JUNIPER
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Complete Hardware Guide for EX4300 Ethernet Switches

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Revision 6

Complete Hardware Guide for EX4300 Ethernet Switches

YEAR 2000 NOTICE

Juniper Networks hardware and software products are Year 2000 compliant. Junos OS has no known time-related limitations through the year 2038. However, the NTP application is known to have some difficulty in the year 2036.

SOFTWARE LICENSE

END USER LICENSE AGREEMENT

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About the Documentation

Junos OS Documentation and Release Notes

For a list of related Junos OS documentation, see
http://www.juniper.net/techpubs/software/junos/.

If the information in the latest release notes differs from the information in the
documentation, follow the *Junos OS Release Notes.*

To obtain the most current version of all Juniper Networks® technical documentation,
see the product documentation page on the Juniper Networks website at
http://www.juniper.net/techpubs/.

Documentation Conventions

Table 1 on page xviii defines the 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.

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**.

Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can provide feedback by using either of the following methods:

Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or Partner Support Service

support contract, or are covered under warranty, and need post-sales technical support, you can access our tools and resources online or open a case with JTAC.

- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the *JTAC User Guide* located at http://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf.

- Product warranties—For product warranty information, visit http://www.juniper.net/support/warranty/.

- 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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For quick and easy problem resolution, Juniper Networks has designed an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

- Find CSC offerings: http://www.juniper.net/customers/support/

- Search for known bugs: http://www2.juniper.net/kb/

- 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/

Opening a Case with JTAC

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

Switch and Components Overview and Specifications

EX4300 Switch Overview

EX4300 Switches Hardware Overview

Juniper Networks EX4300 Ethernet Switches provide connectivity for high-density environments and scalability for growing networks. These switches can be deployed wherever you need high density of Gigabit Ethernet ports or redundancy. Typically, EX4300 switches are used in large branch offices, campus wiring closets, and data centers. In data centers, EX4300 switches can be positioned as top-of-rack switches; the top devices in a rack to provide connectivity for all the devices in the rack and provide options for optimized airflow (hot aisle/cold aisle).

Three variants of the EX4300 switches are available—24-port, 32-port, and 48-port switches, with or without PoE+, with AC or DC power supplies, and with different airflow directions. EX4300 switches also provide uplink ports and a slot for installing an optional uplink module.

You can manage EX4300 switches by using the same interfaces that you use for managing other devices running Juniper Networks Junos operating system (Junos OS)—the CLI, the J-Web graphical interface, and Junos Space.

This topic describes:

Software

Juniper Networks EX Series Ethernet Switches run 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. For information about installing software for your switch, see Software Installation .

EX4300 Switches First View

EX4300 switches provide connectivity for high-density Gigabit Ethernet data center top-of-rack, enterprise, and campus aggregation/core deployments. EX4300 switches can be used in large branch offices, campus wiring closets, and data centers. In data centers, these switches can be positioned as the top devices in a rack to provide connectivity for all devices in the rack and provide options for optimized airflow (hot aisle/cold aisle).

To provide carrier-class reliability, EX4300 switches include:

- Dual redundant, load-sharing power supplies that are hot-insertable and hot-removable field-replaceable units (FRUs).

- Two fan modules that are field-replaceable units.

- Redundant Routing Engines in a Virtual Chassis or Virtual Chassis Fabric (VCF) configuration. This redundancy enables graceful Routing Engine switchover (GRES).

- Junos OS with its modular design that enables failed system processes to gracefully restart.

The following EX4300 switches are available:

- 24-Port EX4300 Switches on page 4
- 32-Port EX4300 Switches on page 6
- 48-Port EX4300 Switches on page 7

24-Port EX4300 Switches

The 24-port EX4300 switches—EX4300-24T and EX4300-24P—provide 24 built-in 10/100/1000BASE-T Ethernet network ports and four built-in 40-Gigabit Ethernet quad small form-factor pluggable plus (QSFP+) ports that can house 40-gigabit QSFP+ transceivers. All network ports in the EX4300-24P switch are equipped for Power over Ethernet (PoE+), whereas EX4300-24T has no PoE+ ports. 24-port EX4300 switches support AC power supply and fan module with front-to-back airflow direction and have a slot for installing an optional 4-port 10-Gigabit Ethernet SFP+ uplink module, which has four 10-Gigabit Ethernet small form-factor pluggable plus (SFP+) ports that can house four 10-gigabit small form-factor pluggable (SFP+) transceivers, four 1-gigabit small form-factor pluggable (SFP) transceivers, or a combination of four SFP+ and SFP transceivers.

Figure 1 on page 5 shows the front panel of a 24-port EX4300 switch.

Figure 1: Front Panel of a 24-Port EX4300 Switch
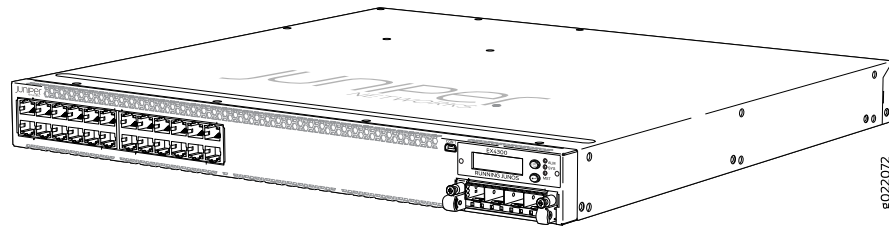
shows the rear panel of a 24-port EX4300 switch with power supplies and fan modules installed.

Figure 2: Rear Panel of a 24-Port EX4300 Switch
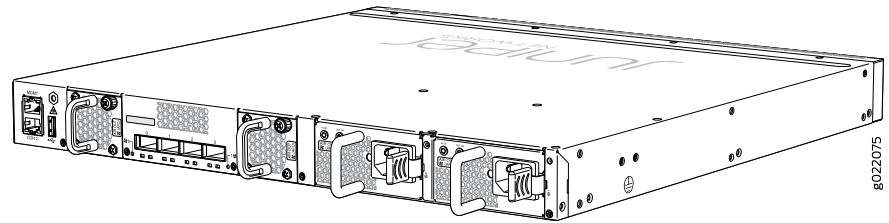
lists the 24-port EX4300 switch models and their components.

Table 3: Components in 24-Port EX4300 Switches

Switch Models	Built-In Ports	Number of PoE-enabled Ports	Fan Modules Shipped by Default	Power Supply Shipped by Default	Supported Uplink Module
EX4300-24T	24 10/100/1000BASE-T Ethernet ports and four QSFP+ ports	0	Two fan modules; each with an **AIR OUT (AFO)** label.	A 350 W AC power supply with the **AIR OUT (AFO)** label.	4-port 10-Gigabit Ethernet SFP+ uplink module
EX4300-24T-S	24 10/100/1000BASE-T Ethernet ports and four QSFP+ ports	0	Fan modules for this model are not shipped by default; you must separately order either two **AIR OUT (AFO)** labelled or two **AIR IN (AFI)** labelled fan modules.	Power supplies for this model are not shipped by default; you must separately order either AC power supplies or DC power supplies.	4-port 10-Gigabit Ethernet SFP+ uplink module
EX4300-24P	24 10/100/1000BASE-T Ethernet ports and four QSFP+ ports	24	Two fan modules; each with an **AIR OUT (AFO)** label.	A 715 W AC power supply with the **AIR OUT (AFO)** label.	4-port 10-Gigabit Ethernet SFP+ uplink module

Table 3: Components in 24-Port EX4300 Switches *(continued)*

Switch Models	Built-In Ports	Number of PoE-enabled Ports	Fan Modules Shipped by Default	Power Supply Shipped by Default	Supported Uplink Module
EX4300-24P-S	24 10/100/1000BASE-T Ethernet ports and four QSFP+ ports	24	Fan modules for this model are not shipped by default; you must separately order either two **AIR OUT (AFO)** labelled or two **AIR IN (AFI)** labelled fan modules.	Power supplies for this model are not shipped by default; you must separately order either AC power supplies or DC power supplies.	4-port 10-Gigabit Ethernet SFP+ uplink module

You can use the QSFP+ ports as network ports or as Virtual Chassis ports (VCPs) to connect the switch in a Virtual Chassis or a VCF. By default, the built-in QSFP+ ports are configured as VCPs. You can also use the uplink module ports to connect members of a Virtual Chassis or a VCF across multiple wiring closets by configuring the ports as VCPs. For more information about Virtual Chassis, see *EX Series Virtual Chassis Overview*. For more information about VCFs, see *Virtual Chassis Fabric Overview*.

32-Port EX4300 Switches

The 32-port EX4300 switches—EX4300-32F and EX4300-32F-DC—provide 32 built-in 1-Gigabit Ethernet small form-factor pluggable (SFP) network ports that can house SFP transceivers, four built-in 10-Gigabit Ethernet small form-factor pluggable plus (SFP+) ports, and two built-in QSFP+ ports. They support power supply and fan module with front-to-back airflow direction and have a slot for installing an optional uplink module—a 2-port 40-Gigabit Ethernet QSFP+ uplink module that can house two QSFP+ transceivers or an 8-port 10-Gigabit Ethernet SFP+ uplink module that can house eight SFP+ transceivers, eight SFP transceivers, or a combination of eight SFP+ and SFP transceivers.

shows the front panel of a 32-port EX4300 switch.

Figure 3: Front Panel of a 32-Port EX4300 Switch
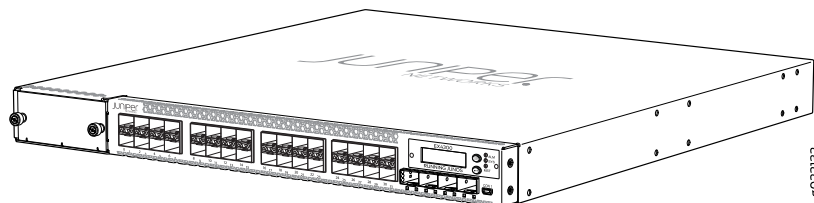
shows the rear panel of a 32-port EX4300 switch.

Figure 4: Rear Panel of a 32-Port EX4300 Switch
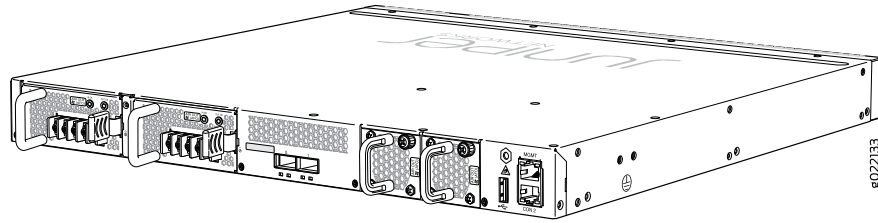
Table 4 on page 7 lists the 32-port EX4300 switch models and their components.

Table 4: Components in 32-Port EX4300 Switches

Switch Models	Built-In Ports	Number of PoE-enabled Ports	Fan Modules	Power Supply Shipped by Default	Supported Uplink Modules
EX4300-32F	32 SFP ports, four SFP+ ports, and two QSFP+ ports	0	Two fan modules; each with an **AIR OUT (AFO)** label.	A 350 W AC power supply with the **AIR OUT (AFO)** label.	2-port 40-Gigabit Ethernet QSFP+ uplink module and 8-port 10-Gigabit Ethernet SFP+ uplink module
EX4300-32F-S	32 SFP ports, four SFP+ ports, and two QSFP+ ports	0	Fan modules for this model are not shipped by default; you must separately order either two **AIR OUT (AFO)** labelled or two **AIR IN (AFI)** labelled fan modules.	Power supplies for this model are not shipped by default; you must separately order either AC power supplies or DC power supplies.	2-port 40-Gigabit Ethernet QSFP+ uplink module and 8-port 10-Gigabit Ethernet SFP+ uplink module
EX4300-32F-DC	32 SFP ports, four SFP+ ports, and two QSFP+ ports	0	Two fan modules; each with an **AIR OUT (AFO)** label.	A 550 W DC power supply with the **AIR OUT (AFO)** label.	2-port 40-Gigabit Ethernet QSFP+ uplink module and 8-port 10-Gigabit Ethernet SFP+ uplink module

You can use the built-in QSFP+ ports as network ports or as VCPs to connect the switch in a Virtual Chassis or a VCF. By default, the built-in QSFP+ ports are configured as VCPs. You can also use the uplink module ports to connect members of a Virtual Chassis or a VCF across multiple wiring closets by configuring these ports as VCPs. For more information about Virtual Chassis, see *EX Series Virtual Chassis Overview*. For more information about VCFs, see *Virtual Chassis Fabric Overview*.

48-Port EX4300 Switches

The 48-port EX4300 switches provide 48 built-in 10/100/1000BASE-T Ethernet network ports, with or without PoE+ depending on the switch model, and four built-in QSFP+ ports. These switches support AC or DC power supply with different airflow directions. Each switch provides a slot for installing an optional 4-port 10-Gigabit Ethernet SFP+ uplink module, which has four SFP+ ports that can house four SFP+ transceivers, four SFP transceivers, or a combination of four SFP+ and SFP transceivers.

shows the front panel of a 48 port EX4300 switch.

Figure 5: Front Panel of a 48-Port EX4300 Switch
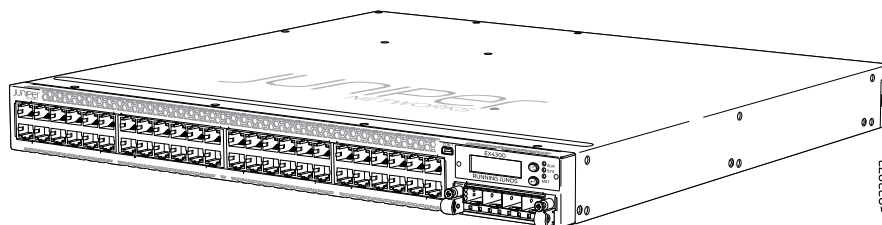
shows the rear panel of an 48-port EX4300 switch with power supplies and fan modules installed.

Figure 6: Rear Panel of a 48-Port EX4300 Switch
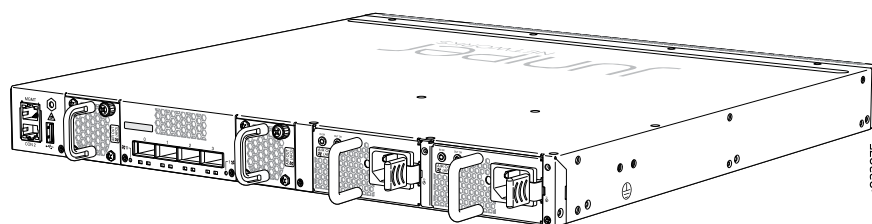
lists the 48-port EX4300 switch models and their components.

Table 5: Components in 48-Port EX4300 Switches

Switch Models	Built-In Ports	Number of PoE-enabled Ports	Fan Modules	Power Supply Shipped by Default	Supported Uplink Module
EX4300-48T	48 10/100/1000BASE-T Ethernet ports and four QSFP+ ports	0	Two fan modules; each with an **AIR OUT (AFO)** label.	A 350 W AC power supply with the **AIR OUT (AFO)** label.	4-port 10-Gigabit Ethernet SFP+ uplink module
EX4300-48T-S	48 10/100/1000BASE-T Ethernet ports and four QSFP+ ports	0	Fan modules for this model are not shipped by default; you must separately order either two **AIR OUT (AFO)** labelled or two **AIR IN (AFI)** labelled fan modules.	Power supplies for this model are not shipped by default; you must separately order either AC power supplies or DC power supplies.	4-port 10-Gigabit Ethernet SFP+ uplink module
EX4300-48T-AFI	48 10/100/1000BASE-T Ethernet ports and four QSFP+ ports	0	Two fan modules; each with an **AIR IN (AFI)** label.	A 350 W AC power supply with the **AIR IN (AFI)** label.	4-port 10-Gigabit Ethernet SFP+ uplink module

Table 5: Components in 48-Port EX4300 Switches *(continued)*

Switch Models	Built-In Ports	Number of PoE-enabled Ports	Fan Modules	Power Supply Shipped by Default	Supported Uplink Module
EX4300-48T-DC	48 10/100/1000BASE-T Ethernet ports and four QSFP+ ports	0	Two fan modules; each with an **AIR OUT (AFO)** label.	A 550 W DC power supply with the **AIR OUT (AFO)** label.	4-port 10-Gigabit Ethernet SFP+ uplink module
EX4300-48T -DC-AFI	48 10/100/1000BASE-T Ethernet ports and four QSFP+ ports	0	Two fan modules; each with an **AIR IN (AFI)** label.	A 550 W DC power supply with the **AIR IN (AFI)** label.	4-port 10-Gigabit Ethernet SFP+ uplink module
EX4300-48P	48 10/100/1000BASE-T Ethernet ports and four QSFP+ ports	48	Two fan modules; each with an **AIR OUT (AFO)** label.	A 1100 W AC power supply with the **AIR OUT (AFO)** label.	4-port 10-Gigabit Ethernet SFP+ uplink module
EX4300-48P-S	48 10/100/1000BASE-T Ethernet ports and four QSFP+ ports	48	Fan modules for this model are not shipped by default; you must separately order either two **AIR OUT (AFO)** labelled or two **AIR IN (AFI)** labelled fan modules.	Power supplies for this model are not shipped by default; you must separately order either AC power supplies or DC power supplies.	4-port 10-Gigabit Ethernet SFP+ uplink module

You can use the QSFP+ ports as network ports or as VCPs to connect the switch in a Virtual Chassis or a VCF. By default, the built-in QSFP+ ports are configured as VCPs. You can also use the uplink module ports to connect members of a Virtual Chassis or a VCF across multiple wiring closets by configuring these ports as VCPs. For more information about Virtual Chassis, see *EX Series Virtual Chassis Overview*. For more information about VCFs, see *Virtual Chassis Fabric Overview*.

Uplink Modules

The 24-port and 48-port EX4300 switches provide one slot for installing an optional uplink module. The 32-port EX4300 switches provide two slots for installing an optional uplink module. You can either use the uplink module ports to connect the switch to other devices or configure these ports as VCPs and use them to interconnect EX4300 switches to form a Virtual Chassis or a VCF.

lists the uplink modules supported on 24-port and 48-port EX4300 switch models. lists the uplink modules supported on 32-port EX4300 switch models.

Table 6: Uplink Modules in 24-Port and 48-Port EX4300 Switches

Uplink Module	Description	Supported EX4300 Switch Models	First Junos OS Release
4-port 10-Gigabit Ethernet SFP+ uplink module	The 4-port SFP+ uplink module can house up to four SFP+ transceivers, four SFP transceivers, or a combination of four SFP+ and SFP transceivers. You can also configure ports on this module as VCPs and use them to connect the switch in a Virtual Chassis or a VCF configuration.	• EX4300-24T • EX4300-24P • EX4300-48T • EX4300-48T-AFI • EX4300-48P • EX4300-48T-DC • EX4300-48T-DC-AFI	13.2X50-D10
		• EX4300-24T-S • EX4300-24P-S • EX4300-48T-S • EX4300-48P-S	13.2X51-D26 or later.

Table 7: Uplink Modules in 32-Port EX4300 Switches

Uplink Module	Description	Supported EX4300 Switch Models	First Junos OS Release
2-port 40-Gigabit Ethernet QSFP+ uplink module	The QSFP+ uplink module can house up to two QSFP+ transceivers. You can also configure the ports on this module as VCPs and use them to connect the switch in a Virtual Chassis or a VCF configuration.	• EX4300-32F • EX4300-32F-DC	13.2X51-D15
		• EX4300-32F-S	13.2X51-D26
8-port 10-Gigabit Ethernet SFP+ uplink module	The 8-port SFP+ uplink module can house up to eight SFP+ transceivers, eight SFP transceivers, or a combination of eight SFP+ and SFP transceivers. You can also configure the ports on this module as VCPs and use them to connect the switch in a Virtual Chassis or a VCF configuration.	• EX4300-32F • EX4300-32F-DC	13.2X51-D15
		• EX4300-32F-S	13.2X51-D26

For more information about uplink modules, see "Uplink Modules in EX4300 Switches" on page 55.

Virtual Chassis

You can interconnect a maximum of 10 EX4300 switches to form a Virtual Chassis of EX4300 switches. You can operate these interconnected switches as a single, logical device with a single IP address.

You can use the following ports to configure an EX4300 switch in a Virtual Chassis:

- For 24-port and 48-port EX4300 switches:

  - QSFP+ ports configured as VCPs

  - SFP+ uplink module ports configured as VCPs

- For 32-port EX4300 switches:

  - QSFP+ ports (built-in) or QSFP+ uplink module ports configured as VCPs

  - SFP+ uplink module ports configured as VCPs

By default, the built-in QSFP+ ports are configured as VCPs.

Power Supplies

EX4300 switches support AC or DC power supplies with different airflow directions. Power supplies for the EX4300 switch are fully redundant, load-sharing, and hot-removable and hot-insertable FRUs. All the EX4300 switch models except EX4300-24T-S, EX4300-24P-S, EX4300-32F-S, EX4300-48T-S, and EX4300-48P-S switches are shipped with one power supply pre-installed in the rear panel of the switches. EX4300-24T-S, EX4300-24P-S, EX4300-32F-S, EX4300-48T-S, and EX4300-48P-S switches are not shipped with pre-installed power supplies; you must order them separately.

Each power supply has a label—**AIR IN (AFI)** or **AIR OUT (AFO)**—on the faceplate of the power supply that indicates the direction of airflow. **AIR IN (AFI)** labels indicate back-to-front airflow while **AIR OUT (AFO)** labels indicate front-to-back airflow.

Table 8 on page 11 lists the AC and DC power supplies used in EX4300 switches and the direction of airflow in them.

Table 8: Airflow Direction in Power Supply for EX4300 Switches

Power Supply Rating	Label on Power Supply	Direction of Airflow
350 W AC	**AIR IN (AFI)**	Back-to-front—that is, air intake to cool the chassis is through the vents on the rear panel of the chassis and hot air exhausts through the vents on the front panel of the chassis.
350 W AC	**AIR OUT (AFO)**	Front-to-back—that is, air intake to cool the chassis is through the vents on the front panel of the chassis and hot air exhausts through the vents on the rear panel of the chassis.
550 W DC	**AIR IN (AFI)**	Back-to-front—that is, air intake to cool the chassis is through the vents on the rear panel of the chassis and hot air exhausts through the vents on the front panel of the chassis.
550 W DC	**AIR OUT (AFO)**	Front-to-back—that is, air intake to cool the chassis is through the vents on the front panel of the chassis and hot air exhausts through the vents on the rear panel of the chassis.
715 W AC	**AIR OUT (AFO)**	Front-to-back—that is, air intake to cool the chassis is through the vents on the front panel of the chassis and hot air exhausts through the vents on the rear panel of the chassis.

Table 8: Airflow Direction in Power Supply for EX4300 Switches *(continued)*

Power Supply Rating	Label on Power Supply	Direction of Airflow
1100 W AC	**AIR OUT (AFO)**	Front-to-back—that is, air intake to cool the chassis is through the vents on the front panel of the chassis and hot air exhausts through the vents on the rear panel of the chassis.

For more information, see "Cooling System and Airflow in an EX4300 Switch" on page 50.

CAUTION: **Do not mix:**

- AC and DC power supplies in the same chassis.
- Power supplies with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis.
- Fan modules with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis.
- Power supplies and fan modules with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis.

Fan Modules

In the EX4300 switches the fan modules are hot-insertable and hot-removable field-replaceable units (FRUs).

All the EX4300 switch models, except EX4300-24T-S, EX4300-24P-S, EX4300-32F-S, EX4300-48T-S, and EX4300-48P-S switches are shipped with two fan modules pre-installed in the rear panel of the switch. EX4300-24T-S, EX4300-24P-S, EX4300-32F-S, EX4300-48T-S, and EX4300-48P-S switches are not shipped with pre-installed fan modules; you must order them separately.

