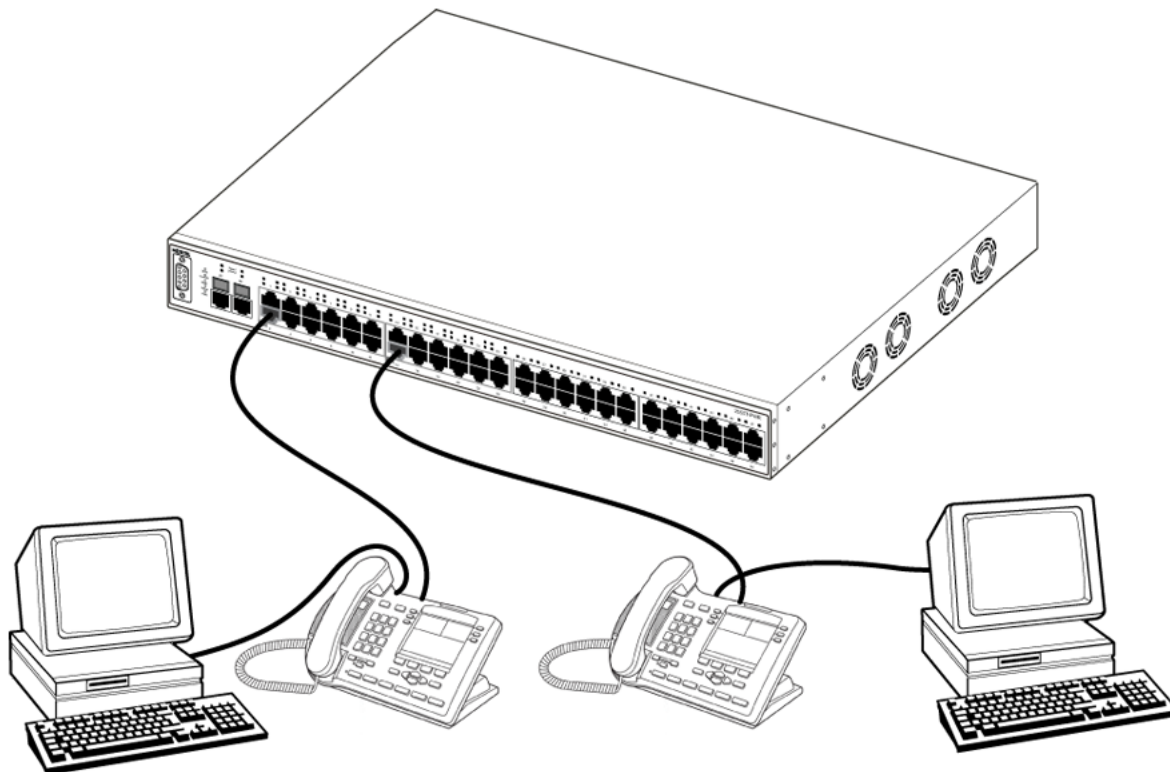
- ["Hardware components of the Ethernet Routing Switch 2500 Series" \(page 23\)](#)
- ["Network configuration examples" \(page 34\)](#)

Hardware components of the Ethernet Routing Switch 2500 Series

Front panel

[Figure 1 "Ethernet Routing Switch 2550T-PWR" \(page 24\)](#) shows an Ethernet Routing Switch 2550T-PWR providing power and Ethernet connections to IP Phones, and data connections to personal computers (PC).

Figure 1
Ethernet Routing Switch 2550T-PWR



The following graphics display the front panel configuration on the Ethernet Routing Switch 2526T, 2526T-PWR, 2550T, and 2550T-PWR. [Table 1 "Components on the Ethernet Routing Switch 2500 front panel"](#) (page 25) describes the components on the front panel.

Figure 2
Ethernet Routing Switch 2526T front panel

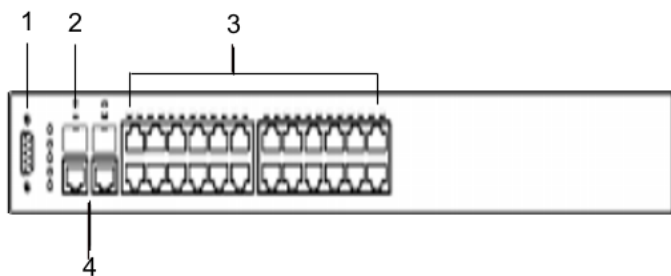


Figure 3
Ethernet Routing Switch 2550T front panel

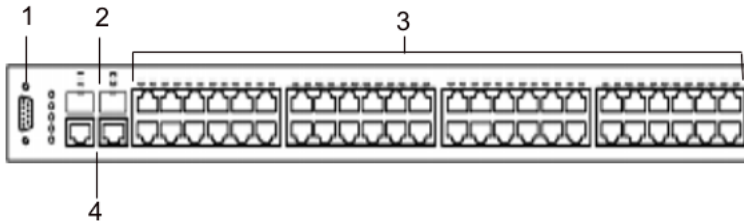


Figure 4
Ethernet Routing Switch 2526T-PWR front panel

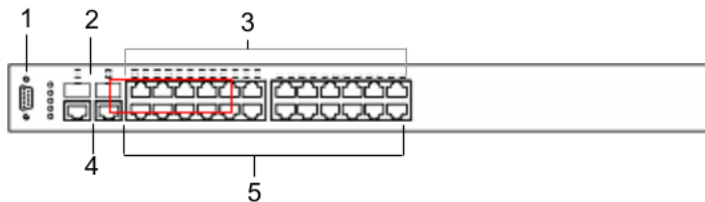


Figure 5
Ethernet Routing Switch 2550T-PWR front panel

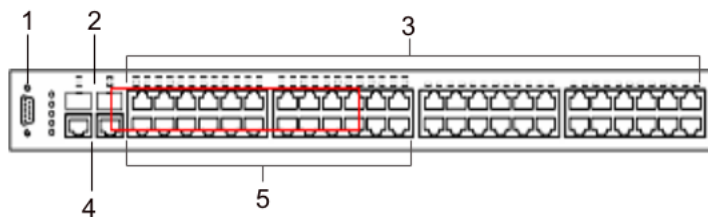


Table 1
Components on the Ethernet Routing Switch 2500 front panel

Item	Description
1	Console port
2	SFP Gigabit Interface Converter (GBIC) slots
3	10/100BaseT RJ-45 connector ports (copper)
4	10/100/1000BaseT RJ-45 connector ports (copper)
5	PoE ports (on 2526T-PWR and 2550T-PWR models only)

Console port

With the Console port, you can access the Command Line Interface (CLI) commands to customize your network. For more information about using the CLI, see ["CLI Basics"](#) (page 81).

The Console port is a DB-9, RS-232-D male serial port connector. You can use this connector to connect a management station, console, or terminal to the Ethernet Routing Switch 2500 Series by using a straight-through DB-9 to DB-9 standard serial port cable. You must use a VT100/ANSI-compatible terminal (for cursor control and to activate cursor and functions keys) to use the Console port.

The default settings of the Console port are:

- 9600 baud with eight data bits
- one stop bit
- no parity as the communications format
- flow control set to disabled

Gigabit Interface Converter

Small Form Factor Pluggable Gigabit Interface Converters are hot-swappable input and output enhancement components designed for use with Nortel products to allow Gigabit Ethernet ports to link with fiber optic networks.

SFP GBIC Support on the Ethernet Routing Switch 2500 Series

Small Form Factor Pluggable (SFP) transceivers are hot-swappable input/output enhancement components designed for use with Nortel products to allow Gigabit Ethernet ports to link with other Gigabit Ethernet ports over various media types.

The Ethernet Routing Switch 2500 Series supports the following SFPs:

- 1000Base-SX SFP GBIC (mini-GBIC, connector type: LC)
- 1000Base-SX SFP GBIC (mini-GBIC, connector type: MT-RJ)
- 1000Base-LX SFP GBIC (mini-GBIC, connector type: LC)
- CWDM SFPs

For more information about the SFP GBICs see *Installing Gigabit Interface Converters, SFPs, and CWDM SFP Gigabit Interface Converters (312865)*.

Port connectors

The Ethernet Routing Switch 2500 Series uses 10BASE-T/100BASE-TX RJ-45 (8-pin modular) port connectors.

The Ethernet Routing Switch 2500 Series uses autosensing ports designed to operate at 10 Mb/s (megabits per second) or at 100 Mb/s, 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 mode operation.

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

ATTENTION

Use only Category 5 copper Unshielded Twisted Pair (UTP) cable connections when connecting 10BASE-T/100BASE-TX ports.

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, you can still use straight-through cables while connecting to an Ethernet hub or switch.

The auto-MDI/MDI-X feature is dependent on the autonegotiation feature. If autonegotiation is enabled on a port, the auto-MDI/MDI-X feature is automatically enabled on the port as well. If autonegotiation is disabled on a port, then the port operates as a standard MDI-X port.

Power over Ethernet on Ethernet Routing Switch 2526T-PWR and 2550T-PWR

The Ethernet Routing Switch 2526T-PWR and 2550T-PWR provide IEEE 802.3af-compliant power over the PoE-labeled front-panel RJ-45 ports. The switches provide power discovery and power management on each port basis. You can use the PoE ports to provide power to network appliances, such as IP Phones, wireless access points, and video devices.

You can enable or disable power to individual ports. For information about configuring PoE, see ["Power over Ethernet for the Ethernet Routing Switch 2526T-PWR and 2550T-PWR" \(page 157\)](#).

LED display panel

[Figure 6 "LED display panel" \(page 28\)](#) shows the LED display panel of the Ethernet Routing Switch 2500 Series. See [Table 2 "Ethernet Routing Switch 2500 Series LED descriptions" \(page 28\)](#) for a description of the LEDs.

Figure 6
LED display panel

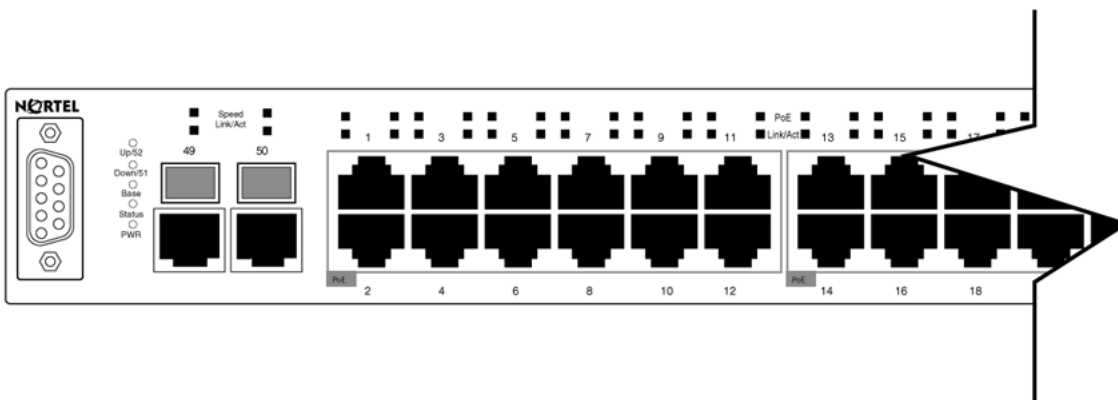


Table 2
Ethernet Routing Switch 2500 Series LED descriptions

Label	Type	Color	State	Meaning
Up/28 or Up/52	Rear port status	Green	Fast Flashing	Link is good and active.
			Slow Flashing	This port is disabled by software.
Down/27 or Down/51	Rear port status	Green	Fast Flashing	Link is good and active.
			Slow Flashing	This port is disabled by software.
Status	Switch status	Green	Flashing	The switch is booting up and performing a self-test.
			On	Self-test passed successfully and switch is operational.
			Off	The switch failed the self-test.
PWR	Switch Power Status	Green	On	Power is present.
			Off	Switch is not connected to a power source.
Speed	RJ45/SFP Uplink port speed	Green	Steady	This port is set to operate at 1 Gb/s, and the link is good.
			Flashing	This port is disabled by software.
		Amber	Steady	This port is set to operate at 10/100 Mb/s, and the link is good.
			Flashing	This port is disabled by software.
Link/Act	RJ45/SFP Uplink port status	Green	Steady	Link is OK.
			Flashing	Traffic activity.
		Off	No link/No traffic.	

Label	Type	Color	State	Meaning
Link/Act	Port connection status	Green	Steady	Station connected at 10/100 Mb/s.
			Flashing	Traffic activity at 10/100 Mb/s.
		Off		No link/No traffic.
PoE (applies to PWR models only)	PoE port power status	Green	Steady	Power is supplied to the port.
		Off		No power is supplied to the port.
Base	Base unit status for stack mode	Green	ON	This unit is permanent base in stack mode.
		Amber	ON	This unit is selected as temporary base in stack mode.

Back panel

The back panel of the Ethernet Routing Switch 2500 Series is shown in [Figure 7 "Ethernet Routing Switch 2500 Series back panel" \(page 29\)](#). [Table 3 "Components on the Ethernet Routing Switch 2500 Series back panel" \(page 29\)](#) describes the components on the back panel.

Figure 7
Ethernet Routing Switch 2500 Series back panel

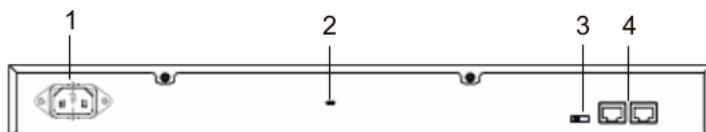


Table 3
Components on the Ethernet Routing Switch 2500 Series back panel

Item	Description
1	AC power receptacle
2	Kensington lock
3	Base Unit select switch
4	Additional 1000BaseT RJ-45 connector rear ports. For switch operating mode: ports 27,28 on 2526T models and ports 51,52 on 2550T models. For stack operating mode: Link UP, Link DOWN for connecting with other units in stack.

Kensington lock

Using the Kensington lock, you can secure your switch. Wrap the steel cable around a secure immovable object, insert the cable lock in the Kensington Security Lock, and turn the key.

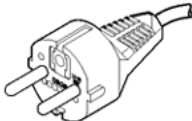
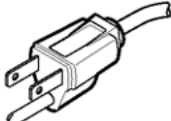
Cooling fans

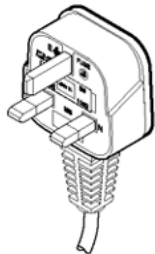
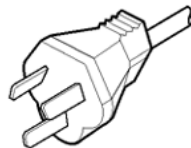
Cooling fans are located on one side of the Ethernet Routing Switch 2500 Series to provide cooling for the internal components. When you install the switch, be sure to allow enough space on both sides of the switch for adequate ventilation.

AC power receptacle

The AC power receptacle accepts the AC power cord that is supplied with the switch. For installation outside North America, make sure 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 4 "International power cord specifications" \(page 30\)](#) lists specifications for international power cords.

Table 4
International power cord specifications

Country/Plug description	Specifications	Typical plug
Continental Europe: <ul style="list-style-type: none"> • 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
U.S./Canada/Japan: <ul style="list-style-type: none"> • 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

Country/Plug description	Specifications	Typical plug
United Kingdom: <ul style="list-style-type: none"> • 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

**CAUTION****Read immediately.**

Inspect the power cord and determine if it provides the proper plug and is appropriately certified for use with your electrical system. Immediately discard this power cord if it is inappropriate for electrical systems in your country and obtain the proper cord as required by your national electrical codes or ordinances.

See the technical documentation for this product for detailed installation procedures to be followed by qualified service personnel.

**CAUTION****Vorsicht:****Bitte sofort lesen.**

Sehen Sie nach, ob dieses Netzkabel über den richtigen Stecker verfügt und für die Verwendung in Ihrem Stromversorgungsnetz zertifiziert ist. Falls dieses Kabel nicht für das Stromversorgungsnetz in Ihrem Land geeignet ist, darf es nicht verwendet werden. Besorgen Sie sich ein Kabel, das die Vorschriften der Zulassungsbehörden in Ihrem Land erfüllt.

Die technische Dokumentation dieses Produkts enthält ausführliche Installationsanweisungen, die nur von qualifiziertem Kundendienstpersonal ausgeführt werden dürfen.

ATTENTION

Attention:
Lisez ceci immédiatement.

Examinez ce cordon d'alimentation pour déterminer s'il dispose de la fiche appropriée et s'il est bien agréé pour utilisation sur votre installation électrique. Débarrassez-vous en immédiatement s'il ne convient pas à l'utilisation sur le secteur électrique en usage dans votre pays et procurez-vous un cordon conforme à la réglementation nationale en vigueur.

Reportez-vous à la documentation technique de ce produit pour obtenir des instructions détaillées d'installation, destinées à un technicien qualifié.



CAUTION
Attenzione:
Leggere attentamente.

Controllare questo cavo di alimentazione, verificarne il collegamento con la presa appropriata nonché la certificazione per l'uso nell'impianto elettrico posseduto. Non utilizzare assolutamente in caso tale cavo non sia adatto al sistema elettrico del paese in cui viene utilizzato e richiederne un altro certificato dall'ente nazionale di fornitura elettrica.

Per le procedure di installazione che devono essere seguite dal personale di servizio, consultare questa documentazione tecnica del prodotto.



CAUTION
Advertencia:
Sírvase leer inmediatamente.

Inspeccione este cable de alimentación eléctrica y determine si viene con el enchufe apropiado y está debidamente certificado para el uso con su sistema eléctrico. Si no cumple con los reglamentos del sistema eléctrico de su país, despójese de este cable de alimentación inmediatamente y obtenga el cable requerido, según las ordenanzas y códigos eléctricos nacionales.

Refiérase a la documentación técnica de este producto para recibir información detallada sobre los procedimientos que el personal calificado de reparaciones deberá seguir.

**Caution:**

注意：最初にお読み下さい。

本電源コードが、ご使用になる電力規格に適したプラグ部で、且つ適正な規格証明がついているかどうかをお確かめ下さい。

もし本電源コードがご使用の電力規格に不適格な場合はただちに使用を中止し、ご使用の国家規格・法令に定められた適切な電源コードをご使用下さい。

本製品の取付方法につきましては、取扱技術説明書をご覧のうえ資格認定を受けたサービス・スタッフの指示に従って下さい。

**WARNING**

Removal of the power cord is the only way to turn off power to this device. The power cord must always be connected in a location that can be accessed quickly and safely in case of an emergency.

**WARNING****Vorsicht:**

Die Stromzufuhr zu diesem Gerat kann nur durch Ziehen des Netzstromkabels unterbrochen werden. Die Netzsteckdose, an die das Netzstromkabel angeschlossen ist, mu sich stets an einem Ort befinden, der bei einem Notfall schnell und einfach zuganglich ist.

**WARNING****Avertissement:**

Le dbranchement du cordon d'alimentation constitue le seul moyen de mettre cet appareil hors tension. Le cordon d'alimentation doit donc toujours tre branch dans une prise accessible pour faciliter la mise hors tension en cas d'urgence.

**WARNING****Advertencia:**

La nica forma de desconectar la alimentacin de este dispositivo es desenchufar el cable de alimentacin. El cable de alimentacin siempre debe estar conectado en una ubicacin que permita acceder al cable de forma rpida y segura en caso de emergencia.



WARNING

Avvertenza:

Estrarre il cavo di alimentazione è l'unico sistema per spegnere il dispositivo. Il cavo di alimentazione deve essere sempre collegato in una posizione che permetta l'accesso facile e sicuro in caso di emergenza.



警告：電源コードを取り外すことが、このデバイスへの電源を切る唯一の方法です。電源コードは緊急の場合、迅速かつ安全に近づける場所に接続してください。

Network configuration examples

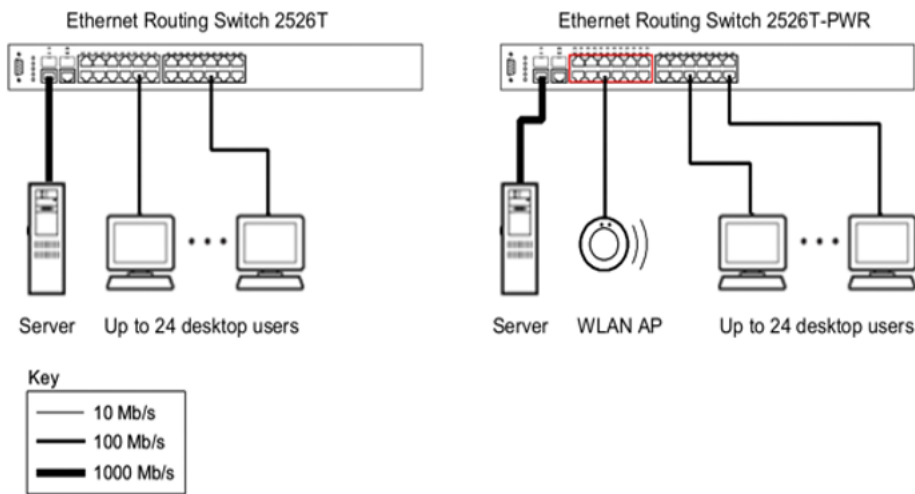
This section provides network configuration examples using the Ethernet Routing Switch 2500 Series switches. In these examples, traffic Quality of service (QoS) feature can be used to prioritize the traffic of the network to ensure uninterrupted traffic of critical applications. The examples are:

- "Small office desktop switch application" (page 34)
- "Branch office workgroup switch application" (page 35)
- "Medium sized office wiring closet switch application" (page 36)

Small office desktop switch application

Figure 8 "Ethernet Routing Switch 2500 Series used as a desktop switch" (page 35) shows the Ethernet Routing Switch 2500 Series used as a desktop switch in a small office environment. The desktop workstations and servers are connected directly to the switch ports. Alternatively, an ERS 2500 series switch that supports Power over Ethernet (PoE) can provide connectivity and power to Wireless LAN Access Points (WLAN APs) in addition to desktop workstations and servers.

Figure 8
Ethernet Routing Switch 2500 Series used as a desktop switch

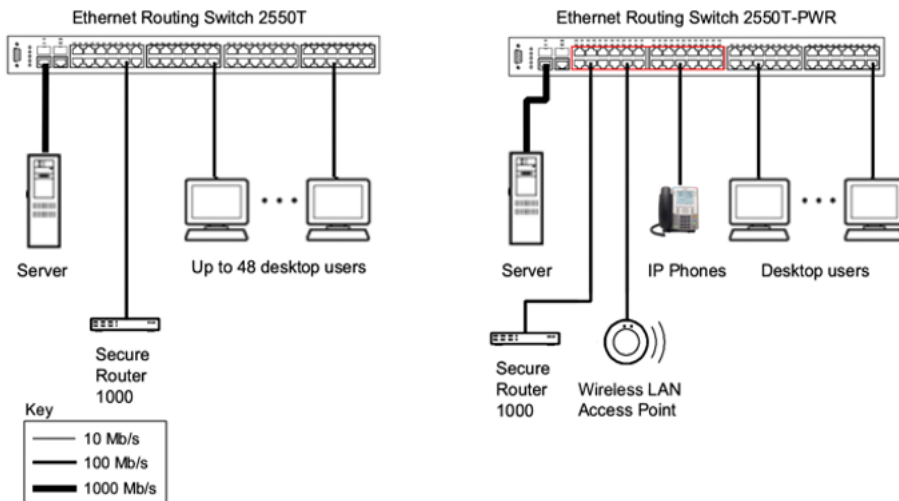


Branch office workgroup switch application

Figure 9 "Ethernet Routing Switch 2500 Series used as a workgroup switch" (page 36) shows the Ethernet Routing Switch 2500 Series used as a workgroup switch in an enterprise branch office environment. Desktop workstations and servers are connected directly to the switch ports. Alternatively, an ERS 2500 series switch that supports Power over Ethernet (PoE) can provide connectivity and power to IP Phones and Wireless LAN Access Points (WLAN APs) in addition to desktop workstations and servers.

The Ethernet Routing Switch 2500 series switch can optionally be stacked up to 8 units to form a single virtual switch providing up to 384 10/100Mb/s connections and 16 1000Mb/s connections.

Figure 9
Ethernet Routing Switch 2500 Series used as a workgroup switch

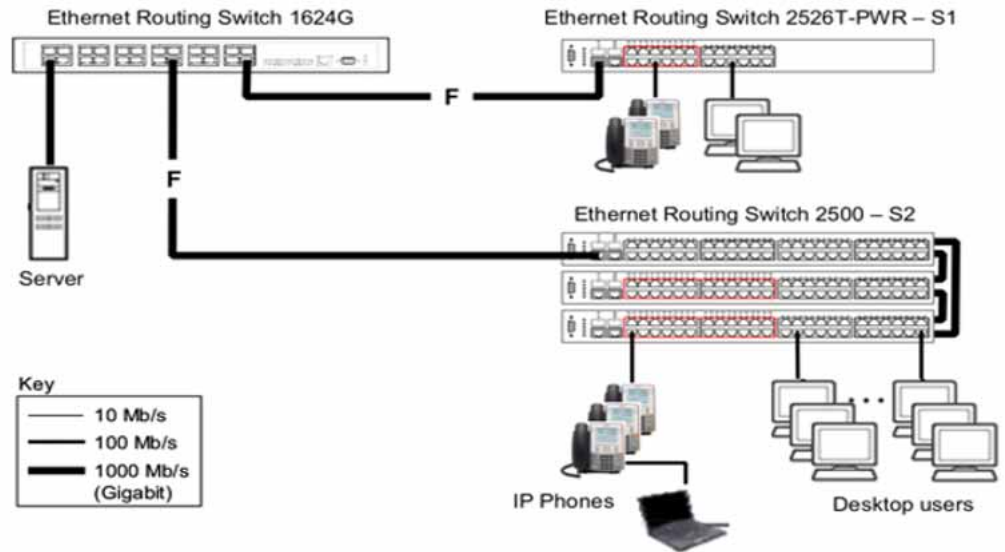


Medium sized office wiring closet switch application

Figure 10 "Configuring power workgroups and a wiring closet switch" (page 37) shows the Ethernet Routing Switch 2500 series used as a wiring closet switch in a medium to large enterprise office environment. Desktop workstations, IP Phones, and WLAN APs are connected directly to the switch ports.

Figure 10 "Configuring power workgroups and a wiring closet switch" (page 37) shows the Ethernet Routing Switch 1600 series used as a backbone switch, connecting to Ethernet Routing Switch 2500 – S1, with an optional 1000BASE-SX SFP GBIC for maximum bandwidth. S2 is a single virtual switch stack of three ERS 2500 switches providing 10 or 100Mb/s, also connecting to the ERS 1624G backbone switch with an optional 1000BASE-SX SFP GBIC in both switches.

Figure 10
Configuring power workgroups and a wiring closet switch



Nortel Ethernet Routing Switch 2500 Series stacking

This chapter includes information about the stacking features, such as stack capabilities, stacking functionality delivery, stack configuration, and Auto Unit Replacement. This chapter contains information about the following topics:

- "Stacking capabilities" (page 39)
- "Stacking functionality delivery" (page 40)
- "Stack configuration" (page 45)
- "Auto Unit Replacement" (page 54)

Stacking capabilities

The Nortel Ethernet Routing Switch 2500 Series contain two built-in rear ports that can be used as stacking/cascade ports to enable a stack of up to eight units.

A stack can consist of Nortel Ethernet Routing Switch 2526T, Nortel Ethernet Routing Switch 2550T, Nortel Ethernet Routing Switch 2526T-PWR, and Nortel Ethernet Routing Switch 2550T-PWR units.

The stack ports on ERS 2500 series switches provide 4Gbps (FDX) stack bandwidth for an aggregate of up to 32Gbps for a stack of eight units.

A stack of Ethernet Routing Switch 2500 series switches can also consist of a mix of stack pre-enabled units as well as non pre-enabled units. The non pre-enabled units in a stack must meet the following requirements before they are added into a stack configuration:

- contain a valid license file (a license file contains the switch MAC addresses)
- Operational mode of rear ports operating in Stacking Mode

Stacking functionality delivery

The Nortel Ethernet Routing Switch 2500 series switches allow you to stack multiple switches together to create a single virtual switch that can be managed as a single device. Stacking functionality is delivered in two distinctively different ways on Ethernet Routing Switch 2500 series switches:

- Through stack enabled units with order codes AL2515xxx-E6. The rear ports of stack enabled ERS 2500 switch are factory pre-enabled, configured, and operating in Stacking Mode by default and are ready to stack. These units do not require or use the software licensing mechanism.
- Through software using a licensing mechanism for standalone units with order codes AL2500xxx-E6. Standalone ERS 2500 switches require the purchase of a Stacking License Kit for each license to create a license file, which unlocks stacking capability on standalone units.

Stack enabled switches

The stack enabled unit rear ports are configured in Stacking Mode at the factory and are ready for immediate use for connection in a stack configuration. Stacking Mode is the default operating mode that cannot be overridden by a factory default. Standalone Mode operation is still available for configuration on the rear-ports of stack enabled units. For information on adding or replacing a new unit, see ["Adding/Replacing a stack unit" \(page 53\)](#).

All factory pre-enabled units are identifiable through CLI, Web UI, and Device Manager with the text **Stack Enabled** included in the switch description for identification purposes.

Standalone configuration with license files

Standalone units are not pre-enabled with stacking capability in the factory and require the use of a software based licensing mechanism to unlock stacking functionality for activation on the rear ports. Standalone units use the GenLic engine for decryption of a license file. The license file must contain the switch MAC address to unlock the stacking functionality.

Standalone units require the purchase of an Ethernet Routing Switch 2500 series Stacking License Kit, of which there are four types available. Each kit contains a License Certificate with a License Authorization Code (LAC) that enables a specific number of stacking licenses for one or multiple ERS 2500 series switches. Each ERS 2500 series switch requires one license file to unlock stacking functionality. A single license file can contain up to 1000 switch MAC addresses for installation on multiple switches.

A Stacking License Certificate contains instructions on how to deposit license entitlements into a license bank, enter switch MAC address(es), create the license file, then download and copy the license file onto each switch requiring stacking functionality. These instructions are carried out on the Nortel Licensing portal web site at: www.nortellicensing.com.

ATTENTION

Once a valid license file is downloaded on to an Nortel Ethernet Routing Switch 2500 Series switch, you can configure the operational mode of rear ports to Stacking Mode. Although the rear ports are set to Stacking Mode, a reboot of the switch is required to fully enable the stacking operation.

Working with license files using the CLI

With the following commands, you can copy the license file to your switch and display or clear the existing license information:

- "copy tftp license command" (page 41)
- "show license command" (page 42)
- "clear license command" (page 42)

copy tftp license command The `copy tftp license` command copies the license file from a TFTP server to your switch. After you copy the license to the switch, you need to perform a reboot to activate the license.

ATTENTION

The license is copied to NVRAM. If you reset the switch to default, this removes the license from the switch. But the stacking feature is enabled until you configure the switch to Standalone Mode.

The syntax for the `copy tftp license` command is:

```
copy tftp license <A.B.C.D> <WORD>
```

The `copy tftp license` command is executed in the Privileged EXEC command mode.

"copy tftp license command parameters" (page 41) describes the parameters and variables for the `copy tftp license` command.

copy tftp license command parameters

Parameters and variables	Description
<A.B.C.D>	The TFTP server address.
<WORD>	The software license filename on the TFTP server.

show license command The `show license` command displays the existing licenses on your switch. The syntax for the `show license` command is:

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

The `show license` command is executed in the Privileged EXEC command mode.

Table 5
show license command parameters

Parameters and variables	Description
<1-10>	Displays the selected licenses.
all	Displays all licenses.

The following figure displays a sample output for the `show license all` command after installing the license file.

Figure 11
show license all command output

```
2526T#show lic all
Number of licenses: 1
-----
                        License 1
-----
version:                0
md5_key:                2e1edfce fe9d8acf e31fbe6a e31fbe6a
md5_file:              60cf72ae 8dbdc0c2 346a5b0d 346a5b0d
time_base:             2007/11/14 09:45:01
time_modify:          2007/11/14 09:45:01
time_expiration:
num_unique_ids:       1
flags:                0x00000022 SITE MEMO
memo:                 Stacking License

2526T#
```

clear license command The `clear license` command deletes the existing licenses on your switch.

The syntax for the `clear license` command is:

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

The `clear license` command is executed in the Privileged EXEC command mode.

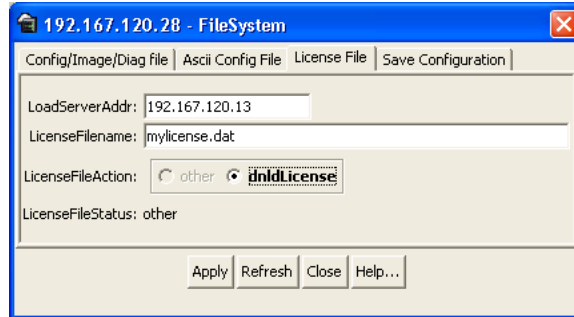
Copying the license file using the Java Device Manager

Use the Java Device Manager to copy the license file to the 2500 Series Nortel Ethernet Routing Switch.

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

1 From the Device Manager menu select **Edit > File System**.
The FileSystem dialog box appears.

2 Click the **License File** tab.
The License File tab appears.



3 In the **LoadServerAddr** field, enter the TFTP server address.

4 In the **LicenseFileName** field, enter the software license filename on the TFTP server.

ATTENTION

The **LicenseFileName** field is case sensitive and you can use a maximum of 64 characters including the file extension. Numerals are allowed in the **LicenseFileName** but special characters like @, -, #, and so on are not allowed.

5 In the **LicenseFileAction** field, select **dnldLicense**.

6 Click **Apply**.

7 Click **Refresh**.

The **LicenseFileStatus** field displays the file copy progress. After the file copy completes, a warning message appears prompting you to reboot the switch and activate the license.

8 To reboot the switch, choose **Edit > Chassis**

9 Under the **System** tab, select the **reboot** option and click **Apply**.

—End—

Downloading the license files using the Web-based management interface

You can download the license files to the Nortel Ethernet Routing Switch. To download the Ethernet Routing Switch 2500 Series license files, a properly configured Trivial File Transfer Protocol (TFTP) server must be present in your network, and the Ethernet Routing Switch 2500 Series must have an IP address.

To download a license file, use the following procedure:

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

- | | |
|---|---|
| 1 | From the main menu, choose Configuration > License Download . The License Download page appears. |
|---|---|

Figure 12
License Download page



The following table describes the fields on the **License Download** page.

Table 6
License Download page fields

Fields	Description
License Image Filename	Type the valid license image filename.
Select Target	Choose the target address.
TFTP Server IP Address	Type the IP address of your TFTP download host.
Start Load of New License File	Choose Yes to start downloading the new license file immediately and No to cancel.
Remove License File Number	Choose the license number to be removed.

- 2 Type information in the text boxes, or select from a list.
- 3 Click **Submit**.

—End—

Stack configuration

The Nortel Ethernet Routing Switch 2500 series provides the capability for intelligent fail-safe resilient stacking of up to eight units in a single switch stack. This provides uninterrupted connectivity of up to 400 user ports in a virtual switch managed as a single unit.

ATTENTION

All ERS 2500 series switches must be running software release 4.1 before being connected in a stack configuration.

To set up a stack, do the following:

Step	Action
1	Power down all switches.
2	Set the Unit Select switch at the rear of the non-base units to the off position.
3	Plug all stack cables in to the rear RJ-45 cascade ports and ensure the cables are connected from Cascade Down on the first unit to Cascade Up on the second unit and so on. The last unit in the stack must be connected back to the first unit for full stack resiliency. Ensure all the cascade cables are properly connected.
4	Power up all the switches in the stack starting with the Base unit.

ATTENTION

In a mixed stack of 2526T, 2526T-PWR, 2550T, and 2550T-PWR, any switch can act as the **Base** unit.

—End—

ATTENTION

The rear ports must be operating Stacking Mode before adding a switch into a stack.

Configuring the operational mode on rear ports using the CLI

You can use the following commands to configure the operational mode of rear ports into Stacking or Standalone Mode:

- "rear-ports mode command" (page 46)
- "show rear-ports mode command" (page 46)

rear-ports mode command

The `rear-ports mode` command configures the operational mode of the rear-port.

The syntax for the `rear-ports mode` is:

```
# rear-ports mode [unit <1-8>] {standalone|stacking}
```

The `rear-ports mode` command is executed in the Global Configuration command mode.

[Table 7 "rear-ports mode command" \(page 46\)](#) describes the parameters and variables for the `rear-ports mode` command.

Table 7
rear-ports mode command

Parameters and variables	Description
[unit <1-8>]	Specifies the unit number. You can use a maximum of eight units.
{standalone stacking}	Specifies the operational mode of the selected unit.

show rear-ports mode command

The `show rear-ports mode` displays the operational mode of the rear port.

The syntax for the `show rear-ports mode` is:

```
# show rear-ports mode
```

The `show rear-ports mode` command is executed in Global Configuration command mode in the CLI. There are no parameters and variables for `show rear-ports mode` command.

[Figure 13 "show rear-ports mode command output" \(page 47\)](#) displays a sample output of the `show rear-ports mode` command when the rear ports are set and running in Stacking Mode.

Figure 13
show rear-ports mode command output

```
2526T#show rear-ports mode
Current rear-ports mode: Stacking Mode
Next rear-ports mode: Stacking Mode
Next mode will be applied after reset
2526T#_
```

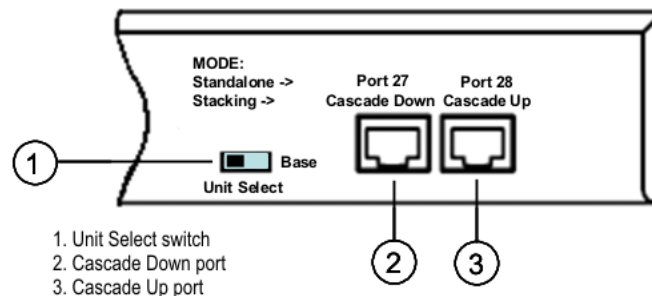
Configuring the operational mode of rear ports using the Device Manager

Use the Device Manager to configure the operational mode of the rear ports into Standalone or Stacking Mode in the Ethernet Routing Switch 2500 Series. For more information on configuring the operational mode of rear ports, see "[Rear Ports Mode tab](#)" ([page 252](#))

Rear ports and stacking

The rear panel view of a Nortel Ethernet Routing Switch 2500 series switch consists of two RJ-45 1000BaseT ports and a Unit Select switch. In Stacking Mode, the two rear ports become the Cascade Down and Cascade Up ports for connecting switch units in a stack configuration. The rear panel components are illustrated in the following diagram:

Figure 14
Rear panel components



Unit Select switch

The Unit Select switch is used to designate a switch in the stack as the *base unit*. Sliding the switch to the right designates that switch as the base unit. Only one switch in a stack has the Unit Select switch in the base unit position. All other switches in the stack must have the Unit Select switch in the left position.

The base unit designation of a switch is also displayed on the front panel LED display. For more information, see [Table 2 "Ethernet Routing Switch 2500 Series LED descriptions"](#) ([page 28](#))

Cascade Down port

The **Cascade Down** port is used to connect this switch unit to the next unit in the stack through a stack cable. A connection from this port must be attached to the **Cascade Up** port of the next switch in the stack. A return cable from the **Cascade Down** port of the last unit must be connected to the **Cascade Up** port of the first unit to complete the stack connection.

ATTENTION

Each Nortel Ethernet Routing Switch 2500 series switch is supplied with one 46-cm stack cable to create a stack connection. For stacking three or more units (maximum 8 units per stack), you need to order the 1.5 or 3 meters stack return cable (order number AL2518002-E6 and AL2518003-E6, respectively).

Cascade Up port

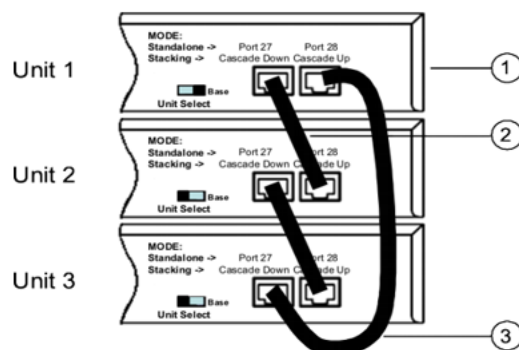
The **Cascade Up** port is used to accept a stack cable connection from an adjacent unit above. A return cable from the **Cascade Up** port of the first unit must be connected to the **Cascade Down** port of the last unit to complete a stack connection.

ATTENTION

Nortel Ethernet Routing Switch 2500 series switches use tested and certified Category 5E UTP cables as stack cables. All Nortel branded ERS 2500 series stack cables are for use with these switches. However, Cat 5E stack cable connections of up to 100 meters is possible between each ERS 2500 switch but not officially supported. Using non-Nortel tested and certified stack cables for such configurations are solely the user's responsibility should any stack operation issues occur.

The following illustration demonstrates the proper stack cable crossover configuration. Failure to use this configuration can result in loss of connectivity. This example shows a cascade down configuration

Connecting stack cables



1. Base Unit
2. Cascade Cable
3. Cascade Cable (used for return)

Initial stack 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 the position of one or more units in the stack is changed.

For example, when the stack is initially powered, the base unit becomes unit 1 and the unit that the base unit connects to (via the Cascade Down 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 the base unit is changed to another unit in the stack, the new base unit keeps its original unit number in the stack.

Stack MAC address

When a switch participates in a stack configuration, a stack MAC address is automatically assigned during stack initialization. The stack MAC address is the base unit MAC address plus 1. If another unit in the stack is assigned as the base unit, the new stack MAC address is the MAC address of the new base unit plus 1. The original stack IP address still applies to the new base unit.

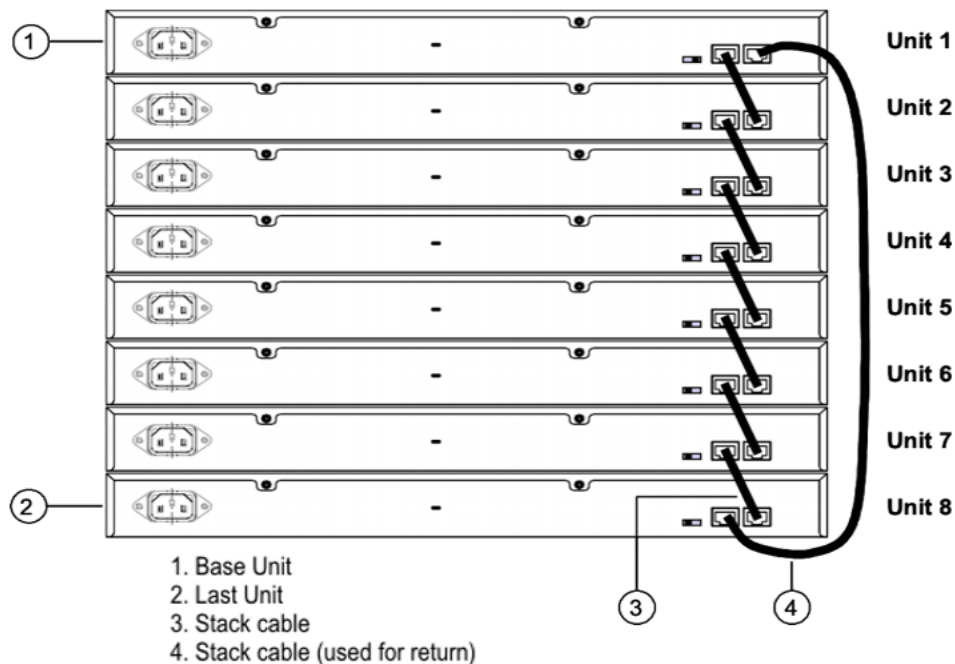
Stack configurations

Due to stack parameters being associated with the base unit, the physical stack order depends on the base unit position and whether the stack is configured *cascade up (stack up)* or *cascade down (stack down)*. This designation depends on the stack cabling arrangement.

The system automatically numbers the physical units based on the designated base unit (Unit 1). In a cascade down configuration, the base unit is physically located as the top unit in the stack. The cable connected to the Cascade Down connector of the base unit terminates in the Cascade Up connector on the next unit in the stack which is physically located below the base unit. This next unit is designated Unit 2. The stack is wired downward through the units and the system continues to number in this manner throughout the stack. In this configuration, the base unit discovers the stack in a cascade down (stack down) direction. The following illustration demonstrates a cascade down (stack down) configuration.

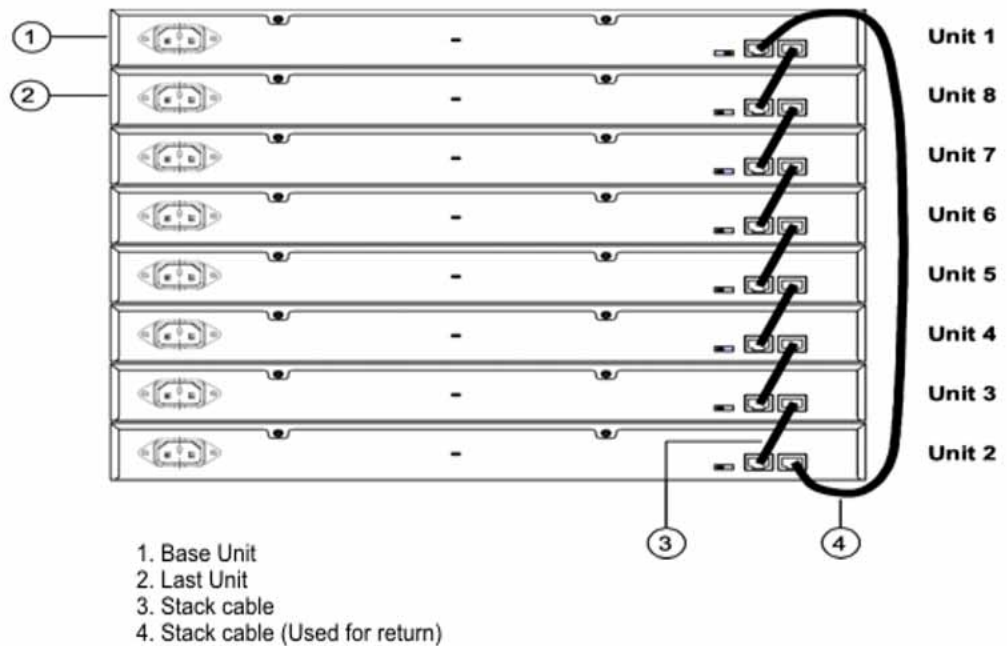
ATTENTION

Many network management software packages assume a cascade down (stack down) configuration, Nortel recommends the usage of this configuration.

Cascade down stack configuration

In a cascade up (stack up) configuration, the base unit is physically located as the top unit in the stack. The cable connected to the Cascade Down connector of the base unit terminates in the Cascade Up connector physically located at the *bottom* of the stack. This next unit is designated Unit 2. The stack is wired upward through the units and the system continues to number in this manner throughout the stack. In this configuration, the base unit discovers the stack in a cascade up (stack up) direction. The following illustration demonstrates a cascade up (stack up) configuration.

Cascade up stack configuration



Regardless of stack configuration, the following applies:

- When power is applied to the stack the base unit initializes, typically within 60 seconds, and the entire stack powers up as a single logical unit.
- A RS-232 communications cable can be attached to the console port of any switch in the stack to establish a console connection.
- A software upgrade can be performed on the stack from any switch using the console interface, a Telnet session, the web-based management interface, or any SNMP-based management software.
- The stack can be managed using a Telnet session, web-based management interface, or any SNMP-based management software through any stack switch port.
- When stacking two or more switches. use the 3 meters cascade max-return cable (part number AL2518003-E6) to complete the link from the last unit in the stack to the 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 moving to a steady amber state.

