EX2200 and EX2200-C Switches Hardware Guide

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Juniper Networks, Inc.
1133 Innovation Way
Sunnyvale, California 94089
USA
408-745-2000
www.juniper.net

EX2200 and EX2200-C Switches Hardware Guide

The information in this document is current as of the date on the title page.

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Supported Platforms

For the features described in this document, the following platforms are supported:

- EX2200

Documentation Conventions

Table 1 on page xvi defines notice icons used in this guide.

Table 1: Notice Icons

Icon	Meaning	Description
	Informational note	Indicates important features or instructions.
	Caution	Indicates a situation that might result in loss of data or hardware damage.
	Warning	Alerts you to the risk of personal injury or death.
	Laser warning	Alerts you to the risk of personal injury from a laser.
	Tip	Indicates helpful information.
	Best practice	Alerts you to a recommended use or implementation.

Table 2 on page xvi defines the text and syntax conventions used in this guide.

Table 2: Text and Syntax Conventions

Convention	Description	Examples
Bold text like this	Represents text that you type.	To enter configuration mode, type the **configure** command: user@host> **configure**
`Fixed-width text like this`	Represents output that appears on the terminal screen.	`user@host>` **show chassis alarms** `No alarms currently active`
Italic text like this	• Introduces or emphasizes important new terms. • Identifies guide names. • Identifies RFC and Internet draft titles.	• A policy *term* is a named structure that defines match conditions and actions. • *Junos OS CLI User Guide* • RFC 1997, *BGP Communities Attribute*
Italic text like this	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the machine's domain name: [edit] root@# **set system domain-name** *domain-name*

Table 2: Text and Syntax Conventions *(continued)*

Convention	Description	Examples
Text like this	Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.	• To configure a stub area, include the **stub** statement at the **[edit protocols ospf area area-id]** hierarchy level. • The console port is labeled **CONSOLE**.
< > (angle brackets)	Encloses optional keywords or variables.	**stub <default-metric *metric*>;**
| (pipe symbol)	Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.	**broadcast | multicast** **(*string1* | *string2* | *string3*)**
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	**rsvp { # Required for dynamic MPLS only**
[ ] (square brackets)	Encloses a variable for which you can substitute one or more values.	**community name members [*community-ids*]**

Indention and braces ({ })	Identifies a level in the configuration hierarchy.	[edit]
		routing-options {
		  static {
		  route default {
		  nexthop *address*;
		  retain;
		  }
		  }
		}

; (semicolon)	Identifies a leaf statement at a configuration hierarchy level.	
GUI Conventions		
Bold text like this	Represents graphical user interface (GUI) items you click or select.	• In the Logical Interfaces box, select **All Interfaces**. • To cancel the configuration, click **Cancel**.
> (bold right angle bracket)	Separates levels in a hierarchy of menu selections.	In the configuration editor hierarchy, select **Protocols>Ospf**.

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- JTAC hours of operation—The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

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- Find product documentation: http://www.juniper.net/techpubs/
- Find solutions and answer questions using our Knowledge Base: http://kb.juniper.net/
- Download the latest versions of software and review release notes: http://www.juniper.net/customers/csc/software/
- Search technical bulletins for relevant hardware and software notifications: http://kb.juniper.net/InfoCenter/
- Join and participate in the Juniper Networks Community Forum: http://www.juniper.net/company/communities/
- Open a case online in the CSC Case Management tool: http://www.juniper.net/cm/

To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool: https://tools.juniper.net/SerialNumberEntitlementSearch/

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You can open a case with JTAC on the Web or by telephone.

- Use the Case Management tool in the CSC at http://www.juniper.net/cm/.
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

For international or direct-dial options in countries without toll-free numbers, see http://www.juniper.net/support/requesting-support.html.

PART 1

Overview

CHAPTER 1

System Overview

EX2200 Switches Hardware Overview

Juniper Networks EX Series Ethernet Switches provide scalable connectivity for the enterprise market, including branch offices, campus locations, and data centers. The switches run the Juniper Networks Junos operating system (Junos OS), which provides Layer 2 and Layer 3 switching, routing, and security services. The same Junos OS code base that runs on EX Series switches also runs on all Juniper Networks M Series, MX Series, and T Series routers and SRX Series Services Gateways.

Juniper Networks EX2200 Ethernet Switches provide connectivity for low-density environments.

This topic describes:

EX2200 Switches First View

EX2200 switches are available in models with 12 , 24, or 48 built-in network ports. The compact, fanless model, EX2200-C switches have 12 network ports.

EX2200 switches provide:

- Up to four uplink ports
- 12 (compact, fanless model), 24, or 48 built-in network ports with 10/100/1000BASE-T Gigabit Ethernet connectors
- Virtual Chassis capability—Starting with Junos OS Release 12.2, you can connect up to four EX2200 switches (including EX2200-C switches) together to form one unit that you manage as a single chassis, called a *Virtual Chassis*. For information about understanding and configuring Virtual Chassis, see *Virtual Chassis Feature Guide for EX2200, EX3300, EX4200, EX4500 and EX4550 Switches*.
- Power over Ethernet (PoE or PoE+) on all network ports (in PoE-capable models)

Uplink Ports

Each EX2200 switch except the EX2200-C switch model has four uplink ports that support 1-gigabit small form-factor pluggable (SFP) transceivers for use with fiber connections and copper connections.

Each EX2200-C switch has two dual-purpose uplink ports. Each dual uplink port consists of an RJ-45 port (in which you can connect a copper Ethernet cable) and an SFP port (into which you can plug a transceiver). Only one of the ports can be active at a time. By default, if you connect a copper Ethernet cable to the RJ-45 port, this port becomes the active port provided that there is no connection made on the other port. If you plug a transceiver into the SFP port, this port becomes the active port whether or not a copper Ethernet cable is connected to the other port. You can change this default behavior by explicitly configuring a media type—copper or fiber—for the dual-purpose port by using the **media-type** command. For more information, see *Configuring the Media Type on Dual-Purpose Uplink Ports (CLI Procedure)*.

You can use an SFP uplink port connection between EX2200 switches to interconnect the switches into an EX2200 Virtual Chassis. For this, you must explicitly configure an SFP port each on the switches to be connected as a VCP. See *Setting an Uplink Port on an EX Series Switch as a Virtual Chassis Port (CLI Procedure)*.

For information about the supported optical and copper interfaces, see "Pluggable Transceivers Supported on EX2200 Switches" on page 67.

Console Port

Each EX2200 switch except the EX2200-C switch model has an RJ-45 console port that accepts a cable with RJ-45 connector.

The EX2200-C switch has two console ports: an RJ-45 port and a Mini-USB Type-B port. The RJ-45 console port accepts a cable with an RJ-45 connector and the Mini-USB Type-B console port accepts a Mini-B plug (5-pin) connector to connect to the console management device. The switch activates only one console port at a time, either the RJ-45 console port or the Mini USB type-B console port. By default, the RJ-45 port is the active console port and the Mini-USB Type-B port is the passive console port. You can change the default setting of a console port by using the **port-type** command. See *Configuring the Console Port Type (CLI Procedure)*.

Cable Guard

On an EX2200-C switch model, you can install a cable guard to secure the cables connected to the switch. The cable guard has slots in the front of it through which you can pass all the cables to prevent them from being accidently unplugged or removed after they are connected. See "Mounting an EX2200 Switch on a Desk or Other Level Surface" on page 92.

Security Slots

Each EX2200-C switch model has security slots on the left and right panels of the chassis. Use the security slots to lock and secure the chassis in the installation site with a standard cable lock . See "Mounting an EX2200 Switch on a Desk or Other Level Surface" on page 92.

Power over Ethernet (PoE) Ports

EX2200 switches are available in models with or without PoE/PoE+ capability. Models that support PoE/PoE+ provide that support on all network ports. PoE ports provide electrical current to devices—such as IP phones, wireless access points, and security cameras—through network cables, thus eliminating the need for separate power cords for those devices.

EX2200 switches with DC power supply do not provide PoE.

NOTE: Starting with Junos OS Release 12.2R1, PoE commands are enabled on all non-PoE-capable EX2200 switch models. The PoE commands do not provide any meaningful information on standalone non-PoE-capable switch models. However, in an EX2200 Virtual Chassis, you can execute PoE commands from a non-PoE-capable switch that is the master, to configure PoE on PoE-capable Virtual Chassis members.

PoE-capable EX2200 switches running Junos OS Release 10.3 or later support powered devices that comply with IEEE 802.3af (PoE) and IEEE 802.3at (PoE+).

NOTE: IEEE 802.3at class 4 powered devices require category 5 or higher Ethernet cables.

EX2200 switches running Junos OS Release 10.2 or earlier support powered devices that comply with IEEE 802.3af (PoE).

The remainder of this topic uses the term PoE to refer to both PoE and PoE+ unless there is a need to distinguish between the two.

Front Panel of an EX2200 Switch

The front panel of an EX2200 switch except the EX2200-C switch models consists of the following components:

- Network ports—depending on the switch model, either of:
  - 24 or 48 10/100/1000BASE-T Gigabit Ethernet ports, with Power over Ethernet (PoE) not available in EX2200-24T, EX2200-24T-DC, and EX2200-48T models
  - 24 or 48 10/100/1000BASE-T Gigabit Ethernet ports, with Power over Ethernet (PoE) available in EX2200-24P and EX2200-48P models
- 4 built-in SFP uplink ports. You can use these ports to forward network traffic or configure them into Virtual Chassis ports (VCPs) to interconnect EX2200 switches into a Virtual Chassis.
- 2 chassis status LEDs
- 4 port status mode LEDs
- Factory reset/Mode button

Figure 1 on page 6 shows the front panel of an EX2200 switch with 48 Gigabit Ethernet ports. Figure 2 on page 6 shows the front panel of an EX2200 switch with 24 Gigabit Ethernet ports.

Figure 1: Front Panel of an EX2200 Switch with 48 Gigabit Ethernet Ports

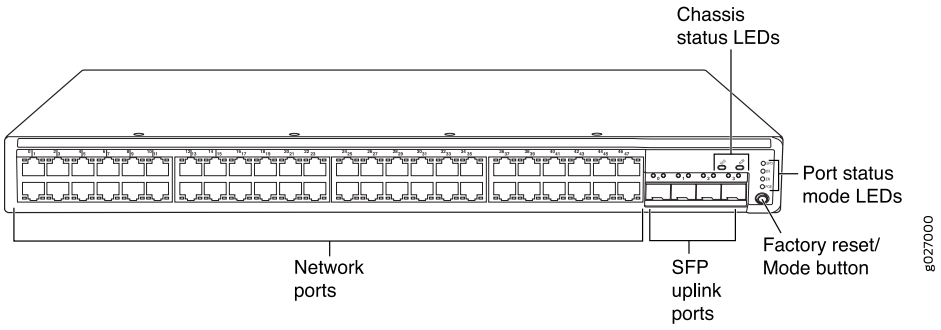
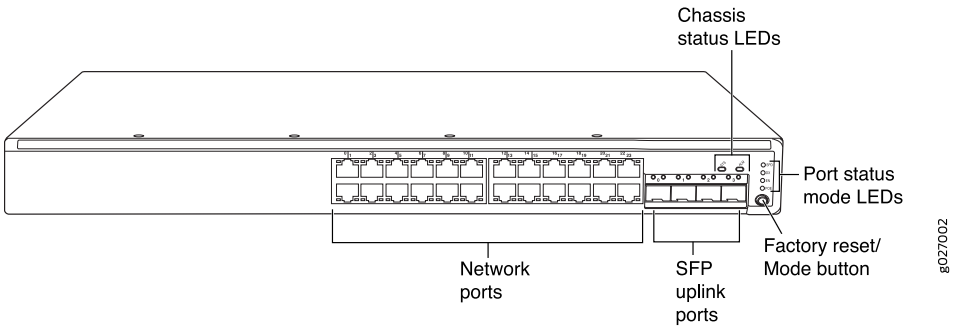


Figure 2: Front Panel of an EX2200 Switch with 24 Gigabit Ethernet Ports



The front panel of an EX2200-C switch consists of the following components:

- Network ports—depending on the switch model, either of:
  - 12 10/100/1000BASE-T Ethernet ports, (PoE+) in EX2200-C-12P
  - 12 10/100/1000BASE-T Ethernet ports, (non-PoE) in EX2200-C-12T
- 2 built-in dual-purpose uplink ports, each of which includes one 10/100/1000 RJ-45 Ethernet port and one SFP port
- 1 USB port
- 1 Mini-USB console port
- 1 RJ-45 console port
- 1 Management Ethernet port
- 2 chassis status LEDs
- 4 port status mode LEDs in PoE+ and 3 port status mode LEDs in non-PoE
- Factory reset/Mode button

Figure 3 on page 7 shows the front panel of an EX2200-C switch with 12 Gigabit Ethernet PoE+ ports and Figure 4 on page 7 shows the front panel of an EX2200-C switch with 12 Gigabit Ethernet non-PoE ports.

Figure 3: Front Panel of an EX2200-C Switch with 12 Gigabit Ethernet Ports (PoE+)

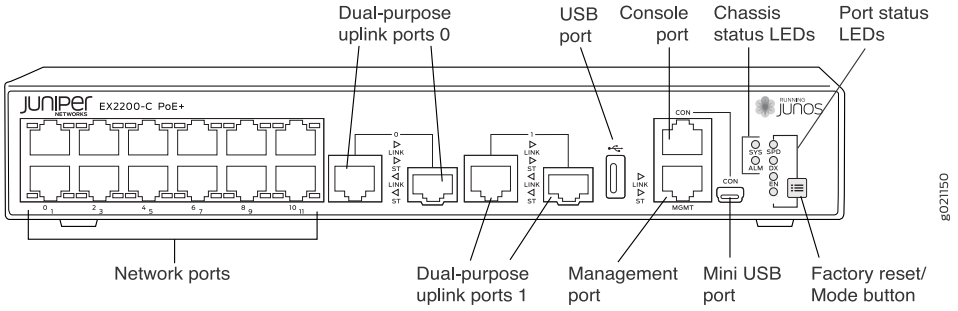
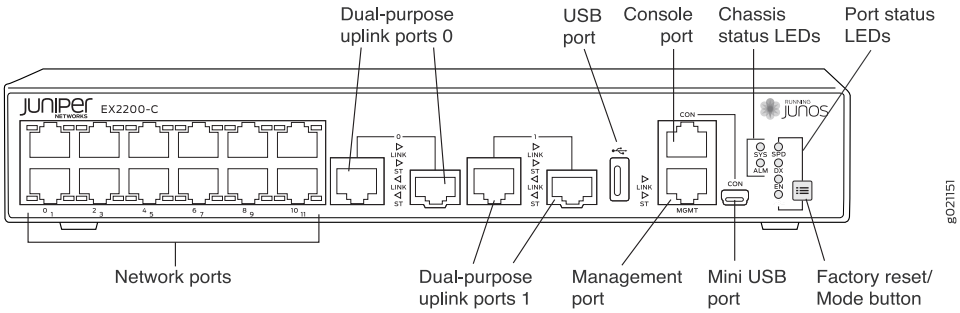


Figure 4: Front Panel of an EX2200-C Switch with 12 Gigabit Ethernet Ports (non-PoE)



Rear Panel of an EX2200 Switch

The rear panel of the EX2200 switch except the EX2200-C switch models consists of the following components:

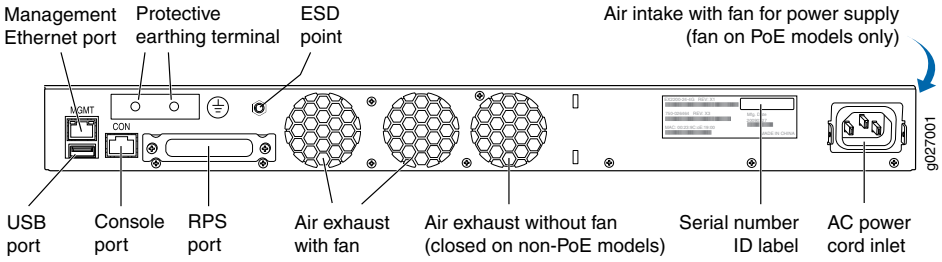
- Management Ethernet port
- USB port
- Console port
- Protective earthing terminal
- Redundant power system (RPS) port
- ESD point
- Air exhaust
- Serial number ID label
- AC power cord inlet or DC power terminals

Figure 5 on page 8 shows the rear panel of an EX2200 switch with an AC power supply.

All EX2200 switches except the EX2200-C switch model have three exhaust openings on the rear panel. The two exhaust openings on the left have fans behind them and are open. The exhaust opening on the right has no fan within it. This opening is exposed on Power over Ethernet (PoE) models and sealed on non-PoE models. On PoE models, this opening exhausts the air from the fan at the air intake for the power supply on the side panel.

The power cord retainer clips extend out of the chassis by 3 in.

Figure 5: Rear Panel of an EX2200 Switch with AC Power Supply



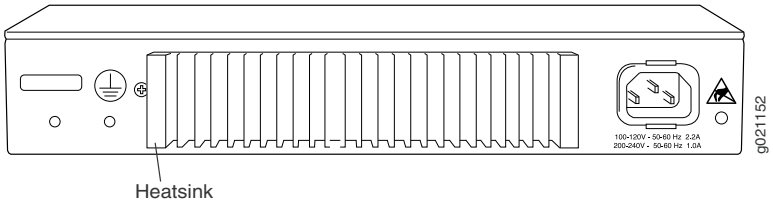
The rear panel of an EX2200-C switch consists of the following components:

- Protective earthing terminal
- ESD point
- Serial number ID label
- AC power cord inlet
- Heatsink—only in PoE+ models

Figure 6 on page 9 shows the rear panel of an EX2200-C-12P switch with heatsink.

EX2200-C switches being fanless models have no exhaust openings. The switch has vents on the top and on both the sides of the chassis. The PoE+ models have a heatsink installed in the rear panel to dissipate the heat, while non-PoE models have no heatsink.

Figure 6: Rear Panel of an EX2200-C-12P Switch with Heatsink



Related Documentation

- EX2200 Switch Models on page 9
- Site Preparation Checklist for EX2200 Switches on page 47

EX2200 Switch Models

The EX2200 switch is available with 12, 24, or 48 built-in network ports with full Power over Ethernet (PoE) capability (all 12, 24, or 48 built-in network ports support PoE) or no PoE capability. EX2200 switches with DC power supply do not provide PoE. Table 3 on page 9 lists the EX2200 switch models.

Table 3: EX2200 Switch Models

Model	Access Ports	Ports in Which PoE is Available	Maximum System Power Available for PoE	First Junos OS Release
EX2200-C-12T-2G	12 Gigabit Ethernet	–	–	11.3R1
EX2200-C-12P-2G	12 Gigabit Ethernet	All 12 ports	100 W	11.3R1
EX2200-24T-4G	24 Gigabit Ethernet	–	–	10.1R1
EX2200-24P-4G	24 Gigabit Ethernet	All 24 ports	405 W	10.1R1
EX2200-24T-4G-DC	24 Gigabit Ethernet	–	–	10.1R1
EX2200-48T-4G	48 Gigabit Ethernet	–	–	10.1R1
EX2200-48P-4G	48 Gigabit Ethernet	All 48 ports	405 W	10.1R1

Related Documentation

- EX2200 Switches Hardware Overview on page 3

EX2200 Switch Hardware and CLI Terminology Mapping

This topic describes the hardware terms used in EX2200 switch documentation and the corresponding terms used in the Junos OS command line interface (CLI). See Table 4 on page 10.

Table 4: CLI Equivalents of Terms Used in Documentation for EX2200 Switches

Hardware Item (as displayed in the CLI)	Description (as displayed in the CLI)	Value (as displayed in the CLI)	Item in Documentation	Additional Information
Chassis	One of the following: • EX2200-C-12T-2G • EX2200-C-12P-2G • EX2200-24T-4G • EX2200-24P-4G • EX2200-24T-4G-DC • EX2200-48T-4G • EX2200-48P-4G	–	Switch chassis	"Chassis Physical Specifications for EX2200 Switches" on page 13
FPC (*n*)	Abbreviated name of the Flexible PIC Concentrator (FPC) One of the following: • EX2200-C-12T-2G • EX2200-C-12P-2G • EX2200-24T-4G • EX2200-24P-4G • EX2200-24T-4G-DC • EX2200-48T-4G • EX2200-48P-4G	Value of *n* is always 0.	The switch does not have actual FPCs. In this case, FPC refers to the switch itself.	*Understanding Interface Naming Conventions on EX Series Switches*
PIC (*n*)	Abbreviated name of the Physical Interface Card (PIC)	*n* is a value in the range of 0–1.	The switch does not have actual PIC devices; see entries for PIC 0 through PIC 1 for the equivalent item on the switch.	*Understanding Interface Naming Conventions on EX Series Switches*
	One of the following: • 12x 10/100/1000 BASE-T • 24x 10/100/1000 BASE-T • 48x 10/100/1000 BASE-T	PIC 0	Built-in network ports on the front panel of the switch	"EX2200 Switches Hardware Overview" on page 3

Table 4: CLI Equivalents of Terms Used in Documentation for EX2200 Switches *(continued)*

Hardware Item (as displayed in the CLI)	Description (as displayed in the CLI)	Value (as displayed in the CLI)	Item in Documentation	Additional Information
	One of the following: • 2x (10/100/1000 BASE-T or GE SFP) or • 2x (100/1000 BASE-X) • 4x GE SFP	PIC 1	Built-in uplink ports and dual-purpose uplink ports on the front panel of the switch	"EX2200 Switches Hardware Overview" on page 3
Xcvr (*n*)	Abbreviated name of the transceiver	*n* is a value equivalent to the number of the port in which the transceiver is installed.	Optical transceivers	"Pluggable Transceivers Supported on EX2200 Switches" on page 67
Power supply (*n*)	Built-in power supply	Value of *n* is always 0.	AC power supply	"Power Supply in EX2200 Switches" on page 23
Fan	Fan NOTE: EX2200-C switches are fanless models.	–	Fan	"Cooling System and Airflow in an EX2200 Switch" on page 19

Related Documentation

- EX2200 Switches Hardware Overview on page 3

CHAPTER 2

Chassis Components and Descriptions

Chassis Physical Specifications for EX2200 Switches

The EX2200 switch chassis is a rigid sheet-metal structure that houses the hardware components. Table 5 on page 13 summarizes the physical specifications of the EX2200 switch chassis.

Table 5: Physical Specifications of the EX2200 Switch Chassis

Description	EX2200 Value	EX2200-C Value
Chassis height	1.75 in. (4.45 cm)	1.75 in. (4.4 cm)
Chassis width	• 17.5 in. (44.5 cm) • 19 in. (48.2 cm) with mounting brackets attached	• 10.6 in. (26.92 cm) • 19 in. (48.26 cm) with mounting brackets
Chassis depth	10.5 in. (26.7 cm)	• EX2200-C-12T: 9.0 in. (22.8 cm) • EX2200-C-12P: 9.4 in. (23.8 cm)
Weight	• EX2200-24T: 6 lb (2.7 kg) • EX2200-24P: 8 lb (3.6 kg) • EX2200-24T-DC: 6 lb (2.7 kg) • EX2200-48T: 8 lb (3.6 kg) • EX2200-48P: 10 lb (4.5 kg)	• EX2200-C-12T: 4.6 lb (2.1 kg) • EX2200-C-12P: 6.4 lb (2.9 kg)

Related Documentation

- Rack Requirements on page 55
- Cabinet Requirements on page 56
- Mounting an EX2200 Switch on page 90
- Installing and Connecting an EX2200 Switch on page 89

Chassis Status LEDs in EX2200 Switches

The front panel of an EX2200 switch has two chassis status LEDs labeled SYS and ALM on the far right side of the panel. See Figure 7 on page 14 and Figure 8 on page 14.

Figure 7: Chassis Status LEDs in an EX2200 Switch Except the EX2200-C Switch

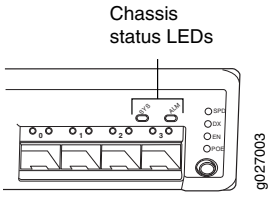


Figure 8: Chassis Status LEDs in an EX2200-C Switch

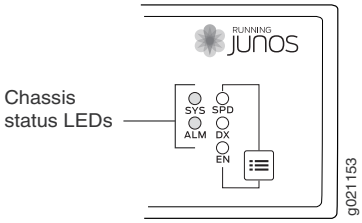


Table 6 on page 14 describes the chassis status LEDs in an EX2200 switch, their colors and states, and the status they indicate.

Table 6: Chassis Status LEDs in an EX2200 Switch

LED Label	Color	State and Description
SYS	Green	• On steadily—The switch is functioning normally. • Blinking—The switch is booting. • Off—The switch is powered off or is halted.
ALM	Unlit	There is no alarm or the switch is halted.
	Amber	There is a minor alarm.
	Red	There is a major alarm.

A major alarm (red) indicates a critical error condition that requires immediate action.

A minor alarm (amber) indicates a noncritical condition that requires monitoring or maintenance. A minor alarm that is left unchecked might cause interruption in service or performance degradation.

Both LEDs can be lit simultaneously.

You can view the colors of the two LEDs remotely through the CLI by issuing the operational mode command *show chassis led*.

Related Documentation

- EX2200 Switches Hardware Overview on page 3
- Chassis Component Alarm Conditions on EX2200 Switches on page 166
- Checking Active Alarms with the J-Web Interface on page 172
- Understanding Alarm Types and Severity Levels on EX Series Switches on page 165

Management Port LEDs in EX2200 Switches

The management port on an EX2200 switch has two LEDs that indicate link/activity and port status. The EX2200 switches except the EX2200-C switch models have the management port on the rear panel and the EX2200-C switch has the management port on the front panel. See Figure 9 on page 15 and Figure 10 on page 15.

Figure 9: LEDs on the Management Port on an EX2200 Switch Except the EX2200-C Switch Model

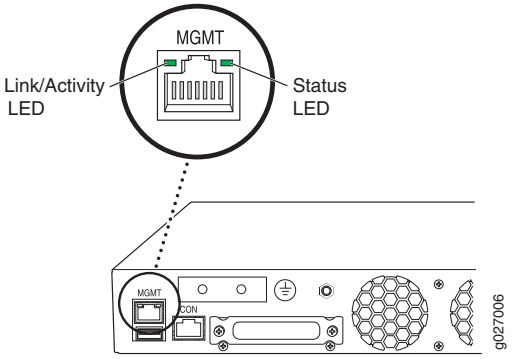


Figure 10: LEDs on the Management Port on an EX2200-C Switch

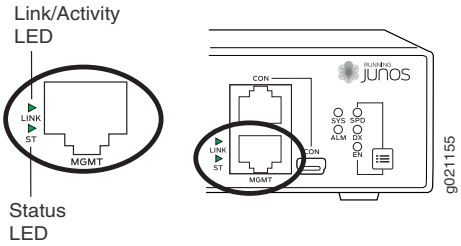


Table 7 on page 15 describes the Link/Activity LED.

Table 7: Link/Activity LED on the Management Port on EX2200 Switches

LED	Color	State and Description
Link/Activity	Green	• Blinking—The port and the link are active, and there is link activity. • On steadily—The port and the link are active, but there is no link activity. • Off—The port is not active.

Table 8 on page 16 describes the Status LED.

Table 8: Status LED on the Management Port on EX2200 Switches

LED	Color	State and Description
Status	Green	Indicates the speed. The speed indicators are: • One blink per second—10 Mbps • Two blinks per second—100 Mbps

Related Documentation

- Connecting a Device to a Network for Out-of-Band Management on page 127

Network Port and Uplink Port LEDs in EX2200 Switches

Each network port and uplink port on the front panel of an EX2200 switch has two LEDs that indicate link/activity and port status. Each dual-purpose uplink port in an EX2200-C switch has two pairs of LEDs that indicate the link/activity status, one pair for each of the two ports that constitute the dual-purpose uplink port. See Figure 11 on page 16, Figure 12 on page 16, and Figure 13 on page 17.

Figure 11: LEDs on the Network Port

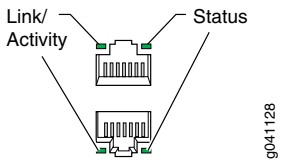


Figure 12: LEDs on the Uplink Ports and Port Status Mode LEDs in an EX2200 Switch Except the EX2200-C Switch Model

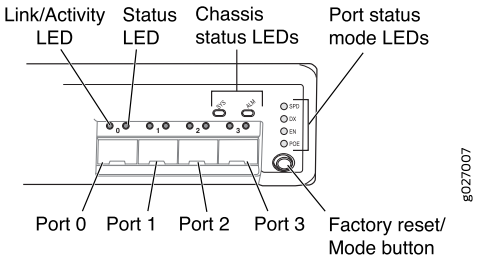


Figure 13: Port Status Mode LEDs of the Dual-Purpose Uplink Ports of an EX2200-C Switch

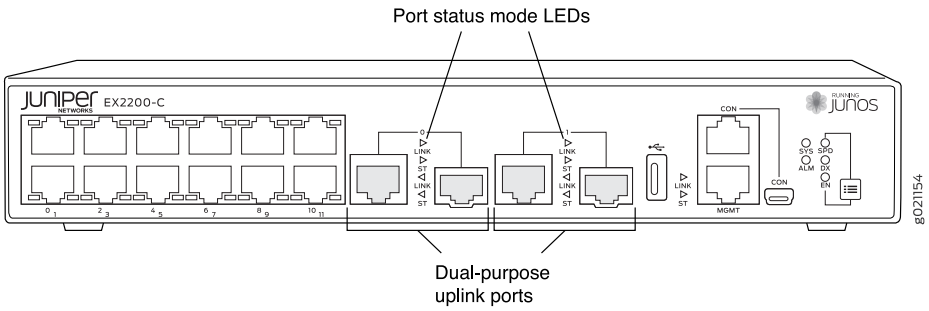


Table 9 on page 17 describes the Link/Activity LED.

Table 9: Link/Activity LED on the Network Ports and Uplink Ports in EX2200 Switches

LED	Color	State and Description
Link/Activity	Green	• Blinking—The port and the link are active, and there is link activity. • On steadily—The port and the link are active, but there is no link activity. • Off—The port is not active.

In Figure 11 on page 16, Figure 12 on page 16, and Figure 13 on page 17 show the LEDs that indicate the status of one of the four port parameters—speed, duplex mode, administrative status, and Power over Ethernet (PoE) status. Use the Factory reset/Mode button below the LED labeled **POE** on the far right side of the front panel to toggle the Status LED to show the different port parameters. You can tell which port parameter is indicated by the Status LED by looking at which port status mode LED (SPD, DX, EN, and POE) is lit. (See Figure 12 on page 16).

Table 10 on page 17 describes the Status LED.

Table 10: Status LED on the Network Ports, Uplink Ports, and Dual-Purpose Uplink Ports in EX2200 Switches

Port Parameters	State and Description
Speed	Indicates the speed. The speed indicators for network ports are: • One blink per second—10 Mbps • Two blinks per second—100 Mbps • Three blinks per second—1000 Mbps The speed indicators for uplink ports are: • On steadily—1000 Mbps • Off—10/100 Mbps The speed indicators for dual-purpose uplink ports of EX2200-C switch model are: • One blink per second—10 Mbps • Two blinks per second—100 Mbps • Three blinks per second—1000 Mbps

Table 10: Status LED on the Network Ports, Uplink Ports, and Dual-Purpose Uplink Ports in EX2200 Switches *(continued)*

Port Parameters	State and Description
Duplex mode	Indicates the duplex mode. The status indicators are: • On steadily—Port is set to full-duplex mode. • Off—Port is set to half-duplex mode.
Administrative status	Indicates the administrative status. The status indicators are: • On steadily—Port is administratively enabled. • Off—Port is administratively disabled.

PoE status	Indicates the PoE status. The status indicators for network ports are:
	• On steadily—PoE is available on the port, a device that draws power from the port is connected to the port, and the device is drawing power from the port.
	• Blinking—PoE is available on the port, but no power is drawn from the port because of one of the following:
	  ◦ No device that draws power from the port is connected to the port.
	  ◦ A device that draws power from the port is connected to the port, but the device is not drawing any power from the port.
	• Off—PoE is not available on the port.
	NOTE: PoE Status LED is available on the following EX2200 switch models:
	• EX2200-C-12P
	• EX2200-24P
	• EX2200-48P
	PoE is not available on uplink ports; therefore, the LED for those ports is always unlit.

You can tell which port parameter is indicated by the Status LED on network ports, uplink ports, and dual-purpose uplink ports by issuing the operational mode command **show chassis led**.

Related Documentation

- EX2200 Switches Hardware Overview on page 3
- *Configuring Gigabit Ethernet Interfaces (CLI Procedure)*
- *Configuring Gigabit Ethernet Interfaces (J-Web Procedure)*

CHAPTER 3

Cooling System and Airflow

Cooling System and Airflow in an EX2200 Switch

The cooling system in EX2200 switches, except EX2200-C, the compact, fanless models, consists of two fans along the rear of the chassis that provide side-to-rear chassis cooling. In the PoE models of these switches, there is an additional fan in the power supply.

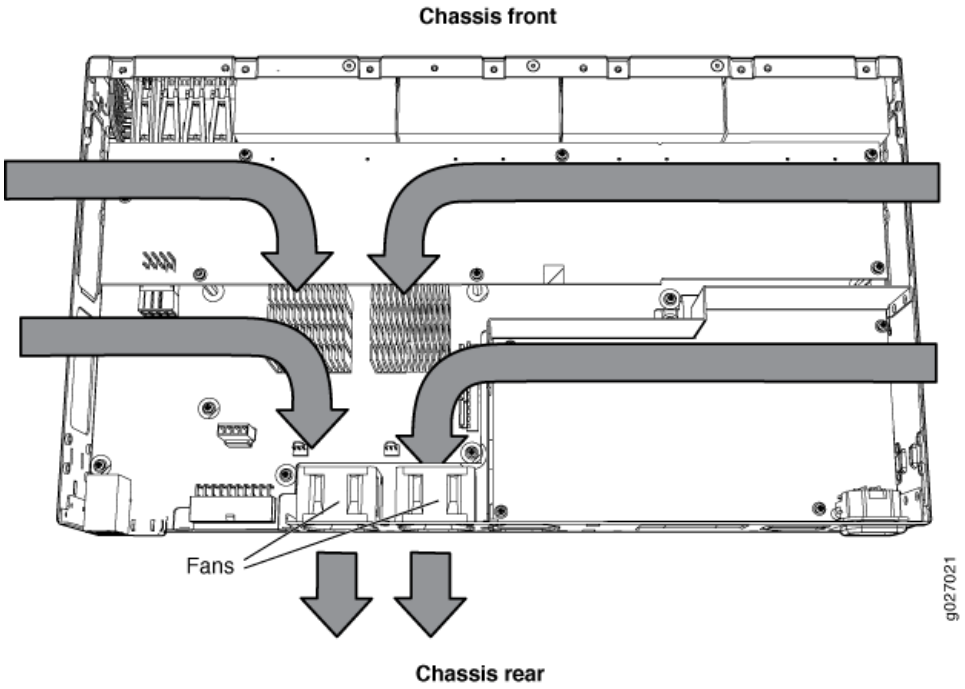
In the EX2200-C switch the cooling is done by the vents on top and sides of the chassis in non-PoE models and by heatsinks in PoE+ models. Do not block the vents on the chassis. Doing this can lead to overheating of the switch chassis

This topic describes:

Airflow Direction in Non-PoE Models of EX2200 Switches, Except for the EX2200-C Models

Figure 14 on page 20 shows the airflow in non-PoE models of EX2200 switches, except for the EX2200-C models.

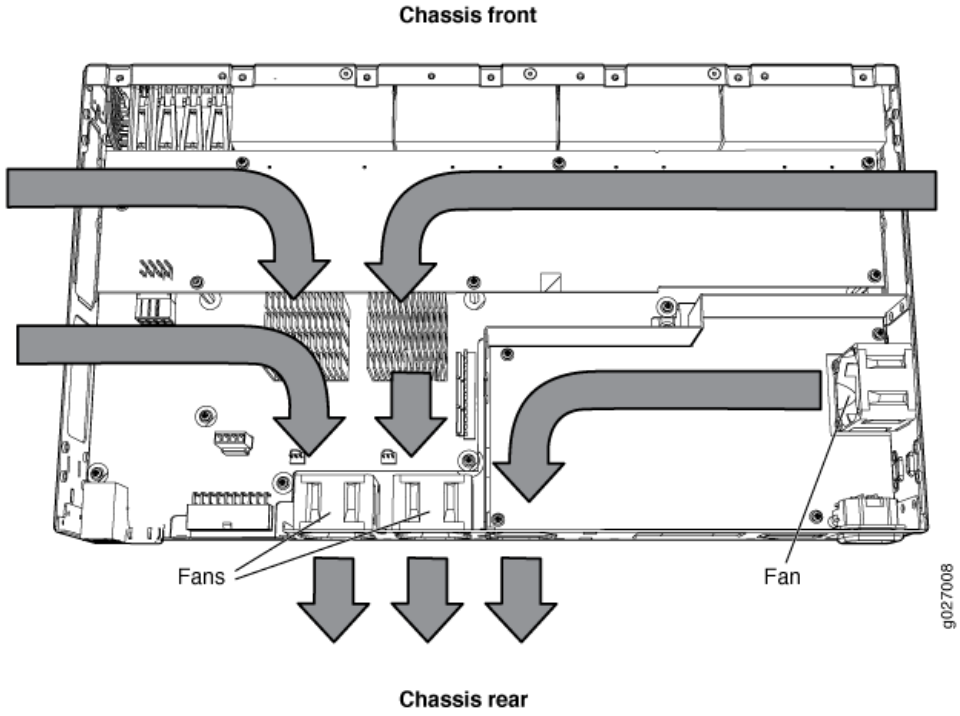
Figure 14: Airflow Through Non-PoE Models of EX2200 Switches Except the EX2200-C Switch Model



Airflow Direction in PoE Models of EX2200 switches, Except for the EX2200-C Models

Figure 15 on page 21 shows the airflow in PoE models of EX2200 switches, except EX2200-C models.

Figure 15: Airflow Through PoE Models of EX2200 Switches Except the EX2200-C Switch Models



Under normal operating conditions, the fans operate at a moderate speed to reduce noise. Temperature sensors in the chassis monitor the temperature within the chassis. If any fan fails or if the temperature inside the chassis rises above the threshold, the switch raises an alarm and all functioning fans operate at a higher speed than normal. If the temperature inside the chassis rises above the threshold, the switch shuts down automatically.

Related Documentation

- EX2200 Switches Hardware Overview on page 3
- Chassis Status LEDs in EX2200 Switches on page 14
- Understanding Alarm Types and Severity Levels on EX Series Switches on page 165
- Prevention of Electrostatic Discharge Damage on page 211

CHAPTER 4

Power Supplies

Power Supply in EX2200 Switches

The power supply in EX2200 switches is built in along the rear panel of the chassis, with an AC power cord inlet or DC power terminals on the rear panel to connect power to the switch.

Table 11 on page 23 lists the power consumed by each EX2200 switch model. The maximum power available on a PoE port is 30 W for switches running Junos OS Release 10.3 or later and 15.4 W for switches running Junos OS Release 10.2 or earlier.

Table 11: Power Consumed by EX2200 Switches

Model Number	Number of PoE-Enabled Ports	Maximum Power Consumed by the Switch	Maximum PoE Power Available
EX2200-C-12T	–	30 W	–
EX2200-C-12P	12	30 W (when no PoE power is drawn)	100 W
EX2200-24T	–	50 W	–
EX2200-24P	24	60 W (when no PoE power is drawn)	405 W
EX2200-24T-DC	–	50 W	–
EX2200-48T	–	76 W	–
EX2200-48P	48	91 W (when no PoE power is drawn)	405 W

Related Documentation

- AC Power Cord Specifications for EX2200 Switches on page 62
- EX2200 Switches Hardware Overview on page 3
- Power Specifications for EX2200 Switches on page 61

- Connecting AC Power to an EX2200 Switch on page 121
- Connecting DC Power to an EX2200 Switch on page 123
- Connecting Earth Ground to an EX Series Switch on page 115

CHAPTER 5

Viewing System Information

Dashboard for EX Series Switches

NOTE: This topic applies only to the J-Web Application package.

When you log in to the J-Web user interface, the dashboard for the Juniper Networks EX Series Ethernet Switches appears. Use the dashboard to view system information.

The Update Available window appears if there is a latest update of the J-Web Application package available on the Juniper Networks server. This window is enabled by the auto update feature of J-Web.

NOTE:

- The Update Available window will *not* appear when you log in, if you have not selected the **Check for updates automatically on every login** in the *Update Preference* section in the **Maintain > Update J-Web** side pane. By default, the *Check for update automatically on every login* is selected.
- If you choose *Update Later*, you can update to the latest J-Web Application package by clicking the orange icon next to *Update Available* on the top pane of the J-Web interface or through **Maintain > Update J-Web**.

The dashboard comprises a graphical chassis viewer and four panels.

This topic describes:

- File System Usage on page 32
- Chassis Viewer on page 32

Graphical Chassis Viewer

The Dashboard panel displays a graphical view of the chassis of a switch. In a Virtual Chassis, it displays a graphical view of each member switch.

In a Virtual Chassis, the default values are shown on the Dashboard panel when no chassis image is clicked. The panel displays the value for a switch if you click its image.

NOTE: If the member switch is not present, inactive, or not provisioned, you cannot expand the member switch image.

In J-Web Application package Release 14.1X53-A2, you can form a Virtual Chassis using EX4600 and EX4300 switches. When in a mixed Virtual Chassis consisting of EX4600 switches and EX4300 switches, the EX4600 switches can be the master, backup, or in the linecard role, while the EX4300 switches must be in the linecard role.

Table 12 on page 26 lists the details that are displayed on each member switch.

Table 12: Details of a Virtual Chassis Member Switch

Details	Example
Model number of the member switch	**EX3300**
Assigned ID that applies to the entire Virtual Chassis configuration	**ID 2** NOTE: If the member switch is not provisioned, the serial number of the switch is displayed instead of its ID.
Role of the member switch	**Master** Possible roles are: **Master**, **Backup**, or **Linecard**
Status of the member switch	**Prsnt** Possible statuses are: **Prsnt**, **NotPrsnt**, **Inactive**, or **Unprvsnd**

The status of the member switch is displayed on the image of the switch. If the member switch appears dimmed, it means the switch is not present, is inactive, or is not provisioned in the Virtual Chassis. If the member switch does not appear dimmed, it means the switch is present and is active.

Table 13 on page 27 describes the possible status of a member switch.

Table 13: Status of a Member Switch in a Virtual Chassis

If the member switch is	It appears as	It means the member switch
Present	**Prsnt**	Has established physical and logical connections with Virtual Chassis member switches.
Not present	dimmed and **NotPrsnt**	Has been disconnected from the existing Virtual Chassis.
Inactive	dimmed and **Inactive**	Has established physical connections, but is unable to establish logical connections.
Not provisioned	dimmed and **Unprvsnd**	Cannot synchronize with the existing preprovisioned Virtual Chassis.