The fan modules are available in two models that have different airflow directions—back-to-front airflow, indicated by the label **AIR IN (AFI)** and front-to-back airflow, indicated by the label **AIR OUT (AFO)**. See "Cooling System and Airflow in an EX4300 Switch" on page 50.

CAUTION: **Do not mix:**

- Fan modules with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis.
- Power supplies with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis.

- Fan modules and power supplies with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis.

- AC and DC power supplies in the same chassis.

EX4300 Switch Components

Figure 7 on page 13 shows the components on the front panel of a 24-port EX4300 switch (with an SFP+ uplink module installed).

Figure 7: Components on the Front Panel of a 24-Port EX4300 Switch
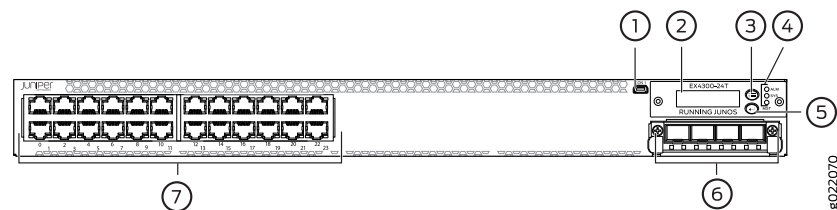
1—Mini-USB console port	5—LCD panel Enter button
2—LCD panel	6—SFP+ uplink module (optional)
3—LCD panel Menu button	7—Network ports
4—Chassis status LEDs	

Figure 8 on page 13 shows the components on the front panel of a 32-port EX4300 switch.

Figure 8: Components on the Front Panel of a 32-Port EX4300 Switch
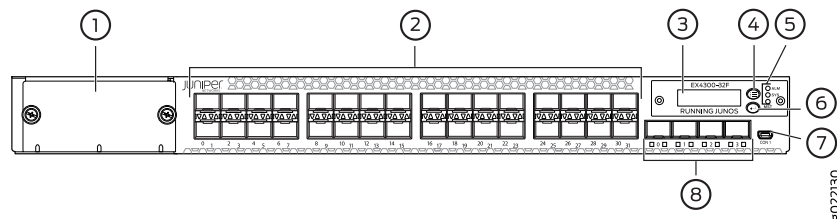
1—Cover panel for uplink module slot	5—Chassis status LEDs
2—SFP network ports	6—LCD panel Enter button
3—LCD panel	7—Mini-USB console port
4—LCD panel Menu button	8—SFP+ uplink ports

Figure 9 on page 14 shows the components on the front panel of a 48-port EX4300 switch (with an SFP+ uplink module installed).

Figure 9: Components on the Front Panel of a 48-Port EX4300 Switch
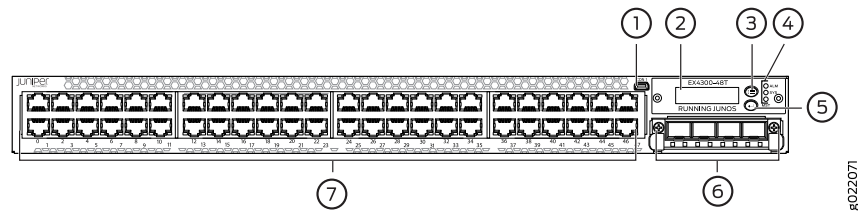
1— Mini-USB console port	5—LCD panel Enter button
2—LCD panel	6—SFP+ uplink module (optional)
3—LCD panel Menu button	7—Network ports
4—Chassis status LEDs	

Figure 10 on page 14 shows the components on the rear panel of a 24-port and 48-port EX4300 switch (with two AC power supplies and two fan modules installed).

Figure 10: Components on the Rear Panel of a 24-Port and 48-Port EX4300 Switch
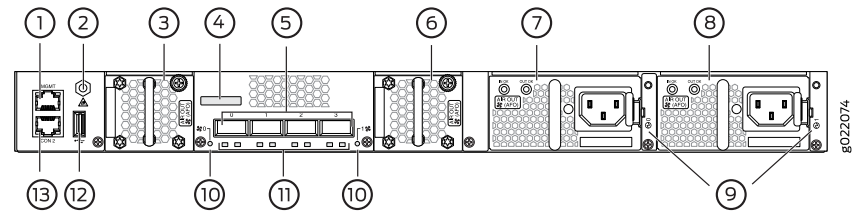
1— Management port	8—AC power supply in slot 1
2—ESD point	9—Power supply slot numbers
3—Fan module in slot 0	10—Fan module slot numbers and LEDs
4—Serial number label	11—QSFP+ port LEDs
5—QSFP+ ports	12—USB port
6—Fan module in slot 1	13—Console port
7—AC power supply in slot 0	

NOTE: DC power supplies are installed in the power supply slots in models that use DC power.

Figure 11 on page 15 shows the components on the rear panel of a 32-port EX4300 switch (with two AC power supplies and two fan modules installed).

Figure 11: Components on the Rear Panel of a 32-Port EX4300 Switch

1— AC power supplies in slot 0 and slot 1	7—USB port
2—QSFP+ ports	8—Fan module slot numbers and LEDs
3—Fan modules in slot 0 and slot 1	9—QSFP+ port LEDs
4—ESD point	10—Serial number label
5—Management port	11—Power supply slot numbers
6—Console port	
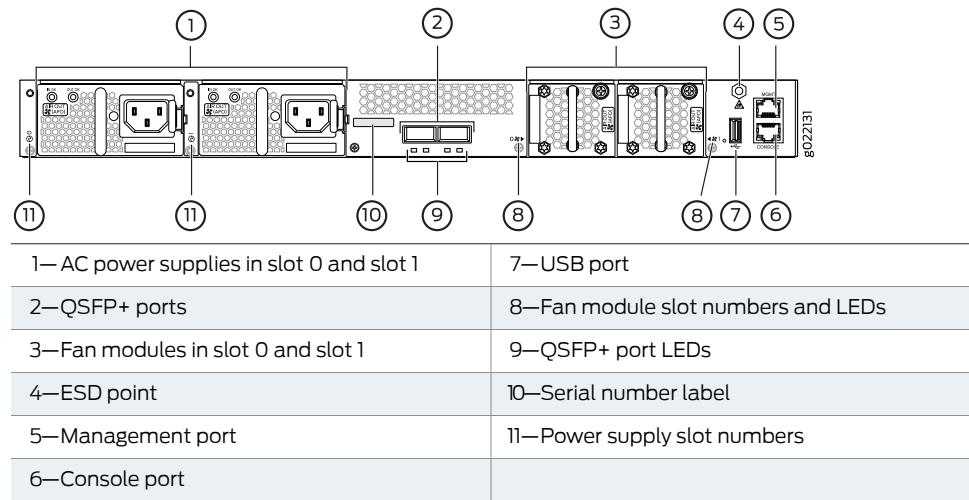
NOTE: DC power supplies are installed in the power supply slots in models that use DC power.

NOTE: The protective earthing terminal is located on the left side of the chassis. See "Connecting Earth Ground to an EX Series Switch" on page 153.

Related Documentation

- EX4300 Switch Models on page 15

- Field-Replaceable Units in EX4300 Switches on page 36

EX4300 Switch Models

The EX4300 switch is available with 24, 32, or 48 ports and with or without Power over Ethernet (PoE+) capability. EX4300 switches support AC and DC power supplies depending on the switch model. EX4300-24P, EX4300-24P-S, EX4300-48P, and EX4300-48P-S provide PoE+. Table 9 on page 15 lists the components shipped with EX4300 switch models.

Table 9: EX4300 Switch Models, Shipped Components, and Supported Junos OS Release

Model Number	Built-In Ports	Number of PoE-enabled Ports	Fan Modules and Airflow	Power Supply Shipped by Default	Supported Uplink Modules	First Junos OS Release
EX4300-24T	24 10/100/1000BASE-T Ethernet ports and four 40-Gigabit Ethernet QSFP+ ports	0	Two fan modules; each with an **AIR OUT (AFO)** label.	A 350 W AC power supply with the **AIR OUT (AFO)** label.	4-port 10-Gigabit Ethernet SFP+ uplink module	13.2X50-D10

Table 9: EX4300 Switch Models, Shipped Components, and Supported Junos OS Release *(continued)*

Model Number	Built-In Ports	Number of PoE-enabled Ports	Fan Modules and Airflow	Power Supply Shipped by Default	Supported Uplink Modules	First Junos OS Release
EX4300-24T-S	24 10/100/1000BASE-T Ethernet ports and four 40-Gigabit Ethernet QSFP+ ports	0	Fan modules for this model are not shipped by default; you must separately order either two **AIR OUT (AFO)** labelled or two **AIR IN (AFI)** labelled fan modules.	Power supplies for this model are not shipped by default; you must separately order either AC power supplies or DC power supplies.	4-port 10-Gigabit Ethernet SFP+ uplink module	13.2X51-D26
EX4300-24P	24 10/100/1000BASE-T Ethernet ports and four 40-Gigabit Ethernet QSFP+ ports	24	Two fan modules; each with an **AIR OUT (AFO)** label.	A 715 W AC power supply with the **AIR OUT (AFO)** label.	4-port 10-Gigabit Ethernet SFP+ uplink module	13.2X50-D10
EX4300-24P-S	24 10/100/1000BASE-T Ethernet ports and four 40-Gigabit Ethernet QSFP+ ports	24	Fan modules for this model are not shipped by default; you must separately order either two **AIR OUT (AFO)** labelled or two **AIR IN (AFI)** labelled fan modules.	Power supplies for this model are not shipped by default; you must separately order either AC power supplies or DC power supplies.	4-port 10-Gigabit Ethernet SFP+ uplink module	13.2X51-D26
EX4300-32F	32 1-Gigabit Ethernet SFP network ports, four 10-Giagbit Ethernet SFP+ uplink ports, and two 40-Gigabit Ethernet QSFP+ ports	0	Two fan modules; each with an **AIR OUT (AFO)** label.	A 350 W AC power supply with the **AIR OUT (AFO)** label.	2-port 40-Gigabit Ethernet QSFP+ uplink module and 8-port 10-Gigabit Ethernet SFP+ uplink module	13.2X51-D15

Table 9: EX4300 Switch Models, Shipped Components, and Supported Junos OS Release *(continued)*

Model Number	Built-In Ports	Number of PoE-enabled Ports	Fan Modules and Airflow	Power Supply Shipped by Default	Supported Uplink Modules	First Junos OS Release
EX4300-32F-S	32 1-Gigabit Ethernet SFP network ports, four 10-Giagbit Ethernet SFP+ uplink ports, and two 40-Gigabit Ethernet QSFP+ ports	0	Fan modules for this model are not shipped by default; you must separately order either two **AIR OUT (AFO)** labelled or two **AIR IN (AFI)** labelled fan modules.	Power supplies for this model are not shipped by default; you must separately order either AC power supplies or DC power supplies.	4-port 10-Gigabit Ethernet SFP+ uplink module	13.2X51-D26
EX4300-32F-DC	32 1-Gigabit Ethernet SFP network ports, four 10-Giagbit Ethernet SFP+ uplink ports, and two 40-Gigabit Ethernet QSFP+ ports	0	Two fan modules; each with an **AIR OUT (AFO)** label.	A 550 W DC power supply with the **AIR OUT (AFO)** label.	2-port 40-Gigabit Ethernet QSFP+ uplink module and 8-port 10-Gigabit Ethernet SFP+ uplink module	13.2X51-D15
EX4300-48T	48 10/100/1000BASE-T Ethernet ports and four 40-Gigabit Ethernet QSFP+ ports	0	Two fan modules; each with an **AIR OUT (AFO)** label.	A 350 W AC power supply with the **AIR OUT (AFO)** label.	4-port 10-Gigabit Ethernet SFP+ uplink module	13.2X50-D10
EX4300-48T-S	48 10/100/1000BASE-T Ethernet ports and four 40-Gigabit Ethernet QSFP+ ports	0	Fan modules for this model are not shipped by default; you must separately order either two **AIR OUT (AFO)** labelled or two **AIR IN (AFI)** labelled fan modules.	Power supplies for this model are not shipped by default; you must separately order either AC power supplies or DC power supplies.	4-port 10-Gigabit Ethernet SFP+ uplink module	13.2X51-D26

Table 9: EX4300 Switch Models, Shipped Components, and Supported Junos OS Release *(continued)*

Model Number	Built-In Ports	Number of PoE-enabled Ports	Fan Modules and Airflow	Power Supply Shipped by Default	Supported Uplink Modules	First Junos OS Release
EX4300-48T-AFI	48 10/100/1000BASE-T Ethernet ports and four 40-Gigabit Ethernet QSFP+ ports	0	Two fan modules; each with an **AIR IN (AFI)** label.	A 350 W AC power supply with the **AIR IN (AFI)** label.	4-port 10-Gigabit Ethernet SFP+ uplink module	13.2X50-D10
EX4300-48T-DC	48 10/100/1000BASE-T Ethernet ports and four 40-Gigabit Ethernet QSFP+ ports	0	Two fan modules; each with an **AIR OUT (AFO)** label.	A 550 W DC power supply with the **AIR OUT (AFO)** label.	4-port 10-Gigabit Ethernet SFP+ uplink module	13.2X50-D10
EX4300-48T-DC-AFI	48 10/100/1000BASE-T Ethernet ports and four 40-Gigabit Ethernet QSFP+ ports	0	Two fan modules; each with an **AIR IN (AFI)** label.	A 550 W DC power supply with the **AIR IN (AFI)** label.	4-port 10-Gigabit Ethernet SFP+ uplink module	13.2X50-D10
EX4300-48P	48 10/100/1000BASE-T Ethernet ports and four 40-Gigabit Ethernet QSFP+ ports	48	Two fan modules; each with an **AIR OUT (AFO)** label.	A 1100 W AC power supply with the **AIR OUT (AFO)** label.	4-port 10-Gigabit Ethernet SFP+ uplink module	13.2X50-D10
EX4300-48P-S	48 10/100/1000BASE-T Ethernet ports and four 40-Gigabit Ethernet QSFP+ ports	48	Fan modules for this model are not shipped by default; you must separately order either two **AIR OUT (AFO)** labelled or two **AIR IN (AFI)** labelled fan modules.	Power supplies for this model are not shipped by default; you must separately order either AC power supplies or DC power supplies.	4-port 10-Gigabit Ethernet SFP+ uplink module	13.2X51-D26

NOTE: Uplink modules and transceivers are not part of the shipping configuration. If you want to purchase any of these components, power supplies, or fan modules for your switch, you must order them separately.

Identifying EX4300 Switch Models

Purpose   Identify the model number of your EX4300 switch.

Action   Check the value of the **FRU Model Number** field in the **Routing Engine** section in the output of the **show chassis hardware extensive** CLI command.

user@switch> **show chassis hardware extensive**

```
....
Routing Engine 1 REV D   650-044930   PD3113060024  EX4300-48P
 Jedec Code:  0x7fb0              EEPROM Version:    0x02
 P/N:         650-044930          S/N:               PD3113060024
 Assembly ID: 0x0b5e              Assembly Version:  03.19
 Date:        02-19-2013          Assembly Flags:    0x00
 Version:     REV D               CLEI Code:
 ID: EX4300-48P                   FRU Model Number:  EX4300-48P
....
```

The model number of your switch is one of the following:

- EX4300-24T
- EX4300-24P
- EX4300-32F
- EX4300-32F-DC
- EX4300-48T
- EX4300-48T-AFI
- EX4300-48T-DC
- EX4300-48T-DC-AFI
- EX4300-48P

In the sample output, the switch model is **EX4300-48P**.

Meaning   In EX4300 switch model numbers:

- The 24T, 24P, 32F, 48T, and 48P in the model number indicate the type of network ports on the switch:
  - 24T—The switch has 24 10/100/1000BASE-T Ethernet network ports.
  - 24P—The switch has 24 10/100/1000BASE-T Ethernet network ports with all ports equipped for Power over Ethernet (PoE+).
  - 32F—The switch has 32 1-Gigabit SFP network ports.

- 48T—The switch has 48 10/100/1000BASE-T Ethernet network ports.

- 48P—The switch has 48 10/100/1000BASE-T Ethernet network ports with all ports equipped for PoE+.

- AFI indicates that the switch is shipped with two fan modules and a power supply, each bearing an **AIR IN (AFI)** label. Switches that do not have AFI in their model numbers ship with two fan modules and a power supply, each bearing an **AIR OUT (AFO)** label.

  The labels on the fan modules and the power supplies indicate the direction of airflow they provide within the chassis when installed in the switch. **AIR IN (AFI)** labels indicate back-to-front airflow, and **AIR OUT (AFO)** labels indicate front-to-back airflow.

- The DC in the model number indicates that the switch model works on DC power supply. Switches that do not have DC in their model numbers work on AC power supply.

Related Documentation

-

Chassis Physical Specifications for EX4300 Switches

The EX4300 switch chassis is a rigid sheet-metal structure that houses all components of the switch. Table 10 on page 20 summarizes the physical specifications of the EX4300 switch chassis.

Table 10: Physical Specifications of the EX4300 Switch Chassis

Description	Value
Chassis height	1.72 in. (4.37 cm)
Chassis width	17.36 in. (44.09 cm) - The outer edges of the front-mounting brackets extend the width to 19 in. (48.2 cm)
Chassis depth	16.38 in. (41.61 cm) - With power supply and uplink module installed: 18.01 in. (45.76 cm)
Weight	- EX4300 switch (with no power supply and no fan module installed): 13 lb (5.9 kg) 350 W AC power supply: 2.4 lb (1.1 kg) 550 W DC power supply: 2.4 lb (1.1 kg) 715 W AC power supply: 2.4 lb (1.1 kg) 1100 W AC power supply: 2.4 lb (1.1 kg) - QSFP+ uplink module: 0.61 lb (0.28 kg) 4-port SFP+ uplink module: 0.44 lb (0.2 kg) 8-port SFP+ uplink module: 0.74 lb (0.34 kg) - Fan module: 0.33 lb (0.15 kg)

You can mount an EX4300 switch on a standard 19-in. two-post or four-post rack. You can also mount the switch in a standard 19-in. enclosed cabinet.

EX4300 Switch Hardware and CLI Terminology Mapping

This topic describes the hardware terms used in EX4300 switch documentation and the corresponding terms used in the Junos OS CLI. See Table 11 on page 21.

Table 11: CLI Equivalents of Terms Used in the Documentation for EX4300 Switches

Hardware Item (CLI)	Description (CLI)	Value	Item In Documentation	Additional Information
Chassis	One of the following: - EX4300-24T - EX4300-24P - EX4300-32F - EX4300-48T - EX4300-48P	–	Switch chassis	"Identifying EX4300 Switch Models" on page 19
Routing Engine (*n*)	One of the following: - EX4300-24T - EX4300-24P - EX4300-32F - EX4300-48T - EX4300-48P	*n* is a value in the range 0 through 9. - On a standalone switch, the default value is 0. - On a Virtual Chassis configuration, the values correspond to the member IDs of switches configured in the master role and the backup role in the Virtual Chassis.	Routing Engine	–
FPC (*n*)	Abbreviated name of the Flexible PIC Concentrator (FPC) One of the following: - EX4300-24T - EX4300-24P - EX4300-32F - EX4300-48T - EX4300-48P	*n* is a value in the range 0 through 9. On a standalone switch, the default value is 0. On a Virtual Chassis configuration, the values correspond to the assigned member IDs of switches in the Virtual Chassis.	In this case, FPC refers to the switch itself. In this case, the FPC number refers to the member ID assigned to the switch.	*Understanding Interface Naming Conventions on EX Series Switches*

Table 11: CLI Equivalents of Terms Used in the Documentation for EX4300 Switches *(continued)*

Hardware Item (CLI)	Description (CLI)	Value	Item In Documentation	Additional Information
PIC (*n*)	Abbreviated name of the Physical Interface Card (PIC)	*n* is a value in the range 0 through 2.		*Understanding Interface Naming Conventions on EX Series Switches*
	One of the following: • 24x 10/100/1000 BASE-T • 48x 10/100/1000 BASE-T • 32x1G SFP	PIC 0	• In 24-port and 48-port switches—PIC 0 stands for built-in network ports numbered 0 through 23 or 0 or through 47. • In 32-port switches—PIC 0 stands for built-in network ports followed by SFP+ uplink ports. In the CLI output, the network ports are numbered 0 through 31 and the SFP+ uplink ports are numbered 32 through 35.	"EX4300 Switches Hardware Overview" on page 3
	• For 24-port and 48-port switches: 4x40GE • For 32-port switches: 2x40GE	PIC 1	Built-in QSFP+ ports	"EX4300 Switches Hardware Overview" on page 3

	• For 24-port and 48-port switches: 4x 1G/10G SFP/SFP+
	• For 32-port switches, one of the following:
	  • 8x1G/10G SFP/SFP+
	  • 2x40GE
		PIC 2	Uplink module installed in the switch	"Uplink Modules in EX4300 Switches" on page 55

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 EX4300 Switches" on page 70
Power supply (*n*)	One of the following: • JPSU-350-AC-AFO-A • JPSU-350-AC-AFI-A • JPSU-550-DC-AFO-A	*n* has a value 0 or 1, corresponding to the power supply slot number.	AC power supply or DC power supply	• AC Power Supply in EX4300 Switches on page 37 • DC Power Supply in EX4300 Switches on page 45

Table 11: CLI Equivalents of Terms Used in the Documentation for EX4300 Switches *(continued)*

Hardware Item (CLI)	Description (CLI)	Value	Item In Documentation	Additional Information
	• JPSU-550-DC-AFI-A • JPSU-715-AC-AFO-A • JPSU-1100-AC-AFO-A	CAUTION: Do not mix: • AC and DC power supplies in the same chassis. • Power supplies with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis. • Fan modules with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis. • Power supplies and fan modules with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis. NOTE: The 32-port EX4300 switches support fan modules and power supplies with the **AIR OUT (AFO)** label only.		
Fan tray	One of the following: • Fan Module, Airflow In (AFI) • Fan Module, Airflow Out (AFO)	*n* has a value 0 or 1, corresponding to the fan module slot number.	Fan module	"Cooling System and Airflow in an EX4300 Switch" on page 50
		CAUTION: Do not mix: • Fan modules with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis. • Power supplies with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis. • Power supplies and fan modules with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis. • AC and DC power supplies in the same chassis. NOTE: The 32-port EX4300 switches support fan modules and power supplies with the **AIR OUT (AFO)** label only.		

Related Documentation

• EX4300 Switches Hardware Overview on page 3

Component Descriptions

LCD Panel in EX4300 Switches

The LCD panel on the front panel of the EX4300 switch shows two lines of text, each with a maximum of 16 characters. The LCD panel displays a variety of information about the switch and also provides a menu to perform basic operations such as initial setup and reboot.

There are two navigation buttons—Menu and Enter—to the right of the LCD panel.

See Figure 12 on page 25.