This automatic failover is only a temporary safeguard. If the stack configuration loses power, the temporary base unit cannot power up as the base unit when power is restored. Also, if the original unit rejoins the stack, it cannot resume base unit status. For this reason, always assign the temporary base unit as the base unit until the failed unit is repaired or replaced.

ATTENTION

If the temporary base unit is not assigned as the new base unit, and the temporary base unit fails, the next unit in the stack order becomes the temporary base unit. This process continues after successive failures until only two units are left in the stack.

Redundant cascade stacking

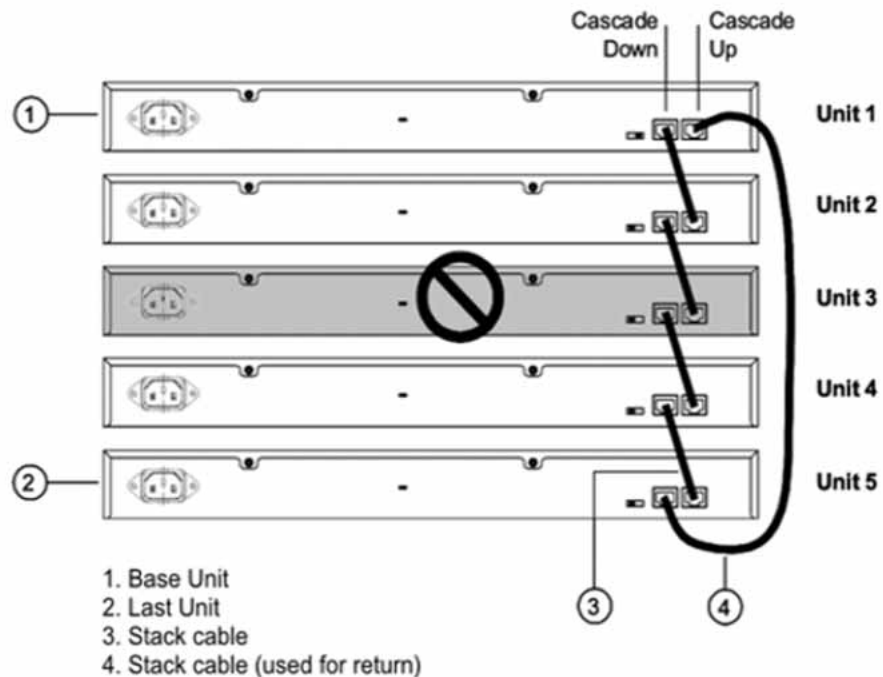
The Nortel Ethernet Routing Switch 2500 Series allows a stack of up to 8 units into a dual-path cascade stack. If any single unit fails or if a cable is accidentally disconnected, other units in the stack remain operational without interruption.

In addition to increasing bandwidth, the software uses the cables to provide two paths between units. If one path breaks the data travels over the remaining path with half the normal inter-switch bandwidth.

The following diagram shows an example of a stack configuration with a unit failure in the stack. This illustrates:

- Unit 3 becomes non-operational due to a unit failure, cable disconnection, or a loss of power.
- Units 2 and 4, directly upstream and downstream from Unit 3, sense the loss of link signals from unit 3. The software causes all the data to traverse the remaining path.
- The Cascade Down LED for Unit 2 and the Cascade Up LED for Unit 4 turn amber to indicate an error has been detected.
- The remaining stack units continue to be connected.

Redundant cascade stacking



Removing a stack unit

If a unit is removed from the stack, the following switch configuration settings revert to those configured before the unit became a member of the stack:

- IP address
- Console, Web, Telnet, and SNMP passwords
- SNMP community strings

Adding/Replacing a stack unit

To replace a failed stack unit or insert a new unit into a stack, follow this procedure:

Step	Action
1	Upload a copy of the stack configuration file to a TFTP server. Since unit failure is not a predictable situation, it is suggested that the stack configuration file is backed up regularly to a TFTP server.
2	Obtain the new ERS 2500 switch.

Ensure that the new switch is set to factory default values. Then, if the unit is a standalone ERS 2500 switch, ensure that a valid stacking license.dat file is installed on the switch and the rear ports are operating in Stacking Mode. If the unit is a Stack Enabled ERS 2500 switch, then the unit is ready for adding or replacing. For information on installing a stacking license, see "[Standalone configuration with license files](#)" (page 40).

- 3 Download the configuration file to the new unit.

Manually insert the new unit in the stack. Turn off the new unit inserted into the stack and manually replace the failed unit in the stack. Plug in the stack cables into the appropriate cascade ports.

- 4 Power up the new unit in the stack.

The new unit joins the stack and the configuration of the failed unit is replicated onto it. Once the replication is completed, the new unit is reset and rejoins the stack automatically.

—End—

If the base unit is being replaced, remember that the stack elected a temporary base unit. The new unit cannot automatically resume operation as the base unit even with the Unit Select switch set to **Base**. To restore the stack to its original running state with the new unit set to **Base** using the Unit Select switch, the switch stack must be reset.

Auto Unit Replacement

The Auto Unit Replacement (AUR) feature enables users 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 main feature of the AUR is the ability to retain 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.

ATTENTION

In order for AUR to function properly, the new unit and the existing units in the stack must all be running the same version of software (Release 4.1 software or later).

ATTENTION

AUR is intended for a stack configuration of two or more units. In a two-unit stack configuration, if a unit fails, the remaining unit becomes a standalone switch. AUR loads the configuration of the failed unit in the replacement of ERS 2500 Series unit if the failed unit was a non-Base Unit.

AUR is not designed for the situation of removing and reinserting the same switch (with the same MAC address).

Other information related to this feature:

- The new unit must be the same hardware configuration as the old, including the same number of ports.
- If the administrator adds a new unit with a different hardware configuration, the configuration of this unit is used.
- If the administrator adds a new unit with the same 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/enabled at any time using the CLI. The default mode is ENABLE.
- Customer log messages are provided.

ATTENTION

After booting a stack, use the CLI command `show stack auto-unit-replacement` from a unit console to find out if that unit is ready for replacement.

AUR function

The CFG mirror image is a mirror of a CFG image (in FLASH) of a unit in a stack. The mirror image does not reside in the same unit with 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 that has its AU in the stack. An INACTIVE CFG Mirror Image is a CFG mirror image for which the associated AU has been removed from the stack. When a CFG mirror image becomes INACTIVE, the INACTIVE CFG mirror image 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.

CFG mirror image process

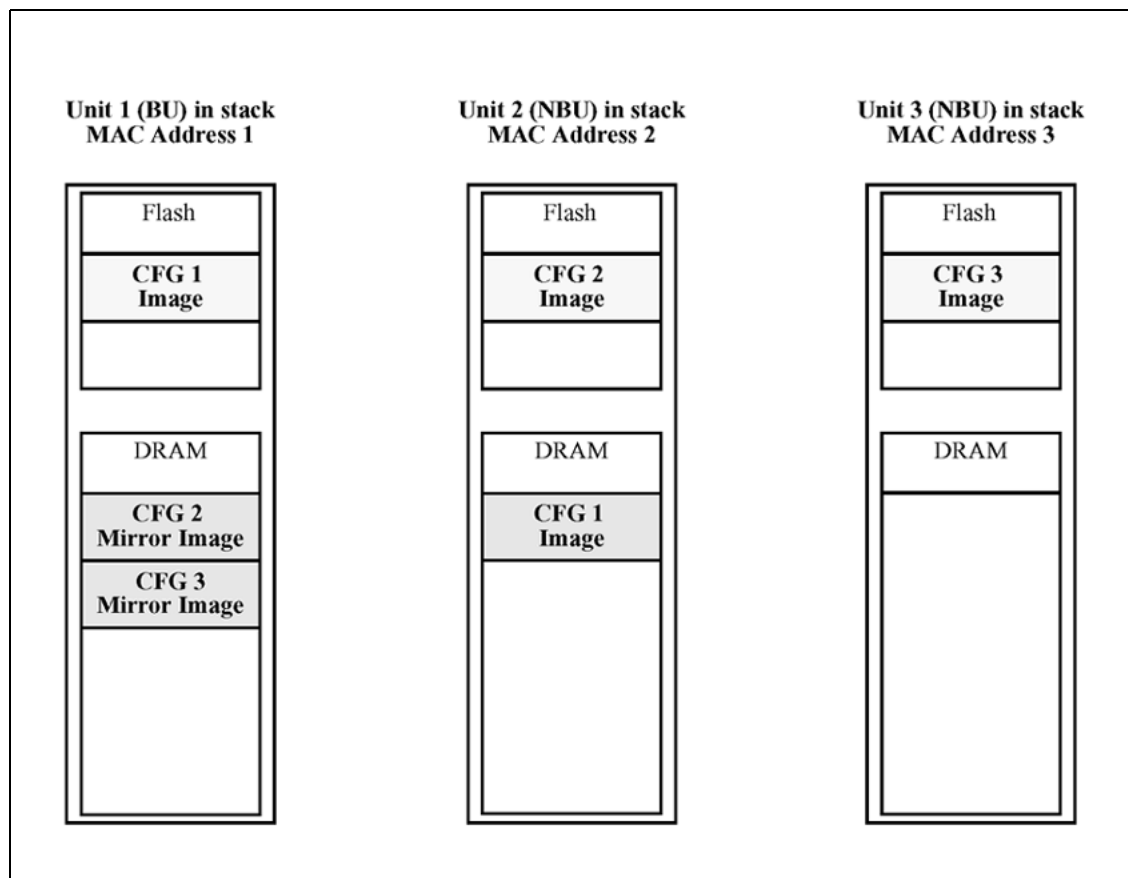
The CFG mirror image process is triggered by specific events.

Power Cycle After a power cycle, all the CFG images in a stack are mirrored.

Figure 15 "CFG mirror process in stack" (page 56) illustrates the CFG mirror images in a three-unit stack after the stack is powered on. Unit 1 is the Based Unit (BU) and all other units are Non-Based Units (NBU).

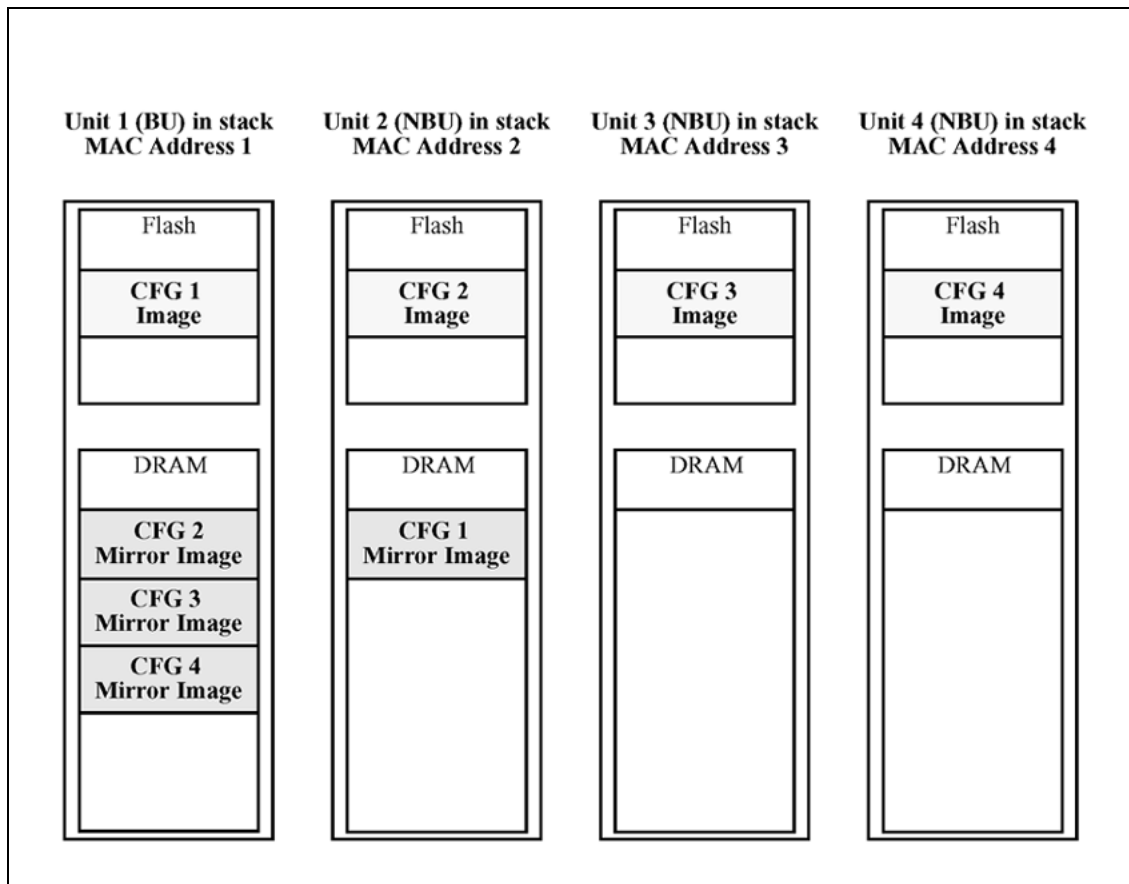
- Unit 1 (BU) contains mirror images for unit 2 (CFG 2) and unit 3 (CFG 3).
- Unit 2 (NBU), is the TEMP-BU. It contains a mirror image of unit 1 (CFG 1), in case the BU (unit 1) is removed from the stack.
- All three mirror images (CFG 1, CFG 2, and CFG 3) are active.
- Unit 2 is the Associated Unit of the CFG 2 mirror image.
- The Mac Address 2 is the Associated Mac Address (AMA) of the CFG 2 mirror image.

Figure 15
CFG mirror process in stack



Adding a unit In a stack that does not have any 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 16 "CFG mirror images in the stack after adding unit 4"](#) (page 57), after adding unit 4 to the stack, the CFG 4 mirror image is created in the BU (unit 1).

Figure 16
CFG mirror images in the stack after adding unit 4

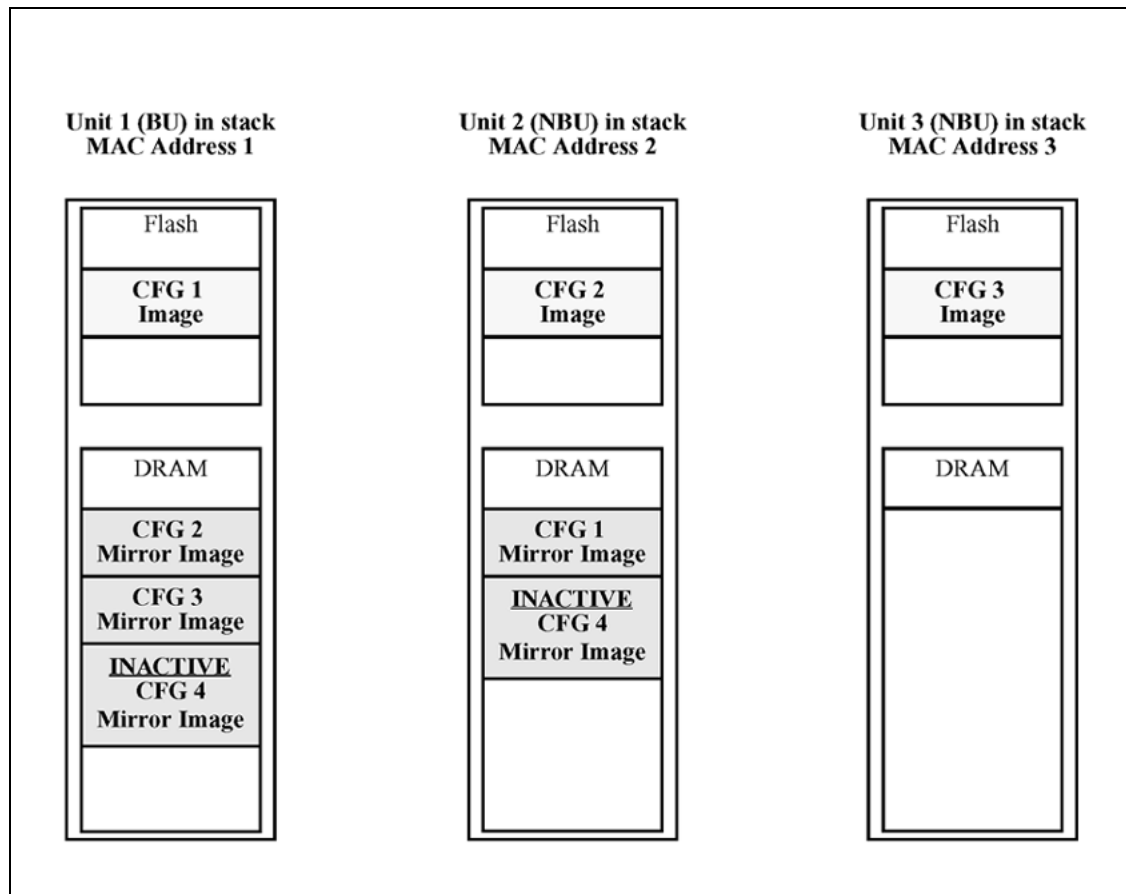


Removing an NBU When an NBU is removed from a stack, the related CFG mirror image in the stack becomes INACTIVE.

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 the removal of unit 4 from the stack shown in [Figure 16 "CFG mirror images in the stack after adding unit 4"](#) (page 57), the CFG 4 mirror image becomes INACTIVE (see [Figure 17 "CFG mirror images after removing unit 4"](#) (page 58)). Another copy of the INACTIVE CFG 4 mirror image is also created in unit 2.

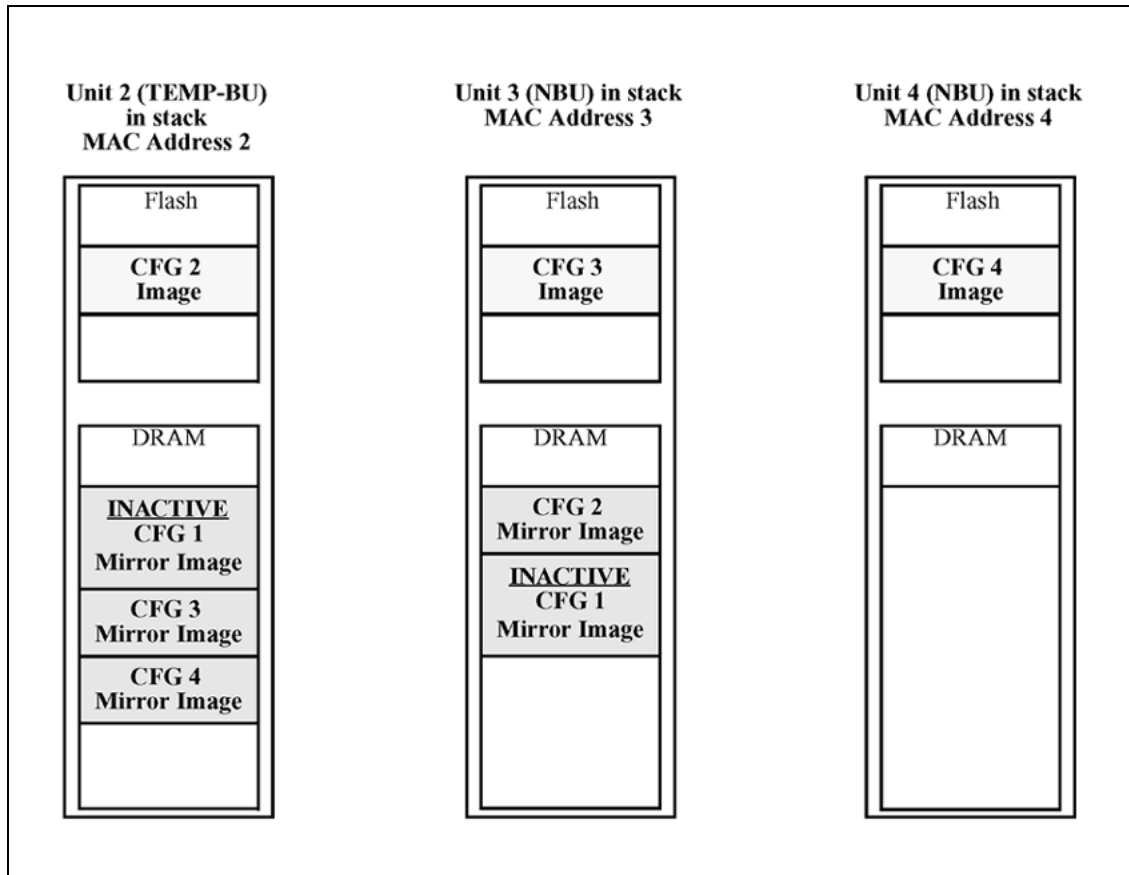
Figure 17
CFG mirror images after removing unit 4



Removing a BU When a BU is removed, 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 image of the NBUs in the stack.

After the removal of the BU from the stack shown in [Figure 16 "CFG mirror images in the stack after adding unit 4" \(page 57\)](#), the TEMP-BU (unit 2) has to mirror all the CFG images in the stack (see [Figure 18 "CFG mirror images in the stack after removing the BU \(unit 1\)" \(page 59\)](#)). The feature also ensures that the stack always has two copies of an INACTIVE CFG mirror image.

Figure 18
CFG mirror images in the stack after removing the BU (unit 1)



As shown in Figure 18 "CFG mirror images in the stack after removing the BU (unit 1)" (page 59):

- 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's 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

Restoring a CFG image is a process that overwrites the CFG image of a new unit in a stack with an INACTIVE mirror image stored in the stack.

ATTENTION

Restore a CFG image to a new unit happens only if the following conditions are met.

- The AUR feature is enabled.
- There is at least one INACTIVE CFG mirror image in the stack.
- The MAC Address of the new unit is different from all the AMA of the INACTIVE CFG mirror images in the stack.

The image restore process consists of the following steps:

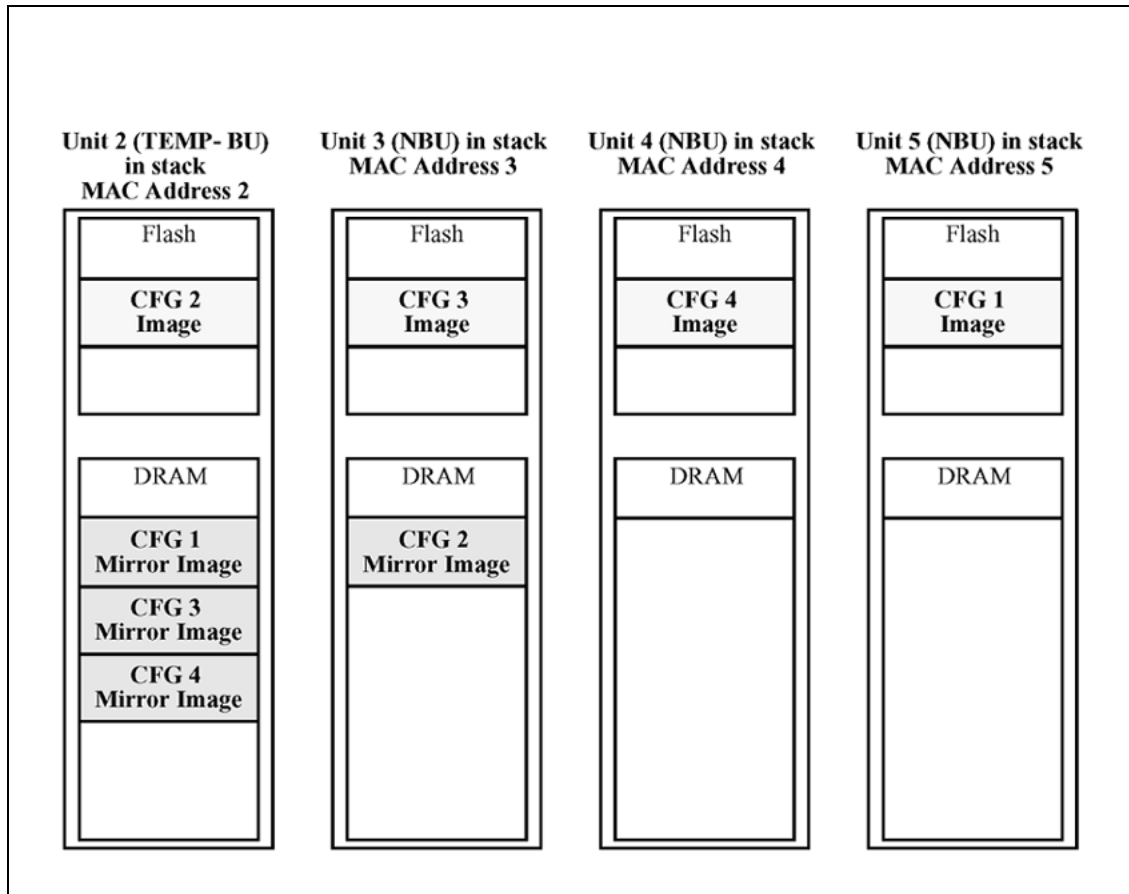
Step	Action
1	Adding a new unit to a stack
2	The INACTIVE CFG mirror image in the stack is sent to the new unit. The INACTIVE CFG mirror image becomes ACTIVE.
3	The new unit saves the received CFG image to its flash.
4	The new unit resets itself.

—End—

For example, if a unit 5 (MAC Address 5) is added to the stack shown in [Figure 18 "CFG mirror images in the stack after removing the BU \(unit 1\)" \(page 59\)](#), the following occurs (see [Figure 19 "CFG mirror images in the stack after adding unit 5" \(page 61\)](#)):

- The INACTIVE CFG 1 mirror image is copied to the CFG 5 image. Unit 5 now has the configuration of unit 1 that 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 the unit 5 becomes the new AMA of the CFG 1 mirror image.

Figure 19
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 synchronization occurs in the AU.

Configuring AUR using the CLI

This section describes the CLI commands used in AUR configuration.

show stack auto-unit-replacement command

The `show stack auto-unit-replacement` command displays the current AUR settings.

The syntax for this command is:

```
show stack auto-unit-replacement
```

The `stack auto-unit-replacement enable` command is in all command modes.

There are no parameters or variables for the `show stack auto-unit replacement` command.

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 executed in the Global Configuration mode.

There are no parameters or variables for the `stack auto-unit-replacement enable` command.

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 executed in the Global Configuration mode.

There are no parameters or variables for the `no stack auto-unit-replacement enable` command.

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 executed in the Global Configuration mode.

There are no parameters or variables for the `default stack auto-unit-replacement enable` command.

Configuring AUR using Device Manager

You also can enable or disable AUR using Device Manager by toggling the `AutoUnitReplacementEnabled` field in the **System** tab (see "[System tab](#)" (page 259)).

Displaying unit stack 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 is connected to the stack. You can use the `show stack-info uptime` to display the unit uptimes. The syntax for the `show stack-info uptime` is

```
show stack-info uptime
```

The `show stack-info uptime` is executed in Privileged EXEC command mode and takes no parameters.

System configuration software features

This chapter describes the software features used for system configuration on the Ethernet Routing Switch 2500 Series. It includes information about the following topics:

- x-ref to switch management features
- x-ref to ethernet port management features
- x-ref to other features

Switch management features

Configuration and switch management

The Ethernet Routing Switch 2500 Series that is shipped directly from the factory is ready to operate in any 10BASE-T or 100BASE-TX standard network.

You must assign an IP address to the switch. You can set both addresses by using the Console port or BootP, which resides on the switch. You can manage the switch using:

- Command Line Interface (CLI)

The CLI is used to automate general management and configuration of the Ethernet Routing Switch 2500. Use the CLI through a Telnet connection or through the serial port on the console. See "[CLI Basics](#)" ([page 81](#)) for more information.

- Java-based Device Manager

Device Manager is a Java-based set of graphical network management applications used to configure and manage an Ethernet Routing Switch 2500 Series. See "[Getting Started with Device Manager](#)" ([page 101](#)) for more information.

- Web-based management

You can manage the network from the World Wide Web. Access the web-based Graphical User Interface (GUI) through the Embedded Web Server (EWS), the HTML-based browser located on your network. The

GUI lets you configure, monitor, and maintain your network through Web browsers. You can also download software using the Web.

For information about web-based management, see ["Using the Web-based management interface" \(page 145\)](#).

- Any generic SNMP-based network management software.

You can use any generic SNMP-based network management software to configure and manage an Ethernet Routing Switch 2500 Series.

Console port settings

The default settings for the Console port are:

- 9600 baud with eight data bits
- One stop bit
- No parity as the communications format
- Flow control set to disabled

Switch banner

When you connect to the switch through the Console port or through a Telnet connection, you are presented with a Nortel switch banner. Enter Ctrl+Y to proceed to the CLI interface.

Figure 20
Login banner

```

#####
#####
#####
#####
#####
#####
#####
#####
#####
#####
#####
#####
#####
#####

Enter Ctrl-Y to begin.

*****
*** Ethernet Routing Switch 2500-50T_PWR          ***
*** Nortel                                           ***
*** Copyright (c) 1996-2006. All Rights Reserved    ***
*** SSH                                             ***
*** HW:0A FW:1.0.0.5 SW:v4.0.0.0                   ***
*****

```

User name and password

You can use the CLI to set user names as well as passwords for system access through the CLI, Telnet, and web-based management. The syntax for the `username` command is:

```
username <username> <password> [ro|rw]
```

You can also set the CLI password using the `cli password` command, or the Password Setting web-based management page. When you log on to the switch, you are prompted to enter a valid user name. Therefore, ensure you are aware of the valid usernames (default RW and RO) before you change passwords.

For the standard software image, the default password for user RO is "user" and for user RW is "secure". For the secure software image, the default password for RO is "userpasswd" and for RW is "securepasswd".

For more information about this and other advanced security features supported on the Ethernet Routing Switch 2500 Series, see *Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)*.

Logging in

If you set a password using the `username` or `cli password` command, the next time you access the switch, you are prompted for a username and password as shown in [Figure 21 "Login screen" \(page 67\)](#) (default usernames are **RW** and **RO**).

Figure 21
Login screen

```

Ethernet Routing Switch 2526T      HW:0A      FW:1.0.0.12  SW:v4.1.0.000

Username: [ ]
Password: [ ***** ]

Enter Username: _

Enter text, press <Return> or <Enter> when complete.

```

Enter a valid user name and password and press **Enter**. You are then directed to the CLI.

For the standard software image, the default password for user RO is "user" and for user RW is "secure". For the secure software image, the default password for RO is "userpasswd" and for RW is "securepasswd".

For information about the security features on the switch, see *Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)*.

Autosave feature

By default, every 60 seconds the Ethernet Routing Switch checks whether a configuration change has occurred, or if a log message is written to nonvolatile storage. If one of these two events has occurred, the system automatically saves its configuration and the nonvolatile log to flash memory. Also, the system automatically saves the configuration file if a system reset command is invoked by the user.

ATTENTION

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 using the `autosave enable` and `no autosave enable` commands.

You can use the CLI command `copy config nvram` to force a manual save of the configuration when the autosave feature is disabled.

Using SNTP

The Simple Network Time Protocol (SNTP) feature synchronizes the Universal Coordinated Time (UTC) 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.

ATTENTION

If you have trouble using this feature, try other NTP servers. Some NTP servers can be overloaded or currently inoperable.

The system attempts to connect to the NTP server at least three times, with five minutes duration between each retry. If the connection fails after three attempts, the system waits for the next synchronization time (the default is 24 hours) and begins the process again.

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

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

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

Configuring with CLI

To use the CLI to configure the SNTP feature, use the following procedure:

Step	Action
1	Set the primary and secondary NTP server.
2	Enable the SNTP.
3	Display the UTC time.
4	Optionally, to ensure the synchronization happens immediately, force a synchronization.

—End—

Setting local time zone

The 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 213)
- "no clock time-zone" (page 213)
- "clock summer-time" (page 213)
- "no clock summer-time" (page 214)
- "show clock time-zone" (page 214)
- Figure 75 "show clock summer-time" (page 215)

Using DNS to ping and Telnet

You can use the DNS client to 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 (DNS). 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.

Configuring with CLI

You can use the CLI to configure the DNS client. Following are the commands used to configure the DNS client using the CLI.

- show ip dns command
- ping command
- ip name-server command
- no ip name-server command
- ip domain-name command
- no ip domain-name command
- default ip domain-name command

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

For more information about these commands, see ["System configuration using the CLI" \(page 177\)](#).

BootP automatic IP configuration/MAC address

The Ethernet Routing Switch 2500 Series has a unique 48-bit hardware address, or MAC address, that is printed on a label on the back panel. You can use this MAC address when you configure the network BootP server to recognize the Ethernet Routing Switch 2500 Series BootP requests. A properly configured BootP server lets the switch automatically learn its assigned IP address, subnet mask, IP address of the default router (default gateway), and software image file name.

For more information and an example of a BootP configuration file, see [Appendix "Sample BootP configuration file" \(page 351\)](#).

Choosing a BootP request mode

The **BootP Request Mode** field in the **IP Configuration** window lets you choose which method the switch uses to broadcast BootP requests:

- BootP or Default IP
- BootP Always
- BootP Disabled

- BootP or Last Address

ATTENTION

Whenever the switch is broadcasting BootP requests, the BootP process eventually times out if a reply is not received. 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 or Default IP
- BootP Always
- BootP or Last Address

BootP or Default IP

The Ethernet Routing Switch 2500 Series operates in the BootP or Default IP mode (the default mode) as follows:

- After the switch is reset or power cycled, if the switch has a configured IP address other than 0.0.0.0 or the default IP address, then the switch uses the configured IP address.
- If the configured IP address is 0.0.0.0 or the default IP address (192.168.1.1/24), then the switch attempts BootP for 1 minute.
- If BootP succeeds, then the switch uses the IP information provided.
- If BootP fails and the configured IP address is the default, then the switch uses the default IP address (192.168.1.1/24).
- If BootP fails and the configured IP address is 0.0.0.0, then the switch retains this address.

BootP Always

This option lets you manage the switch that is configured with the IP address obtained from the BootP server. The Ethernet Routing Switch 2500 Series operates in the BootP Always mode 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 BootP server is not reachable, you cannot change the in-band IP address until the BootP mode is set to BootP Disabled. However, after a period of a few minutes (approximately 10 minutes), the switch automatically enters the BootP Disabled mode. You can then configure the IP address using the CLI.

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

This option lets you manage the switch by using the IP address set from the console terminal. The Ethernet Routing Switch 2500 Series operates in the BootP Disabled mode as described in the following steps:

- 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.

BootP or Last Address

This option lets you manage the switch even if a BootP server is not reachable. The Ethernet Routing Switch 2500 Series operates in the BootP or Last Address mode as described in the following steps:

- When you specify the IP data from the console terminal, the IP address becomes the in-band address of the switch. BootP requests are not broadcast. You can manage the switch using this in-band IP address.
- When you do not specify the in-band IP address 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 the IP address specified as the in-band 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.

Default BootP setting

With Release 4.1 software, the default operational mode for BootP on the switch is `BootP or Default IP`. The switch requests an IP address from BootP only if one is not already set from the console terminal (or if the IP address is the default IP address: 192.168.1.1).

Flash memory storage

Switch software image storage

The Ethernet Routing Switch 2500 Series uses flash memory to store the switch software image. The flash memory lets you update the software image with a newer version without changing the switch hardware (see ["Upgrading software" \(page 229\)](#)). An in-band connection between the switch and the TFTP load host is required to download the software image.

Configuration File Download/Upload

The Configuration Management feature lets you store and retrieve the configuration parameters of an Ethernet Routing Switch 2500 Series to a TFTP server. This feature supports two different methods for managing system configuration files:

- Binary configuration file management
- ASCII configuration file management

Requirements

The following requirements apply to the Configuration file feature:

- The Configuration File feature can only be used to copy standalone switch configuration parameters to other standalone switches.
- A configuration file obtained from a standalone switch can only be used to configure other standalone switches that have the same firmware revision and model type as the donor standalone switch.

[Table 8 "Parameters not saved to the configuration file" \(page 73\)](#) describes configuration file parameter information.

Table 8
Parameters not saved to the configuration file

These parameters are not saved
In-Band Switch IP Address
In-Band Subnet Mask
Default Gateway
Configuration Image Filename
TFTP Server IP Address
Terminal settings (speed, width, length)

Binary configuration file

You can store the configuration parameters of a switch to a TFTP server and retrieve the stored parameters to automatically configure a replacement switch. Certain requirements apply when automatically configuring a switch using this feature (see ["Requirements" \(page 73\)](#)). You can set up the file on your TFTP server and set the filename read and write permission to enabled before you can save the configuration parameters.

Although most configuration parameters are saved to the configuration file, certain parameters are not saved (see [Table 8 "Parameters not saved to the configuration file" \(page 73\)](#)).

ASCII configuration file

You can also store the configuration parameters of a switch/stack as an ASCII configuration file and retrieve the stored file to automatically configure a replacement switch/stack.

Autotopology

You can enable the Optivity* Autotopology* protocol on the Ethernet Routing Switch 2500 Series using the CLI. For more information about Autotopology, go to the Nortel support site: www.nortel.com/support (The product family for Optivity and Autotopology is Data and Internet.)

Link Layer Discovery Protocol (IEEE 802.1ab)

Release 4.1 software supports the Link Layer Discovery Protocol (LLDP) (IEEE 802.1ab), which lets stations connected to a LAN to advertise their capabilities to each other, enabling the discovery of physical topology information for network management. LLDP-compatible stations can consist of any interconnection device including PCs, IP Phones, switches, and routers. Each LLDP station stores LLDP information in a standard Management Information Base (MIB), making it possible for the information to be accessed by a network management system (NMS) or application.

Each LLDP station:

- advertises connectivity and management information about the local station to adjacent stations on the same 802 LAN (802.3 Ethernet with Ethernet Routing Switch 2500)
- receives network management information from adjacent stations on the same LAN

ATTENTION

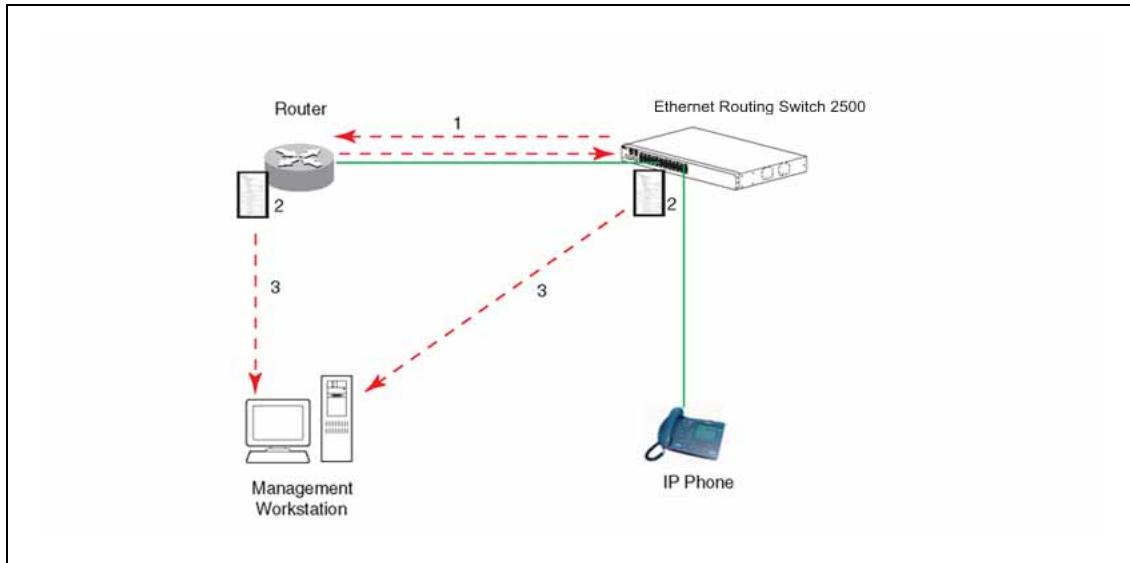
LLDP works in stack mode.

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

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

[Figure 22 "How LLDP works" \(page 75\)](#) shows an example of how LLDP works in a network.

Figure 22
How LLDP works



1. The Ethernet Routing Switch and router advertise chassis or port IDs and system descriptions to each other.
2. The devices store the information about each other in local MIB databases, accessible 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 can also receive information about the capabilities and current status of the system associated with a remote MSAP identifier. However, LLDP agents cannot solicit information from each other.

You can set the local LLDP agent to transmit only, receive only, or to both transmit and receive LLDP information. You can configure the state for LLDP reception and transmission using SNMP or 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 type, length, value (TLV). 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 is used by the recipient 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. All LLDPDU information is automatically discarded by the receiving LLDP agent if the sender fails to update it in a timely manner. A zero value in TTL field of Time To Live TLV tells the receiving LLDP agent to discard the information associated with the LLDPDU MSAP identifier.

In addition to the four mandatory TLVs, Release 4.1 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 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. The TLVs are then inserted into the LLDPDU.

LLDPDUs are regularly transmitted at a user-configurable transmit interval (tx-delay), or when any of the variables contained in the LLDPDU 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 LLDP remote system MIB stores the information received from remote LLDP agents.

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

Configuring LLDP using the CLI

For information about configuring LLDP using the CLI, see "[Configuring LLDP using the CLI](#)" (page 77).

Ethernet port management features

Autosensing and autonegotiation

The Ethernet Routing Switch 2500 Series is an autosensing and autonegotiating device:

- The term autosense refers to the ability of a port 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. Autonegotiation lets the switch select the best of 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 standard. In this case, because it is not possible to sense the duplex mode of the attached device, the Ethernet Routing Switch 2500 Series reverts to half-duplex mode.

When autonegotiation-capable devices are attached to the Ethernet Routing Switch 2500 Series, the ports negotiate down from 100 Mb/s speed and full-duplex mode until the attached device acknowledges a supported speed and duplex mode.

Custom Autonegotiation Advertisements

Custom Autonegotiation Advertisements (CANA) lets you 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.

CANA lets you 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 and duplex modes if customers disable autonegotiation on the neighboring device.

ATTENTION

The CANA feature is available only for built-in 10/100 Ethernet ports and combo ports (not available for rear ports).

You can only enable CANA through the CLI. When CANA is enabled on a port, autonegotiation status is displayed as Custom in the web-based management interface.

High speed flow control

The high speed flow control feature lets you control traffic and avoid congestion on the gigabit full-duplex link. If the receive port buffer becomes full, the Ethernet Routing Switch 2500 Series 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.

High speed flow control cannot be configured unless you set Autonegotiation to Disabled on the port and the speed/duplex is at 1000/full.

Two high speed flow control modes are available:

Symmetric mode

This mode lets both GBIC port and its link partner to 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

This mode lets the link partner 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.

You can choose a high speed flow control mode using CLI commands. For more information about the commands see ["Enabling flow control" \(page 240\)](#).

Rate Limiting Configuration

The Rate Limiting feature lets you configure the threshold limits for broadcast and multicast packets ingressing on a port for a given time interval. The Ethernet Routing Switch 2500 Series drops any packets received above the threshold value if the traffic ingressing on the port exceeds the threshold. The hardware restrictions on this platform do not allow you to determine if the traffic from a port is the cause of excess broadcast or multicast traffic. Consequently you cannot perform port specific actions such as disabling a port. You can generate a trap to detect the excess traffic or you can configure the switch to store a message in the system log when the traffic on the port exceeds the threshold value. This message in the system log conveys that some traffic to the switch is dropped.

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 pps (Packets Per Second) value you set is a small amount of the maximum value of pps for the maximum available bandwidth that is 262143 pps.

ATTENTION

All Rate Limiting configuration settings are applied across the entire unit. You cannot set some ports in the unit to limit broadcast traffic with a value of X pps and some other ports in the same to limit multicast traffic with a value of Y pps.

Other features

RFCs

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

- RFC 1213 (MIB-II)

- RFC 1493 (Bridge MIB)
- RFC 1573 (Interface MIB)
- RFC 1643 (Ethernet MIB)
- RFC 1757 (RMON)
- RFC 1271 (RMON)
- RFC 1157 (SNMP)

Standards

The following IEEE Standards also contain information germane to the Ethernet Routing Switch 2500 Series:

- IEEE 802.1D (Standard for Spanning Tree Protocol)
- IEEE 802.3 (Ethernet)
- IEEE 802.1Q (VLAN Tagging)

CLI Basics

You can manage the Ethernet Routing Switch 2500 Series with the following management tools:

- Device Manager (GUI)
- Web-based management system
- Command Line Interface (CLI)

The Ethernet Routing Switch 2500 Series Command Line Interface (CLI) is a management tool that provides methods for configuring, managing, and monitoring the operational functions of the switch. You can access CLI through a console terminal directly connected to the switch Console port, remotely through a dial-up modem connection, in-band through a Telnet session. For a complete, alphabetical list of CLI commands, see [Appendix "Command List" \(page 353\)](#).

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

- Entering the `configure network` command
- Manually loading the script in the console menu
- Automatically loading the script at boot-up

This chapter contains information about the following CLI topics:

- ["CLI command modes" \(page 82\)](#)
- ["Port numbering" \(page 85\)](#)
- ["Accessing CLI" \(page 86\)](#)
- ["Setting the system username and password" \(page 87\)](#)
- ["Getting help" \(page 87\)](#)
- ["Basic navigation" \(page 87\)](#)
- ["Managing basic system information" \(page 96\)](#)
- ["Managing MAC address forwarding database table" \(page 98\)](#)

CLI command modes

Most CLI commands are available only under a certain command mode. The Ethernet Routing Switch 2500 Series 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 on powering-up the Ethernet Routing Switch 2500 Series. In this command mode, the user can access only a subset of the total 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 are those you would generally need, such as `ping` and `logout`.

Commands in the Privileged EXEC mode are available to all other modes but 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 Ethernet Routing Switch 2500 Series. The Privileged EXEC mode is also referred to as `privExec` mode.

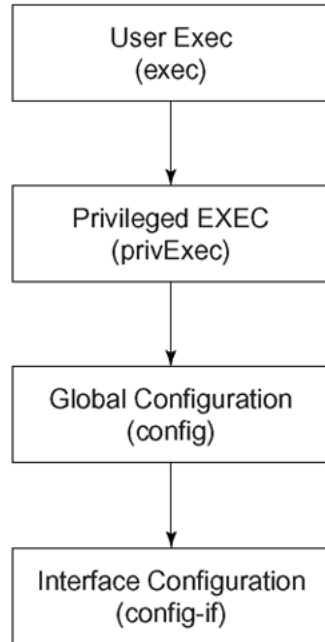
The Global Configuration mode and the Interface Configuration mode allow you to change the configuration of the Ethernet Routing Switch 2500 Series. Changes made in these command modes are immediately applied to the switch configuration and saved to NVRAM.

The Global Configuration commands allow you to set and display general configurations for the switch, such as the IP address, SNMP parameters, the 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 and duplex mode. The Interface Configuration mode is also referred to as `config-if` mode.

[Figure 23 "CLI command mode hierarchy" \(page 83\)](#) provides an illustration of the hierarchy of Ethernet Routing Switch 2500 Series CLI command modes.

Figure 23
CLI command mode hierarchy



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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 9 "Command mode prompts and entrance/exit commands" (page 83)). Additionally, you can only enter command modes from specific modes and only exit to specific command modes.

Table 9 "Command mode prompts and entrance/exit commands" (page 83) describes the command mode prompts and entrance/exit commands.