Click **Rear View** for a graphical view of the rear panel of the switch.

Click **Preferences** to choose which panels must be displayed and set the refresh interval for chassis viewer information. Click **OK** to save your changes and return to the dashboard or click **Cancel** to return to the dashboard without saving changes.

NOTE: You can drag the various panels to different locations in the J-Web window.

System Information Panel

Table 14: System Information

Field	Description
System name	Indicates the local name of the EX Series switch. The local name of the EX Series switches changes when an individual image is clicked.
Device model	Indicates the model of the EX Series switch. In a Virtual Chassis configuration, to indicate the model of a switch, click the image of that switch. NOTE: In a Virtual Chassis setup for an EX6210, EX8208, or EX8216 switch, the Device model field displays details of the master Routing Engine. To view details of a member, select it.

Table 14: System Information *(continued)*

Field	Description
Inventory details	Indicates the following: • For EX3200 switches; and for EX2200, EX2200-C, EX3300, EX4200, EX4300, EX4500, EX4550, and EX4600 switches that are not configured as Virtual Chassis, the value displayed in Inventory details field is always 1 FPC. FPC is a legacy term for a slot in a large Juniper Networks chassis; which simply refers to the standalone switch. • For EX2200 and EX2200-C switches configured as a Virtual Chassis, the value displayed in the Inventory details field is 1–4 FPC, with the number corresponding to the number of member switches. • For EX3300 switches configured as a Virtual Chassis, the value displayed in the Inventory details field is 1–6 FPC, with the number corresponding to the number of member switches. NOTE: For Junos OS Release 14.1X53-D10 and later, EX3300 switches configured as a Virtual Chassis display the value 1–10 FPC in the Inventory details field. • For EX4200, EX4500, EX4550, and EX4600 switches configured as a Virtual Chassis, the value displayed in the Inventory details field is 1–10 FPC, with the number corresponding to the number of member switches. • For EX6210 switches, the values displayed in the Inventory details field are 1–2 CB and 1–9 FPC. CB, or Control Board, refers to the SRE module. FPC refers to line cards and the FPC within the CB. • For an EX8208 switch, the values displayed in Inventory details field are 1–3 CB and 0–8 FPC. CB, or Control Board, refers to SRE and SF modules. FPC refers to line cards. • For EX8216 switches, the values displayed in Inventory details field are 1–2 CB and 0–16 FPC. CB, or Control Board, refers to RE modules and FPC refers to line cards. • For an XRE200 External Routing Engine in an EX8200 Virtual Chassis, the value displayed in Inventory details is 1 XRE. XRE refers to RE modules. For XRE200 External Routing Engines configured as a Virtual Chassis, the values displayed in Inventory details are 1–2 XRE and 0–4 LCC, where LCC refers to the EX8200 line card chassis.
Junos image	Indicates the version of the Junos OS image. In a Virtual Chassis configuration, the Junos OS image of the master switch is displayed by default. To display the Junos OS image of a specific switch, click the image of that switch.
Boot image	Indicates the version of the boot image that is used. In a Virtual Chassis configuration, the boot image of the master switch is displayed by default. To display the boot image of a specific switch, click the image of that switch.

Table 14: System Information *(continued)*

Field	Description
Device uptime	Indicates the time since the last reboot. In a Virtual Chassis configuration, to display the uptime of the specific switch, click the image of that switch.
Last configured time	Indicates the time when the switch was last configured.

Health Status Panel

Table 15: Health Status

Field	Description
EX2200, EX2200-C, EX3200, EX3300, EX4200, and EX4300 Switches	
Memory util.	Indicates the memory used in the Routing Engine. In a Virtual Chassis configuration, the memory utilization value of the master Routing Engine is displayed. NOTE: In EX4300 and EX4600 Virtual Chassis, to display the Routing Engine memory utilization of the master or backup, click the respective image. J-Web is supported on EX4600 switches only in J-Web Application package Release 14.1X53-A2.
Flash	Indicates the usage and capacity of internal flash memory and any external USB flash drive. NOTE: In EX4300 Virtual Chassis, the flash memory utilization of the master switch is displayed by default. To display the flash memory utilization along with the internal and external flash memory utilization details for each switch or line card, mouse over individual switch or line card images. In EX4600 Virtual Chassis, to display the flash memory utilization along with the internal and external flash memory utilization details of each switch or line card mouse over the green-colored indicator.
Temp.	Indicates the chassis temperature status. Temperatures are listed in Celsius and the corresponding Fahrenheit values. NOTE: The **Temp** field is unavailable for a standalone EX2200-C switch. The **Temp** field is dynamically available for an EX2200 Virtual Chassis switch based on the model of the member clicked. NOTE: In EX4300 Virtual Chassis, the temperature of the master Routing Engine is displayed by default. To display the temperature of the Routing Engine of any switch, click the image of that switch. In EX4600 Virtual Chassis, to display the temperature of the Routing Engine of each switch, mouse over the green-colored indicator.
CPU load	Indicates the average CPU usage over 15 minutes. In a Virtual Chassis configuration, on loading the master or backup switch, the CPU load for that switch's Routing Engine is displayed by default. To display the CPU load for a specific switch's Routing Engine, click the image of that switch.

Table 15: Health Status *(continued)*

Field	Description
Fan status	Indicates the status of the fans in the fan tray. The possible values are **OK**, **Failed**, and **Absent**. In a Virtual Chassis configuration, the fan status of the master switch is displayed by default. To display the fan status for any switch , click the image of that switch. NOTE: The **Fan status** field is unavailable for a standalone EX2200-C switch. The **Fan status** field is dynamically available for an EX2200 Virtual Chassis switch based on the model of the member clicked. In EX4600 Virtual Chassis, mouse over the fan icon to display the fan status of all the switches.
EX4500 and EX4550 Switches	
Memory util.	Indicates the memory used in the Routing Engine. In a Virtual Chassis configuration, the memory utilization value of the master Routing Engine is displayed.
Flash	Indicates the usage and capacity of internal flash memory and any external USB flash drive.
Temp.	Indicates the chassis temperature status. Temperatures in the dashboard are listed in Celsius and the corresponding Fahrenheit values. NOTE: The **Temp** field is unavailable for an EX4500 switch.
CPU load	Indicates the average CPU usage over 15 minutes.
Fan status	Indicates the status of the fans in the fan tray. The possible values are **OK**, **Failed**, and **Absent**. This field also indicates the direction of airflow of the fan tray. The possible values are **Front to back** and **Back to front**.
EX6210 Switches	
Memory util.	Indicates the memory used in the master Routing Engine. Click the **backup Routing Engine** to view the memory used in the backup Routing Engine.
CPU load	Indicates the average CPU usage over 15 minutes.
Flash	Indicates the usage and capacity of internal flash memory and any external USB flash drive.
Fan status	Indicates the status of the fans in the fan tray. The possible values are **OK**, **Failed**, and **Absent**.
EX8208 Switches	
Memory util.	Indicates the memory used in the external Routing Engine. In an EX8200 Virtual Chassis, the memory utilization value of the XRE200 External Routing Engine in the master role is displayed. Click the **XRE200 External Routing Engine** in the backup role to view the memory used in the backup external Routing Engine.
CPU load	Indicates the average CPU usage over 15 minutes.
Flash	Indicates the usage and capacity of internal flash memory and any external USB flash drive.
EX8216 Switches	

Table 15: Health Status *(continued)*

Field	Description
Memory util.	Indicates the memory used in the external Routing Engine. In an EX8200 Virtual Chassis, the memory utilization value of the XRE200 External Routing Engine in the master role is displayed. Click the XRE200 External Routing Engine in the backup role to view the memory used in the backup external Routing Engine.
CPU load	Indicates the average CPU usage over 15 minutes.
Flash	Indicates the usage and capacity of internal flash memory and any external USB flash drive.
XRE200 External Routing Engines	
Memory util.	Indicates the memory used in the external Routing Engine. In an EX8200 Virtual Chassis, the memory utilization value of the XRE200 External Routing Engine in the master role is displayed. Click the backup XRE200 External Routing Engine to view the memory used in backup external Routing Engine.
CPU load	Indicates the average CPU usage over 15 minutes.
Flash	Indicates the usage and capacity of internal flash memory and any external USB flash drive.
Fan Status	Indicates the status of the fans in the fan tray. The possible values are **OK**, **Failed**, and **Absent**.

Capacity Utilization Panel

Table 16: Capacity Utilization

Field	Description
Number of active ports	Indicates the number of active ports in the switch. Configured Virtual Chassis ports (VCPs) are considered as active ports.
Total number of ports	Indicates the number of ports in the switch. NOTE: In EX3300 and EX4600 Virtual Chassis, the total number of ports of all of the switches is displayed.
Used-up MAC-Table entries	Indicates the number of MAC table entries.
Supported MAC-Table entries	Indicates the maximum number of MAC table entries permitted.
Number of VLANs configured	Indicates the number of VLANs configured. NOTE: Only tagged VLANs are counted.
Number of VLANs supported	Indicates the maximum number of VLANs supported.

Alarms Panel

Displays information about the last five alarms raised in the system. For example, if there are 5 major alarms, then details of all 5 major alarms are displayed. If there are 4 major

alarms and 3 minor alarms, then details of the 4 major alarms and 1 minor alarm are displayed. Major alarms are displayed in red and minor alarms are displayed in yellow.

In an EX8200 Virtual Chassis, the top 5 alarms for the master external Routing Engine are displayed by default. If you select an EX8200 member switch of the Virtual Chassis, the top 5 alarms for that member switch are displayed.

File System Usage

To display the file system storage details of a switch in the backup or linecard role, click the image of that switch.

Chassis Viewer

Click the **Rear View** button to see the back of the chassis image. Click the **Front View** button to see the front of the chassis image. In a Virtual Chassis configuration, the **Rear View** button is disabled if the switch is not selected.

- Table 17 on page 32—Describes the chassis viewer for EX2200 switches.
- Table 18 on page 33—Describes the chassis viewer for EX2200-C switches.
- Table 19 on page 33—Describes the chassis viewer for EX3200, EX3300, and EX4200 switches.
- Table 20 on page 35—Describes the chassis viewer for EX4300 switches.
- Table 21 on page 36—Describes the chassis viewer for EX4500 switches.
- Table 22 on page 37—Describes the chassis viewer for EX4550 switches.
- Table 23 on page 39—Describes the chassis viewer for EX4600 switches.
- Table 24 on page 39—Describes the chassis viewer for EX6210 switches.
- Table 25 on page 40—Describes the chassis viewer for EX8208 switches.
- Table 26 on page 42—Describes the chassis viewer for EX8216 switches.
- Table 27 on page 42—Describes the chassis viewer for the XRE200 External Routing Engines.

Table 17: Chassis Viewer for EX2200 Switches

Field	Description
Front View	
Interface status	In the image, the following colors denote the interface status: • Green—Interface is up and operational. • Yellow—Interface is up but is nonoperational. • Gray—Interface is down and nonoperational. Mouse over the interface (port) to view more information.
Rear View	

Table 17: Chassis Viewer for EX2200 Switches *(continued)*

Field	Description
Management (**me0**) port	The management port is used to connect the switch to a management device for out-of-band management.
Console port	The console port is used to connect the switch to a management console or to a console server. (You might do this for initial switch configuration.)
USB port	Indicates the USB port for the switch. NOTE: We recommend that you use USB flash drives purchased from Juniper Networks for your EX Series switch.
Fan tray	Mouse over the fan tray icon to display name, status, and description information.
Power supply	Mouse over the power outlet icon to display name, status, and description information.

Table 18: Chassis Viewer for EX2200-C Switches

Field	Description
Front View	
Interface status	In the image, the following colors denote the interface status: • Green—Interface is up and operational. • Yellow—Interface is up but is nonoperational. • Gray—Interface is down and nonoperational. Mouse over the interface (port) to view more information.
Management (**me0**) port	The management port is used to connect the switch to a management device for out-of-band management.
Console port	The console port is used to connect the switch to a management console or to a console server. (You might do this for initial switch configuration.)
USB port	Indicates the USB port for the switch. NOTE: We recommend that you use USB flash drives purchased from Juniper Networks for your EX Series switch.
Rear View	
Power supply	Mouse over the power outlet icon to display name, status, and description information.

Table 19: Chassis Viewer for EX3200, EX3300, and EX4200 Switches

Field	Description
Front View	

Table 19: Chassis Viewer for EX3200, EX3300, and EX4200 Switches *(continued)*

Field	Description
Interface status	In the image, the following colors denote the interface status: • Green—Interface is up and operational. • Yellow—Interface is up but is nonoperational. • Gray—Interface is down and nonoperational. Mouse over the interface (port) to view more information. For a Virtual Chassis configuration, select the switch to view the interface status. If an SFP+ uplink module is installed in the switch, mouse over the port icon to display whether the module is configured to operate in 1-gigabit mode or in 10-gigabit mode. If the module is configured to operate in 1-gigabit mode, the tool tip information is displayed for all 4 ports. If the module is configured to operate in 10-gigabit mode, the tool tip information is displayed only for 2 ports. On an EX3300 switch with the 4x GE/XE SFP+ module, mouse over the port icon to display whether the module is configured to operate in 1-gigabit mode or 10-gigabit mode. For SFP, SFP+, and XFP ports, the interfaces appear dimmed if no transceiver is inserted. The chassis viewer displays **Transceiver not plugged-in** when you mouse over the port icon.
LCD panel	LCD panel configured for the LEDs on the ports. Mouse over the icon to view the current character display.
Rear View of the EX3200 Switch	
Management (**me0**) port	The management port is used to connect the switch to a management device for out-of-band management.
Console port	The console port is used to connect the switch to a management console or to a console server. (You might do this for initial switch configuration.)
USB port	Indicates the USB port for the switch. NOTE: We recommend that you use USB flash drives purchased from Juniper Networks for your EX Series switch.
Fan tray	Mouse over the fan tray icon to display name, status, and description information.
Power supply	Mouse over the power supply icon to display name, status, and description information.
Rear View of the EX3300 and EX4200 Switch	
Fan tray	Mouse over the fan tray icon to display name, status, and description information. For a Virtual Chassis, the status of the fans of the selected member switch is displayed.
Virtual Chassis port	Displayed only when EX4200 switches are configured as a Virtual Chassis. The following colors denote the Virtual Chassis port (VCP) status: • Green—VCP is up and operational. • Yellow—VCP is up but is nonoperational. • Gray—VCP is down and nonoperational.

Table 19: Chassis Viewer for EX3200, EX3300, and EX4200 Switches *(continued)*

Field	Description
USB port	Indicates the USB port for the switch. NOTE: We recommend that you use USB flash drives purchased from Juniper Networks for your EX Series switch.
Management (**me0**) port	The management port is used to connect the switch to a management device for out-of-band management.
Console port	The console port is used to connect the switch to a management console or to a console server. (You might do this for initial switch configuration.)
Power supplies	Mouse over the power supply icons to display name, status, and description information.

Table 20: Chassis Viewer for EX4300 Switches

Field	Description
Front View	
Interface status	In the image, the colors listed below denote the interface status for both copper and fiber media type of ports: • Green—Interface is up and operational. • Yellow—Interface is up but is nonoperational. • Gray—Interface is down and nonoperational. Mouse over the interface (port) to view more information.
LCD panel	LCD panel configured for the LEDs on the ports. Mouse over the icon to view the current character display.
Mini USB console	The mini console port is used to connect the switch to the management console.
PIC 2 slot	You can install an uplink module in the PIC 2 slot. Mouse over the ports in the module to view the details of the ports in module. 24-port and 48-port EX4300 switches support the4-port 10-Gigabit SFP+ uplink module. EX4300-32F switches support the 2-port 40-Gigabit QSFP+ uplink module and the 8-port 10-Gigabit SFP+ uplink module. When you install a transceiver in the port, the following colors denote the interface status: • Green—Interface is up and operational. • Yellow—Interface is up but is not operational. • Gray—Interface is down and not operational.
NOTE: In EX4300 switches the LEDs are seen in the front panel, these are not active.	
Rear View of the EX4300 Switch	
Management port	The management port is used to connect the switch to a management device for out-of-band management.

Table 20: Chassis Viewer for EX4300 Switches *(continued)*

Field	Description
Console port	The Console port (RJ-45) is used to connect the switch to a management console or to a console server.
USB port	Indicates the USB port for the switch. NOTE: We recommend that you use USB flash drives purchased from Juniper Networks for your EX Series switch.
Fan tray	Mouse over the fan tray icons to display name, status, and description information.
Power supplies	Mouse over the power supply icons to display name, status, and description information.
PIC 1 slot	The rear panel of a 24-port and a 48-port EX4300 switch has four (built-in) 40-Gigabit QSFP+ ports, and the rear panel of an EX4300-32F switch has two (built-in) 40-Gigabit QSFP+ ports, in which you can install QSFP+ transceivers. Mouse over the ports to view the details of the ports. After you install a transceiver in the port, the following colors denote the interface status: • Green—Interface is up and operational. • Yellow—Interface is up but is not operational. • Gray—Interface is down and not operational. For QSFP+ ports, the interfaces appear dimmed if no transceiver is inserted. The chassis viewer displays **Transceiver not plugged in** when you mouse over the port. When a QSFP+ port is configured as a Virtual Chassis Port (VCP), the following colors denote the VCP status: • Green—VCP is up and operational. • Yellow—VCP is up but is not operational. • Gray—VCP is down and not operational.

Table 21: Chassis Viewer for EX4500 Switches

Field	Description
Front View	
Interface status	In the image, the colors listed below denote the interface status: • Green—Interface is up and operational. • Yellow—Interface is up but is nonoperational. • Gray—Interface is down and nonoperational. Mouse over the interface (port) to view more information. For a Virtual Chassis configuration, select the switch to view the interface status. If an SFP+ uplink module is installed in the switch, mouse over the interface (ports) on the module for more information. For SFP and SFP+ ports, the interfaces appear dimmed if no transceiver is inserted. The chassis viewer displays **Transceiver not plugged-in** when you mouse over the port icon.

Table 21: Chassis Viewer for EX4500 Switches *(continued)*

Field	Description
LCD panel	LCD panel configured for the LEDs on the ports. Mouse over the icon to view the current character display.
Console port	The console port is used to connect the switch to a management console or to a console server.
Management (**me0**) port	The management port is used to connect the switch to a management device for out-of-band management. Use this port for initial switch configuration.
USB port	Indicates the USB port for the switch. NOTE: We recommend that you use USB flash drives purchased from Juniper Networks for your EX Series switch.
Rear View of the EX4500 Switch	
Fan tray	Mouse over the fan tray icon to display status of the fans and airflow direction information. For a Virtual Chassis, the status of the fans of the selected member switch is displayed.
Virtual Chassis port	Displayed only when switches are configured as a Virtual Chassis. The colors listed below denote the Virtual Chassis port (VCP) status: • Green—VCP is up and operational. • Yellow—VCP is up but is nonoperational. • Gray—VCP is down and nonoperational.
Power supplies	Mouse over the power supply icons to display name, status, and description information.
Intraconnect module	Mouse over the module to display details of the intraconnect module. The intraconnect module helps the switch achieve line rate on all its ports.
Virtual Chassis module	Mouse over to display details of the switches in the Virtual Chassis configuration.

Table 22: Chassis Viewer for EX4550 Switches

Field	Description
Front View	

Table 22: Chassis Viewer for EX4550 Switches *(continued)*

Field	Description
Interface status	In the image, the colors listed below denote the interface status: • Green—Interface is up and operational. • Yellow—Interface is up but is nonoperational. • Gray—Interface is down and nonoperational. Mouse over the interface (port) to view more information. For a Virtual Chassis configuration, select the switch to view the interface status. If an expansion module or a Virtual Chassis module is installed in the switch, mouse over the interface (ports) on the module for more information. On an EX4550-32F switch, for SFP and SFP+ ports, the interfaces appear dimmed if no transceiver is inserted. The chassis viewer displays **Transceiver (1G/10G) not plugged in** when you mouse over the port icon.
LCD panel	LCD panel configured for the LEDs on the ports. Mouse over the icon to view the current character display.
Console port	The console port is used to connect the switch to a management console or to a console server.
Mini Console port	The mini console port is used to connect the switch to the management console.
Management (**me0**) port	The management port is used to connect the switch to a management device for out-of-band management. Use this port for initial switch configuration.
PIC1 slot	You can insert an uplink module or a Virtual Chassis module in the PIC1 slot. Mouse over to display the details of the module inserted (uplink or Virtual Chassis).
USB port	Indicates the USB port for the switch. NOTE: We recommend that you use USB flash drives purchased from Juniper Networks for your EX Series switch.
Rear View of the EX4550 Switch	
Fan tray	Mouse over the fan tray icon to display the status of the fans and airflow direction information. For a Virtual Chassis, the status of the fans of the selected member switch is displayed.
Virtual Chassis port	Displayed only when switches are configured as a Virtual Chassis. In the image, the colors listed below denote the Virtual Chassis port (VCP) status: • Green—VCP is up and operational. • Yellow—VCP is up but is nonoperational. • Gray—VCP is down and nonoperational.
Power supplies	Mouse over the power supply icons to display name, status, and description information.
PIC2 slot	You can insert an uplink module or a Virtual Chassis module into the PIC2 slot. Mouse over to display the details of the module inserted (uplink or Virtual Chassis).

Table 23: Chassis Viewer for EX4600 Switches

Field	Description
Front View	
NOTE: J-Web is supported on EX4600 switches only in J-Web Application package Release 14.1X53-A2.	
Interface status	In the image, the colors listed below denote the interface status for both copper and fiber media type of ports: • Green—Interface is up and operational. • Yellow—Interface is up but is nonoperational. • Gray—Interface is down and nonoperational. Mouse over the interface (port) to view more information.
PIC 1 and PIC 2 slots	You can install an expansion module in the PIC 1 and PIC 2 slots. If you have installed an expansion module, mouse over the ports in the module to view the details of the ports in module. When you install a transceiver in the port, the following colors denote the interface status: • Green—Interface is up and operational. • Yellow—Interface is up but is not operational. • Gray—Interface is down and not operational.
NOTE: • In EX4600 switches the LEDs are seen in the front panel; these are not active. • In EX4600 switches there is no LCD panel.	
Rear View of the EX4600 Switch	
Management port	The management ports (RJ-45 and SFP) is used to connect the switch to a management device for out-of-band management.
Console port	The Console port (RJ-45) is used to connect the switch to a management console or to a console server.
USB port	Indicates the USB port for the switch. NOTE: We recommend that you use USB flash drives purchased from Juniper Networks for your EX Series switch.
Fan tray	Mouse over the fan tray icons to display name, status, and description information.
Power supplies	Mouse over the power supply icons to display name, status, and description information.

Table 24: Chassis Viewer for EX6210 Switches

Field	Description
Front View	
Temperature	Mouse over the temperature icon to display the temperature of the CB or line card.

Table 24: Chassis Viewer for EX6210 Switches *(continued)*

Field	Description
Interface status	Select the CB or line card. In the image, the colors listed below denote the interface status: • Green—Interface is up and operational. • Yellow—Interface is up but is nonoperational. • Gray—Interface is down and nonoperational. Mouse over the interface (port) to view more information. You can view status for the following ports on the SRE module: • USB port—Indicates the USB port for the switch. NOTE: We recommend that you use USB flash drives purchased from Juniper Networks for your EX Series switch. • Management (**me0**) port—The management port is used to connect the switch to a management device for out-of-band management. There are 2 management ports: fiber and copper. The same status is displayed for both the **me0** ports. • Console port—The console port is used to connect the switch to a management console or to a console server. (You might do this for initial switch configuration.) CBs support 4 SFP+ uplink ports. Mouse over the interface on the CB for more information. For SFP and SFP+ ports, the interfaces appear dimmed if no transceiver is inserted. The chassis viewer displays **Transceiver not plugged-in** when you mouse over the port icon.
Power supplies	Mouse over the power supply icons to display name, status, and description information.
LCD panel	LCD panel configured for the LEDs on the ports. Mouse over the icon to view the current character display of the master Routing Engine. The EX6210 switch has 2 LCD panels, one for each Routing Engine. The backup Routing Engine LCD displays **Backup**.
Rear View of the EX6210 Switch	
Fan tray	Mouse over the fan tray icon to display information regarding the cooling fans.

Table 25: Chassis Viewer for EX8208 Switches

Field	Description
Front View	

Table 25: Chassis Viewer for EX8208 Switches *(continued)*

Field	Description
Interface status	In the image, click any line card, SRE module, or SF module to view the front view of the selected component. In the image, the colors listed below denote the interface status: • Green—Interface is up and operational. • Yellow—Interface is up but is nonoperational. • Gray—Interface is down and nonoperational. Mouse over the interface (port) to view more information. You can view status for the following ports on the SRE module: • USB port—Indicates the USB port for the switch. NOTE: We recommend that you use USB flash drives purchased from Juniper Networks for your EX Series switch. • Auxiliary port—This port is unavailable. • Management (**me0**) port—The management port is used to connect the switch to a management device for out-of-band management. • Console port—The console port is used to connect the switch to a management console or to a console server. (You might do this for initial switch configuration.) Because the SF module has no ports, no status information is displayed.
Slot numbers	Slots on the switch are labeled, from the top of the switch down: • 0–3 (line cards) • SRE0, SF, SRE1 (SRE and SF modules) • 4–7 (line cards)
Temperature	The active slots contain a gray temperature icon. Mouse over the icon to display temperature information for the slot.
Fan status	Mouse over the fan tray icon to display name, status, and description information.
Power supplies	Mouse over the power supply icons to display name, status, and description information.
LCD panel	LCD panel configured for the LEDs on the ports. Mouse over the icon to view the current character display.
Rear View	The EX8208 switch does not have any components on the rear of the chassis.

Table 26: Chassis Viewer for EX8216 Switches

Field	Description
Front View	
Interface status	In the image, click any line card or RE module to display the front view of the selected component. In the image, the colors listed below denote the interface status: • Green—Interface is up and operational. • Yellow—Interface is up but is nonoperational. • Gray—Interface is down and nonoperational. Mouse over the interface (port) to view more information. You can view status for the following ports on the RE module: • USB port—Indicates the USB port for the switch. NOTE: We recommend that you use USB flash drives purchased from Juniper Networks for your EX Series switch. • Auxiliary port—This port is unavailable. • Management (**me0**) port—The management port is used to connect the switch to a management device for out-of-band management. • Console port—The console port is used to connect the switch to a management console or to a console server. (You might do this for initial switch configuration.)
Slot numbers	Slots on the switch are labeled, from the top of the switch down: • RE0 (RE module) • RE1 (RE module) • 0–15 (line cards)
Temperature	The active slots contain a gray temperature icon. Mouse over the icon to display temperature information for the slot.
Fan status	Mouse over the fan tray icon to display consolidated information about the fans.
Power supplies	Mouse over the power supply icons to display name, status, and description information.
LCD panel	LCD panel configured for the LEDs on the ports. Mouse over the icon to view the current character display.
Rear View	
SF modules	Mouse over the SF module icons in their respective slots to display information. Slots are numbered SF7–SF0, from left to right.

Table 27: Chassis Viewer for XRE200 External Routing Engines

Field	Description
Front View	

Table 27: Chassis Viewer for XRE200 External Routing Engines *(continued)*

Field	Description
Interface status	In the image, the colors listed below denote the interface status: • Green—Interface is up and operational. • Yellow—Interface is up but is nonoperational. • Gray—Interface is down and nonoperational. Mouse over the interface (port) to view more information. For a Virtual Chassis configuration, select the switch to view the interface status.
Console port	The console port is used to connect the switch to a management console or to a console server.
Management (**me0**) port	The management port is used to connect the switch to a management device for out-of-band management. Use this port for initial switch configuration.
Virtual Chassis port	In the image, the colors listed below denote the Virtual Chassis port (VCP) status: • Green—VCP is up and operational. • Yellow—VCP is up but is nonoperational. • Gray—VCP is down and nonoperational. Mouse over the interface (port) to view more information.
LCD panel	LCD panel configured for the LEDs on the ports. Mouse over the icon to view the current character display.
Temperature	The active slots contain a gray temperature icon. Mouse over the icon to display temperature information for the slot.
USB port	Indicates the USB port for the switch. NOTE: We recommend that you use USB flash drives purchased from Juniper Networks for your EX Series switch.
PIC1 slot	You can install a Virtual Chassis module in the PIC1 slot. Mouse over the Virtual Chassis ports to display the port status details.
PIC2 slot	You can install a Virtual Chassis module in the PIC2 slot. Mouse over the Virtual Chassis ports to display the port status details.
Rear View of the XRE200 External Routing Engine	
Fan modules	Mouse over the fan modules to display status of the fans and airflow direction information. For a Virtual Chassis, the status of the fans of the selected member switch is displayed.
Power supplies	Mouse over the power supply icons to display name, status, and description information.

Release History Table

Release	Description
14.1X53-D10	For Junos OS Release 14.1X53-D10 and later, EX3300 switches configured as a Virtual Chassis display the value 1–10 FPC in the Inventory details field.
14.1X53-A2	In J-Web Application package Release 14.1X53-A2, you can form a Virtual Chassis using EX4600 and EX4300 switches.
14.1X53-A2	J-Web is supported on EX4600 switches only in J-Web Application package Release 14.1X53-A2.

Related Documentation

- *J-Web User Interface for EX Series Switches Overview*
- EX2200 Switches Hardware Overview on page 3
- *EX2300 Switches Hardware Overview*
- *EX3200 Switches Hardware Overview*
- *EX3300 Switches Hardware Overview*
- *EX4200 Switches Hardware Overview*
- *EX4300 Switches Hardware Overview*
- *EX4500 Switches Hardware Overview*
- *EX6210 Switch Hardware Overview*
- *EX8208 Switch Hardware Overview*
- *EX8216 Switch Hardware Overview*
- Checking Active Alarms with the J-Web Interface on page 172
- *XRE200 External Routing Engine Hardware Guide*

PART 2

Site Planning, Preparation, and Specifications

CHAPTER 6

Preparation Overview

Site Preparation Checklist for EX2200 Switches

The checklist in Table 28 on page 47 summarizes the tasks you need to perform when preparing a site for EX2200 switch installation.

Table 28: Site Preparation Checklist

Item or Task	For More Information	Performed by	Date
Environment			
Verify that environmental factors such as temperature and humidity do not exceed switch tolerances.	"Environmental Requirements and Specifications for EX Series Switches" on page 48		
Power			
Measure distance between external power sources and switch installation site.			
Locate sites for connection of system grounding.			
Calculate the power consumption and requirements.	"Power Specifications for EX2200 Switches" on page 61		
Hardware Configuration			

Table 28: Site Preparation Checklist *(continued)*

Item or Task	For More Information	Performed by	Date
Choose the number and types of switches you want to install.	"EX2200 Switches Hardware Overview" on page 3		
Rack or Cabinet			
Verify that your rack or cabinet meets the minimum requirements for the installation of the switch.	"Rack Requirements" on page 55 "Cabinet Requirements" on page 56		
Plan rack or cabinet location, including required space clearances.	"Clearance Requirements for Airflow and Hardware Maintenance for EX2200 Switches" on page 57		
Secure the rack or cabinet to the floor and building structure.			
Wall			
Verify that the wall meets the minimum requirements for the installation of the switch.	"Requirements for Mounting an EX2200 Switch on a Desktop or Wall" on page 55		
Verify that there is appropriate clearance in your selected location.	"Clearance Requirements for Airflow and Hardware Maintenance for EX2200 Switches" on page 57		
Cables			
Acquire cables and connectors: • Determine the number of cables needed based on your planned configuration. • Review the maximum distance allowed for each cable. Choose the length of cable based on the distance between the hardware components being connected.			
Plan the cable routing and management.			

Related Documentation

- General Safety Guidelines and Warnings on page 181
- General Site Guidelines on page 53
- Installing and Connecting an EX2200 Switch on page 89
- Mounting an EX2200 Switch on page 90

Environmental Requirements and Specifications for EX Series Switches

The switch must be installed in a rack or cabinet housed in a dry, clean, well-ventilated, and temperature-controlled environment.

Ensure that these environmental guidelines are followed:

- The site must be as dust-free as possible, because dust can clog air intake vents and filters, reducing the efficiency of the switch cooling system.
- Maintain ambient airflow for normal switch operation. If the airflow is blocked or restricted, or if the intake air is too warm, the switch might overheat, leading to the switch temperature monitor shutting down the switch to protect the hardware components.

Table 29 on page 49 provides the required environmental conditions for normal switch operation.

Table 29: EX Series Switch Environmental Tolerances

Switch or device	Environment Tolerance			
	Altitude	Relative Humidity	Temperature	Seismic
EX2200-C	No performance degradation up to 5,000 feet (1524 meters)	Normal operation ensured in the relative humidity range 10% through 85% (noncondensing)	Normal operation ensured in the temperature range 32° F (0° C) through 104° F (40° C) at altitudes up to 5,000 ft (1,524 m). For information about extended temperature SFP transceivers supported on EX2200 switches, see "Pluggable Transceivers Supported on EX2200 Switches" on page 67.	Complies with Zone 4 earthquake requirements as per GR-63, Issue 4.
EX2200 (except EX2200-C switches)	No performance degradation up to 10,000 feet (3048 meters)	Normal operation ensured in the relative humidity range 10% through 85% (noncondensing)	Normal operation ensured in the temperature range 32° F (0° C) through 113° F (45° C)	Complies with Zone 4 earthquake requirements as per GR-63, Issue 4.
EX2300-C	No performance degradation up to 5,000 feet (1524 meters)	Normal operation ensured in the relative humidity range 10% through 85% (noncondensing)	Normal operation ensured in the temperature range 32° F (0° C) through 104° F (40° C)	Complies with Zone 4 earthquake requirements as per GR-63, Issue 4.
EX2300 (except EX2300-C switches)	No performance degradation up to 13,000 feet (3962.4 meters) at 104° F (40° C) as per GR-63	Normal operation ensured in the relative humidity range 10% through 85% (noncondensing)	Normal operation ensured in the temperature range 32° F (0° C) through 113° F (45° C)	Complies with Zone 4 earthquake requirements as per GR-63, Issue 4.
EX3200	No performance degradation up to 10,000 feet (3048 meters)	Normal operation ensured in the relative humidity range 10% through 85% (noncondensing)	Normal operation ensured in the temperature range 32° F (0° C) through 113° F (45° C)	Complies with Zone 4 earthquake requirements as per GR-63, Issue 4.

Table 29: EX Series Switch Environmental Tolerances *(continued)*

Switch or device	Environment Tolerance			
	Altitude	Relative Humidity	Temperature	Seismic
EX3300	No performance degradation up to 10,000 feet (3048 meters)	Normal operation ensured in the relative humidity range 10% through 85% (noncondensing)	Normal operation ensured in the temperature range 32° F (0° C) through 113° F (45° C)	Complies with Zone 4 earthquake requirements as per GR-63, Issue 4.
EX3400	No performance degradation up to 10,000 feet (3048 meters)	Normal operation ensured in the relative humidity range 10% through 85% (noncondensing)	Normal operation ensured in the temperature range 32° F (0° C) through 113° F (45° C)	Complies with Zone 4 earthquake requirements as per GR-63, Issue 4.
EX4200	No performance degradation up to 10,000 feet (3048 meters)	Normal operation ensured in the relative humidity range 10% through 85% (noncondensing)	Normal operation ensured in the temperature range 32° F (0° C) through 113° F (45° C)	Complies with Zone 4 earthquake requirements as per GR-63, Issue 4.
EX4300	No performance degradation up to 10,000 feet (3048 meters)	Normal operation ensured in the relative humidity range 10% through 85% (noncondensing)	Normal operation ensured in the temperature range 32° F (0° C) through 113° F (45° C)	Complies with Zone 4 earthquake requirements as per GR-63, Issue 4.
EX4500	No performance degradation up to 10,000 feet (3048 meters)	Normal operation ensured in the relative humidity range 10% through 85% (noncondensing)	Normal operation ensured in the temperature range 32° F (0° C) through 113° F (45° C)	Complies with Zone 4 earthquake requirements as per GR-63, Issue 4.
EX4550	No performance degradation up to 10,000 feet (3048 meters)	Normal operation ensured in the relative humidity range 10% through 85% (noncondensing)	• EX4550-32F switches—Normal operation ensured in the temperature range 32° F (0° C) through 113° F (45° C) • EX4550-32T switches—Normal operation is ensured in the temperature range 32° F through 104° F (40° C)	Complies with Zone 4 earthquake requirements as per GR-63, Issue 4.

Table 29: EX Series Switch Environmental Tolerances *(continued)*

Switch or device	Environment Tolerance			
	Altitude	Relative Humidity	Temperature	Seismic
EX4600	No performance degradation to 6,562 feet (2000 meters)	Normal operation ensured in the relative humidity range 5% through 90%, noncondensing • Short-term operation ensured in the relative humidity range 5% through 93%, noncondensing NOTE: As defined in NEBS GR-63-CORE, Issue 4, short-term events can be up to 96 hours in duration but not more than 15 days per year.	• Normal operation ensured in the temperature range 32° F (0° C) through 113° F (45° C) • Nonoperating storage temperature in shipping container: –40° F (–40° C) through 158° F (70° C)	Designed to comply with Zone 4 earthquake requirements per NEBS GR-63-CORE, Issue 4.
EX6210	No performance degradation up to 10,000 feet (3048 meters)	Normal operation ensured in the relative humidity range 10% through 85% (noncondensing)	Normal operation is ensured in the temperature range 32° F (0° C) through 104° F (40° C)	Complies with Zone 4 earthquake requirements as per GR-63, Issue 4.
EX8208	No performance degradation up to 10,000 feet (3048 meters)	Normal operation ensured in the relative humidity range 10% through 85% (noncondensing)	Normal operation is ensured in the temperature range 32° F (0° C) through 104° F (40° C)	Complies with Zone 4 earthquake requirements as per GR-63, Issue 4.
EX8216	No performance degradation up to 10,000 feet (3048 meters)	Normal operation ensured in the relative humidity range 10% through 85% (noncondensing)	Normal operation is ensured in the temperature range 32° F (0° C) through 104° F (40° C)	Complies with Zone 4 earthquake requirements as per GR-63, Issue 4.
EX9204	No performance degradation up to 10,000 feet (3048 meters)	Normal operation ensured in the relative humidity range 5% through 90% (noncondensing)	Normal operation is ensured in the temperature range 32° F (0° C) through 104° F (40° C) Nonoperating storage temperature in shipping container: –40° F (–40° C) to 158° F (70° C)	Complies with Zone 4 earthquake requirements as per GR-63.
EX9208	No performance degradation up to 10,000 feet (3048 meters)	Normal operation ensured in the relative humidity range 5% through 90% (noncondensing)	Normal operation is ensured in the temperature range 32° F (0° C) through 104° F (40° C) Nonoperating storage temperature in shipping container: –40° F (–40° C) to 158° F (70° C)	Complies with Zone 4 earthquake requirements as per GR-63.

Table 29: EX Series Switch Environmental Tolerances *(continued)*

Switch or device	Environment Tolerance			
	Altitude	Relative Humidity	Temperature	Seismic
EX9214	No performance degradation up to 10,000 feet (3048 meters)	Normal operation ensured in the relative humidity range 5% through 90% (noncondensing)	Normal operation is ensured in the temperature range 32° F (0° C) through 104° F (40° C) Nonoperating storage temperature in shipping container: –40° F (–40° C) through 158° F (70° C)	Complies with Zone 4 earthquake requirements as per GR-63.
XRE200	No performance degradation up to 10,000 feet (3048 meters)	Normal operation ensured in the relative humidity range 10% through 85% (noncondensing)	Normal operation ensured in the temperature range 41° F (5° C) through 104° F (40° C)	Complies with Zone 4 earthquake requirements as per GR-63, Issue 4.

NOTE: Install EX Series switches only in restricted areas, such as dedicated equipment rooms and equipment closets, in accordance with Articles 110–16, 110–17, and 110–18 of the National Electrical Code, ANSI/NFPA 70.

Related Documentation

- Clearance Requirements for Airflow and Hardware Maintenance for EX2200 Switches on page 57
- *Clearance Requirements for Airflow and Hardware Maintenance for EX2300 Switches*
- *Clearance Requirements for Airflow and Hardware Maintenance for EX3200 Switches*
- *Clearance Requirements for Airflow and Hardware Maintenance for EX3300 Switches*
- *Clearance Requirements for Airflow and Hardware Maintenance for EX3400 Switches*
- *Clearance Requirements for Airflow and Hardware Maintenance for EX4200 Switches*
- *Clearance Requirements for Airflow and Hardware Maintenance for EX4300 Switches*
- *Clearance Requirements for Airflow and Hardware Maintenance for an EX4600 Switch*
- *Clearance Requirements for Airflow and Hardware Maintenance for an EX Series Redundant Power System*
- *Clearance Requirements for Airflow and Hardware Maintenance for EX4500 Switches*
- *Clearance Requirements for Airflow and Hardware Maintenance for EX4550 Switches*
- *Clearance Requirements for Airflow and Hardware Maintenance for an EX6210 Switch*
- *Clearance Requirements for Airflow and Hardware Maintenance for an EX8208 Switch*
- *Clearance Requirements for Airflow and Hardware Maintenance for an EX8216 Switch*
- *Clearance Requirements for Airflow and Hardware Maintenance for an EX9204 Switch*
- *Clearance Requirements for Airflow and Hardware Maintenance for an EX9208 Switch*

- *Clearance Requirements for Airflow and Hardware Maintenance for an EX9214 Switch*

General Site Guidelines

Efficient device operation requires proper site planning and maintenance and proper layout of the equipment, rack or cabinet (if used), and wiring closet.

To plan and create an acceptable operating environment for your device and prevent environmentally caused equipment failures:

- Keep the area around the chassis free from dust and conductive material, such as metal flakes.
- Follow prescribed airflow guidelines to ensure that the cooling system functions properly and that exhaust from other equipment does not blow into the intake vents of the device.
- Follow the prescribed electrostatic discharge (ESD) prevention procedures to prevent damaging the equipment. Static discharge can cause components to fail completely or intermittently over time.
- Install the device in a secure area, so that only authorized personnel can access the device.

Related Documentation

- Prevention of Electrostatic Discharge Damage on page 211

Site Electrical Wiring Guidelines

Table 30 on page 53 describes the factors you must consider while planning the electrical wiring at your site.

WARNING: **It is particularly important to provide a properly grounded and shielded environment and to use electrical surge-suppression devices.**

Table 30: Site Electrical Wiring Guidelines

Site Wiring Factor	Guidelines
Signaling limitations	If your site experiences any of the following problems, consult experts in electrical surge suppression and shielding: • Improperly installed wires cause radio frequency interference (RFI). • Damage from lightning strikes occurs when wires exceed recommended distances or pass between buildings. • Electromagnetic pulses (EMPs) caused by lightning damage unshielded conductors and electronic devices.