Figure 12: LCD Panel in EX4300 Switches

| 1—LCD panel | 3—LCD panel Menu button |
| 2—LCD panel Enter button | 4—Chassis status LEDs |
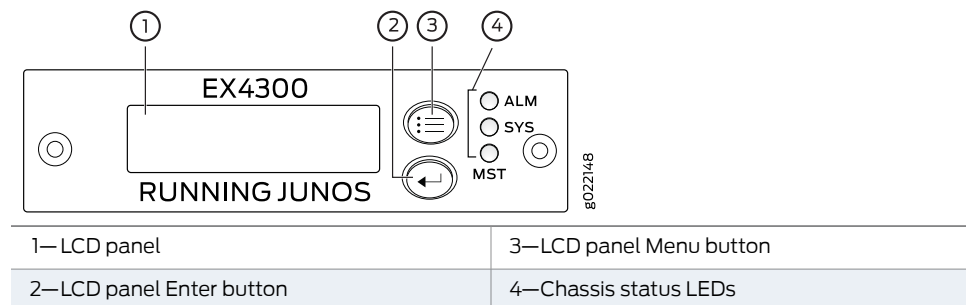
The first line of text on the LCD panel displays basic information about the switch and the second line of text displays information about the mode selected on the LCD panel. You can configure the second line of the text for the LCD panel to display a custom message. If the LCD panel is configured to display a custom message, the Menu button and the Enter button are disabled. See *Configuring the LCD Panel on EX Series Switches (CLI Procedure)*.

The LCD panel has a backlight. If the LCD panel is idle for 60 seconds, the backlight turns off. You can turn on the backlight by pressing the Menu or Enter button once. After turning on the backlight, you can toggle between the LCD panel menus by pressing the Menu button and navigate through the menu options by pressing the Enter button.

> NOTE: The chassis viewer in the J-Web interface also displays the LCD panel. From the J-Web interface, you can view real-time status information in the LCD panel. See *Dashboard for EX Series Switches*.

This topic describes:

- LCD Panel Modes on page 26
- LCD Panel Menus on page 27

LCD Panel Modes

The LCD panel operates in four modes: boot, idle, status, and maintenance.

The first line of text on the LCD panel displays the slot number, the role of the switch, and hostname in all the modes.

For a standalone EX4300 switch, by default the slot number is **00**, and the role is **RE**.

In an EX4300 switch that is a member of a Virtual Chassis, the first line of the LCD panel always displays:

- The slot number (the member ID of the Virtual Chassis member)

- Role of the switch in the Virtual Chassis (**RE** for master, **BK** for backup, and **LC** for line card member)

- Hostname

The LCD panel operates in boot mode during switch reboot. In the boot mode, the second line of the LCD panel displays the key milestones in the switch boot process. The boot mode does not have any menu options. After the boot process is complete, the LCD panel automatically reverts to the Idle (**IDLE**) menu.

In idle mode, the second line of text on the LCD panel displays the mode of the network ports' Status LED and the number of chassis alarms. The number of alarms is updated every second.

In status mode, the second line displays:

- Status of the Virtual Chassis port (VCP)

- Status of the power supplies

- Status of the fan modules and the chassis temperature

- Version of Junos OS for EX Series switches loaded on the switch

In maintenance mode, the second line displays one of the following options, which you can use to configure and troubleshoot the switch:

- System halt

- System reboot

- Load rescue

- Request VC port

- Factory default

- EZSetup

LCD Panel Menus

The LCD panel has three menus: Idle, Status, and Maintenance. You can toggle between the LCD panel menus by pressing the Menu button and navigate through the menu options by pressing the Enter button.

Table 12 on page 27 describes the LCD panel menu options.

Table 12: LCD Panel Menu Options in EX4300 Switches

Menu Label	Description

IDLE	In the Idle menu:
	
	- Press Enter to cycle through the Status LED modes, which are port status indicators:
	  - ADM (administrative status)
	  - DPX (duplex)
	  - SPD (speed)
	  - POE (Power over Ethernet) (only for EX4300-24P, EX4300-24P-S, EX4300-48P, and EX4300-48P-S models)
	  See "Network Port, Built-In QSFP+ Port, Uplink Port, and Uplink Module Port LEDs on EX4300 Switches" on page 31 for information about the Status LED modes.
	- Press Menu to exit the Idle menu and go to the Status menu.

Table 12: LCD Panel Menu Options in EX4300 Switches *(continued)*

Menu Label	Description

STATUS	In the Status menu, press Menu to cycle through the following information:
	
	• VCPs status: Up or Down
	  Display the status of VCPs on the switch. This option is supported only on EX4300 switches in a Virtual Chassis configuration. This option is not supported on standalone EX4300 switches.
	• Power supply status: OK, Failed, or Absent
	• Fan status and Temperature status.
	  ◦ Fan status: OK, Failed, or Absent
	  ◦ Temp status: OK, High, or Shutdown
	• Junos OS version for EX Series switches loaded on the switches.
	• EXIT STAT MENU?
	  Choose one of the following:
	  ◦ Press Enter to exit the Status menu and go to the Maintenance menu.
	  ◦ Press Menu to display the VCPs status again.
	
	You can disable the Status menu or the options in the Status menu in the LCD panel. See *Configuring the LCD Panel on EX Series Switches (CLI Procedure)*.

Table 12: LCD Panel Menu Options in EX4300 Switches *(continued)*

Menu Label	Description

MAINT (Maintenance Menu)	The Maintenance menu has the following options to configure and troubleshoot the switch:
	
	• SYSTEM HALT?—Choose one of the following:
	  • Press Enter to halt the switch. Press Enter again to confirm the halt.
	  • Press Menu to go to the next option in the Maintenance menu.
	
	• SYSTEM REBOOT?—Choose one of the following:
	  • Press Enter to reboot the switch. Press Enter again to confirm the reboot.
	  • Press Menu to go to the next option in the Maintenance menu.
	
	• LOAD RESCUE?—Choose one of the following:
	  • Press Enter to roll back the switch to the previous valid configuration. Press Enter again to confirm the rollback.
	  • Press Menu to go to the next option in the Maintenance menu.
	
	• REQUEST VC PORT?—Choose one of the following:
	  • Press the Enter button to configure an uplink module port or a built-in QSFP+ port to be a VCP or to delete a VCP from the switch configuration (when you delete the VCP, the port is reset to be an uplink module port or a network port).
	  • Press the Menu button to go to the next option in the Maintenance menu.
	
	• FACTORY DEFAULT?—Choose one of the following:
	  • Press Enter to restore the switch to the factory default configuration. Press Enter again to confirm the restoration. The LCD panel flashes a success or failure message, after which it displays the Idle menu.
	  • Press Menu to go to the next option in the Maintenance menu.
	
	• ENTER EZSETUP?—Choose one of the following:
	  • Press Enter to launch EZSetup. Press Enter again to confirm the launch.
	    EZSetup configures DHCP and enables the J-Web user interface on the switch. The LCD panel flashes a success or failure message for approximately 10 seconds, after which it displays the Idle menu.
	
	    NOTE: You can use EZSetup only on a standalone switch that is in the factory default configuration.
	
	    For information about EZSetup, see "Connecting and Configuring an EX Series Switch (J-Web Procedure)" on page 188.
	  • Press Menu to go to the next option in the Maintenance menu.
	
	• EXIT MAINT MENU?—Choose one of the following:
	  • Press Enter to exit the Maintenance menu.
	  • Press Menu to return to the SYSTEM HALT? option.
	
	You can disable the Maintenance menu or the options in the Maintenance menu in the LCD panel. See *Configuring the LCD Panel on EX Series Switches (CLI Procedure)*.

Related Documentation

• EX4300 Switches Hardware Overview on page 3

• Connecting and Configuring an EX Series Switch (CLI Procedure) on page 185

Chassis Status LEDs on EX4300 Switches

An EX4300 switch has three chassis status LEDs (labeled **ALM**, **SYS**, and **MST**) on the right of the LCD panel, next to the Menu and Enter buttons (see Figure 13 on page 30).

Figure 13: Chassis Status LEDs in an EX4300 Switch
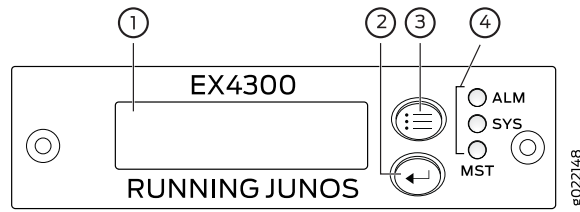
1—LCD panel	3—LCD panel Menu button
2—LCD panel Enter button	4—Chassis status LEDs

Table 13 on page 30 describes the chassis status LEDs on an EX4300 switch, their colors and states, and the status they indicate. You can view the colors of the three LEDs remotely through the CLI by issuing the operational mode command **show chassis led**.

Table 13: Chassis Status LEDs on an EX4300 Switch

LED Label	Color	State and Description
ALM (Alarm)	Unlit	There is no alarm or the switch is halted.
	Red	There is a major alarm. NOTE: When you connect power to the switch, the Alarm (**ALM**) LED glows red. This behavior is normal. Plugging an active Ethernet cable into the management (**MGMT**) port on the switch completes the network link and turns off the **ALM** LED. (See "Connecting a Switch to a Network for Out-of-Band Management" on page 168.) Connecting the switch to a dedicated management console instead of a network does not affect the **ALM** LED. The LED remains red until the switch is connected to a network.
	Yellow	There is a minor alarm. NOTE: The Alarm (**ALM**) LED glows yellow if you commit a configuration to make it active on the switch and do not also create a rescue configuration to back it up. To save the most recently committed configuration as the rescue configuration, enter the operational mode command **request system configuration rescue save**.
SYS (System)	Green	• On steadily—Junos OS for EX Series switches has been loaded on the switch. • Blinking—The switch is booting. • Off—The switch is powered off or is halted.
MST (Master)	Green	In a standalone EX4300 switch: • On steadily—The switch is functioning normally as the master. • Off—The switch is powered off or is halted. In a Virtual Chassis configuration: • On steadily—The switch is the master in the Virtual Chassis configuration. • Blinking—The switch is the backup in the Virtual Chassis configuration. • Off—The switch is a line card member in the Virtual Chassis configuration or is halted.

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

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

All three LEDs can be lit simultaneously.

Related Documentation

- *show chassis lcd*

- *Checking Active Alarms with the J-Web Interface*

- *Understanding Alarm Types and Severity Levels on EX Series Switches*

- EX4300 Switches Hardware Overview on page 3

Network Port, Built-In QSFP+ Port, Uplink Port, and Uplink Module Port LEDs on EX4300 Switches

Each 10/100/1000BASE-T network port, SFP network port, SFP+ uplink port, SFP+ uplink module port, built-in QSFP+ port, and QSFP+ uplink module port on an EX4300 switch has two LEDs that show the link activity and status of the port.

The following figures in this topic shows the location of those LEDs:

- Figure 14 on page 31 shows the location of the LEDs on the 10/100/1000BASE-T Ethernet network ports.

- Figure 15 on page 32 shows the location of the LEDs on the SFP network ports.

- Figure 16 on page 32 shows the location of the LEDs on the built-in QSFP+ ports.

- Figure 17 on page 32 shows the location of the LEDs on the SFP+ uplink ports and on the SFP+ uplink module ports on the 4-port SFP+ uplink module.

- Figure 18 on page 32 shows the location of the LEDs on the QSFP+ uplink module ports on the QSFP+ uplink module.

- Figure 19 on page 33 shows the location of the LEDs on the SFP+ uplink module ports on the 8-port SFP+ uplink module.

Figure 14: LEDs on 10/100/1000BASE-T Network Ports
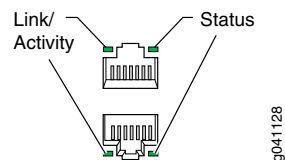
Figure 15: LEDs on SFP Network Ports
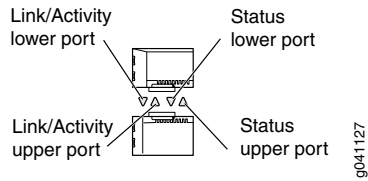
Figure 16: LEDs on the Built-In QSFP+ Ports
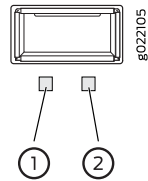
1— Link activity LED	2—Status LED

Figure 17: LEDs on the SFP+ Uplink Ports and on the SFP+ Uplink Module Ports on the 4-Port SFP+ Uplink Module
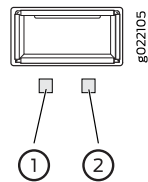
1—Link activity LED	2—Status LED

Figure 18: LEDs on the QSFP+ Uplink Module Ports
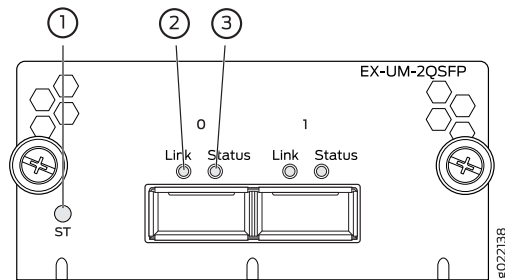
1— Status LED of the uplink module	3—Status LED of the uplink module port
2—Link activity LED of the uplink module port	

Figure 19: LEDs on the SFP+ Ports on the 8-Port SFP+ Uplink Module
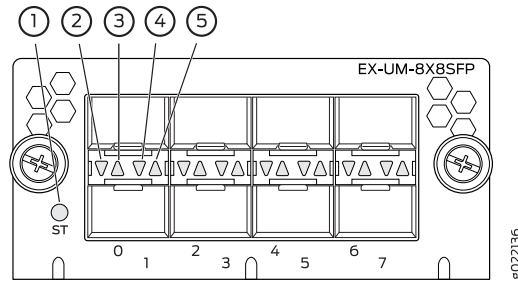
1— Status LED of the uplink module	4—Status LED the lower port
2—Link activity LED of the lower port	5—Status LED the upper port
3—Link activity LED of the upper port	

The Table 14 on page 33 describes the link activity LED on 10/100/1000BASE-T network ports, SFP network ports, SFP+ uplink ports, SFP+ uplink module ports, built-in QSFP+ ports, and QSFP+ uplink module ports.

Table 14: Link/Activity LED

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 15 on page 34 describes the Status LED on 10/100/1000BASE-T Ethernet network ports and SFP network ports. From the Idle menu of the LCD panel, use the Enter button on the LCD panel to toggle between the ADM, DPX, SPD, and PoE+ indicators.

Table 15: Status LED on 10/100/1000BASE-T Ethernet Network Ports and SFP Network Ports

LED	LCD Indicator	State and Description
Status	LED: ADM	Indicates the administrative status (enabled or disabled). The status indicators are: • Green—Port is administratively enabled. • Unlit—Port is administratively disabled.
	LED: DPX	Indicates the duplex mode. The status indicators are: • Green—Port is set to full-duplex mode. • Unlit—Port is set to half-duplex mode. NOTE: In EX4300 switches, the ports operate in full-duplex mode only.
	LED: SPD	Indicates the speed. The speed indicators for 24-port and 48-port EX4300 switches are: • Unlit—10 Mbps • Blinking green—100 Mbps • Steadily green—1000 Mbps NOTE: In 32-port EX4300 switches, when an EX-SFP-1GE-T transceiver is installed in the port, the LED is unlit when the speed is 100 Mbps.
	LED: PoE	Indicates the PoE mode. The status indicators are: • Steadily green—PoE is enabled on the port and a device is drawing power. • Blinking green—PoE is enabled on the port, but no power is drawn from the port. • Unlit—PoE is not enabled on the port.

Table 16 on page 34 describes the Status LED on SFP+ uplink ports and SFP+ uplink module ports.

Table 16: Status LED on SFP+ Uplink Ports and SFP+ Uplink Module Ports

LED	LCD Indicator	State and Description
Status	Green	Indicates the speed. The speed indicators are: • Blinking green—1000 Mbps • Steadily green—10 Gbps

Table 17 on page 34 describes the Status LED on QSFP+ ports in EX4300 switches.

Table 17: Status LED on QSFP+ Ports

LED	LCD Indicator	State and Description
Status	Green	Indicates the status. The status indicators are: • Unlit—40-Gigabit port is down. • Steadily green—40-Gigabit port is up.

- Uplink Modules in EX4300 Switches on page 55
- EX4300 Switches Hardware Overview on page 3

Management Port LEDs on EX4300 Switches

The management port, labeled **MGMT**, on the rear panel of an EX4300 switch, has two LEDs that indicate link activity and status of the management port. Figure 20 on page 35 shows the location of Management port on a 24-port EX4300 switch.

Figure 20: LEDs on the Management Port on a 24-port EX4300 Switch
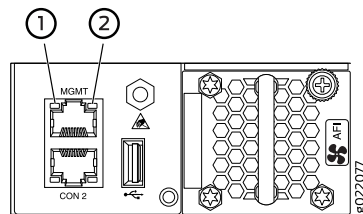
1—Link/Activity LED	2—Status LED

Table 18 on page 35 describes the Link/Activity LED.

Table 18: Link/Activity LED on the Management Port on an EX4300 Switch

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 19 on page 35 describes the Status LED.

Table 19: Status LED on the Management Port on an EX4300 Switch

LED	Color	State and Description
Status	Green	Indicates the speed. The speed indicators are: - Off—Link speed is 10 Mbps. - Blinking—Link speed is 100 Mbps. - On Steadily—Link speed is 1000 Mbps.

- Connecting a Switch to a Network for Out-of-Band Management on page 168
- EX4300 Switches Hardware Overview on page 3

Field-Replaceable Units in EX4300 Switches

Field-replaceable units (FRUs) are components that you can replace at your site. The FRUs in EX4300 switches are hot-removable and hot-insertable: You can remove and replace them without powering off the switch. The FRUs in EX4300 switches are:

- Power supplies

- Fan modules

- Uplink module

- Transceivers

NOTE:
The following switch models ship with one power supply (AC or DC) and two fan modules preinstalled:

- EX4300-24T

- EX4300-24P

- EX4300-32F

- EX4300-32F-DC

- EX4300-48T

- EX4300-48T-AFI

- EX4300-48P

- EX4300-48T-DC

- EX4300-48T-DC-AFI

The following switch models ship without any power supply or fan modules preinstalled:

- EX4300-24T-S

- EX4300-24P-S

- EX4300-48T-S

- EX4300-48P-S

Uplink modules and transceivers are not part of the shipping configuration. If you want to purchase any of these components, power supplies, or fan modules for your switch, you must order them separately.

NOTE: If you have a Juniper J-Care service contract, register any addition, change, or upgrade of hardware components at https://www.juniper.net/customers/csc/management/updateinstallbase.jsp . Failure to do so can result in significant delays if you need replacement parts. This note applies if you change the type of power supply or add a new type of uplink module. It does not apply if you replace these components with the same type of component.

Related Documentation
- Installing and Removing EX4300 Switch Hardware Components on page 141

AC Power Supply in EX4300 Switches

The AC power supply in EX4300 switches is a hot-insertable and hot-removable field-replaceable unit (FRU): You can install it without powering off the switch or disrupting the switching function.

All the EX4300 switches that are powered by AC power supplies except EX4300-24T-S, EX4300-24P-S, EX4300-32F-S, EX4300-48T-S, and EX4300-48P-S switches are shipped with one AC power supply pre-installed in the rear panel of the switches. EX4300-24T-S, EX4300-24P-S, EX4300-32F-S, EX4300-48T-S, and EX4300-48P-S switches are not shipped with pre-installed power supplies; you must order them separately.

This topic describes the AC power supplies.

CAUTION: Do not mix:

- AC and DC power supplies in the same chassis

- Power supplies with different airflow labels (AIR IN (AFI) and AIR OUT (AFO)) in the same chassis.

- Fan modules with different airflow labels (AIR IN (AFI) and AIR OUT (AFO)) in the same chassis.

- Power supplies and fan modules with different airflow labels (AIR IN (AFI) and AIR OUT (AFO)) in the same chassis.

This topic includes:

- Characteristics of an AC Power Supply on page 38
- AC Power Supply Airflow on page 39
- N+0 Redundancy Configuration of AC Power Supplies on page 39
- N+N Redundancy Configuration of AC Power Supplies on page 41

Characteristics of an AC Power Supply

The AC power supplies for EX4300 switches are available in 350 W, 715 W, and 1100 W models. Figure 21 on page 38 shows an AC power supply for an EX4300 switch. The AC power supplies support Power over Ethernet (PoE+) in EX4300-24P, EX4300-24P-S, EX4300-48P, and EX4300-48P-S models.

Figure 21: AC Power Supply for an EX4300 Switch
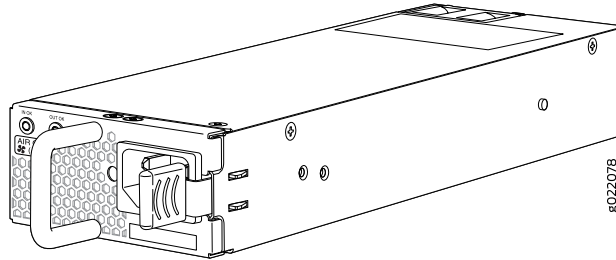
Table 20 on page 38 lists the details of the 350 W, 715 W, and 1100 W AC power supplies used in EX4300 switches.

Table 20: Details of the AC Power Supplies in EX4300 Switches

Details		350 W AC Power Supply	715 W AC Power Supply	1100 W AC Power Supply
Model number		• JPSU-350-AC-AFO-A • JPSU-350-AC-AFI-A	JPSU-715-AC-AFO-A	JPSU-1100-AC-AFO-A
Field-replaceable unit (FRU) type		Hot-insertable and hot-removable	Hot-insertable and hot-removable	Hot-insertable and hot-removable
Power supply weight		2.43 lb (1.1 kg)	2.43 lb (1.1 kg)	2.43 lb (1.1 kg)
Minimum installed in chassis		1	1	1
Maximum installed in chassis		2	2	2
Power supply slots		Install in power supply slots labeled **PSU 0** and **PSU 1** in the rear panel of the chassis.	Install in power supply slots labeled **PSU 0** and **PSU 1** in the rear panel of the chassis.	Install in power supply slots labeled **PSU 0** and **PSU 1** in the rear panel of the chassis.
AC appliance Inlet	Number	1	1	1
NOTE: Each AC appliance inlet requires a dedicated AC power feed.	Type	IEC-320-C13	IEC-320-C13	IEC-320-C15
	Rating	2 A	11–5 A	12–6 A
Fans		Internal	Internal	Internal

Table 20: Details of the AC Power Supplies in EX4300 Switches *(continued)*

Details	350 W AC Power Supply	715 W AC Power Supply	1100 W AC Power Supply
Airflow	• Front-to-back, indicated by label **AIR OUT (AFO)** • Back-to-front, indicated by label **AIR IN (AFI)**	Front-to-back, indicated by label **AIR OUT (AFO)**	Front-to-back, indicated by label **AIR OUT (AFO)**
AC power cord retainer	1	1	1
Power supply status LEDs	**IN OK** and **OUT OK**	**IN OK** and **OUT OK**	**IN OK** and **OUT OK**
Operating range	100–240 VAC	100–240 VAC	115–240 VAC

To prevent electrical injury while installing or removing AC power supplies, carefully follow instructions in "Installing an AC Power Supply in an EX4300 Switch" on page 142 and "Removing an AC Power Supply from an EX4300 Switch" on page 196.

AC Power Supply Airflow

Each power supply has its own fan and is cooled by its own internal cooling system.

Each power supply has a label **AIR OUT (AFO)** or **AIR IN (AFI)** on the faceplate of the power supply that indicates the direction of airflow in the power supply.

Table 21 on page 39 lists the AC power supply models and the direction of airflow in them.

Table 21: Airflow Direction in AC Power Supply Models for EX4300 Switches

Model	Label on Power Supply	Direction of Airflow
JPSU-350-AC-AFO-A	**AIR OUT (AFO)**	Front-to-back—that is, air intake to cool the chassis is through the vents on the front panel of the chassis and hot air exhausts through the vents on the rear panel of the chassis.
JPSU-350-AC-AFI-A	**AIR IN (AFI)**	Back-to-front—that is, air intake to cool the chassis is through the vents on the rear panel of the chassis and hot air exhausts through the vents on the front panel of the chassis.
JPSU-715-AC-AFO-A	**AIR OUT (AFO)**	Front-to-back—that is, air intake to cool the chassis is through the vents on the front panel of the chassis and hot air exhausts through the vents on the rear panel of the chassis.
JPSU-1100-AC-AFO-A	**AIR OUT (AFO)**	Front-to-back—that is, air intake to cool the chassis is through the vents on the front panel of the chassis and hot air exhausts through the vents on the rear panel of the chassis.