Table 9
Command mode prompts and entrance/exit commands

Command mode	Sample Prompt for the Ethernet Switch 2500	Enter/exit command
User EXEC (exec)	2500T>	Default mode, automatically enter logout or exit to quit to Main Menu

Command mode	Sample Prompt for the Ethernet Switch 2500	Enter/exit command
Privileged EXEC (privExec)	2500T#	enable to enter from User EXEC mode logout or exit to quit to Main Menu
Global Configuration (config)	2500T(config)#	configure to enter from Privileged EXEC mode end or exit to exit to Privileged EXEC mode; logout to quit to Main Menu
Interface Configuration (config-if)	2500T(config-if)#	interface FastEthernet {<portnum> all} to enter from Global Configuration mode logout to quit to Main Menu; end to exit to Privileged EXEC mode; exit to exit to Global Configuration mode

The prompt displays the switch name, and the current CLI command mode. For example:

- User EXEC--2500T>
- Privileged EXEC--2500T#
- Global Configuration--2500T(config)#
- Interface Configuration--2500T(config-if)#

See [Appendix "Command List" \(page 353\)](#) for a complete, alphabetical list of all CLI commands and where they are explained.

The initial command mode in CLI depends on your access level when you logged into the Ethernet Routing Switch 2500 Series:

- With no password protection, you can enter the CLI in userExec mode, and use the **enable** command to move to the privExec command mode.
- If you have logged into the CLI with read-only access, you enter the CLI in userExec mode and cannot access any other CLI command modes.

- If you have logged into the CLI with read-write access, you enter the CLI in `privExec` mode and use the commands to move to the other command modes.

Port numbering

The port numbering for different versions of Ethernet switches are listed as follows:

- Ethernet Routing Switch 2526 has 24 10/100 Mb/s ports on the front, as well as two combo ports, which includes two GBIC or two copper ports at 10/100/1000Mbps. The switch also provides two 1000 Mb/s ports on the rear panel.
- Ethernet Routing Switch 2550 has 48 10/100 ports on the front, as well as two combo ports, which includes two GBIC or two copper ports at 10/100/1000Mbps. The switch also provides two 1000 Mb/s ports on the rear panel.

The CLI uses the variable `<portlist>` when a command specifies one or more ports for the command.

Port numbering in Standalone Mode

In a Standalone Mode, the port number variable is an integer between 1 and 52 for Ethernet Routing Switch 2550 and 1 to 28 for Ethernet Routing Switch 2526. You can use the `<portlist>` variable in the following formats:

- A single port number— a integer between 1 and 52.
 - Example: 7 means port 7
- A range of port numbers— a pair of port numbers between 1 and 52 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.
- `a11` means all the ports on the standalone Ethernet Routing Switch 2500 Series, including any GBIC ports.

You can also use the unit/port convention with a standalone Ethernet Routing Switch 2500 Series as long as the unit number is 1.

Accessing CLI

You access the CLI using Telnet or through 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. Make sure that 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* 95, Windows 98, Windows 2000, Windows XP or Windows NT*
- Cable and connector to match the male DTE connector (DB-9) on the Ethernet Routing Switch 2500 Series Console port, with the DCE/DTE switch on the switch management module set to DTE
- VT100 Arrows checked in the Terminal Preferences window under Terminal Options, and Block Cursor unchecked; VT-100/ANSI checked under Emulation

To access CLI, use the following procedure:

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

- 1 When you access the Ethernet Routing Switch 2500 Series, the following banner appears.

Ethernet Routing Switch 2500 Series banner

```

#####

Enter Ctrl-Y to begin.

*****
*** Ethernet Routing Switch 2500-50T_PWR                               ***
*** Nortel                                                              ***
*** Copyright (c) 1996-2006. All Rights Reserved                       ***
***   SSH   FW:1.0.0.5    SW:u4.0.0.0                                   ***
*****

```

- 2 Press **Ctrl+Y**, and the CLI prompt appears.

```
2500>
```

The > sign at the end of the name of the switch indicates that the default CLI mode is User EXEC mode. See ["CLI command modes" \(page 82\)](#), to select the command mode you want to use (and are authorized to use).

—End—

Setting the system username and password

You can set usernames and passwords for system access through the CLI, Telnet, and web-based management. For the standard software image, the default password for user RO is "user" and for user RW is "secure". For the secure software image, the default password for RO is "userpasswd" and for RW is "securepasswd". For more information, see *Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)*.

Getting help

When you navigate through the CLI, online Help is available at all levels. Entering a portion of the command, space, and a question mark (?) at the prompt results in a list of all options for that command.

See ["help command" \(page 89\)](#) for more information about specific types of Help.

Basic navigation

This section discusses basic navigation around the CLI and between the command modes. As you see, the CLI incorporates various shortcut commands and keystrokes to simplify its use. This section contains information about the following topics:

- ["General navigation commands" \(page 88\)](#)
- ["Keystroke navigation" \(page 88\)](#)
- ["help command" \(page 89\)](#)
- ["no command" \(page 90\)](#)
- ["default command" \(page 90\)](#)
- ["logout command" \(page 90\)](#)
- ["enable command" \(page 91\)](#)
- ["configure command" \(page 91\)](#)
- ["interface command" \(page 91\)](#)
- ["disable command" \(page 92\)](#)

- "end command" (page 92)
- "exit command" (page 92)
- "reload command" (page 93)
- "shutdown command" (page 94)

General navigation commands

When you enter "?" at any point in the CLI session, the system retrieves help information for whatever portion of the command you entered thus far. See "help command" (page 89) for more information.

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 192.32.154.126`, you set the IP address. However, when you enter `no ip address`, the system returns the IP address to zero. See Appendix "Command List" (page 353) for an alphabetical list of **no** commands.

Add the word **default** to the beginning of most CLI configuration commands to set the parameters of the command to the factory default values. See Appendix "Command List" (page 353) 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 the following table.

Table 10
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

Key combination	Function
Ctrl+F	Forward 1 character
Ctrl+H	Delete character left of cursor (Backspace key)
Tab	Command/parameter completion
Ctrl+K and Ctrl+R	Redisplay line
Ctrl+N or Down arrow	Next history command
Ctrl+P or Up arrow	Previous history command
Ctrl+T	Transpose characters
Ctrl+U	Delete entire line
Ctrl+W	Delete word left of cursor
Ctrl+X	Delete all characters to left of cursor
Ctrl+z	Exit Global Configuration mode (to Privileged EXEC mode)
?	Context-sensitive help
Esc+C and 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 is executed in the Privileged EXEC command mode.

The `help` command has no parameters or variables.

Figure 24 "help command output" (page 90) shows the output from the help command.

Figure 24
help command output

```

2526T>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 and exit to Privileged EXEC mode
[Ctrl]+D Delete the character indicated by the cursor
[Ctrl]+E End of line
[Ctrl]+F Forward 1 character
[Ctrl]+H & [Backspace] Delete character left of cursor
[Ctrl]+I & [Tab] Command/parameter completion
[Ctrl]+K Delete all characters to right of cursor
[Ctrl]+N or [Down arrow] Next history command
----More (q=Quit, space/return=Continue)----

```

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 "Command List" \(page 353\)](#) for an alphabetical listing of all **no** commands.

ATTENTION

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. The default values are specified by each command.

See [Appendix A](#) for an alphabetical listing of all **default** commands.

ATTENTION

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

logout command

The **logout** command logs you out of the CLI session. 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 executed in the User Exec command mode.

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

configure command

The **configure** command moves you 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 executed in the Privileged EXEC command mode.

[Table 11 "configure command parameters and variables" \(page 91\)](#) describes the parameters and variables for the configure command.

Table 11
configure command parameters and variables

Parameters and variables	Description
terminal network	Specifies the source for the configuration commands for the Ethernet Routing Switch 2500 Series: terminal—a you to enter Global Configuration command mode to enter configuration commands network—lets you 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 to the Interface Configuration (config-if) command mode. The syntax for the **interface** command is:

```
interface FastEthernet <portlist>
```

The **interface** command is executed in the Global Configuration command mode.

Table 12 "interface command parameters and variables" (page 92) describes the parameters and variables for the interface command.

Table 12
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. The syntax for the **disable** command is:

```
disable
```

The **disable** command is executed in the Privileged EXEC command mode.

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

end command

The **end** command moves you to the priv Exec 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 (privExec) command modes, *exit* lets you quit the CLI session.
- In Global Configuration (config) mode, *exit* moves you back to the privExec command mode.
- In Interface Configuration (config-if) command mode, **exit** moves you back to the Global Configuration command mode.

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

exit

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

reload command

The **reload** command provides you with a configuration rollback mechanism to prevent loss of connectivity to a switch, typically for remote configurations. The **reload** command lets you 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 memory**, or **save config** command to force a manual save of your configurations.

Once the reload timer expires, the switch reloads the last saved configuration. To abort 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 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:
4	Save the current running configuration using the copy config nvram , write memory , or save config command.
5	Since 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 re-established. Therefore, you do not have to travel to the remote site to reconfigure the switch.

Initiate the `reload` command before you start the switch configuration commands. Once 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 then appears:

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

Once 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]
```

describes the parameters and variables for the `interface` command.

Table 13
reload command parameters and variables

Parameters and variables	Description
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.
cancel	Aborts all scheduled switch reloads

The `reload` command is executed in the Privileged EXEC command mode.

shutdown command

The `shutdown` command lets you safely shut down and power off the switch. Once the shutdown command is initiated, 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 the `shutdown` command is initiated in the CLI, the following message appears:

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

Enter y at this prompt to shut down the switch.

The following warning message then 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 shutdown command is:

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

Once the shutdown command is initiated, 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 poweroff
the stack. Configuration changes will not be saved.
Shutdown has blocked the flash. Autoreset in <xxxx> seconds.
```

ATTENTION

You can disable switch ports that are trunk members, if you choose to disable them one by one. If you choose to disable all ports of the unit or stack, the changes cannot have effect on the ports belonging to MLTs.

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

[Table 14 "shutdown command parameters and variables" \(page 95\)](#) describes the parameters and variables for the `shutdown` command.

Table 14
shutdown command parameters and variables

Parameters and variables	Description
cancel	Aborts all scheduled switch shutdowns

Parameters and variables	Description
force	Instructs the switch to skip the shutdown confirmation prompt.
minutes-to-wait <1-80>	Specifies the number of minutes that pass before the switch resets itself. The default wait time is set at 10 minutes.

ATTENTION

Any configurations or login 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 executed in the Privileged EXEC command mode.

Managing basic system information

This section shows you how to view basic system information such as the current software version. This section contains information about the following topics:

- ["show sys-info command" \(page 96\)](#)
- ["show tech command" \(page 97\)](#)

show sys-info command

The **show sys-info** command displays the current system characteristics. The syntax for the **show sys-info** command is:

```
show sys-info
```

The **show sys-info** command is executed in the Privileged EXEC command mode.

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

[Figure 25 "show sys-info command output" \(page 97\)](#) displays sample output from the **show sys-info** command.

Figure 25
show sys-info command output

```

2526T(config)#show sys-info
Operation Mode:      Switch
MAC Address:        00-19-69-AF-C8-00
Reset Count:        31
Last Reset Type:    Software Download
Autotopology:       Enabled
Pluggable Port 25:  None
Pluggable Port 26:  None
sysDescr:           Ethernet Routing Switch 2526T
                    HW:0A      FW:1.0.0.9  SW:v4.0.0.001
                    Mfg Date:20060926  HW Dev:
Serial #:            LBNNTMJL44000J
sysObjectID:        1.3.6.1.4.1.45.3.72.1
sysUpTime:           0 days, 01:53:01
sysNtpTime:          SNTP not synchronized.
sysServices:        3
sysContact:
sysName:
sysLocation:

```

To change the system contact, name, or location, see the `snmp-server` command (see *Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)*).

show tech command

The `show tech` command displays detailed system information. The syntax for the `show tech` command is:

```
show tech
```

The `show tech` command is executed in the Privileged EXEC command mode. The `show tech` command has no parameters or variables.

Figure 26 "show tech command output" (page 97) displays a sample output from the `show tech` command.

Figure 26
show tech command output

```

2526T(config)#show tech
*****SYS Info*****
System Information:
  Operation Mode:      Switch
  MAC Address:        00-19-69-AF-C8-00
  Reset Count:        31
  Last Reset Type:    Software Download
  Autotopology:       Enabled
  sysObjectID:        1.3.6.1.4.1.45.3.72.1
  sysUpTime:           0 days, 01:59:37
  sysNtpTime:          SNTP not synchronized.
  sysServices:        3
  sysContact:
  sysName:
  sysLocation:
Unit #1:
  Switch Model:       2526T
  MDA Model:          None
  Hardware Version:   0A
  Firmware Version:  1.0.0.9
  Software Version:   v4.0.0.001
  Serial Number:      LBNNTMJL44000J
  Manufacturing Date: 20060926
---More (q=Quit, space/return=Continue)---

```

Managing MAC address forwarding database table

This section describes the commands to view the contents of the MAC address forwarding database table, as well as setting the age-out time for the addresses. The following topics are covered:

- "show mac-address-table command" (page 98)
- "mac-address-table aging-time command" (page 99)
- "default mac-address-table aging-time command" (page 99)

show mac-address-table command

The `show mac-address-table` command displays the current contents of the MAC address forwarding database table. The syntax for the `show mac-address-table` command is:

```
show mac-address-table [vid <1-4094>] [aging-time] [port
<LINE>] [address <H.H.H> {include | exclude <pattern>}]
```

The `show mac-address-table` command is executed in the Privileged EXEC command mode.

Table 15 "show mac-address-table command parameters and variables" (page 98) describes the parameters and variables for the `show mac-address-table` command.

Table 15
show mac-address-table command parameters and variables

Parameters and variables	Description
vid <1-4094>	Enter the number of the VLAN you want to display the forwarding database. Default is to display the management VLAN's database.
aging-time	Displays the time in seconds after which an unused entry is removed from the forwarding database.
port <LINE>	List of ports.
address <H.H.H>	Displays a specific MAC address if it exists in the database. Enter the MAC address you want displayed.
include exclude <pattern>	Lets you filter the results of the command by printing only those entries in the address table that include or exclude a given pattern. The value for <pattern> must be a sequence of 1 to 6 bytes in hex, separated by dashes. for example: <code>show mac-address-table port 1/1-5 address include 00-0E-45-23</code>

Figure 27 "show mac-address-table command output" (page 99) displays sample output from the show mac-address-table command.

Figure 27
show mac-address-table command output

```

2526T> enable
2526T# show mac-address-table
Mac Address Table Aging Time: 300
Number of addresses: 5

```

MAC Address	Source	MAC Address	Source
00-08-02-E3-D5-D2	Port: 24	00-0E-62-77-60-78	Port: 24
00-11-F9-35-D0-40	Port: 24	00-15-E8-D7-99-80	Port: 24
00-19-69-AF-C8-00		00-60-FD-CB-B8-C1	Port: 24

```

2526T#

```

mac-address-table aging-time command

The `mac-address-table aging-time` command sets the time that the switch retains unseen MAC addresses. The syntax for the `mac-address-table aging-time` command is:

```
mac-address-table aging-time <time>
```

The `mac-address-table aging-time` command is executed in the Global Configuration command mode.

Table 16 "mac-address-table aging-time command parameters and variables" (page 99) describes the parameters and variables for the `mac-address-table aging-time` command.

Table 16
mac-address-table aging-time command parameters and variables

Parameters and variables	Description
time	Enter the aging time in seconds that you want for MAC addresses before they are flushed.

default mac-address-table aging-time command

The `default mac-address-table aging-time` command sets the time that the switch retains unseen MAC addresses to 300 seconds. The syntax for the `default mac-address-table aging-time` command is:

```
default mac-address aging-time
```

The `default mac-address-table aging-time` command is executed in the Global Configuration command mode.

The default `mac-address-table aging-time` command has no parameters or variables.

Getting Started with Device Manager

The Java Device Manager (JDM) software is a Graphical User Interface (GUI) that lets you manage the switch. JDM (also referred to as Device Manager) provides options found in other management tools such as management of VLANs and MultiLink Trunks, and displaying and printing of statistics in graph format.

To use Device Manager, you must have network connectivity to a management station running Device Manager on one of the supported platforms. You must also assign an IP address to the switch.

This chapter contains information on the following topics:

- ["Installing Device Manager" \(page 101\)](#)
- ["Device Manager basics" \(page 119\)](#)

Installing Device Manager

The JDM software is provided on the device 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.

The Java Runtime Environment (JRE) is bundled with the JDM software and does not require a separate installation.

For details on installing Device Manager, see the following sections:

- ["JDM installation precautions" \(page 102\)](#)
- ["Installing the Device Manager software" \(page 102\)](#)
- ["Installing JDM on Windows" \(page 102\)](#)
- ["Installing JDM on UNIX or Linux" \(page 110\)](#)
- ["Starting Device Manager" \(page 119\)](#)

JDM installation precautions

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

- The JDM and Ethernet Routing Switch software versions must match for the correct dialog boxes and information to be shown and accessible. Please see the Release Notes for a complete compatibility list.
- If you want to use JDM to support multiple Nortel switches in your network, ensure that the JDM version you use supports each version of software running on each Nortel device in your network.
- 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 Windows, UNIX, or Linux machine, provided that each version is stored in a separate directory.)

ATTENTION

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

- 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.xml*, and is created in the *jdm* folder, under window user profile directory.
 - In a UNIX environment, the settings file is *~/.jdm/dm.xml*.
 - In a Linux environment, the settings file is *~/.jdm/dm.xml*.
- The *dm.xml* file containing IP addresses visited from a previous JDM.

Installing the Device Manager software

Device Manager software can be installed in Windows, UNIX, or Linux environment. The following sections provide information on the system requirements and installation procedures to install Device Manager software in Windows, UNIX, and Linux environments.

- ["Installing JDM on Windows" \(page 102\)](#)
- ["Installing JDM on UNIX or Linux" \(page 110\)](#)

Installing JDM on Windows

This section includes the following topics:

- ["Windows minimum requirements" \(page 103\)](#)
- ["Removing previous versions of JDM on Windows" \(page 103\)](#)

- "Installing JDM on Windows from the CD" (page 104)
- "Installing JDM on Windows from the web" (page 104)
- "Executing the JDM installation software on Windows" (page 105)

Windows minimum requirements

The minimum system requirements for installing JDM on Microsoft® Windows NT®, Windows 2000, Windows XP, Windows 2003, or Windows Vista are:

- 350 MHz or higher Pentium processor
- 512 MB DRAM
- 400 MB space on hard drive

Removing previous versions of JDM on Windows

ATTENTION

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, then 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, then 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: <i>Uninstall Java Device Manager.exe</i> . |

ATTENTION

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 <i>jdm_xxxx.exe</i> file.

ATTENTION

In the file name, xxxx represents the current version of the JDM software.

Continue with "[Executing the JDM installation software on Windows](#)" (page 105).

—End—

Installing JDM on Windows from the web

To obtain the JDM software from the Nortel web site, use the following procedure:

Step	Action
1	Go to the following URL: www.nortel.com/support
2	Select the software support page for your product. The software page appears.
3	Click the Java Device Manager version you want. The Software Detail Information page appears.

- 4 Download the JDM software for Windows to a desired directory on your system. The software download is a self-extracting .exe file. Once the file transfer is complete, continue with [step 5](#).
- 5 Close all programs.
- 6 Navigate to the directory on your system where you downloaded the JDM Software.
- 7 Double-click the *jdm_xxxx.exe* file.

ATTENTION

In the file name, xxxx represents the current version of the JDM software.

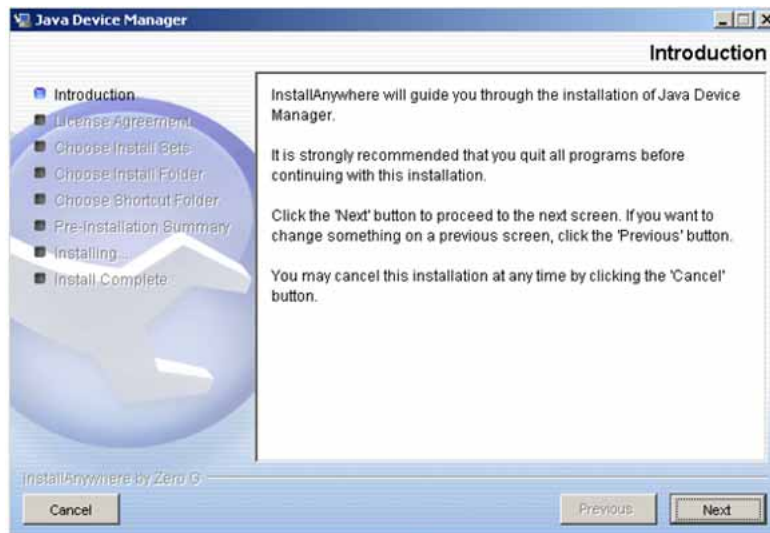
Continue with "[Executing the JDM installation software on Windows](#)" (page 105).

—End—

Executing the JDM installation software on Windows

An install screen appears, followed by a Nortel dialog box. When the InstallAnywhere Introduction dialog box appears you are ready to install the JDM.

Figure 28
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**.

License Agreement dialog box



3 Click **Next**.
The **Choose Install Set** dialog box appears.

Choose Install Set dialog box



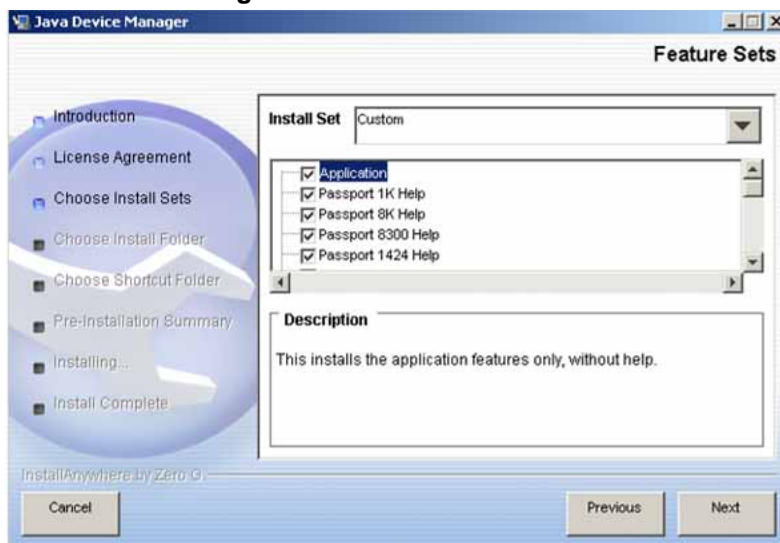
- 4 Do one of the following:
- Select **Typical** installation to install the common set features, as well as online help.
 - Select **Minimal** installation to select minimal features to install (recommended for those with limited disk space).
 - Select **Help** to install only the online help.
 - Select **Custom** installation to customize the features prior to installation.

- 5 Click **Next**.

If you did not select **Custom** installation in [step 4](#), then the **Choose Install Folder** dialog box appears. Continue with [step 8](#).

If you selected **Custom** installation in [step 4](#), then the **Feature Sets** dialog box appears.

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.

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.

ATTENTION

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.

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. A summary of the choices you have made is displayed for confirmation.

Pre-Installation Summary 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.

Install Complete dialog box

- 14 Click **Done** to exit the installation.
JDM is now installed on your machine.

—End—

Installing JDM on UNIX or Linux**ATTENTION**

JDM installation procedures are standardized across all platforms. In addition, the required Java Runtime Environment (JRE) version 1.5 is 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.

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:

- ["Minimum requirements" \(page 111\)](#)
- ["Installing JDM on Solaris from the CD" \(page 111\)](#)
- ["Installing JDM on Linux from the CD" \(page 111\)](#)
- ["Installing JDM on UNIX or Linux from the web" \(page 112\)](#)

Minimum requirements

JDM supports two UNIX platforms and one Linux platform:

- a UNIX SPARC* workstation running the Sun* Solaris* 2.7, 2.8, 2.1.0. (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
- 400 MB free in the directory where you want to install the JDM software
- 512 MB DRAM

Installing JDM on Solaris from the CD

To install the JDM software to a Solaris environment from the CD, use the following procedure:

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 <i>dm_xxxx_solaris_sparc.sh</i> file.

See " Executing the JDM installation software on UNIX or Linux " (page 113). |
-

—End—

Installing JDM on Linux from the CD

To install the Device Manager software to a Linux environment from the CD, use the following procedure:

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 <i>jdm_xxxx_linux.sh</i> file. |

See "Executing the JDM installation software on UNIX or Linux" (page 113).

—End—

Installing JDM on UNIX or Linux from the web

To install the JDM software to a UNIX (Solaris) environment from the web, use the following procedure:

Step	Action
1	Go to the following URL: www.nortel.com/support
2	Select the software support page for your product. The software page appears.
3	Click the Java Device Manager version you want. The Software Detail Information page appears.
4	Download the JDM software for your operating environment to a desired directory on your system. The software download is a self-extracting .sh file. Once the file transfer is complete, continue with the next step.
5	Close all programs.
6	Navigate to the directory on your system where you loaded the JDM software.
7	Make the installation file executable. For the Solaris environment, make the file executable by entering: <code>chmod a+x dm_xxxx_solaris_sparc.sh</code> For the Linux environment, make the file executable by entering: <code>chmod a+x jdm_xxxx_linux.sh</code>
8	Run the installation file. For the Solaris environment, run the <code>dm_xxxx_solaris_sparc.sh</code> file. For the Linux environment, run the <code>jdm_xxxx_linux.sh</code> file. See "Executing the JDM installation software on UNIX or Linux" (page 113).

—End—

Executing the JDM installation software on UNIX or Linux

An install screen appears, followed by a Nortel dialog box. When the **InstallAnywhere Introduction** dialog box appears, you are ready to begin the JDM installation.

Figure 29
InstallAnywhere Introduction dialog box



Step Action

- 1 Click **Next** the installation process.
The **License Agreement** dialog box appears.

License Agreement dialog box

2 Click **I accept the terms of the License Agreement**.

3 Click **Next**.

The **Choose Install Set** dialog box appears.

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](#), then the **Choose Install Folder** dialog box appears. See [step 8](#).

If you selected **Custom** installation in [step 4](#), then the **Feature Sets** dialog box appears.

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.

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.

ATTENTION

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

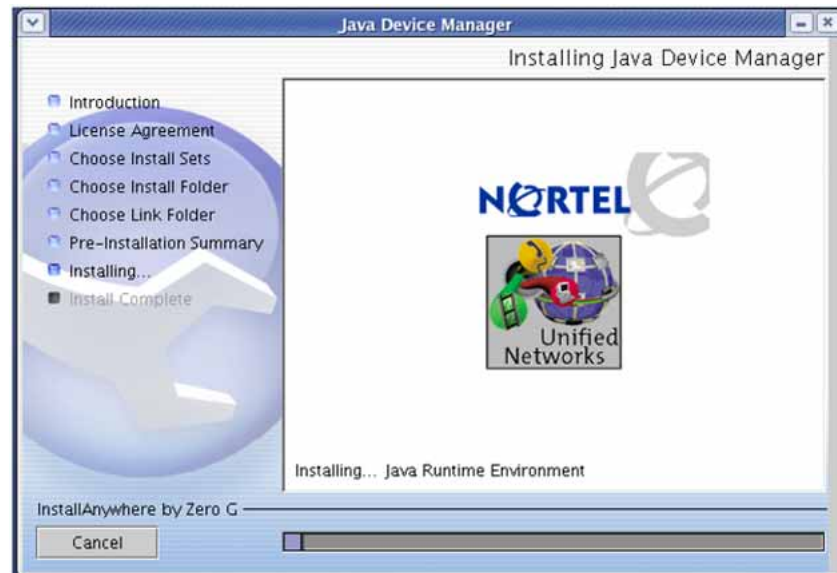
- 9 Click **Next**.
The **Pre-Installation Summary** dialog box appears.

Pre-Installation Summary dialog box

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.

Installing Java Device Manager dialog box

When the installation is complete, the **Install Complete** dialog box appears.

Install Complete dialog box



- 12 Click **Done** to exit the installation.
JDM is now installed on your machine.

—End—

Removing JDM in Unix or Linux environments

In a UNIX or Linux environment, complete the following steps to remove the existing JDM software:

Step	Action
1	Navigate to the directory where the JDM software is installed (for example /JDM).
2	Open the UninstallerData sub-directory.
3	Run the following file: <i>Uninstall_Java_Device_Manager</i> .

—End—

Device Manager basics

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

- "Starting Device Manager" (page 119)
- "Setting the Device Manager properties" (page 120)
- "Opening a device" (page 123)
- "Device Manager window" (page 126)
- "Editing objects" (page 133)
- "Working with statistics and graphs" (page 134)
- "Telnet session" (page 140)
- "Opening an SSH connection to the device" (page 140)
- "Opening the Web-based management home page" (page 141)
- "Trap log" (page 142)
- "Online Help" (page 143)

Starting Device Manager

- Do one of the following, depending upon your operating system environment:
- In a Microsoft* 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; then enter:

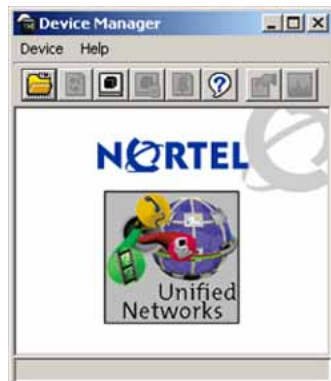
./JDM

The initial Device Manager window appears.

ATTENTION

On startup, the 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 may take up to 30 seconds to open.

Figure 30
Device Manager window



Setting the Device Manager properties

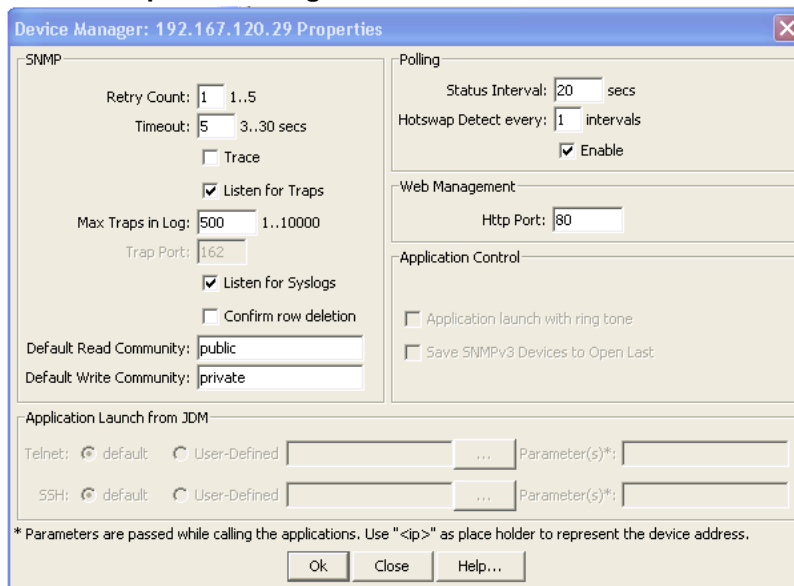
The Device Manager communicates with the Ethernet Routing Switch 2500 Series using Simple Network Management Protocol (SNMP). The software is shipped with default values set for important communication parameters, such as the polling interval, timeout, and retry count. You can set the parameters before you open a device to manage.

To set the Device Manager properties, use the following procedure:

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

- 1 Choose **Device > Properties >Current**.
The **Default Properties** dialog box appears.

Figure 31
Default Properties dialog box



- 2 Type information and select check boxes.
- 3 Click **OK**.

—End—

The following table describes the **Properties** dialog box fields.

Table 17
Properties dialog box fields

Area	Field	Description
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.

Area	Field	Description
	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 listens to receive SNMP traps.
	Listen for Syslogs	When selected (enabled), Device Manager listens to the syslog.
	Confirm row deletion	A dialog box displays when checked, before deleting a row.
	Default Read Community	Specifies the default read community.
	Default Write Community	Specifies the default write community.
Polling	Status Interval	Interval at which status information is gathered (default is 20 seconds).
	Hotswap Detect every:	The interval at which Device Manager detects the module information. The default is 1 interval.
	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.
Web Management	Http Port	Default port is 80. This field specifies the HTTP port for the application. To access the Device Home Page using the Web, ensure that the HTTP Port attribute matches the switch configuration. If you change the port number, the system prompts you with a warning message.
Application Control	Application launch with ring tone	Enabled by default, you can modify this field only when configuring the Device Manager default properties. You cannot modify this field when configuring the per device properties.
	Save SNMPv3 Devices to Open Last	Disabled by default, if you enable this field you are prompted with a security warning message because any user can access the device without entering the SNMPv3 security criteria if this feature is enabled. You can modify this field only when configuring the

Area	Field	Description
		Device Manager default properties. You cannot modify this field when configuring the per device properties.
Application Launch from JDM	Telnet	Default Telnet is the one that comes with the operating system. To define a specific Telnet, select User-Defined and specify the Telnet path and parameters.
	SSH	Default SSH is the one bundled with in the JDM. To define a specific SSH, select User-Defined and specify the SSH client path and parameters.

- ["Opening a device" \(page 123\)](#)

Opening a device

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

[Table 18 "SNMP community string default values" \(page 123\)](#) describes the default access community strings for the Device Manager software.

Table 18
SNMP community string default values

Access level	Description
Read-only	public
Read/write	private

To display the device view, use the following procedure:

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

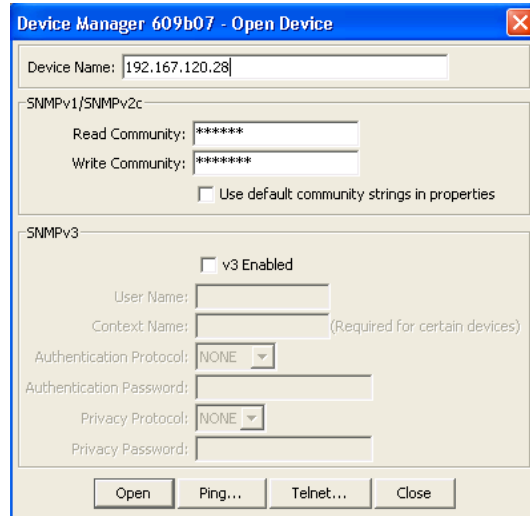
- | | |
|---|---|
| 1 | <p>Do one of the following:</p> <ul style="list-style-type: none"> • Choose Device > Open. • Choose Device > Open Last by SNMPv1/v2, and select an IP address from the list. • For previously-opened SNMPv3-enabled devices, choose Device > Open Last by SNMPv3, and select an IP address from the list. • Click the folder icon in the Device Manager window. |
|---|---|



- Press **Ctrl+O**.

The **Open Device** dialog box appears.

Figure 32
Open Device dialog box



The following table describes the Open Device dialog box fields.

Table 19
Open Device dialog box fields

Field		Description
Device Name		Either an IP address or a DNS name for the device, entered by the user.
SNMPv1/ SNMPv2 c	Read Community	SNMP read community string for the device. Default is <code>public</code> (displayed as <code>*****</code>). The entry is case-sensitive.
	Write Community	SNMP write community string for the device. Default is <code>private</code> (displayed as <code>*****</code>). The entry is case-sensitive.
	Use default community strings in properties	When selected, the Device Manager uses the default community string. Set the default community strings in Device > Properties .

Field		Description
SNMPv3	v3 Enabled	When selected (enabled), Open Device dialog box displays SNMPv3 options.
	User Name	Indicates the name of the user.
	Context Name	Context Name string (Does not apply to Ethernet Routing Switch 2500 Series).
	Authentication Protocol	Identifies the authentication protocol used.
	Authentication Password	Specifies the current authentication password.
	Privacy Protocol	Identifies the privacy protocol.
	Privacy Password	Specifies the current privacy password.

ATTENTION

Not all information is required for connection to a switch. If the **v3 Enabled** check box is not selected, only a **Device Name**, **Read Community**, and **Write Community** value are needed. If the **v3 Enabled** check box is not selected, only a **Device Name**, **Read Community**, and **Write Community** value are needed. If you enable **Use default community strings in properties**, the Device Manager uses the default values specified in the device properties for **Read Community**, and **Write Community**. If **v3 Enabled** is selected, then **Device Name**, **User Name**, **Authentication Protocol**, **Authentication Password**, **Privacy Protocol**, and **Privacy Password** are required. If **v3 Enabled** is selected, then **Device Name**, **User Name**, **Authentication Protocol**, **Authentication Password**, **Privacy Protocol**, and **Privacy Password** are required. Some devices require a value in **Context Name**.

- 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 appropriate community strings.

ATTENTION

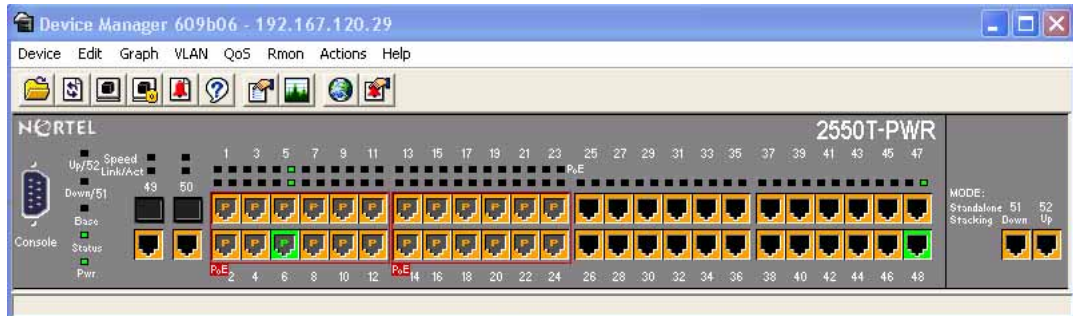
To gain read/write access to a device in Device Manager, you must enter the read/write community string for both the Read Community and Write Community strings.

- 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, showing a picture of the device that represents the physical features of the device.

Device view



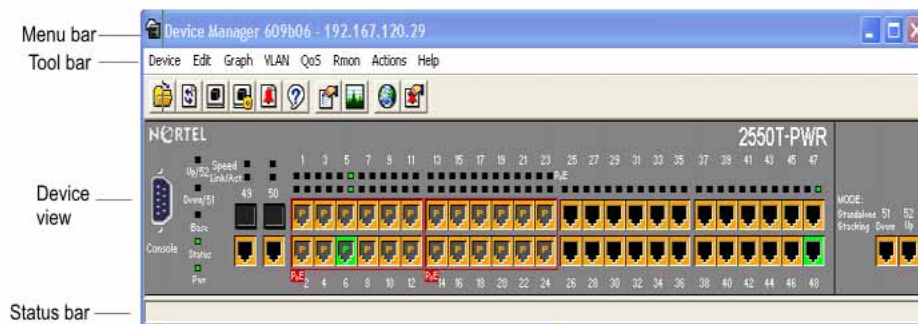
—End—

Device Manager window

The Device Manager window has the following parts:

- Menu bar
- Toolbar
- Device view
- Status bar

Figure 33
Parts of the Device Manager window



Menu bar

Use the menu bar to set up and operate the Device Manager

[Table 20 "Menu bar commands" \(page 127\)](#) describes the Menu Bar commands.

Table 20
Menu bar commands











Command	Description
Device	Opens the Open Device dialog box. You can also: <ul style="list-style-type: none"> • Set the Properties used during a Device Manager session • Refresh the status of the currently viewed device • Rediscover device • Telnet to a device • Open an SSH connection to a device • View SNMP traps that the Device Manager receives • View Syslogs • View SNMP trace logs
Edit	Opens the edit dialog boxes for selected objects in the device view. This command opens dialog boxes for managing files, running diagnostic tests and configuring data for selected objects. This command also lets you set security parameters, SNMP, and SNMP v3 related configurations.
Graph	Opens statistics and graphing dialog boxes for the selected object.
VLAN	Opens dialog boxes for managing VLANs, Spanning Tree Group (STG), RSTP, MSTP, Multi-Link Trunks, and Link Aggregation Control Protocol (LACP).
QoS	Opens configuration dialog boxes for Quality of Service (QoS) and DSCP.
RMON	Opens RMON configuration and monitoring dialog boxes.
Actions	Provides quick access to the Web Management Software Home page.
Help	Opens online 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 21 "Toolbar buttons" \(page 128\)](#) describes the toolbar buttons.

Table 21
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
	Telnet	Opens a Telnet session.	Device > Telnet
	SSH	Opens an SSH session.	Device > SSH Connection
	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 > Port
	Graph Selected	Opens statistics and graphing dialog boxes for the selected object.	Graph > Port Graph > Chassis
	Home Page	Opens the Web Management Software Home Page.	Actions > Open Home Page
	Alarm Manager	Opens the Rmon Alarm Manager.	Rmon > Alarm Manager

Device view

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

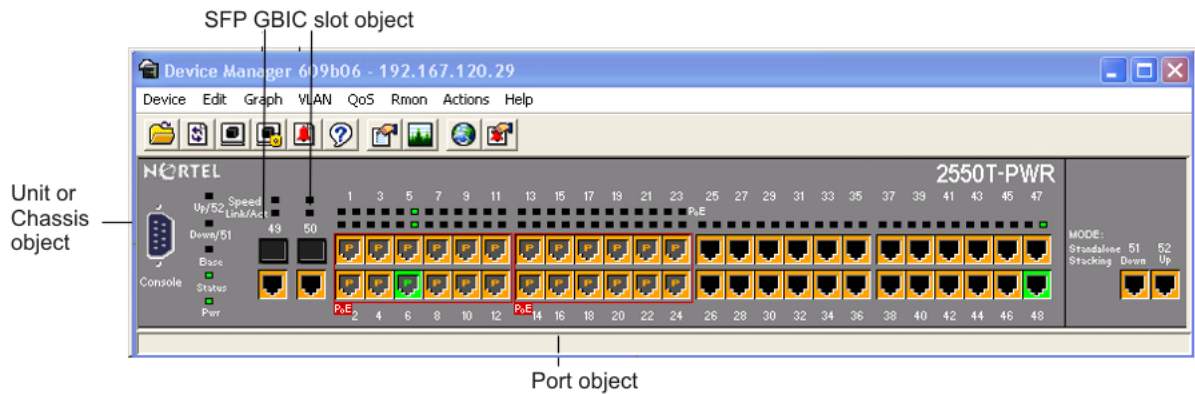
Selecting objects

The types of objects contained in the device view are:

- A standalone switch (called a unit in the menus and dialog boxes)
- A port (including the SFP GBIC port)

Figure 34 "Objects in the device view" (page 129) shows the objects in the device view.

Figure 34
Objects in the device view



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

For instructions on selecting multiple objects (such as ports or switches), see the following table:

Table 22
Selecting multiple objects

Object to be selected	Action
To select a block of contiguous ports	Drag to select the group of ports
To select all ports	Choose Edit > Select > Ports

Viewing information about a GBIC port

To view information about a GBIC port, use the following procedure:

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

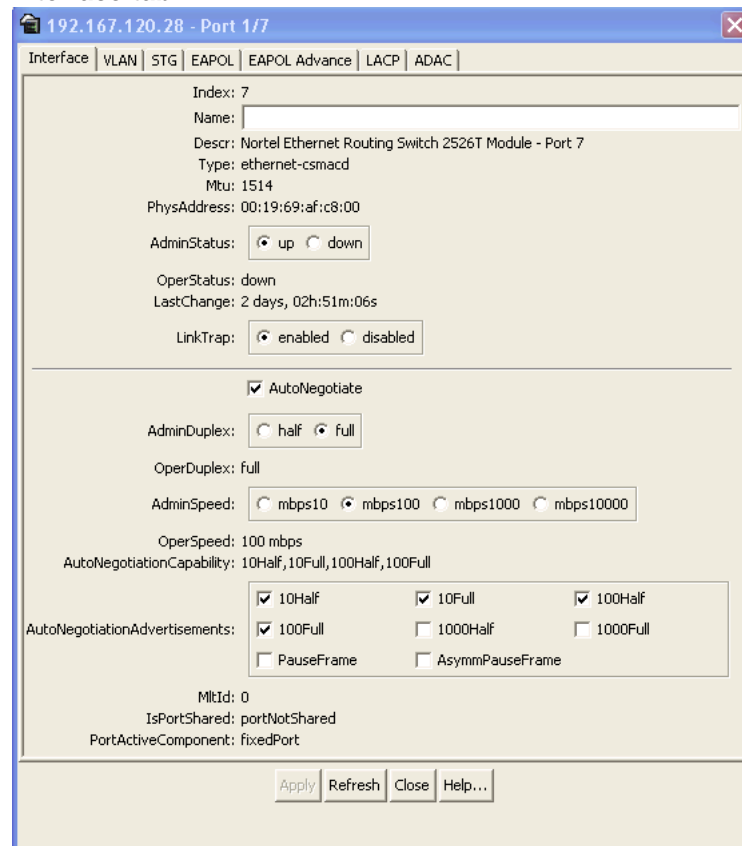
- | | |
|---|--------------------------------|
| 1 | Select the GBIC. |
| 2 | Choose Edit > Port . |

—End—

The **Port** dialog box appears with the **Interface** tab displayed .

The Interface tab describes the GBIC installed in the switch.

Figure 35
Interface tab



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 Routing Switch 2500 Series, see "[LED display panel](#)" (page 27).

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

[Table 23 "Port color codes"](#) (page 131) describes the status assigned to each color.

Table 23
Port color codes

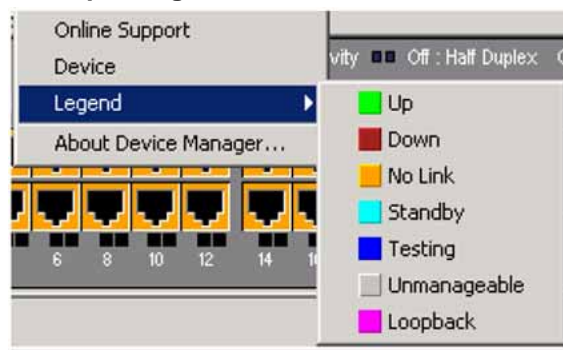
Color	Description
Green	Port is operating.
Red	Port has been manually disabled.
Orange	Port has no link.

In addition, the Help menu provides a legend that identifies the port colors and their meanings, as shown in [Figure 36 "Color port legend" \(page 131\)](#).

ATTENTION

The additional colors displayed in the Device Manager legend are not applicable to the Ethernet Routing Switch 2500 Series.

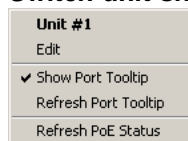
Figure 36
Color port legend



Shortcut menus

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

Figure 37
Switch unit shortcut menu



[Table 24 "Switch unit shortcut menu command" \(page 132\)](#) describes the Switch unit shortcut menu command on the switch unit shortcut menu.

Table 24
Switch unit shortcut menu command

Command	Description
Edit	Opens a dialog box that provides basic hardware information about the switch and lets you set the Rate Limiting configuration for the switch unit.
Show Port Tooltip	Indicates that the tooltip function is active. When unchecked, the tooltip function is disabled. A Tooltip is a descriptive text box that appears when the mouse pointer is held over a port.
Refresh Port Tooltip	Refreshes the tooltip information.
Refresh PoE Status	Refreshes the status for PoE ports.

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 38
Port shortcut menu



Table 25 "Port shortcut menu commands" (page 132) describes the commands on the port shortcut menu.

Table 25
Port shortcut menu commands

Command	Description
Edit	Opens a dialog box that lets you set operating parameters for the port.
Graph	Opens a dialog box that displays statistics for the port and lets you display the statistics 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.

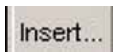






Status bar

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

Table 26 "Device Manager buttons" (page 133) describes buttons in Device Manager dialog boxes.

Table 26
Device Manager buttons

Button	Name	Description
	Insert	Opens a dialog box to create a new entry for a table; then from the dialog box, inserts the new entry 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 the table or graph that is displayed.
	Stop/Refresh	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 then import this file into a text editor or spreadsheet for further analysis.

ATTENTION

Not all buttons appear in all the dialog boxes.