Table 30: Site Electrical Wiring Guidelines *(continued)*

Site Wiring Factor	Guidelines
Radio frequency interference	To reduce or eliminate RFI from your site wiring, do the following: • Use a twisted-pair cable with a good distribution of grounding conductors. • If you must exceed the recommended distances, use a high-quality twisted-pair cable with one ground conductor for each data signal when applicable.
Electromagnetic compatibility	If your site is susceptible to problems with electromagnetic compatibility (EMC), particularly from lightning or radio transmitters, seek expert advice. Some of the problems caused by strong sources of electromagnetic interference (EMI) are: • Destruction of the signal drivers and receivers in the device • Electrical hazards as a result of power surges conducted over the lines into the equipment

Related Documentation

- General Safety Guidelines and Warnings on page 181
- General Electrical Safety Guidelines and Warnings on page 209
- Prevention of Electrostatic Discharge Damage on page 211

Chassis Physical Specifications for EX2200 Switches

The EX2200 switch chassis is a rigid sheet-metal structure that houses the hardware components. Table 5 on page 13 summarizes the physical specifications of the EX2200 switch chassis.

Table 31: Physical Specifications of the EX2200 Switch Chassis

Description	EX2200 Value	EX2200-C Value
Chassis height	1.75 in. (4.45 cm)	1.75 in. (4.4 cm)
Chassis width	• 17.5 in. (44.5 cm) • 19 in. (48.2 cm) with mounting brackets attached	• 10.6 in. (26.92 cm) • 19 in. (48.26 cm) with mounting brackets
Chassis depth	10.5 in. (26.7 cm)	• EX2200-C-12T: 9.0 in. (22.8 cm) • EX2200-C-12P: 9.4 in. (23.8 cm)
Weight	• EX2200-24T: 6 lb (2.7 kg) • EX2200-24P: 8 lb (3.6 kg) • EX2200-24T-DC: 6 lb (2.7 kg) • EX2200-48T: 8 lb (3.6 kg) • EX2200-48P: 10 lb (4.5 kg)	• EX2200-C-12T: 4.6 lb (2.1 kg) • EX2200-C-12P: 6.4 lb (2.9 kg)

Related Documentation

- Rack Requirements on page 55
- Cabinet Requirements on page 56

- Mounting an EX2200 Switch on page 90
- Installing and Connecting an EX2200 Switch on page 89

Requirements for Mounting an EX2200 Switch on a Desktop or Wall

You can install the switch on or under a desk or other level surface or on a wall. When choosing a location, allow at least 6 in. (15.2 cm) of clearance between the front and back of the chassis and adjacent equipment or walls.

Ensure that the wall onto which the switch is installed is stable and securely supported.

If you are mounting the switch in sheetrock (wall board with a gypsum plaster core) or in wall board not backed by wall studs, use hollow wall anchors capable of supporting the combined weight of two fully loaded chassis. Insert the screws into wall studs wherever possible to provide added support for the chassis.

Use the wall-mount kit from Juniper Networks to mount the switch on a wall. The wall-mount kit is not part of the standard package and must be ordered separately.

Related Documentation

- Clearance Requirements for Airflow and Hardware Maintenance for EX2200 Switches on page 57
- Wall-Mounting Warnings for EX2200 Switches on page 196
- Mounting an EX2200 Switch on a Desk or Other Level Surface on page 92
- Mounting an EX2200 Switch on a Wall on page 101

Rack Requirements

You can mount the device on two-post racks or four-post racks.

Rack requirements consist of:

- Rack type
- Mounting bracket hole spacing
- Rack size and strength
- Rack connection to the building structure

Table 32 on page 55 provides the rack requirements and specifications.

Table 32: Rack Requirements and Specifications

Rack Requirement	Guidelines
Rack type	You can mount the device on a rack that provides bracket holes or hole patterns spaced at 1 U (1.75 in. or 4.45 cm) increments and meets the size and strength requirements to support the weight. A U is the standard rack unit defined by the Electronics Industry Association.

Table 32: Rack Requirements and Specifications *(continued)*

Rack Requirement	Guidelines
Mounting bracket hole spacing	The holes in the mounting brackets are spaced at 1 U (1.75 in. or 4.45 cm), so that the device can be mounted in any rack that provides holes spaced at that distance.
Rack size and strength	• Ensure that the rack complies with the size and strength standards of a 19-in. rack as defined by the Electronics Industry Association. • Ensure that the rack rails are spaced widely enough to accommodate the external dimensions of the device chassis. The outer edges of the front-mounting brackets extend the width of the chassis to 19 in. (48.2 cm). • The rack must be strong enough to support the weight of the device. • Ensure that the spacing of rails and adjacent racks provides for proper clearance around the device and rack.
Rack connection to building structure	• Secure the rack to the building structure. • If earthquakes are a possibility in your geographical area, secure the rack to the floor. • Secure the rack to the ceiling brackets as well as wall or floor brackets for maximum stability.

Related Documentation
- Rack-Mounting and Cabinet-Mounting Warnings on page 192

Cabinet Requirements

You can mount the device in a cabinet that contains a 19-in. rack.

Cabinet requirements consist of:

- Cabinet size
- Clearance requirements
- Cabinet airflow requirements

Table 33 on page 56 provides the cabinet requirements and specifications.

Table 33: Cabinet Requirements and Specifications

Cabinet Requirement	Guidelines
Cabinet size	• You can mount the device in a cabinet that contains a 19-in. rack as defined by the Electronics Industry Association. • The minimum cabinet size must be able to accommodate the maximum external dimensions of the device.
Cabinet clearance	• The outer edges of the mounting brackets extend the width of the chassis to 19 in. (48.2 cm). • The minimum total clearance inside the cabinet is 30 in. (76.2 cm) between the inside of the front door and the inside of the rear door.

Table 33: Cabinet Requirements and Specifications *(continued)*

Cabinet Requirement	Guidelines
Cabinet airflow requirements	When you mount the device in a cabinet, ensure that ventilation through the cabinet is sufficient to prevent overheating. • Ensure adequate cool air supply to dissipate the thermal output of the device or devices. • Ensure that the hot air exhaust of the chassis exits the cabinet without recirculating into the device. An open cabinet (without a top or doors) that employs hot air exhaust extraction from the top ensures the best airflow through the chassis. If the cabinet contains a top or doors, perforations in these elements assist with removing the hot air exhaust. • Install the device in the cabinet in a way that maximizes the open space on the side of the chassis that has the hot air exhaust. • Route and dress all cables to minimize the blockage of airflow to and from the chassis. • Ensure that the spacing of rails and adjacent cabinets is such that there is proper clearance around the device and cabinet. • A cabinet larger than the minimum required provides better airflow and reduces the chance of overheating.

Related Documentation
- Rack-Mounting and Cabinet-Mounting Warnings on page 192

Clearance Requirements for Airflow and Hardware Maintenance for EX2200 Switches

When planning the site for installing an EX2200 switch, you must allow sufficient clearance around the installed switch. Figure 16 on page 57 shows the clearance requirement for EX2200 switches except the EX2200-C switch models. Figure 17 on page 58 shows the clearance requirement for the EX2200-C switch models.

Figure 16: Clearance Requirements for Airflow and Hardware Maintenance for EX2200 Switches Except EX2200-C Switch Models

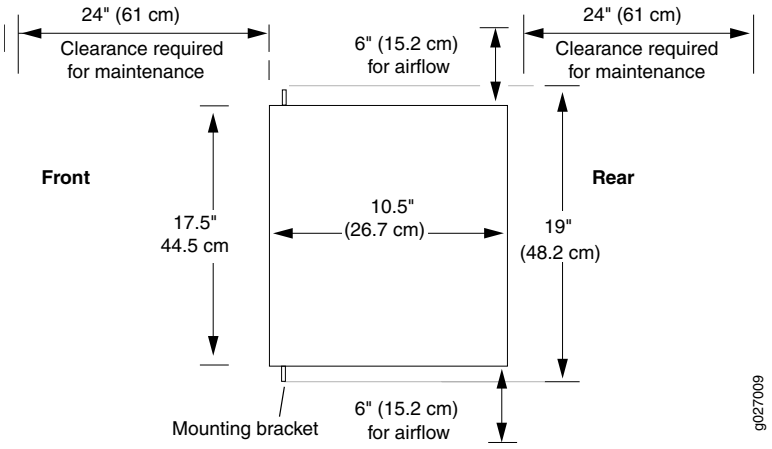
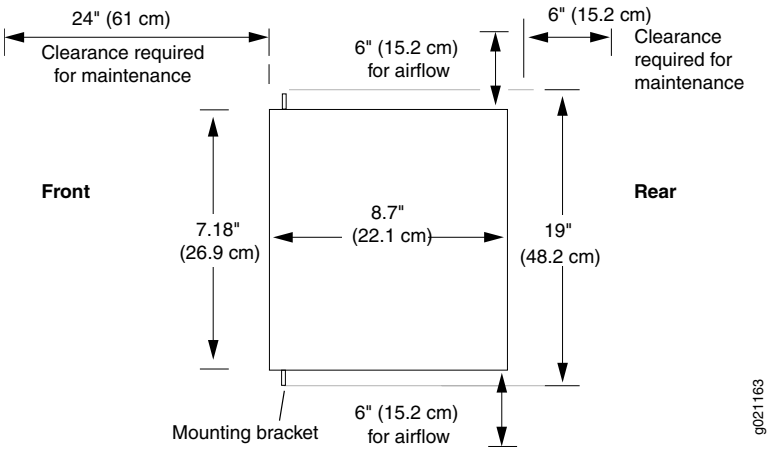


Figure 17: Clearance Requirements for Airflow and Hardware Maintenance for EX2200-C Switch Models



The power cord retainer clips extend out of the rear of the chassis by 3 in.

- Allow at least 6 in. (15.2 cm) of clearance on the side between devices that have fans or blowers installed. Allow 2.8 in. (7 cm) between the side of the chassis and any non-heat-producing surface such as a wall. For the cooling system to function properly, the airflow around the chassis must be unrestricted.

  Figure 18 on page 58 shows the airflow in PoE models of EX2200 switches, except for EX2200-C models. Figure 19 on page 59 shows the airflow non-PoE models of EX2200 switches, except for EX2200-C models.

Figure 18: Airflow Through PoE Models of EX2200 Switches Except EX2200-C Switch Models

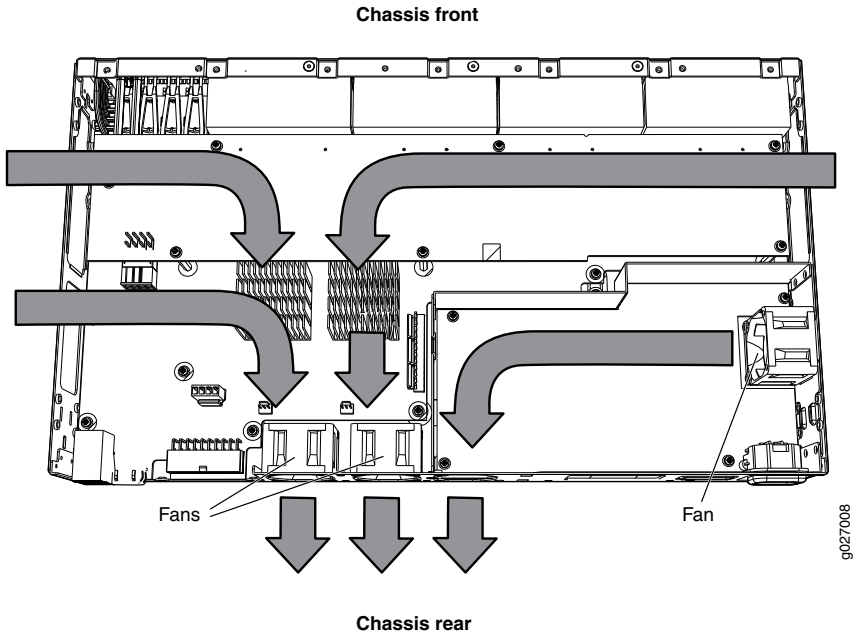
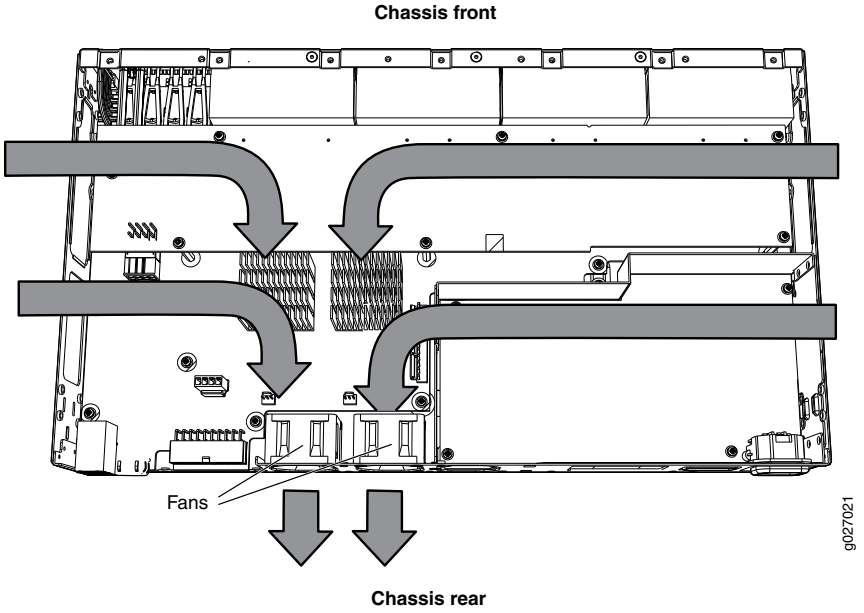


Figure 19: Airflow Through Non-PoE Models of EX2200 Switches Except EX2200-C Switch Models



- If you are mounting an EX2200 switch in a rack or cabinet with other equipment, or if you are placing it on the desktop or floor near other equipment, ensure that the exhaust from other equipment does not blow into the intake vents of the chassis.
- Leave at least 24 in. (61 cm) in front of the switch and 6 in. (15.2 cm) behind the switch. For service personnel to remove and install hardware components, you must leave adequate space at the front and back of the switch. NEBS GR-63 recommends that you allow at least 30 in. (76.2 cm) in front of the rack or cabinet and 24 in. (61 cm) behind the rack or cabinet.

Related Documentation

- Rack Requirements on page 55
- Cabinet Requirements on page 56
- General Site Guidelines on page 53
- Rack-Mounting and Cabinet-Mounting Warnings on page 192
- Cooling System and Airflow in an EX2200 Switch on page 19

CHAPTER 7

Power Specifications and Requirements

Power Specifications for EX2200 Switches

This topic describes the power supply electrical specifications for EX2200 switches.

Table 34 on page 61 provides the AC power supply electrical specifications for EX2200 switches.

Table 35 on page 61 provides the DC power supply electrical specifications for EX2200 switches.

Table 34: AC Power Supply Electrical Specifications for EX2200 Switches

Item	Specification
AC input voltage	100 through 240 VAC
AC input line frequency	50 Hz/60 Hz nominal
AC system current rating	• 7 A at 100 VAC and 2.9 A at 230 VAC (for switches with ports equipped for PoE) • 1.8 A at 100 VAC and 0.5 A at 230 VAC (for switches with no ports equipped for PoE)

Table 35: DC Power Supply Electrical Specifications for EX2200 Switches

Item	Specification
DC input voltage	36 through 75 VDC
DC input current	3.5 A maximum
Power supply output	100 W

Table 35: DC Power Supply Electrical Specifications for EX2200 Switches *(continued)*

Item	Specification
Output holdup time	1 ms minimum

NOTE: EX2200 switches with DC power supply do not provide PoE.

NOTE: For DC power supplies, we recommend that you provide at least 3.5 A at 48 VDC and use a facility circuit breaker rated for 10 A minimum. Doing so enables you to operate the switch in any configuration without upgrading the power infrastructure, and allows the switch to function at full capacity using multiple power supplies.

Related Documentation

- AC Power Cord Specifications for EX2200 Switches on page 62
- Power Supply in EX2200 Switches on page 23
- General Safety Guidelines and Warnings on page 181
- General Electrical Safety Guidelines and Warnings on page 209

AC Power Cord Specifications for EX2200 Switches

A detachable AC power cord is supplied with the AC power supplies. The coupler is type C13 as described by International Electrotechnical Commission (IEC) standard 60320. The plug at the male end of the power cord fits into the power source outlet that is standard for your geographical location.

CAUTION: The AC power cord provided with each power supply is intended for use with that power supply only and not for any other use.

NOTE: In North America, AC power cords must not exceed 4.5 meters (approximately 14.75 feet) in length, to comply with National Electrical Code (NEC) Sections 400-8 (NFPA 75, 5-2.2) and 210-52 and Canadian Electrical Code (CEC) Section 4-010(3). The cords supplied with the switch are in compliance.

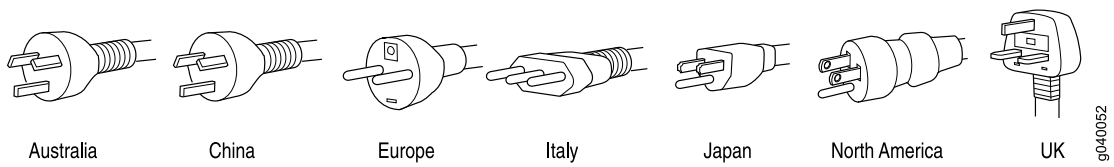
Table 36 on page 63 gives the AC power cord specifications for the countries and regions listed in the table.

Table 36: AC Power Cord Specifications

Country/Region	Electrical Specifications	Plug Standards	Juniper Model Number
Argentina	250 VAC, 10 A, 50 Hz	IRAM 2073 Type RA/3	CBL-EX-PWR-C13-AR
Australia	250 VAC, 10 A, 50 Hz	AS/NZZS 3112 Type SAA/3	CBL-EX-PWR-C13-AU
Brazil	250 VAC, 10 A, 50 Hz	NBR 14136 Type BR/3	CBL-EX-PWR-C13-BR
China	250 VAC, 10 A, 50 Hz	GB 1002-1996 Type PRC/3	CBL-EX-PWR-C13-CH
Europe (except Italy, Switzerland, and United Kingdom)	250 VAC, 10 A, 50 Hz	CEE (7) VII Type VIIG	CBL-EX-PWR-C13-EU
India	250 VAC, 10 A, 50 Hz	IS 1293 Type IND/3	CBL-EX-PWR-C13-IN
Israel	250 VAC, 10 A, 50 Hz	SI 32/1971 Type IL/3G	CBL-EX-PWR-C13-IL
Italy	250 VAC, 10 A, 50 Hz	CEI 23-16 Type I/3G	CBL-EX-PWR-C13-IT
Japan	125 VAC, 12 A, 50 Hz or 60 Hz	SS-00259 Type VCTF	CBL-EX-PWR-C13-JP
Korea	250 VAC, 10 A, 50 Hz or 60 Hz	CEE (7) VII Type VIIGK	CBL-EX-PWR-C13-KR
North America	125 VAC, 13 A, 60 Hz	NEMA 5-15 Type N5-15	CBL-EX-PWR-C13-US
South Africa	250 VAC, 10 A, 50 Hz	SABS 164/1:1992 Type ZA/13	CBL-EX-PWR-C13-SA
Switzerland	250 VAC, 10 A, 50 Hz	SEV 6534-2 Type 12G	CBL-EX-PWR-C13-SZ
Taiwan	125 VAC, 11 A and 15 A, 50 Hz	NEMA 5-15P Type N5-15P	CBL-EX-PWR-C13-TW
United Kingdom	250 VAC, 10 A, 50 Hz	BS 1363/A Type BS89/13	CBL-EX-PWR-C13-UK

Figure 20 on page 63 illustrates the plug on the power cord for some of the countries or regions listed in Table 36 on page 63.

Figure 20: AC Plug Types



Related Documentation

- Power Supply in EX2200 Switches on page 23
- General Safety Guidelines and Warnings on page 181
- General Electrical Safety Guidelines and Warnings on page 209

- Prevention of Electrostatic Discharge Damage on page 211

Calculating the EX Series Switch Fiber-Optic Cable Power Budget

Calculate the link's power budget when planning fiber-optic cable layout and distances to ensure that fiber-optic connections have sufficient power for correct operation. The power budget is the maximum amount of power the link can transmit. When you calculate the power budget, you use a worst-case analysis to provide a margin of error, even though all the parts of an actual system do not operate at the worst-case levels.

To calculate the worst-case estimate for fiber-optic cable power budget (P_B) for the link:

1. Determine values for the link's minimum transmitter power (P_T) and minimum receiver sensitivity (P_R). For example, here, (P_T) and (P_R) are measured in decibels, and decibels are referred to one milliwatt (dBm).

   P_T = –15 dBm

   P_R = –28 dBm

   NOTE: **See the specifications for your transmitter and receiver to find the minimum transmitter power and minimum receiver sensitivity.**

2. Calculate the power budget (P_B) by subtracting (P_R) from (P_T):

   –15 dBm – (–28 dBm) = 13 dBm

Related Documentation

- Calculating the EX Series Switch Fiber-Optic Cable Power Margin on page 64
- Understanding EX Series Switches Fiber-Optic Cable Signal Loss, Attenuation, and Dispersion on page 70
- Pluggable Transceivers Supported on EX Series Switches on page 68

Calculating the EX Series Switch Fiber-Optic Cable Power Margin

Calculate the link's power margin when planning fiber-optic cable layout and distances to ensure that fiber-optic connections have sufficient signal power to overcome system losses and still satisfy the minimum input requirements of the receiver for the required performance level. The power margin (P_M) is the amount of power available after attenuation or link loss (LL) has been subtracted from the power budget (P_B).

When you calculate the power margin, you use a worst-case analysis to provide a margin of error, even though all the parts of an actual system do not operate at worst-case levels. A power margin (P_M) greater than zero indicates that the power budget is sufficient to operate the receiver and that it does not exceed the maximum receiver input power.

This means the link will work. A (P_M) that is zero or negative indicates insufficient power to operate the receiver. See the specification for your receiver to find the maximum receiver input power.

Before you begin to calculate the power margin:

- Calculate the power budget. See "Calculating the EX Series Switch Fiber-Optic Cable Power Budget" on page 64.

To calculate the worst-case estimate for the power margin (P_M) for the link:

1. Determine the maximum value for link loss (*LL*) by adding estimated values for applicable link-loss factors—for example, use the sample values for various factors as provided in Table 37 on page 65 (here, the link is 2 km long and multimode, and the (P_B) is 13 dBm):

Table 37: Estimated Values for Factors Causing Link Loss

Link-Loss Factor	Estimated Link-Loss Value	Sample (LL) Calculation Values
Higher-order mode losses (HOL)	• Multimode—0.5 dBm • Single mode—None	• 0.5 dBm • 0 dBm
Modal and chromatic dispersion	• Multimode—None, if product of bandwidth and distance is less than 500 MHz/km • Single mode—None	• 0 dBm • 0 dBm
Connector	0.5 dBm	This example assumes 5 connectors. Loss for 5 connectors: (5) * (0.5 dBm) = 2.5 dBm
Splice	0.5 dBm	This example assumes 2 splices. Loss for two splices: (2) * (0.5 dBm) = 1 dBm
Fiber attenuation	• Multimode—1 dBm/km • Single mode—0.5 dBm/km	This example assumes the link is 2 km long. Fiber attenuation for 2 km: • (2 km) * (1.0 dBm/km) = 2 dBm • (2 km) * (0.5 dBm/km) = 1 dBm
Clock Recovery Module (CRM)	1 dBm	1 dBm

NOTE: For information about the actual amount of signal loss caused by equipment and other factors, see your vendor documentation for that equipment.

2. Calculate the (P_M) by subtracting (*LL*) from (P_B):

$P_B - LL = P_M$

(13 dBm) – (0.5 dBm [HOL]) – ((5) * (0.5 dBm)) – ((2) * (0.5 dBm)) – ((2 km) * (1.0 dBm/km)) – (1 dB [CRM]) = P_M

13 dBm – 0.5 dBm – 2.5 dBm – 1 dBm – 2 dBm – 1 dBm = P_M

P_M = 6 dBm

The calculated power margin is greater than zero, indicating that the link has sufficient power for transmission. Also, the power margin value does not exceed the maximum receiver input power. Refer to the specification for your receiver to find the maximum receiver input power.

Related Documentation

- Calculating the EX Series Switch Fiber-Optic Cable Power Budget on page 64
- Understanding EX Series Switches Fiber-Optic Cable Signal Loss, Attenuation, and Dispersion on page 70
- Pluggable Transceivers Supported on EX Series Switches on page 68

CHAPTER 8

Transceiver and Cable Specifications

Pluggable Transceivers Supported on EX2200 Switches

Uplink ports and dual-purpose uplink ports on the front panel in EX2200 switches support SFP transceivers. You can find the list of transceivers supported on EX2200 switches and information about those transceivers at the Hardware Compatibility Tool page for EX2200.

NOTE: We recommend that you use only optical transceivers and optical connectors purchased from Juniper Networks with your Juniper Networks device.

CAUTION: If you face a problem running a Juniper Networks device that uses a third-party optic or cable, the Juniper Networks Technical Assistance Center (JTAC) can help you diagnose the source of the problem. Your JTAC engineer might recommend that you check the third-party optic or cable and potentially replace it with an equivalent Juniper Networks optic or cable that is qualified for the device.

NOTE: EX2200-C switches ensure normal operation in the temperature range 30° F (0° C) through 104° F (40° C) at altitudes up to 5,000 ft (1,524 m). In the following conditions, use extended temperature range SFP transceivers when fiber uplinks are used:

- In the temperature range 104° F (40° C) through 113° F (45° C) at altitudes up to 5,000 ft (1,524 m)
- In the temperature range 95° F (35° C) through 113° F (45° C) at altitudes above 5,000 ft (1,524 m) up to 10,000 ft (3,048 m)

Related Documentation

- EX2200 Switches Hardware Overview on page 3
- Installing a Transceiver on page 147
- Removing a Transceiver on page 149

Pluggable Transceivers Supported on EX Series Switches

The transceivers for EX Series switches are hot-removable and hot-insertable field-replaceable units (FRUs): You can remove and replace them without powering off the switch or disrupting switch functions.

NOTE: After you insert a transceiver or after you change the media-type configuration, wait for 6 seconds for the interface to display the operational commands.

Use only optical transceivers and optical connectors purchased from Juniper Networks for your EX Series switches.

- For the list and specifications of transceivers supported on EX2200 switches, see "Pluggable Transceivers Supported on EX2200 Switches" on page 67.
- For the list and specifications of transceivers supported on EX2300 switches, see *Pluggable Transceivers Supported on EX2300 Switches*.
- For the list and specifications of transceivers supported on EX3200 switches, see *Pluggable Transceivers Supported on EX3200 Switches*.
- For the list and specifications of transceivers supported on EX3300 switches, see *Pluggable Transceivers Supported on EX3300 Switches*.
- For the list and specifications of transceivers supported on EX3400 switches, see *Pluggable Transceivers Supported on EX3400 Switches*.
- For the list and specifications of transceivers supported on EX4200 switches, see *Pluggable Transceivers Supported on EX4200 Switches*.
- For the list and specifications of transceivers supported on EX4300 switches, see *Pluggable Transceivers Supported on EX4300 Switches*.

- For the list and specifications of transceivers supported on EX4500 switches, see *Pluggable Transceivers Supported on EX4500 Switches*.
- For the list and specifications of transceivers supported on EX4550 switches, see *Pluggable Transceivers Supported on EX4550 Switches*.
- For the list and specifications of transceivers supported on EX4600 switches, see *Determining Interface Support for an EX4600 Switch*.
- For the list and specifications of transceivers supported on EX6200 switches, see *Pluggable Transceivers Supported on EX6200 Switches*.
- For the list and specifications of transceivers supported on EX8200 switches, see *Pluggable Transceivers Supported on EX8200 Switches*.
- For the list and specifications of transceivers supported on EX9200 switches, see *Pluggable Transceivers Supported on EX9200 Switches*.

Related Documentation

- Installing a Transceiver on page 147
- Removing a Transceiver on page 149
- Connecting a Fiber-Optic Cable on page 131

Management Cable Specifications

Table 38 on page 69 lists the specifications for the cables that connect the console (**CON**) and management (**MGMT**) ports to management devices.

Table 38: Specifications of Cables to Connect to Management Devices

Ports	Cable Specifications	Receptacle	Additional Information
RJ-45 Console (**CON2**) port	CAT5e UTP (unshielded twisted pair) cable	RJ-45	"Connecting a Device to a Management Console by Using an RJ-45 Connector" on page 128
Management (**MGMT**) Ethernet port (10/100/1000)	–	–	"Connecting a Device to a Network for Out-of-Band Management" on page 127
Mini-USB Type-B Console (**CON1**) port	–	–	

Understanding EX Series Switches Fiber-Optic Cable Signal Loss, Attenuation, and Dispersion

To determine the power budget and power margin needed for fiber-optic connections, you need to understand how signal loss, attenuation, and dispersion affect transmission. EX Series Switches use various types of network cable, including multimode and single-mode fiber-optic cable.

Signal Loss in Multimode and Single-Mode Fiber-Optic Cable

Multimode fiber is large enough in diameter to allow rays of light to reflect internally (bounce off the walls of the fiber). Interfaces with multimode optics typically use LEDs as light sources. However, LEDs are not coherent light sources. They spray varying wavelengths of light into the multimode fiber, which reflects the light at different angles. Light rays travel in jagged lines through a multimode fiber, causing signal dispersion. When light traveling in the fiber core radiates into the fiber cladding (layers of lower refractive index material in close contact with a core material of higher refractive index), higher-order mode loss (HOL) occurs. Together, these factors reduce the transmission distance of multimode fiber compared to that of single-mode fiber.

Single-mode fiber is so small in diameter that rays of light reflect internally through one layer only. Interfaces with single-mode optics use lasers as light sources. Lasers generate a single wavelength of light, which travels in a straight line through the single-mode fiber. Compared to multimode fiber, single-mode fiber has a higher bandwidth and can carry signals for longer distances. It is consequently more expensive.

Exceeding the maximum transmission distances can result in significant signal loss, which causes unreliable transmission. For information about the maximum transmission distance and supported wavelength range for the types of single-mode and multimode fiber-optic cables that are used on different EX Series switches see "Pluggable Transceivers Supported on EX Series Switches" on page 68.

Attenuation and Dispersion in Fiber-Optic Cable

An optical data link functions correctly provided that modulated light reaching the receiver has enough power to be demodulated correctly. *Attenuation* is the reduction in strength of the light signal during transmission. Passive media components such as cables, cable splices, and connectors cause attenuation. Although attenuation is significantly lower for optical fiber than for other media, it still occurs in both multimode and single-mode transmission. An efficient optical data link must transmit enough light to overcome attenuation.

Dispersion is the spreading of the signal over time. The following two types of dispersion can affect signal transmission through an optical data link:

- Chromatic dispersion, which is the spreading of the signal over time caused by the different speeds of light rays.

- Modal dispersion, which is the spreading of the signal over time caused by the different propagation modes in the fiber.

For multimode transmission, modal dispersion, rather than chromatic dispersion or attenuation, usually limits the maximum bit rate and link length. For single-mode transmission, modal dispersion is not a factor. However, at higher bit rates and over longer distances, chromatic dispersion limits the maximum link length.

An efficient optical data link must have enough light to exceed the minimum power that the receiver requires to operate within its specifications. In addition, the total dispersion must be within the limits specified for the type of link in Telcordia Technologies document GR-253-CORE (Section 4.3) and International Telecommunications Union (ITU) document G.957.

When chromatic dispersion is at the maximum allowed, its effect can be considered as a power penalty in the power budget. The optical power budget must allow for the sum of component attenuation, power penalties (including those from dispersion), and a safety margin for unexpected losses.

Related Documentation

- Calculating the EX Series Switch Fiber-Optic Cable Power Budget on page 64
- Calculating the EX Series Switch Fiber-Optic Cable Power Margin on page 64

CHAPTER 9

Pinout Specifications

Console Port Connector Pinout Information

The console port on a Juniper Networks device is an RS-232 serial interface that uses an RJ-45 connector to connect to a console management device. The default baud rate for the console port is 9600 baud.

Table 39 on page 73 provides the pinout information for the RJ-45 console connector.

NOTE: If your laptop or PC does not have a DB-9 male connector pin and you want to connect your laptop or PC directly to a device, use a combination of the RJ-45 to DB-9 female adapter and a USB to DB-9 male adapter. You must provide the USB to DB-9 male adapter.

Table 39: Console Port Connector Pinout Information

Pin	Signal	Description
1	RTS Output	Request to send
2	DTR Output	Data terminal ready
3	TxD Output	Transmit data
4	Signal Ground	Signal ground
5	Signal Ground	Signal ground

Table 39: Console Port Connector Pinout Information *(continued)*

Pin	Signal	Description
6	RxD Input	Receive data
7	CD Input	Data carrier detect
8	CTS Input	Clear to send

Related Documentation

- Connecting a Device to a Management Console by Using an RJ-45 Connector on page 128
- *Configuring the Console Port Type (CLI Procedure)*

Mini-USB Port Pinout Specifications

If your management host (laptop or PC) does not have a DB-9 male connector pin or an RJ-45 connector pin but has a USB port, you can connect your management host to the Mini-USB Type-B console port by using a cable that has a standard Type-A USB connector on one end and a Mini-USB Type-B (5-pin) connector on the other end.

The Mini-USB Type-B console port uses a Mini-USB Type-B connector to connect to a console management device. The default baud rate for the console port is 9600 baud.

Table 40 on page 74 provides the pinout information of the Mini-USB Type-B console port.

Table 40: Mini-USB Type-B Console Port Pinout Information

Pin	Signal	Description
1	VCC	+5 VDC
2	D-	Data -
3	D+	Data +
X	N/C	Could be not connected (N/C), connected to ground (GND), or used as an attached device presence indicator
4	GND	Ground

Related Documentation

- Management Cable Specifications on page 69

USB Port Specifications for an EX Series Switch

The following Juniper Networks USB flash drives have been tested and are officially supported for the USB port on all EX Series switches:

- RE-USB-1G-S
- RE-USB-2G-S
- RE-USB-4G-S

CAUTION: Any USB memory product not listed as supported for EX Series switches has not been tested by Juniper Networks. The use of any unsupported USB memory product could expose your EX Series switch to unpredictable behavior. Juniper Networks Technical Assistance Center (JTAC) can provide only limited support for issues related to unsupported hardware. We strongly recommend that you use only supported USB flash drives.

All USB flash drives used on EX Series switches must have the following features:

- USB 2.0 or later.
- Formatted with a FAT or MS-DOS file system.
- If the switch is running Junos OS Release 9.5 or earlier, the formatting method must use a master boot record. Microsoft Windows formatting, by default, does not use a master boot record. See the documentation for your USB flash drive for information about how your USB flash drive is formatted.

Related Documentation

- EX2200 Switches Hardware Overview on page 3
- *EX2300 Switches Hardware Overview*
- *Rear Panel of an EX3200 Switch*
- *Rear Panel of an EX3300 Switch*
- *Rear Panel of an EX3400 Switch*
- *Rear Panel of an EX4200 Switch*
- *EX4300 Switches Hardware Overview*
- *Front Panel of an EX4500 Switch*
- *Management Panel of an EX4600 Switch*
- *EX4550 Switches Hardware Overview*
- *Switch Fabric and Routing Engine (SRE) Module in an EX6200 Switch*
- *Switch Fabric and Routing Engine (SRE) Module in an EX8208 Switch*
- *Routing Engine (RE) Module in an EX8216 Switch*
- *Routing Engine Module in an EX9200 Switch*
- *Booting an EX Series Switch Using a Software Package Stored on a USB Flash Drive*

RJ-45 Management Port Connector Pinout Information

Table 41 on page 76 provides the pinout information for the RJ-45 connector for the management port on Juniper Networks devices.

Table 41: RJ-45 Management Port Connector Pinout Information

Pin	Signal	Description
1	TRP1+	Transmit/receive data pair 1
2	TRP1-	Transmit/receive data pair 1
3	TRP2+	Transmit/receive data pair 2
4	TRP3+	Transmit/receive data pair 3
5	TRP3-	Transmit/receive data pair 3
6	TRP2-	Transmit/receive data pair 2
7	TRP4+	Transmit/receive data pair 4
8	TRP4-	Transmit/receive data pair 4

Related Documentation

- Connecting a Device to a Network for Out-of-Band Management on page 127

RJ-45 Port, QSFP+ Port, SFP+ Port, and SFP Port Connector Pinout Information

Tables in this topic describe the connector pinout information for the RJ-45, QSFP+, SFP+, and SFP ports.

- Table 42 on page 76—10/100/1000BASE-T Ethernet network port connector pinout information
- Table 43 on page 77—SFP network port connector pinout information
- Table 44 on page 78—SFP+ network port connector pinout information
- Table 45 on page 79—QSFP+ network module port connector pinout information

Table 42: 10/100/1000BASE-T Ethernet Network Port Connector Pinout Information

Pin	Signal	Description
1	TRP1+	Transmit/receive data pair 1 Negative Vport (in PoE models)

Table 42: 10/100/1000BASE-T Ethernet Network Port Connector Pinout Information *(continued)*

Pin	Signal	Description
2	TRP1-	Transmit/receive data pair 1 Negative Vport (in PoE models)
3	TRP2+	Transmit/receive data pair 2 Positive Vport (in PoE models)
4	TRP3+	Transmit/receive data pair 3
5	TRP3-	Transmit/receive data pair 3
6	TRP2-	Transmit/receive data pair 2 Positive Vport (in PoE models)
7	TRP4+	Transmit/receive data pair 4
8	TRP4-	Transmit/receive data pair 4

Table 43: SFP Network Port Connector Pinout Information

Pin	Signal	Description
1	VeeT	Module transmitter ground
2	TX_Fault	Module transmitter fault
3	TX_Disable	Transmitter disabled
4	SDA	2-wire serial interface data line
5	SCL-	2-wire serial interface clock
6	MOD_ABS	Module absent
7	RS	Rate select
8	RX_LOS	Receiver loss of signal indication
9	VeeR	Module receiver ground
10	VeeR	Module receiver ground
11	VeeR	Module receiver ground
12	RD-	Receiver inverted data output

Table 43: SFP Network Port Connector Pinout Information *(continued)*

Pin	Signal	Description
13	RD+	Receiver noninverted data output
14	VeeR	Module receiver ground
15	VccR	Module receiver 3.3 V supply
16	VccT	Module transmitter 3.3 V supply
17	VeeT	Module transmitter ground
18	TD+	Transmitter noninverted data input
19	TD-	Transmitter inverted data input
20	VeeT	Module transmitter ground

Table 44: SFP+ Network Port Connector Pinout Information

Pin	Signal	Description
1	VeeT	Module transmitter ground
2	TX_Fault	Module transmitter fault
3	TX_Disable	Transmitter disabled
4	SDA	2-wire serial interface data line
5	SCL-	2-wire serial interface clock
6	MOD_ABS	Module absent
7	RS0	Rate select 0, optionally controls SFP+ module receiver
8	RX_LOS	Receiver loss of signal indication
9	RS1	Rate select 1, optionally controls SFP+ transmitter
10	VeeR	Module receiver ground
11	VeeR	Module receiver ground
12	RD-	Receiver inverted data output
13	RD+	Receiver noninverted data output
14	VeeR	Module receiver ground

Table 44: SFP+ Network Port Connector Pinout Information *(continued)*

Pin	Signal	Description
15	VccR	Module receiver 3.3 V supply
16	VccT	Module transmitter 3.3 V supply
17	VeeT	Module transmitter ground
18	TD+	Transmitter noninverted data input
19	TD-	Transmitter inverted data input
20	VeeT	Module transmitter ground

Table 45: QSFP+ Network Port Connector Pinout Information

Pin	Signal
1	GND
2	TX2n
3	TX2p
4	GND
5	TX4n
6	TX4p
7	GND
8	ModSelL
9	LPMode_Reset
10	VccRx
11	SCL
12	SDA
13	GND
14	RX3p
15	RX3n
16	GND

Table 45: QSFP+ Network Port Connector Pinout Information *(continued)*

Pin	Signal
17	RX1p
18	RX1n
19	GND
20	GND
21	RX2n
22	RX2p
23	GND
24	RX4n
25	RX4p
26	GND
27	ModPrsL
28	IntL
29	VccTx
30	Vcc1
31	Reserved
32	GND
33	TX3p
34	TX3n
35	GND
36	TX1p
37	TX1n
38	GND

Related Documentation

- Installing a Transceiver on page 147

RJ-45 to DB-9 Serial Port Adapter Pinout Information

The console port is an RS-232 serial interface that uses an RJ-45 connector to connect to a management device such as a PC or a laptop. If your laptop or PC does not have a DB-9 male connector pin and you want to connect your laptop or PC to the device, use a combination of the RJ-45 to DB-9 female adapter along with a USB to DB-9 male adapter.

Table 46 on page 81 provides the pinout information for the RJ-45 to DB-9 serial port adapter.

Table 46: RJ-45 to DB-9 Serial Port Adapter Pinout Information

RJ-45 Pin	Signal	DB-9 Pin	Signal
1	RTS	8	CTS
2	DTR	6	DSR
3	TXD	2	RXD
4	GND	5	GND
6	RXD	3	TXD
7	DSR	4	DTR
8	CTS	7	RTS

Related Documentation

- Connecting a Device to a Management Console by Using an RJ-45 Connector on page 128

PART 3

Initial Installation and Configuration

CHAPTER 10

Unpacking the Switch

Unpacking an EX2200 Switch

The EX2200 switches are shipped in a cardboard carton, secured with foam packing material. The carton also contains an accessory box.

CAUTION: **EX2200 switches are maximally protected inside the shipping carton. Do not unpack the switches until you are ready to begin installation.**

To unpack the switch:

1. Move the shipping carton to a staging area as close to the installation site as possible, but where you have enough room to remove the system components.
2. Position the carton so that the arrows are pointing up.
3. Open the top flaps on the shipping carton.
4. Remove the accessory box and verify the contents in it against the parts inventory on the label attached to the carton.
5. Pull out the packing material holding the switch in place.
6. Verify the chassis components received against the packing list included with the switch. An inventory of parts provided with the switch is provided in "Parts Inventory (Packing List) for an EX2200 Switch" on page 86.
7. Save the shipping carton and packing materials in case you need to move or ship the switch later.

Related Documentation

- Mounting an EX2200 Switch on page 90
- Installing and Connecting an EX2200 Switch on page 89
- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 137
- Connecting and Configuring an EX Series Switch (J-Web Procedure) on page 140

Parts Inventory (Packing List) for an EX2200 Switch

EX2200 switches are shipped in a cardboard carton, secured with foam packing material. The carton also contains an accessory box.