N+0 Redundancy Configuration of AC Power Supplies

In an *N+0* redundancy configuration, lower priority PoE ports may be impacted if a power supply fails.

Depending on the power supplies installed in the switch, you can determine the system power budget.

- If one power supply is installed in the switch:

  System power budget = Output wattage of the installed power supply (PSU(W))

- If two power supplies are installed in the switch:
  System power budget = (Sum of the output wattages of the two power supplies) − (10% of the output wattage of the power supply that has the higher output wattage)

  System power budget = $PSU_0(W) + PSU_1(W) − (0.10 \times MAX (PSU_0(W), PSU_1(W))$

Table 22 on page 40 lists the *N*+0 power calculation for 24-port EX4300 switches that use 350 W AC, 715 W AC, and 1100 W AC power supplies.

Table 22: N+0 AC Power Calculations for 24-Port EX4300 Switches

Power Supply Rating		Total Power (in watts) $PSU_0(W) + PSU_1(W)$	System Power Budget (in watts)	Backup Power (in watts)	Base Power (in watts)	Available PoE Power (in watts)	Ports Enabled for PoE+
PSU_0	PSU_1						
350 W AC	–	350	350	0	150	200	6
350 W AC	350 W AC	700	665	0	150	515	17
350 W AC	715 W AC	1065	993.5	0	150	843.5	24
715 W AC	–	715	715	0	150	565	18
715 W AC	715 W AC	1430	1358.5	0	150	1208.5	24
715 W AC	1100 W AC	1815	1705	0	150	1555	24
1100 W AC	–	1100	1100	0	150	950	24
1100 W AC	1100 W AC	2200	2090	0	150	1940	24
1100 W AC	350 W AC	1450	1340	0	150	1190	24

Table 23 on page 40 lists the *N*+0 power calculation for 32-port EX4300 switches that use the 350 W AC power supply.

Table 23: N+0 AC Power Calculations for 32-Port EX4300 Switches

Power Supply Rating		Total Power (in watts) $PSU_0(W) + PSU_1(W)$	System Power Budget (in watts)	Backup Power (in watts)	Base Power (in watts)
PSU_0	PSU_1				
350 W AC	–	350	350	0	164

Table 23: N+0 AC Power Calculations for 32-Port EX4300 Switches *(continued)*

Power Supply Rating		Total Power (in watts)	System Power Budget (in watts)	Backup Power (in watts)	Base Power (in watts)
PSU_0	PSU_1	$PSU_0(W) + PSU_1(W)$			
350 W AC	350 W AC	700	665	0	164

lists the *N+0* power calculation for 48-port EX4300 switches that use 350 W AC, 715 W AC, and 1100 W AC power supplies.

Table 24: N+0 AC Power Calculations for 48-Port EX4300 Switches

Power Supply Rating		Total Power (in watts)	System Power Budget (in watts)	Backup Power (in watts)	Base Power (in watts)	Available PoE Power (in watts)	Ports Enabled for PoE+
PSU_0	PSU_1	$PSU_0(W) + PSU_1(W)$					
350 W AC	–	350	350	0	175	175	5
350 W AC	350 W AC	700	665	0	175	490	16
350 W AC	715 W AC	1065	993.5	0	175	818.5	27
715 W AC	–	715	715	0	175	540	18
715 W AC	715 W AC	1430	1358.5	0	175	1183.5	39
715 W AC	1100 W AC	1815	1705	0	175	1530	48
1100 W AC	–	1100	1100	0	175	925	30
1100 W AC	1100 W AC	2200	2090	0	175	1915	48
1100 W AC	350 W AC	1450	1340	0	175	1165	38

N+N Redundancy Configuration of AC Power Supplies

You can configure your switch for *N+N* redundancy, in which *N* power supplies can be removed or fail and the remaining *N* power supplies continue to supply power to the switch without interruption.

You can configure the power management software to manage switch power for *N+N* redundancy. When you configure power management for *N+N* redundancy, half of the total power available (*N*) is held as reserve power while the other half (*N*) is available for immediate consumption. If the switch configuration changes and requires additional power, then additional power is drawn from the reserve power, and the switch no longer has *N+N* power supply redundancy. This condition raises a minor alarm. If the condition is not corrected within 5 minutes, then a major alarm is issued.

For more information about how power management allocates power to chassis components when power is insufficient, see Understanding Power Management on EX Series Switches.

Depending on the power supplies installed in the switch, you can determine the system power budget.

- If one power supply is installed in the switch:

  - System power budget = Output wattage of the installed power supply (PSU(W))

  - Backup power available = 0 W

  A minor alarm is raised as the switch has no *N+N* power supply redundancy.

- If two power supplies are installed in the switch:

  - System power budget = (Output wattage of the power supply that has the lower output wattage) − (5% of the output wattage of the power supply that has the lower output wattage)

    System power budget = $\text{MIN}(\text{PSU}_0(W), \text{PSU}_1(W)) - (0.05 \times \text{MIN}(\text{PSU}_0(W), \text{PSU}_1(W))$

  - Backup power available = (Output wattage of the power supply that has the lower output wattage) − (5% of the output wattage of the power supply that has the lower output wattage)

    Backup power available = $\text{MIN}(\text{PSU}_0(W), \text{PSU}_1(W)) - (0.05 \times \text{MIN}(\text{PSU}_0(W), \text{PSU}_1(W))$

Table 25 on page 42 lists the *N+N* power calculation for 24-port EX4300 switches that use 350 W, 715 W AC, and 1100 W AC power supplies.

Table 25: N+N AC Power Calculations for 24-Port EX4300 Switches

Power Supply Rating		Total Power (in watts)	System Power Budget (in watts)	Backup Power (in watts)	Base Power (in watts)	Available PoE Power (in watts)	Ports enabled for PoE+
PSU_0	PSU_1						
350 W AC	–	350	350	0	150	200	6
350 W AC	350 W AC	700	332.5	332.5	150	182.5	6
350 W AC	715 W AC	1065	332.5	332.5	150	182.5	6
715 W AC	–	715	715	0	150	565	18
715 W AC	715 W AC	1430	679.25	679.25	150	529.25	17
715 W AC	1100 W AC	1815	679.25	679.25	150	529.25	17
1100 W AC	–	1100	1100	0	150	950	24

Table 25: N+N AC Power Calculations for 24-Port EX4300 Switches *(continued)*

Power Supply Rating		Total Power (in watts)	System Power Budget (in watts)	Backup Power (in watts)	Base Power (in watts)	Available PoE Power (in watts)	Ports enabled for PoE+
PSU_0	PSU_1						
1100 W AC	1100 W AC	2200	1045	1045	150	895	24
1100 W AC	350 W AC	1450	332.5	332.5	150	182.5	6

lists the *N+N* power calculation for 32-port EX4300 switches that use 350 W AC power supplies.

Table 26: N+N AC Power Calculations for 32-Port EX4300 Switches

Power Supply Rating		Total Power (in watts)	System Power Budget (in watts)	Backup Power (in watts)	Base Power (in watts)
PSU_0	PSU_1				
350 W AC	–	350	350	0	177
350 W AC	350 W AC	700	332.5	332.5	177

lists the *N+N* power calculation for 48-port EX4300 switches that use 350 W, 715 W AC, and 1100 W AC power supplies.

Table 27: N+N AC Power Calculations for 48-Port EX4300 Switches

Power Supply Rating		Total Power (in watts)	System Power Budget (in watts)	Backup Power (in watts)	Base Power (in watts)	Available PoE Power (in watts)	Ports enabled for PoE+
PSU_0	PSU_1						
350 W AC	–	350	350	0	175	175	5
350 W AC	350 W AC	700	332.5	332.5	175	157.5	5
350 W AC	715 W AC	1065	332.5	332.5	175	157.5	5
715 W AC	–	715	715	0	175	540	18
715 W AC	715 W AC	1430	679.25	679.25	175	504.25	16
715 W AC	1100 W AC	1815	679.25	679.25	175	504.25	16
1100 W AC	–	1100	1100	0	175	925	30
1100 W AC	1100 W AC	2200	1045	1045	175	870	29
1100 W AC	350 W AC	1450	332.5	332.5	175	157.5	5

AC Power Supply LEDs in EX4300 Switches

Figure 22 on page 44 shows the location of the LEDs on an AC power supply for an EX4300 switch.

Figure 22: AC Power Supply LEDs in an EX4300 Switch
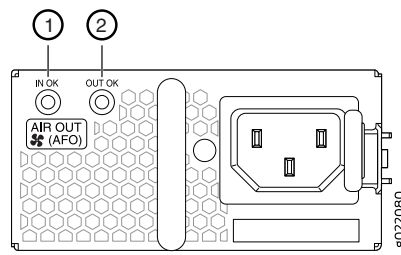
1— IN OK LED	2—OUT OK LED

Table 28 on page 44 describes the AC power supply LEDs.

Table 28: AC Power Supply LEDs in EX4300 Switches

LED	Color	Description
IN OK	Unlit	Indicates one of the following: - AC power input voltage is not within normal operating range. - No AC power input.
	Green	Power supply is receiving proper input power and is functioning normally.
OUT OK	Unlit	Indicates one of the following: - **IN OK** LED is unlit. - The power supply is not delivering power correctly.
	Green	The power supply is delivering power and is functioning correctly.
	Red	The power supply has failed and must be replaced.

NOTE: If the **IN OK** LED and the **OUT OK** LED are not lit green, either the AC power cord is not installed properly or the power input voltage is not within normal operating range.

If the **IN OK** LED is lit green and the **OUT OK** LED is unlit or lit red, the AC power supply is installed properly, but the power supply has an internal failure.

Related Documentation
- AC Power Supply in EX4300 Switches on page 37
- AC Power Supply Specifications for EX4300 Switches on page 119
- Connecting AC Power to an EX4300 Switch on page 159

DC Power Supply in EX4300 Switches

The DC power supply in EX4300 switches is a hot-insertable and hot-removable field-replaceable unit (FRU): You can install it without powering off the switch or disrupting the switching function.

All the EX4300 switches that are powered by DC power supplies except EX4300-24T-S, EX4300-24P-S, EX4300-32F-S, EX4300-48T-S, and EX4300-48P-S switches are shipped with one DC power supply pre-installed in the rear panel of the switches. EX4300-24T-S, EX4300-24P-S, EX4300-32F-S, EX4300-48T-S, and EX4300-48P-S switches are not shipped with pre-installed power supplies; you must order them separately.

This topic describes the DC power supplies.

CAUTION: **Do not mix:**

- AC and DC power supplies in the same chassis
- Power supplies with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis.
- Fan modules with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis.
- Power supplies and fan modules with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis.

This topic includes:

- Characteristics of a DC Power Supply on page 46
- DC Power Supply Airflow on page 47
- N+0 Redundancy Configuration of DC Power Supplies on page 47
- N+N Redundancy Configuration of DC Power Supplies on page 48

Characteristics of a DC Power Supply

EX4300 switches support 550 W DC power supply (see). The DC power supplies support Power over Ethernet (PoE+) in EX4300-24P, EX4300-24P-S, EX4300-48P, and EX4300-48P-S models.

Figure 23: DC Power Supply for an EX4300 Switch
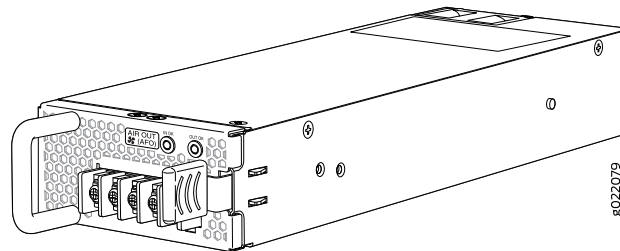
You can install up to two DC power supplies in an EX4300 switch. Power supplies are installed in the power supply slots labeled **PSU 0** and **PSU 1** in the rear panel of the chassis.

lists the details of the 550 W DC power supplies used in EX4300 switches.

Table 29: Details of the DC Power Supplies in EX4300 Switches

Details	550 W DC Power Supply
Model number	• JPSU-550-DC-AFO-A • JPSU-550-DC-AFI-A
Field-replaceable unit (FRU) type	Hot-insertable and hot-removable
Power supply weight	2.43 lb (1.1 kg)
Minimum installed in chassis	1
Maximum installed in chassis	2
Power supply slots	Install in power supply slots labeled **PSU 0** and **PSU 1** in the rear panel of the chassis.
Fans	Internal
Airflow	• Front-to-back, indicated by label **AIR OUT (AFO)** • Back-to-front, indicated by label **AIR IN (AFI)**
Power supply status LEDs	**IN OK** and **OUT OK**
DC input current rating	4 A

Table 29: Details of the DC Power Supplies in EX4300 Switches *(continued)*

Details	550 W DC Power Supply
Operating range	−38 through −60 VDC
	NOTE: The minimum input power required to power on the switch is −43.5 +/− 0.5 VDC. After the switch is powered on, the operating range is −38 through −60 VDC.

To prevent electrical injury while installing or removing DC power supplies, carefully follow instructions in and .

DC Power Supply Airflow

Each power supply has its own fan and is cooled by its own internal cooling system.

Each power supply has a label **AIR OUT (AFO)** or **AIR IN (AFI)** on the faceplate of the power supply that indicates the direction of airflow in the power supply.

lists the DC power supply models and the direction of airflow in them.

Table 30: Airflow Direction in DC Power Supply Models for EX4300 Switches

Model	Label on Power Supply	Direction of Airflow
JPSU-550-DC-AFO-A	**AIR OUT (AFO)**	Front-to-back—that is, air intake to cool the chassis is through the vents on the front panel of the chassis and hot air exhausts through the vents on the rear panel of the chassis.
JPSU-550-DC-AFI-A	**AIR IN (AFI)**	Back-to-front—that is, air intake to cool the chassis is through the vents on the rear panel of the chassis and hot air exhausts through the vents on the front panel of the chassis.

N+0 Redundancy Configuration of DC Power Supplies

In an *N+0* redundancy configuration, no power is reserved for resiliency regardless of number of power supplies installed in the switch.

Depending on the power supplies installed in the switch, you can determine the system power budget.

- If one power supply is installed in the switch:

  System power budget = Output wattage of the installed power supply (PSU(W))

- If two power supplies are installed in the switch:
  System power budget = (Sum of the output wattage of the two power supplies) − (10% of the output wattage of the installed power supply)

  System power budget = $PSU_0(W) + PSU_1(W) − (0.10 \times (PSU(W))$

lists the *N+0* power calculation for EX4300 switches that use 550 W DC power supplies.

Table 31: N+0 DC Power Calculations for EX4300 Switch Configurations

Switch Configuration	Number of Power Supplies	Total Power (in watts)	System Power Budget (in watts)	Backup Power (in watts)	Base Power (in watts)	Available PoE Power (in watts)	Ports Enabled for PoE+
24-port EX4300 switch	1	550	550	0	150	400	13
	2	1100	1045	0	150	895	24
32-port EX4300 switch	1	550	550	0	149	N/A	N/A
	2	1100	550	550	160	N/A	N/A
48-port EX4300 switch	1	550	550	0	175	375	12
	2	1100	1045	0	175	870	29

N+N Redundancy Configuration of DC Power Supplies

You can configure your switch for *N+N* redundancy, in which *N* power supplies can be removed or fail and the remaining *N* power supplies continue to supply power for the switch without interruption.

You can configure the power management software to manage switch power for *N+N* redundancy. When you configure power management for *N+N* redundancy, half of the total power available (*N*) is held as reserve power while the other half (*N*) is available for immediate consumption. If the switch configuration changes and requires additional power, then additional power is drawn from the reserve power, and the switch no longer has *N+N* power supply redundancy. This condition raises a minor alarm. If the condition is not corrected within 5 minutes, then a major alarm is issued.

For more information about how power management allocates power to chassis components when power is insufficient, see *Understanding Power Management on EX Series Switches*.

Depending on the power supplies installed in the switch, you can determine the system power budget.

- If one power supply is installed in the switch:

  - System power budget = Output wattage of the installed power supply (PSU(W))

  - Backup power available = 0 W

  A minor alarm is raised as switch has no *N+N* power supply redundancy.

- If two power supplies are installed in the switch:

  - System power budget = (Output wattage of one power supply) − (5% of the output wattage of one power supply)

System power budget = PSU(W) − (0.05 x PSU(W))

- Backup power available = (Output wattage of one power supply) − (5% of the output wattage of one power supply)

System power budget = PSU(W) − (0.05 x PSU(W))

Table 32 on page 49 lists the *N+N* power calculation for EX4300 switches that use 550 W DC power supplies.

Table 32: N+N DC Power Calculations for EX4300 Switch Configurations

Switch Configuration	Number of Power Supplies	Total Power (in watts)	System Power Budget (in watts)	Backup Power (in watts)	Base Power (in watts)	Available PoE Power (in watts)	Ports Enabled for PoE+
24-port EX4300 switch	1	550	550	0	150	400	13
	2	1100	522.5	522.5	150	372.5	12
32-port EX4300 switch	1	550	550	0	149	N/A	N/A
	2	1100	550	550	160	N/A	N/A
48-port EX4300 switch	1	550	550	0	175	375	12
	2	1100	522.5	522.5	175	347.5	11

Related Documentation

- DC Power Supply LEDs in EX4300 Switches on page 49
- DC Power Supply Specifications for EX4300 Switches on page 120
- Installing a DC Power Supply in an EX4300 Switch on page 144

DC Power Supply LEDs in EX4300 Switches

Figure 24 on page 49 shows the location of the LEDs on a DC power supply for an EX4300 switch.

Figure 24: DC Power Supply Faceplate on an EX4300 Switch
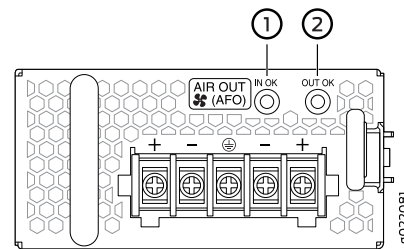
1—OUT OK LED	2—IN OK LED

Table 33 on page 50 describes the LEDs on the DC power supplies.

Table 33: DC Power Supply LEDs on an EX4300 Switch

Name	Color	Description
IN OK	Unlit	Indicates one of the following: • Power supply is disconnected from DC power feed. • DC power input voltage is not within normal operating range. • No DC power input.
	Green	The power supply is receiving power.
OUT OK	Unlit	Indicates one of the following: • **IN OK** LED is unlit. • The power supply is not delivering power correctly.
	Green	The power supply is functioning correctly.
	Red	The power supply has failed and must be replaced.

Related Documentation

- DC Power Supply in EX4300 Switches on page 45

- DC Power Supply Specifications for EX4300 Switches on page 120

- Connecting DC Power to an EX4300 Switch on page 162

Cooling System and Airflow in an EX4300 Switch

The cooling system in an EX4300 switch consists of two fan modules and a single fan in each power supply. EX4300 switches provide back-to-front airflow (air enters through the back of the switch), indicated by the label **AIR IN (AFI)**, or front-to-back (air exhausts through the back of the switch), indicated by the label **AIR OUT (AFO)**—depending on the fan modules and power supplies installed in the switch.

This topic describes:

- Fan Modules on page 50

- Airflow Direction in EX4300 Switch Models on page 52

- Front-to-Back Airflow on page 52

- Back-to-Front Airflow on page 53

- Do Not Mix AIR IN (AFI) and AIR OUT (AFO) Components in the Switch on page 54

- Positioning the Switch on page 54

- Fan Module Status on page 55

Fan Modules

In the EX4300 switches the fan modules are hot-insertable and hot-removable field-replaceable units (FRUs).

All the EX4300 switches, except EX4300-24T-S, EX4300-24P-S, EX4300-32F-S, EX4300-48T-S, and EX4300-48P-S switches are shipped with two fan modules pre-installed in the rear panel of the switch. EX4300-24T-S, EX4300-24P-S, EX4300-32F-S, EX4300-48T-S, and EX4300-48P-S switches are not shipped with pre-installed fan modules; you must order them separately. Each switch can accommodate two fan modules in the fan module slots on the rear panel of the switch. The fan module slots are numbered 0 and 1 and each slot has a fan icon next to it.

Figure 25 on page 51 shows the fan module used in an EX4300 switch:

Figure 25: Fan Module Used in an EX4300 Switch
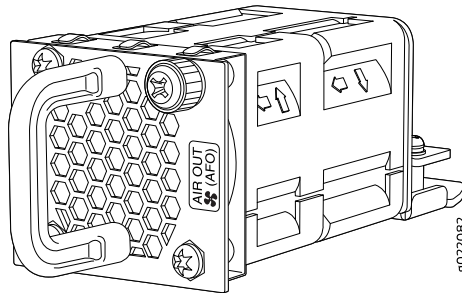
You must remove only one fan module at a time for replacement from the rear panel of the chassis. The switch continues to operate for a limited period of time (30 seconds) during the replacement of the fan module without thermal shutdown.

NOTE: Both the fan modules must be installed for optimal functioning of the switch.

The fan modules are available in two models that have different airflow directions—back-to-front (air enters through the back of the switch), indicated by label **AIR IN (AFI)**, and front-to-back (air exhausts through the back of the switch), indicated by label **AIR OUT (AFO)**. Table 34 on page 51 lists the available fan module models and the direction of airflow in them.

NOTE: The 32-port EX4300 switches support fan modules and power supplies with the **AIR OUT (AFO)** label only.

Table 34: Fan Modules in EX4300 Switches

Fan Module	Label on the Fan Module
EX4300-FAN	**AIR OUT (AFO)**
EX4300-FAN-AFI	**AIR IN (AFI)**

Airflow Direction in EX4300 Switch Models

Table 35 on page 52 shows the direction of airflow in EX4300 switch models as shipped.

Table 35: Airflow Direction in EX4300 Switch Models

Model Number	Fan Modules and Power Supply	Direction of Airflow
• EX4300-24T • EX4300-24P • EX4300-32F • EX4300-48T • EX4300-48P	The switch ships with two fan modules and an AC power supply, each with a label **AIR OUT (AFO)**.	Front-to-back—that is, air intake to cool the chassis is through the vents on the front panel of the chassis and hot air exhausts through the vents on the rear panel of the chassis.
• EX4300-32F-DC • EX4300-48T-DC	The switch ships with two fan modules and a DC power supply, each with a label **AIR OUT (AFO)**.	Front-to-back—that is, air intake to cool the chassis is through the vents on the front panel of the chassis and hot air exhausts through the vents on the rear panel of the chassis.
EX4300-48T-AFI	The switch ships with two fan modules and an AC power supply, each with a label **AIR IN (AFI)**.	Back-to-front—that is, air intake to cool the chassis is through the vents on the rear panel of the chassis and hot air exhausts through the vents on the front panel of the chassis.
EX4300-48T-DC-AFI	The switch ships with two fan modules and a DC power supply, each with a label **AIR IN (AFI)**.	Back-to-front—that is, air intake to cool the chassis is through the vents on the rear panel of the chassis and hot air exhausts through the vents on the front panel of the chassis.

CAUTION: **Do not mix:**

- AC and DC power supplies in the same chassis

- Power supplies and fan modules with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis

- Fan modules with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis.

- Power supplies and fan modules with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis.

Front-to-Back Airflow

In the EX4300 switch models that have front-to-back airflow, the air intake to cool the chassis is through the vents on the front panel of the switch and hot air exhausts through the vents on the rear panel. See Figure 26 on page 53 and Figure 27 on page 53.