Editing objects

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

- Select an object 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 displayed in **bold**. However, changes are not applied to the running configuration until you click **Apply**.

ATTENTION

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 the switch 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" \(page 137\)](#) and to the *Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)*.

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.

[Table 27 "Types of statistics" \(page 134\)](#) describes the types of statistics that are available.

Table 27
Types of statistics

Statistic	Description
AbsoluteValue	The total count since the last time counters were reset. A system reboot resets all counters.
Cumulative	The total count since the statistics window was first opened. The elapsed time for the cumulative counter is displayed at the bottom of the graph window.
Average	The cumulative count divided by the cumulative elapsed time.
Minimum	The minimum average for the counter for a given polling interval over the cumulative elapsed time.

Statistic	Description
Maximum	The maximum average for the counter for a given polling interval over the cumulative elapsed time.
LastValue	The average for the counter over the last polling interval.

Types of graphs

With Device Manager, you can create line, area, bar, and pie graphs. [Figure 39 "Line graph" \(page 135\)](#), [Figure 40 "Area graph" \(page 136\)](#), [Figure 41 "Bar graph" \(page 136\)](#), and [Figure 42 "Pie graph" \(page 137\)](#) provide examples of different types of graphs.

Figure 39
Line graph

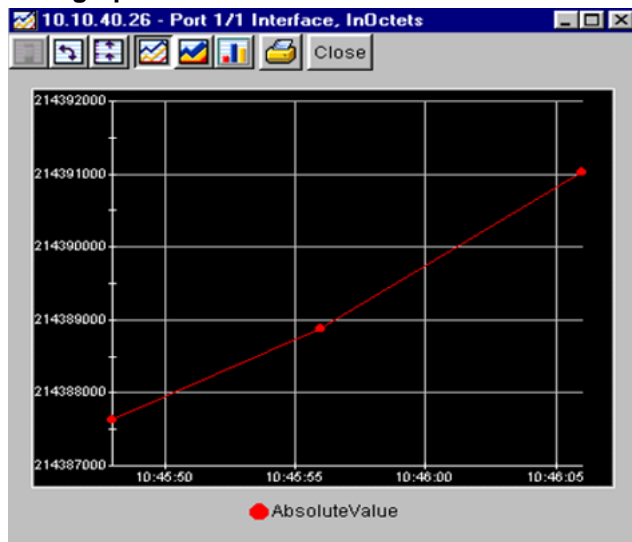


Figure 40
Area graph

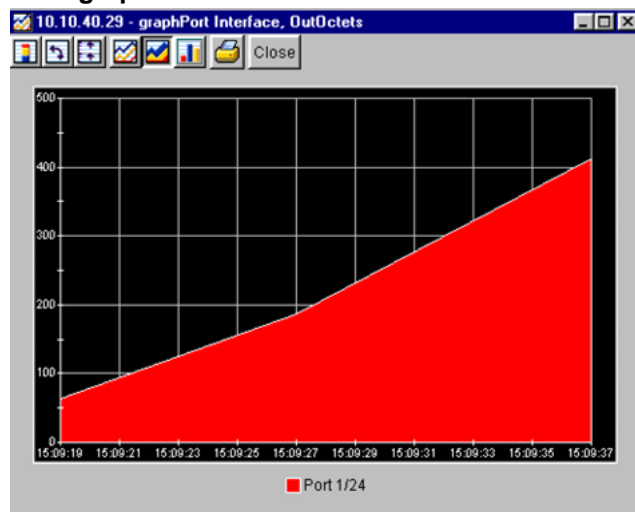


Figure 41
Bar graph

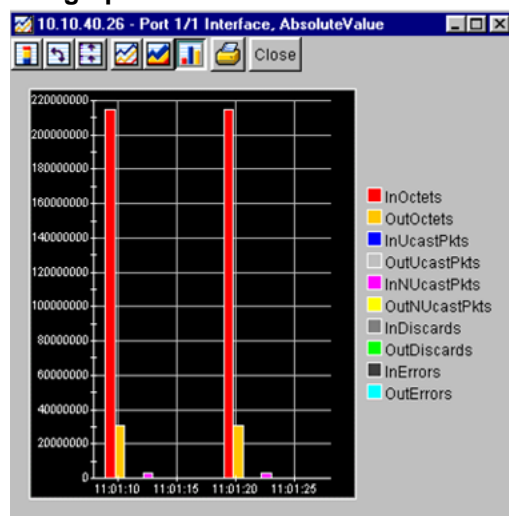
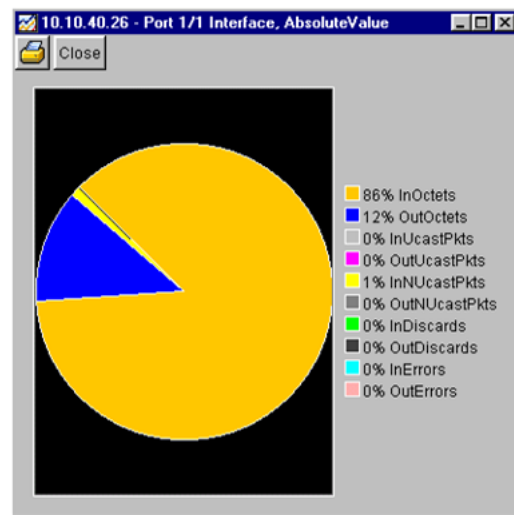


Figure 42
Pie graph



- "Statistics for single and multiple objects" (page 137)
- "Viewing statistics as graphs" (page 138)

Statistics for single and multiple objects

Statistics for a selected object or objects are displayed in the **statistics** dialog box.

The dialog box for a single object shows all six types of statistics for each counter.

Figure 43
Interface statistics for a single port

	AbsoluteValue	Cumulative	Average/sec	Minimum/sec	Maximum/sec	LastVal/sec
InOctets	0	0	0	0	0	0
OutOctets	0	0	0	0	0	0
InUcastPkts	0	0	0	0	0	0
OutUcastPkts	0	0	0	0	0	0
InNUcastPkts	0	0	0	0	0	0
OutNUcastPkts	0	0	0	0	0	0
InDiscards	0	0	0	0	0	0
OutDiscards	0	0	0	0	0	0
InErrors	0	0	0	0	0	0
OutErrors	0	0	0	0	0	0
InUnknownProtos	0	0	0	0	0	0

Clear Counters Close Help... Poll Interval: 10s 0 day, 00h:00m:10s

The statistics dialog box for multiple objects shows a single type of statistics for the selected objects. For example, [Figure 44 "Interface statistics for multiple ports"](#) (page 138) shows LastValue statistics for the selected ports.

Figure 44
Interface statistics for multiple ports

Interface	InOctets	OutOctets	InUcastPkts	OutUcastPkts	InNUcastPkts	OutNUcastPkts	InDiscards	OutDiscards	InErrors	OutErrors	InUnknownProtos
Port: 1/9	0	0	0	0	0	0	0	0	0	0	0
Port: 1/11	0	0	0	0	0	0	0	0	0	0	0

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 the next section, ["Viewing statistics as graphs"](#) (page 138), for instructions to use 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.



- ["Types of statistics"](#) (page 134)
- ["Viewing statistics as graphs"](#) (page 138)

Viewing statistics as graphs

To create a graph for an object, use the following procedure:

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

- | | |
|---|---|
| 1 | Select the object or objects to be graphed. |
| 2 | Do one of the following: <ul style="list-style-type: none"> • 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 45
Statistics dialog box for a port

	AbsoluteValue	Cumulative	Average/sec	Minimum/sec	Maximum/sec	LastVal/sec
InOctets	0	0	0	0	0	0
OutOctets	0	0	0	0	0	0
InUcastPkts	0	0	0	0	0	0
OutUcastPkts	0	0	0	0	0	0
InNUcastPkts	0	0	0	0	0	0
OutNUcastPkts	0	0	0	0	0	0
InDiscards	0	0	0	0	0	0
OutDiscards	0	0	0	0	0	0
InErrors	0	0	0	0	0	0
OutErrors	0	0	0	0	0	0
InUnknownProtos	0	0	0	0	0	0

- 3 Select a tab for the group of statistics you want to view.
- 4 On the displayed data table, click and 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
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.

The following table describes the buttons in the graph dialog boxes.

Table 28
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 unrotated 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 graph or area graph to a pie chart.

Telnet session

From Device Manager, you can initiate a Telnet session to the switch 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 appears.

Opening an SSH connection to the device

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

To open an SSH connection to a device, use the following procedure:

- 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 device appears.

ATTENTION

The SSH connection is established only when the device is SSH capable and enabled. For more information on SSH connections, see *Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)*.

Opening the web-based management home page

From the Device Manager, you can access the web-based management home page.

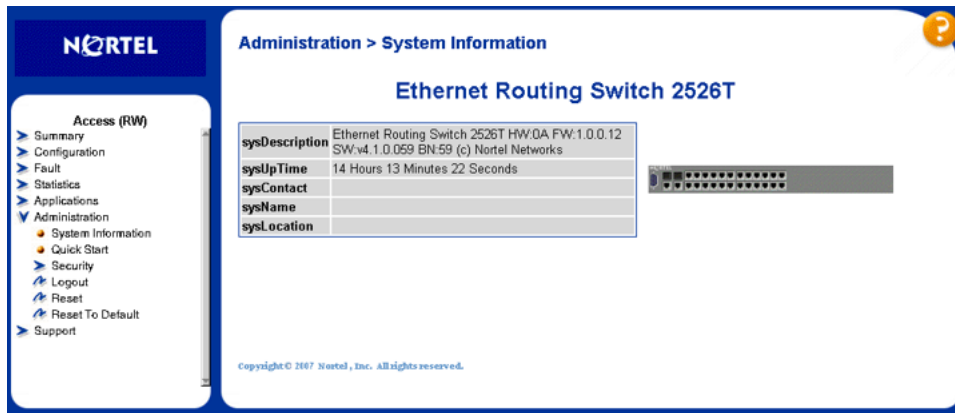
To open the web-based management home page, use the following procedure:

- Do one of the following:
- From the Device Manager main menu, choose **Actions > Open Home Page**.
 - On the toolbar, click the **Open Home Page** button.



The web-based management home page appears.

Figure 46
Web-based management home page



Trap log

You can configure an Ethernet Routing Switch 2500 Series to send SNMP generic traps. When the 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 dialog box ("DCAM-6270493" (page 120)). The default number of trap log entries is 500.

To view the trap log, use the following procedure:

→ Do one of the following:

- On the toolbar, click the **Trap Log** button.



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

ATTENTION

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

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, you can specify the traps to be sent in V1 format.

For more information about traps and trap receivers, see *Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)*.

Online Help

Online Help in Device Manager is context-sensitive. You use a Web browser to display online Help. The Web browser should 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 the Web browser does not launch, the default locations of the Help files are the directories listed as follows:

[Table 29 "Help file locations" \(page 143\)](#) describes the Help file locations.

Table 29
Help file locations

Platform	Default path
Windows 95, Windows 98, Windows NT, Windows 2000, Windows XP, Windows Vista, UNIX	<p><JDM Installation directory>/help/platypus/v410.zip.</p> <p>After you unzip the file, <JDM Installation directory>/help/platypus/v410/help.html, the help.html is the home page for the online help.</p>

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 your Ethernet Routing Switch 2500 Series.

Requirements

To use the web-based management interface, you need the following items:

- A computer connected to a network port that is a member of the management VLAN
- One of the following Web browsers installed on the computer:
 - Microsoft* Internet Explorer, version 4.1 or later on Windows 95, Windows 98, Windows 2000, Windows NT*, Windows XP*, or Windows Vista
 - Netscape Navigator*, version 4.51 or later on Windows 95, Windows 98, Windows 2000, Windows NT, Windows XP, Windows Vista, and UNIX*
- IP address of the Ethernet Routing Switch 2500 Series

ATTENTION

The Web pages of the web-based management interface may load at different speeds depending on the Web browser you use.

In order to use the Ethernet Routing Switch 2500 Series web-based management functionality, such as downloading software, you must connect your TFTP server to an Ethernet Routing Switch 2500 Series.

For instructions to set the IP address of the switch, see "[ip address command](#)" (page 178).

Access to the Web management interface for the switch is enabled by default. You can configure access to the interface using the CLI. For information about enabling Web access, see *Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)*.

Logging in to the web-based management interface

Before you log in to the web-based management interface, use the CLI to verify the VLAN port assignments and to ensure that your switch CPU and computer are assigned to the same VLAN. If the devices are not connected to the same VLAN, the IP address cannot display the home page.

To log in to the web-based management interface, use the following procedure:

Step	Action
1	Start your Web browser.
2	In the address bar, type the IP address for your host switch, for example, http://192.168.151.175 , and press Enter .

The home page appears.

Web-based management interface home page

The screenshot shows the web-based management interface for an Ethernet Routing Switch 2526T. The interface has a blue header with the Nortel logo and a navigation menu on the left. The main content area is titled 'Administration > System Information' and displays the following system information:

sysDescription	Ethernet Routing Switch 2526T HW:0A FW:1.0.0.12 SW:v4.1.0.059 BN:59 (c) Nortel Networks
sysUpTime	14 Hours 13 Minutes 22 Seconds
sysContact	
sysName	
sysLocation	

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—End—

Network security does not exist the first time you access the embedded Web server. The system administrator must create access parameters and passwords to protect the integrity of your network configuration(s). For more information, see *Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)*.

Menu

The menu is the same for all pages. It contains a list of seven main headings.

Figure 47
Menu



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.

The first six headings provide options for viewing and configuring switch parameters. The Support heading provides options to open the online Help file and the Nortel Web site.

[Table 30 "Main headings and options" \(page 147\)](#) lists the main headings in the Web-based management interface and their associated options.

Table 30
Main headings and options

Main menu titles	Option
Summary	Stack Information Switch Information Identify Unit Numbers Stack Numbering

Main menu titles	Option
Configuration	IP System Remote Access SNMPv1 SNMPv3 SNMP Trap MAC Address Find MAC Address Port Management High Speed Flow Control Software Download License 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 Spanning Tree Multilink Trunk Link Aggregation QoS ADAC
Administration	System Information Quick Start Security Logout Reset Reset to Default
Support	Help Release Notes Manuals Upgrade

Tools are provided in the menu to assist you in navigating the web-based management interface.








CAUTION

Web browser capabilities such as page bookmarking, refresh, and page forward and page back, function as they would 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 31 "Menu icons" (page 149) describes the icons that appear on the menu.

Table 31
Menu icons

Button or icon	Description
	This icon identifies a menu title. Click on this icon to display its options.
	This icon identifies a menu title option. Click on 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 corporate home page in a new Web browser.

Management page

When you click a menu option, the corresponding management page appears. Figure 48 "Console page" (page 150) shows the page displayed for the **Administration > Security > Console option**.

Figure 48
Console page

Administration > Security > Console

Console Switch Password Setting

Console Switch Password Type	None
Read-Only Switch Password	user
Read-Write Switch Password	secure

Console Stack Password Setting

Console Stack Password Type	None
Read-Only Stack Password	user
Read-Write Stack Password	secure

Submit

ATTENTION





The **Console Stack Password Setting** section is active only when the switch is in the stack mode.

A page is composed of one or more of the following elements:

- Tables and input forms
The gray cells in a page are display only, and white cells are 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 clicking the checked box.
- Icons and buttons
Icons and buttons perform an action concerning the displayed page or the switch. Some pages include a button that opens another page or updates the values shown on the current page. Some pages include icons that initiate an action, such as reformatting the current displayed data as a bar or pie chart.

[Table 32 "Page icons" \(page 151\)](#) describes the icons that you use to modify information in a statistical table.

Table 32
Page icons

Icon	Name	Description
	Modify	Accesses a modification page for the selected row.
	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.
		<p>ATTENTION</p> <p>Text within a table that is underlined and highlighted in blue and is a hyperlink to a related management page.</p>

Viewing stack information

ATTENTION

The Embedded Web Server automatically detects the operational mode of your system. If the system is in stand-alone mode, the Stack Information page option is not listed in the menu.

To view stack information:

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

- | | |
|---|--|
| 1 | Open the Stack Information screen by selecting Summary > Stack Information from the menu. This screen is illustrated in Figure 49 "Stack Information page" (page 152) . |
|---|--|

—End—

Figure 49
Stack Information page

The screenshot shows the 'Stack Information' page in the Nortel web interface. The left sidebar contains a navigation menu with 'Stack Information' selected. The main content area is titled 'Summary > Stack Information'. It features a 'Stack Information' section with a table of key-value pairs: System Description (F5000 Routing Switch 2500T (Stack Feature)), Software Version (4.1.0.002), MAC Address (00:19:5B:00:04:01), IP Address (47.00.225.123), Manufacturing Date Code (00252006), Serial # (1R00704105000F), and Operational State (Normal). Below this is a 'Stack Inventory' table with columns for Unit, Description, and Pluggable Port (1-4). Two units are listed, both with descriptions of the switch configuration and pluggable ports (40, 50, 05, 05).

"Stack Information screen fields" (page 152) describes the fields on the **Stack Information** and **Stack Inventory** sections of the **Stack Information** screen.

Stack Information screen 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.
	Manufacturing Date Code	The date of manufacture of the board in ASCII format: YYYYMMDD.
	Serial Number	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 154).
	Description	The description of the device or its subcomponent.
	Pluggable port	The SFP GBICs connected to the switch.

Section	Fields	Description
	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.

Viewing summary 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, use the following procedure:

→ From the main menu, choose **Summary > Switch Information**.

The **Switch Information** page appears.

Figure 50
Switch Information page



Table 33 "Switch Information page fields" (page 153) describes the fields on the Switch Information page.

Table 33
Switch Information page fields

Item	Description
Module Description	The factory set description of the Ethernet Routing Switch 2500 Series.
Pluggable Port 25/49	The factory set description of the sub-component/GBIC.
Pluggable Port 26/50	The factory set description of the sub-component/GBIC.
Firmware Version	The firmware version of the Ethernet Routing Switch 2500 Series.
Software Version	The version of the running software.
Manufacturing Data Code	The date of manufacture of the board in ASCII format.

Item	Description
Hardware Version	The hardware version of the Ethernet Routing Switch 2500 Series.
Serial #	The serial number of the Ethernet Routing Switch 2500 Series.
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 switch.
IP Address	The IP address of the switch.
Fans Status	The fan status of the switch.

Changing stack numbering

If the system is in a stack, existing stack numbering information can be viewed and renumbered.

ATTENTION

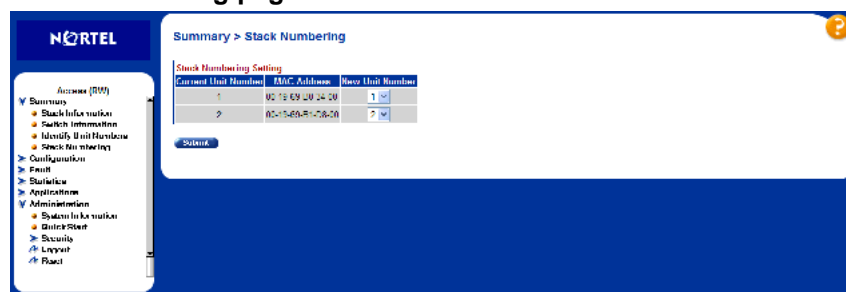
The unit number does not affect the base unit designation.

To view or renumber devices within the stack framework:

Step Action

- 1 Open the **Stack Numbering** screen by selecting **Summary > Stack Numbering** from the menu. This screen is illustrated in Stack Numbering page.

Figure 51
Stack Numbering page



"Stack Numbering screen fields" (page 155) describes the fields on the Stack Numbering screen.

Stack Numbering screen fields

Field	Item	Range	Description
Stack Numbering Setting	Current Unit Number	1..8	Unit number previously assigned to the policy switch. The entries in this column are displayed in order of their current physical cabling with respect to the base unit, and can show non-consecutive unit numbering if one or more units were previously moved or modified. The entries also can 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 policy switch. <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>ATTENTION</p> <p>If you leave the field blank, the system automatically selects the next available number.</p> </div>

- 2 Choose the new number to assign to the switch.
- 3 Click **Submit**.
- 4 A message prompts for confirmation of the request. Click **Yes**.

—End—

Identifying unit numbers

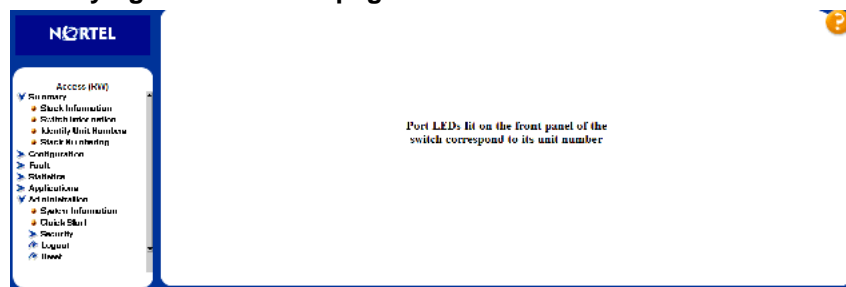
Identify the unit numbers of the switches participating in a stack configuration by viewing the LEDs on the front panel of each switch.

To identify unit numbers in your configuration:

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

- 1 Open the **Identify Unit Numbers** screen by **selecting Summary > Identify Unit Numbers** from the menu. This screen is illustrated in [Figure 52 "Identifying Unit Numbers page" \(page 156\)](#).

Figure 52
Identifying Unit Numbers page



- 2 To continue viewing summary information or to start the configuration process, choose another option from the main menu.

—End—

Power over Ethernet for the Ethernet Routing Switch 2526T-PWR and 2550T-PWR

The Ethernet Routing Switch 2550T-PWR and 2526T-PWR provide IEEE 802.3af-compliant power over half of the front-panel RJ-45 ports, located on the left-hand side of the front panel. The switch provides power discovery, power management, and statistics on power use on each port and each switch basis. You can use the Ethernet Routing Switch 2500 Series to provide power to network appliances, such as IP telephones, wireless access points, and video devices.

The Ethernet Routing Switch 2526T-PWR and 2550T-PWR provide Power over Ethernet for 12 and 24 ports with respectively. The switches only support PoE on the lower-numbered ports (identified by a red border). The switches provide a maximum of 168 Watts of power to PoE ports. Adequate power is available to supply, on average, 7 Watts for each port on the 2550T-PWR, and 14 Watts for each port on the 2526T-PWR. A maximum of 15.4 Watts is available on any port for any given device.

The Ethernet Routing Switch 2550T-PWR and 2526T-PWR supply data terminal equipment (DTE) power only on signal pins.

By default, power is allocated based on real time measurements. If the total Ethernet power budget for the switch is exceeded, the switch sheds load by shutting down power to ports.

You configure the Power over Ethernet (PoE) parameters on the PoE ports 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" \(page 158\)](#)
- ["Configuring PoE switch parameters using the CLI" \(page 158\)](#)
- ["Configuring PoE port parameters using the CLI" \(page 160\)](#)
- ["Displaying PoE configuration using the CLI" \(page 164\)](#)
- ["Configuring PoE using Web-based management" \(page 167\)](#)

- ["Editing and viewing switch PoE configurations using Device Manager" \(page 172\)](#)

Diagnosing and correcting PoE problems

This section discusses some common problems in using the PoE features of the Ethernet Routing Switch 2500-PWR. This section discusses the following topics:

- ["Status codes on PoE ports" \(page 158\)](#)

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:

- Detecting—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 configure power parameters for each Ethernet Routing Switch 2500-PWR using the CLI. You can configure the DC power source, the power pairs, and the power usage with this management system. This section contains information about the following topics:

- ["poe poe-pd-detect-type command" \(page 158\)](#)
- ["poe poe-power-usage-threshold command" \(page 159\)](#)
- ["poe poe-trap command" \(page 160\)](#)
- ["no poe-trap command" \(page 160\)](#)

poe poe-pd-detect-type command

The `poe poe-pd-detect-type` command sets the method the Ethernet Routing Switch 2500-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
{802dot3af | 802dot3af_and_legacy | Unit}

```

The `poe poe-pd-detect-type` command is executed in the Global Configuration command mode.

ATTENTION

You must ensure that this setting is the correct one for the IP appliance you use with the switch. Please note this setting applies to the entire switch, not port-by-port. So, you must ensure that this setting is configured correctly for *all* the IP appliances on a specified switch.

describes the parameters and variables for the `poe poe-pd-detect-type` command.

Table 34
poe poe-pd-detect-type command parameters and variables

Parameters and variables	Description
802dot3af 802dot3af_and_legacy	<p>Sets the detection method the switch use to detect power needs of devices connected to front ports:</p> <ul style="list-style-type: none"> • 802dot3af • 802dot3af_and_legacy <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p style="text-align: center;">ATTENTION</p> <p>The default setting is 802dot3af. Ensure that the power detection method you choose for the Ethernet Routing Switch 2500-PWR matches that used by the IP devices you are powering.</p> </div>
Unit	Set the unit in stack to apply the detection method.

poe poe-power-usage-threshold command

The `poe poe-power-usage-threshold` command lets you set a percentage usage threshold above which the system sends a trap for each Ethernet Routing Switch 2500-PWR. The syntax for the `poe poe-power-usage-threshold` command is:

```

poe poe-power-usage-threshold {<1-99> | Unit}

```

The `poe poe-power-usage-threshold` command is executed in the Global Configuration command mode.

Table 35 "po e poe-power-usage-threshold command parameters and variables" (page 160) describes the parameters and variables for the po e poe-power-usage-threshold command.

Table 35
po e poe-power-usage-threshold command parameters and variables

Parameters and variables	Description
<1-99>	Enter the percentage of total available power you want the switch to use prior to sending a trap. <div style="border: 1px solid black; padding: 5px; text-align: center;">ATTENTION The default setting is 80%.</div>
Unit	Set a percentage usage threshold above which the system sends a trap for each unit.

po e poe-trap command

The po e poe-trap command enables the traps for the PoE functions on the Ethernet Routing Switch 2500-PWR. The syntax for the po e poe-trap command is:

```
po e poe-trap {Unit}
```

The po e poe-trap command is executed in the Global Configuration command mode.

no poe-trap command

The no poe-trap command disables the traps for the PoE functions on the Ethernet Routing Switch 2500-PWR. The syntax for the no poe-trap command is:

```
no poe-trap {Unit}
```

The no poe-trap command is executed in the Global Configuration command mode.

Configuring PoE port parameters using the CLI

You can configure power parameters for each port on the Ethernet Routing Switch 2500 PWR Series using the CLI. You enable the power and set the power limit and power priority on each port. This section covers the following topics:

- "no poe-shutdown command" (page 161)

- "po e poe-shutdown command" (page 161)
- "po e poe-priority command" (page 162)
- "po e poe-limit command" (page 163)

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 executed in the Interface Configuration command mode.

Table 36 "no poe-shutdown command parameters and variables" (page 161) describes the parameters and variables for the `no poe-shutdown` command.

Table 36
no poe-shutdown command parameters and variables

Parameters and variables	Description
<code>port <portlist></code>	<p>Enter the port numbers on which you want to enable power.</p> <p>The default value is enabled.</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>ATTENTION</p> <p>If you omit this parameter, the system uses the port entered with the <code>interface FastEthernet</code> command.</p> </div>

po e poe-shutdown command

The `po e poe-shutdown` command disables power to the port. The syntax for the `po e poe-shutdown` command is:

```
po e poe-shutdown [port <portlist>]
```

The `po e poe-shutdown` command is executed in the Interface Configuration command mode.

Table 37 "po e po e-shutdown command parameters and variables" (page 162) describes the parameters and variables for the po e po e-shutdown command.

Table 37
po e po e-shutdown command parameters and variables

Parameters and variables	Description
<code>port <portlist></code>	<p>Enter the port numbers on which you want to disable power.</p> <p>The default value is enabled.</p> <div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>ATTENTION</p> <p>If you omit this parameter, the system uses the port entered with the <code>interface FastEthernet</code> command.</p> </div>

po e po e-priority command

The `po e po e-priority` command lets you 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 `po e po e-priority` command is:

```
po e po e-priority [port <portlist>] {low | high | critical}
```

The `po e po e-priority` command is executed in the Interface Configuration command mode.

Table 38 "po e po e-priority command parameters and variables" (page 162) describes the parameters and variables for the `po e po e-priority` command.

Table 38
po e po e-priority command parameters and variables

Parameters and variables	Description
<code>port <portlist></code>	Enter the port numbers on which you want to disable power.

Parameters and variables	Description
	<p style="text-align: center;">ATTENTION</p> <p>If you omit this parameter, the system uses the port entered with the <code>interface FastEthernet</code> command.</p>
<code>low high critical</code>	<p>Sets the port priority as:</p> <ul style="list-style-type: none"> • <code>low</code> • <code>high</code> • <code>critical</code> <p style="text-align: center;">ATTENTION</p> <p>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.</p>

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 executed in the Interface Configuration command mode.

Table 39 "poe poe-limit command parameters and variables" (page 164) describes the parameters and variables for the `poe poe-limit` command.

Table 39
poe poe-limit command parameters and variables

Parameters and variables	Description
<3-16>	Enter the maximum number of watts you want for the specified port. The range is 3W to 16W; the default value is 16W.
ports	Enter the port number you want to disable power on. <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>ATTENTION</p> <p>If you omit this parameter, the system uses the port entered with the <code>interface FastEthernet</code> command.</p> </div>

Displaying PoE configuration using the CLI

You display the status for the PoE configuration on the Ethernet Routing Switch 2500-PWR using the following CLI commands:

- "show poe-main-status command" (page 164)
- "show poe-port-status command" (page 165)
- "show poe-power-measurement command" (page 166)

show poe-main-status command

The `show poe-main-status` command displays the current PoE configuration of the Ethernet Routing Switch 2500-PWR, and each port PoE settings. The syntax for the `show poe-main-status` command is:

```
show poe-main-status {Unit}
```

The `show poe-main-status` command is executed in the User Exec command mode.

Figure 53 "show poe-main-status" (page 165) displays sample output from the `show poe-main-status` command.

Figure 53**show poe-main-status command output**

```

2550T-PWR# show poe-main-status
PoE Main Status - Stand-alone
-----
Available DTE Power      : 168 Watts
DTE Power Status        : Normal
DTE Power Consumption    : 4 Watts
DTE Power Usage Threshold : 80 %
Traps Control Status     : Enable
PD Detect Type          : 802.3af and Legacy
Power Source Present     : AC Only
AC Power Status         : Present
DC Power Status         : Not Present
2550T-PWR#

```

ATTENTION

The Power Source Present listing displays the current power source for the switch: AC Only.

show poe-port-status command

The `show poe-port-status` command displays the status, power status, power limit, and port priority of 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 executed in the User Exec command mode.

The DTE Power Status displays error messages if the port is not providing power. The following messages can appear:

- Detecting—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 40 "show poe-port-status command parameters and variables" (page 166) describes the parameters and variables for the `show poe-port-status` command.

Table 40
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.
	<p>ATTENTION</p> <p>If you omit this parameter, the system displays all ports.</p>

Figure 54 "show poe-port-status command output" (page 166) displays sample output from the show poe-port-status command.

Figure 54
show poe-port-status command output

```

2550T-PWR# show poe-port-status
-----
Port      Admin Status      Current Status      Classification      Limit <Watts>      Priority
-----
1         Enable  Detecting    0              0              16              Low
2         Enable  Detecting    0              0              16              Low
3         Enable  Detecting    0              0              16              Low
4         Enable  Detecting    0              0              16              Low
5         Enable  Detecting    0              0              16              Low
6         Enable  Delivering Power  3              0              16              Low
7         Enable  Detecting    0              0              16              Low
8         Enable  Detecting    0              0              16              Low
9         Enable  Detecting    0              0              16              Low
10        Enable  Detecting    0              0              16              Low
11        Enable  Detecting    0              0              16              Low
12        Enable  Detecting    0              0              16              Low
13        Enable  Detecting    0              0              16              Low
14        Enable  Detecting    0              0              16              Low
15        Enable  Detecting    0              0              16              Low
16        Enable  Detecting    0              0              16              Low
17        Enable  Detecting    0              0              16              Low
18        Enable  Detecting    0              0              16              Low
19        Enable  Detecting    0              0              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 executed in the User Exec command mode.

Table 41 "show poe-power-measurement command parameters and variables" (page 167) shows the variables and parameters for the show poe-power-measurement command.

Table 41
show poe-power-measurement command parameters and variables

Parameters and variables	Description
port <portlist>	Enter the ports for which you want to display the power measurements. <div style="border: 1px solid black; padding: 10px; text-align: center;">ATTENTION If you omit this parameter, the system displays all ports.</div>

Figure 55 " show poe-power-measurement command output" (page 167) displays sample output from the show poe-power-measurement command.

Figure 55
show poe-power-measurement command output

```

2550T-PWR# show poe-power-measurement
Port  Volt(U)  Current(mA)  Power(Watt)
-----
1      0.0        0            0.000
2      0.0        0            0.000
3      0.0        0            0.000
4      0.0        0            0.000
5      0.0        0            0.000
6      49.9      86           4.300
7      0.0        0            0.000
8      0.0        0            0.000
9      0.0        0            0.000
10     0.0        0            0.000
11     0.0        0            0.000
12     0.0        0            0.000
13     0.0        0            0.000
14     0.0        0            0.000
15     0.0        0            0.000
16     0.0        0            0.000
17     0.0        0            0.000
18     0.0        0            0.000
19     0.0        0            0.000
20     0.0        0            0.000
-----More (q=Quit, space/return=Continue)-----
    
```

Configuring PoE using web-based management

You can display and configure Power over Ethernet (PoE) parameters using the web-based management system.

- "Displaying and configuring power management for the switch" (page 168)

- "Displaying and configuring power management for the ports" (page 170)

Displaying and configuring power management for the switch

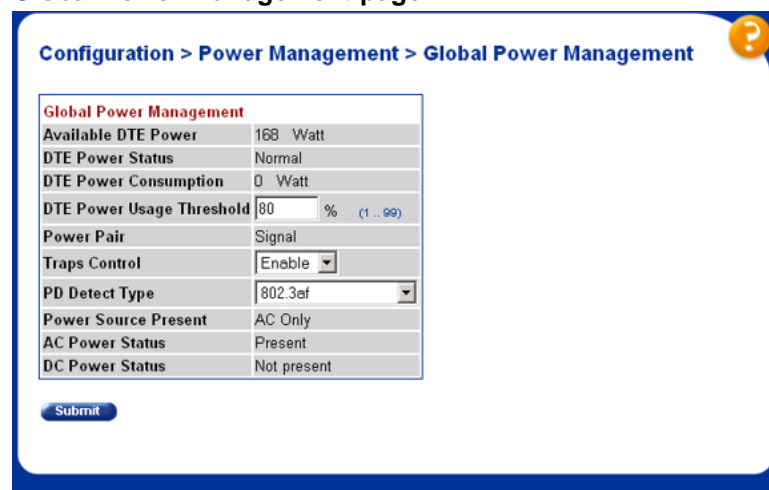
To display and configure power settings for the entire switch, use the following procedure:

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

- | | |
|---|---|
| 1 | From the main menu, choose Configuration > PoE Management > Global Power Mgmt. |
|---|---|

The Global Power Management page appears ("Global Power Management page" (page 168)).

Global Power Management page



The following table describes the items on the Global Power Management page.

Table 42
Global Power Management page items

Item	Description
Available DTE Power	Displays the amount of power available to powered devices from the switch.
DTE Power Status	Displays the status of the PoE feature. It displays: <ul style="list-style-type: none"> • Normal--all power functioning correctly • Error--PoE failed

Item	Description
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	Displays the power pair of the RJ-45 pin connectors that supplies the power. The only available option for the Ethernet Routing Switch 2500 Series is Signal. ATTENTION Ensure that the power pair used by the IP devices you are powering matches the power pair for the Ethernet Routing Switch 2500 Series.
Traps Control	Choose to enable or disable trap from agent.
PD Detect Type	Choose the type of power detection you want for the switch: <ul style="list-style-type: none"> • 802.3af • 802.3af and legacy The default is 802.3af. ATTENTION Ensure that the power detection method you choose for the Ethernet Routing Switch 2500 Series 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: <ul style="list-style-type: none"> • AC Only--using only the internal power source of the switch
AC Power Status	Displays the current status of AC power on the switch.
DC Power Status	Displays the current status of DC power on the switch (Not Present).

- 2 Type the information, or make a selection from the list.
- 3 Click Submit.

—End—

Displaying and configuring power management for the ports

To configure power management settings for each port, use the following procedure:

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

- | | |
|---|--|
| 1 | From the main menu, choose Configuration > PoE Management > Port Property . |
|---|--|

The Port Property page appears ("Port Property page" (page 170)).

Port Property page

Port	Admin. Status	Current Status	Classification	Limit (Watt)	Priority	Volt (V)	Current (mA)	Power (Watt)
1	Enabled	Detecting	0	16	Low	0.0	0	0.000
2	Enabled	Detecting	0	16	Low	0.0	0	0.000
3	Enabled	Detecting	0	16	Low	0.0	0	0.000
4	Enabled	Detecting	0	16	Low	0.0	0	0.000
5	Enabled	Detecting	0	16	Low	0.0	0	0.000
6	Enabled	Detecting	0	16	Low	0.0	0	0.000
7	Enabled	Detecting	0	16	Low	0.0	0	0.000
8	Enabled	Detecting	0	16	Low	0.0	0	0.000
9	Enabled	Detecting	0	16	Low	0.0	0	0.000
10	Enabled	Detecting	0	16	Low	0.0	0	0.000
11	Enabled	Detecting	0	16	Low	0.0	0	0.000
12	Enabled	Detecting	0	16	Low	0.0	0	0.000
Switch	Enabled	<input checked="" type="checkbox"/>		16	Low	<input checked="" type="checkbox"/>		

Submit

[Ports 13 - 24](#)

The following table describes the items on the Port Property page.

Table 43
Port Property page items

Item	Description
Admin Status	Choose to enable or disable power on the selected port. The default value is Enabled.

Item	Description
Current Status	<p>Displays the status of the PoE feature. It displays:</p> <ul style="list-style-type: none"> • 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 <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>ATTENTION</p> <p>Nortel recommends against using the test operational status.</p> </div>
Classification	<p>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.</p> <p>This parameter is valid only while a device is being powered.</p>
Limit (Watt)	<p>Sets the maximum amount of power supplied to that port.</p> <p>The range for Ethernet Routing Switch 2500 Series is 3W to 16W. The default value is 16W.</p>
Priority	<p>Priority is used to determine which port(s) are shut down when the total power of the Ethernet Routing Switch 2500 Series exceeds the power budget for that switch (or available DTE power). The lower priority ports are shut down in favor of higher priority ports.</p> <p>The range is low, high, and critical. The default value is low.</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>ATTENTION</p> <p>When two ports have the same priority and one must be shut down, the port with the higher port number is shut down first.</p> </div>
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

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).

The following sections provide a description of the PoE tabs, and details about each item on the tab:

- ["PoE tab for a single unit" \(page 172\)](#)
- ["Device Manager display for PoE ports" \(page 174\)](#)
- ["PoE tab for ports" \(page 175\)](#)

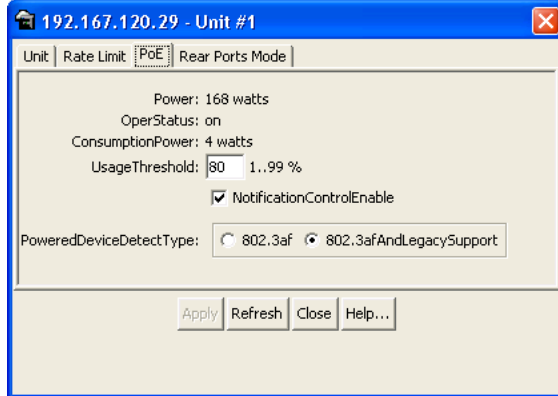
PoE tab for a single unit

To open the PoE tab for a single unit, use the following procedure:

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 .
- 3 Click the **PoE** tab.
The PoE tab appears.

Edit Unit dialog box—PoE tab for a single unit



—End—

Table 44 "PoE tab items for a single unit" (page 173) describes the PoE tab items for a single unit.

Table 44
PoE tab items for a single unit

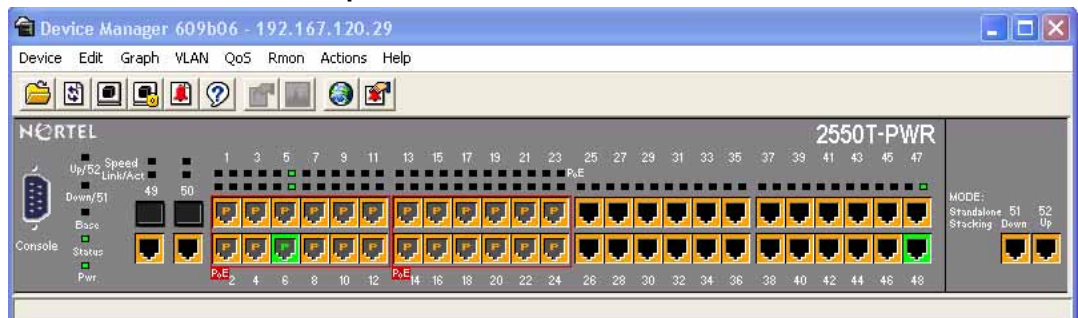
Item	Description
Power	Displays the total power available to the switch.
OperStatus	Displays the power state of the switch: <ul style="list-style-type: none"> • on • off • faulty
Consumption Power	Displays the power being used by the switch.
UsageThreshold	Lets you set a percentage of the total power usage of the switch above which the system sends a trap. <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p style="text-align: center;">ATTENTION</p> <p>You must enable the traps (NotificationControlEnable) to receive a power usage trap.</p> </div>

Item	Description
Notification ControlEnable	Lets you enable or disable sending traps if the switch power usage exceeds the percentage set in the UsageThreshold field.
PowerDevice DetectType	<p>Lets you set the power detection type that the switch uses to detect a request for power from a device connected to all ports on the switch:</p> <ul style="list-style-type: none"> • 802.3af • 802.3af and legacy <div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>ATTENTION</p> <p>The default setting is 802.3af. Ensure that this setting matches the setting for the detection type used by the powered devices on this switch.</p> </div>

Device Manager display for PoE ports

The Device Manager displays PoE ports differently than non-PoE port.

ERS 2550T-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 45 "Port power color codes" (page 174) shows the status assigned to each color.

Table 45
Port power color codes

Color	Description
Green P	Specifies that the port is currently delivering power.

Color	Description
Red P	Specifies that the power and detection mechanism for the port is disabled.
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.

ATTENTION

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 ports

The PoE tab lets you configure PoE power settings for ports.

To view the PoE tab, use the following procedure:

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

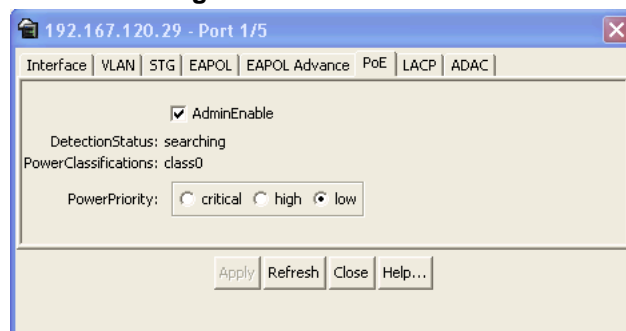
- | | |
|---|---|
| 1 | Select the port you want to edit. |
| 2 | Do one of the following: <ul style="list-style-type: none"> • Double-click the selected port. • From the shortcut menu, choose Edit. • From the Device Manager main menu, choose Edit > Port. • On the toolbar, click Edit. |

The Port dialog box appears with the Interface tab displayed.

- | | |
|---|---------------------------|
| 3 | Click the PoE tab. |
|---|---------------------------|

The PoE tab appears.

Edit Port dialog box— PoE tab



—End—

PoE tab items

Table 46 "PoE tab items" (page 176) describes the PoE tab items.

Table 46
PoE tab items

Item	Description
AdminEnable	<p>Lets you enable or disable PoE on this port.</p> <p>By default, PoE is enabled.</p>
Detection Status	<p>Displays the operational status of the power-device detecting mode on the specified port:</p> <ul style="list-style-type: none"> • disabled—detecting function disabled • searching—detecting function is enabled and the system is searching for a valid powered device on this port • deliveringPower—detection found a valid powered device and the port is delivering power • fault—power-specific fault detected on port • test—detecting device in test mode • otherFault <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>ATTENTION</p> <p>Nortel recommends against using the test operational status.</p> </div>
PowerClassifications	<p>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 can be classified according to their power requirements.</p>
PowerPriority	<p>Lets you set the power priority for the specified port to:</p> <ul style="list-style-type: none"> • critical • high • low

System configuration using the CLI

In the Ethernet Routing Switch 2500 Series, the Command Line Interface (CLI) commands lets you display and modify the switch configuration while the switch is operating.

This chapter includes information about general switch maintenance, such as setting up access parameters, upgrading the software, and setting the speed. This chapter contains information about the following topics:

- "Configuring the switch IP address, subnet mask and default gateway" (page 177)
- "Using DNS to ping and telnet" (page 184)
- "Configuration Management" (page 188)
- "Customizing your system" (page 193)
- "Displaying the ARP table" (page 202)
- "Displaying interfaces" (page 202)
- "Saving the configuration to NVRAM" (page 205)
- "Enabling and disabling autosave" (page 206)
- "Setting time on network elements using Simple Network Time Protocol" (page 208)
- "Enabling Autopology" (page 215)
- "Configuring LLDP using the CLI" (page 217)
- "Configuring LEDs to blink on the display panel" (page 229)
- "Upgrading software" (page 229)

Configuring the switch IP address, subnet mask and default gateway IP notation

To enter IP addresses and subnet masks in the CLI, enter both the IP address and the subnet mask in dotted decimal notation (XXX.XXX.XXX.XXX).

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 contains information about the following topics:

- "ip address command" (page 178)
- "default ip address command" (page 179)
- "no ip address command" (page 179)
- "default ip netmask command" (page 179)
- "no ip netmask command" (page 179)
- "ip default-gateway command" (page 180)
- "no ip default-gateway command" (page 180)
- "default ip default-gateway command" (page 181)
- "show ip command" (page 181)

ip address command

The `ip address` command sets the IP address and subnet mask for the switch. The syntax for the `ip address` command is:

```
ip address <XXX.XXX.XXX.XXX> [netmask <XXX.XXX.XXX.XXX>]
```

The `ip address` command is executed in the Global Configuration command mode.

[Table 47 "ip address command parameters and variables" \(page 178\)](#) describes the parameters and variables for the `ip address` command.

Table 47
ip address command parameters and variables

Parameters and variables	Description
XXX.XXX.XXX.XXX	Enter IP address in dotted decimal notation; netmask is optional.
netmask	Set the IP subnet mask for the switch.

ATTENTION

When you change the IP address or subnet mask, you may lose connection to Telnet and the Web.

default ip address command

The `default ip address` command sets the IP address for the specified unit to the default value as 192.168.1.1 for Standalone Mode and 192.168.1.2 for Stacking Mode. The syntax for the `default ip address` command is:

```
default ip address
```

The `default ip address` command is executed in the Global Configuration command mode.