The switch shipment includes a packing list. Check the parts you receive in the switch shipping carton against the items on the packing list. The parts shipped depend on the configuration you order.

If any part on the packing list is missing, contact your customer service representative or contact Juniper customer care from within the U.S. or Canada by telephone at 1-888-314-5822. For international-dial or direct-dial options in countries without toll-free numbers, see http://www.juniper.net/support/requesting-support.html .

Table 47 on page 86 lists the parts and their quantities in the packing list.

Table 47: Parts List for EX2200 Switches

Component	Quantity
Switch with built-in power supply	1
AC power cord appropriate for your geographical location (only for AC switch models)	1
Power cord retainer clip (only for AC switch models)	1
Mounting brackets: • EX2200 switch—provided • EX2200-C switch—separately orderable	2
Mounting screws to attach the mounting brackets to the switch chassis: • EX2200 switch—provided • EX2200-C switch—separately orderable	8
Rubber feet	4
RJ-45 cable and RJ-45 to DB-9 serial port adapter	1
Cable guard with 3 number-8 Phillips truss-head screws (optional and separately orderable for EX2200-C switches)	–
Quick Start installation instructions	1

Table 47: Parts List for EX2200 Switches *(continued)*

Component	Quantity
Juniper Networks Product Warranty	1
End User License Agreement	1

NOTE: You must provide mounting screws that are appropriate for your rack or cabinet to mount the chassis on a rack or a cabinet.

Related Documentation

- Unpacking an EX2200 Switch on page 85
- EX2200 Switches Hardware Overview on page 3

Registering Products—Mandatory for Validating SLAs

Register all new Juniper Networks hardware products and changes to an existing installed product using the Juniper Networks website to activate your hardware replacement service-level agreements (SLAs).

CAUTION: Register product serial numbers on the Juniper Networks website and update the installation base data if there is any addition or change to the installation base or if the installation base is moved. Juniper Networks will not be held accountable for not meeting the hardware replacement service-level agreement for products that do not have registered serial numbers or accurate installation base data.

Register your product(s) at: https://tools.juniper.net/svcreg/SRegSerialNum.jsp . Update your install base at: https://www.juniper.net/customers/csc/management/updateinstallbase.jsp .

Related Documentation

- Contacting Customer Support to Obtain Return Material Authorization on page 159
- *Contacting Customer Support to Obtain a Return Materials Authorization for an NFX250 Device*

CHAPTER 11

Installing the Switch

Installing and Connecting an EX2200 Switch

To install and connect an EX2200 switch:

1. Follow instructions in "Unpacking an EX2200 Switch" on page 85.

2. Mount the switch by following instructions appropriate for your site:

   - "Mounting an EX2200 Switch on Two Posts of a Rack or Cabinet" on page 94 (using the mounting brackets provided)
   - "Mounting an EX2200 Switch on Four Posts of a Rack or Cabinet" on page 97 (using the separately orderable four-post rack-mount kit)
   - "Mounting an EX2200 Switch in a Recessed Position in a Rack or Cabinet" on page 100 (using the 2-in.-recess front brackets from the separately orderable four-post rack-mount kit)
   - "Mounting an EX2200 Switch on a Desk or Other Level Surface" on page 92 (using the rubber feet provided)
   - "Mounting an EX2200 Switch on a Wall" on page 101 (using the screws or separately orderable wall-mount kit)

- "Mounting an EX2200 Switch On or Under a Desk Using Screws" on page 107 (using the desk/wall mounting screws)
- "Mounting an EX2200 Switch Using the Magnet Mount" on page 110 (using the separately orderable magnet sheet)

3. Follow instructions in "Connecting Earth Ground to an EX Series Switch" on page 115.
4. Follow instructions in "Connecting AC Power to an EX2200 Switch" on page 121 or "Connecting DC Power to an EX2200 Switch" on page 123.
5. Perform initial configuration of the switch by following instructions in "Connecting and Configuring an EX Series Switch (CLI Procedure)" on page 137 or "Connecting and Configuring an EX Series Switch (J-Web Procedure)" on page 140.
6. Set the switch's management options by following the appropriate instructions:
   - Connecting a Device to a Network for Out-of-Band Management on page 127
   - Connecting a Device to a Management Console by Using an RJ-45 Connector on page 128

Related Documentation

- Rack Requirements on page 55
- Cabinet Requirements on page 56
- Clearance Requirements for Airflow and Hardware Maintenance for EX2200 Switches on page 57

Mounting an EX2200 Switch

Table 48 on page 90 lists the methods you can use to mount an EX2200 switch.

Table 48: EX2200 Switch Mounting Methods

Mounting Method	Switch Model	Comments
Desk or other level surface (using rubber feet)	• EX2200 • EX2200-C	On a desk or other level surface by using rubber feet provided with the switch
Desk or other level surface (using screws)	EX2200-C	On or under a desk or other level surface by using screws
Two-post rack or cabinet	• EX2200 • EX2200-C	On two posts in a 19-in. rack or cabinet by using the mounting brackets.
Four-post rack or cabinet	• EX2200 • EX2200-C	• On four posts in a 19-in. rack or cabinet by using the separately orderable four-post rack-mount kit • On two posts in a 19-in. rack or cabinet by using the two post rack mounting brackets.

Table 48: EX2200 Switch Mounting Methods *(continued)*

Mounting Method	Switch Model	Comments
Recessed position	EX2200	In a position recessed 2 in. from the front of a 19-in. rack or cabinet by using the 2-in.-recess front brackets in the separately orderable four-post rack-mount kit. You can mount the switch in this recessed position on two-post or four-post racks and cabinets
Wall mount	• EX2200 • EX2200-C	• On a wall by using screws or separately orderable wall-mount kit • On a wall by using screws
Magnet mount	EX2200-C	On or under a surface made of ferrous material using the separately orderable magnet sheet

WARNING:

- When mounting an EX2200 switch chassis in a vertical position, orient the front panel of the chassis downward to ensure proper airflow and meet safety requirements in the event of a fire.
- When wall mounting EX2200-24P and EX2200-48P models, install the wall-mount baffle above the units to reduce the risk of objects or substances falling into the air exhaust or power supply, which could cause a fire.

The holes in the mounting brackets are placed at 1 U (1.75 in. or 4.45 cm) apart so that the switch can be mounted in any rack or cabinet that provides holes spaced at that distance.

See the Related Documentation for detailed descriptions of the various rack or cabinet mounting options.

Related Documentation

- Mounting an EX2200 Switch on Two Posts of a Rack or Cabinet on page 94
- Mounting an EX2200 Switch on Four Posts of a Rack or Cabinet on page 97
- Mounting an EX2200 Switch in a Recessed Position in a Rack or Cabinet on page 100
- Mounting an EX2200 Switch on a Desk or Other Level Surface on page 92
- Mounting an EX2200 Switch on a Wall on page 101
- Mounting an EX2200 Switch On or Under a Desk Using Screws on page 107
- Mounting an EX2200 Switch Using the Magnet Mount on page 110
- Connecting Earth Ground to an EX Series Switch on page 115

Mounting an EX2200 Switch on a Desk or Other Level Surface

You can mount an EX2200 switch on a desk or other level surface by using the four rubber feet that are shipped with the switch. The rubber feet stabilize the chassis.

Before mounting the switch on a desk or other level surface:

- Verify that the site meets the requirements described in "Site Preparation Checklist for EX2200 Switches" on page 47.
- Place the desk in its permanent location, allowing adequate clearance for airflow and maintenance, and secure it to the building structure.
- Read "General Safety Guidelines and Warnings" on page 181, with particular attention to "Chassis Lifting Guidelines" on page 190.

NOTE: **Do not block the vents on the top of the EX2200-C switches. Doing this can lead to overheating of the switch chassis.**

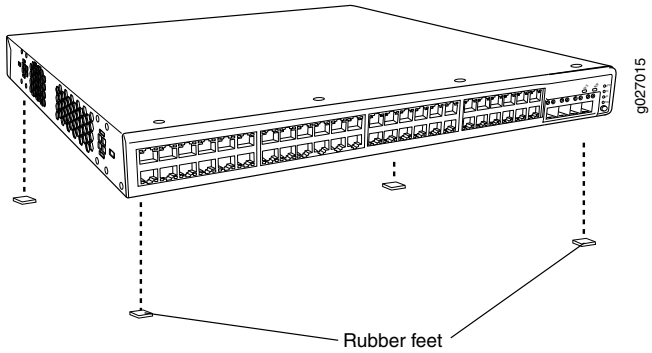
Ensure that you have the following parts and tools available:

- 4 rubber feet to stabilize the chassis on the a desk or other level surface (provided in the accessory box in the switch carton)
- 1 cable guard with 3 number-8 Phillips truss-head screws to secure the cable guard to the EX2200-C switch (optional and separately orderable)
- 1 standard cable lock (optional and separately orderable) to secure the EX2200-C switch from theft by connecting the cable to the security slots on the switch

To mount a switch on a desk or other level surface:

1. Remove the switch from the shipping carton (see "Unpacking an EX2200 Switch" on page 85).
2. Turn the chassis upside down on the desk or the level surface where you intend to mount the switch.
3. Attach the rubber feet to the bottom of the chassis, as shown in Figure 21 on page 93.
4. Turn the chassis right side up on the desk or the level surface.

Figure 21: Attaching Rubber Feet to a Switch Chassis

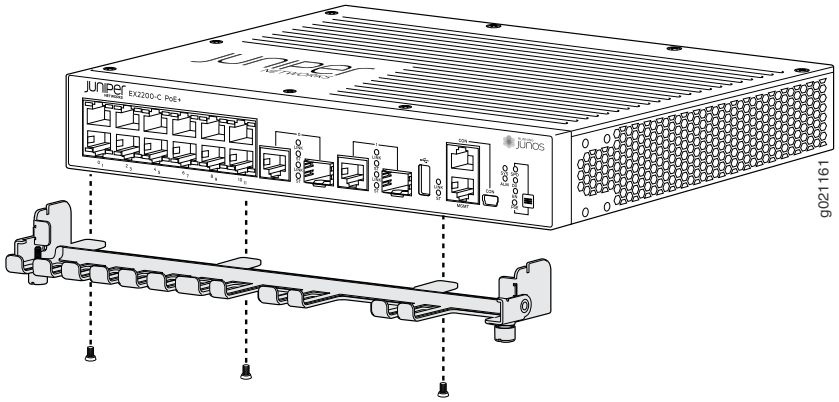


5. (Optional; applies only to EX2200-C switches) Attach the cable guard to protect cable connections:

   a. Use the 3 truss-head screws to attach the cable guard to the bottom of the chassis.

   b. Use the thumbscrews to tighten or loosen the guard to allow you to insert cables. See Figure 22 on page 93.

Figure 22: Attaching a Cable Guard to an EX2200-C Switch

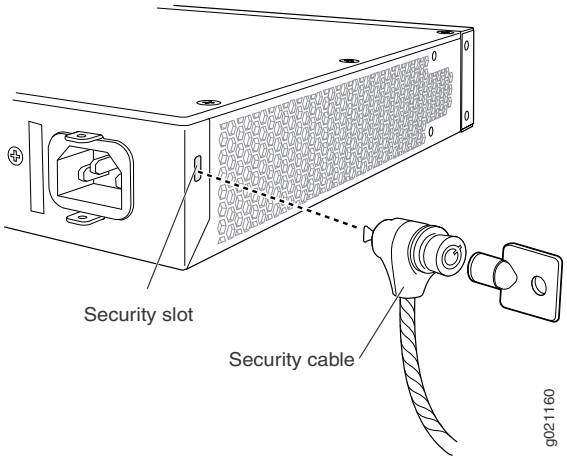


6. (Optional; applies only to EX2200-C switches) Attach the standard cable lock to the security slots on the both sides of the switch:

   a. Rope the cable to a desk or a rack and set the lock to unlocked position.

   b. Insert the lock into one of the security slot on your chassis and set the lock to the locked position. See Figure 23 on page 94.

Figure 23: Securing the EX2200-C Switch Using Security Slots



Related Documentation

- Connecting AC Power to an EX2200 Switch on page 121
- Connecting DC Power to an EX2200 Switch on page 123
- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 137
- Connecting and Configuring an EX Series Switch (J-Web Procedure) on page 140
- Clearance Requirements for Airflow and Hardware Maintenance for EX2200 Switches on page 57

Mounting an EX2200 Switch on Two Posts of a Rack or Cabinet

You can mount all EX2200 switches on two posts of a two-post or a four-post 19-in. rack or cabinet using the mounting brackets and screws provided with all EX2200 switches except the EX2200-C switches. For EX2200-C switches, mounting brackets and screws are separately orderable. (The remainder of this topic uses *rack* to mean *rack* or *cabinet*.)

NOTE: If you need to mount an EX2200 switch except the EX2200-C switch models in a recessed position on either a two-post rack or a four-post rack, you can use the 2-in.-recess front mount brackets provided in the separately orderable four-post rack-mount kit. EX2200-C cannot be mounted in a recessed position.

NOTE: Do not block the vents on the top of the EX2200-C switches. Doing this can lead to overheating of the switch chassis.

Before mounting the switch on two posts of a two-post or a four-post rack:

- Verify that the site meets the requirements described in "Site Preparation Checklist for EX2200 Switches" on page 47.
- Place the rack in its permanent location, allowing adequate clearance for airflow and maintenance, and secure it to the building structure.
- Read "General Safety Guidelines and Warnings" on page 181, with particular attention to "Chassis Lifting Guidelines" on page 190.

Ensure that you have the following parts and tools available:

- Phillips (+) screwdriver, number 2
- 2 mounting brackets and 8 mounting screws (provided with EX2200 switches except the EX2200-C switch model)
- Screws to secure the chassis to the rack (not provided)
- 2-in.-recess front brackets from the separately orderable four-post rack-mount kit if you will mount the switch in a recessed position (not applicable for EX2200-C switches).

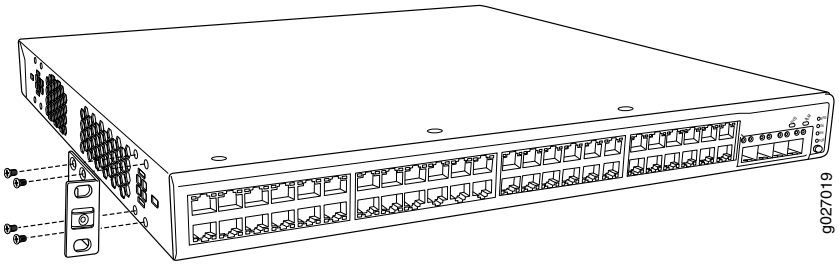
NOTE: **One person must be available to lift the switch while another secures the switch to the rack.**

CAUTION: **If you are mounting multiple units on a rack, mount the heaviest unit at the bottom of the rack and mount the other units from the bottom of the rack to the top in decreasing order of the weight of the units.**

To mount the switch on two posts of a two-post or a four-post rack:

1. Remove the switch from the shipping carton (see "Unpacking an EX2200 Switch" on page 85).
2. Place the switch on a flat, stable surface.
3. Align the mounting brackets along the front or rear of the side panels of the switch chassis depending on how you want to mount the switch. For example, if you want to front-mount the switch, align the brackets along the front of the chassis. Figure 24 on page 96 shows attaching the mounting brackets along the front of the EX2200 switch.

Figure 24: Attaching the Mounting Bracket Along the Front of the Switch



NOTE: The length of the mounting brackets depends on the switch model.

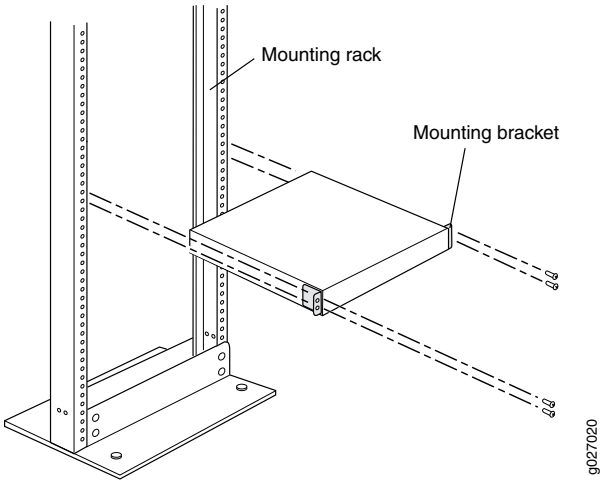
4. Align the bottom holes in the mounting brackets with holes on the side panels of the switch chassis.

5. Insert the mounting screws into the aligned holes. Tighten the screws.

6. Ensure that the other holes in the mounting brackets are aligned with the holes in the side panels. Insert a screw in each hole and tighten the screws.

7. Have one person grasp both sides of the switch, lift the switch, and position it in the rack, aligning the mounting bracket holes with the threaded holes in the rack rail. Align the bottom hole in each mounting bracket with a hole in each rack rail, making sure the chassis is level. See Figure 25 on page 96.

Figure 25: Mounting the Switch on Two Posts of a Rack



8. Have a second person secure the switch to the rack by using the appropriate screws. Tighten the screws.

9. Ensure that the switch chassis is level by verifying that all screws on one side of the rack are aligned with the screws on the other side.

Related Documentation

- Mounting an EX2200 Switch on Four Posts of a Rack or Cabinet on page 97
- Connecting Earth Ground to an EX Series Switch on page 115
- Connecting AC Power to an EX2200 Switch on page 121
- Connecting DC Power to an EX2200 Switch on page 123
- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 137
- Connecting and Configuring an EX Series Switch (J-Web Procedure) on page 140
- Mounting an EX2200 Switch in a Recessed Position in a Rack or Cabinet on page 100
- Rack-Mounting and Cabinet-Mounting Warnings on page 192

Mounting an EX2200 Switch on Four Posts of a Rack or Cabinet

You can mount an EX2200 switch except an EX2200-C switch model on four posts of a 19-in. rack or cabinet by using the separately orderable four-post rack-mount kit. (The remainder of this topic uses “rack” to mean “rack or cabinet.”)

NOTE: EX2200-C switches cannot be mounted on all four posts of a rack.

NOTE: If you need to mount an EX2200 switch except the EX2200-C switch model in a recessed position on either a two-post rack or a four-post rack, you can use the 2-in.-recess front-mounting brackets provided in the separately orderable four-post rack-mount kit. EX2200-C switches cannot be mounted in a recessed position.

Before mounting the switch on four posts of a rack:

- Verify that the site meets the requirements described in “Site Preparation Checklist for EX2200 Switches” on page 47.
- Place the rack in its permanent location, allowing adequate clearance for airflow and maintenance, and secure it to the building structure.
- Read “General Safety Guidelines and Warnings” on page 181, with particular attention to “Chassis Lifting Guidelines” on page 190.

Ensure that you have the following parts and tools available:

- Phillips (+) screwdriver, number 2
- 6 Phillips 4-40 flat-head mounting screws (provided with the four-post rack-mount kit)
- 8 Phillips 4x6-mm flat-head mounting screws (provided with the four-post rack-mount kit)
- One pair each of flush or 2-in.-recess front-mounting brackets
- One pair of side mounting-rails
- One pair of rear mounting-blades
- Screws to secure the chassis and the rear mounting-blades to the rack (not provided)

NOTE: One person must be available to lift the switch while another secures it to the rack.

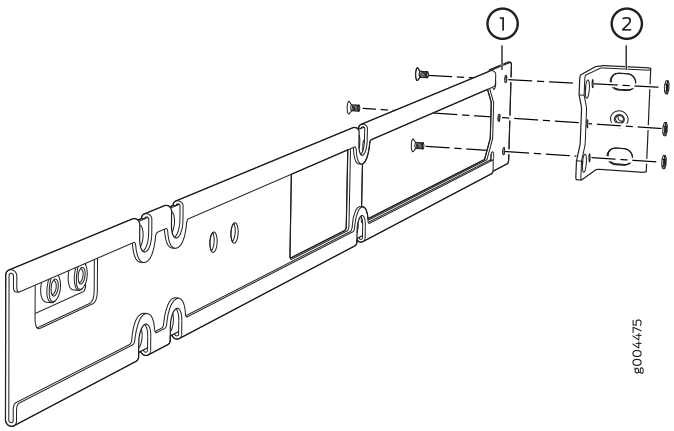
CAUTION: If you are mounting multiple units on a rack, mount the heaviest unit at the bottom of the rack and mount the other units from the bottom of the rack to the top in decreasing order of the weight of the units.

To mount the switch on four posts of a rack:

1. Remove the switch from the shipping carton (see "Unpacking an EX2200 Switch" on page 85).

2. Attach the front-mounting brackets (either the flush or the 2-in.-recess brackets) to the side mounting-rails using 6 Phillips 4-40 flat-head mounting screws. See Figure 26 on page 98.

Figure 26: Attaching the Front-Mounting Bracket to the Side Mounting-Rail



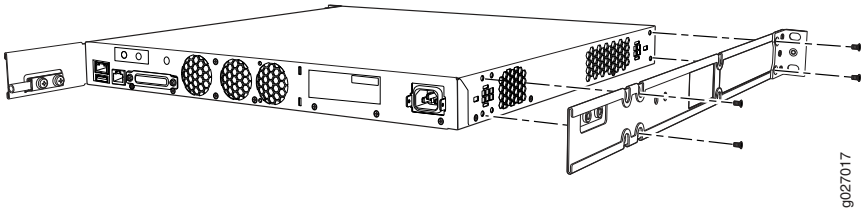
1— Side mounting-rail	2—Front-mounting bracket

3. Place the switch on a flat, stable surface.

4. Align the side mounting-rails along the side panels of the switch chassis. Align the two holes in the rear of the side mounting-rails with the two holes on the rear of the side panel.

5. Insert Phillips 4x6-mm flat-head mounting screws into the two aligned holes and tighten the screws. Ensure that the two holes in the rear of the side mounting-rails are aligned with the remaining two holes in the side panel. See Figure 27 on page 99.

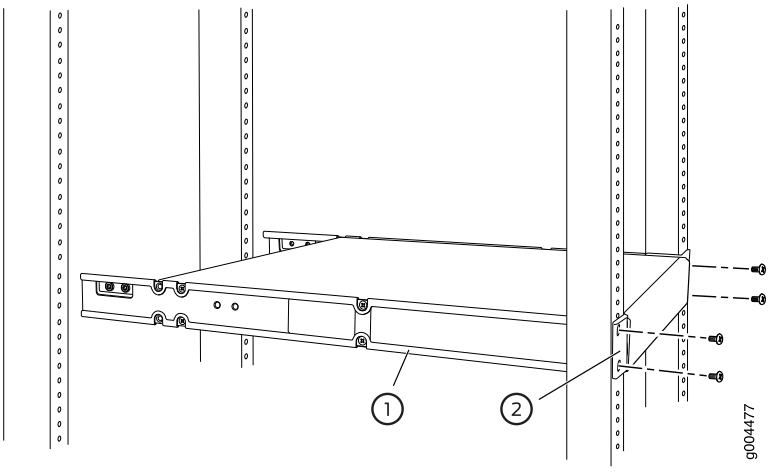
Figure 27: Attaching the Side Mounting-Rail to the Switch Chassis



6. Insert the Phillips 4x6-mm flat-head mounting screws into the remaining two holes in the side mounting-rails and tighten the screws.

7. Have one person grasp both sides of the switch, lift the switch, and position it in the rack, aligning the side mounting-rail holes with the threaded holes in the front post of the rack. Align the bottom hole in both the front-mounting brackets with a hole in each rack rail, making sure the chassis is level. See Figure 28 on page 99.

Figure 28: Mounting the Switch to the Front Posts of a Rack

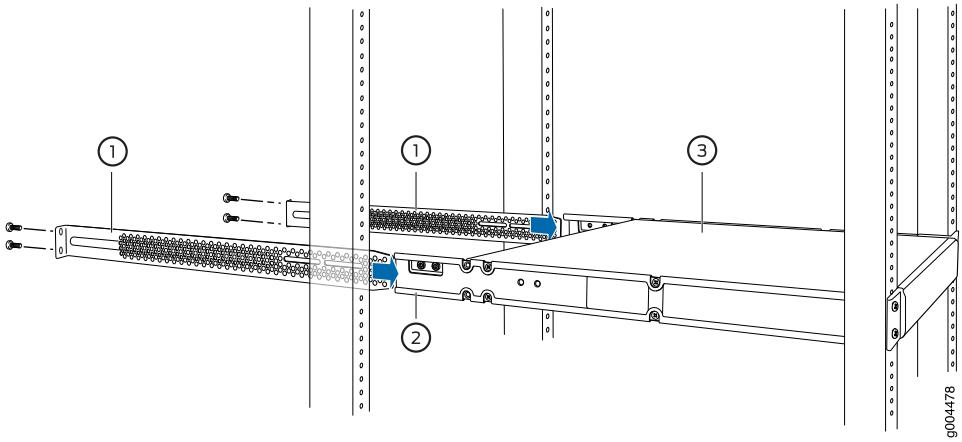


1— Side mounting-rail	2—Front-mounting bracket

8. Have a second person secure the front of the switch to the rack by using the appropriate screws for your rack.

9. Slide the rear mounting-blades into the side mounting-rails. See Figure 29 on page 100.

Figure 29: Sliding the Rear Mounting-Blades into the Side Mounting-Rail



1—Rear mounting-blades	3—Switch
2—Side mounting-rail	

10. Attach the rear mounting-blades to the rear post by using the appropriate screws for your rack. Tighten the screws.

11. Ensure that the switch chassis is level by verifying that all the screws on the front of the rack are aligned with the screws at the back of the rack.

Related Documentation

- Mounting an EX2200 Switch on Two Posts of a Rack or Cabinet on page 94
- Connecting Earth Ground to an EX Series Switch on page 115
- Connecting AC Power to an EX2200 Switch on page 121
- Connecting DC Power to an EX2200 Switch on page 123
- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 137
- Connecting and Configuring an EX Series Switch (J-Web Procedure) on page 140
- Mounting an EX2200 Switch in a Recessed Position in a Rack or Cabinet on page 100
- Rack-Mounting and Cabinet-Mounting Warnings on page 192

Mounting an EX2200 Switch in a Recessed Position in a Rack or Cabinet

You can mount an EX2200 switch except the EX2200-C switch model in a rack or cabinet such that the switch is recessed inside the rack from the rack front by 2 inches. You can use the 2-in.-recess front brackets provided in the separately orderable four-post rack-mount kit to mount the switch in a recessed position.

Reasons that you might want to mount the switch in a recessed position include:

- You are mounting the switch in a cabinet and the cabinet doors will not close completely unless the switch is recessed.
- The switch you are mounting has transceivers installed in the uplink ports—the transceivers in the uplink ports protrude from the front of the switch.

To mount the switch in a recessed position on four posts, follow the instructions in "Mounting an EX2200 Switch on Four Posts of a Rack or Cabinet" on page 97. To mount the switch in a recessed position on two posts, follow the instructions in "Mounting an EX2200 Switch on Two Posts of a Rack or Cabinet" on page 94.

Related Documentation

- Connecting Earth Ground to an EX Series Switch on page 115
- Rack-Mounting and Cabinet-Mounting Warnings on page 192

Mounting an EX2200 Switch on a Wall

This topic describes the process of mounting an EX2200 switch on a wall.

1. Mounting an EX2200 Switch Except the EX2200-C Model on a Wall on page 101
2. Mounting an EX2200-C Switch on a Wall on page 104

Mounting an EX2200 Switch Except the EX2200-C Model on a Wall

You can mount an EX2200 switch on a wall by using the separately orderable wall-mount kit.

WARNING:

- When mounting an EX2200 switch chassis in a vertical position, orient the front panel of the chassis downward to ensure proper airflow and meet safety requirements in the event of a fire.
- When wall mounting Power over Ethernet (PoE) models (EX2200-24P and EX2200-48P), install the wall-mount baffle above the units to reduce the risk of objects or substances falling into the air exhaust or power supply, which could cause a fire.

Before mounting the switch on a wall:

- Verify that the site meets the requirements described in "Site Preparation Checklist for EX2200 Switches" on page 47.
- Read "General Safety Guidelines and Warnings" on page 181, with particular attention to "Chassis Lifting Guidelines" on page 190.

Ensure that you have the following parts and tools available:

- 2 wall-mount brackets (provided in the wall-mount kit)
- 1 wall-mount baffle (provided in the wall-mount kit)

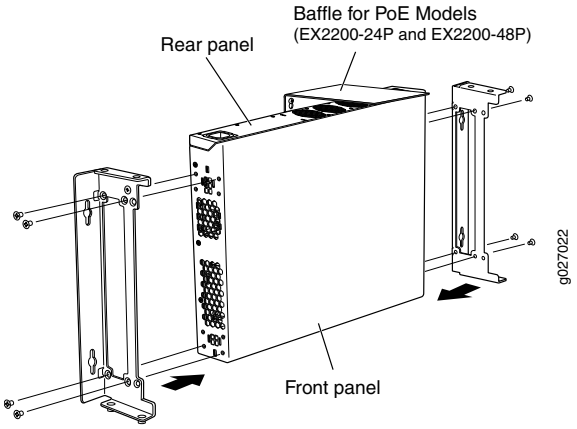
- 12 wall-mount bracket screws (provided in the wall-mount kit)
- 6 mounting screws (8-32 x 1.25 in. or M4 x 30 mm) (not provided)
- Hollow wall anchors rated to support up to 75 lb (34 kg) if you are not screwing the screws directly into wall studs (not provided)
- Phillips (+) screwdriver, number 2

To mount one or two switches on a wall:

1. Remove the switch from the shipping carton (see "Unpacking an EX2200 Switch" on page 85).

2. Attach the wall-mount brackets to the sides of the chassis using four wall-mount bracket screws on each side, as shown in Figure 30 on page 102.

Figure 30: Attaching Wall-Mount Brackets to a Switch Chassis



3. If you are mounting two switches together, align the second switch on top of the first and attach it to the mounting brackets using two additional wall-mount bracket screws on each side. (Figure 32 on page 104 shows two aligned switches.)

4. Install four mounting screws in the wall for the wall-mount brackets (and two more for the baffle if you are installing a switch that supports PoE) as shown in Figure 31 on page 103:
   - Use hollow wall anchors rated to support up to 75 lb (34 kg) if you are not inserting the mounting screws directly into wall studs.
   - Turn the screws only part way in, leaving about 1/4 in. (6 mm) distance between the head of the screw and the wall.

   a. Install screw **A**.

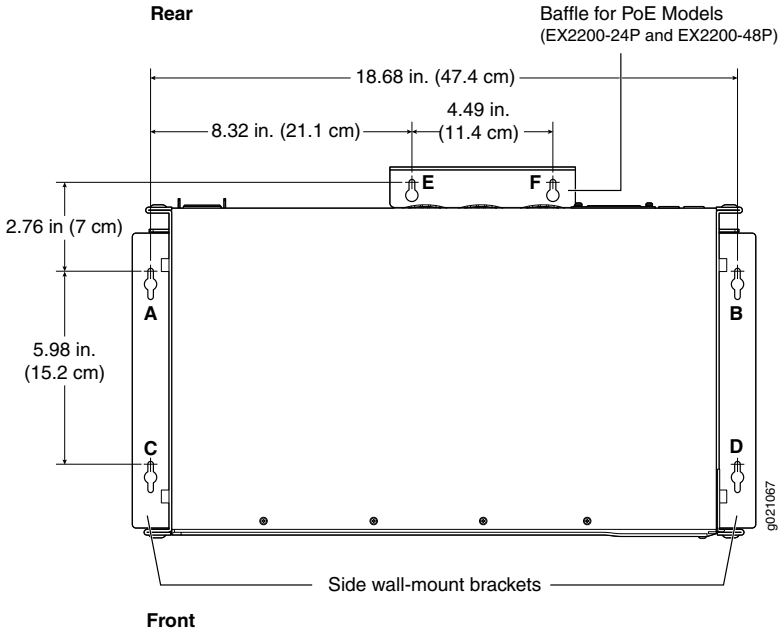
   b. Install screw **B** 18.68 in. (47.4 cm) from screw **A** on a level line.

c. Install screw **C** 5.98 in. (15.2 cm) on a plumb line down from screw **A** and screw **D** 5.98 in. down from screw **B**.

d. For PoE models, install screw **E** 2.76 in. (7 cm) up from and 8.32 in. (21.1 cm) to the right of screw **A**.

e. For PoE models, install screw **F** 4.49 in. (11.4 cm) to the right of screw **E**.

Figure 31: Measurements for Installing Mounting Screws

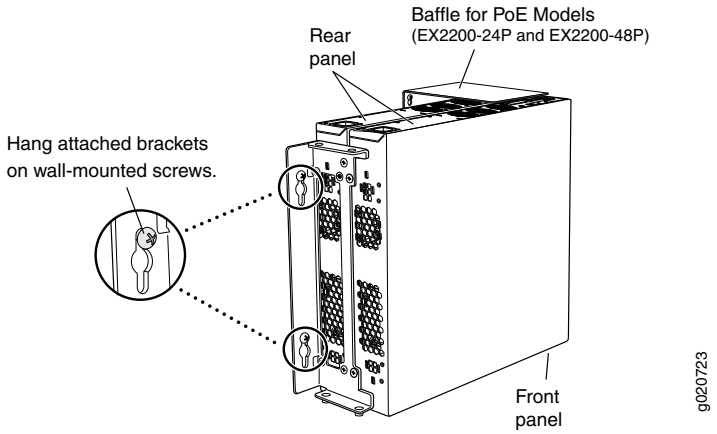


5. Lift the unit (one switch or two) by grasping each side, and hang the unit by attaching the brackets to the mounting screws as shown in Figure 32 on page 104.

6. For PoE models, install the baffle by attaching it to screws **E** and **F**.

7. Tighten all mounting screws.

Figure 32: Mounting the Switch on a Wall



Mounting an EX2200-C Switch on a Wall

You can mount an EX2200-C switch, the compact, fanless model, on a wall by using the flexible mounting slots on the bottom of the chassis to fix to the screws on the wall.

WARNING: When mounting an EX2200-C switch chassis in a vertical position, orient the front panel of the chassis downward to ensure proper airflow and meet safety requirements in the event of a fire.

CAUTION: Do not block the vents on the top of the EX2200-C switches. Doing this can lead to overheating of the switch chassis.

Before mounting the switch on a wall:

- Verify that the site meets the requirements described in "Site Preparation Checklist for EX2200 Switches" on page 47.
- Read "General Safety Guidelines and Warnings" on page 181, with particular attention to "Chassis Lifting Guidelines" on page 190.

Ensure that you have the following parts and tools available:

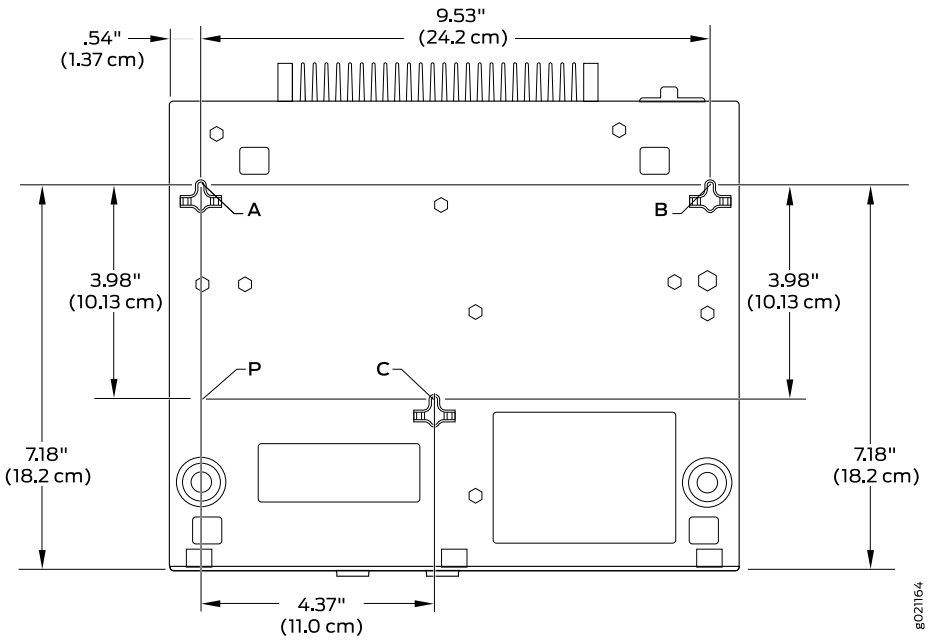
- 3 wall mounting screws (M4 x 30mm or 8-32 x 1.25 in. Phillips pan-head machine screws—not provided)
- Phillips (+) screwdriver, number 2
- 1 cable guard with 3 number-8 Phillips truss-head screws to secure the cable guard to the EX2200-C switch (optional and separately orderable)
- 1 standard cable lock (optional and separately orderable) to secure the switch from theft by connecting the cable to a security slot on the switch

To mount the switch on a wall:

1. Remove the switch from the shipping carton (see "Unpacking an EX2200 Switch" on page 85).

2. Drill three holes **A**, **B**, and **C** on the wall as shown in Figure 33 on page 105.

Figure 33: Measurements for Installing Mounting Screws for the EX2200-C Switch



   a. Drill hole **A** and install a mounting screw.

   b. Drill hole **B** 9.53 in. (24.2 cm) on a level line from hole **A** and install a mounting screw.

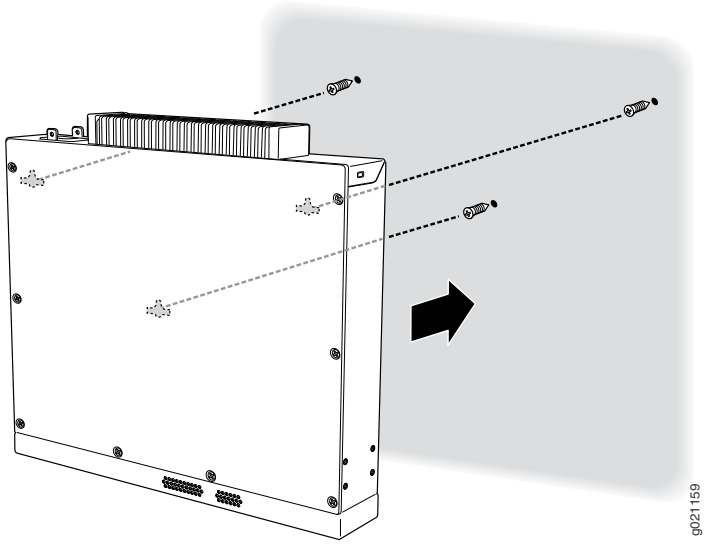
   c. Mark a point **P** 3.98 in. (10.13 cm) on a plumb line down from hole **A**.

   d. From point **P** 4.37 in. (11.0 cm) on a level line drill hole **C** and install a mounting screw.

3. Tighten the screws only part way in, leaving about 1/4 in. (6 mm) distance between the head of the screw and the wall.

4. Mount the switch on the mounting screws facing front panel downwards, and slide it downward until it locks in place as shown in Figure 34 on page 106.

Figure 34: Mounting the EX2200-C Switch on a Wall Using Screws

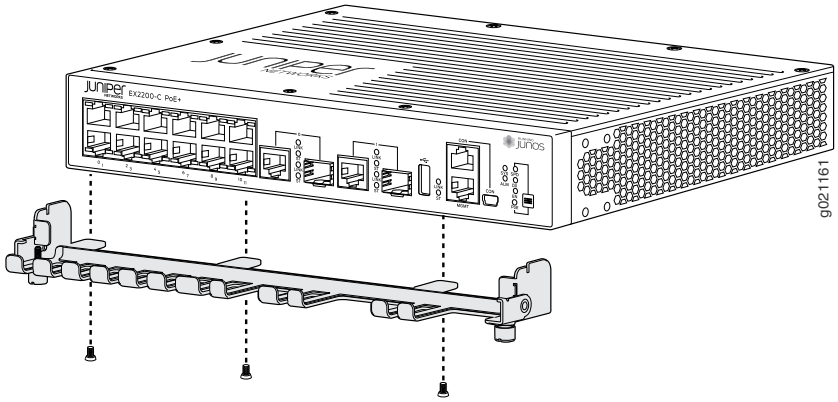


5. (Optional) Attach the optional cable guard to protect cable connections:

   a. Use the 3 truss-head screws to attach the cable guard to the bottom of the chassis.

   b. Use the thumbscrews to tighten or loosen the guard to allow you to insert cables. See Figure 35 on page 106.

Figure 35: Attaching a Cable Guard to an EX2200-C Switch

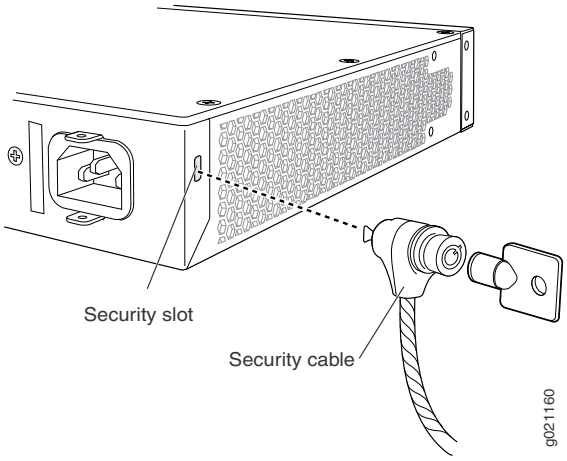


6. (Optional) Attach the optional standard cable lock to a security slot on the side of the switch:

   a. Rope the cable to a desk or a rack and set the lock to the unlocked position.

   b. Insert the lock into a security slot on your chassis and set the lock to the locked position. See Figure 36 on page 107.

Figure 36: Securing the EX2200-C Switch Using Security Slots



Related Documentation

- Connecting AC Power to an EX2200 Switch on page 121
- Connecting DC Power to an EX2200 Switch on page 123
- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 137
- Connecting and Configuring an EX Series Switch (J-Web Procedure) on page 140
- Wall-Mounting Warnings for EX2200 Switches on page 196

Mounting an EX2200 Switch On or Under a Desk Using Screws

This topic applies only to the EX2200-C switch, the compact, fanless model.

You can mount an EX2200-C switch on or under a desk or other level surface by using the flexible mounting slots on the bottom of the chassis to secure the switch.

Before mounting the switch on or under a desk or other lever surface:

- Verify that the site meets the requirements described in "Site Preparation Checklist for EX2200 Switches" on page 47.
- Place the desk in its permanent location, allowing adequate clearance for airflow and maintenance, and secure it to the building structure.
- Read "General Safety Guidelines and Warnings" on page 181, with particular attention to "Chassis Lifting Guidelines" on page 190.
- Remove the switch from the shipping carton (see "Unpacking an EX2200 Switch" on page 85).

NOTE: Do not block the vents on the top of the EX2200-C switches. Doing this can lead to overheating of the switch chassis.