Figure 26: Front-to-Back Airflow Through 24-Port and 48-Port EX4300 Switch Chassis
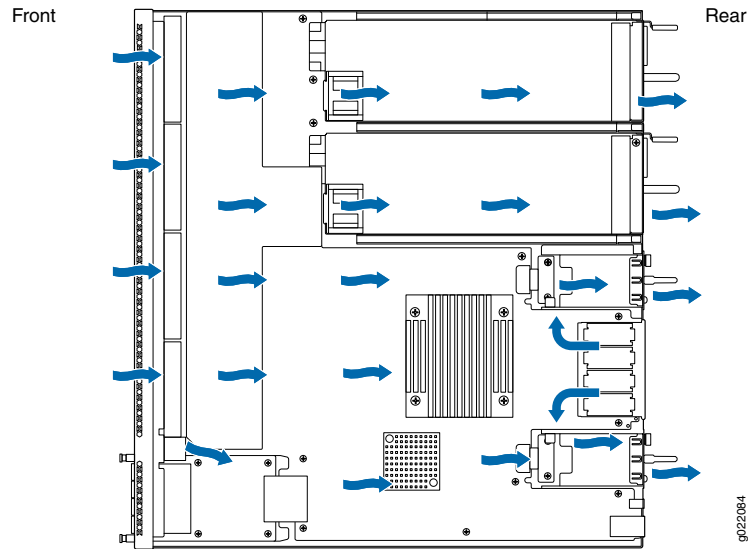
Figure 27: Front-to-Back Airflow Through 32-Port EX4300 Switch Chassis
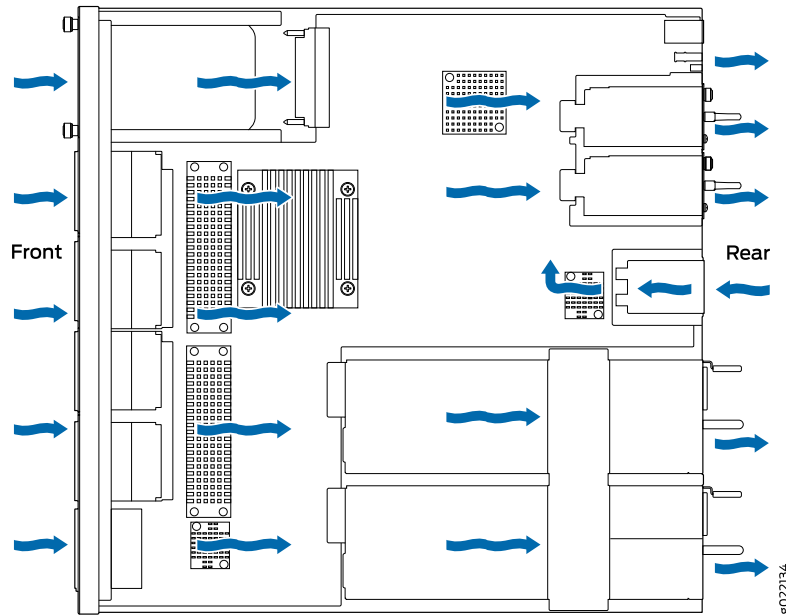
You must install only power supplies that have **AIR OUT (AFO)** labels in switches in which the fan modules have **AIR OUT (AFO)** labels.

Back-to-Front Airflow

In the EX4300 switch models that have back-to-front airflow, the air intake to cool the chassis is through the vents on the rear panel and hot air exhausts through the vents on the front panel of the switch. See Figure 28 on page 54.

Figure 28: Back-to-Front Airflow Through the 24-Port and 48-Port EX4300 Switch Chassis
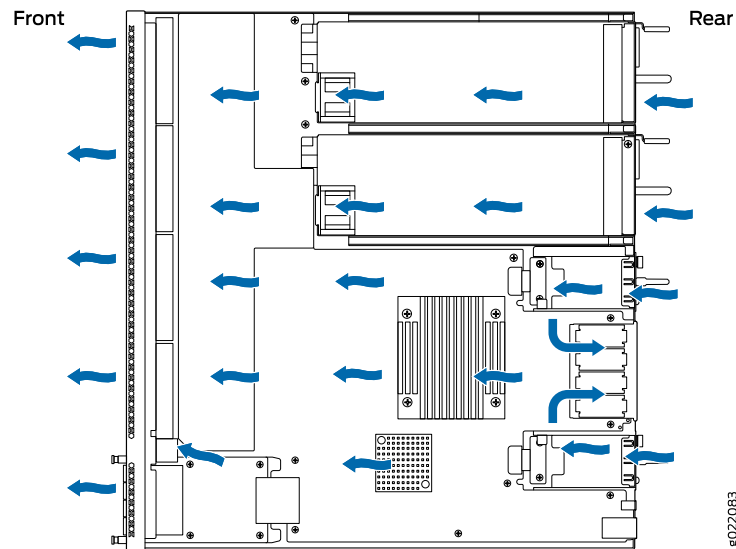
You must install only power supplies that have **AIR IN (AFI)** labels in switches in which the fan modules have **AIR IN (AFI)** labels.

Do Not Mix AIR IN (AFI) and AIR OUT (AFO) Components in the Switch

Do not mix power supplies and fan modules with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis. If the fan modules have **AIR IN (AFI)** labels, the power supplies must also have **AIR IN (AFI)** labels; if the fan modules have **AIR OUT (AFO)** labels, the power supplies must also have **AIR OUT (AFO)** labels.

The labels on the power supplies and fan modules should match the labels on the switch chassis.

Mixing components with **AIR IN (AFI)** and **AIR OUT (AFO)** labels in the same chassis hampers the performance of the cooling system of the switch and leads to overheating of the chassis.

CAUTION: **The system raises an alarm if a fan module fails or if the ambient temperature inside the chassis rises above the acceptable range. If the temperature inside the chassis rises above the threshold temperature, the system shuts down automatically.**

Positioning the Switch

In front-to-back airflow, indicated by the label **AIR OUT (AFO)** on the fan modules and power supplies, hot air exhausts through the vents on the rear panel of the switch. In back-to-front airflow, indicated by the label **AIR IN (AFI)** on the fan modules and power supplies, hot air exhausts through the vents on the front panel of the switch.

In data center deployments, position the switch in such a manner that the **AIR IN (AFI)** labels on switch components are next to the cold aisle, and **AIR OUT (AFO)** labels on switch components are next to the hot aisle.

Fan Module Status

Each switch has a status LED for each fan module next to the fan module slot on the rear panel of the chassis. The Status LED indicates the status of the fan module. Table 36 on page 55 describes the Status LED on the fan module in an EX4300 switch.

Table 36: Fan Module Status LED

LED	State	Description
Status	Green	The fan module is functioning normally.
	Unlit	Indicates one of the following: • The fan module is not installed. • The fan module is not functioning normally. • The airflow direction of the fan module does not match with the airflow direction of other components.

Under normal operating conditions, the fan modules operate at a moderate speed. Temperature sensors in the chassis monitor the temperature within the chassis.

The system raises an alarm if a fan module fails or if the ambient temperature inside the chassis rises above the acceptable range. If the temperature inside the chassis rises above the threshold temperature, the system shuts down automatically.

You can check the status of fans and the chassis temperature from the Environment Status option in the Status menu on the LCD panel. See "LCD Panel in EX4300 Switches" on page 25.

Related Documentation

- Field-Replaceable Units in EX4300 Switches on page 36
- EX4300 Switches Hardware Overview on page 3
- Prevention of Electrostatic Discharge Damage on page 254
- Installing a Fan Module in an EX4300 Switch on page 145
- Removing a Fan Module from an EX4300 Switch on page 201

Uplink Modules in EX4300 Switches

EX4300 switches provide a slot to install an optional uplink module. Uplink modules are hot-insertable and hot-removable field-replaceable units (FRUs).

You can install an uplink module horizontally in the uplink module slot on the front panel of the switch. By installing an uplink module, you add more ports to your switch, thereby increasing the port density of the switch.

shows the uplink modules supported on 24-port and 48-port EX4300 switches, their descriptions, and the Junos OS release in which the models were released. shows the uplink modules supported on 32-port EX4300 switches, their descriptions, and the Junos OS release in which the models were released.

Table 37: Uplink Modules in 24-Port and 48-Port EX4300 Switches

Uplink Module Name	Description	Supported EX4300 Switches	First Junos OS Release
4-port 10-Gigabit Ethernet SFP+ uplink module	This uplink module can house up to four SFP+ transceivers, four SFP transceivers, or a combination of four SFP+ and SFP transceivers. You can also configure these ports as Virtual Chassis ports (VCPs) and use them to connect the switch in a Virtual Chassis configuration or a VCF.	• EX4300-24T • EX4300-24P • EX4300-48T • EX4300-48T-AFI • EX4300-48P • EX4300-48T-DC • EX4300-48T-DC-AFI	Junos OS Release 13.2X50-D10
		• EX4300-24T-S • EX4300-24P-S • EX4300-48T-S • EX4300-48P-S	Junos OS Release 13.2X51-D26

Table 38: Uplink Modules in 32-Port EX4300 Switches

Uplink Module Name	Description	Supported EX4300 Switches	First Junos OS Release
2-port 40-Gigabit Ethernet QSFP+ uplink module	This uplink module can house up to two QSFP+ transceivers. You can also configure these ports as VCPs and use them to connect the switch in a Virtual Chassis configuration or a VCF.	• EX4300-32F • EX4300-32F-DC	Junos OS Release 13.2X51-D15
		• EX4300-32F-S	Junos OS Release 13.2X51-D26
8-port 10-Gigabit Ethernet SFP+ uplink module	This uplink module can house up to eight SFP+ transceivers, eight SFP transceivers, or a combination of eight SFP+ and SFP transceivers. You can also configure these ports as VCPs and use them to connect the switch in a Virtual Chassis configuration or a VCF.	• EX4300-32F • EX4300-32F-DC	Junos OS Release 13.2X51-D15
		• EX4300-32F-S	Junos OS Release 13.2X51-D26

NOTE: Uplink modules and transceivers are not part of the shipping configuration. You must order them separately.

shows the uplink modules used in 24-port and 48-port EX4300 switches and their components. shows the uplink modules used in 32-port EX4300 switches and their components.

Table 39: Uplink Modules Used in 24-Port and 48-Port EX4300 Switches

Uplink Module	Figure
4-port 10-Gigabit Ethernet SFP+ uplink module	Figure 29: 4-Port 10-Gigabit Ethernet SFP+ Uplink Module Figure 30: LEDs on the 4-Port 10-Gigabit Ethernet SFP+ Uplink Module 1— Link activity LED of the uplink module port 3—Captive screws of the uplink module 2—Status LED of the uplink module port 4—Handle of the uplink module
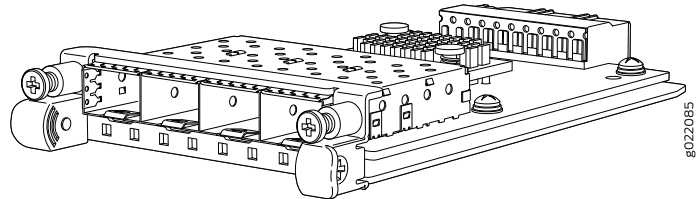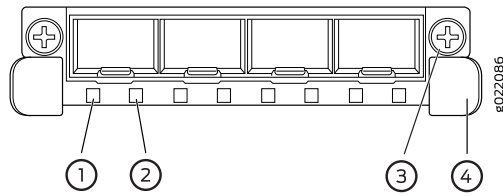
Table 40: Uplink Modules Used in 32-Port EX4300 Switches
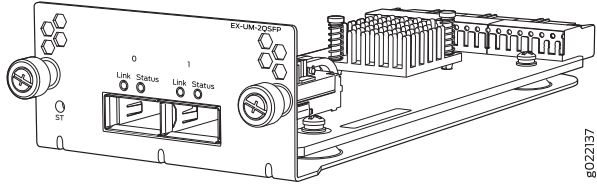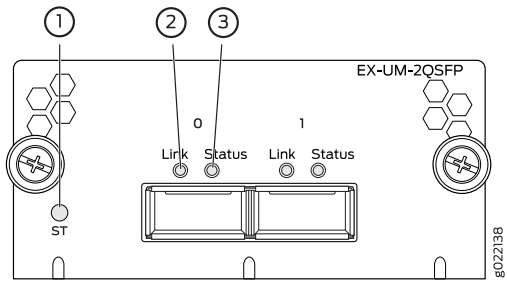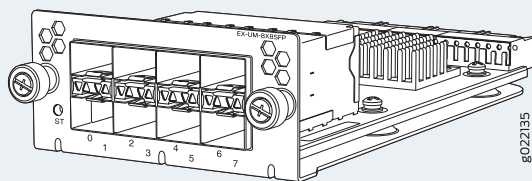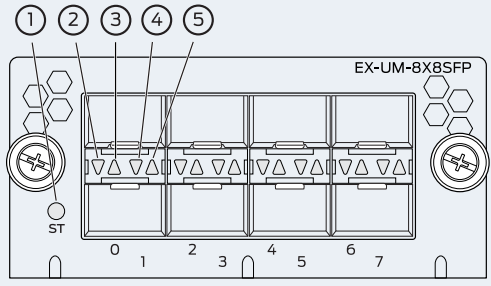
Uplink Module	Figure
2-port 40-Gigabit Ethernet QSFP+ uplink module	**Figure 31: 2-Port 40-Gigabit Ethernet QSFP+ Uplink Module** **Figure 32: LEDs on the 2-Port 40-Gigabit Ethernet QSFP+ Uplink Module**

1— Status LED of the uplink module	3—Status LED of the uplink module port
2—Link activity LED of the uplink module port	

Table 40: Uplink Modules Used in 32-Port EX4300 Switches *(continued)*

Uplink Module	Figure
8-port 10-Gigabit Ethernet SFP+ uplink module	**Figure 33: 8-Port 10-Gigabit Ethernet SFP+ Uplink Module** **Figure 34: LEDs on the 8-Port 10-Gigabit Ethernet SFP+ Uplink Module** 1— Status LED of the uplink module 4—Status LED the lower port 2—Link activity LED of the lower port 5—Status LED the upper port 3—Link activity LED of the upper port

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NOTE: When you install an uplink module in the switch or replace an uplink module with another uplink module, the switch detects the ports on the uplink module. The switch creates the required interfaces when transceivers are installed in these ports.

The SFP+ uplink module ports can operate either in 10-gigabit or in 1-gigabit mode depending on the transceiver you install in them. The operating mode for an SFP+ uplink module is shown in the output of the **show chassis pic fpc-slot** *slot number* **pic-slot** *slot number* command.

Each port on the uplink modules has a pair of LEDs that indicate the link activity and status of the port. See "Network Port, Built-In QSFP+ Port, Uplink Port, and Uplink Module Port LEDs on EX4300 Switches" on page 31 for details about the status and link activity LEDs.

The SFP+ uplink modules are shipped with dust covers installed in the ports. The QSFP+ uplink module is shipped with a dust cover installed in one of the ports.

Related Documentation

- SFP+ Direct Attach Cables for EX Series Switches on page 90

- Installing an Uplink Module in an EX4300 Switch on page 147

- *EX Series Switches Interfaces Overview*

Component Specifications

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*
- *Rear Panel of an EX3200 Switch*
- *Rear Panel of an EX3300 Switch*
- *Rear Panel of an EX4200 Switch*
- EX4300 Switches Hardware Overview on page 3
- *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*

Console Port Connector Pinout Information for an EX Series Switch

The console port on an EX Series switch 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 41 on page 62 provides the pinout information for the RJ-45 console connector. An RJ-45 cable and an RJ-45 to DB-9 serial port adapter are supplied with the switch.

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 an EX Series switch, use a combination of the RJ-45 to DB-9 female adapter supplied with the switch and a USB to DB-9 male adapter. You must provide the USB to DB-9 male adapter.

Table 41: EX Series Switches Console Port Connector Pinout Information

Pin	Signal	Description
1	RTS Output	Request to send
2	DTR Output	Data terminal ready

Table 41: EX Series Switches Console Port Connector Pinout Information *(continued)*

Pin	Signal	Description
3	TxD Output	Transmit data
4	Signal Ground	Signal ground
5	Signal Ground	Signal ground
6	RxD Input	Receive data
7	CD Input	Data carrier detect
8	CTS Input	Clear to send

Related Documentation

- *EX2200 Switches Hardware Overview*
- *Rear Panel of an EX3200 Switch*
- *Rear Panel of an EX3300 Switch*
- *Rear Panel of an EX4200 Switch*
- EX4300 Switches Hardware Overview on page 3
- *Front Panel of an EX4500 Switch*
- *EX4550 Switches Hardware Overview*
- *Management Panel of an EX4600 Switch*
- *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*
- Connecting a Switch to a Management Console on page 170
- *Configuring the Console Port Type (CLI Procedure)*

Mini-USB Port Specifications for an EX4300 Switch

The EX4300 switch has two management console ports: an RJ-45 port and a Mini-USB Type-B port. The RJ-45 console port is on the rear panel of the switch and the Mini-USB Type-B console port is on the front panel of the switch. Figure 35 on page 64 shows the location of the Mini-USB Type-B console port on a 24-port EX4300 switch.

Figure 35: Location of the Mini-USB Type-B Console Port on the Front Panel of an EX4300 Switch
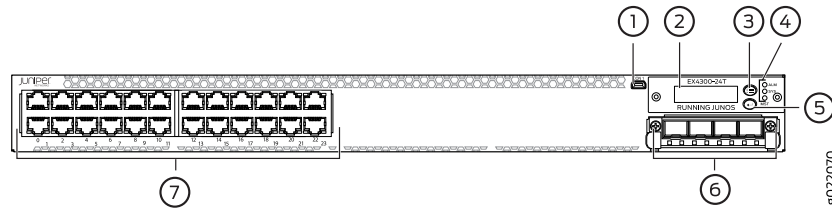
1—Mini-USB console port	5—LCD panel Enter button
2—LCD panel	6—SFP+ uplink module ports (optional)
3—LCD panel Menu button	7—Network ports
4—Chassis status LEDs	

If your management host (laptop or PC) does not have a DB-9 male connector pin or an RJ-45 connector pin, you can connect your management host to the Mini-USB Type-B console port of an EX4300 switch 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 42 on page 64 provides the pinout information of the Mini-USB Type-B console port.

Table 42: Mini-USB Type-B Console Port Pinout Information for EX4300 Switches

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
- EX4300 Switches Hardware Overview on page 3

Management Port Connector Pinout Information for an EX4300 Switch

The management port on an EX4300 switch uses an RJ-45 connector to connect to a management device for out-of-band management.

The port uses an autosensing RJ-45 connector to support a 10/100/1000BASE-T connection. Two LEDs on the port indicate link activity on the port and the administrative status of the port. See "Management Port LEDs on EX4300 Switches" on page 35.

Table 43 on page 65 provides the pinout information for the RJ-45 connector for the management port. An RJ-45 cable, with a connector attached, is supplied with the switch.

Table 43: Management Port Connector Pinout Information for EX4300 Switches

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

- EX4300 Switches Hardware Overview on page 3
- Connecting a Switch to a Network for Out-of-Band Management on page 168

Network Port, QSFP+ Port, SFP Port, and SFP+ Port Connector Pinout Information for EX4300 Switches

Depending on the switch model EX4300 switches support 10/100/1000BASE-T Ethernet network ports, SFP network ports, SFP+ uplink and uplink module ports, and QSFP+ ports.

Tables in this topic describe the connector pinout information for these ports.

- Table 44 on page 66—10/100/1000BASE-T Ethernet network port connector pinout information
- Table 45 on page 66—SFP network port connector pinout information
- Table 46 on page 67—Built-in SFP+ port and SFP+ uplink module port connector pinout information
- Table 47 on page 68—Built-in QSFP+ port and QSFP+ uplink module port connector pinout information

Table 44: 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)
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 45: 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

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

Pin	Signal	Description
12	RD-	Receiver inverted data output
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 46: Built-in SFP+ Uplink Port and SFP+ Uplink Module 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

Table 46: Built-in SFP+ Uplink Port and SFP+ Uplink Module Port Connector Pinout Information *(continued)*

Pin	Signal	Description
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 47: Built-in QSFP+ Port and QSFP+ Uplink Module 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

Table 47: Built-in QSFP+ Port and QSFP+ Uplink Module Port Connector Pinout Information *(continued)*

Pin	Signal
15	RX3n
16	GND
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

Table 47: Built-in QSFP+ Port and QSFP+ Uplink Module Port Connector Pinout Information *(continued)*

Pin	Signal
38	GND

Related Documentation

- Uplink Modules in EX4300 Switches on page 55
- EX4300 Switches Hardware Overview on page 3

Pluggable Transceivers Supported on EX4300 Switches

Optional uplink modules for EX4300 switches support SFP, SFP+, and QSFP+ transceivers. This topic describes the optical interfaces supported for those transceivers. It also lists the copper interfaces supported for the SFP transceivers.

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

CAUTION: If you are having a problem running a Juniper Networks device that is using 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.

The Gigabit Ethernet SFP, SFP+, and QSFP+ transceivers installed in EX4300 switches support digital optical monitoring (DOM): You can view the diagnostic details for these transceivers by issuing the operational mode CLI command **show interfaces diagnostics optics**.

NOTE: The transceivers support DOM even if they are installed in the SFP+ uplink module ports or QSFP+ ports configured as Virtual Chassis ports (VCPs).

The tables in this topic describe the optical interface support over single-mode fiber-optic (SMF) and multimode fiber-optic (MMF) cables for SFP, SFP+, and QSFP+ transceivers and the copper interfaces supported for the SFP transceivers:

- Table 48 on page 71—Optical interface support and copper interface support for Gigabit Ethernet SFP transceivers.
- Table 49 on page 79—Optical interface support for Fast Ethernet SFP transceivers.

> **NOTE:** Only the SFP network ports on 32-port EX4300 switches support Fast Ethernet SFP transceivers. The built-in uplink ports or the uplink module ports do not support Fast Ethernet SFP transceivers.