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
```

The `no ip address` command is executed in the Global Configuration command mode.

The `no ip address` command has no parameters or variables.

ATTENTION

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 netmask command

The `default ip netmask` command sets the subnet mask to the default value (255.255.255.0). The syntax for the `default ip netmask` command is:

```
default ip netmask
```

The `default ip netmask` command is executed in the Global Configuration command mode.

The `default ip netmask` command has no parameters or variables .

no ip netmask command

The `no ip netmask` command sets the subnet mask for a switch to all zeros (000.000.000.000). The syntax for the `no ip netmask` command is:

```
no ip netmask
```

The `no ip netmask` command is executed in the Global Configuration command mode.

The `no ip netmask` command has no parameters or variables .

ip default-gateway command

The `ip default-gateway` command sets the IP default gateway address for a switch. The syntax for the `ip default-gateway` command is:

```
ip default-gateway <XXX.XXX.XXX.XXX>
```

The `ip default-gateway` command is executed in the Global Configuration command mode.

Table 48 "ip default-gateway command parameters and variables" (page 180) describes the parameters and variables for the `ip default-gateway` command.

Table 48
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.

ATTENTION

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 executed in the Global Configuration command mode.

The `no ip default-gateway` command has no parameters or variables.

ATTENTION

When you change the IP gateway address, you may lose connection to Telnet and the Web. You also may disable any new Telnet connection required to connect to the serial Console port to configure a new IP Gateway address.

default ip default-gateway command

The `default ip default-gateway` command sets the IP default gateway address to all zeros (000.000.000.000). The syntax for the `default ip default-gateway` command is:

```
default ip default-gateway
```

The `default ip default-gateway` command is executed in the Global Configuration command mode.

The `default ip default-gateway` command has no parameters or variables.

show ip command

The `show ip` command displays the IP configurations, specifically BootP mode, switch address, subnet mask, and gateway address. This command displays the these 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]] [dns]
```

The `show ip` command is executed in the User Exec command mode.

If you do not enter any parameters, this command displays all the IP-related configuration information.

[Table 49 "show ip command parameters and variables" \(page 181\)](#) describes the parameters and variables for the `show ip` command.

Table 49
show ip command parameters and variables

Parameters and variables	Description
bootp mode	Displays BootP-related IP information.
default-gateway	Displays the IP address of the default gateway.
address	Displays the current IP address.
switch	Specifies current IP address of the switch.
dns	Displays DNS configuration.

[Figure 56 "show ip command output" \(page 182\)](#) displays a sample output of the `show ip` command.

Figure 56
show ip command output

```

2550T-PWR> show ip
Bootp Mode: BootP Or Default IP

           Configured      In Use      Last BootP
-----
Stack IP Address: 192.168.1.2          0.0.0.0
Switch IP Address: 192.167.120.29    192.167.120.29  0.0.0.0
Subnet Mask:      255.255.255.0      255.255.255.0  0.0.0.0
Default Gateway: 192.167.120.1      192.167.120.1  0.0.0.0
2550T-PWR>

```

show ip address command

The **show ip address** command displays the IP configurations, switch address, subnet mask, and gateway address. The syntax for the **show ip address** command is:

```
show ip address
```

The **show ip address** command is executed in the User Exec command mode.

[Table 50 "show ip address command parameters and variables" \(page 182\)](#) describes the parameters and variables for the **show ip address** command.

Table 50
show ip address command parameters and variables

Parameters and variables	Description
address	Displays the current IP address.

[Figure 57 "show ip address command output" \(page 182\)](#) displays a sample output of the **show ip address** command.

Figure 57
show ip address command output

```

2550T-PWR# show ip address

           Configured      In Use      Last BootP
-----
Stack IP Address: 192.168.1.2          0.0.0.0
Switch IP Address: 192.167.120.29    192.167.120.29  0.0.0.0
Subnet Mask:      255.255.255.0      255.255.255.0  0.0.0.0
2550T-PWR#

```

Pinging

To ensure that the Ethernet Routing Switch 2500 Series has connectivity to the network, ping a device you know is connected to this network.

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. The local IP address must be set before issuing the `ping` command. See ["Assigning and clearing IP addresses"](#) (page 178) for information on setting IP addresses.

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 executed in the User Exec command mode.

[Table 51 "ping command parameters and variables"](#) (page 183) describes the parameters and variables for the `ping` command.

Table 51
ping command parameters and variables

Parameters and variables	Description
XXX.XXX.XXX.XXX	Specify the IP address of the target device in dotted-decimal notation.
datasize <64-4096>	Specifies the size of the ICMP packet to be sent. The data size range is from 64 to 4096 bytes.
{count <1-9999>} continuous	Sets the number of ICMP packets to be sent. The continuous mode sets the ping running until the user interrupts it by entering Ctrl-C.
{timeout -t} <1-120>	Set the timeout using either the <code>timeout</code> or <code>-t</code> 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 being used. If no reply is received, a message indicates that the address is not responding.

Figure 58 "ping command responses" (page 184) shows sample ping responses.

Figure 58
ping command responses

```
2550T-PWR#ping 192.167.120.28 debug
PING 192.167.120.28: 56(64) data bytes
Reply from 192.167.120.28: 64 bytes icmp_seq=1 time=30 ms
-----192.167.120.28 PING Statistics-----
1 packets transmitted, 1 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 30/30/30
Host is reachable
2550T-PWR#
```

Resetting the switch to default configuration

The `restore factory-default` command resets the switch to its default configuration.

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

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

where the `-y` or `force` parameter instructs the switch not to prompt for confirmation. If the `-y` or `force` parameter is not included in the command, the following message appears:

```
Warning the switch 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 executed in the Privileged EXEC command mode.

Using DNS to ping and telnet

Using the Domain Name Server (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 DNS; you may also configure a default domain name. If you configure a default domain name, that name is appended to hostnames that do not contain a dot. The default domain name and addresses are saved in NVRAM.

The hostnames 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" (page 185)
- "ping command" (page 183)
- "ip name-server command" (page 186)

- "no ip name-server command" (page 187)
- "ip domain-name command" (page 187)
- "no ip domain-name command" (page 188)
- "default ip domain-name command" (page 188)

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 executed in the User Exec command mode.

The `show ip dns` command has no parameters or variables.

[Figure 59 "show ip dns command output" \(page 185\)](#) displays sample output from the `show ip dns` command.

Figure 59
show ip dns command output

```
2550T-PWR# show ip dns
DNS Default Domain name: None

DNS Servers
-----
0.0.0.0
0.0.0.0
0.0.0.0
2550T-PWR#
```

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. The local IP address must be set before issuing the `ping` command.

You can ping a host using either its IP address or hostname.

The syntax for the `ping` command is:

```
ping <A.B.C.D or Hostname>
```

The `ping` command is executed in the User Exec command mode.

[Table 52 "ping command parameters and variables" \(page 186\)](#) describes the parameters and variables for the `ping` command.

Table 52
ping command parameters and variables

Parameters and variables	Description
<A.B.C.D or Hostname>	Specify: <ul style="list-style-type: none"> the IP address of the target device in dotted-decimal notation the hostname of the device to ping (The hostname can be a simple name, such as fred; in this case the DNS domain name, if set, is appended. Or the hostname can be a full hostname, such as fred.ca.nortel.com.)

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 being used. If no reply is received, a message indicates that the address is not responding.

Figure 60 "ping command responses" (page 186) displays sample ping responses.

Figure 60
ping command responses

```
2550T-PWR> ping 192.167.120.29
Host is reachable
2550T-PWR>
```

There is no default value for this command.

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 executed in the Global Configuration command mode.

ATTENTION

You can add up to three servers; adding one at a time.

Table 53 "ip name-server command parameters and variables" (page 187) describes the parameters and variables for the ip name-server command.

Table 53
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 executed in the Global Configuration command mode.

Table 54 "no ip name-server command parameters and variables" (page 187) describes the parameters and variables for the no ip name-server command.

Table 54
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 executed in the Global Configuration command mode.

Table 55 "ip domain-name command parameters and variables" (page 188) describes the parameters and variables for the ip domain-name command.

Table 55
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 executed in the Global Configuration 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 executed in the Global Configuration command mode.

The `default ip domain-name` command has no parameters or variables.

Configuration Management

This section covers the following topics:

- ["Automatically loading Configuration file" \(page 188\)](#)
- ["ASCII Configuration Generator" \(page 191\)](#)

Automatically loading 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 contains information about the following commands:

- ["configure network command" \(page 189\)](#)

- ["show config-network command" \(page 190\)](#)

configure network command

The `configure network` command lets you load and execute a script immediately and to configure parameters to automatically download a configuration file when you reboot the switch. 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 executed in the User Exec mode.

ATTENTION

When you enter `configure network` with no parameters, the system prompts you for the script file name and TFTP server address and then downloads the script.

[Table 56 "configure network command parameters and variables" \(page 189\)](#) describes the parameters and variables for the `configure network` command.

Table 56
configure network command parameters and variables

Parameters and variables	Description
load-on-boot {disable use-bootp use-config}	<p>Specifies the settings for automatically loading a configuration file when the system boots:</p> <ul style="list-style-type: none"> • disable—disables the automatic loading of config file • 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 <div> <h4>ATTENTION</h4> </div> <p>When you enter <code>configure network</code> with no parameters, the system prompts you for the script file name and TFTP server address and then downloads the script.</p> <p>If you omit this parameter, the system immediately downloads and runs the ASCII config file.</p>

Parameters and variables	Description
filename <WORD>	<p>Specifies the file name.</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>ATTENTION</p> <p>If you omit this parameter and do not specify BootP, the system uses the configured file name.</p> </div>
address <XXX.XXX.XXX.XXX>	<p>Specifies the TFTP server from which to load the file. Enter the IP address in dotted-decimal notation.</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>ATTENTION</p> <p>If you omit this parameter and do not specify BootP, the system uses the configured address.</p> </div>

ATTENTION

When you specify the file name or address, these parameters change 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 executed in the Privileged EXEC command mode.

The `show config-network` command has no parameters or values.

Figure 61 "show config-network command output" (page 191) shows the output for the `show config-network` command.

Figure 61
show config-network command output

```
2550T-PWR# show config-network
Auto-Load Configuration On Boot: Disabled
Configuration Filename:
TFTP Server IP Address: 192.167.120.13
Last Auto Configuration Status: Passed
Last Manual Configuration Status: Passed
2550T-PWR#
```

ASCII Configuration Generator

The primary goal of the ASCII Configuration Generator (ACG) is to provide the users of the Ethernet Routing Switch 2500 Series with a tool that lets them easily modify configuration of a particular switch or stack.

ACG generates an ASCII configuration file which reproduces the behavior of the current binary configuration file. The user can also rely on this function to maintain backup configurations, as well as use it as a reliable method for debugging the current configuration of a switch.

ATTENTION

When you are connected to a stack from the console port, ensure that the console is on the base unit before downloading an ASCII file.

The Ethernet Routing Switch 2500 Series can download an editable ASCII configuration file from the TFTP server. You can load the ASCII configuration file automatically at boot time or on demand using console menus or CLI. Once downloaded, the configuration file automatically configures the switch according to the Command Line Interface (CLI) commands in the file. The maximum size for an ASCII configuration file is 100 KBs; larger configuration files must be split into multiple files.

For more information on loading the ASCII configuration file automatically, see "[Automatically loading Configuration file](#)" (page 188).

The commands that are associated with ACG are:

- "[show running-config command](#)" (page 191)
- "[copy running-config tftp command](#)" (page 192)

show running-config command

This command displays the current configuration of switch as a series of CLI commands.

This command must be executed in the configuration mode and has no parameters or variables.

The syntax of this command is:

```
show running-config
```

Figure 62 "show running-config command output" (page 192) shows the output of the show running-config command

Figure 62
show running-config command output

```
2550T-PWR# show running-config
? Embedded ASCII Configuration Generator Script
? Model = Ethernet Routing Switch 2550T-PWR
? Software version = v4.1.0.053
enable
configure terminal
?
? *** CORE ***
?
autosave enable
mac-address-table aging-time 300
autotopology
no radius-server
radius-server host 0.0.0.0
radius-server secondary-host 0.0.0.0
radius-server port 1812
? radius-server key *****
radius-server timeout 2
telnet-access login-timeout 1
telnet-access retry 3
telnet-access inactive-timeout 15
telnet-access logging all
cli password switch serial none
----More (q=Quit, space/return=Continue)----
```

copy running-config tftp command

This command copies contents of the current configuration file to another file on the TFTP server. The syntax of the command is

```
copy running-config tftp {<address> <filename>}
```

This command can be executed in the Global Configuration command mode.

Table 57 "copy running-config tftp command parameters and variables" (page 192) describes the parameters and variables of this command.

Table 57
copy running-config tftp command parameters and variables

Parameter	Description
address	Signifies the IP address of the TFTP server.
filename	Denotes the filename to store configuration commands on the TFTP server.

ATTENTION

Use the `copy running-config tftp` command only from the base unit in a stack.

Customizing your system

You can customize your system using the CLI commands described in this section. This section covers the following topics:

- ["Setting the terminal" \(page 193\)](#)
- ["Displaying system information" \(page 195\)](#)
- ["Setting boot parameters" \(page 196\)](#)
- ["Setting TFTP parameters" \(page 197\)](#)
- ["Customizing the opening banner" \(page 200\)](#)

Setting the terminal

You can view the terminal settings, set them to default settings, or customize the terminal settings. This sections contains information about the following commands:

- ["show terminal command" \(page 193\)](#)
- ["terminal command" \(page 193\)](#)

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 executed in the User Exec command mode.

The `show terminal` command has no parameters or variables.

[Figure 63 "show terminal command output" \(page 193\)](#) shows the output from the `show terminal` command.

Figure 63
show terminal command output

```
2550T-PWR> enable
2550T-PWR# show terminal
Terminal speed: 9600
Terminal width: 79
Terminal length: 23
2550T-PWR#
```

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 executed in the User Exec mode.

[Table 58 "terminal command parameters and variables" \(page 194\)](#) describes the parameters and variables for the terminal command.

Table 58
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 displaying characters; default 79.

show cli command

The `show cli` command displays the current CLI settings. The syntax for the `show cli` command is:

```
show cli {info | mode | password [type]}
```

The `show cli` command is executed in the User Exec command mode.

[Table 59 "show cli command parameters and variables" \(page 194\)](#) describes the parameters and variables for the show cli command.

Table 59
show cli command parameters and variables

Parameters and variables	Description
info	Displays general Console settings.
mode	Displays CLI mode.
password	Displays CLI user names and passwords.
type	Displays password types.

[Figure 64 "show cli command output" \(page 195\)](#) displays the output from the show cli command.

Figure 64
show cli command output

```
2526T#config t
Enter configuration commands, one per line. End with CNTL/Z.
2526T(config)# show cli info
Inactivity Timeout: 15 minute(s)
Login Timeout: 1 minute(s)
Login Retries: 3
More: True
Screen Lines: 23
2526T(config)#
```

Displaying system information

The `show sys-info` command displays the current system characteristics.

ATTENTION

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 executed in the Privileged EXEC command mode.

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

[Figure 65 "show sys-info command output" \(page 195\)](#) displays sample output from the `show sys-info` command.

Figure 65
show sys-info command output

```
2526T(config)#show sys-info
Operation Mode:      Switch
MAC Address:        00-19-69-AF-C8-00
Reset Count:        31
Last Reset Type:    Software Download
Autotopology:       Enabled
Pluggable Port 25:  None
Pluggable Port 26:  None
sysDescr:           Ethernet Routing Switch 2526T
                    HW:00A          FW:1.0.0.9   SW:v4.0.0.001
                    Mfg Date:20060926   HW Dev:
                    LBNNTMJL44000J
Serial #:
sysObjectID:        1.3.6.1.4.1.45.3.72.1
sysUpTime:          0 days, 01:53:01
sysNtpTime:         SNTP not synchronized.
sysServices:        3
sysContact:
sysName:
sysLocation:
```

Setting boot parameters

You can reboot the switch and configure BootP. The topics covered in this section are:

- ["boot command" \(page 196\)](#)
- ["ip bootp server command" \(page 196\)](#)
- ["no ip bootp server command" \(page 197\)](#)
- ["default ip bootp server command" \(page 197\)](#)

boot command

The `boot` command performs a soft-boot of the switch. The syntax for the `boot` command is:

```
boot [default]
```

The `boot` command is executed in the Privileged EXEC command mode.

[Table 60 "boot command parameters and variables" \(page 196\)](#) describes the parameters and variables for the `boot` command.

Table 60
boot command parameters and variables

Parameters and variables	Description
default	Restores switch to factory-default settings after rebooting.

ATTENTION

When you reset to factory defaults, the last reset count and reason for last reset will not be set to factory defaults.

ip bootp server command

The `ip bootp server` command configures BootP on the current instance of the switch or server. The syntax for the `ip bootp server` command is:

```
ip bootp server {default-ip|last|disable|always}
```

The `ip bootp server` command is executed in the Global Configuration command mode.

[Table 61 "ip bootp server command parameters and variables" \(page 197\)](#) describes the parameters and variables for the `ip bootp server` command.

Table 61
ip bootp server command parameters and variables

Parameters and variables	Description
last needed disable always	<p>Specifies when to use BootP:</p> <ul style="list-style-type: none"> • default-ip—use BootP or the default IP • last—use BootP or the last known address • disable—never use BootP • always—Always use 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 executed in the Global Configuration command mode.

The `no ip bootp server` command has no parameters or values.

default ip bootp server command

The `default ip bootp server` command sets the BootP server status to BootP or Default IP. The syntax for the `default ip bootp server` command is:

```
default ip bootp server
```

The `default ip bootp server` command is executed in the Global Configuration command mode.

The `default ip bootp server` command has no parameters or values.

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" \(page 198\)](#)
- ["tftp-server command" \(page 198\)](#)
- ["default tftp-server command" \(page 199\)](#)
- ["no tftp-server command" \(page 199\)](#)

- ["copy config tftp command"](#) (page 199)
- ["copy tftp config command"](#) (page 200)

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 executed in the Privileged EXEC command mode.

The `show tftp-server` command has no parameters or variables.

[Figure 66 "show tftp-server command output"](#) (page 198) shows a sample output of the `show tftp-server` command.

Figure 66
show tftp-server command output

```
2550T-PWR# show tftp-server
TFTP Server IP address : 192.167.120.13
2550T-PWR#
```

tftp-server command

The `tftp-server` command assigns the address for the switch to use for TFTP services. The syntax of the `tftp-server` command is:

```
tftp-server <XXX.XXX.XXX.XXX>
```

The `tftp-server` command is executed in the Global Configuration command mode.

[Table 62 "tftp-server command parameters and variables"](#) (page 198) describes the parameters and variables for the `tftp-server` command.

Table 62
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 executed in the Global Configuration command mode.

The `no tftp-server` command has no parameters or values.

default tftp-server command

The `default tftp-server` command sets the TFTP server IP address to 0.0.0.0. The syntax of the `default tftp-server` command is:

```
default tftp-server
```

The `default tftp-server` command is executed in the Global Configuration command mode.

The `default tftp-server` command has no parameters or values.

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 executed in the Privileged EXEC command mode.

[Table 63 "copy config tftp command parameters and variables" \(page 199\)](#) describes the parameters and variables for the `copy config tftp` command.

Table 63
copy config tftp command parameters and variables

Parameters and variables	Description
address <XXX.XXX.XX.XXX>	Specifies the TFTP server IP address; enter in dotted-decimal notation.
filename <WORD>	Specifies filename 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.

copy tftp config command

The `copy tftp config` command retrieves the system configuration file from the TFTP server and uses the retrieved information as the current configuration on the system. The syntax for the `copy tftp config` command is:

```
copy tftp config [address <XXX.XXX.XXX.XXX>] filename <WORD>
```

The `copy tftp config` command is executed in the Privileged EXEC command mode.

Table 64 "copy tftp config command parameters and variables" (page 200) describes the parameters and variables for the `copy tftp config` command.

Table 64
copy tftp config command parameters and variables

Parameters and variables	Description
address <XXX.XXX.XX.XXX>	Specifies the TFTP server IP address; enter in dotted-decimal notation.
filename <WORD>	Enter the name of the configuration file you want to copy from the TFTP server.

Customizing the opening banner

You can customize the banner that appears when you connect to the Ethernet Routing Switch 2500 Series. You can customize the text that reads **NORTEL**. However you cannot customize the second line that reads **Enter [Ctrl]+y to begin**.

The Banner Control feature provides an option to specify the banner text. If you choose not to display the banner, the system enters the command mode through the default command interface. You do not have to press the **Ctrl+y** keys.

The Banner display that you select is used for subsequent console sessions. For executing the new mode in the console, you must logout. For Telnet access, all subsequent sessions use the selected mode.

This section contains information about the following commands:

- "banner command for displaying banner" (page 201)
- "show banner command" (page 201)
- "no banner command" (page 202)

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 to display banner is:

```
banner [ custom | static | disabled | <1-19> LINE ]
```

The **banner** command for displaying banner is executed in the Global Configuration command mode.

[Table 65 "banner command parameters" \(page 201\)](#) describes the parameters for the banner command.

Table 65
banner command parameters

Parameters	Description
static	Displays the default agent-banner.
custom	Displays the custom agent-banner.
disabled	Skips the agent-banner display.
<1-19> LINE	Fills the Nth line of the custom banner (1<N<19) with the text specified in LINE.

show banner command

The **show banner** command displays the banner. The syntax for the show banner command is:

```
show banner [ custom | static ]
```

The **show banner** command is executed in the Global Configuration command mode.

[Table 66 "show banner command parameters and variables" \(page 201\)](#) describes the parameters for the banner command.

Table 66
show banner command parameters and variables

Parameters	Description
static	Displays default banner
custom	Displays custom banner
(if empty)	Displays static, custom or disabled status if parameter is not entered.

no banner command

The **no banner** command lets you clear all lines of a previously stored custom banner. The syntax for the **no banner** command is:

```
no banner
```

The **no banner** command is executed in the Global Configuration command mode.

Displaying the ARP table

The **show arp-table** command displays the arp table of the device. The syntax for the **show arp-table** command is:

```
show arp-table
```

The **show arp-table** command is executed in the User Exec command mode.

The **show arp-table** command has no parameters or variables.

[Figure 67 "show arp-table command output" \(page 202\)](#) displays a sample output of the show arp-table command.

Figure 67
show arp-table command output

Displaying interfaces

You can view the status of all interfaces on the switch, including MultiLink Trunk membership, link status, autonegotiation, and speed. This section contains information about the following:

- ["show interfaces command" \(page 202\)](#)
- ["show interfaces config command" \(page 204\)](#)

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 | gbic-info] [<portlist>]
```

The **show interfaces** command is executed in the User Exec command mode.

Table 67 "show interfaces command parameters and variables" (page 203) describes the parameters and variables for the show interfaces command.

Table 67
show interfaces command parameters and variables

Parameters and variables	Description
gbic-info	Displays gbic details.
LINE	Displays the interface information for specific ports
names	Displays the interface names.
verbose	Displays information about STP and EAP.

Figure 68 "show interfaces names command output" (page 203) displays a sample output of the show interfaces names command.

Figure 68
show interfaces names command output

```

2550T(config-if)#show interfaces name 1-3
Port Name
-----
1    LabBldg
2    Testing
3    FloorBldg
    
```

Figure 69 "show interfaces command output" (page 203) shows a sample output of the show interfaces command without the names variable.

Figure 69
show interfaces command output

```

2550T-PWR#show interfaces
          Status
Port Trunk Admin Oper Link LinkTrap Auto Negotiation Speed Duplex Flow 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 Up Up Enabled Enabled 100Mbps Full Disable
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 Down Down Enabled Enabled
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 (q=Quit, space/return=Continue)-----
    
```

The following figure shows a sample output of the show interfaces verbose command.

Figure 70
show interfaces verbose command output

```

2526T>show interfaces verbose
Port: 1
  Trunk:
  Admin: Enable
  Oper: Down
  Oper EAP: Up
  Oper STP: Forwarding
  Link: Down
  LinkTrap: Enabled
  Autonegotiation: Enabled

Port: 2
  Trunk:
  Admin: Enable
  Oper: Down
  Oper EAP: Up
  Oper STP: Forwarding
  Link: Down
  LinkTrap: Enabled
  Autonegotiation: Enabled

Port: 3
  Trunk:
  ----More (q=Quit, space/return=Continue)----

```

show interfaces config command

The `show interfaces config` command displays the current operational status of interfaces and provides supplementary information about the current port settings for Spanning Tree Protocol.

The syntax for the `show interfaces config` command is:

```
show interfaces [<portlist>] config
```

The `show interfaces config` command is executed in the Privileged EXEC command mode.

[Table 68 "show interfaces config command parameters and variables" \(page 204\)](#) describes the parameters and variables for the show interfaces config command.

Table 68
show interfaces config command parameters and variables

Parameters and variables	Description
<portlist>	Enter the ports you want to display.

[Figure 71 "show interfaces config command output" \(page 205\)](#) displays a sample output of the show interfaces config command.

Figure 71
show interfaces config command output

```

2526T(config-if)#show interfaces 10-14 config
                Status
Port Trunk Admin Oper Link LinkTrap Negotiation Speed Duplex Flow Control
-----
10          Enable Down Down Enabled Enabled
11          Enable Down Down Enabled Enabled
12          Enable Down Down Enabled Custom
13          Enable Down Down Enabled Enabled
14          Enable Down Down Enabled Enabled

*****VLAN interfaces configuration*****
                Filter Filter
                Untagged Unregistered
Port  Frames      Frames      PVID  PRI  Remarking  Tagging  Name
-----
10   No           Yes           1     0   Disabled  UntagAll  Port 10
11   No           Yes           1     0   Disabled  UntagAll  Port 11
12   No           Yes           1     0   Disabled  UntagAll  Port 12
13   No           Yes           1     0   Disabled  UntagAll  Port 13
14   No           Yes           1     0   Disabled  UntagAll  Port 14

*****VLAN ID port member configuration*****
Port_VLAN_VLAN_Name      VLAN VLAN Name      VLAN VLAN Name
2526T(config-if)#

```

Saving the configuration to NVRAM

You can save your configuration parameters to Non-Volatile RAM (NVRAM) using any of the following CLI commands:

- "copy config nvram command" (page 205)
- "write memory command" (page 205)
- "save config command" (page 206)

copy config nvram command

The `copy config nvram` command copies the current configuration to NVRAM. The syntax for the `copy config nvram` command is:

```
copy config nvram
```

The `copy config nvram` command is executed in the Privileged EXEC command mode.

The `copy config nvram` command has no parameters or variables.

ATTENTION

The system automatically issues the `copy config nvram` command periodically. See "Enabling and disabling autosave" (page 206) for details.

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 executed in the Privileged 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 executed in the Privileged EXEC command mode.

The `save config` command has no parameters or variables.

Enabling and disabling autosave

The Ethernet Routing Switch 2500 Series performs a check every 60 seconds to detect changes in the configuration file or a new log message in the nonvolatile storage. If any of these two events occurs, the switch automatically saves its configuration and the nonvolatile log to flash memory. Autosave also automatically saves your configuration information across reboots.

You can enable or disable this feature. When you disable autosave, changes in the configuration file are not saved to the flash memory.

This section contains information about the following commands:

- ["show autosave command" \(page 206\)](#)
- ["autosave enable command" \(page 207\)](#)
- ["no autosave enable command" \(page 207\)](#)
- ["default autosave enable command" \(page 207\)](#)

ATTENTION

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 executed in the Privileged EXEC command mode.

The `show autosave` command has no parameters or variables.

Figure 72 "show autosave command output" (page 207) displays sample output from the `show autosave` command.

Figure 72
show autosave command output

```
2550T-PWR(config)# show autosave
Auto Save: Enabled
2550T-PWR(config)#
```

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 executed in the Global Configuration 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 executed in the Global Configuration 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 executed in the Global Configuration command mode.

The `default autosave enable` command has no parameters or variables.

Setting time on network elements using Simple Network Time Protocol

The Simple Network Time Protocol (SNTP) feature synchronizes the Universal Coordinated Time (UTC) 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.

ATTENTION

If you have trouble using this feature, try various NTP servers. Some NTP servers may be overloaded or currently inoperable.

- ["show sntp command" \(page 208\)](#)
- ["sntp enable command" \(page 209\)](#)
- ["no sntp enable command" \(page 209\)](#)
- ["sntp server primary address command" \(page 209\)](#)
- ["sntp server secondary address command" \(page 210\)](#)
- ["no sntp server command" \(page 210\)](#)
- ["sntp sync-now command" \(page 211\)](#)
- ["sntp sync-interval command" \(page 211\)](#)
- ["default sntp command" \(page 212\)](#)

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 executed in the Privileged EXEC command mode.

The `show sntp` command has no parameters or variables.

[Figure 73 "show sntp command output" \(page 209\)](#) displays sample output from the `show sntp` command.

Figure 73
show sntp command output

```

2526I(config)#show sntp
SNTP Status:                Disabled
Primary server address:     0.0.0.0
Secondary server address:   0.0.0.0
Sync interval:              24 hours
Last sync source:          0.0.0.0
Primary server sync failures: 0
Secondary server sync failures: 0
Last sync time:             Not Set
Next sync time:             Not Set
Current time:               Not Set
2526I(config)#_

```

sntp enable command

ATTENTION

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 executed in the Global Configuration 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 executed in the Global Configuration 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 executed in the Global Configuration command mode.

Table 69 "sntp server primary address command parameters and variables" (page 210) describes the parameters and variables for the sntp server primary address command.

Table 69
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 executed in the Global Configuration command mode.

Table 70 "sntp server secondary address command parameters and variables" (page 210) describes the parameters and variables for the sntp server secondary address command.

Table 70
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 executed in the Global Configuration command mode.

Table 71 "no sntp server command parameters and variables" (page 211) describes the parameters and variables for the no sntp server command.

Table 71
no sntp server command parameters and variables

Parameters and variables	Description
<primary secondary>	Enter the NTP server you want to clear: <ul style="list-style-type: none"> • primary—the IP address for the primary NTP server • secondary—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.

ATTENTION

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 executed in the Global Configuration command mode.

The `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 executed in the Global Configuration command mode.

[Table 72 "sntp sync-interval command parameters and variables" \(page 212\)](#) describes the parameters and variables for the `sntp sync-interval` command.

Table 72
sntp sync-interval command parameters and variables

Parameters and variables	Description
<0-168>	<p>Enter the number of hours you want for periodic synchronization with the NTP server.</p> <div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>ATTENTION</p> <p>0 is boot-time only, and 168 is once a week; the default value is 24 hours.</p> </div>

default sntp command

The `default sntp` command sets the SNTP parameters to their default values. The syntax for the `default sntp` command is:

```
default sntp [enable | server | sync-interval]
```

The `default sntp` command is executed in the Global Configuration command mode.

[Table 73 "default sntp command parameters and variables" \(page 212\)](#) describes the parameters and variables for the default sntp command.

Table 73
default sntp command parameters and variables

Parameters and variables	Description
enable	Disables SNTP.
server	Clears stored SNTP server addresses.
sync-interval	Restores the default SNTP re-synchronization interval.

Setting local time zone

SNTP uses Universal Coordinated Time (UTC) for all time synchronizations so it is not affected by different time zones. In order for the switch report the correct time for your local time zone and daylight savings time, you must use the following commands:

- ["clock time-zone" \(page 213\)](#)
- ["no clock time-zone" \(page 213\)](#)
- ["clock summer-time" \(page 213\)](#)

- "no clock summer-time" (page 214)
- "show clock time-zone" (page 214)
- "show clock summer-time" (page 215)

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 executed in the Global Configuration command mode.

Table 74 "clock time-zone command parameters and variables" (page 213) describes the parameters and variables for the clock time-zone command.

Table 74
clock time-zone command parameters and variables

Parameters and variables	Description
zone	Time zone acronym that can be displayed when showing system time (Range: Up to 4 characters)
hours	Hours difference from UTC. (Valid Range: -12 to +12)
minutes	Optional minutes difference from UTC. (Range: 0-59)

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 executed in the Global Configuration 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 executed in the Global Configuration command mode.

Table 75 "clock summer-time command parameters and variables" (page 214) describes the parameters and variables for the `clock summer-time` command.

Table 75
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 4 characters)
date {<day> <month> <year> <hh:mm>} {<day> <month> <year> <hh:mm>}	<p>The first date specifies when summer time should start and the second date specifies when summer time should end.</p> <ul style="list-style-type: none"> • 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 <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>ATTENTION</p> <p><day> <month> parameters can also be entered in order: <month> <day>.</p> </div>
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 executed in the Global Configuration command mode.

The `no clock time-zone` 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 executed in the Global Configuration command mode.

The `show clock time-zone` command has no parameters or variables.

Figure 74 "show clock time-zone output" (page 215) displays sample output from the `show clock time-zone` command.

Figure 74
show clock time-zone output

```
2526T(config)#show clock time-zone
Time Zone offset from UTC is 00:00
2526T(config)#
```

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 executed in the Global Configuration command mode.

The `show clock summer-time` command has no parameters or variables.

Figure 75 "show clock summer-time" (page 215) displays sample output from the `show clock summer-time` command.

Figure 75
show clock summer-time

```
2550T-PWR# show clock summer-time
Daylight saving time is DISABLED
2550T-PWR#
```

Enabling Autopology

You can enable the Optivity* Autopology* protocol using the CLI. See www.nortel.com/support for information on Autopology. (The product family for Optivity and Autopology is Data and Internet.) This section covers the following commands:

- "autopology command" (page 216)
- "no autopology command" (page 216)

- ["default autotopology command" \(page 216\)](#)

autotopology command

The `autotopology` command enables the Autotopology protocol. The syntax for the `autotopology` command is:

```
autotopology
```

The `autotopology` command is executed in the Global Configuration command mode.

The `autotopology` command has no parameters or values.

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 executed in the Global Configuration command mode.

The `no autotopology` command has no parameters or values.

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 executed in the Global Configuration command mode.

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

show autotopology settings

The `show autotopology settings` command displays information on the Autotopology configuration. The syntax for the `show autotopology settings` command is:

```
show autotopology settings
```

The `show autotopology settings` command is executed in the Privileged EXEC command mode.

The `show autotopology settings` command has no parameters or variables.

Figure 76 "show autotopology settings command output" (page 217) displays a sample output of the show autotopology settings command.

Figure 76
show autotopology settings command output

```
2526T(config)#show autotopology settings
Autotopology: Enabled
Last NMM Table Change: 0 days, 20:53:44
Maximum NMM Table Entries: 100
Current NMM Table Entries: 2
2526T(config)#_
```

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 executed in the Privileged EXEC command mode.

The `show autotopology nmm-table` command has no parameters or variables.

Figure 77 "show autotopology nmm-table command output" (page 217) displays a sample output of the show autotopology nmm-table command.

Figure 77
show autotopology nmm-table command output

```
2526T(config)#show autotopology nmm-table
LSlot
LPort IP Addr          Seg ID  MAC Addr  Chassis Type  BT  LS  CS  RSlot
-----
0/ 0 192.167.120.28 0x000000 001969AFC801 2526T        12 Yes HTBT  NA
1/24 192.167.120.8 0x000109 000EC0831020 Passport 1648 12 Yes HTBT 1/ 9
2526T(config)#_
```

Configuring LLDP using the CLI

You can enable the LLDP using the CLI. For more information about LLDP, see "Link Layer Discovery Protocol (IEEE 802.1ab)" (page 74). This section covers the following commands:

- "lldp command" (page 218)
- "default lldp command" (page 219)
- "lldp config-notification command" (page 219)

- "no lldp config-notification command" (page 220)
- "default lldp config-notification command" (page 220)
- "lldp tx-tlv command" (page 221)
- "no lldp tx-tlv command" (page 221)
- "default lldp tx-tlv command" (page 222)
- "lldp status command" (page 222)
- "no lldp status command" (page 223)
- "default lldp status command" (page 223)
- "show lldp command" (page 224)
- "show lldp port command" (page 226)

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 executed in the Global Configuration command mode.

Table 76 "lldp command parameters and variables" (page 218) describes the parameters and variables for the `lldp` command.

Table 76
lldp command parameters and variables

Parameters and variables	Description
<code>tx-interval <5-32768></code>	Sets the interval between successive transmission cycles.
<code>tx-hold-multiplier <2-10></code>	Sets the multiplier for <code>tx-interval</code> used to compute the Time To Live value for the TTL TLV.
<code>reinit-delay <1-10></code>	Sets the delay for re-initialization attempt if the <code>adminStatus</code> is disabled.
<code>tx-delay <1-8192 ></code>	Sets the minimum delay between successive LLDP frame transmissions.
<code>notification-interval <5-3600></code>	Sets the interval between successive transmissions of LLDP notifications.

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` command sets all parameters to their default values.

The `default lldp` command is executed in the Global Configuration command mode.

[Table 77 "default lldp command parameters and variables" \(page 219\)](#) describes the parameters and variables for the `default lldp` command.

Table 77
default lldp command parameters and variables

Parameters and variables	Description
<code>tx-interval</code>	Sets retransmit interval to the default value (30).
<code>tx-hold-multiplier</code>	Sets transmission multiplier to the default value (4).
<code>reinit-delay</code>	Sets reinitialize delay to the default value (2).
<code>tx-delay</code>	Sets transmission delay to the default value (2).
<code>notification-interval</code>	Sets notification interval to the default value (5).

lldp config-notification command

The `lldp config-notification` command enables notification when new neighbor information is stored or when existing information is removed.

The syntax for the `lldp config-notification` command is:

```
lldp [port <portlist>] config-notification
```

The `lldp config-notification` command is executed in the Interface Configuration command mode.

[Table 78 "lldp config-notification command parameters and variables" \(page 220\)](#) describes the parameters and variables for the `lldp config-notification` command.

Table 78
lldp config-notification command parameters and variables

Parameters and variables	Description
<portlist>	Specifies the ports affected by the command.

no lldp config-notification command

The `no lldp config-notification` command disables config notification. The syntax for the `no lldp config-notification` command is:

```
no lldp [port <portlist>] config-notification
```

The `no lldp config-notification` command is executed in the Interface Configuration command mode.

[Table 79 "no lldp config-notification command parameters and variables" \(page 220\)](#) describes the parameters and variables for the `no lldp config-notification` command.

Table 79
no lldp config-notification command parameters and variables

Parameters and variables	Description
<portlist>	Specifies the ports affected by the command.

default lldp config-notification command

The `default lldp config-notification` command sets config notification to its default value (disabled). The syntax for the `default lldp config-notification` command is:

```
default lldp [port <portlist>] config-notification
```

The `default lldp config-notification` command is executed in the Interface Configuration command mode.

[Table 80 "default lldp config-notification command parameters and variables" \(page 220\)](#) describes the parameters and variables for the `default lldp config-notification` command.

Table 80
default lldp config-notification command parameters and variables

Parameters and variables	Description
line <portlist>	Specifies the ports affected by the command.

lldp tx-tlv command

The `lldp tx-tlv` command specifies the optional TLVs to include in the transmitted LLDPDUs. The syntax for the `lldp tx-tlv` command is:

```
lldp tx-tlv [port <portlist>] [local-mgmt-addr] [port-desc]
[sys-cap] [sys-desc] [sys-name]
```

The `lldp tx-tlv` command is executed in the Interface Configuration command mode.

[Table 81 "lldp tx-tlv command parameters and variables" \(page 221\)](#) describes the parameters and variables for the `lldp tx-tlv` command.

Table 81
lldp tx-tlv command parameters and variables

Parameters and variables	Description
port <portlist>	Specifies the ports affected by the command.
local-mgmt-addr	Local management address TLV
port-desc	Port description TLV
sys-cap	System capabilities TLV
sys-desc	System description TLV
sys-name	System name TLV

no lldp tx-tlv command

The `no lldp tx-tlv` command specifies the optional TLVs not to include in the transmitted LLDPDUs. The syntax for the `lldp tx-tlv` command is:

```
no lldp tx-tlv [port <portlist>] [local-mgmt-addr]
[port-desc]
[sys-cap] [sys-desc] [sys-name]
```

The `no lldp tx-tlv` command is executed in the Interface Configuration command mode.

[Table 82 "no lldp tx-tlv command parameters and variables" \(page 221\)](#) describes the parameters and variables for the `no lldp tx-tlv` command.

Table 82
no lldp tx-tlv command parameters and variables

Parameters and variables	Description
port <portlist>	Specifies the ports affected by the command.
local-mgmt-addr	Local management address TLV

Parameters and variables	Description
port-desc	Port description TLV.
sys-cap	System capabilities TLV
sys-desc	System description TLV
sys-name	System name TLV

default lldp tx-tlv command

The `default lldp tx-tlv` command specifies the optional TLVs not to include in the transmitted LLDPDUs (by default, the optional TLVs are not included in LLDPDUs). The syntax for the `default lldp tx-tlv` command is:

```
default lldp tx-tlv [port <portlist>] [local-mgmt-addr]
[port-desc]
[sys-cap] [sys-desc] [sys-name]
```

The `default lldp tx-tlv` command is executed in the Interface Configuration command mode.

[Table 83 "default lldp tx-tlv command parameters and variables" \(page 222\)](#) describes the parameters and variables for the `default lldp tx-tlv` command.

Table 83
default lldp tx-tlv command parameters and variables

Parameters and variables	Description
port <portlist>	Specifies the ports affected by the command.
local-mgmt-addr	Local management address TLV (default value is false: not included)
port-desc	Port description TLV. (default value is false: not included)
sys-cap	System capabilities TLV (default value is false: not included)
sys-desc	System description TLV (default value is false: not included)
sys-name	System name TLV (default value is false: not included)

lldp status command

The `lldp status` command sets the LLDPDU transmit and receive status on ports. The syntax for the `lldp status` command is:

```
lldp [port <portlist>] status [rxOnly | txAndRx | txOnly]
```

The `lldp status` command is executed in the Interface Configuration command mode.

[Table 84 "lldp status command parameters and variables" \(page 223\)](#) describes the parameters and variables for the `lldp status` command.

Table 84
lldp status command parameters and variables

Parameters and variables	Description
<code>port <portlist></code>	Specifies the ports affected by the command.
<code>rxOnly</code>	Enables LLDP receive only.
<code>txAndRx</code>	Enables LLDP transmit and receive.
<code>txOnly</code>	Enables LLDP transmit only.

no lldp status command

The `no lldp status` command disables 802.1ab on ports. The syntax for the `no lldp status` command is:

```
no lldp [port <portlist>] status
```

The `no lldp status` command is executed in the Interface Configuration command mode.

[Table 85 "no lldp status command parameters and variables" \(page 223\)](#) describes the parameters and variables for the `no lldp status` command.

Table 85
no lldp status command parameters and variables

Parameters and variables	Description
<code>port <portlist></code>	Specifies the ports affected by the command.

default lldp status command

The `default lldp status` command sets the LLDP transmit and receive status on specified ports to its default value (`txAndRx`). The syntax for the `default lldp status` command is:

```
default lldp [port <portlist>] status
```

The `default lldp status` command is executed in the Interface Configuration command mode.

Table 86 "default lldp status command parameters and variables" (page 224) describes the parameters and variables for the default lldp status command.

Table 86
default lldp status command parameters and variables

Parameters and variables	Description
port <portlist>	Specifies the ports affected by the command.

show lldp command

The `show lldp` command displays configuration data for LLDP. The syntax for the show lldp command is:

```
show lldp [local-sys-data] [mgmt-sys-data] [pdu-tlv-size]
[stats]
```

The `show lldp` command is executed in the User Exec command mode.

Table 87 "show lldp command parameters and variables" (page 224) describes the parameters and variables for the show lldp command.

Table 87
show lldp command parameters and variables

Parameters and variables	Description
local-sys-data	Displays local LLDP system data.
mgmt-sys-data	Displays LLDP management data.
pdu-tlv-size	Displays 802.1ab tlv in pdu.
stats	Displays LLDP statistics.

Figure 78 "show lldp local-sys-data command output" (page 225) displays the output from the show lldp local-sys-data command.

Figure 78
show lldp local-sys-data command output

```

2526T# show lldp local-sys-data
-----
                    lldp local-sys-data chassis
-----
ChassisId: MAC address      00:19:69:af:c8:00
SysName:
SysCap:      B / B          <Supported/Enabled>
SysDescr:
Ethernet Routing Switch 2526T  HW:00A      FW:1.0.0.12  SW:v4.1.0.053
-----
                    lldp local-sys-data port
-----
Port: 1
PortId: 1      MAC address 00:19:69:af:c8:01      Port Desc: Port 1
Port: 2
PortId: 2      MAC address 00:19:69:af:c8:02      Port Desc: Port 2
Port: 3
PortId: 3      MAC address 00:19:69:af:c8:03      Port Desc: Port 3
Port: 4
PortId: 4      MAC address 00:19:69:af:c8:04      Port Desc: Port 4
Port: 5
PortId: 5      MAC address 00:19:69:af:c8:05      Port Desc: Port 5
-----More <q=Quit, space/return=Continue>-----

```

Figure 79 "show lldp mgmt-sys-data command output" (page 225) displays the output from the show lldp mgmt-sys-data command.

Figure 79
show lldp mgmt-sys-data command output

```

2526T> show lldp
802.1ab configuration:
-----
TxInterval:30
TxHoldMultiplier:4
ReInitDelay:2
TxDelay:2
NotificationInterval:5
2526T> show lldp mgmt-sys-data
-----
                    lldp mgmt-sys-data
-----
MgmtAddr      MgmtIfId MgmtAddrOID
-----
ipV4 192.167.120.28      0      1.3.6.1.4.1.45.3.72.1
2526T>

```

Figure 80 "show lldp stats command output" (page 226) displays the output from the show lldp stats command.

Figure 80
show lldp stats command output

```

2526T#show lldp stats
-----
                        lldp stats
-----
LastChange              RemTable  RemTable  RemTable  RemTable
Time                   Inserts   Deletes   Drops     Ageouts
-----
0 days, 00:00:00         0         0         0         0
-----
2526T#

```

show lldp port command

The `show lldp port` command displays configuration data for LLDP ports. The syntax for the `show lldp port` command is:

```
show lldp [port <portlist>] [neighbor] [neighbor-mgmt-addr]
[rx-stats] [tx-stats] [tx-tlv]
```

The `show lldp port` command is executed in the User Exec command mode.

[Table 88 "show lldp port command parameters and variables" \(page 226\)](#) describes the parameters and variables for the `show lldp port` command.

Table 88
show lldp port command parameters and variables

Parameters and variables	Description
port <portlist>	Specifies the ports affected by the command.
neighbor	Displays LLDP neighbors.
neighbor-mgmt-addr	Displays LLDP management addresses for neighbors.
rx-stats	Displays LLDP receive statistics.
tx-stats	Displays LLDP transmit statistics.
tx-tlv	Displays LLDP transmit TLVs.

[Figure 81 "show lldp port neighbor command output" \(page 227\)](#) displays the output from the `show lldp port neighbor` command.

Figure 81
show lldp port neighbor command output

```

2526T# show lldp neighbor
-----
                        lldp neighbor
-----
Sys capability: 0-Other; R-Repeater; B-Bridge; W-WLAN accesspoint; r-Router;
T-Telephone; D-DOCSIS cable device; S-Station only.
2526T#

```

Figure 82 "show lldp port neighbor-mgmt-addr command output" (page 227) displays the output from the show lldp port neighbor-mgmt-addr command.

Figure 82
show lldp port neighbor-mgmt-addr command output

```

2526T> show lldp
802.1ab configuration:
-----
          TxInterval:30
          TxHoldMultiplier:4
          ReInitDelay:2
          TxDelay:2
          NotificationInterval:5
2526T> show lldp neighbor-mgmt-addr
-----
                        lldp neighbor-mgmt-addr
-----
2526T>

```

ATTENTION

To display the neighbor management addresses using the `show lldp port neighbor-mgmt-addr` command, you must configure the connected port of the neighbor to transmit local management address TLVs (`lldp tx-tlv [port <portlist>] local-mgmt-addr`).

Figure 83 "show lldp port rx-stats command output" (page 228) displays the output from the show lldp rx-stats command.