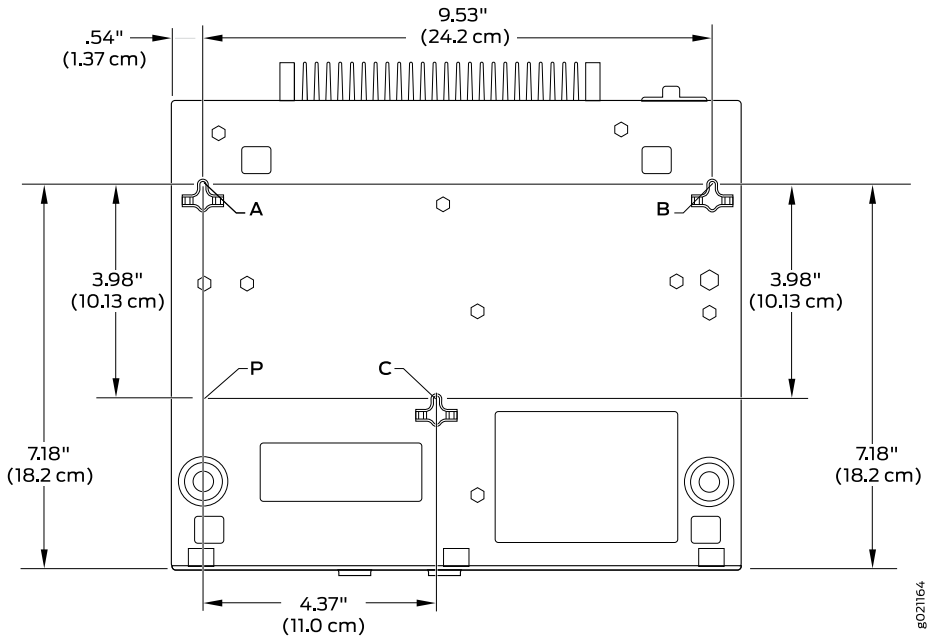
Ensure that you have the following parts and tools available:

- 3 desk mounting screws (M4 x 30mm or 8-32 x 1.25 in. Phillips pan-head machine screws—not provided)
- Phillips (+) screwdriver, number 2.
- 1 cable guard with 3 number-8 Phillips truss-head screws to secure the cable guard to the EX2200-C switch (optional and separately orderable)
- 1 standard cable lock (optional and separately orderable) to secure the switch from theft by connecting the cable to the security slots on the switch

To mount the switch on or under a desk or other level surface:

1. Drill three holes **A**, **B**, and **C** on or under the desk as shown in Figure 37 on page 108.

Figure 37: Measurements for Installing Mounting Screws for EX2200-C Switch



   a. Drill hole **A** and install a mounting screw.

   b. Drill hole **B** 9.52 in. (22.1 cm) on a level line from hole **A** and install a mounting screw.

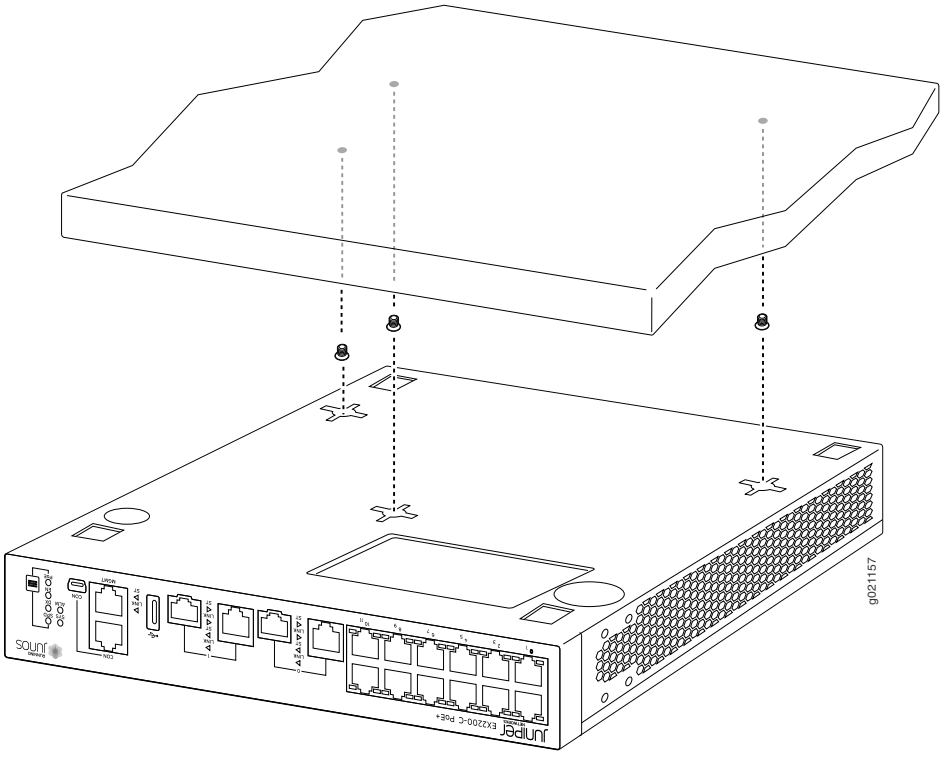
c. Mark a point **P** 3.98 in. (10.13 cm) on a plumb line down from hole **A**.

d. From point **P** 4.37 in. (11.0 cm) on a level line drill hole **C** and install a mounting screw.

2. Tighten the screws only part way in, leaving about 1/4 in. (6 mm) distance between the head of the screw and the desk.

3. Place the switch on the mounting screws, and slide it forward or backward until it locks in place. See Figure 38 on page 109.

Figure 38: Mounting the EX2200-C Switch On or Under a Desk Using Screws

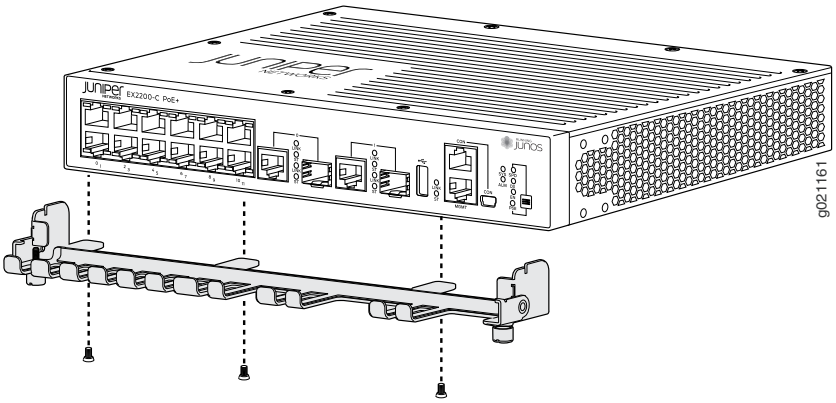


4. (Optional) Attach the cable guard to protect cable connections:

a. Use the 3 truss-head screws to attach the cable guard to the bottom of the chassis.

b. Use the thumbscrews to tighten or loosen the guard to allow you to insert cables. See Figure 39 on page 110.

Figure 39: Attaching a Cable Guard to an EX2200-C Switch

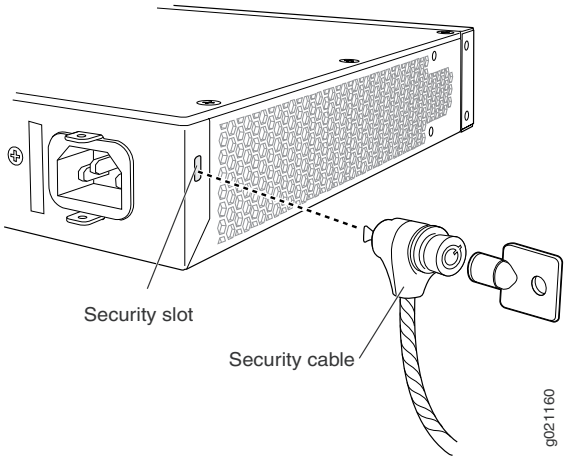


5. (Optional) Attach the standard cable lock to the security slots on the both sides of the switch

   a. Rope the cable to a desk or a rack and set the lock to unlocked position.

   b. Insert the lock into one of the security slot on your chassis and set the lock to the locked position. See Figure 40 on page 110.

Figure 40: Securing the EX2200-C Switch Using Security Slots



Related Documentation

- Connecting AC Power to an EX2200 Switch on page 121
- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 137
- Wall-Mounting Warnings for EX2200 Switches on page 196

Mounting an EX2200 Switch Using the Magnet Mount

This topic applies only to the EX2200-C switch, the compact, fanless model.

You can mount an EX2200-C switch on or under a surface made of ferrous material using the separately orderable magnet sheet.

WARNING: When mounting an EX2200-C switch chassis in a vertical position, orient the front panel of the chassis downward to ensure proper airflow and meet safety requirements in the event of a fire.

NOTE: Do not block the vents on the top of the EX2200-C switches. Doing this can lead to overheating of the switch chassis.

Before mounting the switch using magnet mount:

- Ensure that no rubber feet are installed on the bottom of the switch.
- Verify that the site meets the requirements described in "Site Preparation Checklist for EX2200 Switches" on page 47.
- Place the desk in its permanent location, allowing adequate clearance for airflow and maintenance, and secure it to the building structure.
- Read "General Safety Guidelines and Warnings" on page 181, with particular attention to "Chassis Lifting Guidelines" on page 190.
- Remove the switch from the shipping carton (see "Unpacking an EX2200 Switch" on page 85).

Ensure that you have the following parts and tools available:

- Magnet sheet (separately orderable)
- Flat surface made of ferrous material
- 1 cable guard with 3 number-8 Phillips truss-head screws to secure the cable guard to the EX2200-C switch (optional and separately orderable)
- 1 standard cable lock (optional and separately orderable) to secure the switch from theft by connecting the cable to the security slots on the switch

1. Mount the switch under a ferrous surface using magnet mount:
   a. Turn the chassis upside down.
   b. Place the magnet sheet on the bottom of the chassis.

NOTE: You can place the magnet sheet only at the bottom of the switch.

c. Mount the magnet sheet along with the switch under the surface where you want to mount the switch.

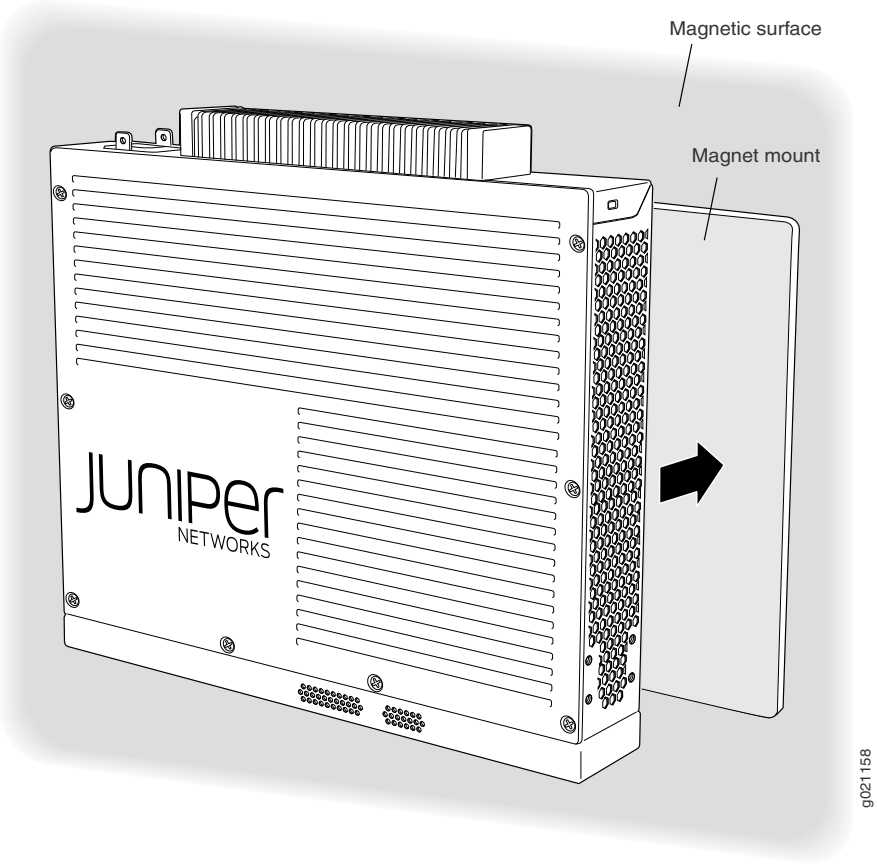
2. Mount the switch vertically on a ferrous surface using magnet mount:

   a. Place the magnet sheet at the bottom of the chassis.

   NOTE: You can place the magnet sheet only at the bottom of the switch.

   b. Mount the magnet along with the switch on the ferrous surface where you want to mount the switch orienting the front panel downwards as shown in Figure 41 on page 112.

Figure 41: Mounting an EX2200-C Switch Using Magnet Mount

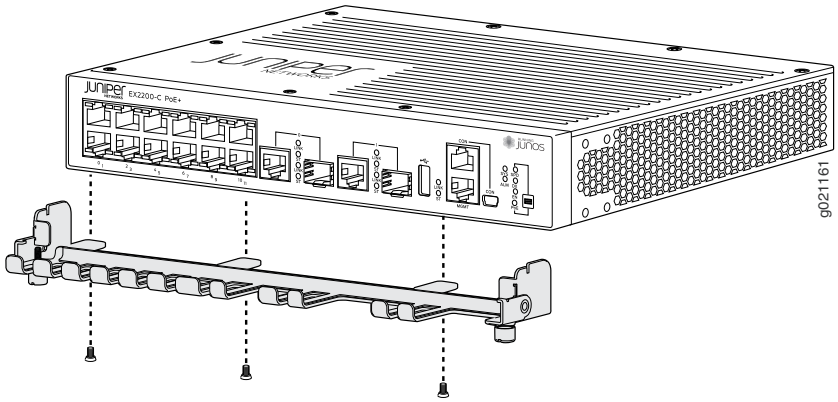


3. (Optional) Attach the cable guard to protect cable connections:

   a. Use the 3 truss-head screws to attach the cable guard to the bottom of the chassis.

b. Use the thumbscrews to tighten or loosen the guard to allow you to insert cables. See Figure 42 on page 113.

Figure 42: Attaching a Cable Guard to an EX2200-C Switch

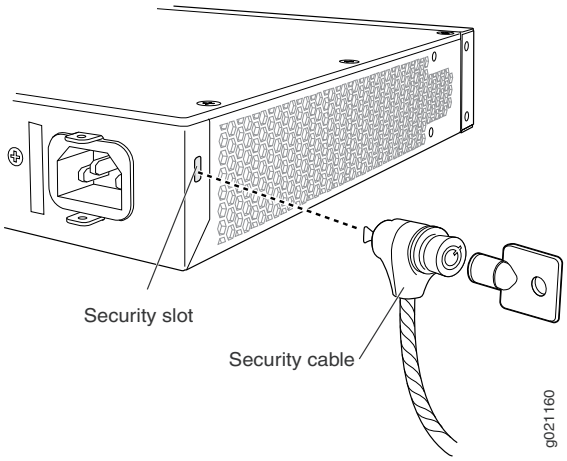


4. (Optional) Attach the standard cable lock to the security slots on the both sides of the switch

   a. Rope the cable to a desk or a rack and set the lock to unlocked position.

   b. Insert the lock into one of the security slot on your chassis and set the lock to the locked position. See Figure 43 on page 113.

Figure 43: Securing the EX2200-C Switch Using Security Slots



Related Documentation

- Connecting AC Power to an EX2200 Switch on page 121
- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 137
- Wall-Mounting Warnings for EX2200 Switches on page 196

CHAPTER 12

Connecting the Switch to Power

Connecting Earth Ground to an EX Series Switch

To ensure proper operation and to meet safety and electromagnetic interference (EMI) requirements, you must connect an EX Series switch to earth ground before you connect power to the switch. You must use the protective earthing terminal on the switch chassis to connect the switch to earth ground (see Figure 45 on page 120).

WARNING: The switch is installed in a restricted-access location. It has a separate protective earthing terminal on the chassis that must be permanently connected to earth ground to adequately ground the chassis and protect the operator from electrical hazards.

CAUTION: Before switch installation begins, ensure that a licensed electrician has attached an appropriate grounding lug to the grounding cable that you supply. Using a grounding cable with an incorrectly attached lug can damage the switch.

This topic describes:

Parts and Tools Required for Connecting an EX Series Switch to Earth Ground

Table 49 on page 116 lists the earthing terminal location, grounding cable requirements, grounding lug specifications, screws and washers required, and the screwdriver needed

for connecting a switch to earth ground. Before you begin connecting a switch to earth ground, ensure you have the parts and tools required for your switch.

Table 49: Parts and Tools Required for Connecting an EX Series Switch to Earth Ground

Switch	Earthing Terminal Location	Grounding Cable Requirements	Grounding Lug Specifications	Screws and Washers	Screwdriver	Additional Information
EX2200	Rear panel of the chassis	14 AWG (2 mm^2), minimum 90°C wire, or as permitted by the local code	Panduit LCC10-14BWL or equivalent—not provided	• Two 10-32 x .25 in. screws with #10 split-lock washer—not provided • Two #10 flat washers—not provided	Phillips (+) number 2	
EX2300-C	Rear panel of the chassis	14 AWG (2 mm^2), minimum 90°C wire, or as permitted by the local code	Panduit LCC10-14BWL or equivalent—not provided	• Two 10-32 x .25 in. screws with #10 split-lock washer—not provided • Two #10 flat washers—not provided	Phillips (+) number 2	
EX2300	Rear panel of the chassis	14 AWG (2 mm^2), minimum 90°C wire, or as permitted by the local code	Panduit LCC10-14BWL or equivalent—not provided	• Two 10-32 x .25 in. screws with #10 split-lock washer—not provided • Two #10 flat washers—not provided	Phillips (+) number 2	
EX3200	Rear panel of the chassis	14 AWG (2 mm^2), minimum 90°C wire, or as permitted by the local code	Panduit LCC10-14BWL or equivalent—not provided	• Two 10-32 x .25 in. screws with #10 split-lock washer—not provided • Two #10 flat washers—not provided	Phillips (+) number 2	See "Special Instructions to Follow Before Connecting Earth Ground to a Switch" on page 118.
EX3300	Rear panel of the chassis	14 AWG (2 mm^2), minimum 90°C wire, or as permitted by the local code	Panduit LCC10-14BWL or equivalent—not provided	• Two 10-32 x .25 in. screws with #10 split-lock washer—not provided • Two #10 flat washers—not provided	Phillips (+) number 2	
EX3400	Rear panel of the chassis	14 AWG (2 mm^2), minimum 90°C wire, or as permitted by the local code	Panduit LCC10-14BWL or equivalent—not provided	• Two 10-32 x .25 in. screws with #10 split-lock washer—not provided • Two #10 flat washers—not provided	Phillips (+) number 2	

Table 49: Parts and Tools Required for Connecting an EX Series Switch to Earth Ground *(continued)*

Switch	Earthing Terminal Location	Grounding Cable Requirements	Grounding Lug Specifications	Screws and Washers	Screwdriver	Additional Information
EX4200	Left side of the chassis	14 WG (2 mm²), minimum 90°C wire, or as permitted by the local code	Panduit LCC10-14BWL or equivalent—not provided	• Two 10-32 x .25 in. screws with #10 split-lock washer—not provided • Two #10 flat washers—not provided	Phillips (+) number 2	See "Special Instructions to Follow Before Connecting Earth Ground to a Switch" on page 118.
EX4300	Left side of the chassis	14 AWG (2 mm²), minimum 90°C wire, or as permitted by the local code	Panduit LCC10-14BWL or equivalent—not provided	• Two 10-32 x .25 in. screws with #10 split-lock washer—not provided • Two #10 flat washers—not provided	Phillips (+) number 2	See "Special Instructions to Follow Before Connecting Earth Ground to a Switch" on page 118.
EX4500	Left side of the chassis	14 AWG (2 mm²), minimum 90°C wire, or as permitted by the local code	Panduit LCC10-14BWL or equivalent—not provided	• Two 10-32 x .25 in. screws with #10 split-lock washer—not provided • Two #10 flat washers—not provided	Phillips (+) number 2	See "Special Instructions to Follow Before Connecting Earth Ground to a Switch" on page 118.
EX4550	Left side of the chassis	14 AWG (2 mm²), minimum 90°C wire, or as permitted by the local code	Panduit LCC10-14BWL or equivalent—not provided	• Two 10-32 x .25 in. screws with #10 split-lock washer—not provided • Two #10 flat washers—not provided	Phillips (+) number 2	See "Special Instructions to Follow Before Connecting Earth Ground to a Switch" on page 118.
EX6210	Rear panel of the chassis (on lower left side)	The grounding cable must be the same gage as the power feed cables and as permitted by the local code.	Panduit LCD2-14A-Q or equivalent—provided	• Two ¼-20 x 0.5 in. screws with #¼" split-washer—provided • Two #¼" flat washers—provided	Phillips (+) number 2	
EX8208	Left side of the chassis	6 AWG (13.3 mm²), minimum 60°C wire, or as permitted by the local code	Panduit LCD2-14A-Q or equivalent—provided	• Two ¼-20 x 0.5 in. screws with #¼" split-washer—provided • Two #¼" flat washers—provided	Phillips (+) number 2	

Table 49: Parts and Tools Required for Connecting an EX Series Switch to Earth Ground *(continued)*

Switch	Earthing Terminal Location	Grounding Cable Requirements	Grounding Lug Specifications	Screws and Washers	Screwdriver	Additional Information
EX8216	Two earthing terminals: • Left side of the chassis • Rear panel of the chassis	2 AWG (33.6 mm^2), minimum 60°C wire, or as permitted by the local code	Panduit LCD2-14A-Q or equivalent —provided	• Two ¼-20 x 0.5 in. screws with #¼" split-washer —provided • Two #¼" flat washers—provided	Phillips (+) number 2	See "Special Instructions to Follow Before Connecting Earth Ground to a Switch" on page 118.
EX9204	Rear panel of the chassis	One 6 AWG (13.3 mm^2), minimum 60°C wire, or one that complies with the local code	Thomas&Betts LCN6-14 or equivalent—provided	• Two ¼-20 x 0.5 in. screws with #¼" split-washer—provided • Two #¼" flat washers—provided	Phillips (+) number 2	See *Grounding Cable and Lug Specifications for EX9200 Switches*.
EX9208	Rear panel of the chassis	One 6 AWG (13.3 mm^2), minimum 60°C wire, or one that complies with the local code	Thomas&Betts LCN6-14 or equivalent—provided	• Two ¼-20 x 0.5 in. screws with #¼" split-washer—provided • Two #¼" flat washers—provided	Phillips (+) number 2	See *Grounding Cable and Lug Specifications for EX9200 Switches*.
EX9214	Rear panel of the chassis	One 6 AWG (13.3 mm^2), minimum 60°C wire, or one that complies with the local code	Thomas&Betts LCN6-14 or equivalent—provided	• Two ¼-20 x 0.5 in. screws with #¼" split-washer—provided • Two #¼" flat washers—provided	Phillips (+) number 2	See *Grounding Cable and Lug Specifications for EX9200 Switches*.

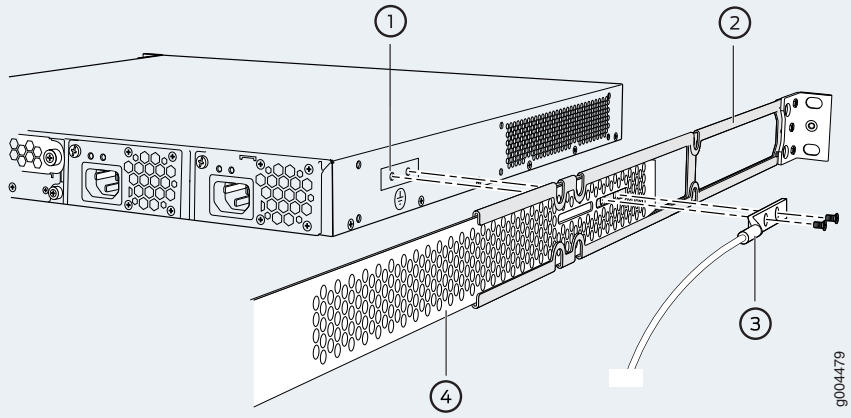
Special Instructions to Follow Before Connecting Earth Ground to a Switch

Table 50 on page 118 lists the special instructions that you might need to follow before connecting earth ground to a switch.

Table 50: Special Instructions to Follow Before Connecting Earth Ground to a Switch

Switch	Special Instructions
EX3200	NOTE: Some early variants of EX3200 switches for which the Juniper Networks model number on the label next to the protective earthing terminal is from 750-021*xxx* through 750-030*xxx* require 10-24x.25 in. screws.

Table 50: Special Instructions to Follow Before Connecting Earth Ground to a Switch *(continued)*

Switch	Special Instructions
EX4200	NOTE: Some early variants of EX4200 switches for which the Juniper Networks model number on the label next to the protective earthing terminal is from 750-021*xxx* through 750-030*xxx* require 10-24x.25 in. screws. NOTE: The protective earthing terminal on an EX4200 switch mounted on four posts of a rack is accessible through the slot on the left rear bracket only if the rack is 27.5 in. (69.85 cm) through 30.5 in. (77.47 cm) deep for a switch mounted flush with the rack front and 29.5 in. (74.93 cm) through 32.5 in. (82.55 cm) deep for a switch mounted 2 in. (5.08 cm) recessed from the rack front. See Figure 44 on page 119. **Figure 44: Connecting the Grounding Lug to a Switch Mounted on Four Posts of a Rack**  1—Protective earthing terminal; 3—Grounding lug 2—Side mounting-rail; 4—Rear mounting-blade NOTE: The brackets must be attached to the chassis before the grounding lug is attached. (The brackets are shown pulled away from the chassis so that the protective earthing terminal is seen.)
EX4300	NOTE: The protective earthing terminal on an EX4300 switch mounted on four posts of a rack is accessible through the slot on the left rear bracket only if the rack is 27.5 in. (69.85 cm) through 30.5 in. (77.47 cm) deep for a switch mounted flush with the rack front and 29.5 in. (74.93 cm) through 32.5 in. (82.55 cm) deep for a switch mounted 2 in. (5.08 cm) recessed from the rack front.
EX4500	NOTE: If you plan to mount your switch on four posts of a rack or cabinet, mount your switch in the rack or cabinet before attaching the grounding lug to the switch. See *Mounting an EX4500 Switch on Four Posts in a Rack or Cabinet*. NOTE: The protective earthing terminal on an EX4500 switch mounted on four posts of a rack is accessible through the slot on the left rear bracket only if the rack is 27.5 in. (69.85 cm) through 30.5 in. (77.47 cm) deep for a switch mounted flush with the rack front and 29.5 in. (74.93 cm) through 32.5 in. (82.55 cm) deep for a switch mounted 2 in. (5.08 cm) recessed from the rack front.
EX4550	NOTE: The protective earthing terminal on an EX4550 switch mounted on four posts of a rack is accessible through the slot on the left rear bracket only if the rack is 27.5 in. (69.85 cm) through 30.5 in. (77.47 cm) deep for a switch mounted flush with the rack front and 29.5 in. (74.93 cm) through 32.5 in. (82.55 cm) deep for a switch mounted 2 in. (5.08 cm) recessed from the rack front.
EX8216	NOTE: Only one of the two protective earthing terminals needs to be permanently connected to earth ground.

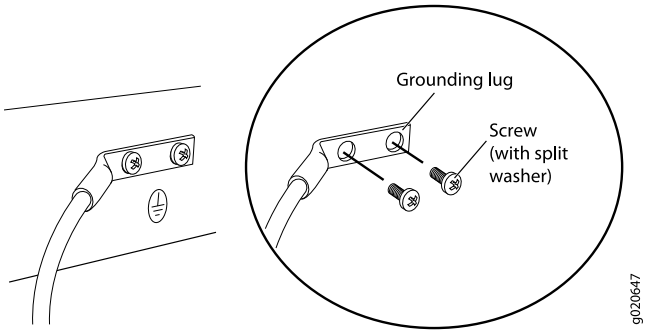
Connecting Earth Ground to an EX Series Switch

To connect earth ground to a switch:

1. Connect one end of the grounding cable to a proper earth ground, such as the rack in which the switch is mounted.

2. Place the grounding lug attached to the grounding cable over the protective earthing terminal. See Figure 45 on page 120.

Figure 45: Connecting a Grounding Cable to an EX Series Switch



3. Secure the grounding lug to the protective earthing terminal with the washers and screws.

4. Dress the grounding cable and ensure that it does not touch or block access to other switch components.

WARNING: **Ensure that the cable does not drape where people could trip over it.**

Related Documentation

- Connecting AC Power to an EX2200 Switch on page 121
- Connecting DC Power to an EX2200 Switch on page 123
- *Connecting AC Power to an EX2300 Switch*
- *Connecting AC Power to an EX3200 Switch*
- *Connecting DC Power to an EX3200 Switch*
- *Connecting AC Power to an EX3300 Switch*
- *Connecting DC Power to an EX3300 Switch*
- *Connecting AC Power to an EX3400 Switch*
- *Connecting AC Power to an EX4200 Switch*
- *Connecting DC Power to an EX4200 Switch*

- *Connecting AC Power to an EX4300 Switch*
- *Connecting DC Power to an EX4300 Switch*
- *Connecting AC Power to an EX4500 Switch*
- *Connecting DC Power to an EX4500 Switch*
- *Connecting AC Power to an EX4550 Switch*
- *Connecting DC Power to an EX4550 Switch*
- *Connecting AC Power to an EX6200 Switch*
- *Connecting DC Power to an EX6200 Switch*
- *Connecting AC Power to an EX8200 Switch*
- *Connecting DC Power to an EX8200 Switch*
- *Connecting AC Power to an EX9204 Switch*
- *Connecting DC Power to an EX9204 Switch*
- *Connecting AC Power to an EX9208 Switch*
- *Connecting DC Power to an EX9208 Switch*
- *Connecting AC Power to an EX9214 Switch*
- *Connecting DC Power to an EX9214 Switch*
- General Safety Guidelines and Warnings on page 181
- Grounded Equipment Warning on page 196

Connecting AC Power to an EX2200 Switch

The power supply in an EX2200 switch is located on the rear panel.

Ensure that you have the following parts and tools available:

- A power cord appropriate for your geographical location
- A power cord retainer clip

Ensure that you have connected the switch chassis to earth ground.

CAUTION: To meet safety and electromagnetic interference (EMI) requirements and to ensure proper operation, you must connect the switches to earth ground before you connect them to power. For installations that require a separate grounding conductor to the chassis, use the protective earthing terminal on the switch chassis to connect to the earth ground. For instructions on connecting earth ground, see "Connecting Earth Ground to an EX Series Switch" on page 115. An EX2200 switch gets additional grounding when you plug the power supply in the switch into a grounded AC power

outlet by using the AC power cord appropriate for your geographical location (see "AC Power Cord Specifications for EX2200 Switches" on page 62).

To connect AC power to the switch:

1. Squeeze the two sides of the power cord retainer clip and insert the L-shaped ends of the wire clip into the holes in the bracket on each side of the AC power cord inlet on the rear panel (Figure 46 on page 122).

   The power cord retainer clip extends out of the chassis by 3 in.

2. Locate the power cord or cords shipped with the switch; the cords have plugs appropriate for your geographical location. See "AC Power Cord Specifications for EX2200 Switches" on page 62.

   WARNING: Ensure that the power cord does not drape where people can trip on it or block access to switch components.

3. Insert the coupler end of the power cord into the AC power cord inlet on the rear panel.

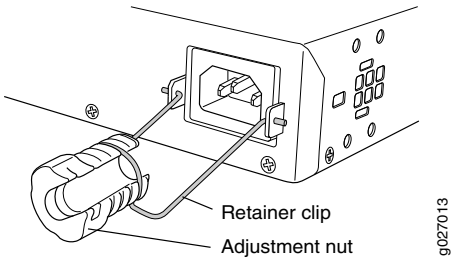
4. Push the power cord into the slot in the adjustment nut of the power cord retainer clip. Turn the nut until it is tight against the base of the coupler and the slot in the nut is turned 90º from the top of the switch (see Figure 47 on page 123).

5. If the AC power source outlet has a power switch, set it to the OFF (0) position.

6. Insert the power cord plug into an AC power source outlet.

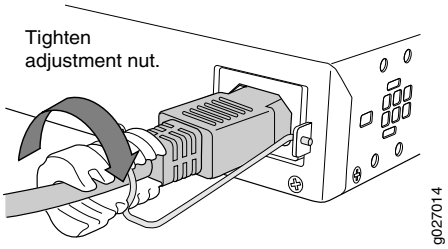
7. If the AC power source outlet has a power switch, set it to the ON (|) position.

Figure 46: Connecting an AC Power Cord Retainer Clip to the AC Power Cord Inlet on an EX2200 Switch



NOTE: The retainer brackets on your switch might be above and below the power inlet rather than on either side.

Figure 47: Connecting an AC Power Cord to the AC Power Cord Inlet on an EX2200 Switch



Related Documentation

- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 137
- Connecting and Configuring an EX Series Switch (J-Web Procedure) on page 140
- Power Supply in EX2200 Switches on page 23

Connecting DC Power to an EX2200 Switch

The power supply is built-in along the rear panel.

WARNING: DC-powered switches are intended for installation only in a restricted access location.

Before you begin connecting DC power to the switch, ensure that you have connected earth ground to the switch chassis.

CAUTION: Before you connect power to the switch, a licensed electrician must attach a cable lug to the grounding and power cables that you supply. A cable with an incorrectly attached lug can damage the switch (for example, by causing a short circuit).

To meet safety and electromagnetic interference (EMI) requirements and to ensure proper operation, you must connect the switch to earth ground before you connect them to power. For installations that require a separate grounding conductor to the chassis, use the protective earthing terminal on the switch chassis to connect to the earth ground. For instructions on connecting earth ground, see "Connecting Earth Ground to an EX Series Switch" on page 115.

NOTE: Grounding is required for DC systems and recommended for AC systems. An AC-powered switch gets additional grounding when you plug the power supply in the switch into a grounded AC power outlet by using the AC power cord appropriate for your geographical location.

Ensure that you have the following parts and tools available:

- DC power source cables (14 AWG) with ring lug (Molex 0190700067 or equivalent) (not provided) attached to them by a licensed electrician
- Phillips (+) screwdriver, number 2

To connect DC power to the switch:

1. Ensure that the input circuit breaker is open so that the cable leads do not become active while you are connecting DC power.

   NOTE: The DC power supply in the switch has four terminals labeled A+, B+, A–,and B–for connecting DC power source cables labeled positive (+) and negative (–). The terminals are covered by a clear plastic cover.

   NOTE: The A+and B+ terminals are referred to as +RTN and A– and B– terminals are referred to as –48 V in "DC Power Wiring Sequence Warning" on page 219 and "DC Power Electrical Safety Guidelines for Switches" on page 214.

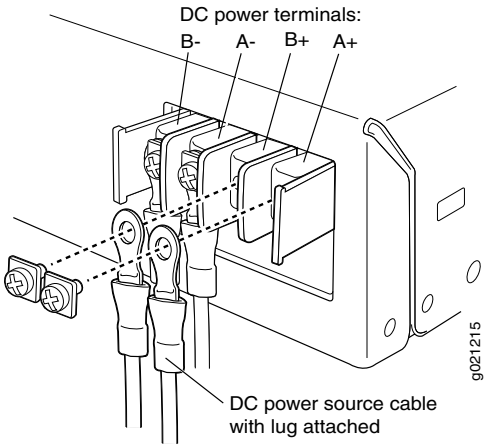
2. Grasp the plastic cover in the middle, gently flex it outward, and pull it out. Save the cover.

3. Remove the screws on the terminals by using the screwdriver. Save the screws.

   WARNING: Ensure that the power cables do not block access to switch components or drape where people can trip on them.

4. Connect the power supply to the power sources. Secure power source cables to the power supply by screwing the ring lugs attached to the cables to the appropriate terminals by using the screw from the terminals (see Figure 48 on page 125).

Figure 48: Securing Ring Lugs to the Terminals on the DC Power Supply



- To connect the power supply to a power source:
  a. Secure the ring lug of the positive (+) DC power source cable to the A+ or B+ terminal on the DC power supply.
  b. Secure the ring lug of the negative (–) DC power source cable to the A– or B– terminal on the DC power supply.
  c. Tighten the screws on the power supply terminals until snug by using the screwdriver. Do not overtighten—apply between 8 in.-lb (0.9 Nm) and 9 in.-lb (1.02 Nm) of torque to the screws.

- To connect the power supply to two power sources:
  a. Secure the ring lug of the positive (+) DC power source cable from the first DC power source to the A+ terminal on the power supply.
  b. Secure the ring lug of the negative (–) DC power source cable from the first DC power source to the A– terminal on the power supply.
  c. Secure the ring lug of the positive (+) DC power source cable from the second DC power source to the B+ terminal on the power supply.
  d. Secure the ring lug of the negative (–) DC power source cable from the second DC power source to the B– terminal on the power supply.
  e. Tighten the screws on the power supply terminals on both the power supplies until snug by using the screwdriver. Do not overtighten—apply between 8 in.-lb (0.9 Nm) and 9 in.-lb (1.02 Nm) of torque to the screws.

5. Hook the plastic cover on one side of the terminal block and gently flex it inward to hook it on the other side also.

6. Close the input circuit breaker.

Related Documentation

- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 137
- Connecting and Configuring an EX Series Switch (J-Web Procedure) on page 140
- Power Supply in EX2200 Switches on page 23

CHAPTER 13

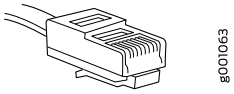
Connecting the Switch to the Network

Connecting a Device to a Network for Out-of-Band Management

You can monitor and manage these devices by using a dedicated management channel. Each device has a management port to which you can connect an Ethernet cable with an RJ-45 connector. Use the management port to connect the device to the management device.

Ensure that you have an Ethernet cable that has an RJ-45 connector at either end. Figure 49 on page 127 shows the RJ-45 connector of the Ethernet cable supplied with the device.

Figure 49: RJ-45 Connector on an Ethernet Cable

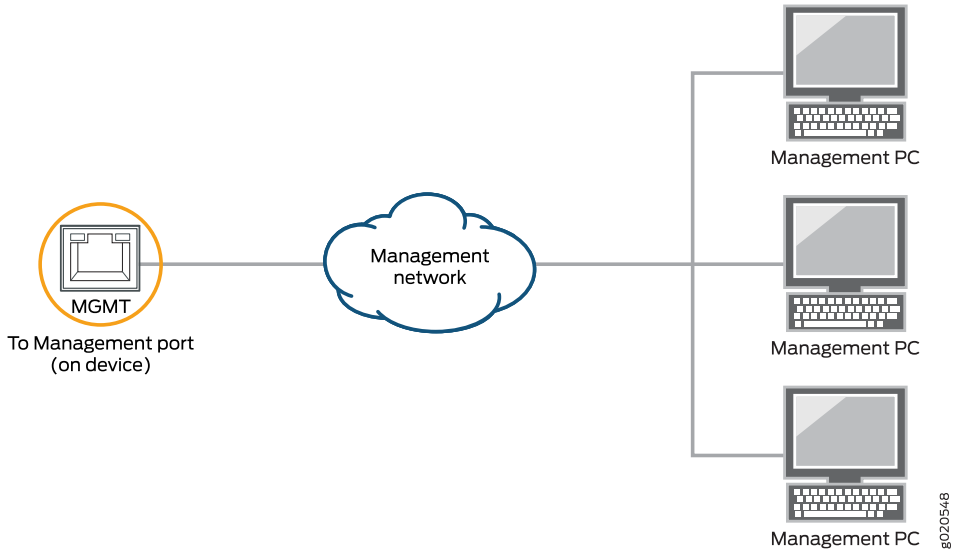


To connect a device to a network for out-of-band management (see Figure 50 on page 128):

1. Connect one end of the Ethernet cable to the management port (labeled **MGMT** or **ETHERNET**) on the device.

2. Connect the other end of the Ethernet cable to the management device.

Figure 50: Connecting a Device to a Network for Out-of-Band Management



Related Documentation

- Connecting a Device to a Management Console by Using an RJ-45 Connector on page 128

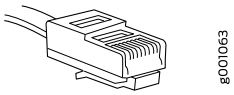
Connecting a Device to a Management Console by Using an RJ-45 Connector

You can configure and manage these devices by using a dedicated management channel. Each device has a console port to which you can connect an Ethernet cable with an RJ-45 connector. Use the console port to connect the device to the console server or management console. The console port accepts a cable that has an RJ-45 connector.

Ensure that you have an Ethernet cable that has an RJ-45 connector at either end. One such cable and an RJ-45 to DB-9 serial port adapter are supplied with the device.

Figure 51 on page 128 shows the RJ-45 connector of the Ethernet cable.

Figure 51: RJ-45 Connector on an Ethernet Cable



NOTE: If your laptop or PC does not have a DB-9 male connector pin and you want to connect your laptop or PC directly to the device, use a combination of the RJ-45 to DB-9 female adapter supplied with the device and a USB to DB-9 male adapter. You must provide the USB to DB-9 male adapter.

To connect the device to a management console (see Figure 52 on page 129 and Figure 53 on page 129):

1. Connect one end of the Ethernet cable to the console port (labeled **CON**, **CONSOLE**, or **CON1**) on the device.

2. Connect the other end of the Ethernet cable to the console server (see Figure 52 on page 129) or management console (see Figure 53 on page 129).

Figure 52: Connecting a Device to a Management Console Through a Console Server

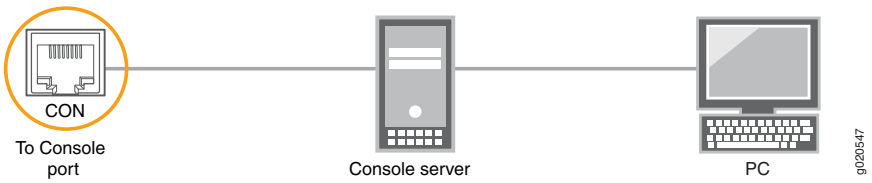


Figure 53: Connecting a Device Directly to a Management Console

Related Documentation

- Connecting a Device to a Network for Out-of-Band Management on page 127

Connecting an EX Series Switch to a Management Console by Using the Mini-USB Type-B Console Port

You can configure and manage EX2200-C, EX2300, EX3400, EX4300, and EX4550 switches by using the RJ-45 console port or the Mini-USB Type-B console port. However, on EX2200-C and EX4550 switches, only one console port is active at a time and the console input is active only on that port. On EX2300, EX3400, and EX4300 switches, both the RJ-45 console port and the Mini-USB Type-B console port are active at the same time.