Table 48: Optical interface Support and Copper Interface Support for Gigabit Ethernet SFP Transceivers in EX4300 Switches

Ethernet Standard	Specification	Value
1000BASE-T	Model number	EX-SFP-1GE-T
	Rate	10/100/1000 Mbps
	Connector type	RJ-45
	Transmitter wavelength	–
	Minimum launch power	–
	Maximum launch power	–
	Minimum receiver sensitivity	–
	Maximum input power	–
	Core/Cladding size	–
	Modal bandwidth	–
	Distance	100 m (328 ft)
	Software required	• EX4300-32F switches—Junos OS for EX Series switches, Release 13.2X51-D15 or later • EX4300-32F-S switches—Junos OS for EX Series switches, Release 13.2X51-D26 or later
	Support for Virtual Chassis configuration	No

Table 48: Optical interface Support and Copper Interface Support for Gigabit Ethernet SFP Transceivers in EX4300 Switches *(continued)*

Ethernet Standard	Specification	Value			
1000BASE-SX	Model number	EX-SFP-1GE-SX			
	Rate	1000 Mbps			
	Connector type	LC			
	Transmitter wavelength	850 nm			
	Minimum launch power	−9.5 dBm			
	Maximum launch power	−3 dBm			
	Minimum receiver sensitivity	−21 dBm			
	Maximum input power	0 dBm			
	Fiber type	MMF			
	Core size	62.5 µm	62.5 µm	50 µm	50 µm
	Modal bandwidth	160 MHz/km	200 MHz/km	400 MHz/km	500 MHz/km
	Distance	220 m (721 ft)	275 m (902 ft)	500 m (1640 ft)	550 m (1804 ft)
	DOM support	Available			
	Support for Virtual Chassis configuration	No			
	Software required	• EX4300-24T, EX4300-24P, EX4300-48T, EX4300-48T-AFI, EX4300-48P, EX4300-48T-DC, and EX4300-48T-DC-AFI switches—Junos OS for EX Series switches, Release 13.2X50-D10 or later • EX4300-32F switches—Junos OS for EX Series switches, Release 13.2X51-D15 or later • EX4300-24T-S, EX4300-24P-S, EX4300-32F-S, EX4300-48T-S, and EX4300-48P-S switches—Junos OS for EX Series switches, Release 13.2X51-D26 or later			

Table 48: Optical interface Support and Copper Interface Support for Gigabit Ethernet SFP Transceivers in EX4300 Switches *(continued)*

Ethernet Standard	Specification	Value
1000BASE-LX	Model number	EX-SFP-1GE-LX
	Rate	1000 Mbps
	Connector type	LC
	Fiber count	Dual
	Transmitter wavelength	1310 nm
	Minimum launch power	−9.5 dBm
	Maximum launch power	−3 dBm
	Minimum receiver sensitivity	−25 dBm
	Maximum input power	−3 dBm
	Fiber type	SMF
	Core/Cladding size	9/125 μm
	Modal bandwidth	−
	Distance	10 km (6.2 miles)
	DOM support	Available
	Support for Virtual Chassis configuration	No
	Software required	• EX4300-24T, EX4300-24P, EX4300-48T, EX4300-48T-AFI, EX4300-48P, EX4300-48T-DC, and EX4300-48T-DC-AFI switches—Junos OS for EX Series switches, Release 13.2X50-D10 or later • EX4300-32F switches—Junos OS for EX Series switches, Release 13.2X51-D15 or later • EX4300-24T-S, EX4300-24P-S, EX4300-32F-S, EX4300-48T-S, and EX4300-48P-S switches—Junos OS for EX Series switches, Release 13.2X51-D26 or later

Table 48: Optical interface Support and Copper Interface Support for Gigabit Ethernet SFP Transceivers in EX4300 Switches *(continued)*

Ethernet Standard	Specification	Value
1000BASE-BX-U	Model number	EX-SFP-GE10KT13R14
	Rate	1000 Mbps
	Connector type	LC
	Fiber count	Single
	Transmitter wavelength	1310 nm
	Receiver wavelength	1490 nm
	Minimum launch power	−9 dBm
	Maximum launch power	−3 dBm
	Minimum receiver sensitivity	−30 dBm
	Maximum input power	−3 dBm
	Fiber type	SMF
	Core/Cladding size	9/125 μm
	Modal bandwidth	−
	Distance	10 km (6.2 miles)
	DOM support	Available
	Support for Virtual Chassis configuration	No
	Software required	Junos OS for EX Series switches, Release 14.1X53-D26 or later

Table 48: Optical interface Support and Copper Interface Support for Gigabit Ethernet SFP Transceivers in EX4300 Switches *(continued)*

Ethernet Standard	Specification	Value
1000BASE-BX-D	Model number	EX-SFP-GE10KT14R13
	Rate	1000 Mbps
	Connector type	LC
	Fiber count	Single
	Transmitter wavelength	1490 nm
	Receiver wavelength	1310 nm
	Minimum launch power	−9 dBm
	Maximum launch power	−3 dBm
	Minimum receiver sensitivity	−30 dBm
	Maximum input power	−3 dBm
	Fiber type	SMF
	Core/Cladding size	9/125 µm
	Modal bandwidth	−
	Distance	10 km (6.2 miles)
	DOM support	Available
	Support for Virtual Chassis configuration	No
	Software required	Junos OS for EX Series switches, Release 14.1X53-D26 or later

Table 48: Optical interface Support and Copper Interface Support for Gigabit Ethernet SFP Transceivers in EX4300 Switches *(continued)*

Ethernet Standard	Specification	Value
1000BASE-BX-U	Model number	EX-SFP-GE10KT13R15
	Rate	1000 Mbps
	Connector type	LC
	Fiber count	Single
	Transmitter wavelength	1310 nm
	Receiver wavelength	1550 nm
	Minimum launch power	−9 dBm
	Maximum launch power	−3 dBm
	Minimum receiver sensitivity	−21 dBm
	Maximum input power	−3 dBm
	Fiber type	SMF
	Core/Cladding size	9/125 μm
	Modal bandwidth	−
	Distance	10 km (6.2 miles)
	DOM support	Available
	Support for Virtual Chassis configuration	No
	Software required	Junos OS for EX Series switches, Release 14.1X53-D26 or later

Table 48: Optical interface Support and Copper Interface Support for Gigabit Ethernet SFP Transceivers in EX4300 Switches *(continued)*

Ethernet Standard	Specification	Value
1000BASE–BX-D	Model number	EX–SFP-GE10KT15R13
	Rate	1000 Mbps
	Connector type	LC
	Fiber count	Single
	Transmitter wavelength	1550 nm
	Receiver wavelength	1310 nm
	Minimum launch power	−9 dBm
	Maximum launch power	−3 dBm
	Minimum receiver sensitivity	−21 dBm
	Maximum input power	−3 dBm
	Fiber type	SMF
	Core/Cladding size	9/125 μm
	Modal bandwidth	−
	Distance	10 km (6.2 miles)
	DOM support	Available
	Support for Virtual Chassis configuration	No
	Software required	Junos OS for EX Series switches, Release 14.1X53-D26 or later

Table 48: Optical interface Support and Copper Interface Support for Gigabit Ethernet SFP Transceivers in EX4300 Switches *(continued)*

Ethernet Standard	Specification	Value
1000BASE-LH (or 1000BASE-ZX)	Model number	EX-SFP-1GE-LH
	Rate	1000 Mbps
	Connector type	LC
	Fiber count	Dual
	Transmitter wavelength	1550 nm
	Minimum launch power	−2 dBm
	Maximum launch power	5 dBm
	Minimum receiver sensitivity	−25 dBm
	Maximum input power	−3 dBm
	Fiber type	SMF
	Core/Cladding size	9/125 μm
	Modal bandwidth	−
	Distance	70 km (43.5 miles)
	DOM support	Available
	Support for Virtual Chassis configuration	No
	Software required	• EX4300-24T, EX4300-24P, EX4300-48T, EX4300-48T-AFI, EX4300-48P, EX4300-48T-DC, and EX4300-48T-DC-AFI switches—Junos OS for EX Series switches, Release 13.2X50-D10 or later • EX4300-32F switches—Junos OS for EX Series switches, Release 13.2X51-D15 or later • EX4300-24T-S, EX4300-24P-S, EX4300-32F-S, EX4300-48T-S, and EX4300-48P-S switches—Junos OS for EX Series switches, Release 13.2X51-D26 or later

Table 49: Optical interface Support for Fast Ethernet SFP Transceivers in EX4300 Switches

Ethernet Standard	Specification	Value
100BASE-FX NOTE: Only the SFP network ports on 32-port EX4300 switches support Fast Ethernet SFP transceivers. The built-in uplink ports or the uplink module ports do not support Fast Ethernet SFP transceivers.	Model number	EX-SFP-1FE-FX
	Rate	100 Mbps
	Connector type	LC
	Fiber count	Dual
	Transmitter wavelength	1310 nm
	Minimum launch power	−20 dBm
	Maximum launch power	−14 dBm
	Minimum receiver sensitivity	−32.5 dBm
	Maximum input power	−8 dBm
	Fiber type	MMF
	Core/Cladding size	62.5/125 μm
	Fiber grade	FDDI/OM1
	Modal bandwidth	500 MHz/km
	Distance	2 km (1.2 miles)
	DOM support	Not available
	Support for Virtual Chassis configuration	No
	Software required	• EX4300-32F switches—Junos OS for EX Series switches, Release 13.2X51-D15 or later • EX4300-32F-S switches—Junos OS for EX Series switches, Release 13.2X51-D26 or later

Table 50: Optical interface Support for SFP+ Transceivers in EX4300 Switches

Ethernet Standard	Specification	Value		
10GBASE-USR	Model number	EX-SFP-10GE-USR		
	Rate	10 Gbps		
	Connector type	LC		
	Fiber count	Dual		
	Transmitter wavelength	850 nm		
	Minimum launch power	−7.3 dBm		
	Maximum launch power	−1.3 dBm		
	Minimum receiver sensitivity	−11.1 dBm		
	Maximum input power	−1.0 dBm		
	Fiber type	MMF		
	Core/Cladding size	62.5/125 μm	50/125 μm	50/125 μm
	Fiber grade	OM1	OM3	OM3
	Modal bandwidth	200 MHz/km	500 MHz/km	1500 MHz/km
	Distance	10 m (32.8 ft)	30 m (98.4 ft)	100 m (328 ft)
	DOM support	Available		
	Support for Virtual Chassis configuration	Yes		
	Software required	• EX4300-24T, EX4300-24P, EX4300-48T, EX4300-48T-AFI, EX4300-48P, EX4300-48T-DC, and EX4300-48T-DC-AFI switches—Junos OS for EX Series switches, Release 13.2X50-D10 or later • EX4300-32F switches—Junos OS for EX Series switches, Release 13.2X51-D15 or later • EX4300-24T-S, EX4300-24P-S, EX4300-32F-S, EX4300-48T-S, and EX4300-48P-S switches—Junos OS for EX Series switches, Release 13.2X51-D26 or later		

Table 50: Optical interface Support for SFP+ Transceivers in EX4300 Switches *(continued)*

Ethernet Standard	Specification	Value				
10GBASE-SR	Model number	EX-SFP-10GE-SR				
	Rate	10 Gbps				
	Connector type	LC				
	Fiber count	Dual				
	Transmitter wavelength	850 nm				
	Minimum launch power	−7.3 dBm				
	Maximum launch power	−1 dBm				
	Minimum receiver sensitivity	−9.9 dBm				
	Maximum input power	−1 dBm				
	Fiber type	MMF				
	Core/Cladding size	62.5/125 µm	62.5/125 µm	50/125 µm	50/125 µm	50/125 µm
	Fiber grade	FDDI	OM1	−	OM2	OM3
	Modal bandwidth	160 MHz/km	200 MHz/km	400 MHz/km	500 MHz/km	1500 MHz/km
	Distance	26 m (85 ft)	33 m (108 ft)	66 m (216 ft)	82 m (269 ft)	300 m (984 ft)
	DOM support	Available				
	Support for Virtual Chassis configuration	Yes				
	Software required	• EX4300-24T, EX4300-24P, EX4300-48T, EX4300-48T-AFI, EX4300-48P, EX4300-48T-DC, and EX4300-48T-DC-AFI switches—Junos OS for EX Series switches, Release 13.2X50-D10 or later • EX4300-32F switches—Junos OS for EX Series switches, Release 13.2X51-D15 or later • EX4300-24T-S, EX4300-24P-S, EX4300-32F-S, EX4300-48T-S, and EX4300-48P-S switches—Junos OS for EX Series switches, Release 13.2X51-D26 or later				

Table 50: Optical interface Support for SFP+ Transceivers in EX4300 Switches *(continued)*

Ethernet Standard	Specification	Value		
10GBASE-LRM	Model number	EX-SFP-10GE-LRM		
	Rate	10 Gbps		
	Connector type	LC		
	Fiber count	Dual		
	Transmitter wavelength	1310 nm		
	Minimum launch power	−6.5 dBm		
	Maximum launch power	0.5 dBm		
	Minimum receiver sensitivity	−21 dBm		
	Maximum input power	0.5 dBm		
	Fiber type	MMF		
	Core/Cladding size	62.5/125 μm	50/125 μm	50/125 μm
	Fiber grade	FDDI/OM1	OM2	OM3
	Modal bandwidth	500 MHz/km	500 MHz/km	500 MHz/km
	Distance	220 m (722 ft)	220 m (722 ft)	220 m (722 ft)
	DOM support	Available		
	Support for Virtual Chassis configuration	Yes		
	Software required	• EX4300-24T, EX4300-24P, EX4300-48T, EX4300-48T-AFI, EX4300-48P, EX4300-48T-DC, and EX4300-48T-DC-AFI switches—Junos OS for EX Series switches, Release 13.2X50-D10 or later • EX4300-32F switches—Junos OS for EX Series switches, Release 13.2X51-D15 or later • EX4300-24T-S, EX4300-24P-S, EX4300-32F-S, EX4300-48T-S, and EX4300-48P-S switches—Junos OS for EX Series switches, Release 13.2X51-D26 or later		

Table 50: Optical interface Support for SFP+ Transceivers in EX4300 Switches *(continued)*

Ethernet Standard	Specification	Value
10GBASE-LR	Model number	EX–SFP–10GE–LR
	Rate	10 Gbps
	Connector type	LC
	Fiber count	Dual
	Transmitter wavelength	1310 nm
	Minimum launch power	−8.2 dBm
	Maximum launch power	0.5 dBm
	Minimum receiver sensitivity	−18 dBm
	Maximum input power	0.5 dBm
	Fiber type	SMF
	Core/Cladding size	9/125 μm
	Modal bandwidth	–
	Distance	10 km (6.2 miles)
	DOM support	Available
	Support for Virtual Chassis configuration	Yes
	Software required	• EX4300-24T, EX4300-24P, EX4300-48T, EX4300-48T-AFI, EX4300-48P, EX4300-48T-DC, and EX4300-48T-DC-AFI switches—Junos OS for EX Series switches, Release 13.2X50-D10 or later • EX4300-32F switches—Junos OS for EX Series switches, Release 13.2X51-D15 or later • EX4300-24T-S, EX4300-24P-S, EX4300-32F-S, EX4300-48T-S, and EX4300-48P-S switches—Junos OS for EX Series switches, Release 13.2X51-D26 or later

Table 50: Optical interface Support for SFP+ Transceivers in EX4300 Switches *(continued)*

Ethernet Standard	Specification	Value
10GBASE-ER	Model number	EX–SFP–10GE–ER
	Rate	10 Gbps
	Connector type	LC
	Fiber count	Dual
	Transmitter wavelength	1550 nm
	Minimum launch power	−4.7 dBm
	Maximum launch power	4 dBm
	Minimum receiver sensitivity	−15.8 dBm
	Maximum input power	−1 dBm
	Fiber type	SMF
	Core/Cladding size	9/125 μm
	Modal bandwidth	−
	Distance	40 km (24.8 miles)
	DOM support	Available
	Support for Virtual Chassis configuration	Yes
	Software required	• EX4300-24T, EX4300-24P, EX4300-48T, EX4300-48T-AFI, EX4300-48P, EX4300-48T-DC, and EX4300-48T-DC-AFI switches—Junos OS for EX Series switches, Release 13.2X50-D10 or later • EX4300-32F switches—Junos OS for EX Series switches, Release 13.2X51-D15 or later • EX4300-24T-S, EX4300-24P-S, EX4300-32F-S, EX4300-48T-S, and EX4300-48P-S switches—Junos OS for EX Series switches, Release 13.2X51-D26 or later

Table 50: Optical interface Support for SFP+ Transceivers in EX4300 Switches *(continued)*

Ethernet Standard	Specification	Value
10GBASE-ZR	Model number	EX–SFP–10GE–ZR
	Rate	10 Gbps
	Connector type	LC
	Fiber count	Dual
	Transmitter wavelength	1550 nm
	Minimum launch power	0 dBm
	Maximum launch power	5 dBm
	Minimum receiver sensitivity	−20 dBm
	Maximum input power	−8 dBm
	Fiber type	SMF
	Core/Cladding size	9/125 μm
	Modal bandwidth	−
	Distance	80 km (49.7 miles)
	DOM support	Available
	Support for Virtual Chassis configuration	Yes
	Software required	• EX4300-24T, EX4300-24P, EX4300-48T, EX4300-48T-AFI, EX4300-48P, EX4300-48T-DC, and EX4300-48T-DC-AFI switches—Junos OS for EX Series switches, Release 13.2X50-D10 or later • EX4300-32F switches—Junos OS for EX Series switches, Release 13.2X51-D15 or later • EX4300-24T-S, EX4300-24P-S, EX4300-32F-S, EX4300-48T-S, and EX4300-48P-S switches—Junos OS for EX Series switches, Release 13.2X51-D26 or later

Table 51: Optical interface Support for QSFP+ Transceivers in EX4300 Switches

Ethernet Standard	Specification	Value	
40GBASE-SR4	Model number	QFX-QSFP-40G-SR4	
	Rate	40 Gbps	
	Connector type	12-ribbon multimode fiber crossover cable with female MTP connectors	
	Fiber count	12	
	Transmitter wavelength	850 nm	
	Minimum launch power	−7.6 dBm (per lane)	
	Maximum launch power	2.4 dBm (per lane)	
	Maximum receiver sensitivity	−5.4 dBm	
	Maximum input power	4 dBm	
	Fiber type	MMF	
	Core/Cladding size	50/125 µm	50/125 µm
	Fiber grade	OM3	OM4
	Modal bandwidth	2000 MHz/km	4700 MHz/km
	Distance	100 m (328 ft)	150 m (492 ft)
	DOM support	Available	
	Support for Virtual Chassis configuration	Yes	
	Software required	• EX4300-24T, EX4300-24P, EX4300-48T, EX4300-48T-AFI, EX4300-48P, EX4300-48T-DC, and EX4300-48T-DC-AFI switches—Junos OS for EX Series switches, Release 13.2X50-D10 or later • EX4300-32F switches—Junos OS for EX Series switches, Release 13.2X51-D15 or later • EX4300-24T-S, EX4300-24P-S, EX4300-32F-S, EX4300-48T-S, and EX4300-48P-S switches—Junos OS for EX Series switches, Release 13.2X51-D26 or later	

Table 51: Optical interface Support for QSFP+ Transceivers in EX4300 Switches *(continued)*

Ethernet Standard	Specification	Value	
40GBASE-ESR4	Model number	QFX-QSFP-40G-ESR4	
	Rate	40 Gbps	
	Connector type	12-ribbon multimode fiber crossover cable with female MTP connectors	
	Fiber count	12	
	Transmitter wavelength	850 nm	
	Minimum launch power	−4.3 dBm (per lane)	
	Maximum launch power	−1 dBm (per lane)	
	Maximum receiver sensitivity	−7.5 dBm	
	Maximum input power	−1 dBm	
	Fiber type	MMF	
	Core/Cladding size	50/125 µm	50/125 µm
	Fiber grade	OM3	OM4
	Modal bandwidth	2000 MHz/km	4700 MHz/km
	Distance	300 m (984 ft)	400 m (1312 ft)
	DOM support	Available	
	Support for Virtual Chassis configuration	Yes	
	Software required	• EX4300-24T, EX4300-24P, EX4300-48T, EX4300-48T-AFI, EX4300-48P, EX4300-48T-DC, and EX4300-48T-DC-AFI switches—Junos OS for EX Series switches, Release 13.2X50-D10 or later • EX4300-32F switches—Junos OS for EX Series switches, Release 13.2X51-D15 or later • EX4300-24T-S, EX4300-24P-S, EX4300-32F-S, EX4300-48T-S, and EX4300-48P-S switches—Junos OS for EX Series switches, Release 13.2X51-D26 or later	

Table 51: Optical interface Support for QSFP+ Transceivers in EX4300 Switches *(continued)*

Ethernet Standard	Specification	Value	
40GBASE-LX4	Model number	JNP-QSFP-40G-LX4	
	Rate	40 Gbps (10 Gbps per lane)	
	Connector type	Dual LC	
	Fiber count	Dual	
	Lane wavelength	Lane 0–1271 nm Lane 1–1291 nm Lane 2–1311 nm Lane 3–1331 nm	
	Minimum launch power	-7.0 dBm (per lane)	
	Maximum launch power	4.3 dBm (per lane)	
	Maximum power draw	3.5 W	
	Fiber type	MMF	MMF
	Core/Cladding size	50/125 µm	50/125 µm
	Fiber grade	OM3	OM4
	Modal bandwidth	2000 MHz/km	4700 MHz/km
	Distance	100 m (328 ft)	150 m (328 ft)
	DOM support	Available	
	Support for Virtual Chassis configuration	Yes	
	Software required	Junos OS for EX Series switches, Release 14.1 or later	

Table 51: Optical interface Support for QSFP+ Transceivers in EX4300 Switches *(continued)*

Ethernet Standard	Specification	Value
40GBASE-LR4	Model number	JNP-QSFP-40G-LR4
	Rate	40 Gbps (10Gbps per Lane)
	Connector type	LC
	Fiber count	Dual
	Lane wavelength	Lane 0—1264.5 nm through 1277.5 nm
		Lane 1—1284.5 nm through 1297.5 nm
		Lane 2—1304.5 nm through 1317.5 nm
		Lane 3—1324.5 nm through 1337.5 nm
	Minimum launch power	−7.0 dBm (per lane)
	Maximum launch power	2.3 dBm (per lane)
	Maximum receiver sensitivity	−11.5 dBm (per lane)
	Maximum input power (per lane)	3.3 dBm (per lane)
	Fiber type	SMF
	Core/Cladding size	9/125 μm
	Distance	10 km (6.2 miles)
	DOM support	Available
	Support for Virtual Chassis configuration	Yes
	Software required	• EX4300-24T, EX4300-24P, EX4300-48T, EX4300-48T-AFI, EX4300-48P, EX4300-48T-DC, and EX4300-48T-DC-AFI switches—Junos OS for EX Series switches, Release 13.2X50-D10 or later • EX4300-32F switches—Junos OS for EX Series switches, Release 13.2X51-D15 or later • EX4300-24T-S, EX4300-24P-S, EX4300-32F-S, EX4300-48T-S, and EX4300-48P-S switches—Junos OS for EX Series switches, Release 13.2X51-D26 or later

Related Documentation

SFP+ Direct Attach Cables for EX Series Switches

Small form-factor pluggable plus transceiver (SFP+) direct attach copper cables, also known as Twinax cables, are suitable for in-rack connections between servers and switches. They are suitable for short distances of up to 7 m (23 ft), making them ideal for highly cost-effective networking connectivity within a rack and between adjacent racks. See Figure 36 on page 90.

Figure 36: SFP+ Direct Attach Cables for EX Series Switches
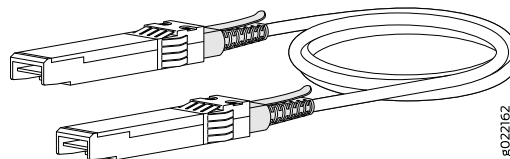
This topic describes:

Cable Specifications

EX Series switches support SFP+ passive direct attach cables. The passive Twinax cable is a straight cable with no active electronic components. EX Series switches support 1 m, 3 m, 5 m, and 7 m long SFP+ passive direct attach cables.

Table 52 on page 90 describes the support for SFP+ passive direct attach cable lengths on EX Series switches for Junos OS releases.