Figure 83
show lldp port rx-stats command output

```

2526T> show lldp rx-stats
-----
                        lldp rx-stats
-----
Port Num   Frames Discarded   Frames Errors   Frames Total   TLVs Discarded   TLVs Unrecognized   AgeOuts
-----
1           0                   0               0               0               0               0                   0
2           0                   0               0               0               0               0                   0
3           0                   0               0               0               0               0                   0
4           0                   0               0               0               0               0                   0
5           0                   0               0               0               0               0                   0
6           0                   0               0               0               0               0                   0
7           0                   0               0               0               0               0                   0
8           0                   0               0               0               0               0                   0
9           0                   0               0               0               0               0                   0
10          0                   0               0               0               0               0                   0
11          0                   0               0               0               0               0                   0
12          0                   0               0               0               0               0                   0
13          0                   0               0               0               0               0                   0
14          0                   0               0               0               0               0                   0
15          0                   0               0               0               0               0                   0
-----
More <q=Quit, space/return=Continue>-----

```

Figure 84 "show lldp port tx-stats command output" (page 228) displays the output from the show lldp tx-stats command.

Figure 84
show lldp port tx-stats command output

```

2526T> show lldp tx-stats
-----
                        lldp tx-stats
-----
Port          Frames
-----
1              0
2              0
3              0
4              0
5              0
6              0
7              0
8              0
9              0
10             0
11             0
12             0
13             0
14             0
15             0
16             0
-----
More <q=Quit, space/return=Continue>-----

```

Figure 85 "show lldp port tx-tlv command output" (page 229) displays the output from the show lldp stats command.

Figure 85
show lldp port tx-tlv command output

```

25261> show lldp tx-tlv
-----
                        lldp port tlv
-----
Port  PortDesc  SysName  SysDesc  SysCap  MgmtAddr
-----
1      false    false    false    false   false
2      false    false    false    false   false
3      false    false    false    false   false
4      false    false    false    false   false
5      false    false    false    false   false
6      false    false    false    false   false
7      false    false    false    false   false
8      false    false    false    false   false
9      false    false    false    false   false
10     false    false    false    false   false
11     false    false    false    false   false
12     false    false    false    false   false
13     false    false    false    false   false
14     false    false    false    false   false
15     false    false    false    false   false
16     false    false    false    false   false
-----More (q=Quit, space/return=Continue)-----

```

Configuring LEDs to blink on the display panel

With the `blink-leds` command, you can set the LEDs on the display panel to blink to identify a particular unit. The syntax for the `blink-leds` command is:

```
blink-leds [off | time <1-10>]
```

The `blink-leds` command is executed in the Privileged EXEC command mode.

Table 89
blink-leds command parameters and variables

Parameters and variables	Description
off	Sets the LEDs to stop blinking.
time <1-10>	Indicates the duration, in minutes, for the LEDs to blink in order to identify the unit.

Upgrading software

You can download the Ethernet Routing Switch 2500 Series software image that is located in nonvolatile flash memory. To download the Ethernet Routing Switch 2500 Series software image, a properly configured Trivial File Transfer Protocol (TFTP) server must be present in your network, and the Ethernet Routing Switch 2500 Series must have an IP address. To learn how to configure the switch IP address, see ["Assigning and clearing IP addresses"](#) (page 178).

**CAUTION**

Do not interrupt power to the device during the software download process. A power interruption can corrupt the firmware image.

This section contains information about the following:

- "download command" (page 230)

download command

The `download` command upgrades the software for the Ethernet Routing Switch 2500 Series. You can upgrade both the software image and the diagnostics image.

ATTENTION

The system resets after downloading a new image.

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 executed in the Privileged EXEC command mode.

ATTENTION

You can use the `download` command without parameters. The system displays the most recently used TFTP server IP address and file name; if you still want to use these, press **Enter**. You can also change these.

Table 90 "download command parameters and variables" (page 230) describes the parameters and variables for the download command.

Table 90
download command parameters and variables

Parameters and variables	Description
address <ip>	Specifies the IP address of the TFTP server you want to use.

Parameters and variables	Description
	<p>ATTENTION</p> <p>If this parameter is omitted, the system goes to the server specified by the <code>tftp-server</code> command.</p>
<code>image <image-name></code>	Enter the name of the Ethernet Routing Switch 2500 Series software image you want to download.
<code>image-if-newer <image-name></code>	Enter the name of the Ethernet Routing Switch 2500 Series software image of the newer version you want to download.
<code>diag <filename></code>	Enter the name of the Ethernet Routing Switch 2500 Series diagnostics image you want to download.
<code>no-reset</code>	Download the specified software without resetting the unit or stack.
<code>poe-module-image</code>	Specifies the name of the PoE image file.

The software download process automatically completes 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. The system returns a message after successfully downloading a new image.

Figure 86 "download message" (page 231) shows a sample output of the download command.

Figure 86
download message

```
Download Image [/]
Saving Image [-]
Finishing Upgrading Image
```

During the download process, the Ethernet Routing Switch 2500 Series is not operational. You can monitor the progress of the download process by observing the LED indications.

Ethernet port management using the CLI

This chapter describes how to enable a port, name a port, and enable rate limiting. This chapter covers the following topics:

- "Enabling or disabling a port" (page 233)
- "Naming ports" (page 235)
- "Setting port speed" (page 237)
- "Enabling flow control" (page 240)
- "Enabling rate-limiting" (page 242)
- "Enabling Custom Autonegotiation Advertisements (CANA)" (page 244)

Enabling or disabling a port

You can enable or disable a port using the CLI. This section covers the following commands:

- "shutdown command for the port" (page 233)
- "no shutdown command" (page 234)

shutdown command for the port

The `shutdown [port <portlist>]` command disables the port.

The syntax for the `shutdown [port <portlist>]` command is:

```
shutdown [port <portlist>]
```

Table 91 "shutdown port command parameters and variables" (page 234) describes the parameters and variables for the shutdown [line <portlist>] command.

Table 91
shutdown port command parameters and variables

Parameters and variables	Description
line <portlist>	<p>Specifies the port numbers to shut down or disable. Enter the port numbers you want to disable.</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>ATTENTION</p> <p>If you omit this parameter, the system uses the port number you specified in the <code>interface</code> command.</p> </div>

The `shutdown [line <portlist>]` command is executed in the Interface Configuration command mode.

Figure 87 "shutdown port command output" (page 234) displays sample output from the `shutdown [line <portlist>]` command.

<p>ATTENTION</p> <p>You can disable switch ports that are trunk members, if you choose to disable them one by one. If you choose to disable all ports of the unit or stack, the changes can have effect on the ports belonging to MLTs.</p>
--

Figure 87
shutdown port command output

```
2526T(config-if)#shutdown port 6
2526T(config-if)#
```

no shutdown command

The `no shutdown` command enables the port. The syntax for the `no shutdown` command is:

```
no shutdown [line <portlist>]
```

The `no shutdown` command is executed in the Interface Configuration command mode.

Table 92 "no shutdown command parameters and variables" (page 235) describes the parameters and variables for the `no shutdown` command.

Table 92
no shutdown command parameters and variables

Parameters and variables	Description
line <portlist>	<p>Specifies the port numbers to enable. Enter the port numbers you want to disable.</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>ATTENTION</p> <p>If you omit this parameter, the system uses the port number you specified in the <code>interface</code> command.</p> </div>

Naming ports

You can name a port using the CLI. This section covers the following commands:

- ["name command" \(page 235\)](#)
- ["no name command" \(page 236\)](#)
- ["default name command" \(page 236\)](#)

name command

The `name` command lets you name ports or to change the name. The syntax for the `name` command is:

```
name [port <portlist>] <LINE>
```

The `name` command is executed in the Interface Configuration command mode.

[Table 93 "name command parameters and variables" \(page 235\)](#) describes the parameters and variables for the name command.

Table 93
name command parameters and variables

Parameters and variables	Description
port <portlist>	Specifies the port numbers to name.

Parameters and variables	Description
	ATTENTION If you omit this parameter, the system uses the port number you specified in the <code>interface</code> 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 executed in the Interface Configuration command mode.

[Table 94 "no name command parameters and variables" \(page 236\)](#) describes the parameters and variables for the `no name` command.

Table 94
no name command parameters and variables

Parameters and variables	Description
port <portlist>	Specifies the port numbers to clear of names.
	ATTENTION If you omit this parameter, the system uses the port number you specified in the <code>interface</code> 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 executed in the Interface Configuration command mode.

[Table 95 "default name command parameters and variables" \(page 237\)](#) describes the parameters and variables for the `default name` command.

Table 95
default name command parameters and variables

Parameters and variables	Description
port <portlist>	Specifies the port numbers to clear of names. ATTENTION If you omit this parameter, the system uses the port number you specified in the <code>interface</code> command.

Setting port speed

You can set the speed and duplex mode for a port. This section covers:

- "speed command" (page 237)
- "default speed command" (page 238)
- "duplex command" (page 239)
- "Enabling or disabling a port" (page 233)

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 executed in the Interface Configuration command mode.

Table 96 "speed command parameters and variables" (page 237) describes the parameters and variables for the speed command.

Table 96
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
	ATTENTION If you omit this parameter, the system uses the port number you specified in the <code>interface</code> command.
10 100 1000 auto	Sets speed to: <ul style="list-style-type: none"> • 10—10 Mb/s • 100—100 Mb/s • 1000—1000 Mb/s or 1 GB/s • auto—autonegotiation

ATTENTION 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 executed in the Interface Configuration command mode.

Table 97 "default speed command parameters and variables" (page 238) describes the parameters and variables for the default speed command.

Table 97
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.
	ATTENTION If you omit this parameter, the system uses the port number you specified in the <code>interface</code> 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 executed in the Interface Configuration command mode.

Table 98 "duplex command parameters and variables" (page 239) describes the parameters and variables for the duplex command.

Table 98
duplex command parameters and variables

Parameters and variables	Description
port <portlist>	<p>Specifies the port number to configure the duplex mode. Enter the port number you want to configure, or all to configure all ports simultaneously.</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>ATTENTION</p> <p>If you omit this parameter, the system uses the port number you specified in the <code>interface</code> command.</p> </div>
full half auto	<p>Sets duplex to:</p> <ul style="list-style-type: none"> • full—full-duplex mode • half—half-duplex mode • auto—autonegotiation

ATTENTION

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 executed in the Interface Configuration command mode.

Table 99 "default duplex command parameters and variables" (page 240) describes the parameters and variables for the default duplex command.

Table 99
default duplex command parameters and variables

Parameters and variables	Description
port <portlist>	<p>Specifies the port numbers to reset the duplex mode to factory default values. Enter the port numbers you want to configure, or all to configure all ports simultaneously. The default value is autonegotiation.</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>ATTENTION</p> <p>If you omit this parameter, the system uses the port number you specified in the <code>interface</code> command.</p> </div>

Enabling flow control

If you use a Gigabit Ethernet with the Ethernet Routing Switch 2500 Series, you control traffic on this port using the `flowcontrol` command. This section covers the following commands:

- "flowcontrol command" (page 240)
- "no flowcontrol command" (page 241)
- "default flowcontrol command" (page 242)

flowcontrol command

The `flowcontrol` command is used only on Gigabit Ethernet 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 executed in the Interface Configuration command mode.

Table 100 "flowcontrol command parameters and variables" (page 241) describes the parameters and variables for the flowcontrol command.

Table 100
flowcontrol command parameters and variables

Parameters and variables	Description
port <portlist>	<p>Specifies the port numbers to configure for flow control.</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>ATTENTION</p> <p>If you omit this parameter, the system uses the port number you specified in the <code>interface</code> command.</p> </div>
asymmetric symmetric auto disable	<p>Sets the mode for flow control:</p> <ul style="list-style-type: none"> • 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 executed in the Interface Configuration command mode.

[Table 101 "no flowcontrol command parameters and variables" \(page 242\)](#) describes the parameters and variables for the `no flowcontrol` command.

Table 101
no flowcontrol command parameters and variables

Parameters and variables	Description
port <portlist>	<p>Specifies the port numbers to disable flow control.</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>ATTENTION</p> <p>If you omit this parameter, the system uses the port number you specified in the <code>interface</code> command.</p> </div>

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 executed in the Interface Configuration command mode.

Table 102 "default flowcontrol command parameters and variables" (page 242) describes the parameters and variables for the default flowcontrol command.

Table 102
default flowcontrol command parameters and variables

Parameters and variables	Description
port <portlist>	<p>Specifies the port numbers to default to auto flow control.</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>ATTENTION</p> <p>If you omit this parameter, the system uses the port number you specified in the <code>interface</code> command.</p> </div>

Enabling rate-limiting

You can limit the percentage of multicast traffic, or broadcast traffic, or both using the CLI.

This section contains information about the following:

- "show rate-limit command" (page 243)
- "rate-limit command" (page 243)
- "no rate-limit command" (page 244)
- "default rate-limit command" (page 244)

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 executed in the Privileged EXEC command mode.

The `show rate-limit` command has no parameters or variables.

Figure 88 "show rate-limit command output" (page 243) displays sample output from the `show rate-limit` command.

Figure 88
show rate-limit command output

```
2526T#show rate-limit
  Packet Type  Limit
  -----
  Both          0 pps
2526T#
```

rate-limit command

The `rate-limit` command configures rate-limiting on the switch.

The syntax for the `rate-limit` command is:

```
rate-limit [multicast | broadcast | both] <0-262143>
```

The `rate-limit` command is executed in the Global Configuration command mode.

Table 103 "rate-limit command parameters and variables" (page 244) describes the parameters and variables for the `rate-limit` command.

Table 103
rate-limit command parameters and variables

Parameters and values	Description
<code>multicast</code> <code>broadcast</code> <code>both</code> <code><0-262143></code>	<p>Applies rate-limiting, in packets/second, to the specified type of traffic.</p> <ul style="list-style-type: none"> • <code>multicast</code>—applies rate-limiting to multicast packets • <code>broadcast</code>—applies rate-limiting to broadcast packets • <code>both</code>—applies rate-limiting to both multicast and broadcast packets

no rate-limit command

The `no rate-limit` command disables rate-limiting on the switch/stack. The syntax for the `no rate-limit` command is:

```
no rate-limit
```

The `no rate-limit` command is executed in the Global Configuration command mode.

default rate-limit command

The `default rate-limit` command restores the rate-limiting value for the switch/stack to the default setting. The syntax for the `default rate-limit` command is:

```
default rate-limit
```

The `default rate-limit` command is executed in the Global Configuration command mode.

Enabling Custom Autonegotiation Advertisements (CANA)

You can control the capabilities that are advertised by the Ethernet Routing Switch as part of the auto-negotiation 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 auto-negotiation is enabled, the advertisement made by the switch is a constant value based upon all speed and duplex modes supported by the hardware. When auto-negotiating, the switch selects the highest common operating mode supported between it and its link partner.

This section covers:

- ["show auto-negotiation-advertisements command" \(page 245\)](#)
- ["show auto-negotiation-capabilities command" \(page 245\)](#)

- "auto-negotiation-advertisements command" (page 246)
- "no auto-negotiation-advertisements command" (page 247)
- "default auto-negotiation-advertisements command" (page 247)

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 executed in the User Exec command mode.

Table 104 "show auto-negotiation-advertisements command" (page 245) describes the parameters and variables for the `show auto-negotiation-advertisements` command.

Table 104
show auto-negotiation-advertisements command

Parameters and values	Description
port <portlist>	Enter ports for which you want the current autonegotiation advertisements displayed.

Figure 89 "show auto-negotiation-advertisements command output" (page 245) displays sample output from the `show auto-negotiation-advertisements` command.

Figure 89
show auto-negotiation-advertisements command output

```
2526T(config-if)#show auto-negotiation-advertisements port 2,4,8
Port Autonegotiation Advertised Capabilities
-----
2   10Full 10Half 100Full 100Half
4   10Full 10Half 100Full 100Half
8   10Full 10Half 100Full 100Half
2526T(config-if)#
```

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 executed in the User Exec command mode.

Table 105 "show auto-negotiation-capabilities command" (page 246) describes the parameters and variables for the show auto-negotiation-capabilities command.

Table 105
show auto-negotiation-capabilities command

Parameters and values	Description
port <portlist>	Enter ports for which you want the autonegotiation capabilities displayed.

Figure 90 "show auto-negotiation-capabilities command output" (page 246) displays sample output from the show auto-negotiation-capabilities command.

Figure 90
show auto-negotiation-capabilities command output

```

2526T(config-if)#show auto-negotiation-capabilities port 2,4,8
Port Autonegotiation Capabilities
-----
2      10Full 10Half 100Full 100Half
4      10Full 10Half 100Full 100Half
8      10Full 10Half 100Full 100Half
2526T(config-if)#_

```

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]
[asymm-pause-frame] [pause-frame] [none]

```

The `auto-negotiation-advertisements` command is executed in the Interface Configuration command mode.

Table 106 "auto-negotiation-advertisements command" (page 246) describes the parameters and variables for the auto-negotiation-advertisements command.

Table 106
auto-negotiation-advertisements command

Parameters and values	Description
port <portlist>	Enter ports for which you want to configure advertisements.

Parameters and values	Description
[10-full] [10-half] [100-full] [100-half] [1000-full] [asymm-pause-frame] [pause-frame]	These are speed-duplex-pause settings. Any combination of these settings is allowed, but parameters must be given in the order shown.
none	Do not advertise any settings during auto-negotiation.

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>]
```

ATTENTION

The use of this command affects traffic and brings down the link.

The `no auto-negotiation-advertisements` command is executed in the Interface Configuration command mode.

[Table 107 "no auto-negotiation-advertisements command" \(page 247\)](#) describes the parameters and variables for the `no auto-negotiation-advertisements` command.

Table 107
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 executed in the interface configuration command mode.

Table 108 "default auto-negotiation-advertisements command" (page 248) describes the parameters and variables for the default auto-negotiation-advertisements command.

Table 108
default auto-negotiation-advertisements command

Parameters and values	Description
port <portlist>	Enter ports for which you want to set default advertisements.

This feature lets you customize the capabilities that you advertise. It also lets you control the capabilities that are advertised by the Ethernet Routing Switch as part of the auto-negotiation process.

Configuring the switch using Device Manager

This section describes how you can use Device Manager to configure your switch, manage SNMP, and display topology information.

The section includes information on the following topics:

- "Viewing Unit information" (page 249)
- "Viewing switch IP information" (page 253)
- "Editing the chassis configuration" (page 258)
- "Working with configuration files" (page 272)
- "Working with SNMP" (page 276)
- "Displaying topology information using Device Manager" (page 279)

Viewing Unit information

You can view unit information by using the **Unit** dialog box.

To open the **Unit** dialog box, use the following procedure:

Step	Action
1	Double-click on a single unit or select the units you want to edit.
2	Do one of the following: <ul style="list-style-type: none"> • From the shortcut menu, choose Edit. • From the Device Manager main menu, choose Edit > Unit. • On the toolbar, click Edit.



—End—

The following sections provide a description of the tabs in the Edit > Unit dialog box and details about each item on the tab.

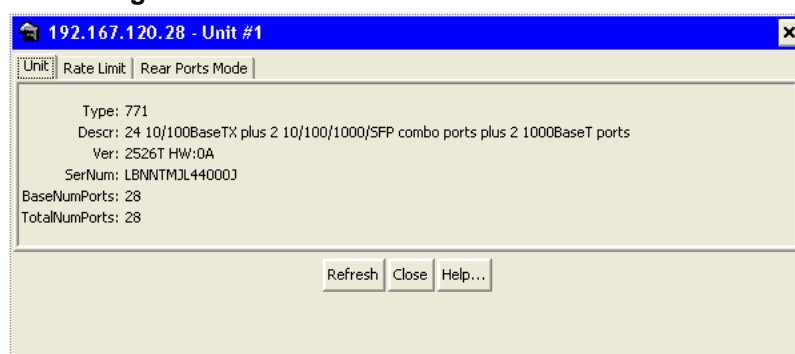
Unit tab

To open the **Unit** tab:

→ From the Device Manager main menu, choose **Edit > Unit**.

The **Unit** dialog box appears with the **Unit** tab displayed.

Figure 91
Unit dialog box



The following table describes the Unit tab fields.

Table 109
Unit tab fields

Field	Description
Type	Specifies the type of switch.
Descr	Description of switch.
Ver	Specifies the hardware 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.

Rate Limit tab

To open the **Rate Limit** tab, use the following procedure:

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

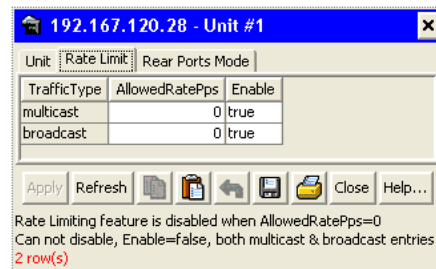
1	From the Device Manager main menu, choose Edit > Unit .
---	---

The **Unit** dialog box appears with the **Unit** tab displayed.

- 2 Click the **Rate Limit** tab.

The **Rate limit** tab appears.

Rate Limit tab



—End—

The following table describes the Rate Limit tab fields.

Table 110
Rate Limit tab fields

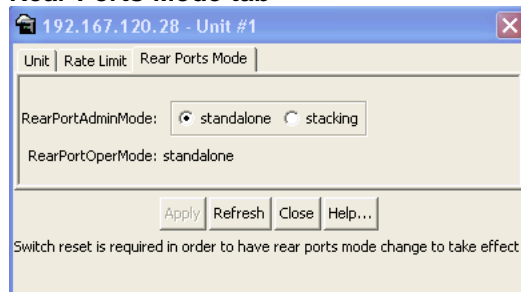
Field	Description
Traffic Type	Specifies the traffic type.
AllowedRatePps	<p>Allowed traffic rate packets/second. It is in the range of 0-262143 (0-3FFFFh).</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>ATTENTION</p> <p>Rate Limiting feature is disabled when AllowedRatePps equals to 0.</p> </div>
Enable	<p>When Enable is set to True, the TrafficType can either be multicast, broadcast, or both.</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>ATTENTION</p> <p>You cannot set the Enabled field for both multicast and broadcast TrafficType to False at the same time. This is illegal configuration.</p> </div>

Rear Ports Mode tab Use the JDM to configure the operational mode of the rear ports into standalone or Stacking Mode in the Ethernet Routing Switch 2500 Series.

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

- 1 From the JDM menu, select **Edit > Unit**. The Unit dialog box opens with the Unit tab displayed.
- 2 Click the **Rear Ports Mode** tab. The **Rear Ports Mode** tab appears.

Rear Ports Mode tab



- 3 Select **Standalone** or **Stacking** Mode from the radio buttons to configure the operational mode of the rear ports.

ATTENTION

A switch reboot is required to the configured operational mode to take effect.

—End—

The following table describes the **Rear Port Mode** tab items.

Table 111
Rear Ports Mode tab fields

Field	Description
RearPortAdminMode	<ul style="list-style-type: none"> • Standalone: Select this radio button to configure the operational mode of the rear ports to Standalone Mode. • Stacking: Select this radio button to configure the operational mode of the rear ports to Stacking Mode.
RearPortOperMode	Displays the configured operational mode of the rear ports.

Viewing switch IP information

You can view the switch IP information using the **IP** dialog box.

To open the **IP** dialog box, use the following procedure:

→ From the Device Manager main menu, choose **Edit > IP**.

The **Edit IP** dialog box appears with the **Globals** tab displayed.

The following sections provide a description of the tabs in the Edit > IP dialog box and details about each item on the tab:

- "Globals tab" (page 253)
- "Addresses tab" (page 254)
- "ARP tab" (page 255)
- "TCP tab" (page 256)
- "TCP Connections tab" (page 257)
- "UDP Listeners tab" (page 257)

Globals tab

To open the **Globals** tab, use the following procedure:

→ From the Device Manager main menu, choose **Edit > IP**.

The **IP** dialog box appears with the **Globals** tab displayed.

Figure 92
Globals tab



The following table describes the Globals tab fields.

Table 112
Globals tab fields

Field and MIB association	Description
DefaultTTL	Default value inserted into the Time-To-Live field of the IP header of datagrams originated by the switch, whenever a TTL value is not supplied by the transport layer protocol. Default value is 64.
ReasmTimeout	Maximum number of seconds that received fragments are held while they are awaiting reassembly by the switch. Default value is 60.

Addresses tab

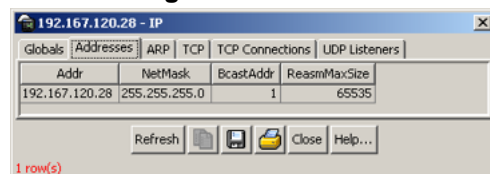
The **Addresses** tab shows the IP address information for the device.

To open the **Addresses** tab, use the following procedure:

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

- From the Device Manager main menu, choose **Edit > IP**.
The **IP** dialog box appears with the **Globals** tab displayed.
- Click the **Addresses** tab.
The **Addresses** tab appears.

Edit IP dialog box IP Address tab



—End—

The following table describes the Address tab fields.

Table 113
Addresses tab fields

Field	Description
Addr	The device IP address.
NetMask	The subnet mask address.

Field	Description
BcastAddr	The value of the least-significant bit in the IP broadcast address used for sending datagrams on the (logical) interface associated with the IP address of this entry. For example, when the Internet standard all-ones broadcast address is used, the value is 1. This value applies to both the subnet and network broadcasts addresses used by the entity on this (logical) interface.
ReasmMaxSize	The size of the largest IP datagram that this entity can reassemble from incoming IP fragmented datagrams received on this interface.

ARP tab

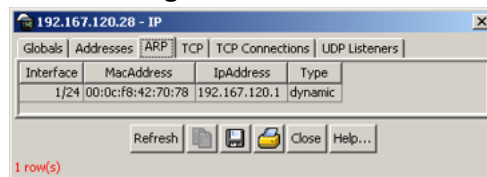
The **ARP** (Address Resolution Protocol) tab shows the MAC addresses and the associated IP addresses for the switch.

To open the **ARP** tab, use the following procedure:

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

- | | |
|---|--|
| 1 | From the Device Manager main menu, choose Edit > IP .
The IP dialog box appears with the Globals tab displayed. |
| 2 | Click the ARP tab.
The ARP tab appears. |

Edit IP dialog box ARP tab



—End—

The following table describes the ARP tab fields.

Table 114
ARP tab fields

Field	Description
Interface	The unit and port number.
MacAddress	The unique hardware address of the device.

Field	Description
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.

TCP tab

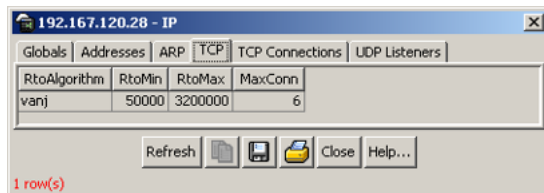
The TCP tab displays TCP information for the switch.

To open the TCP tab, use the following procedure:

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

- From the Device Manager main menu, choose **Edit > IP**.
The **IP** dialog box appears with the **Globals** tab displayed.
- Click the **TCP** tab.
The **TCP** tab appears.

TCP tab



The following table describes the TCP tab fields.

Table 115
TCP tab fields

Field	Description
RtoAlgorithm	The algorithm used to determine the timeout value used for retransmitting unacknowledged octets.
RtoMin	The minimum value permitted by a TCP implementation for the retransmission timeout, measured in milliseconds.
RtoMax	The maximum value permitted by a TCP implementation for the retransmission timeout, measured in milliseconds.
MaxConn	The limit on the total number of TCP connections that the entity can support. In entities where the maximum number of connections is dynamic, this object contains the value -1.

—End—

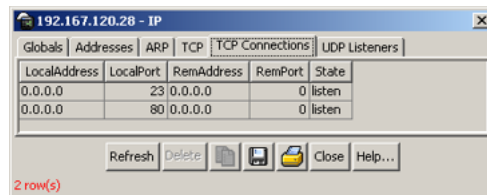
TCP Connections tab

The TCP Connections tab displays information on the current TCP connections the switch maintains.

To open the TCP Connections tab, use the following procedure:

Step Action

- 1 From the Device Manager main menu, choose **Edit > IP**.
The **IP** dialog box appears with the **Globals** tab displayed.
- 2 Click the **TCP Connections** tab.
The **TCP Connections** tab appears.



The following table describes the TCP Connections tab fields.

TCP Connections tab fields

Field	Description
LocalAddress	The local IP address for this TCP connection. In the case of a connection in the listen state, which is willing to accept connections for any IP interface associated with the node, the value 0.0.0.0 is used.
LocalPort	The local port number for this TCP connection.
RemAddress	The remote IP address for this TCP connection.
RemPort	The remote port number for this TCP connection.
State	The state of this TCP connection.

—End—

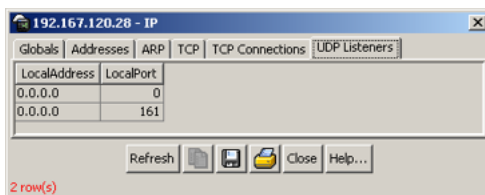
UDP Listeners tab

The UDP Listeners tab displays information on the UDP listeners currently maintained by the switch.

To open the UDP Listeners tab, use the following procedure:

Step Action

- 1 From the Device Manager main menu, choose **Edit > IP**.
The **IP** dialog box appears with the **Globals** tab displayed.
- 2 Click the **UDP Listeners** tab.
The **UDP Listeners** tab appears.



The following table describes the **UDP Listeners** tab fields.

Table 116
UDP Listeners tab fields

Field	Description
LocalAddress	The local IP address for this UDP listener. In the case of a UDP listener that accepts datagrams for any IP interface associated with the node, the value 0.0.0.0 is used.
LocalPort	The local port number for this UDP listener.

—End—

Editing the chassis configuration

You can edit a chassis configuration from the **Edit Chassis** dialog box.

To open the **Chassis** dialog box, use the following procedure:

Step Action

- 1 Select the chassis.
- 2 Do one of the following:
 - From the Device Manager main menu, choose **Edit > Chassis**.

—End—

The following sections provide a description of the tabs in the Edit > Chassis dialog box and details about each field on the tab.

- "System tab" (page 259)
- "Base Unit Info tab" (page 261)
- "Agent tab" (page 265)
- "PowerSupply tab" (page 267)
- "Fan tab" (page 268)
- "Banner tab" (page 269)
- "Custom Banner tab" (page 271)

System tab

You can use the **System** tab to specify tracking information for a device, device descriptions, and so on.

To open the **System** tab, use the following procedure:

Step Action

- 1 Select the chassis.
- 2 From the shortcut menu, choose **Edit > Chassis**.


The **Chassis** dialog box appears with the **System** tab displayed.

Edit Chassis dialog box System tab

—End—

The following table describes the System tab fields.

Table 117
System tab fields

Field	Description
sysDescr	The assigned system description.
sysUpTime	The time since the system was last booted.
sysObjectID	The unique sysObjectID (OID) assigned to the device.
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.
SerNum	The switch serial number.
AuthenticationTraps	<p>Click to enable or disable. When you enable, SNMP traps are sent to trap receivers for all SNMP access authentication. When you disable, no traps are received.</p> <p>To view traps, click the Trap toolbar button.</p> 
ReBoot	By default, the switch is in the Running mode. The reboot command initiates a hardware reset.
AutoPVID	Click to enable or disable. When you enable, AutoPVID is activated. When you disable, AutoPVID is inactivated.
ManagementVlanId	The current management VLAN ID.
StackInsertionUnitNumber	This field specifies the unit number to be assigned to the next unit that joins the stack, when in stack mode.
AutoUnitReplacement Enabled	Click to enable or disable the auto-unit-replacement feature.
NextBootMgmt Protocol	The transport protocol(s) to use after the next boot of the agent.
CurrentMgmtProtocol	The current transport protocol(s) that the agent supports.

Field	Description
BootMode	<p>This setting determines how the management interface of the switch can be assigned an IP address, the next time the switch boots. The four BootMode options are:</p> <ul style="list-style-type: none"> • bootpDisabled - use the IP address contained in the configuration file. • bootpAlways - always attempt to get an IP address from the network. • bootpOrElseDefaultIP - attempt to get an IP address from the network only when one is not contained in the configuration file. • bootpOrElseLastAddress - attempt to get an IP address from the network and if that fails use the IP address that was in use on this switch before the last reboot.
ImageLoadMode	The source from which the agent image is loaded at the next boot.
CurrentImageVersion	The version number of the agent image that is currently used on the switch.
LocalStorageImage Version	The version number of the agent image that is stored in flash memory on the switch.
NextBootDefault Gateway	The IP address of the default gateway for the agent to use after the next time the switch is booted.
CurrentDefault Gateway	The IP address of the default gateway that is currently in use.
NextBootLoad Protocol	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 on the switch.

Base Unit Info tab

The **Base Unit Info** tab provides read-only information about the operating status of the hardware and whether or not the default factory settings are being used.

To open the **Base Unit Info** tab, use the following procedure:

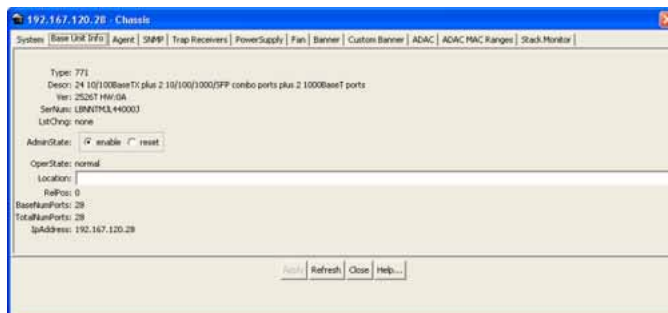
Step	Action
------	--------

- | | |
|---|---|
| 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 **Base Unit Info** tab.

The **Base Unit Info** tab appears.



—End—

The following table describes the Base Unit Info tab fields.

Table 118
Base Unit Info tab fields

Field	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. ATTENTION In a stack configuration, Reset only resets the base unit.
OperState	The operational state of the switch.
Location	Type the physical location of the switch.
RelPos	The relative position of the switch.

Field	Description
BaseNumPorts	The number of base ports of the switch.
TotalNumPorts	The number of ports of the switch.
IPAddress	The base unit IP address.

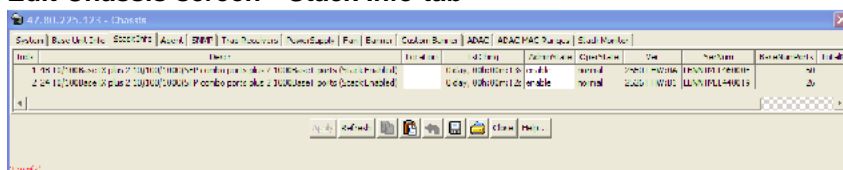
Stack Info tab

Like the **Base Unit Info** tab, the **Stack Info** tab provides read-only information about the operating status of the *stacked* switches and whether or not the default factory settings are being used.

To open the **Stack Info** tab:

Step	Action
1	Open the Edit Chassis screen in the manner detailed at the beginning of this section.
2	Click the Stack Info tab. This tab is illustrated in "Edit Chassis screen -- Stack Info tab" (page 263).

Edit Chassis screen—Stack Info tab



"Stack Info tab fields" (page 263) describes the **Stack Info** tab fields.

Stack Info tab fields

Field	Description
Descr	A description of the component or subcomponent. If not available, the value is a zero length string.
Location	The geographic location of a component in a system modeled as a chassis, but possibly physically implemented with geographically separate devices connected together to exchange management information. Chassis modeled in this manner are sometimes referred to as virtual chassis. An example value is: 4th flr wiring closet in blg A.

Field	Description
	<p style="text-align: center;">ATTENTION</p> <p>1. This field is applicable only to components that can be found in either the Board or Unit groups. If the information is unavailable, for example, the chassis is not modeling a virtual chassis or component is not in Board or Unit group, the value is a zero length string.</p> <p>2. If this field is applicable and is not assigned a value through a SNMP SET PDU when the row is created, the value defaults to the value of the object s5ChasComSerNum.</p>
LstChng	The value of sysUpTime when it was detected that the component/sub-component was added to the chassis. If this action has not occurred since the cold/warm start of the agent, then the value is zero.
AdminState	<p>The state of the component or subcomponent.</p> <p>The values that are read-only are:</p> <ul style="list-style-type: none"> • other – currently in some other state • notAvail – actual value is not available <p>The possible values that can be read and written are:</p> <ul style="list-style-type: none"> • disable—disables operation • enable—enables operation • reset—resets component • 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	<p>The current operational state of the component. The possible values are:</p> <ul style="list-style-type: none"> • 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 <p>The allowable (and meaningful) values are determined by the component type.</p>
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.

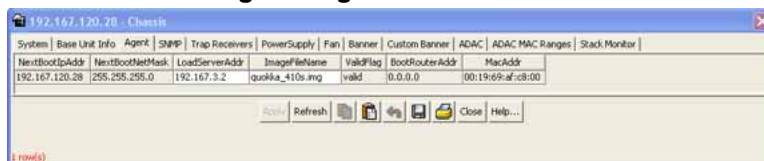
—End—

Agent tab

The **Agent** tab provides read-only information about the addresses that the agent software uses to identify the switch.

To open the **Agent** tab, use the following procedure:

- | 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 Agent tab.
The Agent tab appears. |

Edit Chassis dialog box Agent tab

—End—

The following table describes the Agent tab fields.

Table 119
Agent tab fields

Field	Description
NextBootIpAddr	The IP address to be used the next time the switch is booted.
NextBootNetMask	The subnet mask to be used the next time the switch is booted.
LoadServerAddr	The IP address of the load server for the configuration file and/or the image file. If not used, then the value is 0.0.0.0.
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.
ValidFlag	Indicates if the configuration and/or image file(s) were downloaded from this interface and if the file names have not been changed.
BootRouterAddr	The IP address of the boot router for the configuration file and/or the image file.
MacAddr	The MAC address of the switch.

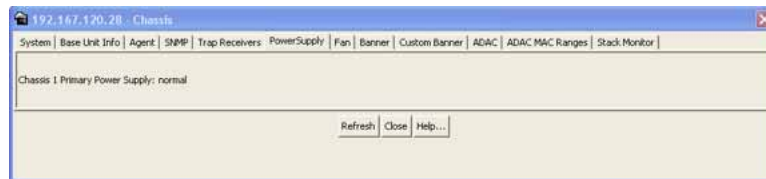
PowerSupply tab

The **PowerSupply** tab provides read-only information about the operating status of the switch power supplies.

To open the **PowerSupply** tab, use the following procedure:

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.

Edit Chassis dialog box PowerSupply tab



—End—

The following table describes the PowerSupply tab fields.

Table 120
Power Supply tab fields

Field	Description
Chassis Primary Power Supply	<p>The operational state of the power supply. Possible values include:</p> <ul style="list-style-type: none"> • other: Some other state. • notAvail: State not available. • removed: Component was removed. • disabled: Operation disabled. • 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.

Field	Description
	<ul style="list-style-type: none"> 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.

Fan tab

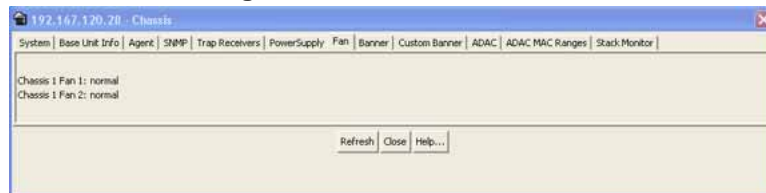
The **Fan** tab provides read-only information about the operating status of the switch fans.

To open the **Fan** tab, use the following procedure:

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 Fan tab.
The Fan tab appears. |

Edit Chassis dialog box Fan tab



—End—

The following table describes the Fan tab fields.

Table 121
Fan tab fields

Field	Description
Chassis Fan	<p>The operational state of the fan. Values include:</p> <ul style="list-style-type: none"> • 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 needs to be configured. The allowable values are determined by the component type.

Banner tab

The **Banner** tab lets you specify banner display in TELNET. You can specify either the default banner or a custom banner.

To open the **Banner** tab, use the following procedure:

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

- | | |
|---|--|
| 1 | Select the chassis. |
| 2 | From the main menu, choose Edit > Chassis .
The Chassis dialog box appears with the System tab displayed. |
| 3 | Click the Banner tab.
The Banner tab appears. |

Edit Chassis dialog box Banner tab



Custom Banner tab

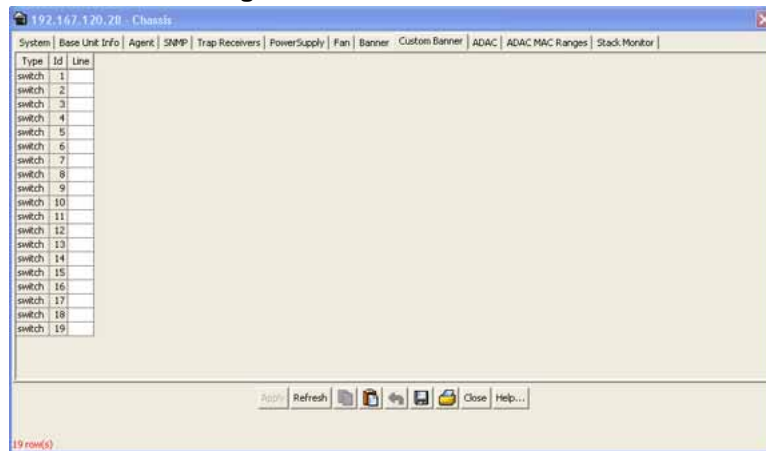
The **Custom Banner** tab lets you specify the display for a custom banner in Telnet.

To open the **Custom Banner** tab, use the following procedure:

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

- 1 Select the chassis.
- 2 From the main menu, choose **Edit > Chassis**.
The **Chassis** dialog box appears with the **System** tab displayed.
- 3 Click the **Custom Banner** tab.
The **Custom Banner** tab appears.

Edit Chassis dialog box Custom Banner tab



—End—

To create a Custom Banner, use the following procedure:

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

- 1 In the **Banner** tab, click on the **custom** radio button, and then click **Apply**.
- 2 Click on the **Custom Banner** tab.
- 3 In the **Custom Banner** tab, make the changes to the lines of the banner that you want to create, and click **Apply**. The custom banner is 19 lines high and can be up to 80 characters long.

—End—

Working with configuration files

This chapter describes how you can view information and upload or download the configuration and image files.

FileSystem dialog box

To open the **Edit FileSystem** dialog box, use the following procedure:

→ From the Device Manager main menu, choose **Edit > File System**.

The **FileSystem** dialog box appears and displays the **Config/Image/Diag** tab.

Figure 94
FileSystem - Config/Image/Diag File tab dialog box

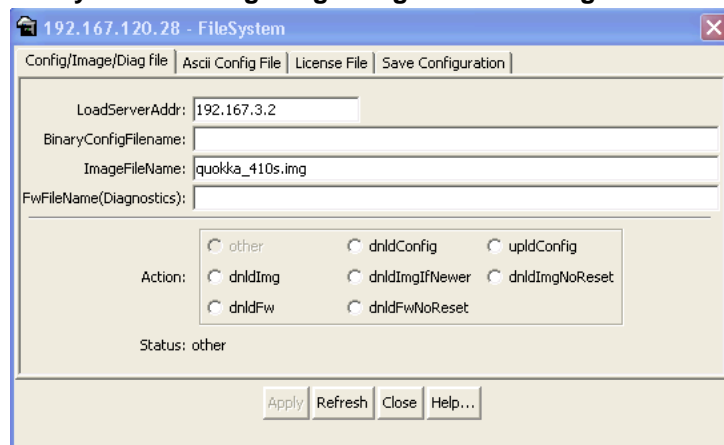


Table 122 "FileSystem Config/Image/Diag file dialog box fields" (page 272) describes the **FileSystem Config/Image/Diag file** dialog box fields.

Table 122
FileSystem Config/Image/Diag file dialog box fields

Field	Description
LoadServerAddr	The IP address of the load server for the configuration file and/or the image file. If not used, then the value is 0.0.0.0.
BinaryConfigFilename	Name of the configuration file currently associated with the interface. When not used, the value is a zero length string.

Field	Description
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.
FwFileName (Diagnostics)	Specifies the FWFileName.
Action	<ul style="list-style-type: none"> This object is used to download or upload a config file, an image file or diag firmware file. 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. In a write operation, the values that can be written are: <ul style="list-style-type: none"> dnldConfig dnldImg upldConfig dnldFw dnldImgIfNewer dnldImgNoReset dnldFwNoReset The newly downloaded config, image or diag file cannot take effect until the next boot cycle of the device.
Status	<p>This object is used to get the status of the latest action as shown by s5AgInfoFileAction. The values that can be read are:</p> <ul style="list-style-type: none"> 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

To display the **ASCII Config file** tab, use the following procedure:

- In the **File System** dialog box, click on the **ASCII Config File** tab.
The **ASCII Config File** tab appears.

Figure 95
File system - ASCII Config File dialog box

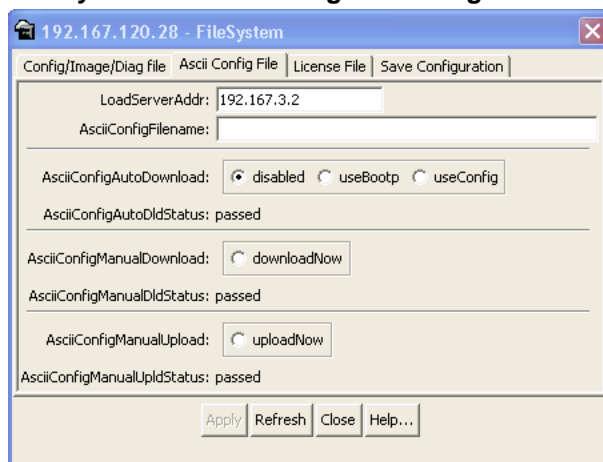


Table 123 "ASCII Config File tab fields" (page 274) describes the ASCII Config File tab fields.

Table 123
ASCII Config File tab fields

Field	Description
LoadServerAddr	The IP address of the load server for the ASCII configuration file. If not used, then the value is 0.0.0.0.
ASCIIConfigFileName	Name of the ASCII configuration file currently associated with the interface. When not used, the value is a zero length string.
ASCIIConfigAutoDownload	Specifies automatic ASCII configuration download.
ASCIIConfigAutodldStatus	Specifies the current status of the ASCII configuration file download.
ASCIIConfigManualDownload	Specifies manual download of an ASCII configuration file.
ASCIIConfigManualdldStatus	Specifies the current status of the manual download of an ASCII configuration file.
ASCIIConfigManualUpload	Specifies manual upload of an ASCII configuration file.
ASCIIConfigManualUpldStatus	Specifies the current status of the manual upload of an ASCII configuration file.

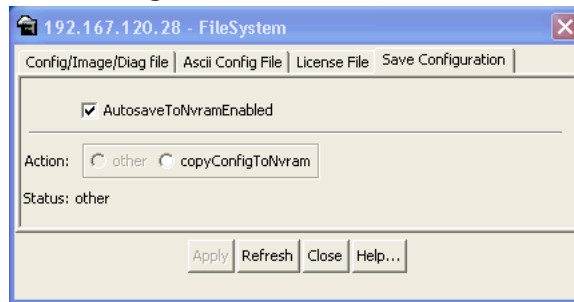
Save Configuration tab

You can use the Save Configuration tab to save the switch configuration to NVRAM.

To open the Save Configuration tab, use the following procedure:

Step	Action
1	From the Device Manager main menu, choose Edit > File System . The FileSystem dialog box appears with the Config/Image/Diag tab displayed.
2	Click the Save Configuration tab. The Save Configuration tab appears.

Figure 96
Save Config tab



The following table describes the Save Configuration tab fields.