If your laptop or PC does not have a DB-9 male connector pin or RJ-45 connector pin, you can connect your laptop or PC directly to the switch by using a mini-USB cable that has a Standard-A USB connector on one end and a Mini-USB Type-B (5-pin) connector on the other end.

This topic describes the procedure to connect an EX2200-C, EX2300, EX3400, EX4300, and EX4550 switch to the management console by using the Mini-USB Type-B console port.

For information about configuring and managing an EX Series switch by using the RJ-45 console port, see "Connecting a Device to a Management Console by Using an RJ-45 Connector" on page 128.

Before you begin connecting the switch by using the Mini-USB Type-B console port:

- Ensure that the USB to Serial driver is installed on the host machine. You can download the driver from https://webdownload.juniper.net/swdl/dl/secure/site/1/record/5029.html.
- Ensure that the HyperTerminal properties of the console server or laptop are set as follows:
  - Baud rate—9600
  - Flow control—None
  - Data—8
  - Parity—None
  - Stop bits—1
  - DCD state—Disregard

Ensure that you have the following parts and tools available:

- One mini-USB cable with Standard-A and Mini-USB Type-B (5-pin) connectors (not provided).

To connect the switch to the console by using the Mini-USB Type-B console port:

1. Connect the Standard-A connector of the mini-USB cable to the host machine (PC or laptop).
2. Connect the Mini-USB Type-B (5-pin) connector of the mini-USB cable to the Mini-USB Type-B console port (labeled **CON**) on the switch.
3. Set the Mini-USB Type-B console port as the active console port by using the **port-type** command.

   By default, the RJ-45 port is set as an active console port and the Mini-USB Type-B port is the passive console port. For information about configuring the console port type, see *Configuring the Console Port Type (CLI Procedure)*.
4. Reboot the switch.

After the connection is established, the Mini-USB Type-B becomes the active console port. The host machine connected to the Mini-USB Type-B console port displays log messages and enables you to control switch functionality through it.

Related Documentation

- Connecting a Device to a Network for Out-of-Band Management on page 127
- Console Port Connector Pinout Information on page 73

- Management Cable Specifications on page 69

Connecting a Fiber-Optic Cable

Before you begin connecting a fiber-optic cable to an optical transceiver installed in a device, ensure that you have taken the necessary precautions for safe handling of lasers (see "Laser and LED Safety Guidelines and Warnings" on page 199).

To connect a fiber-optic cable to an optical transceiver installed in a device:

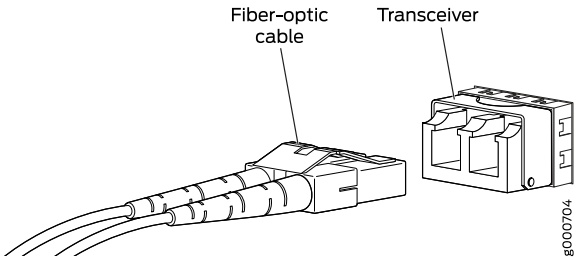
WARNING: Do not look directly into a fiber-optic transceiver or into the ends of fiber-optic cables. Fiber-optic transceivers and fiber-optic cables connected to transceivers emit laser light that can damage your eyes.

1. If the fiber-optic cable connector is covered with a rubber safety cap, remove the cap. Save the cap.

2. Remove the rubber safety cap from the optical transceiver. Save the cap.

3. Insert the cable connector into the optical transceiver (see Figure 54 on page 131).

Figure 54: Connecting a Fiber-Optic Cable to an Optical Transceiver Installed in a Device



4. Secure the cables so that they do not support their own weight. Place excess cable out of the way in a neatly coiled loop. Placing fasteners on a loop helps cables maintain their shape.

CAUTION: Do not bend fiber-optic cables beyond their minimum bend radius. An arc smaller than a few inches in diameter can damage the cables and cause problems that are difficult to diagnose.

Do not let fiber-optic cables hang free from the connector. Do not allow fastened loops of cables to dangle, which stresses the cables at the fastening point.

Related Documentation

- Disconnecting a Fiber-Optic Cable from a Device on page 154
- Installing a Transceiver on page 147
- Maintaining Fiber-Optic Cables on page 155

CHAPTER 14

Performing Initial Configuration

EX2200 Switch Default Configuration

Each EX Series switch is programmed with a factory default configuration that contains the values set for each configuration parameter when a switch is shipped. The default configuration file for an EX2200 switch configures Ethernet switching and storm control on all interfaces, configures Power over Ethernet (PoE) on all interfaces of models that provide PoE, and enables the LLDP, LLDP-MED, and RSTP protocols and IGMP snooping.

When you commit changes to the configuration, a new configuration file is created that becomes the active configuration. You can always revert to the factory default configuration—because an EX2200 switch does not have an LCD panel, use the CLI commands to revert to the factory default configuration. See *Reverting to the Default Factory Configuration for the EX Series Switch*.

The following factory default configuration file is for an EX2200 switch with 24 ports, all of which have PoE capability:

NOTE: The factory default configuration file is different for different EX2200 switch models.

The number of interfaces in the default configuration file depends on the number of ports in the EX2200 switch.

The poe stanza does not appear for models without PoE.

Uplink ports for the EX2200 switches except the EX2200-C models will be listed as ge-0/1/0 to ge-0/1/3 and for the EX2200-C switches as ge-0/1/0 to ge-0/1/1.

```
system {
    syslog {
        user * {
            any emergency;
```

```
        }
        file messages {
            any notice;
            authorization info;
        }
        file interactive-commands {
            interactive-commands any;
        }
    }
    commit {
        factory-settings {
            reset-chassis-lcd-menu;
            reset-virtual-chassis-configuration;
        }
    }
}
    interfaces {
        ge-0/0/0 {
            unit 0 {
                family ethernet-switching;
            }
        }
        ge-0/0/1 {
            unit 0 {
                family ethernet-switching;
            }
        }
        ge-0/0/2 {
            unit 0 {
                family ethernet-switching;
            }
        }
        ge-0/0/3 {
            unit 0 {
                family ethernet-switching;
            }
        }
        ge-0/0/4 {
            unit 0 {
                family ethernet-switching;
            }
        }
        ge-0/0/5 {
            unit 0 {
                family ethernet-switching;
            }
        }
        ge-0/0/6 {
            unit 0 {
                family ethernet-switching;
            }
        }
        ge-0/0/7 {
            unit 0 {
                family ethernet-switching;
            }
```

```
}
ge-0/0/8 {
    unit 0 {
        family ethernet-switching;
    }
}
ge-0/0/9 {
    unit 0 {
        family ethernet-switching;
    }
}
ge-0/0/10 {
    unit 0 {
        family ethernet-switching;
    }
}
ge-0/0/11 {
    unit 0 {
        family ethernet-switching;
    }
}
ge-0/0/12 {
    unit 0 {
        family ethernet-switching;
    }
}
ge-0/0/13 {
    unit 0 {
        family ethernet-switching;
    }
}
ge-0/0/14 {
    unit 0 {
        family ethernet-switching;
    }
}
ge-0/0/15 {
    unit 0 {
        family ethernet-switching;
    }
}
ge-0/0/16 {
    unit 0 {
        family ethernet-switching;
    }
}
ge-0/0/17 {
    unit 0 {
        family ethernet-switching;
    }
}
ge-0/0/18 {
    unit 0 {
        family ethernet-switching;
    }
}
```

```
    ge-0/0/19 {
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/0/20 {
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/0/21 {
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/0/22 {
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/0/23 {
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/1/0 {
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/1/1 {
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/1/2 {
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/1/3 {
        unit 0 {
            family ethernet-switching;
        }
    }
}
protocols {
    igmp-snooping {
        vlan all;
    }
    rstp;
    lldp {
        interface all;
    }
    lldp-med {
        interface all;
```

```
    }
  }
  ethernet-switching-options {
    storm-control {
      interface all;
    }
  }
```

Related Documentation

- *Configuration Files Terms*
- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 137
- Connecting and Configuring an EX Series Switch (J-Web Procedure) on page 140
- *Understanding Configuration Files for EX Series Switches*
- EX2200 Switches Hardware Overview on page 3

Connecting and Configuring an EX Series Switch (CLI Procedure)

There are two ways to connect and configure an EX Series switch: one method is through the console by using the CLI and the other is by using the J-Web interface.

NOTE: EX2200-24T-4G-DC switches do not support switch connection and configuration through the J-Web interface.

This topic describes the CLI procedure.

NOTE: To run the ezsetup script, the switch must have the factory-default configuration as the active configuration. If you have configured anything on the switch and want to run ezsetup, revert to the factory-default configuration. See *Reverting to the Default Factory Configuration for the EX Series Switch*.

Using the CLI, set the following parameter values in the console server or PC:

- Baud rate—9600
- Flow control—None
- Data—8
- Parity—None
- Stop bits—1
- DCD state—Disregard

To connect and configure the switch from the console by using the CLI:

1. Connect the console port to a laptop or PC by using the RJ-45 to DB-9 serial port adapter. An Ethernet cable that has an RJ-45 connector at either end and an RJ-45 to DB-9 serial port adapter are supplied with the switch.

   For the location of the console port on different EX Series switches:

   - See "EX2200 Switches Hardware Overview" on page 3.
   - See *EX2300 Switches Hardware Overview*.
   - See *Rear Panel of an EX3200 Switch*.
   - See *Rear Panel of an EX3300 Switch*.
   - See *Rear Panel of an EX3400 Switch*.
   - See *Rear Panel of an EX4200 Switch*.
   - See *EX4300 Switches Hardware Overview*
   - See *Front Panel of an EX4500 Switch*.
   - See *EX4550 Switches Hardware Overview*
   - See *Switch Fabric and Routing Engine (SRE) Module in an EX6200 Switch*.
   - See *Switch Fabric and Routing Engine (SRE) Module in an EX8208 Switch*.
   - See *Routing Engine (RE) Module in an EX8216 Switch*.

   NOTE: In EX2200-C, EX2300, EX3400, EX4300, and EX4550 switches, you can also use the Mini-USB Type-B console port to connect to a laptop or PC. See "Connecting an EX Series Switch to a Management Console by Using the Mini-USB Type-B Console Port" on page 129.

2. At the Junos OS shell prompt **root%**, type **ezsetup**.

3. Enter the hostname. This is optional.

4. Enter the root password you want to use for the device. Reenter the root password when prompted.

5. Enable services such as SSH and Telnet.

   NOTE: You will not be able to log in to the switch as the root user through Telnet. Root login is allowed only through SSH.

   - The default option for SSH is **yes**. Select this to enable SSH.
   - The default option for Telnet is **no**. Change this to **yes** to enable Telnet.

6. Use the Management Options page to select the management scenario:

   NOTE: **On EX4500, EX6200, and EX8200 switches, only the out-of-band management option is available.**

   - *Configure in-band management*. In in-band management, you configure a network interface or an uplink module (expansion module) interface as the management interface and connect it to the management device.
     In this scenario, you have the following two options:
     - Use the automatically created VLAN *default* for management—Select this option to configure all data interfaces as members of the default VLAN. Specify the management IP address and the default gateway.
     - Create a new VLAN for management—Select this option to create a management VLAN. Specify the VLAN name, VLAN ID, management IP address, and default gateway. Select the ports that must be part of this VLAN.
   - *Configure out-of-band management*—Configure the management port. In out-of-band management, you use a dedicated management channel (**MGMT** port) to connect to the management device. Specify the IP address and gateway of the management interface. Use this IP address to connect to the switch.
7. Specify the SNMP read community, location, and contact to configure SNMP parameters. These parameters are optional.
8. Specify the system date and time. Select the time zone from the list. These options are optional.
9. The configured parameters are displayed. Enter **yes** to commit the configuration. The configuration is committed as the active configuration for the switch.
10. (For EX4500 switches only) Enter the operational mode command **request chassis pic-mode intraconnect** to set the PIC mode to intraconnect.

You can now log in with the CLI or the J-Web interface to continue configuring the switch. If you use the J-Web interface to continue configuring the switch, the Web session is redirected to the new management IP address. If the connection cannot be made, the J-Web interface displays instructions for starting a J-Web session.

Related Documentation

- Connecting and Configuring an EX Series Switch (J-Web Procedure) on page 140
- Installing and Connecting an EX2200 Switch on page 89
- *Installing and Connecting an EX2300 Switch*
- *Installing and Connecting an EX3200 Switch*
- *Installing and Connecting an EX3300 Switch*
- *Installing and Connecting an EX3400 Switch*

- *Installing and Connecting an EX4200 Switch*
- *Installing and Connecting an EX4300 Switch*
- *Installing and Connecting an EX4550 Switch*
- *Installing and Connecting an EX4500 Switch*
- *Installing and Connecting an EX6210 Switch*
- *Installing and Connecting an EX8208 Switch*
- *Installing and Connecting an EX8216 Switch*

Connecting and Configuring an EX Series Switch (J-Web Procedure)

There are two ways to connect and configure an EX Series switch: one method is through the console by using the CLI and the other is by using the J-Web interface.

NOTE: You cannot connect to and perform initial configuration of EX2200-24T-4G-DC and EX4600 switches using EZSetup procedure from the J-Web interface. For EX2200-24T-4G-DC switches, you must use EZSetup from the switch console, and for EX4600 switches, you must use the CLI procedure through the switch console.

This topic describes the J-Web procedure.

NOTE: Before you begin the configuration, enable a DHCP client on the management PC that you will connect to the switch so that the PC can obtain an IP address dynamically.

NOTE: Read the following steps before you begin the configuration. You must complete the initial configuration by using EZSetup within 10 minutes. The switch exits EZSetup after 10 minutes and reverts to the factory default configuration, and the PC loses connectivity to the switch.

- EX2200 and EX2200-C switch—The LEDs on the network ports on the front panel blink when the switch is in the initial setup mode.
- EX3200, EX3300, EX4200, EX4300, EX4500, EX4550, EX6200, or EX8200 switch—The LCD panel displays a count-down timer when the switch is in initial setup mode.

To connect and configure the switch by using the J-Web interface:

1. Transition the switch into initial setup mode:
   - EX2200 and EX2200-C switch—Press the mode button located on the lower right corner of the front panel for 10 seconds.
   - EX3200, EX3300, EX4200, EX4300, EX4500, EX4550, EX6200, or EX8200 switch—Use the **Menu** and **Enter** buttons located to the right of the LCD panel (see Figure 55 on page 141 or Figure 56 on page 141):

Figure 55: LCD Panel in an EX3200, EX4200, EX4500, EX4550, or EX8200 Switch

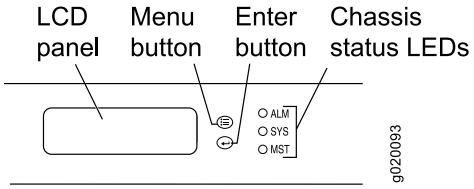
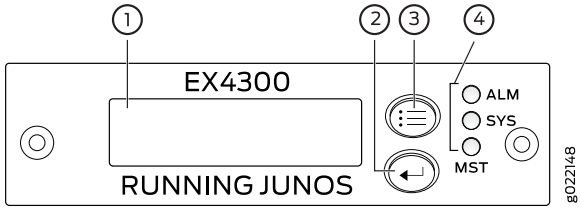


Figure 56: LCD Panel in an EX4300 Switch



1—LCD panel	3—LCD panel Menu button
2—LCD panel Enter button	4—Chassis status LEDs

   1. Press the **Menu** button until you see **MAINTENANCE MENU**. Then press the **Enter** button.
   2. Press **Menu** until you see **ENTER EZSetup**. Then press **Enter**.

      If EZSetup does not appear as an option in the menu, select **Factory Default** to return the switch to the factory default configuration. EZSetup is displayed in the menu of standalone switches only when a switch is set to the factory default configuration.
   3. Press **Enter** to confirm setup and continue with EZSetup.

2. Connect the Ethernet cable from the Ethernet port on the PC to the switch.
   - EX2200, EX3200, or EX4200 switch—Connect the cable to port 0 (ge-0/0/0) on the front panel of the switch.
   - EX3300, EX4500, or EX4550 switch—Connect the cable to the port labeled **MGMT** on the front panel (LCD panel side) of the switch.
   - EX4300 switch—Connect the cable to the port labeled **MGMT** on the rear panel of the switch.

- EX6200 switch—Connect the cable to one of the ports labeled **MGMT** on the Switch Fabric and Routing Engine (SRE) module in slot 4 or 5 in an EX6210 switch.
- EX8200 switch—Connect the cable to the port labeled **MGMT** on the Switch Fabric and Routing Engine (SRE) module in slot SRE0 in an EX8208 switch or on the Routing Engine (RE) module in slot RE0 in an EX8216 switch.

These ports are configured as the DHCP server with the default IP address, 192.168.1.1. The switch can assign an IP address to the management PC in the IP address range 192.168.1.2 through 192.168.1.253.

3. From the PC, open a Web browser, type **http://192.168.1.1** in the address field, and press **Enter**.

4. On the J-Web login page, type **root** as the username, leave the password field blank, and click **Login**.

5. On the Introduction page, click **Next**.

6. On the Basic Settings page, modify the hostname, the root password, and date and time settings:
   - Enter the hostname. This is optional.
   - Enter a password and reenter the password.
   - Specify the time zone.
   - Synchronize the date and time settings of the switch with the management PC or set them manually by selecting the appropriate option button. This is optional.

   Click **Next**.

7. Use the Management Options page to select the management scenario:

   NOTE: **On EX4500, EX6210, and EX8200 switches, only the out-of-band management option is available.**

   - **In-band Management—Use VLAN 'default' for management**.

     Select this option to configure all data interfaces as members of the default VLAN. Click **Next**. Specify the management IP address and the default gateway for the default VLAN.

   - **In-band Management—Create new VLAN for management**.

     Select this option to create a management VLAN. Click **Next**. Specify the VLAN name, VLAN ID, member interfaces, management IP address, and default gateway for the new VLAN.

   - **Out-of-band Management—Configure management port**.

Select this option to configure only the management interface. Click **Next**. Specify the IP address and default gateway for the management interface.

8. Click **Next**.

9. On the Manage Access page, you can select options to enable Telnet, SSH, and SNMP services. For SNMP, you can configure the read community, location, and contact.

10. Click **Next**. The Summary screen displays the configured settings.

11. Click **Finish**. The configuration is committed as the active switch configuration.

NOTE: **After the configuration is committed, the connectivity between the PC and the switch might be lost. To renew the connection, release and renew the IP address by executing the appropriate commands on the management PC or by removing and reinserting the Ethernet cable.**

12. (For EX4500 switches only) In the CLI, enter the **request chassis pic-mode intraconnect** operational mode command to set the PIC mode to intraconnect.

You can now log in by using the CLI or the J-Web interface to continue configuring the switch.

If you use the J-Web interface to continue configuring the switch, the Web session is redirected to the new management IP address. If the connection cannot be made, the J-Web interface displays instructions for starting a J-Web session.

Related Documentation

- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 137
- Installing and Connecting an EX2200 Switch on page 89
- *Installing and Connecting an EX2300 Switch*
- *Installing and Connecting an EX3200 Switch*
- *Installing and Connecting an EX3300 Switch*
- *Installing and Connecting an EX4200 Switch*
- *Installing and Connecting an EX4300 Switch*
- *Installing and Connecting an EX4500 Switch*
- *Installing and Connecting an EX4550 Switch*
- *Installing and Connecting an EX4600 Switch*
- *Installing and Connecting an EX6210 Switch*
- *Installing and Connecting an EX8208 Switch*
- *Installing and Connecting an EX8216 Switch*

PART 4

Installing, Maintaining, and Replacing Components

CHAPTER 15

Replacing Transceiver

Installing a Transceiver

The transceivers for Juniper Networks devices are hot-removable and hot-insertable field-replaceable units (FRUs): You can remove and replace them without powering off the device or disrupting the device functions.

NOTE: After you insert a transceiver or after you change the media-type configuration, wait for 6 seconds for the interface to display operational commands.

NOTE: We recommend that you use only optical transceivers and optical connectors purchased from Juniper Networks with your Juniper Networks device.

CAUTION: If you face a problem running a Juniper Networks device that uses a third-party optic or cable, the Juniper Networks Technical Assistance Center (JTAC) can help you diagnose the source of the problem. Your JTAC engineer might recommend that you check the third-party optic or cable and potentially replace it with an equivalent Juniper Networks optic or cable that is qualified for the device.

NOTE: On an EX3200 switch, if you install a transceiver in a 1-Gigabit Ethernet uplink module port, a corresponding network port from the last four built-in ports is disabled. For example, if you install a transceiver in the uplink module port 3 (ge-0/1/2), then the built-in port 23 (ge-0/0/22) is disabled. The disabled port is not listed in the output of show interface commands.

Before you begin installing a transceiver in a device, ensure that you have taken the necessary precautions for safe handling of lasers (see "Laser and LED Safety Guidelines and Warnings" on page 199).

Ensure that you have a rubber safety cap available to cover the transceiver.

Figure 57 on page 149 shows how to install a QSFP+ transceiver. The procedure is the same for all types of transceivers except the CFP transceivers.

To install a transceiver:

CAUTION: To prevent electrostatic discharge (ESD) damage to the transceiver, do not touch the connector pins at the end of the transceiver.

1. Remove the transceiver from its bag.
2. Check to see whether the transceiver is covered with a rubber safety cap. If it is not, cover the transceiver with a rubber safety cap.

WARNING: Do not leave a fiber-optic transceiver uncovered except when inserting or removing a cable. The rubber safety cap keeps the port clean and prevents accidental exposure to laser light.

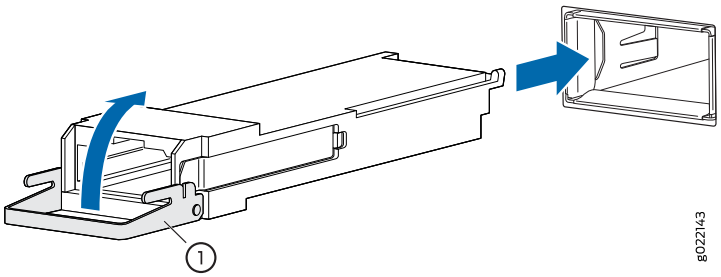
3. If the port in which you want to install the transceiver is covered with a dust cover, remove the dust cover and save it in case you need to cover the port later. If you are hot-swapping a transceiver, wait for at least 10 seconds after removing the transceiver from the port before installing a new transceiver.
4. Using both hands, carefully place the transceiver in the empty port. The connectors must face the chassis.

CAUTION: Before you slide the transceiver into the port, ensure that the transceiver is aligned correctly. Misalignment might cause the pins to bend, making the transceiver unusable.

5. Slide the transceiver in gently until it is fully seated. If you are installing a CFP transceiver, tighten the captive screws on the transceiver by using your fingers.
6. Remove the rubber safety cap when you are ready to connect the cable to the transceiver.

WARNING: Do not look directly into a fiber-optic transceiver or into the ends of fiber-optic cables. Fiber-optic transceivers and fiber-optic cables connected to transceivers emit laser light that can damage your eyes.

Figure 57: Installing a Transceiver



1— Ejector lever	

Related Documentation

- Removing a Transceiver on page 149
- Connecting a Fiber-Optic Cable on page 131

Removing a Transceiver

The transceivers for Juniper Networks devices are hot-removable and hot-insertable field-replaceable units (FRUs): You can remove and replace them without powering off the device or disrupting device functions.

NOTE: After you remove a transceiver or when you change the media-type configuration, wait for 6 seconds for the interface to display the operational commands.

Before you begin removing a transceiver from a device, ensure that you have taken the necessary precautions for safe handling of lasers (see "Laser and LED Safety Guidelines and Warnings" on page 199).

Ensure that you have the following parts and tools available:

- An antistatic bag or an antistatic mat
- Rubber safety caps to cover the transceiver and fiber-optic cable connector
- A dust cover to cover the port

Figure 58 on page 151 shows how to remove a QSFP+ transceiver. The procedure is the same for all types of transceivers except the CFP transceivers.

To remove a transceiver from a device:

1. Place the antistatic bag or antistatic mat on a flat, stable surface.

2. Label the cable connected to the transceiver so that you can reconnect it correctly.

WARNING: Do not look directly into a fiber-optic transceiver or into the ends of fiber-optic cables. Fiber-optic transceivers and fiber-optic cables connected to transceivers emit laser light that can damage your eyes.

WARNING: Do not leave a fiber-optic transceiver uncovered except when inserting or removing a cable. The rubber safety cap keeps the port clean and prevents accidental exposure to laser light.

CAUTION: Do not bend fiber-optic cables beyond their minimum bend radius. An arc smaller than a few inches in diameter can damage the cables and cause problems that are difficult to diagnose.

3. Remove the cable connected to the transceiver (see "Disconnecting a Fiber-Optic Cable from a Device" on page 154). Cover the transceiver and the end of each fiber-optic cable connector with a rubber safety cap immediately after disconnecting the fiber-optic cables.

4. To remove an SFP, SFP+, XFP, or a QSFP+ transceiver:

   a. By using your fingers, pull open the ejector lever on the transceiver to unlock the transceiver.

   CAUTION: Before removing the transceiver, make sure that you open the ejector lever completely until you hear it click. This prevents damage to the transceiver.

   b. Grasp the transceiver ejector lever and gently slide the transceiver approximately 0.5 in. (1.3 cm) straight out of the port.

   CAUTION: To prevent electrostatic discharge (ESD) damage to the transceiver, do not touch the connector pins at the end of the transceiver.

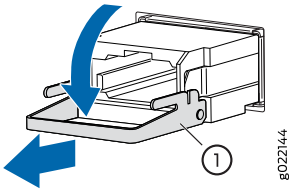
   To remove a CFP transceiver:

   a. Loosen the screws on the transceiver by using your fingers.

   b. Grasp the screws on the transceiver and gently slide the transceiver approximately 0.5 in. (1.3 cm) straight out of the port.

   CAUTION: To prevent electrostatic discharge (ESD) damage to the transceiver, do not touch the connector pins at the end of the transceiver.

Figure 58: Removing an SFP, SFP+, XFP, or a QSFP+ Transceiver



1— Ejector lever	

5. By using your fingers, grasp the body of the transceiver and pull it straight out of the port.

6. Place the transceiver in the antistatic bag or on the antistatic mat placed on a flat, stable surface.

7. Place the dust cover over the empty port.

Related Documentation

- Installing a Transceiver on page 147

CHAPTER 16

Maintaining and Replacing Fiber-Optic Cable

Connecting a Fiber-Optic Cable

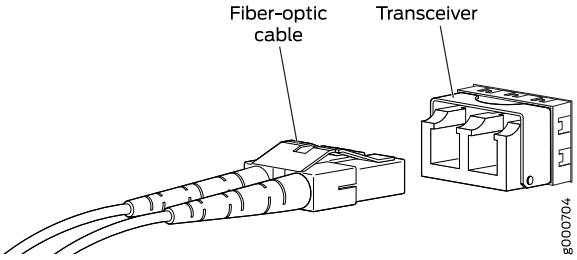
Before you begin connecting a fiber-optic cable to an optical transceiver installed in a device, ensure that you have taken the necessary precautions for safe handling of lasers (see "Laser and LED Safety Guidelines and Warnings" on page 199).

To connect a fiber-optic cable to an optical transceiver installed in a device:

WARNING: **Do not look directly into a fiber-optic transceiver or into the ends of fiber-optic cables. Fiber-optic transceivers and fiber-optic cables connected to transceivers emit laser light that can damage your eyes.**

1. If the fiber-optic cable connector is covered with a rubber safety cap, remove the cap. Save the cap.
2. Remove the rubber safety cap from the optical transceiver. Save the cap.
3. Insert the cable connector into the optical transceiver (see Figure 54 on page 131).

Figure 59: Connecting a Fiber-Optic Cable to an Optical Transceiver Installed in a Device



4. Secure the cables so that they do not support their own weight. Place excess cable out of the way in a neatly coiled loop. Placing fasteners on a loop helps cables maintain their shape.

CAUTION: Do not bend fiber-optic cables beyond their minimum bend radius. An arc smaller than a few inches in diameter can damage the cables and cause problems that are difficult to diagnose.

Do not let fiber-optic cables hang free from the connector. Do not allow fastened loops of cables to dangle, which stresses the cables at the fastening point.

Related Documentation

- Disconnecting a Fiber-Optic Cable from a Device on page 154
- Installing a Transceiver on page 147
- Maintaining Fiber-Optic Cables on page 155

Disconnecting a Fiber-Optic Cable from a Device

Juniper Networks devices have field-replaceable unit (FRU) optical transceivers to which you can connect fiber-optic cables.

Before you begin disconnecting a fiber-optic cable from an optical transceiver, ensure that you have taken the necessary precautions for safe handling of lasers. See "Laser and LED Safety Guidelines and Warnings" on page 199.

Ensure that you have the following parts and tools available:

- A rubber safety cap to cover the transceiver
- A rubber safety cap to cover the fiber-optic cable connector

To disconnect a fiber-optic cable from an optical transceiver installed in the device:

1. Disable the port in which the transceiver is installed by issuing the following command:

```
[edit interfaces]
user@device# set interface-name disable
```

WARNING: Do not look directly into a fiber-optic transceiver or into the ends of fiber-optic cables. Fiber-optic transceivers and fiber-optic cables connected to transceivers emit laser light that can damage your eyes.

2. Carefully unplug the fiber-optic cable connector from the transceiver.

3. Cover the transceiver with a rubber safety cap.

WARNING: Do not leave a fiber-optic transceiver uncovered except when inserting or removing a cable. The rubber safety cap keeps the port clean and prevents accidental exposure to laser light.

4. Cover the fiber-optic cable connector with the rubber safety cap.

Related Documentation

- Connecting a Fiber-Optic Cable on page 131
- Removing a Transceiver on page 149
- Maintaining Fiber-Optic Cables on page 155

Maintaining Fiber-Optic Cables

Fiber-optic cables connect to optical transceivers that are installed in Juniper Networks devices.

To maintain fiber-optic cables:

- When you unplug a fiber-optic cable from a transceiver, place rubber safety caps over the transceiver and on the end of the cable.
- Anchor fiber-optic cables to prevent stress on the connectors. When attaching a fiber-optic cable to a transceiver, be sure to secure the fiber-optic cable so that it does not support its own weight as it hangs to the floor. Never let a fiber-optic cable hang free from the connector.
- Avoid bending fiber-optic cables beyond their minimum bend radius. Bending fiber-optic cables into arcs smaller than a few inches in diameter can damage the cables and cause problems that are difficult to diagnose.

- Frequent plugging and unplugging of fiber-optic cables in and out of optical instruments can damage the instruments, which are expensive to repair. Attach a short fiber extension to the optical equipment. Any wear and tear due to frequent plugging and unplugging is then absorbed by the short fiber extension, which is easier and less expensive to replace than the instruments.
- Keep fiber-optic cable connections clean. Microdeposits of oil and dust in the canal of the transceiver or cable connector can cause loss of light, reduction in signal power, and possibly intermittent problems with the optical connection.
  - To clean the transceiver canal, use an appropriate fiber-cleaning device such as RIFOCS Fiber Optic Adaptor Cleaning Wands (part number 946). Follow the directions in the cleaning kit you use.
  - After cleaning the transceiver, make sure that the connector tip of the fiber-optic cable is clean. Use only an approved alcohol-free fiber-optic cable cleaning kit such as the Opptex Cletop-S® Fiber Cleaner. Follow the directions in the cleaning kit you use.

Related Documentation

- Connecting a Fiber-Optic Cable on page 131
- Laser and LED Safety Guidelines and Warnings on page 199

CHAPTER 17

Contacting Customer Support and Returning the Chassis or Components

Returning an EX2200 Switch or Component for Repair or Replacement

If you need to return an EX2200 switch or hardware component to Juniper Networks for repair or replacement, follow this procedure:

1. Determine the serial number of the component. For instructions, see "Locating the Serial Number on an EX2200 Switch or Component" on page 158.

2. Obtain an RMA number from JTAC as described in "Contacting Customer Support to Obtain Return Material Authorization" on page 159.

   NOTE: **Do not return any component to Juniper Networks unless you have first obtained an RMA number. Juniper Networks reserves the right to refuse shipments that do not have an RMA. Refused shipments are returned to the customer through collect freight.**

3. Pack the switch or component for shipping as described in "Packing an EX2200 Switch or Component for Shipping" on page 160.

For more information about return and repair policies, see the customer support page at http://www.juniper.net/support/guidelines.html .

Related Documentation

- EX2200 Switches Hardware Overview on page 3

Locating the Serial Number on an EX2200 Switch or Component

If you are returning an EX2200 switch or hardware component to Juniper Networks for repair or replacement, you must locate the serial number of the switch or component. You must provide the serial number to the Juniper Networks Technical Assistance Center (JTAC) when you contact them to obtain Return Materials Authorization (RMA).

If the switch is operational and you can access the CLI, you can list serial numbers for the switch and for some components with a CLI command. If you do not have access to the CLI or if the serial number for the component does not appear in the command output, you can locate the serial number ID label on the physical switch (see Figure 60 on page 159) or component.

NOTE: If you want to find the serial number on the physical switch component, you will need to remove the component from the switch chassis, for which you must have the required parts and tools available.

Listing the Switch and Components Details with the CLI

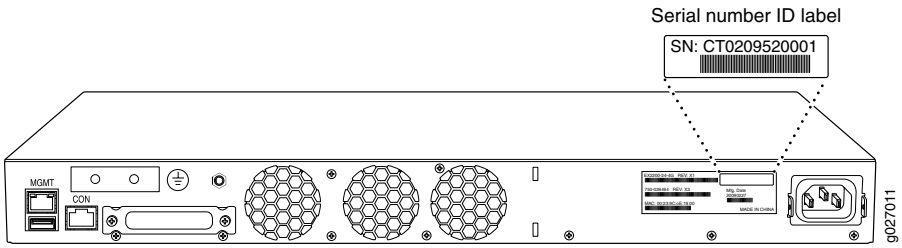
To list the switch and switch components and their serial numbers, enter the following CLI command:

```
user@switch> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                CV0209096579      EX2200-24P-4G
Routing Engine 0 REV 2A   750-026464   CV0209096579      EX2200-24P-4G, POE
FPC 0            REV 2A   750-026464   CV0209096579      EX2200-24P-4G, POE
  CPU                     BUILTIN      BUILTIN           FPC CPU
  PIC 0                   BUILTIN      BUILTIN           24x 10/100/1000 Base-T
  PIC 1            REV 2A   750-026464   CV0209096579      4x GE SFP
Power Supply 0                                           PS 550W AC
Fan Tray                                                 Fan Tray
```

Locating the Chassis Serial Number ID Label on an EX2200 Switch

EX2200 switches have serial number ID labels located on the rear panel of the chassis (see Figure 60 on page 159).

Figure 60: Location of the Serial Number ID Label on EX2200 Switches



Related Documentation

- Contacting Customer Support to Obtain Return Material Authorization on page 159
- Returning an EX2200 Switch or Component for Repair or Replacement on page 157

Contacting Customer Support to Obtain Return Material Authorization

If you are returning a device or hardware component to Juniper Networks for repair or replacement, obtain a Return Material Authorization (RMA) number from Juniper Networks Technical Assistance Center (JTAC).

After locating the serial number of the device or hardware component you want to return, open a Case with Juniper Networks Technical Assistance Center (JTAC) on the Web or by telephone.

Before you request an RMA number from JTAC, be prepared to provide the following information:

- Your existing case number, if you have one
- Serial number of the component
- Your name, organization name, telephone number, fax number, and shipping address
- Details of the failure or problem
- Type of activity being performed on the device when the problem occurred
- Configuration data displayed by one or more **show** commands

You can contact JTAC 24 hours a day, seven days a week on the Web or by telephone:

- Case Manager at CSC: http://www.juniper.net/cm/
- Telephone: +1-888-314-JTAC1-888-314-5822, toll free in U.S., Canada, and Mexico

NOTE: **For international or direct-dial options in countries without toll free numbers, see** http://www.juniper.net/support/requesting-support.html.

If you are contacting JTAC by telephone, enter your 11-digit case number followed by the pound (#) key for an existing case, or press the star (*) key to be routed to the next available support engineer.

The support representative validates your request and issues an RMA number for return of the component.

Related Documentation

- Prevention of Electrostatic Discharge Damage on page 211

Packing an EX2200 Switch or Component for Shipping

If you are returning an EX2200 switch or component to Juniper Networks for repair or replacement, pack the item as described in this topic.

Before you begin, ensure that you have retrieved the original shipping carton and packing materials. Contact your JTAC representative if you do not have these materials, to learn about approved packing materials. See "Contacting Customer Support to Obtain Return Material Authorization" on page 159.

Ensure that you have the following parts and tools available:

- Antistatic bag, one for each switch or component
- Phillips (+) screwdriver, number 2

This topic describes:

Packing a Switch for Shipping

To pack a switch for shipping:

1. On the console or other management device connected to the switch, enter the CLI operational mode and issue the following command to shut down the switch software:

   ```
   user@switch> request system halt
   ```

   Wait until a message appears on the console confirming that the operating system has halted.

2. Disconnect power from the switch by performing one of the following:
   - If the power source outlet has a power switch, set it to the OFF (0) position.
   - If the power source outlet does not have a power switch, gently pull out the male end of the power cord connected to the power source outlet.
3. Remove the cables that connect the switch to all external devices. See "Disconnecting a Fiber-Optic Cable from a Device" on page 154.
4. Remove all optical transceivers installed in the switch. See "Removing a Transceiver" on page 149.

5. If the switch is mounted on a wall or on two posts, have one person hold the switch while another person unscrews and removes the mounting screws.
6. Use the Phillips (+) screwdriver, number 2 to remove the screws.
7. Remove the switch from the wall, rack, cabinet, or desk and place the switch in an antistatic bag.
8. Slip on the end caps of the packaging foam on both sides of the switch.
9. Place the switch in the shipping carton.
10. Place the packing foam on top of and around the switch.
11. If you are returning accessories or FRUs with the switch, pack them as instructed in "Packing Switch Components for Shipping" on page 161.
12. Close the top of the cardboard carton and seal it with packing tape.
13. Write the RMA number on the exterior of the carton to ensure proper tracking.

Packing Switch Components for Shipping

To pack and ship switch components:

- Place individual components in antistatic bags.
- Ensure that the components are adequately protected with packing materials and packed so that the pieces are prevented from moving around inside the carton.
- Close the top of the cardboard shipping carton and seal it with packing tape.
- Write the RMA number on the exterior of the carton to ensure proper tracking.

Related Documentation

- Returning an EX2200 Switch or Component for Repair or Replacement on page 157

PART 5

Troubleshooting

CHAPTER 18

Alarms and Syslog Messages

Understanding Alarm Types and Severity Levels on EX Series Switches

NOTE: This topic applies only to the J-Web Application package.

Alarms alert you to conditions that might prevent normal operation of the switch. Before monitoring alarms on a Juniper Networks EX Series Ethernet switch, become familiar with the terms defined in Table 51 on page 165.

Table 51: Alarm Terms

Term	Definition
alarm	Signal alerting you to conditions that might prevent normal operation. On a switch, the alarm signal is the **ALM** LED lit on the front of the chassis.
alarm condition	Failure event that triggers an alarm.
alarm severity	Seriousness of the alarm. If the Alarm (**ALM**) LED is red, this indicates a major alarm. If the Alarm LED is yellow, this indicates a minor alarm. If the Alarm LED is unlit, there is no alarm or the switch is halted.
chassis alarm	Preset alarm triggered by a physical condition on the switch such as a power supply failure, excessive component temperature, or media failure.
system alarm	Preset alarm triggered by a missing rescue configuration or failure to install a license for a licensed software feature. NOTE: On EX6200 switches, a system alarm can be triggered by an internal link error.

Alarm Types

The switch supports these alarms:

- Chassis alarms indicate a failure on the switch or one of its components. Chassis alarms are preset and cannot be modified.
- System alarms indicate a missing rescue configuration. System alarms are preset and cannot be modified, although you can configure them to appear automatically in the J-Web interface display or the CLI display.

Alarm Severity Levels

Alarms on switches have two severity levels:

- Major (red)—Indicates a critical situation on the switch that has resulted from one of the following conditions. A red alarm condition requires immediate action.
  - One or more hardware components have failed.
  - One or more hardware components have exceeded temperature thresholds.
  - An alarm condition configured on an interface has triggered a critical warning.
- Minor (yellow or amber)—Indicates a noncritical condition on the switch that, if left unchecked, might cause an interruption in service or degradation in performance. A yellow alarm condition requires monitoring or maintenance.

  A missing rescue configuration generates a yellow system alarm.

Related Documentation

- Checking Active Alarms with the J-Web Interface on page 172
- Dashboard for EX Series Switches on page 25

Chassis Component Alarm Conditions on EX2200 Switches

This topic describes the chassis component alarm conditions on EX2200 switches.

Table 52 on page 167 lists the alarm conditions on EX2200 switches, their severity levels, and the actions you can take to respond to them.

Table 52: Chassis Component Alarm Conditions on EX2200 Switches

Chassis Component	Alarm Condition	Alarm Severity	Remedy
Fan	One fan in the chassis is not spinning or is spinning at below the required speed.	Major (red)	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-5822 (toll-free within the United States and Canada) or 1-408-745-9500 (from outside the United States).
	Fan failure–i2c read failure.	Major (red)	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-5822 (toll-free within the United States and Canada) or 1-408-745-9500 (from outside the United States).

Table 52: Chassis Component Alarm Conditions on EX2200 Switches *(continued)*

Chassis Component	Alarm Condition	Alarm Severity	Remedy
Temperature	Temperature is below the low operating temperature.	Major (red)	• Check the fan. • Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-5822 (toll-free within the United States and Canada) or 1-408-745-9500 (from outside the United States).
	Temperature is above the high operating temperature.	Major (red)	• Check the fan. • Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-5822 (toll-free within the United States and Canada) or 1-408-745-9500 (from outside the United States).
	In EX2200 switches except EX2200-C switches: If the temperature reaches the shutdown temperature low limit of 32° F (0° C) or high limit of 194° F (90° C) and the shutdown extend time is configured through the CLI, an alarm is raised before the shutdown timer starts.	Major (red)	• Check the fan. • Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-5822 (toll-free within the United States and Canada) or 1-408-745-9500 (from outside the United States).
	In EX2200 switches except EX2200-C switches: The temperature inside the chassis has exceeded the red alarm limit of 158° F (70° C) or exceeded the bad fan red alarm limit of 140° F (60° C) and the fan is not spinning properly.	Major (red)	• Check the fan. • Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-5822 (toll-free within the United States and Canada) or 1-408-745-9500 (from outside the United States).
		Minor (yellow)	

Table 52: Chassis Component Alarm Conditions on EX2200 Switches *(continued)*

Chassis Component	Alarm Condition	Alarm Severity	Remedy
	In EX2200 switches except EX2200-C switches: The temperature inside the chassis has exceeded the yellow alarm limit of 140° F (60° C) or exceeded the bad fan red alarm limit of 122° F (50° C) and the fan is not spinning properly.		• Check the fan. • Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-5822 (toll-free within the United States and Canada) or 1-408-745-9500 (from outside the United States).
	The temperature sensor has failed.	Major (red)	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-5822 (toll-free within the United States and Canada) or 1-408-745-9500 (from outside the United States).
	In EX2200-C switches: If the temperature reaches the shutdown temperature low limit of 32° F (0° C) or high limit of 212° F (100° C) and the shutdown extend time is configured through the CLI, an alarm is raised before the shutdown timer starts.	Major (red)	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-5822 (toll-free within the United States and Canada) or 1-408-745-9500 (from outside the United States).
	In EX2200-C switches: The temperature inside the chassis has exceeded the red alarm limit of 203° F (95° C).	Major (red)	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-5822 (toll-free within the United States and Canada) or 1-408-745-9500 (from outside the United States).
	In EX2200-C switches: The temperature inside the chassis has exceeded the yellow alarm limit of 176° F (80° C).	Minor (yellow)	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-5822 (toll-free within the United States and Canada) or 1-408-745-9500 (from outside the United States).