Table 52: Software Support for SFP+ Passive Direct Attach Cables for EX Series Switches

Switch	Software Support Added	Cable Length
EX3200 switches	Junos OS Release 10.3	1 m (3 ft), 3 m (10 ft), 5 m (16 ft), and 7 m (23 ft)
EX4200-24T, EX4200-24T-DC, EX4200-24P, EX4200-24PX, EX4200-24F, EX4200-24F-DC, EX4200-48T, EX4200-48T-DC, EX4200-48P, and EX4200-48PX switches	Junos OS Release 10.3	1 m (3 ft), 3 m (10 ft), 5 m (16 ft), and 7 m (23 ft)
EX4200-24F-S and EX4200-48T-S switches	Junos OS Release 12.3R4	1 m (3 ft), 3 m (10 ft), 5 m (16 ft), and 7 m (23 ft)
EX3300 switches	Junos OS Release 11.3	1 m (3 ft), 3 m (10 ft), 5 m (16 ft), and 7 m (23 ft)

Table 52: Software Support for SFP+ Passive Direct Attach Cables for EX Series Switches *(continued)*

Switch	Software Support Added	Cable Length
EX4300-24T, EX4300-24P, EX4300-48T, EX4300-48T-AFI, EX4300-48P, EX4300-48T-DC, and EX4300-48T-DC-AFI switches	Junos OS Release 13.2X50-D10	1 m (3 ft), 3 m (10 ft), 5 m (16 ft), and 7 m (23 ft)
EX4300-32F switches	Junos OS Release 13.2X51-D15	1 m (3 ft) and 3 m (10 ft)
EX4300-24T-S, EX4300-24P-S, EX4300-48T-S, and EX4300-48P-S switches	Junos OS Release 13.2X51-D26	1 m (3 ft), 3 m (10 ft), 5 m (16 ft), and 7 m (23 ft)
EX4300-32F-S switches	Junos OS Release 13.2X51-D26	1 m (3 ft) and 3 m (10 ft)
EX4500 switches	Junos OS Release 10.2	1 m (3 ft), 3 m (10 ft), and 7 m (23 ft)
	Junos OS Release 11.2	5 m (16 ft)
EX4550-32T-AFI, EX4550-32T-AFO, EX4550-32T-DC-AFI, EX4550-32T-DC-AFO, EX4550-32F-AFI, EX4550-32F-AFO, EX4550-32F-DC-AFI, and EX4550-32F-DC-AFO switches	Junos OS Release 12.2	1 m (3 ft), 3 m (10 ft), 5 m (16 ft), and 7 m (23 ft)
EX4550-32F-S switches	Junos OS Release 12.3R5	1 m (3 ft), 3 m (10 ft), 5 m (16 ft), and 7 m (23 ft)
EX8200 8-port SFP+ line cards (EX8200-8XS)	Junos OS Release 10.0	1 m (3 ft), 3 m (10 ft), and 7 m (23 ft)
	Junos OS Release 10.3	5 m (16 ft)
EX8200 40-port SFP+ line cards (EX8200-40XS)	Junos OS Release 10.3	1 m (3 ft), 3 m (10 ft), and 7 m (23 ft)
	Junos OS Release 11.1	5 m (16 ft)

NOTE: We recommend that you use only SFP+ direct attach cables purchased from Juniper Networks with your Juniper Networks device.

CAUTION: If you are having a problem running a Juniper Networks device that is using 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.

The cables are hot-removable and hot-insertable: You can remove and replace them without powering off the switch or disrupting switch functions. A cable comprises a low-voltage cable assembly that connects directly into two SFP+ ports, one at each end of the cable. The cables use high-performance integrated duplex serial data links for bidirectional communication and are designed for data rates of up to 10 Gbps.

Table 53 on page 92 describes the cable specifications.

Table 53: SFP+ Direct Attach Cable Specifications

Model Number	Specification	Value
EX-SFP-10GE-DAC-1M	Rate	10-Gbps full-duplex serial transmission
	Connector type	SFP+ passive Twinax cable assembly
	Supply voltage	3.3 V
	Power consumption (per end)	0.57 W
	Storage temperature	−40°C through 85°C
	Cable type	Twinax
	Wire AWG	30 AWG
	Minimum cable bend radius	1 in. (2.54 cm)
	Cable characteristic impedance	100 ohms
	Crosstalk between pairs	2% maximum
	Time delay	1.31 nsec/ft
	Length	3.3 ft (1 m)

Table 53: SFP+ Direct Attach Cable Specifications *(continued)*

Model Number	Specification	Value
EX-SFP-10GE-DAC-3M	Rate	10-Gbps full-duplex serial transmission
	Connector type	SFP+ passive Twinax cable assembly
	Supply voltage	3.3 V
	Power consumption (per end)	0.57 W
	Storage temperature	−40°C through 85°C
	Cable type	Twinax
	Wire AWG	30 AWG
	Minimum cable bend radius	1 in. (2.54 cm)
	Cable characteristic impedance	100 ohms
	Crosstalk between pairs	2% maximum
	Time delay	1.31 nsec/ft
	Length	9.9 ft (3 m)
EX-SFP-10GE-DAC-5M	Rate	10-Gbps full-duplex serial transmission
	Connector type	SFP+ passive Twinax cable assembly
	Supply voltage	3.3 V
	Power consumption (per end)	0.57 W
	Storage temperature	−40°C through 85°C
	Cable type	Twinax
	Wire AWG	24 AWG
	Minimum cable bend radius	1 in. (2.54 cm)
	Cable characteristic impedance	100 ohms
	Crosstalk between pairs	2% maximum
	Time delay	1.31 nsec/ft
	Length	16.4 ft (5 m)

Table 53: SFP+ Direct Attach Cable Specifications *(continued)*

Model Number	Specification	Value
EX-SFP-10GE-DAC-7M	Rate	10-Gbps full-duplex serial transmission
	Connector type	SFP+ passive Twinax cable assembly
	Supply voltage	3.3 V
	Power consumption (per end)	0.57 W
	Storage temperature	−40°C through 85°C
	Cable type	Twinax
	Wire AWG	24 AWG
	Minimum cable bend radius	1 in. (2.54 cm)
	Cable characteristic impedance	100 ohms
	Crosstalk between pairs	2% maximum
	Time delay	1.31 nsec/ft
	Length	23 ft (7 m)

Standards Supported by These Cables

The cables comply with the following standards:

- SFP mechanical standard SFF-843—see ftp://ftp.seagate.com/sff/SFF-8431.PDF .

- Electrical interface standard SFF-8432—see ftp://ftp.seagate.com/sff/SFF-8432.PDF .

- SFP+ Multi-Source Alliance (MSA) standards.

Related Documentation
- *Pluggable Transceivers Supported on EX Series Switches*
- Installing a Transceiver in an EX Series Switch on page 149
- Removing a Transceiver from a Switch on page 203

QSFP+ Direct Attach Cables for EX Series Switches

Quad small form-factor pluggable plus (QSFP+) direct attach copper cables are suitable for in-rack connections between QSFP+ ports of EX Series switches. They are suitable for short distances of up to 16.4 ft (5 m), making them ideal for highly cost-effective networking connectivity within a rack and between adjacent racks. See Figure 37 on page 95.

Figure 37: QSFP+ Direct Attach Cables for EX Series Switches
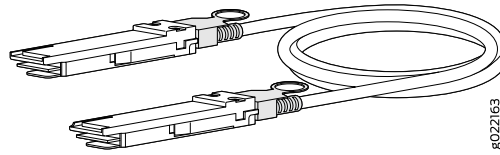
This topic describes:

- Cable Specifications on page 95

Cable Specifications

QSFP+ passive direct attach cables are hot-removable and hot-insertable. A cable consists of a cable assembly that connects directly into two QSFP+ modules, one at each end of the cable. The cables use integrated duplex serial data links for bidirectional communication and are designed for data rates up to 40 Gbps. Passive direct attach cables have no signal amplification built into the cable assembly.

Table 54 on page 95 describes the support for QSFP+ passive direct attach cable lengths on EX Series switches for Junos OS releases.

Table 54: Software Support for QSFP+ Passive Direct Attach Cables for EX Series Switches

Switch	Software Support Added	DAC Model Number
EX4300 switches	• EX4300-24T, EX4300-24P, EX4300-48T, EX4300-48T-AFI, EX4300-48P, EX4300-48T-DC, and EX4300-48T-DC-AF switches—Junos OS for EX Series switches, Release 13.2X50-D10 or later • EX4300-32F switches—Junos OS for EX Series switches, Release 13.2X51-D15 or later • EX4300-24T-S, EX4300-24P-S, EX4300-32F-S, EX4300-48T-S, and EX4300-48P-S switches—Junos OS for EX Series switches, Release 13.2X51-D26 or later	• EX-QSFP-40GE-DAC-50CM • QFX-QSFP-DAC-1M • QFX-QSFP-DAC-3M • JNP-QSFP-DAC-5M
EX4550 switches	• EX4550-32T-AFI, EX4550-32T-AFO, EX4550-32T-DC-AFI, EX4550-32T-DC-AFO, EX4550-32F-AFI, EX4550-32F-AFO, EX4550-32F-DC-AFI, and EX4550-32F-DC-AFO switches—Junos OS for EX Series switches, Release 13.2X50-D10 or later • EX4550-32F-S switches—Junos OS for EX Series switches, Release 12.3R5 or later	• EX-QSFP-40GE-DAC-50CM • QFX-QSFP-DAC-1M • QFX-QSFP-DAC-3M • JNP-QSFP-DAC-5M

NOTE: We recommend that you use only QSFP+ direct attach cables purchased from Juniper Networks with your Juniper Networks device.

CAUTION: If you are having a problem running a Juniper Networks device that is using 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.

Table 55 on page 96 describes the cable specifications.

Table 55: QSFP+ Direct Attach Cable Specifications

Model Number	Specification	Value
EX-QSFP-40GE-DAC-50CM	Rate	40-Gbps full-duplex serial transmission
	Connector type	QSFP+ passive Twinax cable assembly
	Supply voltage	3.3 V
	Power consumption (per end)	0.015 W
	Storage temperature	−40°C through 85°C
	Cable type	Twinax
	Wire AWG	30 AWG
	Minimum cable bend radius	2.54 cm (1 in.)
	Cable characteristic impedance	100 ohms
	Crosstalk between pairs	1% maximum
	Time delay	4.3 nsec/ft
	Length	0.5 m (1.6 ft)

Table 55: QSFP+ Direct Attach Cable Specifications *(continued)*

Model Number	Specification	Value
QFX-QSFP-DAC-1M	Rate	40-Gbps full-duplex serial transmission
	Connector type	Copper pigtail
	Supply voltage	3.3 V
	Power consumption (per end)	0.015 W
	Storage temperature	−40°C through 85°C
	Cable type	Twinax
	Wire AWG	30 AWG
	Minimum cable bend radius	2.54 cm (1 in.)
	Cable characteristic impedance	100 ohms
	Crosstalk between pairs	1% maximum
	Time delay	4.3 nsec/ft
	Length	1 m (3.28 ft)
QFX-QSFP-DAC-3M	Rate	40-Gbps full-duplex serial transmission
	Connector type	Copper pigtail
	Supply voltage	3.3 V
	Power consumption (per end)	0.015 W
	Storage temperature	−40°C through 85°C
	Cable type	Twinax
	Wire AWG	30 AWG
	Minimum cable bend radius	2.54 cm (1 in.)
	Cable characteristic impedance	100 ohms
	Crosstalk between pairs	1% maximum
	Time delay	4.3 nsec/ft
	Length	3 m (9.84 ft)

Table 55: QSFP+ Direct Attach Cable Specifications *(continued)*

Model Number	Specification	Value
JNP-QSFP-DAC-5M	Rate	40-Gbps full-duplex serial transmission
	Connector type	QSFP+ passive Twinax cable assembly
	Supply voltage	3.3 V
	Power consumption (per end)	0.015 W
	Storage temperature	−40°C through 85°C
	Cable type	Twinax
	Wire AWG	26 AWG
	Minimum cable bend radius	2.54 cm (1 in.)
	Cable characteristic impedance	100 ohms
	Crosstalk between pairs	1% maximum
	Time delay	4.3 nsec/ft
	Length	5 m (16.4 ft)

Related Documentation

- Pluggable Transceivers Supported on EX4300 Switches on page 70
- *Pluggable Transceivers Supported on EX4550 Switches*
- Installing a Transceiver in an EX Series Switch on page 149
- Removing a Transceiver from a Switch on page 203

RJ-45 to DB-9 Serial Port Adapter Pinout Information for a Switch

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 switch, use a combination of the RJ-45 to DB-9 female adapter supplied with the switch along with a USB to DB-9 male adapter.

Table 56 on page 99 provides the pinout information for the RJ-45 to DB-9 serial port adapter.

Table 56: 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 Switch to a Management Console on page 170
- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 185
- *Connecting an EX9200 Switch to a Management Console or an Auxiliary Device*
- *Connecting and Configuring an EX9200 Switch (CLI Procedure)*
- *Connecting and Configuring an OCX1100 Switch (CLI Procedure)*

PART 2

Planning for Switch Installation

CHAPTER 4

Site Preparation

Site Preparation Checklist for EX4300 Switches

The checklist in Table 57 on page 103 summarizes the tasks you need to perform when preparing a site for EX4300 switch installation.

Table 57: 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 107		
Power			
Measure the distance between external power sources and the switch installation site.			
Locate sites for connection of system grounding.			
Calculate the power consumption and requirements.	• AC Power Supply Specifications for EX4300 Switches on page 119 • DC Power Supply Specifications for EX4300 Switches on page 120		
Hardware Configuration			
Choose the number and types of switches you want to install.	"EX4300 Switches Hardware Overview" on page 3		
Rack or Cabinet			

Table 57: Site Preparation Checklist *(continued)*

Item or Task	For More Information	Performed by	Date
Verify that your rack or cabinet meets the minimum requirements for the installation of the switch.	• Rack Requirements for EX4300 Switches on page 111 • Cabinet Requirements for EX4300 Switches on page 112		
Plan rack or cabinet location, including required space clearances.	"Clearance Requirements for Airflow and Hardware Maintenance for EX4300 Switches" on page 113		
Secure the rack or cabinet to the floor and building structure.			
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 225

- General Site Guidelines on page 104

- Installing and Connecting an EX4300 Switch on page 127

- Mounting an EX4300 Switch on page 130

General Site Guidelines

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 also applies to hardware devices in the QFX Series and to OCX1100 switches.

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 254
- Environmental Requirements and Specifications for EX Series Switches on page 107
- *Environmental Requirements and Specifications for OCX1100 Switches*
- *Environmental Requirements and Specifications for a QFX3100 Director Device*
- *Environmental Requirements and Specifications for a QFX3008-I Interconnect Device*
- *Environmental Requirements and Specifications for a QFX3500 Device*
- *Environmental Requirements and Specifications for QFX3600 and QFX3600-I Devices*
- *Environmental Requirements and Specifications for a QFX5100 Device*

Site Electrical Wiring Guidelines

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 also applies to hardware devices in the QFX Series and to OCX1100 switches.

Table 58 on page 106 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 58: 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.
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 switch • Electrical hazards as a result of power surges conducted over the lines into the equipment

Related Documentation

- General Safety Guidelines and Warnings on page 225

- General Electrical Safety Guidelines and Warnings on page 253

- Prevention of Electrostatic Discharge Damage on page 254

- *Power Supply in EX2200 Switches*

- *Power Supply in EX3200 Switches*

- *Power Supply in EX3300 Switches*

- *Power Supply in EX4200 Switches*

- AC Power Supply in EX4300 Switches on page 37

- DC Power Supply in EX4300 Switches on page 45

- *AC Power Supply in EX4500 Switches*

- *DC Power Supply in EX4500 Switches*

- *AC Power Supply in EX4550 Switches*

- *DC Power Supply in EX4550 Switches*

- *AC Power Supply in an EX4600 Switch*

- *DC Power Supply in an EX4600 Switch*

- *AC Power Supplies in an EX6200 Switch*

- *DC Power Supply in an EX6200 Switch*

- *AC Power Supply in an EX8200 Switch*

- *DC Power Supply in an EX8200 Switch*

- *AC Power Supply in an EX9204 Switch*

- *DC Power Supply in an EX9204 Switch*

- *AC Power Supply in an EX9208 Switch*

- *DC Power Supply in an EX9208 Switch*

- *AC Power Supply in an EX9214 Switch*

- *DC Power Supply in an EX9214 Switch*

- *Power Supply in an EX Series Redundant Power System*

- *AC Power Supply in OCX1100 Switches*

- *DC Power Supply in OCX1100 Switches*

- *AC Power Supply in a QFX3100 Director Device*

- *AC Power Supply in a QFX3008-I Interconnect Device*

- *Wiring Tray in a QFX3008-I Interconnect Device*

- *AC Power Supply for a QFX3500, QFX3600, or QFX3600-I Device*

- *DC Power Supply for a QFX3500, QFX3600, or QFX3600-I Device*

- *AC Power Supply for a QFX5100 Device*

- *DC Power Supply in a QFX5100 Device*

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 59 on page 108 provides the required environmental conditions for normal switch operation.

Table 59: 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 relative humidity range of 10% through 85% (noncondensing)	Normal operation ensured in the temperature range 32º F through 104º F (0º C through 40º C) at altitudes up to 5,000 ft (1,524 m). For information about extended temperature SFPs, see *Pluggable Transceivers Supported on EX2200 Switches.*	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 relative humidity range of 10% through 85% (noncondensing)	Normal operation ensured in the temperature range 32º F through 113º F (0º C through 45º 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 relative humidity range of 10% through 85% (noncondensing)	Normal operation ensured in the temperature range 32º F through 113º F (0º C through 45º C)	Complies with Zone 4 earthquake requirements as per GR-63, Issue 4.
EX3300	No performance degradation up to 10,000 feet (3048 meters)	Normal operation ensured in relative humidity range of 10% through 85% (noncondensing)	Normal operation ensured in the temperature range 32º F through 113º F (0º C through 45º 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 relative humidity range of 10% through 85% (noncondensing)	Normal operation ensured in the temperature range 32º F through 113º F (0º C through 45º 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 relative humidity range of 10% through 85% (noncondensing)	Normal operation ensured in the temperature range 32º F through 113º F (0º C through 45º 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 relative humidity range of 10% through 85% (noncondensing)	Normal operation ensured in the temperature range 32º F through 113º F (0º C through 45º 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 relative humidity range of 10% through 85% (noncondensing)	• EX4550-32F switches—Normal operation ensured in the temperature range 32º F through 113º F (0º C through 45º C) • EX4550-32T switches—Normal operation is ensured in the temperature range 32º F through 104º F (0º C through 40º C)	Complies with Zone 4 earthquake requirements as per GR-63, Issue 4.

Table 59: 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 relative humidity range of 5% through 90%, noncondensing • Short-term operation ensured in relative humidity range of 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 temperature range of 32º F through 104º F (0º C through 40º C) • Nonoperating storage temperature in shipping container: −40º F through 158º F (−40º C through 70º 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 relative humidity range of 10% through 85% (noncondensing)	Normal operation ensured in the temperature range 32º F through 104º F (0º C through 40º 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 relative humidity range of 10% through 85% (noncondensing)	Normal operation ensured in the temperature range 32º F through 104º F (0º C through 40º 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 relative humidity range of 10% through 85% (noncondensing)	Normal operation ensured in the temperature range 32º F through 104º F (0º C through 40º 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 relative humidity range of 5% through 90% (noncondensing)	Normal operation ensured in the temperature range 32º F through 104º F (0º C through 40º C) Nonoperating storage temperature in shipping container: −40º F (−40º C) to 158º F (70º 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 relative humidity range of 5% through 90% (noncondensing)	Normal operation ensured in the temperature range 32º F through 104º F (0º C through 40º C) Nonoperating storage temperature in shipping container: −40º F (−40º C) to 158º F (70º C)	Complies with Zone 4 earthquake requirements as per GR-63.

Table 59: 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 relative humidity range of 5% through 90% (noncondensing)	Normal operation ensured in the temperature range 32º F through 104º F (0º C through 40º C) Nonoperating storage temperature in shipping container: −40º F (−40º C) to 158º F (70º 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 relative humidity range of 10% through 85% (noncondensing)	Normal operation ensured in the temperature range 41º F through 104º F (5º C through 40º 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*
- *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 EX4200 Switches*
- Clearance Requirements for Airflow and Hardware Maintenance for EX4300 Switches on page 113
- *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*

Mounting and Clearance Requirements

Rack Requirements for EX4300 Switches

You can mount the switch 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 60 on page 111 provides the rack requirements and specifications for the switch.

Table 60: Rack Requirements and Specifications for the Switch

Rack Requirement	Guidelines
Rack type	Use a two-post rack or a four-post rack. You can mount the switch on any two-post or four-post rack that provides bracket holes or hole patterns spaced at 1 U (1.75 in. or 4.45 cm) increments and that meets the size and strength requirements to support the weight. A U is the standard rack unit defined in *Cabinets, Racks, Panels, and Associated Equipment* (document number EIA-310–D) published by the Electronics Industry Association (http://www.eia.org) .
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 switch can be mounted in any rack that provides holes spaced at that distance.

Table 60: Rack Requirements and Specifications for the Switch *(continued)*

Rack Requirement	Guidelines
Rack size and strength	• Ensure that the rack complies with the size and strength standards of a 19-in. rack as defined in *Cabinets, Racks, Panels, and Associated Equipment* (document number EIA-310–D) published by the Electronics Industry Association (http://www.eia.org) . • Ensure that the rack rails are spaced widely enough to accommodate the external dimensions of the switch chassis. The outer edges of the front mount 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 switch. • Ensure that the spacing of rails and adjacent racks provides for proper clearance around the switch 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.

One pair of mounting brackets for mounting the switch on two posts of a rack is supplied with each switch. For mounting the switch on four posts of a rack or cabinet, you can order a four-post rack-mount kit separately.

Related Documentation

- Chassis Physical Specifications for EX4300 Switches on page 20
- Clearance Requirements for Airflow and Hardware Maintenance for EX4300 Switches on page 113
- Mounting an EX4300 Switch on page 130
- Rack-Mounting and Cabinet-Mounting Warnings on page 240

Cabinet Requirements for EX4300 Switches

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

Cabinet requirements consist of:

- Cabinet size
- Clearance requirements
- Cabinet airflow requirements

Table 61 on page 113 provides the cabinet requirements and specifications for the switch.

Table 61: Cabinet Requirements and Specifications for the Switch

Cabinet Requirement	Guidelines
Cabinet size	• You can mount the switch in a cabinet that contains a 19-in. rack as defined in *Cabinets, Racks, Panels, and Associated Equipment* (document number EIA-310–D) published by the Electronics Industry Association (http://www.ecianow.org/standards-practices/standards/) . • The minimum cabinet size must be able to accommodate the maximum external dimensions of the switch.
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.
Cabinet airflow requirements	When you mount the switch 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 switch or switches. • Ensure that the hot air exhaust of the chassis exits the cabinet without recirculating into the switch. 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 switch 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 switch and cabinet. • A cabinet larger than the minimum required provides better airflow and reduces the chance of overheating.

Related Documentation

- Chassis Physical Specifications for EX4300 Switches on page 20

- Clearance Requirements for Airflow and Hardware Maintenance for EX4300 Switches on page 113

- Mounting an EX4300 Switch on page 130

- Rack-Mounting and Cabinet-Mounting Warnings on page 240

Clearance Requirements for Airflow and Hardware Maintenance for EX4300 Switches

When planning the site for installing an EX4300 switch, you must ensure sufficient clearance around the switch.

Follow these clearance requirements:

- For the cooling system to function properly, the airflow around the chassis must be unrestricted. See Figure 38 on page 114, Figure 39 on page 114, and Figure 40 on page 114 for reference.