Table 124
Save Configuration tab fields

Field	Description
AutoSavetoNvramEnabled	Enables or disables autosave on the switch.
Action	Select the copyConfigToNvram option to save the switch configuration to NVRAM (and click Apply).
Status	This field displays the status of the copyConfigToNvram action. Possible values are: <ul style="list-style-type: none"> • other—no action has been taken since switch boot • inProgress—the operation is in progress • success—the operation succeeded • fail—the operation failed

—End—

Working with SNTP

The Simple Network Time Protocol (SNTP) feature synchronizes the Universal Coordinated Time (UTC) 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.

Configuring SNTP

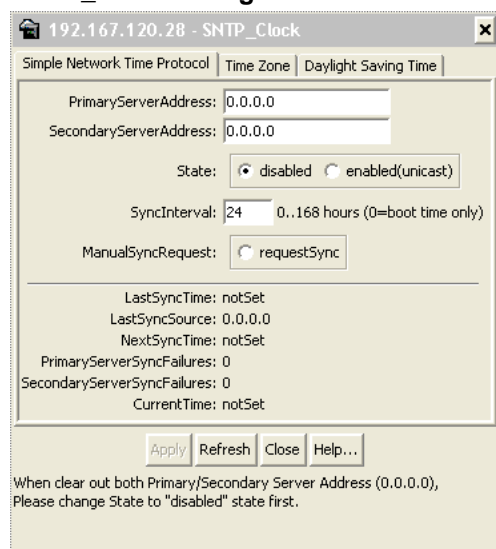
The **SNTP_Clock** dialog box contains the parameters for configuring Simple Network Time Protocol (SNTP).

To open the **SNTP_clock** dialog box, use the following procedure:

Step	Action
1	From the Main Menu, choose Edit > SNTP/Clock . The SNTP_Clock dialog box appears. Select the Simple Network Time Protocol tab.

—End—

Figure 97
SNTP_Clock dialog box



The following table describes the SNTP dialog box fields.

Table 125
SNTP_Clock dialog box fields

Field	Description
Primary Server Address	The IP address of the primary SNTP server.
Secondary Server 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's clock to the Coordinated Universal Time (UTC). If the value is disabled, the device cannot 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.
SyncInterval	Controls the frequency, in hours, that the device attempts to synchronize with the NTP servers.
ManualSync Request	Specifies that the device to immediately attempt to synchronize with the NTP servers.
LastSync Time	Specifies the Coordinated Universal Time (UTC) when the device last synchronized with an NTP server.
LastSync Source	Specifies the IP source address of the NTP server with which this device last synchronized
NextSync Time	Specifies the the Coordinated Universal Time (UTC) at which the next synchronization is scheduled.
PrimaryServerSynchFailures	Specifies the number of times the switch failed to synchronize with the primary server address. However, synchronization with the secondary server address may still occur.
SecondaryServerSynchFailures	Specifies the number of times the switch failed to synchronize with the secondary server address,
CurrentTime	Specifies the switch's current Coordinated Universal Time (UTC).

ATTENTION

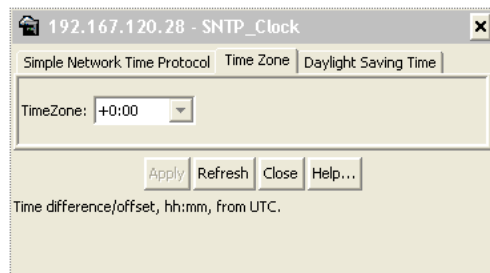
In order to clear out the PrimaryServerAddress and SecondaryServerAddress, you must first set the State to disabled.

Configuring local time zone using the device manager

You can set the local time zone on the ERS 2500 using **Time Zone** tab. Use the following procedure to set the local time zone.

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

- 1 From the **Edit** menu, choose **SNTP/Clock**. The **SNTP_Clock** dialog box appears.
- 2 Click the **Time Zone** tab. The **Time Zone** tab appears.



- 3 Select the time zone offset in the **TimeZone** box.
- 4 Click **Apply**.

—End—

Configuring daylight savings time using the device manager

You can set daylight saving start and end time using the on the ERS 2500 using **Daylight Saving Time** tab. Use the following procedure to set daylight saving start and end time.

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

- 1 From the **Edit** menu, choose **SNTP/Clock**. The **SNTP_Clock** dialog box appears.
- 2 Click the **Daylight Saving Time** tab. The **Daylight Saving Time** tab appears.

192.167.120.28 - SNTP_Clock

Simple Network Time Protocol | Time Zone | Daylight Saving Time

Offset: 0 -840..840 minutes

StartYear: 1990 1990..2099

StartMonth: Jan

StartDay: 1 1..31

StartHour: 12am

StartMinutes: 0 0..59

EndYear: 1990 1990..2099

EndMonth: Jan

EndDay: 1 1..31

EndHour: 12am

EndMinutes: 0 0..59

Enabled

Apply Refresh Close Help...

Offset, in minutes, is added to the current time when daylight saving time begins, and subtracted when it ends. Daylight saving time (summer time) must be disabled when configure daylight saving time attributes. Setup proper daylight saving time attributes first before enable the daylight saving time.

- 3 Type the number of minutes to shift the clock in the **Offset** box.
- 4 Select the **StartYear**, **StartMonth**, **StartDate**, **StartHour**, and type the **StartMinutes** to define when to switch the clock to daylight saving time.
- 5 Select the **EndYear**, **EndMonth**, **EndDate**, **EndHour**, and type the **EndMinutes** (if applicable) to define when to switch the clock back to normal time. If you want to keep the same daylight saving time changeover dates, you can set the **EndYear** to a year in the future.
- 6 Click **Enabled** to enable daylight savings time.
- 7 Click **Apply**.

—End—

Displaying topology information using Device Manager

This section describes diagnostic information available in Device Manager on the following tabs:

- "Topology tab" (page 279)
- "Topology Table tab" (page 280)

Topology tab

To view topology information, use the following procedure:

- From the Device Manager menu bar, select **Edit > Diagnostics > Topology**.
The **Topology** dialog box appears with the **Topology** tab displayed.

Figure 98
Diagnostics dialog box Topology tab

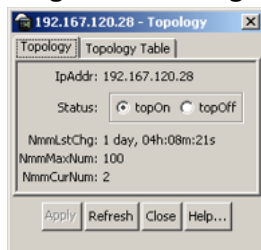


Table 126 "Topology tab fields" (page 280) describes the Topology tab fields.

Table 126
Topology tab fields

Field	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.
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

To view more topology information, use the following procedure:

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.

Figure 99
Diagnostics dialog box Topology Table tab

Slot	Port	IpAddr	SegId	MacAddr	ChassisType	BkplType	LocalSeg	CurState
0	0	192.167.120.28	0	00:19:69:af:c8:01	mER52500-26T	enetFastGigEneT	true	heartbeat
1	24	192.167.120.8	265	00:0e:c0:83:10:20	mPassport1648	enetFastGigEneT	true	heartbeat

—End—

The following table describes the **Topology Table** tab fields.

Table 127
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: <ul style="list-style-type: none"> topChanged—Topology information has recently changed. heartbeat—Topology information is unchanged. new—The sending agent is in a new state.

Configuring LLDP using Device Manager

Use the following tabs to configure LLDP properties for local and neighbor systems:

- "LLDP Globals tab" (page 282)

- "Port tab" (page 285)
- "TX Stats tab" (page 287)
- "Graphing LLDP transmit statistics" (page 288)
- "RX Stats tab" (page 289)
- "Graphing LLDP receive statistics" (page 291)
- "Local System tab" (page 291)
- "Local Port tab" (page 292)
- "Local Management tab" (page 294)
- "Neighbor tab" (page 295)
- "Neighbor Mgmt Address tab" (page 297)
- "Unknown TLV tab" (page 299)
- "Organizational Defined Info tab" (page 300)

LLDP Globals tab

With the **Globals** tab, you can configure LLDP 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, choose Edit > Diagnostics > 802.1ab > LLDP .
The LLDP dialog box appears with the Globals tab displayed. |
|---|--|

Figure 100
LLDP Globals tab



The following table describes the Globals tab fields.

Table 128
LLDP Globals tab fields

Field	Description
IldpMessageTxInterval	The interval (in seconds) at which LLDP frames are transmitted on behalf of this LLDP agent.
IldpMessageTxHoldMultiplier	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: $TTL = \min(65535, (IldpMessageTxInterval * IldpMessageTxHoldMultiplier))$ For example, if the value of IldpMessageTxInterval is 30, and the value of IldpMessageTxHoldMultiplier is 4, the value 120 is encoded in the TTL field in the LLDP header.
IldpReinitDelay	The IldpReinitDelay indicates the delay (in seconds) from when the LLDP Port AdminStatus of a particular port is disabled until reinitialization begins.
IldpTxDelay	The IldpTxDelay indicates the delay (in seconds) between successive LLDP frame transmissions initiated by value or status changes in the LLDP local systems MIB. The recommended value for the IldpTxDelay is set by the following formula: $1 \leq IldpTxDelay \leq (0.25 * IldpMessageTxInterval)$
IldpNotificationInterval	This object controls the transmission of LLDP notifications. The agent must not generate more than one IldpRemTablesChange notification-event in the indicated period, where a <i>notification-event</i> is the "transmission of a single notification PDU type to a list of notification destinations." If additional changes in IldpRemoteSystemsData 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 IldpStatsRemTableLastChangeTime to detect any missed IldpRemTablesChange notification-events, for example, due to throttling or transmission loss. If notification

Field	Description
	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 IldpRemoteSystemsData objects, and all LLDP extension objects associated with remote systems. An NMS can use this object to reduce polling of the IldpRemoteSystemsData objects.
RemTablesInserts	The number of times the complete set of information advertised by a particular MSAP is inserted into tables contained in IldpRemoteSystemsData and IldpExtensions 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 IldpStatsRemTablesInserts because the insert is not completed yet or in IldpStatsRemTablesDeletes, because the deletion is only a partial deletion. If the failure is the result of a lack of resources, the IldpStatsRemTablesDrops 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 IldpRemoteSystemsData and IldpExtensions objects. This counter is incremented only once when the complete set of information is completely deleted from all related tables. Partial deletions, such as a deletion of rows associated with a particular MSAP, from some tables, but not from all tables, are not allowed, and thus, do not change the value of this counter.
RemTablesDrops	The number of times the complete set of information advertised by a particular MSAP can not be entered into tables contained in IldpRemoteSystemsData and IldpExtensions 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 IldpRemoteSystemsData and IldpExtensions objects because the information timeliness interval has expired. This counter is incremented only once when the complete set of information is completely invalidated (aged out) from all related tables. Partial aging, similar to deletion case, is not allowed, and thus, does not change the value of this counter.

—End—

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, choose Edit > Diagnostics > 802.1ab > LLDP . The LLDP dialog box appears with the Globals tab displayed.

- 2 Click the **Port** tab.
The Port tab appears.

Figure 101
LLDP Port tab

PortNum	AdminStatus	NotificationEnable	TLVStxEnable
1/1	txAndRx	false	
1/2	txAndRx	false	
1/3	txAndRx	false	
1/4	txAndRx	false	
1/5	txAndRx	false	
1/6	txAndRx	false	
1/7	txAndRx	false	
1/8	txAndRx	false	
1/9	txAndRx	false	
1/10	txAndRx	false	
1/11	txAndRx	false	
1/12	txAndRx	false	

The following table describes the Port tab fields.

Table 129
Port tab fields

Field	Description
PortNum	Port number.
AdminStatus	<p>The administratively desired status of the local LLDP agent:</p> <ul style="list-style-type: none"> txOnly: the LLDP agent transmits LLDP frames on this port and does not store any information about the remote systems to which it is connected. rxOnly: the LLDP agent receives but does not transmit LLDP frames on this port. txAndRx: the LLDP agent transmits and receives LLDP frames on this port. disabled: the LLDP agent does not transmit or receive LLDP frames on this port. If the port receives remote systems information which is stored in other tables before AdminStatus is disabled, the information ages out.

Field	Description
NotificationEnable	<p>Controls, on a per-port basis, whether notifications from the agent are enabled.</p> <ul style="list-style-type: none"> • true: indicates that notifications are enabled • false: indicates that notifications are disabled.
TLVsTxEnable	<p>Sets the optional Management TLVs to be included in the transmitted LLDPDUs:</p> <ul style="list-style-type: none"> • portDesc: Port Description TLV • sysName: System Name TLV • sysDesc: System Description TLV • sysCap: System Capabilities TLV <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p style="text-align: center;">ATTENTION</p> <p>The Local Management tab controls Management Address TLV transmission.</p> </div>

—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	<p>From the Device Manager menu bar, choose Edit > Diagnostics > 802.1ab > LLDP.</p> <p>The LLDP dialog box appears with the Globals tab displayed.</p>
2	<p>Click the TX Stats tab.</p> <p>The TX Stats tab appears.</p>

Figure 102
TX Stats tab



The following table describes the TX Stats tab fields.

Table 130
TX Stats tab fields

Field	Description
PortNum	port number
FramesTotal	the number of LLDP frames transmitted by this LLDP agent on the indicated port

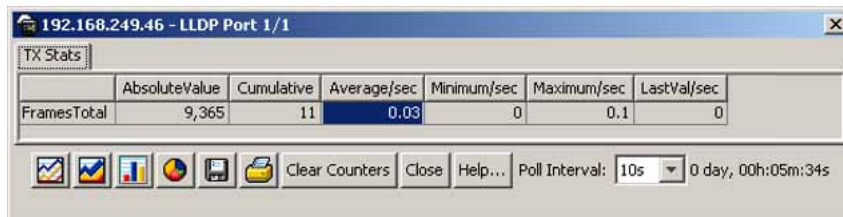
—End—

Graphing LLDP transmit statistics

Use the following procedure to graph LLDP transmit statistics:

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

- | | |
|---|---|
| 1 | From the TX Stats tab, select the port for which you want to display statistics. |
| 2 | Click Graph .
The TX Stats – Graph dialog box appears. |



- | | |
|---|-----------------------------------|
| 3 | Highlight a data column to graph. |
| 4 | Click one of the graph buttons. |

—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, choose Edit > Diagnostics > 802.1ab > LLDP . The LLDP dialog box appears with the Globals tab displayed.
2	Click the RX Stats tab. The RX Stats tab appears.

Figure 103
RX Stats tab

PortNum	FramesDiscardedTotal	FramesErrors	FramesTotal	TLVsDiscardedTotal	TLVsUnrecognizedTotal	AgeoutsTotal
1/1	0	0	0	0	0	0
1/2	0	0	0	0	0	0
1/3	0	0	0	0	0	0
1/4	0	0	0	0	0	0
1/5	0	0	0	0	0	0
1/6	0	0	0	0	0	0
1/7	0	0	0	0	0	0
1/8	0	0	0	0	0	0
1/9	0	0	0	0	0	0
1/10	0	0	0	0	0	0
1/11	0	0	0	0	0	0
1/12	0	0	0	0	0	0
1/13	0	0	0	0	0	0
1/14	0	0	0	0	0	0
1/15	0	0	0	0	0	0
1/16	0	0	0	0	0	0
1/17	0	0	0	0	0	0
1/18	0	0	0	0	0	0
1/19	0	0	0	0	0	0
1/20	0	0	0	0	0	0
1/21	0	0	0	0	0	0
1/22	0	0	0	0	0	0
1/23	0	0	0	0	0	0
1/24	0	0	0	0	0	0

The following table describes the RX Stats tab fields.

Table 131
RX Stats tab fields

Field	Description
PortNum	Port number.
FramesDiscardedTotal	The number of LLDP frames received on the port and discarded for any reason. This counter provides an indication that LLDP header formatting problems exist with the local LLDP agent in the sending system, or that LLDPDU validation problems exist with the local LLDP agent in the receiving system.

Field	Description
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 referred to as the TLV whose type value is in the range of reserved TLV types (000 1001 - 111 1110) in Table 9.1 of IEEE 802.1AB-2004. An unrecognized TLV can be a basic management TLV from a later LLDP version.
AgeoutsTotal	This counter represents the number of age-outs that occurred on a given port. An <i>age-out</i> is "the number of times the complete set of information advertised by a particular MSAP is deleted from tables contained in <code>IldpRemoteSystemsData</code> and <code>IldpExtensions</code> objects because the information timeliness interval has expired." This counter is similar to <code>IldpStatsRemTablesAgeouts</code> , except that it is on a per-port basis. This enables NMS to poll tables associated with the <code>IldpRemoteSystemsData</code> 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.

—End—

Graphing LLDP receive statistics

Use the following procedure to graph LLDP receive statistics:

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

- 1 From the **RX Stats** tab, select the port for which you want to display statistics.
- 2 Click **Graph**.
The RX Stats – Graph dialog box appears.

The screenshot shows a dialog box titled "192.168.249.46 - LLDP Port 1/1" with a tab labeled "RX Stats". The dialog contains a table with the following data:

	AbsoluteValue	Cumulative	Average/sec	Minimum/sec	Maximum/sec	LastVal/sec
FramesDiscardedTotal	0	0	0	0	0	0
FramesErrors	0	0	0	0	0	0
FramesTotal	0	0	0	0	0	0
TLVsDiscardedTotal	0	0	0	0	0	0
TLVsUnrecognizedTotal	0	0	0	0	0	0

Below the table are several icons and buttons: "Clear Counters", "Close", "Help...", and a "Poll Interval" dropdown set to "10s" with a time display of "0 day, 00h:00m:20s".

- 3 Highlight a data column to graph.
- 4 Click one of the graph buttons.

—End—

Local System tab

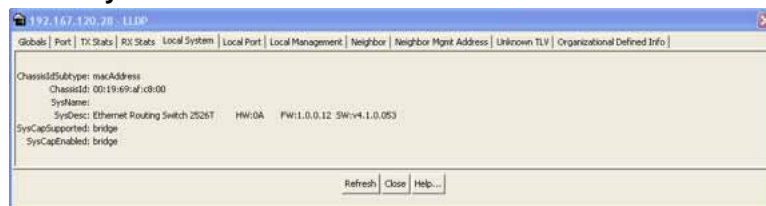
With the Local System tab, you can view LLDP properties for the local system.

Use the following procedure to open the Local System tab:

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

- 1 From the **Device Manager** menu bar, choose **Edit > Diagnostics > 802.1ab > LLDP**.
The LLDP dialog box appears with the Globals tab displayed.
- 2 Select **Local System**.
The Local System tab appears.

Figure 104
Local System tab



The following table describes the Local System tab fields.

Table 132
Local System tab fields

Field	Description
ChassisIdSubtype	the type of encoding used to identify the local system chassis: <ul style="list-style-type: none"> 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—

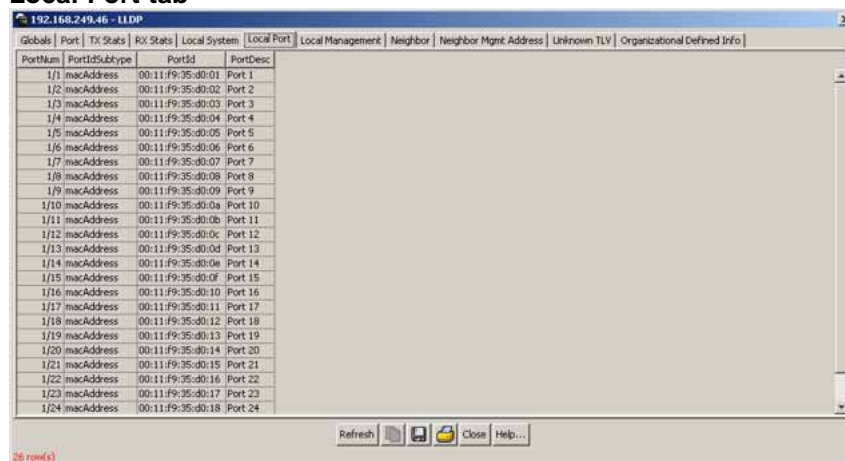
Local Port tab

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, choose Edit > Diagnostics > 802.1ab > LLDP .
The LLDP dialog box appears with the Globals tab displayed. |
| 2 | Click the Local Port tab.
The Local Port tab appears. |

Figure 105
Local Port tab



The following table describes the Local Port tab fields.

Table 133
Local Port tab fields

Field	Description
PortNum	Port number.
PortIdSubtype	The type of port identifier encoding used in the associated PortId object. <ul style="list-style-type: none"> 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, choose Edit > Diagnostics > 802.1ab > LLDP .
The LLDP dialog box appears with the Globals tab displayed. |
| 2 | Click the Local Management tab.
The Local Management tab appears. |

Figure 106
Local Management tab

The following table describes the Local Management tab fields.

Table 134
Local Management tab fields

Field	Description
AddrSubtype	The type of management address identifier encoding used in the associated Addr object.

Field	Description
Addr	The string value used to identify the management address component associated with the local system. This address is used to contact the management entity.
AddrLen	The total length of the management address subtype and the management address fields in LLDPDUs transmitted by the local LLDP agent. The management address length field is needed so that the receiving systems that do not implement SNMP are not required to implement an iana family numbers/address length equivalency table to decode the management address.
AddrIfSubtype	Identifies the numbering method used to define the interface number associated with the remote system. <ul style="list-style-type: none"> • unknown • ifIndex • systemPortNumber
AddrIfId	The integer value used to identify the interface number of the management address component associated with the local system.
AddrOID	The value used to identify the type of hardware component or protocol entity associated with the management address advertised by the local system agent.
AddrPortsTxEnable	Identifies the ports on which the local system management address TLVs are transmitted in the LLDPDUs.

—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, choose Edit > Diagnostics > 802.1ab > LLDP . The LLDP dialog box appears with the Globals tab displayed.
2	Click the Neighbor tab. The Neighbor tab appears.

Figure 107
Neighbor tab



The following table describes the Neighbor tab fields.

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: <ul style="list-style-type: none"> chassisComponent interfaceAlias portComponent macAddress networkAddress interfaceName local.

Field	Description
ChassisId	Remote chassis ID.
SysCapSupported	Identifies the system capabilities supported on the remote system.
SysCapEnabled	Identifies the system capabilities that are enabled on the remote system.
SysName	Remote system name.
SysDesc	Remote system description.
PortIdSubtype	The type of encoding used to identify the remote port. <ul style="list-style-type: none"> • 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, choose Edit > Diagnostics > 802.1ab > LLDP . The LLDP dialog box appears with the Globals tab displayed.
2	Click the Neighbor Mgmt Address tab. The Neighbor Mgmt Address tab appears.

Figure 108
Neighbor Mgmt Address tab



The following table describes the Neighbor Mgmt Address tab fields.

Table 135
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. <ul style="list-style-type: none"> unknown ifIndex systemPortNumber
AddrIfId	The integer value used to identify the interface number of the management address component associated with the remote system.
AddrOID	The value used to identify the type of hardware component or protocol entity associated with the management address advertised by the remote system agent.

—End—

Unknown TLV tab

With the Unknown TLV tab, you can view details about unknown TLVs received on the local system.

Use the following procedure to open the Unknown TLV tab:

Step	Action
1	From the Device Manager menu bar, choose Edit > Diagnostics > 802.1ab > LLDP . The LLDP dialog box appears with the Globals tab displayed.
2	Click the Unknown TLV tab. The Unknown TLV tab appears.

Unknown TLV tab



The following table describes the Unknown TLV tab fields.

Table 136
Unknown TLV 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.
UnknownTLVType	The value extracted from the type field of the unknown TLV.
UnknownTLVInfo	The value extracted from the value field of the unknown TLV.

—End—

Organizational Defined Info tab

With the Organizational Defined Info tab, you can view organizationally specific properties for the remote system.

Use the following procedure to open the Organizational Defined Info tab:

Step	Action
1	From the Device Manager menu bar, choose Edit > Diagnostics > 802.1ab > LLDP . The LLDP dialog box appears with the Globals tab displayed.
2	Click the Organizational Defined Info tab. The Organizational Defined Info tab appears.

Figure 109
Organizational Defined Info tab



The following table describes the Organizational Defined Info tab fields.

Table 137
Organizational Defined Info 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.
OrgDefInfoOUI	The Organizationally Unique Identifier (OUI), as defined in IEEE 802-2001, is a 24 bit (three octets) globally unique assigned number referenced by various standards, of the information received from the remote system.

Field	Description
OrgDefInfoSubtype	The integer value used to identify the subtype of the organizationally defined information received from the remote system. The subtype value is required to identify different instances of organizationally defined information that cannot be retrieved without a unique identifier that indicates the particular type of information contained in the information string.
OrgDefInfoIndex	This object represents an arbitrary local integer value used by this agent to identify a particular unrecognized organizationally defined information instance, unique only for the OrgDefInfoOUI and lldpRemOrgDefInfoSubtype of the same remote system. An agent is encouraged to assign monotonically increasing index values to new entries, starting with one, after each reboot. It is unlikely that the lldpRemOrgDefInfoIndex wraps between reboots.
OrgDefInfo	The string value used to identify the organizationally defined information of the remote system. The encoding for this object is the same as that defined for SnmpAdminString TC.

—End—

Configuring ports using Device Manager

This chapter describes how to use Device Manager to configure ports on an Ethernet Routing Switch 2500 Series.

The windows displayed when you configure a single port differ from the ones displayed when you configure multiple ports. However, the options are similar.

This section covers:

- "Viewing and editing a single port configuration" (page 303)
- "Viewing and editing multiple port configurations" (page 307)

Viewing and editing a single port configuration

To view or edit the configuration of a single port, use the following procedure:

→ Do one of the following:

- Double-click on a single port.
- From the Device Manager main menu, choose **Edit > Port**.
- From the shortcut menu, choose **Edit**.
- From the toolbar, click **Edit**.



ATTENTION

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.

The following sections provide a description of the **Edit Port** dialog box, and details about the fields in the **Interface** tab:

- "Interface tab for a single port" (page 304)
- "Interface tab for multiple ports" (page 308)

Interface tab for a single port

The **Interface** tab shows the basic configuration and status of a single port.

To view the **Interface** tab, use the following procedure:

Step	Action
1	Select the port you want to edit.
2	Do one of the following: <ul style="list-style-type: none">• Double-click on the selected port.• From the Device Manager main menu, choose Edit > Port.• From the shortcut menu, choose Edit.• From the toolbar, click Edit.

The **Port** dialog box for a single port appears with the **Interface** tab displayed.

Figure 110
Port dialog box Interface tab

ATTENTION

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.

—End—

- ["Interface tab fields" \(page 305\)](#)

Interface tab fields

[Table 138 "Interface tab fields for a single port" \(page 306\)](#) describes the Interface tab fields for a single port.

Table 138
Interface tab fields for a single port

Field	Description
Index	A unique value assigned to each interface. The value ranges between 1 and 512.
Name	Specifies a name for the port.
Descr	The description of the selected port.
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	<p>The current administrative state of the device, which can be one of the following:</p> <ul style="list-style-type: none"> • up • down <p>When a managed system is initialized, all interfaces start with AdminStatus in the up state. AdminStatus changes to the down state (or remains in the up state) as a result of either management action or the configuration information available to the managed system.</p>
OperStatus	<p>The current operational state of the interface, which can be one of the following:</p> <ul style="list-style-type: none"> • up • down • testing <p>If AdminStatus is up, then OperStatus should be up if the interface is ready to transmit and receive network traffic. If AdminStatus is down, then OperStatus should be down. It should remain in the down state if and only if there is a fault that prevents it from going to the up state. The testing state indicates that no operational packets can be passed.</p>
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	Specifies whether linkUp/linkDown traps should be generated for this interface.
AutoNegotiate	Indicates whether this port is enabled for autonegotiation or not.
AdminDuplex	The current administrative duplex mode of the port (half or full).

Field	Description
OperDuplex	The current mode of the port (half duplex or full duplex).
AdminSpeed	Set the port's speed.
OperSpeed	The current operating speed of the port.
AutoNegotiationCapability	Specifies the port speed and duplex capabilities that a switch can support on a port, and that may be advertised by the port using auto-negotiation.
AutoNegotiation Advertisements	Specifies the port speed and duplex abilities to be advertised during link negotiation.
MtId	The MultiLink Trunk to which the port is assigned (if any).
IsPortShared	Specifies whether a port is shared. Multiple ports that are logically represented as a single port are shared. Only one shared port may be active at a time.
PortActiveComponent	Specifies the physical port components that are active for a shared port.

- ["Viewing and editing multiple port configurations" \(page 307\)](#)
- ["Interface tab for multiple ports" \(page 308\)](#)

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: <ul style="list-style-type: none"> • From the shortcut menu, choose Edit. • From the Device Manager main menu, choose Edit > Port. • From the shortcut menu, choose Edit. • From the toolbar, click Edit.



ATTENTION

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.

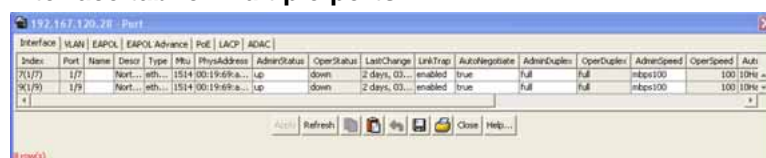
To view or edit the **Interface** tab for multiple ports, use the following procedure:

Step Action

- 1 Select the ports that you want to edit.
Press **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**.

The **Interface** tab shows port interface statistics.

Figure 111
Interface tab for multiple ports



Index	Port	Name	Descr	Type	PhysAddress	AdminStatus	OperStatus	LastChange	LinkTrap	AutoNegotiate	AdminDuplex	OperDuplex	AdminSpeed	OperSpeed	Auto
1(1/1)	1/1	Port...	eth...	10/100/1000	151410019169a...	Up	down	2 days, 03...	enabled	true	Full	Full	1000	1000	100%
2(1/1)	1/1	Port...	eth...	10/100/1000	151410019169a...	Up	down	2 days, 03...	enabled	true	Full	Full	1000	1000	100%

—End—

Table 139 "Interface tab fields for multiple ports" (page 309) describes the Interface tab fields for multiple ports.

Table 139
Interface tab fields for multiple ports

Field	Description
Index	A unique value assigned to each interface. The value ranges between 1 and 512.
Port	Port Id in unit and port format.
Name	Lets you 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 octets, that can be sent or received on the interface.
PhysAddress	MAC address assigned to a particular interface.
AdminStatus	<p>Current administrative state of the device, which can be one of the following:</p> <ul style="list-style-type: none"> • up • down <p>When a managed system is initialized, all interfaces start with AdminStatus in the up state. AdminStatus changes to the down state (or remains in the up state) as a result of either management action or the configuration information available to the managed system.</p>
OperStatus	<p>Current operational state of the interface, which can be one of the following:</p> <ul style="list-style-type: none"> • up • down • testing <p>If AdminStatus is up, then OperStatus should be up if the interface is ready to transmit and receive network traffic. If AdminStatus is down, then OperStatus should be down. It should remain in the down state if and only if there is a fault that prevents it from going to the up state. The testing state indicates that no operational packets can be passed.</p>
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	Specifies whether linkUp/linkDown traps should be generated for this interface

Field	Description
Auto Negotiate	Indicates whether the port is enabled (checked) for autonegotiation or not.
AdminDuplex	The current administrative duplex mode of the port (half or full).
OperDuplex	Indicate current duplex value of the port.
AdminSpeed	Set the speed of a port: none, mbps10, and mbps100.
OperSpeed	The current operating speed of the port.
AutoNegotiation Capability	Specifies the port speed and duplex capabilities that a switch can support on a port, and that may be advertised by the port using auto-negotiation
AutoNegotiation Advertisements	Specifies the port speed and duplex abilities to be advertised during link negotiation.
MltId	The MultiLink Trunk to which the port is assigned (if any).
IsPortShared	Specifies whether a port is shared. Multiple ports that are logically represented as a single port are shared. Only one shared port may be active at a time.
PortActive Component	Specifies the physical port components that are active for a shared port.

Administering the switch using web-based management

The administrative options available to you are:

- "Viewing system information" (page 311)
- "Quick Start" (page 312)
- "Configuring system security" (page 314)
- "Rebooting the Ethernet Routing Switch 2500 Series" (page 315)
- "Changing the Ethernet Routing Switch 2500 Series to system defaults" (page 316)
- "Logging out of the management interface" (page 316)

Viewing system information

You can view an image of the Ethernet Routing Switch 2500 Series, information about the host device and, if provided, the contact person or manager for the switch. The **System Information** page is also the web-based management interface home page.

To view system information, use the following procedure:

→ From the main menu, choose **Administration > System Information**.

The **System Information** page appears.

ATTENTION

You may create or modify existing system information parameters using the **System** page. For more information on configuring system information, see "Modifying system settings" (page 322).

Figure 112
System Information page

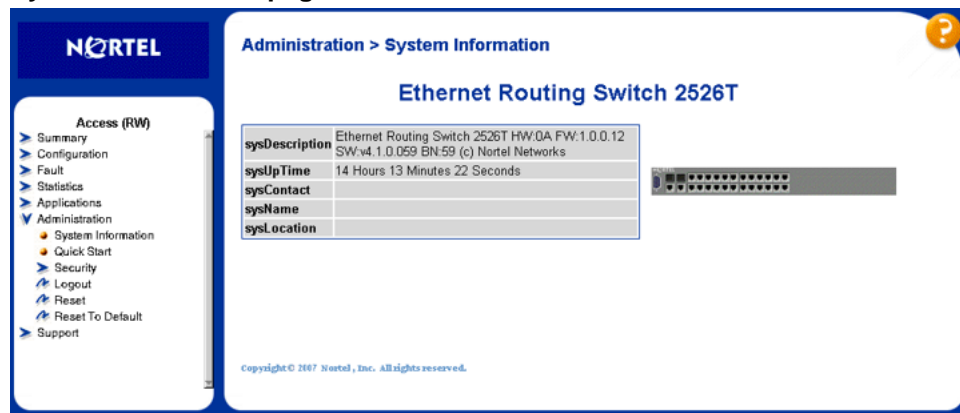


Table 140 "System Information page items" (page 312) describes the items on the System Information page.

Table 140
System Information page items

Item	Description
sysDescription	The default description of the Ethernet Routing Switch 2500 Series.
sysUpTime	The elapsed time since the last network management portion of the system was last re-initialized.
sysName	The name created by the network administrator to identify the switch, for example, Finance Group.
sysLocation	The location name created by the network administrator to identify the switch location, for example, first floor.
sysContact	The name, email, address, and telephone number of the person to contact about switch operation.

Quick Start

The Quick Start feature lets the administrator of the Ethernet Routing Switch 2500 Series make the initial setup by consolidating multiple setup pages into a single page. The **Quick Start** screen allows the administrator to configure the following information:

- IP address
- Subnet mask
- Default gateway
- SNMP Read community

- SNMP Write community
- SNMP Trap IP addresses and communities (up to four)
- New default VLAN

During the initial setup mode, all ports are assigned to the new default VLAN.

A port-based Quick Start VLAN is created if the new default VLAN does not exist. All ports are removed from the current default VLAN and assigned to the Quick Start VLAN. The PVIDs for all ports are changed to the Quick Start VLAN. The Quick Start VLAN is also designated as the management VLAN.

To configure the initial settings using the Quick Start feature:

Step Action

- 1 From the main menu, select **Administration > Quick Start**.

The **Quick Start** page is displayed.

Figure 113
Quick Start page

The screenshot shows the 'Administration > Quick Start' configuration page. On the left is a navigation menu with 'Administration > Quick Start' selected. The main content area is titled 'Administration > Quick Start' and contains the following sections:

- IP Configuration Table:**

	Configurable	In Use
In-Band Stack IP Address	10.111.111.10	10.111.111.10
In-Band Subnet Mask	255.255.255.0	255.255.255.0
Default Gateway	10.111.111.254	10.111.111.254
- Community String:**
 - Read-Only Community String: [masked] [No order to verify]
 - Read-Write Community String: [masked] [No order to verify]
- Trap Receiver Table:**

Index	IP Address	Community
1	0.0.0.0	[No order to verify]
2	0.0.0.0	[No order to verify]
3	0.0.0.0	[No order to verify]
4	0.0.0.0	[No order to verify]
- VLAN:**
 - Quick Start VLAN: [input field]

A 'Submit' button is located at the bottom left of the configuration area.

- 2 Click on the **Submit** button after making the required settings.
The following table describes the items on the **Quick Start** page.

Table 141
Items on the Quick Start page

Section	Item	Description
IP	In-Band Switch IP Address	Specify a new IP address for the switch.
	In-Band Subnet Mask	Enter a new subnet mask.
	Default Gateway	Specify an IP address for the default gateway.
Community String	Read-Only Community String	Specify a character string to identify the community string for the SNMPv1 Read-Only community, for example, public or private. Re-enter character string to verify. The default value is public.
	Read-Write Community String	Specify a character string to identify the community string for the SNMPv1 Read-Write community, for example, public or private. Re-enter character string to verify. The default value is private.
Trap Receiver	Index	Select the number of the Trap Receiver to create or modify.
	IP address	Specify the network address for the SNMP Manager that is to receive the specified Trap.
	Community	Type the Community String for the specified Trap Receiver. Re-enter Community String to verify.
VLAN	Quick Start VLAN	Specify the IP of the port-based Quick Start VLAN.

—End—

Configuring system security

For information on configuring system security, please see *Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)*.

Rebooting the Ethernet Routing Switch 2500 Series

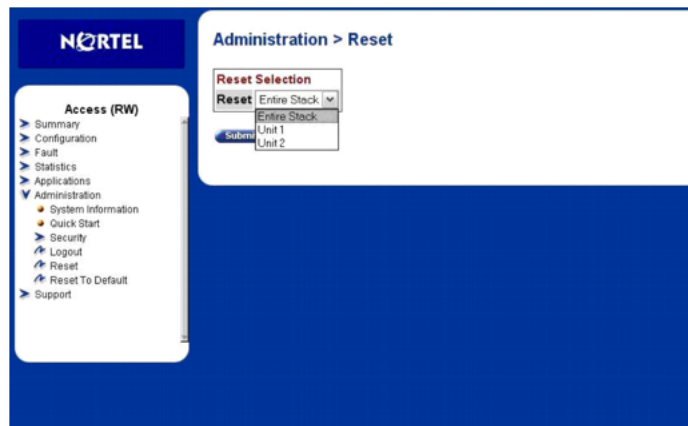
You can reboot a unit in stack or an entire stack without erasing any configured switch parameters. While rebooting, the switch initiates a self-test that comprises various diagnostic routines and subtests. The LEDs display various patterns to indicate that the subtests are in progress.

To reboot the Ethernet Routing Switch 2500 Series without making changes (since your last Submit request):

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

- 1 From the main menu, choose **Administration > Reset**.

Figure 114
Reset page



The reset warning message displays.

Figure 115
Reset page message



- 2 Click **OK**.

—End—

Changing the Ethernet Routing Switch 2500 Series to system defaults

You can replace all configured switch parameters with the factory default values.



CAUTION

If you choose change to default settings, all configured settings are replaced with factory default settings when you click Submit. For more information about factory default settings, see [Appendix "Default settings" \(page 343\)](#).

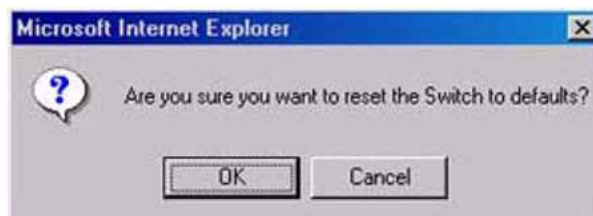
During the process of changing to default settings, the switch initiates a self-test that comprises various diagnostic routines and subtests. The LEDs display various patterns to indicate that the subtests are in progress.

To change the Ethernet Routing Switch 2500 Series to system defaults:

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

- | | |
|---|--|
| 1 | From the main menu, choose Administration > Reset to Default .
The reset to default warning message displays. |
|---|--|

Figure 116
Reset to Default page message



—End—

Logging out of the management interface

To log out of the Web-based management interface, use the following procedure:

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

- | | |
|---|--|
| 1 | From the main menu, choose Administration > Logout .
A logout message displays. |
|---|--|

Figure 117
Logout message



- 2 Do one of the following:
- Click **OK** to log out.
 - Click **Cancel** to return to the web-based management interface home page.

ATTENTION

If you have not configured system password security, a reset returns you to the home page. If you have configured system password security, a reset returns you to a log on page (for details on configuring management passwords, see *Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)*).

—End—

Configuring the switch using web-based management

The switch configuration options available to you are:

- "Configuring BootP, IP, and gateway settings" (page 319)
- "Modifying system settings" (page 322)
- "Configuring switch port status" (page 324)
- "Configuring high speed flow control" (page 327)
- "Downloading switch images" (page 328)
- "Downloading ASCII configuration files" (page 330)
- "Storing and retrieving a switch configuration file from a TFTP server" (page 331)
- "Enabling and disabling autosave" (page 333)
- "Configuring port communication speed" (page 334)
- "Configuring Rate Limiting" (page 335)

Configuring BootP, IP, and gateway settings

You can configure the BootP mode settings, create and modify the In-band switch IP addresses and In-band subnet mask parameters, and configure the IP address of your default gateway.

ATTENTION

Settings take effect immediately when you click **Submit**.

To configure BootP, IP, and gateway settings, use the following procedure:

Step	Action
1	From the main menu, choose Configuration > IP . The IP page appears.

Figure 118
IP page

Configuration > IP

IP Setting			
	Configurable	In Use	Last BootP
BootP Request Mode	BootP or Default IP		
In-Band Stack IP Address	0.0.0.0	0.0.0.0	0.0.0.0
In-Band Switch IP Address	192.167.120.28	192.167.120.28	0.0.0.0
In-Band Subnet Mask	255.255.255.0	255.255.255.0	0.0.0.0
Default Gateway	192.167.120.1	192.167.120.1	0.0.0.0

Submit

The following table describes the items on the IP page.

Table 142
IP page items

Section	Item	Range	Description
Boot Mode Setting	BootP Request Mode	BootP or Default IP (default)	Choose this mode to inform the switch to send a BootP request when the switch IP address stored in nonvolatile memory is the factory default value. If the stored IP address differs from the factory default value, the switch uses the stored network parameters. If the switch cannot find a BootP server, it tries five more times to find one and then defaults to the factory settings
		BootP Always	Choose this mode to inform the switch to ignore any stored network parameters and send a BootP request, each time it 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 lets the switch boot normally.
		BootP Disabled	Choose this mode to inform the switch to use the IP configuration parameters stored in nonvolatile

Section	Item	Range	Description
			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	<p>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 nonvolatile memory.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p style="text-align: center;">ATTENTION</p> <p>Valid parameters obtained in using BootP always replace current information stored in the nonvolatile memory.</p> </div>
		<p>ATTENTION</p> <p>Whenever the switch is broadcasting BootP requests, the BootP process times out if a reply is not received within 7 minutes (approximately). 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 or Default IP, BootP Always, or to BootP or Last Address.</p>	
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	XXX.XXX.XXX.XXX	Type a new switch IP address in the appropriate format.

Section	Item	Range	Description
	Address		<p style="text-align: center;">ATTENTION</p> <p>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 <i>in-use</i> 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.</p>
	In-Band Subnet Mast	XXX.XXX.XXX.XXX	Type a new subnet mask in the appropriate format. 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.
Gateway Setting	Default Gateway	XXX.XXX.XXX.XXX	Type an IP address for the default gateway in the appropriate format.

- 2 Type information in the text boxes, or select from a list.
- 3 Click **Submit**.

—End—

Modifying system settings

You can create or modify the system name, system location, and network manager contact information.

ATTENTION

The configurable parameters on the System page are displayed in a read only format on the System Information home page.

To configure system settings, use the following procedure:

Step Action

- 1 From the main menu, choose **Configuration > System**.
The **System** page appears.

Figure 119
System page

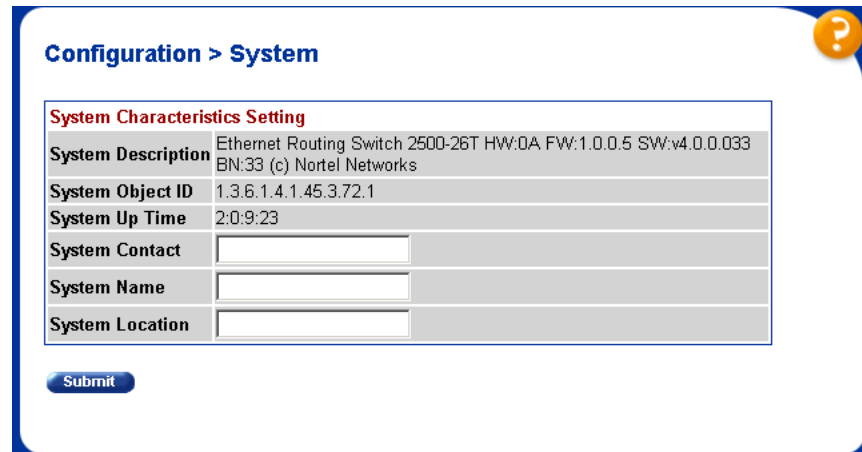


Table 143 "System page items" (page 323) describes the items on the System page.

Table 143
System page items

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.

Item	Range	Description
System Up Time		<p>The elapsed time since the last network management portion of the system was last re-initialized.</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>ATTENTION</p> <p>This field is updated only when the screen is redisplayed.</p> </div>
System Name	1..255	Type a character string to create a name to identify the switch, for example Finance Group.
System Location	1..255	Type a character string to create a name for the switch location, for example, First Floor.
System Contact	1..255	<p>Type a character string to create the contact information for the network manager or the selected person to contact regarding switch operation, for example, mcarlson@company.com</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>ATTENTION</p> <p>To operate correctly with the Web interface, the system contact should be an e-mail address.</p> </div>

2 Type information in the text boxes.

3 Click **Submit**.

—End—

Configuring switch port status

You can use the Port Management page to 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.

ATTENTION

Autonegotiation is not supported on 1000 Mb/s fiber optic ports.

You can disable switch ports that are trunk members, if you choose to disable them one by one. If you choose to disable all ports of the unit or stack, the changes cannot have effect on the ports belonging to MLTs.

ATTENTION

The **Autonegotiation**, **Speed**, and the **Duplex** fields are independent of MultiLink Trunking, VLANs, and the STP.

To configure switch port properties, use the following procedure:

Step Action

- 1 From the main menu, choose **Configuration > Port Management**.

The Port Management page appears.

Figure 120
Port Management page

The screenshot shows the 'Configuration > Port Management' page. It features a table titled 'Port Management Setting' with columns: Port, Trunk, Status, Link, Link Trap, Autonegotiation, and Speed / Duplex. The table lists ports 1 through 12, each with a 'Status' dropdown set to 'Enabled', 'Link' set to 'Down', and 'Link Trap' set to 'On'. Below the table is a 'Submit' button and navigation links for 'Ports 13 - 24', 'Ports 25 - 36', 'Ports 37 - 48', and 'Ports 49 - 50'.

Port	Trunk	Status	Link	Link Trap	Autonegotiation	Speed / Duplex
1		Enabled	Down	On	Enabled	
2		Enabled	Down	On	Enabled	
3		Enabled	Down	On	Enabled	
4		Enabled	Down	On	Enabled	
5		Enabled	Down	On	Enabled	
6		Enabled	Down	On	Enabled	
7		Enabled	Down	On	Enabled	
8		Enabled	Down	On	Enabled	
9		Enabled	Down	On	Enabled	
10		Enabled	Down	On	Enabled	
11		Enabled	Down	On	Enabled	
12		Enabled	Down	On	Enabled	
Switch		Enable	<input type="checkbox"/>	On	<input type="checkbox"/>	<input type="checkbox"/>

The following table describes the items on the Port Management page.

Table 144
Port Management page items

Item	Range	Description
Port		The switch port number of the corresponding row. The values that you set in each switch row affect all switch ports.