Table 52: Chassis Component Alarm Conditions on EX2200 Switches *(continued)*

Chassis Component	Alarm Condition	Alarm Severity	Remedy
Media	Device booted from backup root.	Minor (yellow)	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-5822 (toll-free within the United States and Canada) or 1-408-745-9500 (from outside the United States).
	/var or **/config** full (only 10% free).	Major (red)	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-5822 (toll-free within the United States and Canada) or 1-408-745-9500 (from outside the United States).
	/var or **/config** full (only 25% free).	Minor (yellow)	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-5822 (toll-free within the United States and Canada) or 1-408-745-9500 (from outside the United States).
	Upgrade bank is empty or corrupted.	Major (red)	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-5822 (toll-free within the United States and Canada) or 1-408-745-9500 (from outside the United States).
	Firmware version is not the latest.	Minor (yellow)	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-5822 (toll-free within the United States and Canada) or 1-408-745-9500 (from outside the United States).
	Single-bit ECC error detected.	Major (red)	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-5822 (toll-free within the United States and Canada) or 1-408-745-9500 (from outside the United States).

Table 52: Chassis Component Alarm Conditions on EX2200 Switches *(continued)*

Chassis Component	Alarm Condition	Alarm Severity	Remedy
Redundant power system (RPS)	RPS is disconnected.	Major (red)	Check the RPS connection.
	RPS fan has failed.	Major (red)	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-5822 (toll-free within the United States and Canada) or 1-408-745-9500 (from outside the United States).
	RPS power supply has failed.	Major (red)	Open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-5822 (toll-free within the United States and Canada) or 1-408-745-9500 (from outside the United States).
	RPS is backing up the switch for the first time.	Minor (yellow)	Check the reason for power supply failure.
Management Ethernet interface	Management Ethernet link is down.	Major (red)	• Check whether a cable is connected to the management Ethernet interface, or whether the cable is defective. Replace the cable if required. • If you are unable to resolve the problem, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-5822 (toll-free within the United States and Canada) or 1-408-745-9500 (from outside the United States).

Table 52: Chassis Component Alarm Conditions on EX2200 Switches *(continued)*

Chassis Component	Alarm Condition	Alarm Severity	Remedy
Routing Engine	**/var** partition usage is high.	Minor (yellow)	Clean up the system file storage space on the switch. For more information, see *Cleaning Up the System File Storage Space*.
	/var partition is full.	Major (red)	Clean up the system file storage space on the switch. For more information, see *Cleaning Up the System File Storage Space*.
	Rescue configuration is not set.	Minor (yellow)	Use the **request system configuration rescue save** command to set the rescue configuration. For more information, see *Setting or Deleting the Rescue Configuration (CLI Procedure)*.
	Feature usage requires a license or the license for the feature usage has expired.	Minor (yellow)	Install the required license for the feature specified in the alarm. For more information, see *Understanding Software Licenses for EX Series Switches*.

Related Documentation

- Chassis Status LEDs in EX2200 Switches on page 14
- Understanding Alarm Types and Severity Levels on EX Series Switches on page 165

Checking Active Alarms with the J-Web Interface

Purpose

NOTE: This topic applies only to the J-Web Application package.

Use the monitoring functionality to view alarm information for the EX Series switches including alarm type, alarm severity, and a brief description for each active alarm on the switching platform.

Action

To view the active alarms:

1. Select **Monitor** > **Events and Alarms** > **View Alarms** in the J-Web interface.
2. Select an alarm filter based on alarm type, severity, description, and date range.
3. Click **Go**.

   All the alarms matching the filter are displayed.

NOTE: When the switch is reset, the active alarms are displayed.

Meaning Table 53 on page 173 lists the alarm output fields.

Table 53: Summary of Key Alarm Output Fields

Field	Values
Type	Category of the alarm: • Chassis—Indicates an alarm condition on the chassis (typically an environmental alarm such as one related to temperature). • System—Indicates an alarm condition in the system.
Severity	Alarm severity—either major (red) or minor (yellow).
Description	Brief synopsis of the alarm.
Time	Date and time when the failure was detected.

Related Documentation

- Monitoring System Log Messages on page 173
- Dashboard for EX Series Switches on page 25
- Understanding Alarm Types and Severity Levels on EX Series Switches on page 165

Monitoring System Log Messages

Purpose

NOTE: This topic applies only to the J-Web Application package.

Use the monitoring functionality to filter and view system log messages for EX Series switches.

Action To view events in the J-Web interface, select **Monitor** > **Events and Alarms** > **View Events**.

Apply a filter or a combination of filters to view messages. You can use filters to display relevant events. Table 54 on page 174 describes the different filters, their functions, and the associated actions.

To view events in the CLI, enter the following command:

show log

Table 54: Filtering System Log Messages

Field	Function	Your Action
System Log File	Specifies the name of a system log file for which you want to display the recorded events. Lists the names of all the system log files that you configure. By default, a log file, **messages**, is included in the **/var/log/** directory.	To specify events recorded in a particular file, select the system log filename from the list—for example, **messages**. Select **Include archived files** to include archived files in the search.
Process	Specifies the name of the process generating the events you want to display. To view all the processes running on your system, enter the CLI command **show system processes**. For more information about processes, see the *Junos OS Installation and Upgrade Guide*.	To specify events generated by a process, type the name of the process. For example, type **mgd** to list all messages generated by the management process.
Date From To	Specifies the time period in which the events you want displayed are generated. Displays a calendar that allows you to select the year, month, day, and time. It also allows you to select the local time. By default, the messages generated during the last one hour are displayed. End Time shows the current time and Start Time shows the time one hour before End Time.	To specify the time period: • Click the **Calendar** icon and select the year, month, and date—for example, **02/10/2007**. • Click the **Calendar** icon and select the year, month, and date—for example, **02/10/2007**. • Click to select the time in hours, minutes, and seconds.
Event ID	Specifies the event ID for which you want to display the messages. Allows you to type part of the ID and completes the remainder automatically. An event ID, also known as a system log message code, uniquely identifies a system log message. It begins with a prefix that indicates the generating software process or library.	To specify events with a specific ID, type the partial or complete ID—for example, **TFTPD_AF_ERR**.
Description	Specifies text from the description of events that you want to display. Allows you to use regular expressions to match text from the event description. NOTE: Regular expression matching is case-sensitive.	To specify events with a specific description, type a text string from the description with regular expression. For example, type **^Initial*** to display all messages with lines beginning with the term *Initial*.
Search	Applies the specified filter and displays the matching messages.	To apply the filter and display messages, click **Search**.

Table 54: Filtering System Log Messages *(continued)*

Field	Function	Your Action
Reset	Resets all the fields in the Events Filter box.	To reset the field values that are listed in the Events Filter box, click **Reset**.
Generate Raw Report NOTE: • Starting in Junos OS Release 14.1X53, a Raw Report can be generated from the log messages being loaded in the Events Detail table.The Generate Raw Report button is enabled after the event log messages start loading in the Events Detail table. • After the log messages are completely loaded in the Events Detail table, Generate Raw Report changes to Generate Report.	Generates a list of event log messages in nontabular format.	To generate a raw report: 1. Click **Generate Raw Report**. The *Opening filteredEvents.html* window appears. 2. Select **Open with** to open the HTML file or select **Save File** to save the file. 3. Click **OK**.
Generate Report NOTE: Starting in Junos OS Release 14.1X53, a Formatted Report can be generated from event log messages being loaded in an Events Detail table.The Generate Report button appears only after event log messages are completely loaded in the Events Detail table. The Generate Raw Report button is displayed while event log messages are being loaded.	Generates a list of event log messages in tabular format, which shows system details, events filter criteria, and event details.	To generate a formatted report: 1. Click **Generate Report**. The *Opening Report.html* window appears. 2. Select **Open with** to open the HTML file or select **Save File** to save the file. 3. Click **OK**.

Meaning Table 55 on page 176 describes the Event Summary fields.

NOTE: By default, the View Events page in the J-Web interface displays the most recent 25 events, with severity levels highlighted in different colors. After you specify the filters, Event Summary displays the events matching the specified filters. Click the First, Next, Prev, and Last links to navigate through messages.

Table 55: Viewing System Log Messages

Field	Function	Additional Information
Process	Displays the name and ID of the process that generated the system log message.	The information displayed in this field is different for messages generated on the local Routing Engine than for messages generated on another Routing Engine (on a system with two Routing Engines installed and operational). Messages from the other Routing Engine also include the identifiers **re0** and **re1** that identify the Routing Engine.
Severity	Severity level of a message is indicated by different colors. • **Unknown**—Gray—Indicates no severity level is specified. • **Debug/Info/Notice**—Green—Indicates conditions that are not errors but are of interest or might warrant special handling. • **Warning**—Yellow—Indicates conditions that warrant monitoring. • **Error**—Blue—Indicates standard error conditions that generally have less serious consequences than errors in the emergency, alert, and critical levels. • **Critical**—Pink—Indicates critical conditions, such as hard-drive errors. • **Alert**—Orange—Indicates conditions that require immediate correction, such as a corrupted system database. • **Emergency**—Red—Indicates system panic or other conditions that cause the switch to stop functioning.	A severity level indicates how seriously the triggering event affects switch functions. When you configure a location for logging a facility, you also specify a severity level for the facility. Only messages from the facility that are rated at that level or higher are logged to the specified file.
Event ID	Displays a code that uniquely identifies the message. The prefix on each code identifies the message source, and the rest of the code indicates the specific event or error.	The event ID begins with a prefix that indicates the generating software process. Some processes on a switch do not use codes. This field might be blank in a message generated from such a process. An event can belong to one of the following type categories: • **Error**—Indicates an error or failure condition that might require corrective action. • **Event**—Indicates a condition or occurrence that does not generally require corrective action.
Event Description	Displays a more detailed explanation of the message.	
Time	Displays the time at which the message was logged.	

Release History Table

Release	Description
14.1X53	Starting in Junos OS Release 14.1X53, a Raw Report can be generated from the log messages being loaded in the Events Detail table.
14.1X53	Starting in Junos OS Release 14.1X53, a Formatted Report can be generated from event log messages being loaded in an Events Detail table.

Related Documentation

- Checking Active Alarms with the J-Web Interface on page 172
- Understanding Alarm Types and Severity Levels on EX Series Switches on page 165

PART 6

Safety and Compliance Information

CHAPTER 19

General Safety Guidelines and Warnings

General Safety Guidelines and Warnings

The following guidelines help ensure your safety and protect the device from damage. The list of guidelines might not address all potentially hazardous situations in your working environment, so be alert and exercise good judgment at all times.

- Perform only the procedures explicitly described in the hardware documentation for this device. Make sure that only authorized service personnel perform other system services.
- Keep the area around the device clear and free from dust before, during, and after installation.
- Keep tools away from areas where people could trip over them while walking.
- Do not wear loose clothing or jewelry, such as rings, bracelets, or chains, which could become caught in the device.
- Wear safety glasses if you are working under any conditions that could be hazardous to your eyes.
- Do not perform any actions that create a potential hazard to people or make the equipment unsafe.
- Never attempt to lift an object that is too heavy for one person to handle.
- Never install or manipulate wiring during electrical storms.
- Never install electrical jacks in wet locations unless the jacks are specifically designed for wet environments.
- Operate the device only when it is properly grounded.
- Ensure that the separate protective earthing terminal provided on this device is permanently connected to earth.
- Replace fuses only with fuses of the same type and rating.

- Do not open or remove chassis covers or sheet-metal parts unless instructions are provided in the hardware documentation for this device. Such an action could cause severe electrical shock.
- Do not push or force any objects through any opening in the chassis frame. Such an action could result in electrical shock or fire.
- Avoid spilling liquid onto the chassis or onto any device component. Such an action could cause electrical shock or damage the device.
- Avoid touching uninsulated electrical wires or terminals that have not been disconnected from their power source. Such an action could cause electrical shock.
- Always ensure that all modules, power supplies, and cover panels are fully inserted and that the installation screws are fully tightened.

Related Documentation

- AC Power Electrical Safety Guidelines on page 212
- General Electrical Safety Guidelines and Warnings on page 209
- Maintenance and Operational Safety Guidelines and Warnings on page 203
- Installation Instructions Warning on page 189
- Grounded Equipment Warning on page 196

Definitions of Safety Warning Levels

The documentation uses the following levels of safety warnings (there are two *Warning* formats):

NOTE: You might find this information helpful in a particular situation, or you might overlook this important information if it was not highlighted in a Note.

CAUTION: You need to observe the specified guidelines to prevent minor injury or discomfort to you or severe damage to the device.

WARNING: This symbol alerts you to the risk of personal injury from a laser.

WARNING: This symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents.

Waarschuwing Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige

apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van standaard maatregelen om ongelukken te voorkomen.

Varoitus Tämä varoitusmerkki merkitsee vaaraa. Olet tilanteessa, joka voi johtaa ruumiinvammaan. Ennen kuin työskentelet minkään laitteiston parissa, ota selvää sähkökytkentöihin liittyvistä vaaroista ja tavanomaisista onnettomuuksien ehkäisykeinoista.

Attention Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant causer des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers posés par les circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents.

Warnung Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu einer Körperverletzung führen könnte. Bevor Sie mit der Arbeit an irgendeinem Gerät beginnen, seien Sie sich der mit elektrischen Stromkreisen verbundenen Gefahren und der Standardpraktiken zur Vermeidung von Unfällen bewußt.

Avvertenza Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di lavorare su qualsiasi apparecchiatura, occorre conoscere i pericoli relativi ai circuiti elettrici ed essere al corrente delle pratiche standard per la prevenzione di incidenti.

Advarsel Dette varselsymbolet betyr fare. Du befinner deg i en situasjon som kan føre til personskade. Før du utfører arbeid på utstyr, må du vare oppmerksom på de faremomentene som elektriske kretser innebærer, samt gjøre deg kjent med vanlig praksis når det gjelder å unngå ulykker.

Aviso Este símbolo de aviso indica perigo. Encontra-se numa situação que lhe poderá causar danos físicos. Antes de começar a trabalhar com qualquer equipamento, familiarize-se com os perigos relacionados com circuitos eléctricos, e com quaisquer práticas comuns que possam prevenir possíveis acidentes.

¡Atención! Este símbolo de aviso significa peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considerar los riesgos que entraña la corriente eléctrica y familiarizarse con los procedimientos estándar de prevención de accidentes.

Varning! Denna varningssymbol signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanligt förfarande för att förebygga skador.

Related Documentation

- General Safety Guidelines and Warnings on page 181

- Installation Instructions Warning on page 189
- Maintenance and Operational Safety Guidelines and Warnings on page 203
- Grounded Equipment Warning on page 196
- Laser and LED Safety Guidelines and Warnings on page 199
- *Laser and LED Safety Guidelines and Warnings for the QFX Series*
- *Laser and LED Safety Guidelines and Warnings for the PTX Series*
- Warning Statement for Norway and Sweden on page 185

Qualified Personnel Warning

WARNING: **Only trained and qualified personnel should install or replace the device.**

Waarschuwing Installatie en reparaties mogen uitsluitend door getraind en bevoegd personeel uitgevoerd worden.

Varoitus Ainoastaan koulutettu ja pätevä henkilökunta saa asentaa tai vaihtaa tämän laitteen.

Attention Tout installation ou remplacement de l'appareil doit être réalisé par du personnel qualifié et compétent.

Warnung Gerät nur von geschultem, qualifiziertem Personal installieren oder auswechseln lassen.

Avvertenza Solo personale addestrato e qualificato deve essere autorizzato ad installare o sostituire questo apparecchio.

Advarsel Kun kvalifisert personell med riktig opplæring bør montere eller bytte ut dette utstyret.

Aviso Este equipamento deverá ser instalado ou substituído apenas por pessoal devidamente treinado e qualificado.

¡Atención! Estos equipos deben ser instalados y reemplazados exclusivamente por personal técnico adecuadamente preparado y capacitado.

Varning! Denna utrustning ska endast installeras och bytas ut av utbildad och kvalificerad personal.

Related Documentation

- General Safety Guidelines and Warnings on page 181
- General Electrical Safety Guidelines and Warnings on page 209
- AC Power Electrical Safety Guidelines on page 212
- DC Power Electrical Safety Guidelines for Switches on page 214

Warning Statement for Norway and Sweden

WARNING: The equipment must be connected to an earthed mains socket-outlet.

Advarsel Apparatet skal kobles til en jordet stikkontakt.

Varning! Apparaten skall anslutas till jordat nätuttag.

Related Documentation

- General Safety Guidelines and Warnings on page 181

CHAPTER 20

Fire Safety Requirements

Fire Safety Requirements

In the event of a fire emergency, the safety of people is the primary concern. You should establish procedures for protecting people in the event of a fire emergency, provide safety training, and properly provision fire-control equipment and fire extinguishers.

In addition, you should establish procedures to protect your equipment in the event of a fire emergency. Juniper Networks products should be installed in an environment suitable for electronic equipment. We recommend that fire suppression equipment be available in the event of a fire in the vicinity of the equipment and that all local fire, safety, and electrical codes and ordinances be observed when you install and operate your equipment.

Fire Suppression

In the event of an electrical hazard or an electrical fire, you should first turn power off to the equipment at the source. Then use a Type C fire extinguisher, which uses noncorrosive fire retardants, to extinguish the fire.

Fire Suppression Equipment

Type C fire extinguishers, which use noncorrosive fire retardants such as carbon dioxide and Halotron™, are most effective for suppressing electrical fires. Type C fire extinguishers displace oxygen from the point of combustion to eliminate the fire. For extinguishing fire on or around equipment that draws air from the environment for cooling, you should use this type of inert oxygen displacement extinguisher instead of an extinguisher that leaves residues on equipment.

Do not use multipurpose Type ABC chemical fire extinguishers (dry chemical fire extinguishers). The primary ingredient in these fire extinguishers is monoammonium phosphate, which is very sticky and difficult to clean. In addition, in the presence of minute amounts of moisture, monoammonium phosphate can become highly corrosive and corrodes most metals.

Any equipment in a room in which a chemical fire extinguisher has been discharged is subject to premature failure and unreliable operation. The equipment is considered to be irreparably damaged.

NOTE: To keep warranties effective, do not use a dry chemical fire extinguisher to control a fire at or near a Juniper Networks device. If a dry chemical fire extinguisher is used, the unit is no longer eligible for coverage under a service agreement.

We recommend that you dispose of any irreparably damaged equipment in an environmentally responsible manner.

Related Documentation

- General Safety Guidelines and Warnings on page 181
- General Electrical Safety Guidelines and Warnings on page 209
- Action to Take After an Electrical Accident on page 210

CHAPTER 21

Installation Safety Guidelines and Warnings

Installation Instructions Warning

WARNING: Read the installation instructions before you connect the device to a power source.

Waarschuwing Raadpleeg de installatie-aanwijzingen voordat u het systeem met de voeding verbindt.

Varoitus Lue asennusohjeet ennen järjestelmän yhdistämistä virtalähteeseen.

Attention Avant de brancher le système sur la source d'alimentation, consulter les directives d'installation.

Warnung Lesen Sie die Installationsanweisungen, bevor Sie das System an die Stromquelle anschließen.

Avvertenza Consultare le istruzioni di installazione prima di collegare il sistema all'alimentatore.

Advarsel Les installasjonsinstruksjonene før systemet kobles til strømkilden.

Aviso Leia as instruções de instalação antes de ligar o sistema à sua fonte de energia.

¡Atención! Ver las instrucciones de instalación antes de conectar el sistema a la red de alimentación.

Varning! Läs installationsanvisningarna innan du kopplar systemet till dess strömförsörjningsenhet.

Related Documentation

- General Safety Guidelines and Warnings on page 181
- Laser and LED Safety Guidelines and Warnings on page 199
- Grounded Equipment Warning on page 196

Chassis Lifting Guidelines

- Before moving the device to a site, ensure that the site meets the power, environmental, and clearance requirements.
- Before lifting or moving the device, disconnect all external cables and wires.
- As when lifting any heavy object, ensure that most of the weight is borne by your legs rather than your back. Keep your knees bent and your back relatively straight. Do not twist your body as you lift. Balance the load evenly and be sure that your footing is firm.
- Use the following lifting guidelines to lift routing devices and components:
  - Up to 39.7 lb (18 kg): One person.
  - 39.7 lb (18 kg) to 70.5 lb (32 kg): Two or more people.
  - 70.5 lb (32 kg) to 121.2 lb (55 kg): Three or more people.
  - Above 121.2 lbs (55 kg): Material handling systems (such as levers, slings, lifts and so on) must be used. When this is not practical, specially trained persons or systems must be used (riggers or movers).

Related Documentation

- General Safety Guidelines and Warnings on page 181
- Installation Instructions Warning on page 189

Restricted Access Warning

WARNING: This unit is intended for installation in restricted access areas. A restricted access area is an area to which access can be gained only by service personnel through the use of a special tool, lock and key, or other means of security, and which is controlled by the authority responsible for the location.

Waarschuwing Dit toestel is bedoeld voor installatie op plaatsen met beperkte toegang. Een plaats met beperkte toegang is een plaats waar toegang slechts door servicepersoneel verkregen kan worden door middel van een speciaal instrument, een slot en sleutel, of een ander veiligheidsmiddel, en welke

beheerd wordt door de overheidsinstantie die verantwoordelijk is voor de locatie.

Varoitus Tämä laite on tarkoitettu asennettavaksi paikkaan, johon pääsy on rajoitettua. Paikka, johon pääsy on rajoitettua, tarkoittaa paikkaa, johon vain huoltohenkilöstö pääsee jonkin erikoistyökalun, lukkoon sopivan avaimen tai jonkin muun turvalaitteen avulla ja joka on paikasta vastuussa olevien toimivaltaisten henkilöiden valvoma.

Attention Cet appareil est à installer dans des zones d'accès réservé. Ces dernières sont des zones auxquelles seul le personnel de service peut accéder en utilisant un outil spécial, un mécanisme de verrouillage et une clé, ou tout autre moyen de sécurité. L'accès aux zones de sécurité est sous le contrôle de l'autorité responsable de l'emplacement.

Warnung Diese Einheit ist zur Installation in Bereichen mit beschränktem Zutritt vorgesehen. Ein Bereich mit beschränktem Zutritt ist ein Bereich, zu dem nur Wartungspersonal mit einem Spezialwerkzeugs, Schloß und Schlüssel oder anderer Sicherheitsvorkehrungen Zugang hat, und der von dem für die Anlage zuständigen Gremium kontrolliert wird.

Avvertenza Questa unità deve essere installata in un'area ad accesso limitato. Un'area ad accesso limitato è un'area accessibile solo a personale di assistenza tramite un'attrezzo speciale, lucchetto, o altri dispositivi di sicurezza, ed è controllata dall'autorità responsabile della zona.

Advarsel Denne enheten er laget for installasjon i områder med begrenset adgang. Et område med begrenset adgang gir kun adgang til servicepersonale som bruker et spesielt verktøy, lås og nøkkel, eller en annen sikkerhetsanordning, og det kontrolleres av den autoriteten som er ansvarlig for området.

Aviso Esta unidade foi concebida para instalação em áreas de acesso restrito. Uma área de acesso restrito é uma área à qual apenas tem acesso o pessoal de serviço autorizado, que possua uma ferramenta, chave e fechadura especial, ou qualquer outra forma de segurança. Esta área é controlada pela autoridade responsável pelo local.

¡Atención! Esta unidad ha sido diseñada para instalarse en áreas de acceso restringido. Área de acceso restringido significa un área a la que solamente tiene acceso el personal de servicio mediante la utilización de una herramienta especial, cerradura con llave, o algún otro medio de seguridad, y que está bajo el control de la autoridad responsable del local.

Varning! Denna enhet är avsedd för installation i områden med begränsat tillträde. Ett område med begränsat tillträde får endast tillträdas av servicepersonal med ett speciellt verktyg, lås och nyckel, eller annan säkerhetsanordning, och kontrolleras av den auktoritet som ansvarar för området.

Related Documentation

- General Safety Guidelines and Warnings on page 181
- General Electrical Safety Guidelines and Warnings on page 209
- Installation Instructions Warning on page 189
- Grounded Equipment Warning on page 196

Ramp Warning

WARNING: When installing the device, do not use a ramp inclined at more than 10 degrees.

Waarschuwing Gebruik een oprijplaat niet onder een hoek van meer dan 10 graden.

Varoitus Älä käytä sellaista kaltevaa pintaa, jonka kaltevuus ylittää 10 astetta.

Attention Ne pas utiliser une rampe dont l'inclinaison est supérieure à 10 degrés.

Warnung Keine Rampen mit einer Neigung von mehr als 10 Grad verwenden.

Avvertenza Non usare una rampa con pendenza superiore a 10 gradi.

Advarsel Bruk aldri en rampe som heller mer enn 10 grader.

Aviso Não utilize uma rampa com uma inclinação superior a 10 graus.

¡Atención! No usar una rampa inclinada más de 10 grados

Varning! Använd inte ramp med en lutning på mer än 10 grader.

Related Documentation

- General Safety Guidelines and Warnings on page 181
- Installation Instructions Warning on page 189
- Grounded Equipment Warning on page 196

Rack-Mounting and Cabinet-Mounting Warnings

Ensure that the rack or cabinet in which the device is installed is evenly and securely supported. Uneven mechanical loading could lead to a hazardous condition.

WARNING: To prevent bodily injury when mounting or servicing the device in a rack, take the following precautions to ensure that the system remains stable. The following directives help maintain your safety:

- The device must be installed in a rack that is secured to the building structure.
- The device should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting the device on a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing equipment, install the stabilizers before mounting or servicing the device in the rack.

Waarschuwing Om lichamelijk letsel te voorkomen wanneer u dit toestel in een rek monteert of het daar een servicebeurt geeft, moet u speciale voorzorgsmaatregelen nemen om ervoor te zorgen dat het toestel stabiel blijft. De onderstaande richtlijnen worden verstrekt om uw veiligheid te verzekeren:

- De Juniper Networks switch moet in een stellage worden geïnstalleerd die aan een bouwsel is verankerd.
- Dit toestel dient onderaan in het rek gemonteerd te worden als het toestel het enige in het rek is.
- Wanneer u dit toestel in een gedeeltelijk gevuld rek monteert, dient u het rek van onderen naar boven te laden met het zwaarste onderdeel onderaan in het rek.
- Als het rek voorzien is van stabiliseringshulpmiddelen, dient u de stabilisatoren te monteren voordat u het toestel in het rek monteert of het daar een servicebeurt geeft.

Varoitus Kun laite asetetaan telineeseen tai huolletaan sen ollessa telineessä, on noudatettava erityisiä varotoimia järjestelmän vakavuuden säilyttämiseksi, jotta vältytään loukkaantumiselta. Noudata seuraavia turvallisuusohjeita:

- Juniper Networks switch on asennettava telineeseen, joka on kiinnitetty rakennukseen.
- Jos telineessä ei ole muita laitteita, aseta laite telineen alaosaan.
- Jos laite asetetaan osaksi täytettyyn telineeseen, aloita kuormittaminen sen alaosasta kaikkein raskaimmalla esineellä ja siirry sitten sen yläosaan.
- Jos telinettä varten on vakaimet, asenna ne ennen laitteen asettamista telineeseen tai sen huoltamista siinä.

Attention Pour éviter toute blessure corporelle pendant les opérations de montage ou de réparation de cette unité en casier, il convient de prendre des précautions spéciales afin de maintenir la stabilité du système. Les directives ci-dessous sont destinées à assurer la protection du personnel:

- Le rack sur lequel est monté le Juniper Networks switch doit être fixé à la structure du bâtiment.
- Si cette unité constitue la seule unité montée en casier, elle doit être placée dans le bas.
- Si cette unité est montée dans un casier partiellement rempli, charger le casier de bas en haut en plaçant l'élément le plus lourd dans le bas.
- Si le casier est équipé de dispositifs stabilisateurs, installer les stabilisateurs avant de monter ou de réparer l'unité en casier.

Warnung Zur Vermeidung von Körperverletzung beim Anbringen oder Warten dieser Einheit in einem Gestell müssen Sie besondere Vorkehrungen treffen, um sicherzustellen, daß das System stabil bleibt. Die folgenden Richtlinien sollen zur Gewährleistung Ihrer Sicherheit dienen:

- Der Juniper Networks switch muß in einem Gestell installiert werden, das in der Gebäudestruktur verankert ist.
- Wenn diese Einheit die einzige im Gestell ist, sollte sie unten im Gestell angebracht werden.
- Bei Anbringung dieser Einheit in einem zum Teil gefüllten Gestell ist das Gestell von unten nach oben zu laden, wobei das schwerste Bauteil unten im Gestell anzubringen ist.
- Wird das Gestell mit Stabilisierungszubehör geliefert, sind zuerst die Stabilisatoren zu installieren, bevor Sie die Einheit im Gestell anbringen oder sie warten.

Avvertenza Per evitare infortuni fisici durante il montaggio o la manutenzione di questa unità in un supporto, occorre osservare speciali precauzioni per garantire che il sistema rimanga stabile. Le seguenti direttive vengono fornite per garantire la sicurezza personale:

- Il Juniper Networks switch deve essere installato in un telaio, il quale deve essere fissato alla struttura dell'edificio.
- Questa unità deve venire montata sul fondo del supporto, se si tratta dell'unica unità da montare nel supporto.
- Quando questa unità viene montata in un supporto parzialmente pieno, caricare il supporto dal basso all'alto, con il componente più pesante sistemato sul fondo del supporto.
- Se il supporto è dotato di dispositivi stabilizzanti, installare tali dispositivi prima di montare o di procedere alla manutenzione dell'unità nel supporto.

Advarsel Unngå fysiske skader under montering eller reparasjonsarbeid på denne enheten når den befinner seg i et kabinett. Vær nøye med at systemet er stabilt. Følgende retningslinjer er gitt for å verne om sikkerheten:

- Juniper Networks switch må installeres i et stativ som er forankret til bygningsstrukturen.
- Denne enheten bør monteres nederst i kabinettet hvis dette er den eneste enheten i kabinettet.
- Ved montering av denne enheten i et kabinett som er delvis fylt, skal kabinettet lastes fra bunnen og opp med den tyngste komponenten nederst i kabinettet.
- Hvis kabinettet er utstyrt med stabiliseringsutstyr, skal stabilisatorene installeres før montering eller utføring av reparasjonsarbeid på enheten i kabinettet.

Aviso Para se prevenir contra danos corporais ao montar ou reparar esta unidade numa estante, deverá tomar precauções especiais para se certificar de que o sistema possui um suporte estável. As seguintes directrizes ajudá-lo-ão a efectuar o seu trabalho com segurança:

- O Juniper Networks switch deverá ser instalado numa prateleira fixa à estrutura do edificio.
- Esta unidade deverá ser montada na parte inferior da estante, caso seja esta a única unidade a ser montada.
- Ao montar esta unidade numa estante parcialmente ocupada, coloque os itens mais pesados na parte inferior da estante, arrumando-os de baixo para cima.
- Se a estante possuir um dispositivo de estabilização, instale-o antes de montar ou reparar a unidade.

¡Atención! Para evitar lesiones durante el montaje de este equipo sobre un bastidor, o posteriormente durante su mantenimiento, se debe poner mucho cuidado en que el sistema quede bien estable. Para garantizar su seguridad, proceda según las siguientes instrucciones:

- El Juniper Networks switch debe instalarse en un bastidor fijado a la estructura del edificio.
- Colocar el equipo en la parte inferior del bastidor, cuando sea la única unidad en el mismo.
- Cuando este equipo se vaya a instalar en un bastidor parcialmente ocupado, comenzar la instalación desde la parte inferior hacia la superior colocando el equipo más pesado en la parte inferior.
- Si el bastidor dispone de dispositivos estabilizadores, instalar éstos antes de montar o proceder al mantenimiento del equipo instalado en el bastidor.

Varning! För att undvika kroppsskada när du installerar eller utför underhållsarbete på denna enhet på en ställning måste du vidta särskilda

försiktighetsåtgärder för att försäkra dig om att systemet står stadigt. Följande riktlinjer ges för att trygga din säkerhet:

- Juniper Networks switch måste installeras i en ställning som är förankrad i byggnadens struktur.
- Om denna enhet är den enda enheten på ställningen skall den installeras längst ned på ställningen.
- Om denna enhet installeras på en delvis fylld ställning skall ställningen fyllas nedifrån och upp, med de tyngsta enheterna längst ned på ställningen.
- Om ställningen är försedd med stabiliseringsdon skall dessa monteras fast innan enheten installeras eller underhålls på ställningen.

Related Documentation

- General Safety Guidelines and Warnings on page 181
- Installation Instructions Warning on page 189
- Grounded Equipment Warning on page 196

Wall-Mounting Warnings for EX2200 Switches

WARNING:

- When mounting an EX2200 switch chassis in a vertical position, orient the front panel of the chassis downward to ensure proper airflow and meet safety requirements in the event of a fire.
- When wall mounting Power over Ethernet (PoE) models (EX2200-24P and EX2200-48P), install the wall-mount baffle above the units to reduce the risk of objects or substances falling into the air exhaust or power supply, which could cause a fire.

Related Documentation

- Mounting an EX2200 Switch on a Wall on page 101

Grounded Equipment Warning

WARNING: The device is intended to be grounded. During normal use, ensure that you have connected earth ground to the chassis.

Waarschuwing Deze apparatuur hoort geaard te worden Zorg dat de host-computer tijdens normaal gebruik met aarde is verbonden.

Varoitus Tämä laitteisto on tarkoitettu maadoitettavaksi. Varmista, että isäntälaite on yhdistetty maahan normaalikäytön aikana.

Attention Cet équipement doit être relié à la terre. S'assurer que l'appareil hôte est relié à la terre lors de l'utilisation normale.

Warnung Dieses Gerät muß geerdet werden. Stellen Sie sicher, daß das Host-Gerät während des normalen Betriebs an Erde gelegt ist.

Avvertenza Questa apparecchiatura deve essere collegata a massa. Accertarsi che il dispositivo host sia collegato alla massa di terra durante il normale utilizzo.

Advarsel Dette utstyret skal jordes. Forviss deg om vertsterminalen er jordet ved normalt bruk.

Aviso Este equipamento deverá estar ligado à terra. Certifique-se que o host se encontra ligado à terra durante a sua utilização normal.

¡Atención! Este equipo debe conectarse a tierra. Asegurarse de que el equipo principal esté conectado a tierra durante el uso normal.

Varning! Denna utrustning är avsedd att jordas. Se till att värdenheten är jordad vid normal användning.

Related Documentation

- General Safety Guidelines and Warnings on page 181
- AC Power Electrical Safety Guidelines on page 212
- DC Power Electrical Safety Guidelines for Switches on page 214

CHAPTER 22

Radiation and Laser Safety Guidelines and Warnings

Laser and LED Safety Guidelines and Warnings

Juniper Networks devices are equipped with laser transmitters, which are considered a Class 1 Laser Product by the U.S. Food and Drug Administration and are evaluated as a Class 1 Laser Product per EN 60825-1 requirements.

Observe the following guidelines and warnings:

General Laser Safety Guidelines

When working around ports that support optical transceivers, observe the following safety guidelines to prevent eye injury:

- Do not look into unterminated ports or at fibers that connect to unknown sources.
- Do not examine unterminated optical ports with optical instruments.
- Avoid direct exposure to the beam.

WARNING: **Unterminated optical connectors can emit invisible laser radiation. The lens in the human eye focuses all the laser power on the retina, so focusing the eye directly on a laser source—even a low-power laser—could permanently damage the eye.**

Class 1 Laser Product Warning

WARNING: Class 1 laser product.

Waarschuwing Klasse-1 laser produkt.

Varoitus Luokan 1 lasertuote.

Attention Produit laser de classe I.

Warnung Laserprodukt der Klasse 1.

Avvertenza Prodotto laser di Classe 1.

Advarsel Laserprodukt av klasse 1.

Aviso Produto laser de classe 1.

¡Atención! Producto láser Clase I.

Varning! Laserprodukt av klass 1.

Class 1 LED Product Warning

WARNING: Class 1 LED product.

Waarschuwing Klasse 1 LED-product.

Varoitus Luokan 1 valodiodituote.

Attention Alarme de produit LED Class I.

Warnung Class 1 LED-Produktwarnung.

Avvertenza Avvertenza prodotto LED di Classe 1.

Advarsel LED-produkt i klasse 1.

Aviso Produto de classe 1 com LED.

¡Atención! Aviso sobre producto LED de Clase 1.

Varning! Lysdiodprodukt av klass 1.

Laser Beam Warning

WARNING: Do not stare into the laser beam or view it directly with optical instruments.

Waarschuwing Niet in de straal staren of hem rechtstreeks bekijken met optische instrumenten.

Varoitus Älä katso säteeseen äläkä tarkastele sitä suoraan optisen laitteen avulla.

Attention Ne pas fixer le faisceau des yeux, ni l'observer directement à l'aide d'instruments optiques.

Warnung Nicht direkt in den Strahl blicken und ihn nicht direkt mit optischen Geräten prüfen.

Avvertenza Non fissare il raggio con gli occhi né usare strumenti ottici per osservarlo direttamente.

Advarsel Stirr eller se ikke direkte p strlen med optiske instrumenter.

Aviso Não olhe fixamente para o raio, nem olhe para ele directamente com instrumentos ópticos.

¡Atención! No mirar fijamente el haz ni observarlo directamente con instrumentos ópticos.

Varning! Rikta inte blicken in mot strålen och titta inte direkt på den genom optiska instrument.

Related Documentation

- General Safety Guidelines and Warnings on page 181
- Radiation from Open Port Apertures Warning on page 201
- Installation Instructions Warning on page 189
- Grounded Equipment Warning on page 196

Radiation from Open Port Apertures Warning

WARNING: Because invisible radiation might be emitted from the aperture of the port when no fiber cable is connected, avoid exposure to radiation and do not stare into open apertures.

Waarschuwing Aangezien onzichtbare straling vanuit de opening van de poort kan komen als er geen fiberkabel aangesloten is, dient blootstelling aan straling en het kijken in open openingen vermeden te worden.

Varoitus Koska portin aukosta voi emittoitua näkymätöntä säteilyä, kun kuitukaapelia ei ole kytkettynä, vältä säteilylle altistumista äläkä katso avoimiin aukkoihin.

Attention Des radiations invisibles à l'il nu pouvant traverser l'ouverture du port lorsqu'aucun câble en fibre optique n'y est connecté, il est recommandé de ne pas regarder fixement l'intérieur de ces ouvertures.

Warnung Aus der Port-Öffnung können unsichtbare Strahlen emittieren, wenn kein Glasfaserkabel angeschlossen ist. Vermeiden Sie es, sich den Strahlungen auszusetzen, und starren Sie nicht in die Öffnungen!

Avvertenza Quando i cavi in fibra non sono inseriti, radiazioni invisibili possono essere emesse attraverso l'apertura della porta. Evitate di esporvi alle radiazioni e non guardate direttamente nelle aperture.

Advarsel Unngå utsettelse for stråling, og stirr ikke inn i åpninger som er åpne, fordi usynlig stråling kan emiteres fra portens åpning når det ikke er tilkoblet en fiberkabel.

Aviso Dada a possibilidade de emissão de radiação invisível através do orifício da via de acesso, quando esta não tiver nenhum cabo de fibra conectado, deverá evitar a exposição à radiação e não deverá olhar fixamente para orifícios que se encontrarem a descoberto.

¡Atención! Debido a que la apertura del puerto puede emitir radiación invisible cuando no existe un cable de fibra conectado, evite mirar directamente a las aperturas para no exponerse a la radiación.

Varning! Osynlig strålning kan avges från en portöppning utan ansluten fiberkabel och du bör därför undvika att bli utsatt för strålning genom att inte stirra in i oskyddade öppningar.

Related Documentation

- General Safety Guidelines and Warnings on page 181
- Laser and LED Safety Guidelines and Warnings on page 199
- Installation Instructions Warning on page 189
- Grounded Equipment Warning on page 196

CHAPTER 23

Maintenance and Operational Safety Warnings

Maintenance and Operational Safety Guidelines and Warnings

While performing the maintenance activities for devices, observe the following guidelines and warnings:

Battery Handling Warning

WARNING: Replacing a battery incorrectly might result in an explosion. Replace a battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Waarschuwing Er is ontploffingsgevaar als de batterij verkeerd vervangen wordt. Vervang de batterij slechts met hetzelfde of een equivalent type dat door de fabrikant aanbevolen is. Gebruikte batterijen dienen overeenkomstig fabrieksvoorschriften weggeworpen te worden.

Varoitus Räjähdyksen vaara, jos akku on vaihdettu väärään akkuun. Käytä vaihtamiseen ainoastaan saman- tai vastaavantyyppistä akkua, joka on valmistajan suosittelema. Hävitä käytetyt akut valmistajan ohjeiden mukaan.

Attention Danger d'explosion si la pile n'est pas remplacée correctement. Ne la remplacer que par une pile de type semblable ou équivalent, recommandée par le fabricant. Jeter les piles usagées conformément aux instructions du fabricant.

Warnung Bei Einsetzen einer falschen Batterie besteht Explosionsgefahr. Ersetzen Sie die Batterie nur durch den gleichen oder vom Hersteller empfohlenen Batterietyp. Entsorgen Sie die benutzten Batterien nach den Anweisungen des Herstellers.

Advarsel Det kan være fare for eksplosjon hvis batteriet skiftes på feil måte. Skift kun med samme eller tilsvarende type som er anbefalt av produsenten. Kasser brukte batterier i henhold til produsentens instruksjoner.

Avvertenza Pericolo di esplosione se la batteria non è installata correttamente. Sostituire solo con una di tipo uguale o equivalente, consigliata dal produttore. Eliminare le batterie usate secondo le istruzioni del produttore.

Aviso Existe perigo de explosão se a bateria for substituída incorrectamente. Substitua a bateria por uma bateria igual ou de um tipo equivalente recomendado pelo fabricante. Destrua as baterias usadas conforme as instruções do fabricante.

¡Atención! Existe peligro de explosión si la batería se reemplaza de manera incorrecta. Reemplazar la batería exclusivamente con el mismo tipo o el equivalente recomendado por el fabricante. Desechar las baterías gastadas según las instrucciones del fabricante.

Varning! Explosionsfara vid felaktigt batteribyte. Ersätt endast batteriet med samma batterityp som rekommenderas av tillverkaren eller motsvarande. Följ tillverkarens anvisningar vid kassering av använda batterier.

Jewelry Removal Warning

WARNING: Before working on equipment that is connected to power lines, remove jewelry, including rings, necklaces, and watches. Metal objects heat up when connected to power and ground and can cause serious burns or can be welded to the terminals.

Waarschuwing Alvorens aan apparatuur te werken die met elektrische leidingen is verbonden, sieraden (inclusief ringen, kettingen en horloges) verwijderen. Metalen voorwerpen worden warm wanneer ze met stroom en aarde zijn verbonden, en kunnen ernstige brandwonden veroorzaken of het metalen voorwerp aan de aansluitklemmen lassen.

Varoitus Ennen kuin työskentelet voimavirtajohtoihin kytkettyjen laitteiden parissa, ota pois kaikki korut (sormukset, kaulakorut ja kellot mukaan lukien). Metalliesineet kuumenevat, kun ne ovat yhteydessä sähkövirran ja maan kanssa, ja ne voivat aiheuttaa vakavia palovammoja tai hitsata metalliesineet kiinni liitäntänapoihin.

Attention Avant d'accéder à cet équipement connecté aux lignes électriques, ôter tout bijou (anneaux, colliers et montres compris). Lorsqu'ils sont branchés

à l'alimentation et reliés à la terre, les objets métalliques chauffent, ce qui peut provoquer des blessures graves ou souder l'objet métallique aux bornes.

Warnung Vor der Arbeit an Geräten, die an das Netz angeschlossen sind, jeglichen Schmuck (einschließlich Ringe, Ketten und Uhren) abnehmen. Metallgegenstände erhitzen sich, wenn sie an das Netz und die Erde angeschlossen werden, und können schwere Verbrennungen verursachen oder an die Anschlußklemmen angeschweißt werden.

Avvertenza Prima di intervenire su apparecchiature collegate alle linee di alimentazione, togliersi qualsiasi monile (inclusi anelli, collane, braccialetti ed orologi). Gli oggetti metallici si riscaldano quando sono collegati tra punti di alimentazione e massa: possono causare ustioni gravi oppure il metallo può saldarsi ai terminali.

Advarsel Fjern alle smykker (inkludert ringer, halskjeder og klokker) før du skal arbeide på utstyr som er koblet til kraftledninger. Metallgjenstander som er koblet til kraftledninger og jord blir svært varme og kan forårsake alvorlige brannskader eller smelte fast til polene.

Aviso Antes de trabalhar em equipamento que esteja ligado a linhas de corrente, retire todas as jóias que estiver a usar (incluindo anéis, fios e relógios). Os objectos metálicos aquecerão em contacto com a corrente e em contacto com a ligação à terra, podendo causar queimaduras graves ou ficarem soldados aos terminais.

¡Atención! Antes de operar sobre equipos conectados a líneas de alimentación, quitarse las joyas (incluidos anillos, collares y relojes). Los objetos de metal se calientan cuando se conectan a la alimentación y a tierra, lo que puede ocasionar quemaduras graves o que los objetos metálicos queden soldados a los bornes.

Varning! Tag av alla smycken (inklusive ringar, halsband och armbandsur) innan du arbetar på utrustning som är kopplad till kraftledningar. Metallobjekt hettas upp när de kopplas ihop med ström och jord och kan förorsaka allvarliga brännskador; metallobjekt kan också sammansvetsas med kontakterna.

Lightning Activity Warning

WARNING: Do not work on the system or connect or disconnect cables during periods of lightning activity.

Waarschuwing Tijdens onweer dat gepaard gaat met bliksem, dient u niet aan het systeem te werken of kabels aan te sluiten of te ontkoppelen.

Varoitus Älä työskentele järjestelmän parissa äläkä yhdistä tai irrota kaapeleita ukkosilmalla.

Attention Ne pas travailler sur le système ni brancher ou débrancher les câbles pendant un orage.

Warnung Arbeiten Sie nicht am System und schließen Sie keine Kabel an bzw. trennen Sie keine ab, wenn es gewittert.

Avvertenza Non lavorare sul sistema o collegare oppure scollegare i cavi durante un temporale con fulmini.

Advarsel Utfør aldri arbeid på systemet, eller koble kabler til eller fra systemet når det tordner eller lyner.

Aviso Não trabalhe no sistema ou ligue e desligue cabos durante períodos de mau tempo (trovoada).

¡Atención! No operar el sistema ni conectar o desconectar cables durante el transcurso de descargas eléctricas en la atmósfera.

Varning! Vid åska skall du aldrig utföra arbete på systemet eller ansluta eller koppla loss kablar.

Operating Temperature Warning

WARNING: To prevent the device from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature. To prevent airflow restriction, allow at least 6 in. (15.2 cm) of clearance around the ventilation openings.

Waarschuwing Om te voorkomen dat welke switch van de Juniper Networks router dan ook oververhit raakt, dient u deze niet te bedienen op een plaats waar de maximale aanbevolen omgevingstemperatuur van 40° C wordt overschreden. Om te voorkomen dat de luchtstroom wordt beperkt, dient er minstens 15,2 cm speling rond de ventilatie-openingen te zijn.

Varoitus Ettei Juniper Networks switch-sarjan reititin ylikuumentuisi, sitä ei saa käyttää tilassa, jonka lämpötila ylittää korkeimman suositellun ympäristölämpötilan 40° C. Ettei ilmanvaihto estyisi, tuuletusaukkojen ympärille on jätettävä ainakin 15,2 cm tilaa.

Attention Pour éviter toute surchauffe des routeurs de la gamme Juniper Networks switch, ne l'utilisez pas dans une zone où la température ambiante est supérieure à 40° C. Pour permettre un flot d'air constant, dégagez un espace d'au moins 15,2 cm autour des ouvertures de ventilations.

Warnung Um einen Router der switch vor Überhitzung zu schützen, darf dieser nicht in einer Gegend betrieben werden, in der die Umgebungstemperatur das empfohlene Maximum von 40° C überschreitet. Um Lüftungsverschluß zu verhindern, achten Sie darauf, daß mindestens 15,2 cm lichter Raum um die Lüftungsöffnungen herum frei bleibt.

Avvertenza Per evitare il surriscaldamento dei switch, non adoperateli in un locale che ecceda la temperatura ambientale massima di 40° C. Per evitare che la circolazione dell'aria sia impedita, lasciate uno spazio di almeno 15.2 cm di fronte alle aperture delle ventole.

Advarsel Unngå overoppheting av eventuelle rutere i Juniper Networks switch Disse skal ikke brukes på steder der den anbefalte maksimale omgivelsestemperaturen overstiger 40° C (104° F). Sørg for at klaringen rundt lufteåpningene er minst 15,2 cm (6 tommer) for å forhindre nedsatt luftsirkulasjon.

Aviso Para evitar o sobreaquecimento do encaminhador Juniper Networks switch, não utilize este equipamento numa área que exceda a temperatura máxima recomendada de 40° C. Para evitar a restrição à circulação de ar, deixe pelo menos um espaço de 15,2 cm à volta das aberturas de ventilação.

¡Atención! Para impedir que un encaminador de la serie Juniper Networks switch se recaliente, no lo haga funcionar en un área en la que se supere la temperatura ambiente máxima recomendada de 40° C. Para impedir la restricción de la entrada de aire, deje un espacio mínimo de 15,2 cm alrededor de las aperturas para ventilación.

Varning! Förhindra att en Juniper Networks switch överhettas genom att inte använda den i ett område där den maximalt rekommenderade omgivningstemperaturen på 40° C överskrids. Förhindra att luftcirkulationen inskränks genom att se till att det finns fritt utrymme på minst 15,2 cm omkring ventilationsöppningarna.

Product Disposal Warning

WARNING: Disposal of this device must be handled according to all national laws and regulations.

Waarschuwing Dit produkt dient volgens alle landelijke wetten en voorschriften te worden afgedankt.

Varoitus Tämän tuotteen lopullisesta hävittämisestä tulee huolehtia kaikkia valtakunnallisia lakeja ja säännöksiä noudattaen.

Attention La mise au rebut définitive de ce produit doit être effectuée conformément à toutes les lois et réglementations en vigueur.

Warnung Dieses Produkt muß den geltenden Gesetzen und Vorschriften entsprechend entsorgt werden.

Avvertenza L'eliminazione finale di questo prodotto deve essere eseguita osservando le normative italiane vigenti in materia

Advarsel Endelig disponering av dette produktet må skje i henhold til nasjonale lover og forskrifter.

Aviso A descartagem final deste produto deverá ser efectuada de acordo com os regulamentos e a legislação nacional.

¡Atención! El desecho final de este producto debe realizarse según todas las leyes y regulaciones nacionales

Varning! Slutlig kassering av denna produkt bör skötas i enlighet med landets alla lagar och föreskrifter.

Related Documentation

- General Safety Guidelines and Warnings on page 181
- General Electrical Safety Guidelines and Warnings on page 209
- AC Power Electrical Safety Guidelines on page 212
- DC Power Electrical Safety Guidelines for Switches on page 214
- Laser and LED Safety Guidelines and Warnings on page 199
- Installation Instructions Warning on page 189
- Grounded Equipment Warning on page 196

CHAPTER 24

Electrical Safety Guidelines and Warnings

General Electrical Safety Guidelines and Warnings

WARNING: Certain ports on the device are designed for use as intrabuilding (within-the-building) interfaces only (Type 2 or Type 4 ports as described in *GR-1089-CORE*) and require isolation from the exposed outside plant (OSP) cabling. To comply with NEBS requirements and protect against lightning surges and commercial power disturbances, the intrabuilding ports *must not* be metallically connected to interfaces that connect to the OSP or its wiring. The intrabuilding ports on the device are suitable for connection to intrabuilding or unexposed wiring or cabling only. The addition of primary protectors is not sufficient protection for connecting these interfaces metallically to OSP wiring.

CAUTION: Before removing or installing components of a device, attach an electrostatic discharge (ESD) grounding strap to an ESD point and place the other end of the strap around your bare wrist. Failure to use an ESD grounding strap could result in damage to the device.

- Install the device in compliance with the following local, national, and international electrical codes:
  - United States—National Fire Protection Association (NFPA 70), United States National Electrical Code.
  - Other countries—International Electromechanical Commission (IEC) 60364, Part 1 through Part 7.
  - Evaluated to the TN power system.
  - Canada—Canadian Electrical Code, Part 1, CSA C22.1.
- Locate the emergency power-off switch for the room in which you are working so that if an electrical accident occurs, you can quickly turn off the power.
- Make sure that grounding surfaces are cleaned and brought to a bright finish before grounding connections are made.
- Do not work alone if potentially hazardous conditions exist anywhere in your workspace.
- Never assume that power is disconnected from a circuit. Always check the circuit before starting to work.
- Carefully look for possible hazards in your work area, such as moist floors, ungrounded power extension cords, and missing safety grounds.
- Operate the device within marked electrical ratings and product usage instructions.
- To ensure that the device and peripheral equipment function safely and correctly, use the cables and connectors specified for the attached peripheral equipment, and make certain they are in good condition.

You can remove and replace many device components without powering off or disconnecting power to the device, as detailed elsewhere in the hardware documentation for this device. Never install equipment that appears to be damaged.

Related Documentation

- General Safety Guidelines and Warnings on page 181
- AC Power Electrical Safety Guidelines on page 212
- DC Power Electrical Safety Guidelines for Switches on page 214

Action to Take After an Electrical Accident

If an electrical accident results in an injury, take the following actions in this order:

1. Use caution. Be aware of potentially hazardous conditions that could cause further injury.
2. Disconnect power from the device.
3. If possible, send another person to get medical aid. Otherwise, assess the condition of the victim, then call for help.

Related Documentation

- General Safety Guidelines and Warnings on page 181
- General Electrical Safety Guidelines and Warnings on page 209
- AC Power Electrical Safety Guidelines on page 212
- DC Power Electrical Safety Guidelines for Switches on page 214

Prevention of Electrostatic Discharge Damage

Device components that are shipped in antistatic bags are sensitive to damage from static electricity. Some components can be impaired by voltages as low as 30 V. You can easily generate potentially damaging static voltages whenever you handle plastic or foam packing material or if you move components across plastic or carpets. Observe the following guidelines to minimize the potential for electrostatic discharge (ESD) damage, which can cause intermittent or complete component failures:

- Always use an ESD grounding strap when you are handling components that are subject to ESD damage, and make sure that it is in direct contact with your skin.

  If a grounding strap is not available, hold the component in its antistatic bag (see Figure 61 on page 212) in one hand and touch the exposed, bare metal of the device with the other hand immediately before inserting the component into the device.

  WARNING: **For safety, periodically check the resistance value of the ESD grounding strap. The measurement must be in the range 1 through 10 Mohms.**

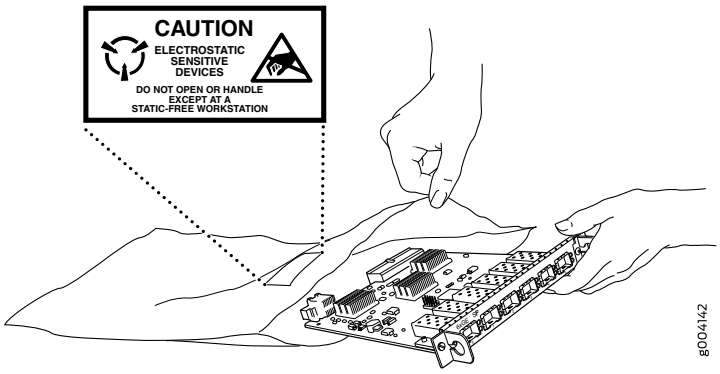
- When handling any component that is subject to ESD damage and that is removed from the device, make sure the equipment end of your ESD grounding strap is attached to the ESD point on the chassis.

  If no grounding strap is available, touch the exposed, bare metal of the device to ground yourself before handling the component.

- Avoid contact between the component that is subject to ESD damage and your clothing. ESD voltages emitted from clothing can damage components.

- When removing or installing a component that is subject to ESD damage, always place it component-side up on an antistatic surface, in an antistatic card rack, or in an antistatic bag (see Figure 61 on page 212). If you are returning a component, place it in an antistatic bag before packing it.

Figure 61: Placing a Component into an Antistatic Bag



CAUTION: ANSI/TIA/EIA-568 cables such as Category 5e and Category 6 can get electrostatically charged. To dissipate this charge, always ground the cables to a suitable and safe earth ground before connecting them to the system.

Related Documentation

- General Safety Guidelines and Warnings on page 181

AC Power Electrical Safety Guidelines

CAUTION: For devices with AC power supplies, an external surge protective device (SPD) must be used at the AC power source.

The following electrical safety guidelines apply to AC-powered devices:

- Note the following warnings printed on the device:

  "**CAUTION:** THIS UNIT HAS MORE THAN ONE POWER SUPPLY CORD. DISCONNECT ALL POWER SUPPLY CORDS BEFORE SERVICING TO AVOID ELECTRIC SHOCK."

  "**ATTENTION:** CET APPAREIL COMPORTE PLUS D'UN CORDON D'ALIMENTATION. AFIN DE PRÉVENIR LES CHOCS ÉLECTRIQUES, DÉBRANCHER TOUT CORDON D'ALIMENTATION AVANT DE FAIRE LE DÉPANNAGE."

- AC-powered devices are shipped with a three-wire electrical cord with a grounding-type plug that fits only a grounding-type power outlet. Do not circumvent this safety feature. Equipment grounding must comply with local and national electrical codes.
- You must provide an external certified circuit breaker rated minimum 20 A in the building installation.

- The power cord serves as the main disconnecting device for the AC-powered device. The socket outlet must be near the AC-powered device and be easily accessible.
- For devices that have more than one power supply connection, you must ensure that all power connections are fully disconnected so that power to the device is completely removed to prevent electric shock. To disconnect power, unplug all power cords (one for each power supply).

Power Cable Warning (Japanese)

WARNING: The attached power cable is only for this product. Do not use the cable for another product.

注意

附属の電源コードセットはこの製品専用です。
他の電気機器には使用しないでください。

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Related Documentation

- General Safety Guidelines and Warnings on page 181
- General Electrical Safety Guidelines and Warnings on page 209
- Multiple Power Supplies Disconnection Warning on page 222

AC Power Disconnection Warning

WARNING: Before working on the device or near power supplies, unplug all the power cords from an AC-powered device.

Waarschuwing Voordat u aan een frame of in de nabijheid van voedingen werkt, dient u bij wisselstroom toestellen de stekker van het netsnoer uit het stopcontact te halen.

Varoitus Kytke irti vaihtovirtalaitteiden virtajohto, ennen kuin teet mitään asennuspohjalle tai työskentelet virtalähteiden läheisyydessä.

Attention Avant de travailler sur un châssis ou à proximité d'une alimentation électrique, débrancher le cordon d'alimentation des unités en courant alternatif.

Warnung Bevor Sie an einem Chassis oder in der Nähe von Netzgeräten arbeiten, ziehen Sie bei Wechselstromeinheiten das Netzkabel ab bzw.

Avvertenza Prima di lavorare su un telaio o intorno ad alimentatori, scollegare il cavo di alimentazione sulle unità CA.

Advarsel Før det utføres arbeid på kabinettet eller det arbeides i nærheten av strømforsyningsenheter, skal strømledningen trekkes ut på vekselstrømsenheter.

Aviso Antes de trabalhar num chassis, ou antes de trabalhar perto de unidades de fornecimento de energia, desligue o cabo de alimentação nas unidades de corrente alternada.

¡Atención! Antes de manipular el chasis de un equipo o trabajar cerca de una fuente de alimentación, desenchufar el cable de alimentación en los equipos de corriente alterna (CA).

Varning! Innan du arbetar med ett chassi eller nära strömförsörjningsenheter skall du för växelströmsenheter dra ur nätsladden.

Related Documentation

- General Safety Guidelines and Warnings on page 181
- General Electrical Safety Guidelines and Warnings on page 209
- AC Power Electrical Safety Guidelines on page 212

DC Power Electrical Safety Guidelines for Switches

This topic applies to hardware devices in the EX Series product family, which includes EX Series switches and the XRE200 External Routing Engine.

This topic also applies to hardware devices in the QFX Series and to OCX1100 switches.

- A DC-powered device is equipped with a DC terminal block that is rated for the power requirements of a maximally configured device.

  NOTE: To supply sufficient power, terminate the DC input wiring on a facility DC source that is capable of supplying:

  - Minimum of 7.5 A at –48 VDC for EX2200, EX2300, EX3300, and EX3400 switches
  - Minimum of 8 A at –48 VDC for EX3200 and EX4200 switches
  - Minimum of 20 A at –48 VDC for EX4300, EX4500, EX4550, and QFX10002 switches
  - Minimum of 50 A at –48 VDC for EX6210 switches
  - Minimum of 60 A at –48 VDC for EX8208, QFX10008 and QFX10016 switches
  - Minimum of 100 A at –48 VDC for EX8216 switches
  - Minimum of 7 A at –48 VDC for QFX3500, EX4600, QFX5100, QFX5110,and QFX5200 devices
  - Minimum of 8 A at –48 VDC for QFX3600 devices
  - Minimum of 7 A at –48 VDC for OCX1100 switches

  Incorporate an easily accessible disconnect device into the facility wiring. Be sure to connect the ground wire or conduit to a solid office earth ground. A closed loop ring is recommended for terminating the ground conductor at the ground stud.

- Run two wires from the circuit breaker box to a source of 48 VDC.
- A DC-powered device that is equipped with a DC terminal block is intended only for installation in a restricted-access location. In the United States, a restricted-access area is one in accordance with Articles 110-16, 110-17, and 110-18 of the National Electrical Code ANSI/NFPA 70.

  NOTE: Primary overcurrent protection is provided by the building circuit breaker. This breaker must protect against excess currents, short circuits, and earth grounding faults in accordance with NEC ANSI/NFPA 70.

- Ensure that the polarity of the DC input wiring is correct. Under certain conditions, connections with reversed polarity might trip the primary circuit breaker or damage the equipment.
- For personal safety, connect the green and yellow wire to safety (earth) ground at both the device and the supply side of the DC wiring.

- The marked input voltage of –48 VDC for a DC-powered device is the nominal voltage associated with the battery circuit, and any higher voltages are only to be associated with float voltages for the charging function.
- Because the device is a positive ground system, you must connect the positive lead to the terminal labeled **RTN**, the negative lead to the terminal labeled –48 VDC, and the earth ground to the device grounding points.

Related Documentation

- General Safety Guidelines and Warnings on page 181
- General Electrical Safety Guidelines and Warnings on page 209
- DC Power Disconnection Warning on page 217
- DC Power Grounding Requirements and Warning on page 218
- DC Power Wiring Sequence Warning on page 219
- DC Power Wiring Terminations Warning on page 221
- Connecting DC Power to an EX2200 Switch on page 123
- *Connecting DC Power to an EX2300 Switch*
- *Connecting DC Power to an EX3200 Switch*
- *Connecting DC Power to an EX3400 Switch*
- *Connecting DC Power to an EX4200 Switch*
- *Connecting DC Power to an EX4300 Switch*
- *Connecting DC Power to an EX4500 Switch*
- *Connecting DC Power to an EX4550 Switch*
- *Connecting DC Power to an EX4600 Switch*
- *Connecting DC Power to an EX6200 Switch*
- *Connecting DC Power to an EX8200 Switch*
- *Connecting DC Power to an EX9204 Switch*
- *Connecting DC Power to an EX9208 Switch*
- *Connecting DC Power to an EX9214 Switch*
- *Connecting DC Power to an OCX1100 Switch*
- *Connecting DC Power to an XRE200 External Routing Engine*
- *Connecting DC Power to a QFX3500, QFX3600, or QFX3600-I Device*
- *Connecting DC Power to a QFX5100 Device*
- *Connecting DC Power to a QFX5200*
- *Connecting DC Power to a QFX10002*
- *Connecting DC Power to a QFX10000*

DC Power Disconnection Warning

WARNING: Before performing any of the DC power procedures, ensure that power is removed from the DC circuit. To ensure that all power is off, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the device handle of the circuit breaker in the OFF position.

Waarschuwing Voordat u een van de onderstaande procedures uitvoert, dient u te controleren of de stroom naar het gelijkstroom circuit uitgeschakeld is. Om u ervan te verzekeren dat alle stroom UIT is geschakeld, kiest u op het schakelbord de stroomverbreker die het gelijkstroom circuit bedient, draait de stroomverbreker naar de UIT positie en plakt de schakelaarhendel van de stroomverbreker met plakband in de UIT positie vast.

Varoitus Varmista, että tasavirtapiirissä ei ole virtaa ennen seuraavien toimenpiteiden suorittamista. Varmistaaksesi, että virta on KATKAISTU täysin, paikanna tasavirrasta huolehtivassa kojetaulussa sijaitseva suojakytkin, käännä suojakytkin KATKAISTU-asentoon ja teippaa suojakytkimen varsi niin, että se pysyy KATKAISTU-asennossa.

Attention Avant de pratiquer l'une quelconque des procédures ci-dessous, vérifier que le circuit en courant continu n'est plus sous tension. Pour en être sûr, localiser le disjoncteur situé sur le panneau de service du circuit en courant continu, placer le disjoncteur en position fermée (OFF) et, à l'aide d'un ruban adhésif, bloquer la poignée du disjoncteur en position OFF.

Warnung Vor Ausführung der folgenden Vorgänge ist sicherzustellen, daß die Gleichstromschaltung keinen Strom erhält. Um sicherzustellen, daß sämtlicher Strom abgestellt ist, machen Sie auf der Schalttafel den Unterbrecher für die Gleichstromschaltung ausfindig, stellen Sie den Unterbrecher auf AUS, und kleben Sie den Schaltergriff des Unterbrechers mit Klebeband in der AUS-Stellung fest.

Avvertenza Prima di svolgere una qualsiasi delle procedure seguenti, verificare che il circuito CC non sia alimentato. Per verificare che tutta l'alimentazione sia scollegata (OFF), individuare l'interruttore automatico sul quadro strumenti che alimenta il circuito CC, mettere l'interruttore in posizione OFF e fissarlo con nastro adesivo in tale posizione.

Advarsel Før noen av disse prosedyrene utføres, kontroller at strømmen er frakoblet likestrømkretsen. Sørg for at all strøm er slått AV. Dette gjøres ved å lokalisere strømbryteren på brytertavlen som betjener likestrømkretsen, slå strømbryteren AV og teipe bryterhåndtaket på strømbryteren i AV-stilling.

Aviso Antes de executar um dos seguintes procedimentos, certifique-se que desligou a fonte de alimentação de energia do circuito de corrente contínua. Para se assegurar que toda a corrente foi DESLIGADA, localize o disjuntor no

painel que serve o circuito de corrente contínua e coloque-o na posição OFF (Desligado), segurando nessa posição a manivela do interruptor do disjuntor com fita isoladora.

¡Atención! Antes de proceder con los siguientes pasos, comprobar que la alimentación del circuito de corriente continua (CC) esté cortada (OFF). Para asegurarse de que toda la alimentación esté cortada (OFF), localizar el interruptor automático en el panel que alimenta al circuito de corriente continua, cambiar el interruptor automático a la posición de Apagado (OFF), y sujetar con cinta la palanca del interruptor automático en posición de Apagado (OFF).

Varning! Innan du utför någon av följande procedurer måste du kontrollera att strömförsörjningen till likströmskretsen är bruten. Kontrollera att all strömförsörjning är BRUTEN genom att slå AV det överspänningsskydd som skyddar likströmskretsen och tejpa fast överspänningsskyddets omkopplare i FRÅN-läget.

Related Documentation

- General Safety Guidelines and Warnings on page 181
- General Electrical Safety Guidelines and Warnings on page 209
- DC Power Electrical Safety Guidelines for Switches on page 214
- DC Power Grounding Requirements and Warning on page 218
- DC Power Wiring Sequence Warning on page 219
- DC Power Wiring Terminations Warning on page 221

DC Power Grounding Requirements and Warning

An insulated grounding conductor that is identical in size to the grounded and ungrounded branch circuit supply conductors but is identifiable by green and yellow stripes is installed as part of the branch circuit that supplies the device. The grounding conductor is a separately derived system at the supply transformer or motor generator set.

WARNING: **When you install the device, the ground connection must always be made first and disconnected last.**

Waarschuwing Bij de installatie van het toestel moet de aardverbinding altijd het eerste worden gemaakt en het laatste worden losgemaakt.

Varoitus Laitetta asennettaessa on maahan yhdistäminen aina tehtävä ensiksi ja maadoituksen irti kytkeminen viimeiseksi.

Attention Lors de l'installation de l'appareil, la mise à la terre doit toujours être connectée en premier et déconnectée en dernier.

Warnung Der Erdanschluß muß bei der Installation der Einheit immer zuerst hergestellt und zuletzt abgetrennt werden.

Avvertenza In fase di installazione dell'unità, eseguire sempre per primo il collegamento a massa e disconnetterlo per ultimo.

Advarsel Når enheten installeres, må jordledningen alltid tilkobles først og frakobles sist.

Aviso Ao instalar a unidade, a ligação à terra deverá ser sempre a primeira a ser ligada, e a última a ser desligada.

¡Atención! Al instalar el equipo, conectar la tierra la primera y desconectarla la última.

Varning! Vid installation av enheten måste jordledningen alltid anslutas först och kopplas bort sist.

Related Documentation

- General Safety Guidelines and Warnings on page 181
- General Electrical Safety Guidelines and Warnings on page 209
- DC Power Electrical Safety Guidelines for Switches on page 214
- DC Power Disconnection Warning on page 217
- DC Power Wiring Sequence Warning on page 219
- DC Power Wiring Terminations Warning on page 221

DC Power Wiring Sequence Warning

WARNING: Wire the DC power supply using the appropriate lugs. When connecting power, the proper wiring sequence is ground to ground, +RTN to +RTN, then –48 V to –48 V. When disconnecting power, the proper wiring sequence is –48 V to –48 V, +RTN to +RTN, then ground to ground. Note that the ground wire must always be connected first and disconnected last.

Waarschuwing De juiste bedradingsvolgorde verbonden is aarde naar aarde, +RTN naar +RTN, en –48 V naar – 48 V. De juiste bedradingsvolgorde losgemaakt is en –48 naar –48 V, +RTN naar +RTN, aarde naar aarde.

Varoitus Oikea yhdistettava kytkentajarjestys on maajohto maajohtoon, +RTN varten +RTN, –48 V varten – 48 V. Oikea irrotettava kytkentajarjestys on –48 V varten – 48 V, +RTN varten +RTN, maajohto maajohtoon.

Attention Câblez l'approvisionnement d'alimentation CC En utilisant les crochets appropriés à l'extrémité de câblage. En reliant la puissance, l'ordre approprié de câblage est rectifié pour rectifier, +RTN à +RTN, puis –48 V à

–48 V. En débranchant la puissance, l'ordre approprié de câblage est –48 V à –48 V, +RTN à +RTN, a alors rectifié pour rectifier. Notez que le fil de masse devrait toujours être relié d'abord et débranché pour la dernière fois. Notez que le fil de masse devrait toujours être relié d'abord et débranché pour la dernière fois.

Warnung Die Stromzufuhr ist nur mit geeigneten Ringösen an das DC Netzteil anzuschliessen. Die richtige Anschlusssequenz ist: Erdanschluss zu Erdanschluss, +RTN zu +RTN und dann -48V zu -48V. Die richtige Sequenz zum Abtrennen der Stromversorgung ist -48V zu -48V, +RTN zu +RTN und dann Erdanschluss zu Erdanschluss. Es ist zu beachten dass der Erdanschluss immer zuerst angeschlossen und als letztes abgetrennt wird.

Avvertenza Mostra la morsettiera dell alimentatore CC. Cablare l'alimentatore CC usando i connettori adatti all'estremità del cablaggio, come illustrato. La corretta sequenza di cablaggio è da massa a massa, da positivo a positivo (da linea ad L) e da negativo a negativo (da neutro a N). Tenere presente che il filo di massa deve sempre venire collegato per primo e scollegato per ultimo.

Advarsel Riktig tilkoples tilkoplingssekvens er jord til jord, +RTN til +RTN, –48 V til – 48 V. Riktig frakoples tilkoplingssekvens er –48 V til – 48 V, +RTN til +RTN, jord til jord.

Aviso Ate con alambre la fuente de potencia cc Usando los terminales apropiados en el extremo del cableado. Al conectar potencia, la secuencia apropiada del cableado se muele para moler, +RTN a +RTN, entonces –48 V a –48 V. Al desconectar potencia, la secuencia apropiada del cableado es –48 V a –48 V, +RTN a +RTN, entonces molió para moler. Observe que el alambre de tierra se debe conectar siempre primero y desconectar por último. Observe que el alambre de tierra se debe conectar siempre primero y desconectar por último.

¡Atención! Wire a fonte de alimentação de DC Usando os talões apropriados na extremidade da fiação. Ao conectar a potência, a seqüência apropriada da fiação é moída para moer, +RTN a +RTN, então –48 V a –48 V. Ao desconectar a potência, a seqüência apropriada da fiação é –48 V a –48 V, +RTN a +RTN, moeu então para moer. Anote que o fio à terra deve sempre ser conectado primeiramente e desconectado por último. Anote que o fio à terra deve sempre ser conectado primeiramente e desconectado por último.

Varning! Korrekt kopplingssekvens ar jord till jord, +RTN till +RTN, –48 V till –48 V. Korrekt kopplas kopplingssekvens ar –48 V till –48 V, +RTN till +RTN, jord till jord.

Related Documentation

- General Safety Guidelines and Warnings on page 181
- General Electrical Safety Guidelines and Warnings on page 209
- DC Power Electrical Safety Guidelines for Switches on page 214

- DC Power Disconnection Warning on page 217
- DC Power Grounding Requirements and Warning on page 218
- DC Power Wiring Terminations Warning on page 221

DC Power Wiring Terminations Warning

WARNING: When stranded wiring is required, use approved wiring terminations, such as closed-loop or spade-type with upturned lugs. These terminations must be the appropriate size for the wires and must clamp both the insulation and conductor.

Waarschuwing Wanneer geslagen bedrading vereist is, dient u bedrading te gebruiken die voorzien is van goedgekeurde aansluitingspunten, zoals het gesloten-lus type of het grijperschop type waarbij de aansluitpunten omhoog wijzen. Deze aansluitpunten dienen de juiste maat voor de draden te hebben en dienen zowel de isolatie als de geleider vast te klemmen.

Varoitus Jos säikeellinen johdin on tarpeen, käytä hyväksyttyä johdinliitäntää, esimerkiksi suljettua silmukkaa tai kourumaista liitäntää, jossa on ylöspäin käännetyt kiinnityskorvat. Tällaisten liitäntöjen tulee olla kooltaan johtimiin sopivia ja niiden tulee puristaa yhteen sekä eristeen että johdinosan.

Attention Quand des fils torsadés sont nécessaires, utiliser des douilles terminales homologuées telles que celles à circuit fermé ou du type à plage ouverte avec cosses rebroussées. Ces douilles terminales doivent être de la taille qui convient aux fils et doivent être refermées sur la gaine isolante et sur le conducteur.

Warnung Wenn Litzenverdrahtung erforderlich ist, sind zugelassene Verdrahtungsabschlüsse, z.B. für einen geschlossenen Regelkreis oder gabelförmig, mit nach oben gerichteten Kabelschuhen zu verwenden. Diese Abschlüsse sollten die angemessene Größe für die Drähte haben und sowohl die Isolierung als auch den Leiter festklemmen.

Avvertenza Quando occorre usare trecce, usare connettori omologati, come quelli a occhiello o a forcella con linguette rivolte verso l'alto. I connettori devono avere la misura adatta per il cablaggio e devono serrare sia l'isolante che il conduttore.

Advarsel Hvis det er nødvendig med flertrådede ledninger, brukes godkjente ledningsavslutninger, som for eksempel lukket sløyfe eller spadetype med oppoverbøyde kabelsko. Disse avslutningene skal ha riktig størrelse i forhold til ledningene, og skal klemme sammen både isolasjonen og lederen.

Aviso Quando forem requeridas montagens de instalação eléctrica de cabo torcido, use terminações de cabo aprovadas, tais como, terminações de cabo em circuito fechado e planas com terminais de orelha voltados para cima.

Estas terminações de cabo deverão ser do tamanho apropriado para os respectivos cabos, e deverão prender simultaneamente o isolamento e o fio condutor.

¡Atención! Cuando se necesite hilo trenzado, utilizar terminales para cables homologados, tales como las de tipo "bucle cerrado" o "espada", con las lengüetas de conexión vueltas hacia arriba. Estos terminales deberán ser del tamaño apropiado para los cables que se utilicen, y tendrán que sujetar tanto el aislante como el conductor.

Varning! När flertrådiga ledningar krävs måste godkända ledningskontakter användas, t.ex. kabelsko av sluten eller öppen typ med uppåtvänd tapp. Storleken på dessa kontakter måste vara avpassad till ledningarna och måste kunna hålla både isoleringen och ledaren fastklämda.

Related Documentation

- General Safety Guidelines and Warnings on page 181
- General Electrical Safety Guidelines and Warnings on page 209
- DC Power Electrical Safety Guidelines for Switches on page 214
- DC Power Disconnection Warning on page 217
- DC Power Grounding Requirements and Warning on page 218
- DC Power Wiring Sequence Warning on page 219

Multiple Power Supplies Disconnection Warning

WARNING: For a device that has more than one power supply connection, you must ensure that all power connections are fully disconnected so that power to the device is completely removed.

Related Documentation

- General Safety Guidelines and Warnings on page 181
- General Electrical Safety Guidelines and Warnings on page 209
- AC Power Electrical Safety Guidelines on page 212
- DC Power Electrical Safety Guidelines for Switches on page 214

TN Power Warning

WARNING: The device is designed to work with a TN power system.

Waarschuwing Het apparaat is ontworpen om te functioneren met TN energiesystemen.

Varoitus Koje on suunniteltu toimimaan TN-sähkövoimajärjestelmien yhteydessä.

Attention Ce dispositif a été conçu pour fonctionner avec des systèmes d'alimentation TN.

Warnung Das Gerät ist für die Verwendung mit TN-Stromsystemen ausgelegt.

Avvertenza Il dispositivo è stato progettato per l'uso con sistemi di alimentazione TN.

Advarsel Utstyret er utfomet til bruk med TN-strømsystemer.

Aviso O dispositivo foi criado para operar com sistemas de corrente TN.

¡Atención! El equipo está diseñado para trabajar con sistemas de alimentación tipo TN.

Varning! Enheten är konstruerad för användning tillsammans med elkraftssystem av TN-typ.

Related Documentation

- General Safety Guidelines and Warnings on page 181
- General Electrical Safety Guidelines and Warnings on page 209
- Grounded Equipment Warning on page 196
- Multiple Power Supplies Disconnection Warning on page 222

CHAPTER 25

Agency Approvals and Compliance Statements

Agency Approvals for EX Series Switches

This topic applies to hardware devices in the EX Series product family, which includes EX Series switches, the EX Series Redundant Power System (RPS), and the XRE200 External Routing Engine.

These hardware devices comply with the following standards:

- Safety
  - CAN/CSA-C22.2 No. 60950-1 Information Technology Equipment
  - UL 60950-1 Information Technology Equipment
  - EN 60950-1 Information Technology Equipment
  - IEC 60950-1 Information Technology Equipment
  - EN 60825-1 Safety of Laser Products - Part 1: Equipment classification and requirements
- EMC
  - FCC 47CFR Part 15 Class A (USA)
  - EN 55022 Class A Emissions (Europe)
  - ICES-003 Class A
  - VCCI Class A (Japan)
  - AS/NZS CISPR 22 Class A (Australia/New Zealand)
  - CISPR 22 Class A
  - EN 55024
  - EN 300386

- EN 61000-3-2 Power Line Harmonics
- EN 61000-3-3 Voltage Fluctuations and Flicker
- EN 61000-4-2 ESD
- EN 61000-4-3 Radiated Immunity
- EN 61000-4-4 EFT
- EN 61000-4-5 Surge
- EN 61000-4-6 Low Frequency Common Immunity
- EN 61000-4-11 Voltage Dips and Sags

Related Documentation

- Compliance Statements for EMC Requirements for EX Series Switches on page 226
- Compliance Statements for Acoustic Noise for EX Series Switches on page 230

Compliance Statements for EMC Requirements for EX Series Switches

This topic applies to hardware devices in the EX Series product family, which includes EX Series switches, the EX Series Redundant Power System (RPS), and the XRE200 External Routing Engine.

This topic describes the EMC requirements for these hardware devices for:

Canada

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. Industry Canada does not guarantee the equipment will operate to the users' satisfaction.

Before installing this equipment, users should ensure that it is permissible to connect the equipment to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the

inside wiring associated with a single line individual service can be extended by means of a certified connector assembly. The customer should be aware that compliance with the above conditions might not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, might give the telecommunications company cause to request the user to disconnect the equipment.

CAUTION: **Users should not attempt to make electrical ground connections by themselves, but should contact the appropriate inspection authority or an electrician, as appropriate.**

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution might be particularly important in rural areas.

European Community

This is a Class A device. In a domestic environment this device might cause radio interference, in which case the user needs to take adequate measures.

Israel

אזהרה

מוצר זה הוא מוצר Class A.
בסביבה ביתית,מוצר זה עלול לגרום הפרעות בתדר רדיו,ובמקרה זה ,המשתמש עשוי להידרש לנקוט אמצעים מתאימים.

Translation from Hebrew–Warning: This product is Class A. In residential environments, the product may cause radio interference, and in such a situation, the user may be required to take adequate measures.

Japan

この装置は、クラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。 VCCI-A

The preceding translates as follows:

This is a Class A device. In a domestic environment this device might cause radio interference, in which case the user needs to take adequate measures.

VCCI-A

Korea

이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

Korean Class A Warning g040913

The preceding translates as follows:

This equipment is Industrial (Class A) electromagnetic wave suitability equipment and seller or user should take notice of it, and this equipment is to be used in the places except for home

United States

The device has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, might cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users need to correct the interference at their own expense.

FCC Part 15 Statement

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, might cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or TV technician for help.

Nonregulatory Environmental Standards

NEBS compliance—These EX Series switches are Network Equipment Building System (NEBS) compliant:

- EX2200-24T and EX2200-48T
- EX3200-24T, EX3200-48T
- EX3300-24T, EX3300-48T
- EX4200-24T, EX4200-24F, EX4200-24F-S, EX4200-48T and EX4200-48T-S
- EX4300-24T, EX4300-24T-S, EX4300-24P, EX4300-24P-S, EX4300-32F, EX4300-32F-S, EX4300-48T, EX4300-48T-AFI, EX4300-48T-S, EX4300-48P, and EX4300-48P-S
- All EX4500 switches with AC power supplies
- EX4550-32T-AFO, EX4550-32T-AFI, EX4550-32F-AFO, EX4550-32F-AFI, and EX4550-32F-S
- EX4600-40F and EX4600-40F-S
- All EX6200 switches

NOTE: **For the EX6200-48P line cards, the intrabuilding ports must use shielded intrabuilding cabling or wiring that is grounded at both ends.**

- All EX8200 switches

These switches meet the following NEBS compliance standards:

- SR-3580 NEBS Criteria Levels (Level 4 Compliance)
- GR-1089-CORE: EMC and Electrical Safety for Network Telecommunications Equipment
- GR-63-CORE: NEBS, Physical Protection
  - The equipment is suitable for installation as part of the Common Bonding Network (CBN).
  - The equipment is suitable for installation in locations where the National Electrical Code (NEC) applies.
  - The battery return connection is to be treated as an Isolated DC return (DC-I), as defined in GR-1089-CORE.

Related Documentation

- Agency Approvals for EX Series Switches on page 225
- Compliance Statements for Acoustic Noise for EX Series Switches on page 230

Compliance Statements for Acoustic Noise for EX Series Switches

This topic applies to hardware devices in the EX Series product family, which includes EX Series switches, the EX Series Redundant Power System (RPS), and the XRE200 External Routing Engine.

Maschinenlärminformations-Verordnung - 3. GPSGV, der höchste Schalldruckpegel beträgt 70 dB(A) oder weniger gemäss EN ISO 7779

Translation:

The emitted sound pressure is below 70 dB(A) per EN ISO 7779.

Related Documentation

- Agency Approvals for EX Series Switches on page 225
- Compliance Statements for EMC Requirements for EX Series Switches on page 226