Item	Range	Description
Alias		Displays the name, or alias, you assigned the port. To assign or 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.
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 receiver 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. <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>ATTENTION</p> <p>Autonegotiation also enables auto sensing on 10/100 ports.</p> </div> The default setting is Enabled.
Speed / Duplex	(1) 10Mbps / Half (2) 10Mbps / Full (3) 100Mbps / Half (4) 100Mbps / Full (5) 1000Mbps / Full	Lets you manually configure any port to support a specific Ethernet speed and duplex setting. The default setting is 10 Mbs/Half when autonegotiation is disabled and 1000 Mb/s full-duplex for gigabit ports only.

- 2 In the port row of your choice, select from the lists.
- 3 Click **Submit**.

—End—

Configuring high speed flow control

You can view the High Speed Flow Control parameters for Ethernet Routing Switch 2500 Series in this page.

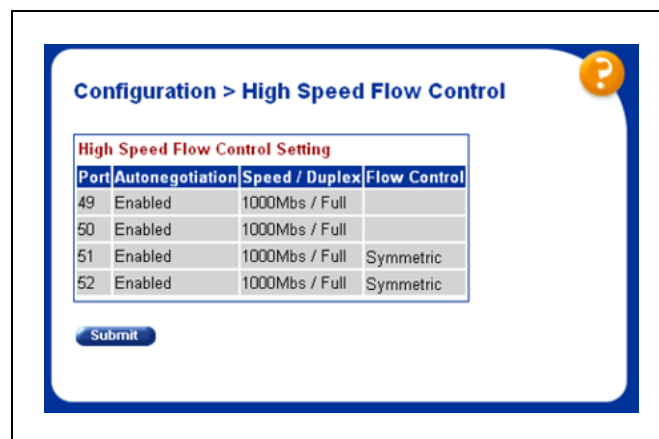
To configure high speed flow control, use the following procedure:

Step Action

- 1 From the main menu, choose **Configuration > High Speed Flow Control**.

The **High Speed Flow Control** page appears.

Figure 121
High Speed Flow Control page



The following table describes the items on the High Speed Flow Control page.

Table 145
High Speed Flow Control page items

Item	Range	Description
Port		The switch port number of the corresponding row.
Autonegotiation	(1) Enabled (2) Disabled	Displays if the autonegotiation feature is enabled or disabled. When enabled, the port advertises support only for 1000Mb/s operation in full-duplex mode.

Item	Range	Description
Speed/Duplex	100MBS/Full	XXXXXX
Flow Control	(1) Enabled (2) Symmetric (3) Asymmetric	Displays current settings of flow control.

—End—

Downloading switch images

You can download the Ethernet Routing Switch 2500 Series software image to nonvolatile flash memory. To download the Ethernet Routing Switch 2500 Series software image, a properly configured Trivial File Transfer Protocol (TFTP) server must be present in your network, and the Ethernet Routing Switch 2500 Series must have an IP address. To learn how to configure the switch IP address, see ["ip address command"](#) (page 178).



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, use the following procedure:

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

- 1 From the main menu, choose **Configuration > Software Download**.

The **Software Download** page appears.

Figure 122
Software Download page

Configuration > Software Download

Software Download Setting	
Current Running Version	v4.0.0.029
Local Store Version	4.0.0.029
Software Image Filename	<input type="text" value="platypus_400s.img"/>
Diagnostics Image Filename	<input type="text"/>
TFTP Server IP Address	<input type="text" value="192.167.120.13"/> (xxx.xxx.xxx.xxx)
Start TFTP Load of New Image	<input type="text" value="No"/>

The following table describes the fields on the Software Download page.

Table 146
Software Download page fields

Fields	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 file name.
Diagnostics Filename	1..30	Type the diagnostics file name.
TFTP Server IP Address	XXX.XXX.XXX.XXX	Type the IP address of your TFTP load host.
Download Option	No Software Image Diagnostics Software Image If Newer Download without reset	Choose the software download option.

- 2 Type information in the text boxes, or select from a list.
- 3 Click **Submit**.

The software download process automatically completes 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 ten minutes, depending on network conditions).

Unless you choose the Download without reset option, the switch automatically resets after the download process is complete. The new software image then initiates a self-test.

During the download process, the Ethernet Routing Switch 2500 Series is not operational. You can monitor the progress of the download process by observing the LED indications.

—End—

The following table describes the LED indications displayed during the software download process.

ATTENTION

The LED indications described in the following table apply to a 2526T switch model. Although a 2550T switch provides *similar* LED indications, the LED indication sequence is associated within the 48-port range.

Table 147
LED Indications during the software download process

Phase	Description	LED Indications
1	The switch downloads the new software image and programs it.	100 Mb/s port status LEDs (ports 18 to 24 only): The LEDs begin to turn on in succession on each ASIC as follows: ASIC 1 from port 1 to port 12 and return, ASIC 2 from with port 24 to port 13 and return, ASIC 3 from port 25 to port 36 and return, ASIC 4 from port 48 to port 37 and return.
2	The switch resets automatically.	<p>After the reset completes, the new software image initiates the switch self-test, which comprises various diagnostic routines and subtests.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p style="text-align: center;">ATTENTION</p> <p>The LEDs display various patterns to indicate that the subtests are in progress.</p> </div>

Downloading ASCII configuration files

The ASCII Config Download feature lets you upload an ASCII configuration file from a personal computer to the Ethernet Routing Switch 2500 Series. In the current implementation, you require a TFTP server to upload an ASCII configuration file to the Ethernet Routing Switch 2500 Series. But with this feature the requirement of a TFTP server is eliminated. This feature lets you upload an ASCII configuration file using the HTTP protocol.

To download the ASCII configuration file to the Ethernet Routing Switch 2500 Series.

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

- | | |
|---|--|
| 1 | From the main menu, choose Configuration > Ascii Config Download . |
| 2 | The Ascii Configuration File Download page appears. |

Figure 123
Ascii Configuration file download page

Configuration > Ascii Configuration File Download

Ascii Configuration File Download Setting

Ascii Configuration File \\ntpk110\ntl-doc\Current Projects\ Browse...

Last Manual Configuration Status Passed

Submit

—End—

The following table describes the items displayed on the ASCII Configuration File Download page.

Table 148
Ascii Configuration file download page items

Item	Description
Ascii Configuration File	Lets you select the ASCII config file located on a personal computer.
Last Manual Configuration Status	Displays the status of the download.
Submit	Click on this button to upload the ASCII configuration file from the personal computer to the Ethernet Routing Switch 2500 Series.

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 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 Ethernet Routing Switch 2500 Series configuration file, a properly configured TFTP server must be present in your network, and the Ethernet Routing Switch 2500 Series must have an IP address.

To learn how to configure the switch IP address, see "[Configuring BootP, IP, and gateway settings](#)" (page 319).

To store or retrieve a switch configuration file, use the following procedure:

- | Step | Action |
|------|--|
| 1 | From the main menu, choose Configuration > Configuration File .
The Configuration File page appears. |

Figure 124
Configuration File

The following table describes the Configuration File Setting items on the Configuration File page.

Table 149
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 Target	(1) Yes (2) No	Choose whether or not to copy the configuration image to the server.
Retrieve Configuration Image from Target	(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 to reset with the new configuration parameters.

- | | |
|---|--|
| 2 | Type information in the text boxes, or select from a list. |
|---|--|

3 Click **Submit**.

—End—

Requirements for storing and retrieving configuration parameters on a TFTP server

The following requirements apply when storing and retrieving configuration parameters on a TFTP server:

- The Configuration File feature can only be used to copy standalone switch configuration parameters to other standalone switches.
- A configuration file obtained from a standalone switch can only be used to configure other standalone switches that have the same firmware revision and model type as the donor standalone switch.
- 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 can also apply to and override the existing GBIC settings.

Table 150 "Parameters not saved to the configuration file" (page 333) describes the parameters that are not saved to the configuration file.

Table 150
Parameters not saved to the configuration file

These parameters are not saved:
In-Band Switch IP Address
In-Band Subnet Mask
Default Gateway
Configuration Image Filename
TFTP Server IP Address

Enabling and disabling autosave

The **Configuration File** page also lets you enable and disable the autosave feature on the switch.

To enable or disable autosave, use the following procedure:

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

- | | |
|---|--|
| 1 | From the main menu, choose Configuration > Configuration File .
The Configuration File page appears. |
|---|--|

- 2 Under **Autosave Configuration**, choose **Enabled** or **Disabled** from the drop-down list.
- 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, use the following procedure:

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

- 1 From the main menu, choose **Configuration > Console/Comm Port**.


The **Console/Communication Port** page appears.

Figure 125
Console/Communication Port page

The following table describes the items on the Console/Communication Port page.

Table 151
Console/Communication Port 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.

Item	Range	Description
Comm Port Stop Bits		The current console communication port stop bit setting.
Console port Speed	2400 4800 9600 19200 38400	<p>Choose the Console port speed baud rate.</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p style="text-align: center;">ATTENTION</p> <p>The default setting is 9600.</p> </div> <div style="border: 1px solid black; padding: 5px;"> <div style="display: flex; align-items: center;">  <p>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.</p> </div> </div>

- 2 Select from the list.
- 3 Click **Submit**.

—End—

Configuring Rate Limiting

Broadcast Rate Limiting is a box-oriented feature which lets you configure threshold limits for either broadcast or multicast packets ingressing on a port for a given time interval (in packets/second). If the configured threshold exceeds on a port, the switch drops extra packets received. No SNMP trap or syslog is generated in case of congestion.

Configuring Rate Limiting

To configure Rate Limiting using the web-based management system, use the following procedure:

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

- 1 From the main menu, choose **Application > Rate Limiting**.
The **Rate Limiting** page appears.

Figure 126
Rate Limiting page

The following table describes the items on the Rate Limiting page.

Table 152
Rate Limiting page items

Section	Description
Port	The port number that corresponds to the selected switch or stack.
Packet Type	Select the type of packet: Multicast, Broadcast, or Both.
Limit	Configure the threshold limit for the selected type of packet.

- 2 On the **Rate Limiting** page, type information in the text boxes, or select from a list.
- 3 Click **Submit**.

—End—

Troubleshooting

This chapter describes how to isolate and diagnose problems with your Ethernet Routing Switch 2500 Series and covers the following topics:

- "Interpreting the LEDs" (page 337)
- "Diagnosing and correcting problems" (page 337)
 - Normal power-up sequence
 - Port connection problems

Interpreting the LEDs

For information on interpreting the LEDs for the Ethernet Routing Switch 2500 Series, see "LED display panel" (page 27).

Diagnosing and correcting problems

Before you execute the problem-solving steps described in this section, cycle the power to the Ethernet Routing Switch 2500 Series (disconnect and then reconnect the AC power cord); then verify that the switch follows the normal power-up sequence.

**WARNING**

To avoid injury from hazardous electrical current, do not remove the top cover of the device. There are no user-serviceable components inside.

**WARNING****Vorsicht**

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.



WARNING
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.



WARNING
Advertencia

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.



WARNING
Avvertenza

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:

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. After the self-test, the remaining port LEDs indicate their operational status, as described in the following table.

Table 153
Corrective actions

Symptom	Probable cause	Corrective action
All LEDs are off.	<p>The switch is not receiving AC power.</p> <p>The fans are not operating or the airflow is blocked, causing the unit to overheat.</p>	<p>Verify that the AC power cord is fastened securely at both ends and that power is available at the AC power outlet.</p> <p>Verify that there is sufficient space for adequate airflow on both sides of the switch.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p style="text-align: center;">ATTENTION</p> <p>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.</p> </div>
The Activity LED for a connected port is off or does not blink (and you have reason to believe that traffic is present).	<p>The switch is experiencing a port connection problem.</p> <p>The switch's link partner is not autonegotiating properly.</p>	See "Port connection problems" (page 339).

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).

The Ethernet Routing Switch 2500 Series 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 Ethernet Routing Switch 2500 Series cannot negotiate a compatible mode for correct operation.
- If the autonegotiation feature is not present or not enabled at the connected station, the Ethernet Routing Switch 2500 Series may not be able to determine the correct duplex modes.

In both situations, the Ethernet Routing Switch 2500 Series "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 this mode mismatch problem, use the following procedure:

1. Use the Port Management page to disable autonegotiation for the suspect port (see "[Configuring switch port status](#)" (page 324)).
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.

If the problem persists:

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 have manually set for the Ethernet Routing Switch 2500 Series port.

Port interface

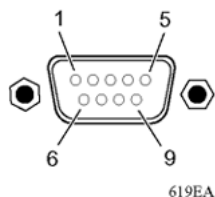
Ensure that the devices are connected using the appropriate crossover or straight-through cable, or that autonegotiation is active.

Appendix A

DB-9 (RS-232-D) Console/Comm Port connector

The Console/Comm Port connector 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 Routing Switch by using a straight-through DB-9 to DB-9 standard serial port cable.

Figure 127
DB-9 Console port connector



The following table lists the DB-9 Console port connector pin assignments.

Table 154
DB-9 Console port connector pin assignments

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)

Pin number	Signal
8	Not used
9	Ring indicator (not used)

Appendix B

Default settings

The following table lists the factory default settings for the Ethernet Routing Switch 2500 Series.

Table 155
Factory default settings

Field	Default setting
BootP Request Mode	BootP or Default IP
In-Band Switch IP Address	192.168.1.1
In-Band Subnet Mask	255.255.255.0
Default Gateway	0.0.0.0 (no IP address assigned)
Read-Only Community String	public
Read-Write Community String	private
Trap IP Address	0.0.0.0 (no IP address assigned)
Community String	Zero-length string
Autotopology	Enabled
Authentication Trap	Enabled
Link Up/Down Trap	Enabled
Reset Count	1 (This is the value only when the flash memory is erased. Even if you reboot the switch to factory defaults, the Reset Count increases and is equal to the number of times the switch restarted from the last flash memory erase.)
Last Reset Type	Power Cycle
sysContact	Zero-length string
sysName	Zero-length string
sysLocation	Zero-length string

Field	Default setting
Aging Time	300 seconds
Find an Address	00-00-00-00-00-00 (no MAC address assigned)
MAC Address Security	Disabled
MAC Address Security SNMP-Locked	Disabled
Partition Port on Intrusion Detected	Disabled
Partition Time	0 seconds (the value 0 indicates forever)
DA Filtering on Intrusion Detected	Disabled
Generate SNMP Trap on Intrusion	Disabled
Clear by Ports	NONE
Learn by Ports	NONE
Current Learning Mode	Not Learning
Trunk	blank field
Security	Disabled
Port List	Blank field
Find an Address	Blank field
MAC Address	Blank field (no address assigned)
Allowed Source	Blank field
Display/Create MAC Address	00-00-00-00-00-00
EAPOL Administrative Stat	Disabled
Initialize	No
Operational Status	Authorized
Administrative Traffic Control	Incoming and Outgoing
Operational Traffic Control	Incoming and Outgoing
Re-authenticate Now	No
Re-authentication	Enabled
Re-authentication period	3600 seconds
Quiet Period	60 seconds
Transmit Period	30 seconds
Supplicant Timeout	30 seconds
Server Timeout	30 seconds
Maximum Requests	2 attempts
Create VLAN	1
Delete VLAN	blank field

Field	Default setting
VLAN Name	VLAN # (VLAN number)
Management VLAN	Yes, VLAN #1
VLAN State	Inactive
Port Membership	Default (all ports assigned as untagged members of VLAN 1)
Unit	1
Port	1
Filter Untagged Frames	No
Port Name	Unit 1, Port 1
PVID	1
Tagging	Untagged Access
Unit	1
Port	1
PVID	1 (read only)
Port Name	Unit 1, Port 1 (read only)
Unit	1
Status	Enabled (for all ports)
LnkTrap	On
Autonegotiation	Enabled (for all ports)
Speed/Duplex	100Mbps/Half (when Autonegotiation is Disabled)
Autonegotiation	Enabled
Speed/Duplex	100Mbps/Half (when Autonegotiation is Disabled)
Flow Control	Disabled
Trunk	1 to 6 (depending on configuration status)
Trunk Members (Unit/Port)	Blank field
STP Learning	Normal
Trunk Mode	Basic
Trunk Status	Disabled
Trunk Name	Trunk #1 to Trunk #6
Traffic Type	Rx and Tx
Monitoring Mode	Disabled
Monitor/Unit Port	Zero-length string
Unit/Port X	Zero-length string
Limit	0 pps

Field	Default setting
Packet Type	Both
Snooping	Disabled
VLAN	1
Proxy	Disabled
Robust Value	2
Query Time	125 seconds
Set Router Ports	Version 1
Static Router Ports	Blank
Unit	1
Port	1
Display Messages From	Volatile
Display configuration complete?	No
Clear Messages From	None
Console Port Speed	9600 Baud
Console Switch Password	Not Required
TELNET/WEB Switch Password Type	None
TELNET Password Type	None
Console Read-Only Switch Password (standard software image)	user
Console Read-Write Switch Password (standard software image)	secure
Console Read-Only Switch Password (secure software image)	userpasswd
Console Read-Write Switch Password (secure software image)	securepasswd
Primary RADIUS Server	0.0.0.0
Secondary RADIUS Server	0.0.0.0
RADIUS UDP Port	1812
RADIUS Shared Secret	Null String
RADIUS Timeout	2 seconds.
STP Mode	IEEE 802.1s
Bridge Priority	8000 in Hex.
Bridge Hello Time	2 seconds
Bridge Max. Age Time	20 seconds
Bridge Forward Delay Time	15 seconds

Field	Default setting
Bridge Max. Age Time	20 seconds
Bridge Forward Delay Time	15 seconds
Participation	Normal Learning
Priority	128
Path Cost	10 or 100
State	Topology dependent
Bridge Priority	0x0000 - 0xF000
Root Path Cost	0
Maximum Age Time	20 seconds
Forward Delay	15 seconds
Bridge Maximum Age Time	15 seconds
Bridge Priority	0x8000
Bridge Hello Time	20 seconds
Bridge Max. Age Time	20 seconds
Bridge Forward Delay Time	15 seconds
Default Path Cost Type	<ul style="list-style-type: none"> • 32 bits in MSTP/RSTP mode • 16 bits in legacy STP mode • Not supported in STPG mode
Priority	128
Path Cost	10 or 100 (1 for Gigabit port) Path Cost = 1000/LAN speed (in Mb/s)
Bridge Priority	0x8000
Root Port	0
Root Path Cost	0
Maximum Age Time	20 seconds
Forward Delay	15 seconds
Bridge Hello Time	20 seconds
Bridge Max. Age Time	20 seconds
Bridge Forward Delay Time	15 seconds
Bridge Priority	0x8000
Bridge Hello Time	2 seconds
Bridge Maximum Age Time	20 seconds
Bridge Forward Delay Time	15 seconds
Add VLAN membership	1

Field	Default setting
Delete VLAN Membership	Blank
STP Group State	Active for CIST; InActive for MSTIs 2 to 7.
Participation	Normal Learning
Priority	128
Path Cost	200000 (20 000 for Gigabit port) Path Cost = $2 \times 10^{10} / (\text{Number of Kilobits/link})$
State	Topology dependent
Bridge Priority	HEX: 0x0000 - 0xF000
Bridge Priority	HEX: 0x0000 - 0xF000
Root Port	0
Root Path Cost	0
Maximum Age Time	20 seconds
Forward Delay	15 seconds
Bridge Forward Delay	15 seconds
Tx Hold Count	3
Hop Count (Max)	2000
Default Path Cost Type	<ul style="list-style-type: none"> • 32 bits in MSTP/RSTP mode • 16 bits in legacy STP802.1d mode • Not supported in STP802.1d mode
Region Name	MAC address of the device
TELNET Access	Enabled
SNMP Access	Enabled
Web Access	Enabled, Yes
Login Timeout	1 minute
Login Retries	3
Inactivity Timeout	15 minutes
Event Logging	All
Allowed Source IP Address (10 user-configurable fields)	First field: 0.0.0.0 (no IP address assigned) Remaining nine fields: 255.255.255.255
Allowed Source Mask (10 user-configurable fields)	First field: 0.0.0.0 (no IP address assigned) Remaining nine fields: 255.255.255.255

Field	Default setting
Image Filename	Zero-length string
Diagnostics Filename	Zero-length string
TFTP Server IP Address	0.0.0.0 (no IP address assigned)
Start TFTP Load of New Image	No
Configuration Image Filename	Zero-length string
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
TFTP Server IP Address	0.0.0.0
Retrieve Configuration File from Server	No
Last Manual Configuration Status	Passed
Last Auto Configuration Status	Passed
Auto Configuration on Reset	Disabled
Operational Mode of rear ports (for pre-enabled units)	Stacking Mode
Operational Mode of rear ports (for non pre-enabled units)	Standalone Mode

Appendix C

Sample BootP configuration file

This appendix 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 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
#
# 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\images|bf=BS425-24T_100.img

# 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
#   boot file:                bps2000_100.img

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\images|bf=Hummingbird_3.5_100.img
# 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
# boot file: hummingbird_3.5_100.img

```


Appendix D Command List

This appendix provides the complete CLI command list in alphabetical order, with approximate page references for the beginning pages of further explanations.

ATTENTION

This information is presented for reference only and must not be considered to be an exact representation.

Table 156
CLI command list

Command	Page No.
auto-negotiation-advertisements [port <portlist>] [10-full] [10-half] [100-full] [100-half] [1000-full] [asymm-pause-frame] [pause-frame] [none]	"auto-negotiation-advertisements command" (page 246)
auto-pvid	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
autotopology	"autotopology command" (page 216)
autosave enable	"autosave enable command" (page 207)
banner [custom static disabled <1-19> LINE]	"banner command for displaying banner" (page 201)
blink-leds [off time <1-10>]	"Configuring LEDs to blink on the display panel" (page 229)
boot [default]	"boot command" (page 196)
clear logging [nv nonvolatile volatile]	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>
clear-stats [port<portlist>]	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>

Command	Page No.
cli password {read-only read-write} <WORD>	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
cli password {serial telnet} {none local radius}	
clock summer-time <zone> [date {<day> <month> <year> <hh:mm>} {<day> <month> <year> <hh:mm>}] [<offset>]	"clock summer-time" (page 213)
clock time-zone <zone> <hours> <minutes>	"clock time-zone" (page 213)
configure {terminal network}	"configure command" (page 91)
configure network [load-on-boot {disable use-bootp use-config}]	"Configuration Management" (page 188)
configure network [filename <FILENAME>]	
configure network [address <XXX.XXX.XXX.XXX>]	
configure command	"configure command" (page 91)
copy config nvram	"copy config nvram command" (page 205)
copy config tftp [address <XXX.XXX.XXX.XXX>] filename <WORD>	"copy config tftp command" (page 199)
copy tftp config [address <XXX.XXX.XXX.XXX>] filename <WORD>	"copy tftp config command" (page 200)
copy running-config tftp {<IP Address> <filename>}	"copy running-config tftp command" (page 192)
default auto-negotiation-advertisements [port <portlist>]	"default auto-negotiation-advertisements command" (page 247)
default autotopology	"default autotopology command" (page 216)
default autosave enable	"default autosave enable command" (page 207)
default command	"default command" (page 90)
default duplex [port <portlist>]	"default duplex command" (page 239)
default eapol guest-vlan	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
default flowcontrol [port <portlist>]	"default flowcontrol command" (page 242)
default http-port	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
default ip address	"default ip address command" (page 179)
default ip bootp server	"default ip bootp server command" (page 197)

Command	Page No.
default ip default-gateway	"default ip default-gateway command" (page 181)
default ip domain-name	"default ip domain-name command" (page 188)
default ip netmask	"default ip netmask command" (page 179)
default lacp aggregation [port <portlist>] enable	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
default lacp key [port <portlist>]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
default lacp mode [port <portlist>]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
default lacp priority [port <portlist>]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
default lacp system-priority	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
default lacp timeout-time [port <portlist>]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
default lldp [port <portlist>] config-notification	"default lldp config-notification command" (page 220)
default lldp [port <portlist>] status	"default lldp status command" (page 223)
default lldp [tx-interval] [tx-hold-multiplier] [reinit-delay] [tx-delay] [notification-interval]	"default lldp command" (page 219)
default lldp tx-tlv [port <portlist>] [local-mgmt-addr] [port-desc] [sys-cap] [sys-desc] [sys-name]	"default lldp tx-tlv command" (page 222)
default logging	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>
default logging remote level	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>
default mac-address-table aging-time	"default mac-address-table aging-time command" (page 99)
default name [port <port.ist>]	"default name command" (page 236)
default qos egressmap	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — Quality of Service (NN47215-504)</i>

Command	Page No.
default radius-server [host key password port secondary-host timeout]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
default rate-limit	"default rate-limit command" (page 244)
default snmp-server authentication-trap	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
default snmp-server community [ro rw]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
default snmp-server contact	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
default snmp-server host	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
default snmp-server location	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
default snmp-server name	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
default snmp trap link-status [port <portlist>]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
default snmp [enable server sync-interval]	"default snmp command" (page 212)
default spanning-tree [port <portlist>] [learning] [cost] [priority]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
default speed [port <portlist>]	"default speed command" (page 238)
default ssh [dsa-auth pass-auth port timeout]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
default telnet-access	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
default tftp-server	"default tftp-server command" (page 199)
default vlan configcontrol	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>

Command	Page No.
default vlan igmp <1-4094>	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — IP Multicast (NN47215-503)</i>
default vlan mgmt	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
disable	"disable command" (page 92)
download [address <ip>] {image <image-name> image-if-newer <image-name> diag <filename>} [no-reset]	"download command" (page 230)
duplex [port <portlist>] {full half auto}	"speed command" (page 237)
eapol {disable enable}	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
eapol guest-vlan [vid <1-4094> enable]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
eapol [port <portlist>] [init] [status authorized unauthorized auto] [traffic-control in-out in] [re-authentication enable disable] [re-authentication-period <1-604800>] [re-authenticate] [quiet-interval <num>] [transmit-interval <num>] [supplicant-timeout <num>] [server-timeout <num>][max-request <num>]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
enable command	"enable command" (page 91)
Enabling CANA	"Enabling Custom Autonegotiation Advertisements (CANA)" (page 244)
end command	"end command" (page 92)
exit	"exit command" (page 92)
flowcontrol [port <portlist>] {asymmetric symmetrid auto disable}	"Enabling flow control" (page 240)
help	"help command" (page 89)
http-port <1024-65535>	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
interface FastEthernet {<portlist>}	"interface command" (page 91)
ip address <XXX.XXX.XXX.XXX> [netmask <XXX.XXX.XXX.XXX>]	"ip address command" (page 178)
ip bootp server {last needed disable always}	"ip bootp server command" (page 196)
ip domain-name [<LINE>]	"ip domain-name command" (page 187)

Command	Page No.
ip default-gateway <XXX.XXX.XXX.XXX>	"ip default-gateway command" (page 180)
ip name-server <A.B.C.D>	"ip name-server command" (page 186)
ipmgr {source-ip <1-10> <XXX.XXX.XXX.XXX> [mask <XXX.XXX.XXX.XXX>]}	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
ipmgr {telnet snmp http} [source-ip <1-10> <XXX.XXX.XXX.XXX> [mask <XXX.XXX.XXX.XXX>]]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
lACP aggregation [port <portlist>] enable	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
lACP clear-stats [port <WORD>]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
lACP key [port <portlist>] <1-4095>	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
lACP mode [port <portlist>] {off passive active}	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
lACP priority [port <portlist>] <0-255>	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
lACP system-priority [0-65535]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
lACP timeout-time [port <portlist>] {short long}	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
lldp [port <portlist>] config-notification	"lldp config-notification command" (page 219)
lldp [port <portlist>] status [rxOnly txAndRx txOnly]	"lldp status command" (page 222)
lldp [tx-interval <5-32768>] [tx-hold-multiplier <2-10>] [reinit-delay <1-10>] [tx-delay <1-8192>] [notification-interval <5-3600>]	"lldp command" (page 218)
lldp tx-tlv [port <portlist>] [local-mgmt-addr] [port-desc] [sys-cap] [sys-desc] [sys-name]	"lldp tx-tlv command" (page 221)
logging [enable disable] [level critical serious informational] [nv-level critical serious informational none]	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>

Command	Page No.
logging remote address <A.B.C.D>	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>
logging remote enable	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>
logging remote level {critical informational serious none}	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>
logout	"logout command" (page 90)
mac-address-table aging-time <time>	"mac-address-table aging-time command" (page 99)
mac-security [disable enable] [filtering {enable disable}] [intrusion-detect {enable disable forever}] [intrusion-timer <1-65535>] [learning-ports <portlist> [add <portlist> [remove <portlist>]]] [learning {enable disable}] [mac-address-table mac-da-filter security list [snmp-lock {enable disable}] [snmp-trap {enable disable}]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
mac-security [port <portlist>] {disable enable learning}	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
mac-security mac-address-table address <H.H.H.> {port <portlist> security-list <1-32>}	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
mac-security mac-da-filter {add <H.H.H.> delete <H.H.H.>}	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
mac-security security-list <1-32> [add <portlist>] [remove <portlist>] [<portlist>]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
mlt <id> [name <trunkname>] [enable disable] [member <portlist>][learning {disable fast normal}] [bpdu{all-ports single-port}]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
name [port <portlist>] <LINE>	"name command" (page 235)
no auto-pvid	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
no auto-negotiation-advertisements [port <portlist>]	"no auto-negotiation-advertisements command" (page 247)
no autosave enable	"no autosave enable command" (page 207)

Command	Page No.
no autotopology	"no autotopology command" (page 216)
no-banner	"no banner command" (page 202)
no clock summer-time	"no clock summer-time" (page 214)
no clock time-zone	"no clock time-zone" (page 213)
no command	"no command" (page 90)
no eapol guest-vlan [enable]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
no flowcontrol [port <portlist>]	"no autotopology command" (page 216)
no ip address	"no ip address command" (page 179)
no ip bootp server	"no ip bootp server command" (page 197)
no ip default-gateway	"no ip default-gateway command" (page 180)
no ip domain-name	"no ip domain-name command" (page 188)
no ip name-server <A.B.C.D>	"no ip name-server command" (page 187)
no ip netmask	"no ip netmask command" (page 179)
no ipmgr {source-ip [<1-10>]}	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
no ipmgr {telnet snmp web}	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
no lacp aggregation [port <portlist>] enable	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
no lldp [port <portlist>] config-notification	"no lldp config-notification command" (page 220)
no lldp [port <portlist>] status	"no lldp status command" (page 223)
no lldp tx-tlv [port <portlist>] [local-mgmt-addr] [port-desc] [sys-cap] [sys-desc] [sys-name]	"no lldp tx-tlv command" (page 221)
no logging	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>
no logging remote address	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>
no logging remote enable	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>

Command	Page No.
no logging remote level	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>
no mac-security	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
no mac-security mac-address-table {address <H.H.H> port <portlist> security-list <1-32>}	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
no mac-security security-list <1-32>	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
no mlt [<id>]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
no name [port <portlist>]	"no name command" (page 236)
no password security	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
no port-mirroring	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>
no radius-server [host] [key] [password fallback] [secondary host]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
no rate-limit	"no rate-limit command" (page 244)
no rmon alarm [<1-65535>]	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>
no rmon event [<1-65535>]	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>
no rmon history [<1-65535>]	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>
no rmon stats [<1-65535>]	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>
no shutdown [port <portlist>]	"no shutdown command" (page 234)

Command	Page No.
no snmp server [authentication-trap community [ro rw <community-string>] contact host [<host-ip> [port <1-65535>] [v1 v2c v3] <community-string>]] location name user [engine-id <snmpEngineID>] <User id> view <view name>]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
no snmp-server	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
no snmp-server authentication-trap	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
no snmp-server community [ro rw <community-string>]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
no snmp-server contact	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
no snmp-server host <host-ip> {v1 v2c v3}	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
no snmp-server location <text>	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
no snmp-server name <text>	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
no snmp-server user [engine-id <engineid>] <username>	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
no snmp-server view <viewname>	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
no snmp trap link-status [port <portlist>]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
no ssh	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
no ssh dsa-auth	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>

Command	Page No.
no ssh dsa-auth-key	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
no ssh dsa-host-key	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
no ssh pass-auth	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
no snmp enable	"no snmp enable command" (page 209)
no snmp server <primary secondary>	"no snmp server command" (page 210)
no spanning-tree mstp msti <1 - 7> [port <portlist>]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
no spanning-tree [port <portlist>]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
no telnet-access [source-ip [<1-10>]]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
no tftp-server	"no tftp-server command" (page 199)
no vlan <1-4094>	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
no web-server	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
password aging-time day <1-2730>	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
password security	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
ping <A.B.C.D or Hostname>	"ping command" (page 183)
ping <XXX.XXX.XXX.XXX> [datasize <64-4096>] [{count <1-9999>} continuous] [{timeout -t} <1-120>] [interval <1-60>] [debug]	"ping command" (page 183)
port-mirroring mode {disable Xrx Xtx XrxOrXtx} monitor-port <portlist> mirror-port-X <portlist>	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>

Command	Page No.
qos egressmap ds <0-63> 1p <0-7>	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — Quality of Service (NN47215-504)</i>
qos egressmap enable	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — Quality of Service (NN47215-504)</i>
radius-server host <address> [secondary-host <address>] port <num> key <string> [timeout <1-60>]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
radius-server password fallback	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
rate-limit {multicast <pct> broadcast <pct> both <pct>}	"rate-limit command" (page 243)
reload [force] [minutes-to-wait <1-60>] [cancel]	"reload command" (page 93)
restore factory-default [-y]	"Resetting the switch to default configuration" (page 184)
rmon alarm <1-65535> <WORD> <1-2147483647> {absolute delta} rising-threshold <-2147483648-2147483647> [<1-65535>] falling-threshold <-2147483648-2147483647> [<1-65535>] [owner <LINE>]	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>
rmon event <1-65535> [log] [trap] [description <LINE>] [owner <LINE>]	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>
rmon history <1-65535> <LINE> <1-65535> <1-3600> [owner <LINE>]	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>
rmon stats <1-65535> <port> [owner <LINE>]	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>
save config	"save config command" (page 206)
show arp-table	"Displaying the ARP table" (page 202)
show auto-negotiation-advertisements [port <portlist>]	"Enabling Custom Autonegotiation Advertisements (CANA)" (page 244)
show auto-negotiation-capabilities [port <portlist>]	"show auto-negotiation-capabilities command" (page 245)
show auto-pvid	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
show autosave	"show autosave command" (page 206)

Command	Page No.
show autotopology nmm-table	"show autotopology nmm-table" (page 217)
show autotopology settings	"show autotopology settings" (page 216)
show banner [custom static]	"show banner command" (page 201)
show config-network	"show config-network command" (page 190)
show cli {info mode password [type]}	"show cli command" (page 194)
show clock summer-time	"show clock summer-time" (page 215)
show clock time-zone	"show clock time-zone" (page 214)
show eapol	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
show eapol guest-vlan [interface < portlist>]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
show http-port	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
show interfaces [names] [<portlist>]	"show interfaces command" (page 202)
show interface FastEthernet eapol [auth-diags [portlist] auth-stats [portlist]]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
show interfaces [gbic-info [<portlist>] <portlist> [config] names [<portlist>]]	"show interfaces command" (page 202)
show interfaces [<portlist>] config	"show interfaces config command" (page 204)
show ip address	"show ip address command" (page 182)
show ip [bootp] [default-gateway]	"show ip command" (page 181)
show ip dns	"show ip dns command" (page 185)
show ipmgr	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
show lacp aggr <1-65535>	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
show lacp debug member [portlist]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
show lacp port [<portlist>]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>

Command	Page No.
show lacp stats [port <portlist>]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
show lacp system	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
show lldp [local-sys-data] [mgmt-sys-data] [stats]	"show lldp command" (page 224)
show lldp [port <portlist>] [neighbor] [neighbor-mgmt-addr] [rx-stats] [tx-stats] [tx-tlv]	"show lldp port command" (page 226)
show logging [config] [critical] [informational] [serious] [sort-reverse]	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>
show mac-address-table [vid <1-4094>] [aging-time] [address <H.H.H>] [port <LINE>] [include/exclude <pattern>]	"show mac-address-table command" (page 98)
show mac-security {config mac-address-table [address <macaddr>] port security-lists mac-da-filter}	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
show mlt [utilization <1-6>]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
show password [aging-time day security]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
show poe-main-status	"show poe-main-status command" (page 164)
show poe-port-status	"show poe-port-status command" (page 165)
show poe-power-measurement	"show poe-power-measurement command" (page 166)
show port-mirroring	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>
show port-statistics [port <portlist>]	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>
show qos egressmap ds <0-63>	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — Quality of Service (NN47215-504)</i>
show qos egressmap status	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — Quality of Service (NN47215-504)</i>

Command	Page No.
show radius-server	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
show rate-limit	"show rate-limit command" (page 243)
show rmon alarm	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>
show rmon event	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>
show rmon history	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>
show rmon stats	<i>Nortel Ethernet Routing Switch 2500 Series Performance Management — System Monitoring (NN47215-502)</i>
show running-config	"show running-config command" (page 191)
show snmp-server community	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
show snmp	"show snmp command" (page 208)
show spanning-tree {config [port [< portlist>] cost-calc-mode op-mode port [< portlist>]}	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
show spanning-tree mstp config	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
show spanning-tree mstp msti config <1 - 7>	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
show spanning-tree mstp msti port config <1 - 7> [<portlist>]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
show spanning-tree mstp msti port statistics <1 - 7> [<portlist>]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
show spanning-tree mstp msti statistics <1 - 7>	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
show spanning-tree mstp port config [<portlist>]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>

Command	Page No.
show spanning-tree mstp port statistics [<portlist>]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
show spanning-tree mstp statistics	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
show spanning-tree mstp status	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
show spanning-tree rstp config	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
show spanning-tree rstp port config [<portlist>]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
show spanning-tree rstp port statistics [<portlist>]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
show spanning-tree rstp port status [<portlist>]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
show spanning-tree rstp statistics	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
show spanning-tree rstp status	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
show ssh download-auth-key	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
show ssh global	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
show ssh session	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
show sys-info	"show sys-info command" (page 96)
show tech	"show tech command" (page 97)
show telnet-access	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
show terminal	"show terminal command" (page 193)

Command	Page No.
show tftp-server	"show tftp-server command" (page 198)
show vlan configcontrol	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
show vlan igmp <1-4094>	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — IP Multicast (NN47215-503)</i>
show vlan interface info [<portlist>]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
show vlan interface vids [<portlist>]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
show vlan multicast membership <1-4094>	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — IP Multicast (NN47215-503)</i>
show vlan vid <1-4094>	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
shutdown [force] [minutes-to-wait <1-60>] [cancel]	"shutdown command" (page 94)
shutdown [port <portlist>]	"shutdown command for the port" (page 233)
snmp-server {enable disable}	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
snmp-server authentication-trap {enable disable}	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
snmp-server bootstrap <minimum-secure> <semi-secure> <very-secure>	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
snmp-server community <community-string> [ro rw]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
snmp-server community <community-string> {read-view <view-name> write-view <view-name> notify-view <view-name>}	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
snmp-server contact <text>	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>

Command	Page No.
snmp-server host <host-ip> [port <1-65535>] {<community-string> v2c <community-string> v3 {auth no-auth auth-priv} <username>}	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
snmp-server location <text>	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
snmp-server name <text>	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
snmp-server user [engine-id <engineid>] <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>]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
snmp-server view <view-name> <OID> [<OID> [<OID> [<OID> [<OID> [<OID> [<OID> [<OID> [<OID> [<OID>]]]]]]]]]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
snmp trap link-status [port <portlist>]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
sntp enable	"sntp enable command" (page 209)
sntp server primary address <A.B.C.D>	"sntp server primary address command" (page 209)
sntp server secondary address <A.B.C.D>	"sntp server secondary address command" (page 210)
sntp sync-interval <0-168>	"sntp sync-interval command" (page 211)
sntp sync-now	"sntp sync-now command" (page 211)

Command	Page No.
spanning-tree mstp [max-hop <100 - 4000>] [forward-time <4 - 30>] [max-age <6 - 40>] [pathcost-type {bits16 bits32}][priority {0000 10000 20000 É F0000}] [tx-hold count <1 - 10>] [version {stp-compatible rstp mstp}] [add-vlan <1-4094>] [remove-vlan <1-4094>] [msti <1-7>] [region {config-id-sel region-name region-version}]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
spanning-tree mstp msti <1 - 7> [port <portlist>]enable	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
spanning-tree mstp msti <1 - 7> [port <portlist>]disable	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
spanning-tree mstp msti <1 - 7> [port <portlist>] [cost <1 - 200000000>][learning {disable enable}][priority {00 10 É F0}]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
spanning-tree mstp msti<1 - 7>[priority{0000 1000 É F000}] [add-vlan <vid>][remove-vlan <vid>][enable]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
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 É F0}] [protocol-migration {false true}]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
spanning-tree mstp region [config-id-sell <0 - 255>] [region-name <1 - 32 chars>][region-version <0 - 65535>]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
spanning-tree [port <portlist>] [learning {disable normal fast}] [cost <1-65535>] [priority <0-255>]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
spanning-tree rstp[forward-time<4 - 30>] [hello-time <1 - 10>][max-age <6 - 40>] [pathcost-type{ bits16 bits32}] [priority{0000 10 000 20000 É F0000}] [tx-holdcount<1 - 10>] [version stp-compatible rstp}]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
spanning-tree rstp [port <portlist>] [cost <1 - 200000000>] [edge-port {false true}] [learning {disable enable}] [p2p {auto force-false force-true}][priority {00 10 É F0}] [protocol-migration {false true}]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>

Command	Page No.
speed [port <portlist>] {10 100 1000 auto}	"speed command" (page 237)
ssh	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
ssh download-auth-key [address <XXX.XXX.XX X.XXX>] [key-name <file>]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
ssh dsa-auth	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
ssh dsa-host-key	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
ssh pass-auth	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
ssh port <1-65535>	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
ssh secure [force]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
ssh timeout <1-120>	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
telnet-access [enable disable] [login-timeout <1-10>] [retry <1-100>] [inactive-timeout <0-60>]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
[logging {none access failures all}]	
[source-ip <1-10> <XXX.XXX.XXX.XXX> [mask <XXX.XXX.XXX.XXX>]]	
terminal speed {2400 4800 9600 19200 38400} length <1-132> width <1-132>	"terminal command" (page 193)
tftp-server <XXX.XXX.XXX.XXX>	"tftp-server command" (page 198)
username <username> <password> [ro rw]	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
vlan configcontrol <vcc_option>	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>

Command	Page No.
vlan create <1-4094>	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
vlan delete <1-4094>	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
vlan igmp {<1-4094> [snooping {enable disable}] [proxy {enable disable}] [robust-value <value>] [query-interval <time>] [v1-members <portlist>] [v2-members <portlist>]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — IP Multicast (NN47215-503)</i>
vlan members [add remove] <1-4094> <portlist>	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
vlan mgmt <1-4094>	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
vlan name <1-4094> <line>	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
vlan ports [<portlist>] [tagging {enable disable tagAll untagAll tagPvidOnly untagPvidOnly}] [pvid <1-4094>] [remarking {enable disable}] [filter-unregistered-frames {enable disable}] [filter-untagged-frame {enable disable}] [priority <0-7>] [name <line>]	<i>Nortel Ethernet Routing Switch 2500 Series Configuration — VLANs, Spanning Tree, and MultiLink Trunking (NN47215-501)</i>
web-server{enable disable}	<i>Nortel Ethernet Routing Switch 2500 Series Security — Configuration and Management (NN47215-505)</i>
write memory	"write memory command" (page 205)

Appendix E

Technical specifications

This appendix provides technical specifications for the Ethernet Routing Switch 2500 Series.

Environmental specifications

The following table lists environmental specifications for the Ethernet Routing Switch 2500 Series.

Table 157
Environmental specifications

Parameter	Operating specification	Storage specification
Temperature	0° to 40°C (32° to 104°F)	-40° to 70°C (-40° to 158°F)
Humidity	10 to 85% maximum relative humidity, noncondensing	5 to 95% maximum relative humidity, noncondensing
Altitude	3024 m (10,000 ft)	3024 m (10,000 ft)

AC power specifications

The following table describes the AC power specifications for the Ethernet Routing Switch 2500 Series.

Table 158
AC power specifications

Models	2526T 2550T	2526T-PWR 2550T-PWR
Input current	Maximum 0.8 A	Maximum 2.9 A
Input voltage (rms)	100-240 VAC at 50-60Hz	100-240 VAC at 50-60 Hz
Power consumption	Maximum 96 W	Maximum 350 W
Thermal rating	327 Btu/h maximum	500 Btu/h maximum

Physical dimensions

Table 159 "Physical dimensions of the Ethernet Routing Switch 2500 Series" (page 376) lists physical dimensions for the Ethernet Routing Switch 2500 Series.

Table 159
Physical dimensions of the Ethernet Routing Switch 2500 Series

Parameter	Specifications
Height	1 U (44 mm) (1.73 in)
Width	441.0 mm (17.36 in)
Depth (2526T and 2526T-PWR)	309 mm (12.17 in)
Depth (2550T and 2550T-PWR)	369 mm (14.53 in)
Weight (2526T and 2526T-PWR)	9.4 lbs
Weight (2550T and 2550T-PWR)	11.6 lbs

Performance specifications

Table 160 "Performance specifications of the Ethernet Routing Switch 2500 Series" (page 376) lists performance specifications for the Ethernet Routing Switch 2500 Series.

Table 160
Performance specifications of the Ethernet Routing Switch 2500 Series

Parameter	Specifications
Frame Forward Rate (64-byte packets)	10.2 Million packets/second (Mpps) on 2550T/2550T-PWR, and 6.6 Mpps on 2526T/2526T-PWR
MAC Address Database Size	16,000 entries
Addressing	48-bit MAC address

Network protocol and standards compatibility

The following are protocols and standards used by the Ethernet Routing Switch 2500 Series:

- IEEE 802.3 10BASE-T (ISO/IEC 8802-3, Clause 14)
- IEEE 802.3u 100BASE-TX (ISO/IEC 8802-3, Clause 25)
- IEEE 802.3u Autonegotiation on Twisted Pair (ISO/IEC 8802-3, Clause 28)

- IEEE 802.3x (Flow Control on the Gigabit Uplink ports)
- IEEE 802.3z (Gigabit)
- IEEE 802.1d MAC Bridges (ISO/IEC 10038)
- IEEE 802.1p (Prioritizing)
- IEEE 802.1Q (VLAN Tagging)
- IEEE 802.1D (Spanning tree protocol)
- IEEE 802.3ad (LACP)
- IEEE 802.1w (Rapid Spanning Tree Protocol)
- IEEE 802.3af (Power over Ethernet)
- IEEE 802.1AB (Link Layer Discovery)

Safety agency certification

- The safety certifications follow for the Ethernet Routing Switch 2500 Series:
- UL 60950
- IEC 60950, CB report and certificate with all national deviations
- EN 60950
- CSA 22.2 No. 60950950
- UL-94-V1 flammability requirements for PC board
- NOM (NOM-019)

Electromagnetic emissions

The electromagnetic emission standards for the Ethernet Routing Switch 2500 Series:

- CISPR 22, Class A
- CISPR 24, Class A
- US. CFR47, Part 15, Subpart B, Class A
- Canada: ICES-003, Issue 3, Class A
- Australia/New Zealand. AS/NZS 3548, Class A
- Japan: VCCI, class A
- Taiwan. CNS 13438, Class A
- Europe: EN55022, Class A and EN55024
- EN61000-3-2, EN61000-3-3

- EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11

Electromagnetic immunity

The Ethernet Routing Switch 2500 Series meets the EN50082-1:1997 standard.

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Nortel Ethernet Routing Switch 2500 Series

Overview — System Configuration

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