Figure 38: Front-to-Back Airflow on 24-Port and 48-Port EX4300 Switches
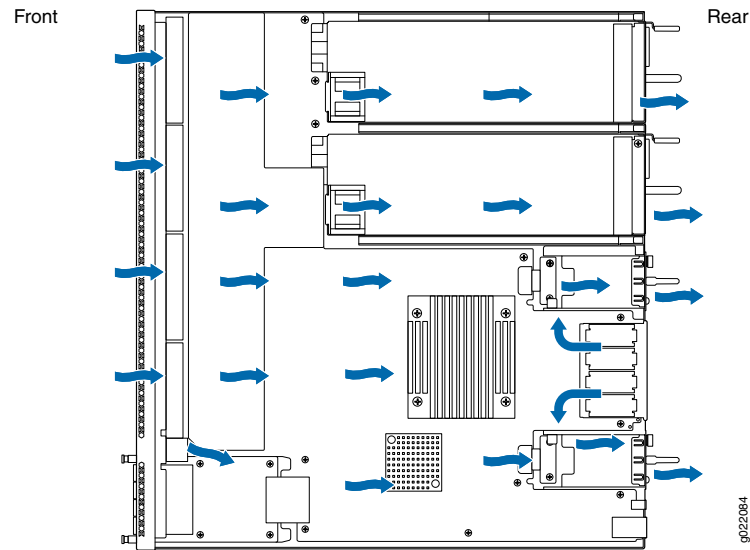
Figure 39: Front-to-Back Airflow on 32-Port EX4300 Switches
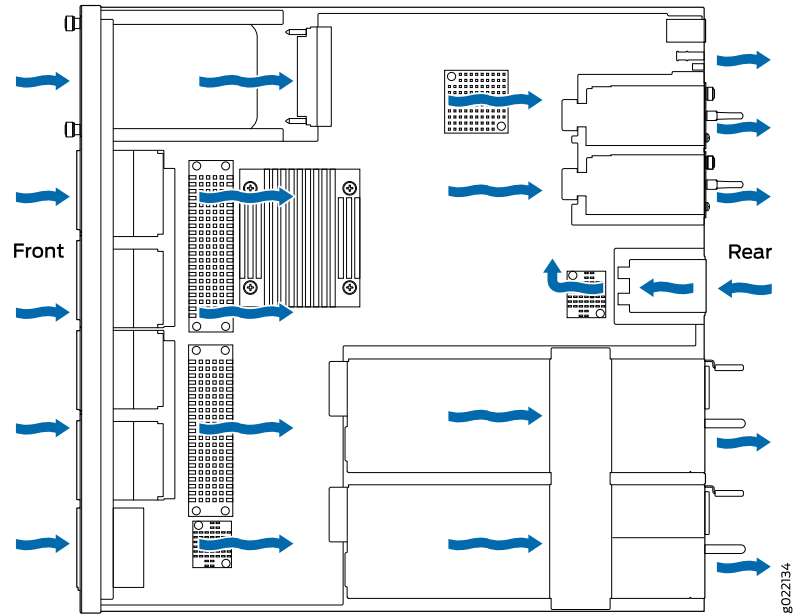
Figure 40: Back-to-Front Airflow on 24-Port and 48-Port EX4300 Switches
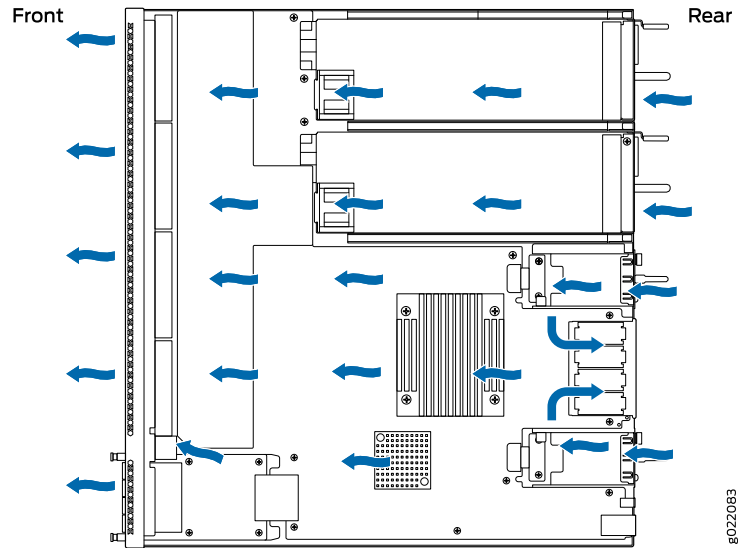
- If you are mounting the switch on a rack or cabinet along with other equipment, ensure that the exhaust from other equipment does not blow into the intake vents of the chassis.

- Leave at least 6 in. (15.2 cm) clearance in front of and behind the chassis for airflow.

- Leave at least 6 in. (15.2 cm) clearance on the left of the chassis for installing the grounding lug.

- Leave at least 24 in. (61 cm) clearance in front of and behind the switch for service personnel to remove and install hardware components. See Figure 41 on page 115.

Figure 41: Clearance Requirements for Airflow and Hardware Maintenance for an EX4300 Switch Chassis
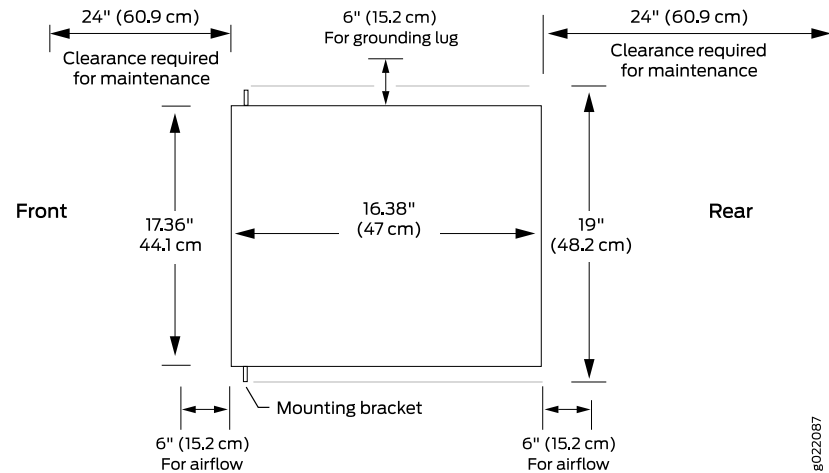
NOTE: The 32-port EX4300 switches support fan modules and power supplies with the AIR OUT (AFO) label only.

Related Documentation

- Chassis Physical Specifications for EX4300 Switches on page 20

- Rack-Mounting and Cabinet-Mounting Warnings on page 240

- General Site Guidelines on page 104

- Cooling System and Airflow in an EX4300 Switch on page 50

CHAPTER 6

Cable Specifications

- Network Cable Specifications for EX4300 Switches on page 117

Network Cable Specifications for EX4300 Switches

EX4300 switches have interfaces that use various types of network cables.

Table 62 on page 117 lists the specifications for the cables that connect the console (**CON**) and management (**MGMT**) ports to management devices.

Table 62: Cable Specifications for Switch-to-Management-Device Connections

Ports on EX4300 Switches	Cable Specification	Cable/Wire Supplied	Maximum Length	Switch Receptacle	Additional Information
RJ-45 Console (**CON2**) port	CAT5e UTP (unshielded twisted pair) cable	One 7-ft (2.13-m) length with RJ-45/DB-9 connectors	7 ft (2.13 m)	RJ-45	"Connecting a Switch to a Management Console" on page 170
Management (**MGMT**) Ethernet port (10/100/1000)	–	No	–	–	"Connecting a Switch to a Network for Out-of-Band Management" on page 168
Mini-USB Type-B Console (**CON1**) port	–	No	–	–	"Connecting an EX4300 Switch to a Management Console Using the Mini-USB Type-B Console Port" on page 172

Related Documentation

- Management Port Connector Pinout Information for an EX4300 Switch on page 64

- Mini-USB Port Specifications for an EX4300 Switch on page 63

- Console Port Connector Pinout Information for an EX Series Switch on page 62

- EX4300 Switches Hardware Overview on page 3

CHAPTER 7

Planning Power Requirements

- AC Power Supply Specifications for EX4300 Switches on page 119
- DC Power Supply Specifications for EX4300 Switches on page 120
- AC Power Cord Specifications for an EX4300 Switch on page 121

AC Power Supply Specifications for EX4300 Switches

EX4300 switches support 350 W, 715 W, and 1100 W AC power supplies.

The tables in this topic provides power supply specification of AC power supplies used in an EX4300 switch:

- Table 63 on page 119: 350 W AC power supply specifications
- Table 64 on page 120: 715 W AC power supply specifications
- Table 65 on page 120: 1100 W AC power supply specifications

Table 63: 350 W AC Power Supply Specifications for an EX4300 Switch

Item	Specification
AC input voltage	• Low-voltage line: 100–120 VAC • High-voltage line: 200–240 VAC
AC input line frequency	50–60 Hz
AC input current rating	• Low-voltage line: 4 A • High-voltage line: 2 A
Output power	350 W

NOTE: The 32-port EX4300 switches support only 350 W AC power supplies with front-to-back airflow direction.

Table 64: 715 W AC Power Supply Specifications for an EX4300 Switch

Item	Specification
AC input voltage	• Low-voltage line: 100–120 VAC • High-voltage line: 200–240 VAC
AC input line frequency	50–60 Hz
AC input current rating	• Low-voltage line: 11 A • High-voltage line: 5 A
Output power	715 W

Table 65: 1100 W AC Power Supply Specifications for an EX4300 Switch

Item	Specification
AC input voltage	• Low-voltage line: 115–120 VAC • High-voltage line: 200–240 VAC
AC input line frequency	50–60 Hz
AC input current rating	• Low-voltage line: 12 A • High-voltage line: 6 A
Output power	1100 W

Related Documentation
- AC Power Supply in EX4300 Switches on page 37
- AC Power Supply LEDs in EX4300 Switches on page 44

DC Power Supply Specifications for EX4300 Switches

Table 66 on page 120 lists the power supply specifications for a DC power supply used in an EX4300 switch.

Table 66: DC Power Supply Specifications for an EX4300 Switch

Item	Specifications
DC input voltage	• Nominal operating voltage: −48 VDC • Operating voltage range: −48 VDC through −60 VDC
DC input current rating	4 A maximum at nominal operating voltage (−48 VDC)
Output power	550 W

Related Documentation
- DC Power Supply in EX4300 Switches on page 45
- DC Power Supply LEDs in EX4300 Switches on page 49

AC Power Cord Specifications for an EX4300 Switch

Each AC power supply has a single AC appliance inlet that requires a dedicated AC power feed. A detachable AC power cord is supplied with each AC power supply. The 350 W AC and the 715 W AC power supplies are shipped with AC power cords with the C13 coupler type and the 1100 W AC power supply is shipped with AC power cord with the C15 coupler type 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.

> **NOTE:** In North America, AC power cords must not exceed 14.75 ft (4.5 m) 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 tables in this topic list the AC power cords specifications provided for different power supplies for each country or region.

- —Power cords for 350 W AC and 715 W AC power supplies
- —Power cords for 1100 W AC power supplies

Table 67: AC Power Cord Specifications for 350 W and 715 W AC Power Supplies for an EX4300 Switch
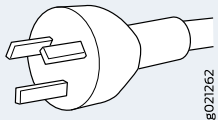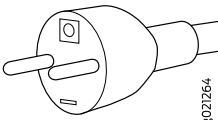
Country/ Region	Electrical Specifications	Plug Standards	Juniper Model Number	Graphic
Argentina	250 VAC, 10 A, 50 Hz	IRAM 2073 Type RA/3	CBL-EX-PWR-C13-AR	No graphic available
Australia	250 VAC, 10 A, 50 Hz	AS/NZS 3112 Type SAA/3	CBL-EX-PWR-C13-AU	
Brazil	250 VAC, 10 A, 50 Hz	NBR 14136 Type BR/3	CBL-EX-PWR-C13-BR	No graphic available
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	No graphic available

Table 67: AC Power Cord Specifications for 350 W and 715 W AC Power Supplies for an EX4300 Switch *(continued)*
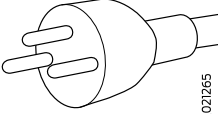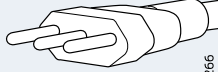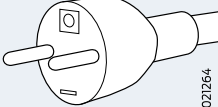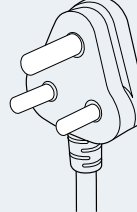
Country/ Region	Electrical Specifications	Plug Standards	Juniper Model Number	Graphic
Israel	250 VAC, 10 A, 50 Hz	SI 32/1971 Type IL/3G	CBL-EX-PWR-C13-IL	g021265
Italy	250 VAC, 10 A, 50 Hz	CEI 23-16 Type I/3G	CBL-EX-PWR-C13-IT	g021266
Japan	125 VAC, 12 A, 50 Hz or 60 Hz	SS-00259 Type VCTF	CBL-EX-PWR-C13-JP	g021275
Korea	250 VAC, 10 A, 50 Hz or 60 Hz	CEE (7) VII Type VIIGK	CBL-EX-PWR-C13-KR	g021264
North America	125 VAC, 13 A, 60 Hz	NEMA 5-15 Type N5-15	CBL-EX-PWR-C13-US	g021274
South Africa	250 VAC, 10 A, 50 Hz	SABS 164/1:1992 Type ZA/3	CBL-EX-PWR-C13-SA	g021289
Switzerland	250 VAC, 10 A, 50 Hz	SEV 6534-2 Type 12G	CBL-EX-PWR-C13-SZ	No graphic available

Table 67: AC Power Cord Specifications for 350 W and 715 W AC Power Supplies for an EX4300 Switch *(continued)*
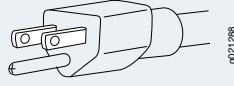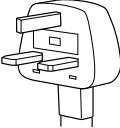
Country/Region	Electrical Specifications	Plug Standards	Juniper Model Number	Graphic
Taiwan	125 VAC, 10 A, 50 Hz	NEMA 5-15P Type N5-15P	CBL-EX-PWR-C13-TW	
United Kingdom	250 VAC, 10 A, 50 Hz	BS 1363/A Type BS89/13	CBL-EX-PWR-C13-UK	

Table 68: AC Power Cord Specifications for 1100 W AC Power Supplies for an EX4300 Switch

Country/Region	Electrical Specifications	Plug Standards	Juniper Model Number
Argentina	250 VAC, 10 A, 50 Hz	IRAM 2073 Type RA/3	CBL-PWR-C15M-HITEMP-AR
Australia	250 VAC, 10 A, 50 Hz	AS/NZZS 3112-2000 Type SAA/3	CBL-PWR-C15M-HITEMP-AU
Brazil	250 VAC, 10 A, 50 Hz	NBR 14136 Type BR/3	CBL-PWR-C15M-HITEMP-BR
China	250 VAC, 10 A, 50 Hz	GB2099, GB1002 Type PRC/3	CBL-PWR-C15M-HITEMP-CH
Europe (except Italy, Switzerland, and United Kingdom)	250 VAC, 10 A, 50 Hz	CEE (7) VII Type VIIG	CBL-PWR-C15M-HITEMP-EU
Israel	250 VAC, 10 A, 50 Hz	SI 32 Type IL/3G	CBL-PWR-C15M-HITEMP-IL
India	250 VAC, 10 A, 50 Hz	SABS 164/1:1992 Type ZA/3	CBL-PWR-C15M-HITEMP-IN
Italy	250 VAC, 10 A, 50 Hz	CEI 23-16 Type I/3G	CBL-PWR-C15M-HITEMP-IT
Japan	125 VAC, 15 A, 50 Hz or 60 Hz	JIS 8303 Type 498GJ	CBL-PWR-C15M-HITEMP-JP
Korea	250 VAC, 10 A, 50 Hz	CEE (7) VII Type VIIG	CBL-PWR-C15M-HITEMP-KR
South Africa	250 VAC, 10 A, 50 Hz	SABS 164/1:1992 Type ZA/3	CBL-PWR-C15M-HITEMP-SA
North America	125 VAC, 15 A, 60 Hz	NEMA 5-15 Type N5/15	CBL-PWR-C15M-HITEMP-US
Switzerland	250 VAC, 10 A, 50 Hz	SEV 1011 / 6534-2 Type 12G	CBL-PWR-C15M-HITEMP-SZ
United Kingdom	250 VAC, 10 A, 50 Hz	BS 1363/A Type BS89/13	CBL-PWR-C15M-HITEMP-UK

> **CAUTION:** The AC power cord for the EX4300 switch is intended for use with this switch only. Do not use the cord with any other product.

> **CAUTION:** Power cords must not block access to switch components.

Related Documentation

- AC Power Supply in EX4300 Switches on page 37
- General Safety Guidelines and Warnings on page 225
- General Electrical Safety Guidelines and Warnings on page 253
- Prevention of Electrostatic Discharge Damage on page 254
- Connecting AC Power to an EX4300 Switch on page 159

PART 3

Installing and Connecting the Switch and Switch Components

CHAPTER 8

Installing the Switch

Installing and Connecting an EX4300 Switch

To install and connect an EX4300 switch:

1. Follow instructions in "Unpacking an EX4300 Switch" on page 128.

2. Install a power supply if it is not preinstalled:

   - Installing an AC Power Supply in an EX4300 Switch on page 142

   - Installing a DC Power Supply in an EX4300 Switch on page 144

3. Install a fan module if it is not preinstalled; see "Installing a Fan Module in an EX4300 Switch" on page 145.

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

   - "Mounting an EX4300 Switch on Two Posts of a Rack or Cabinet" on page 131 (by using the mounting brackets provided)

   - "Mounting an EX4300 Switch in a Recessed Position in a Rack or Cabinet" on page 137 (by using the 2-in.-recess front brackets from the separately orderable four-post rack-mount kit)

   - "Mounting an EX4300 Switch on Four Posts of a Rack or Cabinet" on page 133 (by using the separately orderable four-post rack-mount kit)

   - "Mounting an EX4300 Switch on a Wall" on page 137 (by using the separately orderable wall-mount kit)

5. Follow instructions in "Connecting Earth Ground to an EX Series Switch" on page 153.

6. Follow instructions for connecting power as appropriate for your site:

   - Connecting AC Power to an EX4300 Switch on page 159

   - Connecting DC Power to an EX4300 Switch on page 162

7. Register your product by following instructions in "Registering Products—Mandatory for Validating SLAs" on page 166.

8. Perform initial configuration of the switch by following the instructions in "Connecting and Configuring an EX Series Switch (CLI Procedure)" on page 185 or "Connecting and Configuring an EX Series Switch (J-Web Procedure)" on page 188.

9. Set the switch's management options by following the instructions in:

   - Connecting a Switch to a Network for Out-of-Band Management on page 168

   - Connecting a Switch to a Management Console on page 170

   - Connecting an EX4300 Switch to a Management Console Using the Mini-USB Type-B Console Port on page 172

Related Documentation
- Rack Requirements for EX4300 Switches on page 111
- Cabinet Requirements for EX4300 Switches on page 112
- Clearance Requirements for Airflow and Hardware Maintenance for EX4300 Switches on page 113

Unpacking an EX4300 Switch

EX4300 switches are shipped in a cardboard carton, secured with foam packing material. The carton has an accessory compartment and contains the quick start instructions.

⚠️ CAUTION: **EX4300 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. Pull out the packing material holding the switch in place.

5. Verify the parts received against the inventory on the label attached to the carton. See "Parts Inventory (Packing List) for an EX4300 Switch" on page 129.

6. Save the shipping carton and packing materials in case you need to move or ship the switch later.

Parts Inventory (Packing List) for an EX4300 Switch

The switch shipment includes a packing list. Check the parts you receive with the switch against the items on the packing list. The packing list specifies the part number and provides a description of each part in your order. The parts shipped depend on the switch model you order. See "EX4300 Switch Models" on page 15 for more information.

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 1–800–638–8296. For international-dial or direct-dial options in countries without toll-free numbers, see http://www.juniper.net/support/requesting-support.html .

Table 69 on page 129 lists the parts and their quantities as in the standard packing list for an EX4300 switch.

Table 69: Inventory of Components Provided with an EX4300 Switch

Component		Quantity
Switch		1
Fan modules	EX4300-24T, EX4300-24P, EX4300-32F, EX4300-48T, EX4300-48T-AFI, EX4300-48P, EX4300-48T-DC, and EX4300-48T-DC-AFI switches	2 preinstalled
	EX4300-24T-S, EX4300-24P-S, EX4300-32F-S, EX4300-48T-S, and EX4300-48P-S switches	Fan modules for this model are not shipped by default; you must separately order either two **AIR OUT (AFO)** labelled or two **AIR IN (AFI)** labelled fan modules.
Power supplies	EX4300-24T, EX4300-24P, EX4300-32F, EX4300-48T, EX4300-48T-AFI, EX4300-48P, EX4300-48T-DC, and EX4300-48T-DC-AFI switches	1 (AC or DC) preinstalled
	EX4300-24T-S, EX4300-24P-S, EX4300-32F-S, EX4300-48T-S, and EX4300-48P-S switches	Power supplies for this model are not shipped by default; you must separately order either AC power supplies or DC power supplies.

Table 69: Inventory of Components Provided with an EX4300 Switch *(continued)*

Component		Quantity
AC power cord appropriate for your geographical location	EX4300-24T, EX4300-24P, EX4300-32F, EX4300-48T, EX4300-48T-AFI, EX4300-48P, EX4300-48T-DC, and EX4300-48T-DC-AFI switches	1
	EX4300-24T-S, EX4300-24P-S, EX4300-32F-S, EX4300-48T-S, and EX4300-48P-S switches	AC power cord for these models is not shipped by default; you must order it separately.
Cover panels for slots without preinstalled components		• Uplink module slot cover panel: 1 • Power supply cover panel: 1
Mounting brackets		2
Mounting screws		8
Rubber feet		4
RJ-45 cable and RJ-45 to DB-9 serial port adapter		1
Quick Start installation instructions		1
Juniper Networks Product Warranty		1
End User License Agreement		1

NOTE: You must provide the appropriate mounting screws for mounting the switch on a rack or a cabinet.

Related Documentation

- EX4300 Switches Hardware Overview on page 3
- Unpacking an EX4300 Switch on page 128

Mounting an EX4300 Switch

You can mount an EX4300 switch:

- On two posts of a 19-in. rack or a 19-in. cabinet by using the mounting brackets provided with the switch.

- On four posts of a 19-in. rack or a 19-in. cabinet by using the separately orderable four-post rack-mount kit.

- In a position recessed 2 in. from the front of a 19-in. rack or a 19-in. 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.

- On a wall by using the separately orderable wall-mount kit.

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 EX4300 Switch on Two Posts of a Rack or Cabinet on page 131
- Mounting an EX4300 Switch in a Recessed Position in a Rack or Cabinet on page 137
- Mounting an EX4300 Switch on Four Posts of a Rack or Cabinet on page 133
- Mounting an EX4300 Switch on a Wall on page 137
- Connecting Earth Ground to an EX Series Switch on page 153

Mounting an EX4300 Switch on Two Posts of a Rack or Cabinet

You can mount an EX4300 switch on two posts of a 19-in. rack (either a two-post or a four-post rack) or a 19-in. cabinet by using the mounting brackets provided with the switch. (The remainder of this topic uses *rack* to mean *rack* or *cabinet*.)

You can mount the switch on four posts of a four-post rack by using the mounting brackets provided with the separately orderable four-post rack-mount kit. See "Mounting an EX4300 Switch on Four Posts of a Rack or Cabinet" on page 133.

> **NOTE:** If you need to mount the switch in a recessed position on two posts of 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.

Before mounting the switch on two posts of a rack:

- Verify that the site meets the requirements described in "Site Preparation Checklist for EX4300 Switches" on page 103.
- 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 225, with particular attention to "Chassis Lifting Guidelines for EX4300 Switches" on page 239.
- Remove the switch from the shipping carton (see "Unpacking an EX4300 Switch" on page 128).

Ensure that you have the following parts and tools available:

- Phillips (+) screwdriver, number 2 (not provided)

- 2 mounting brackets and 8 mounting screws (provided in the accessory box shipped with the switch)

- Screws to secure the chassis to the rack (not provided)

- 2-in.-recess front-mounting brackets if you will mount the switch in a recessed position (part of the separately orderable four-post rack-mount kit)

- Cover panels for uplink module and power supply slots (provided)

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

CAUTION: If you are mounting multiple switches on a rack, mount a switch in the bottom of the rack first and proceed to mount the rest of the switches from bottom to top.

To mount the switch on two posts of a rack:

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

2. Align the mounting brackets along the front, rear, or center 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 side panel. See Figure 42 on page 132.

Figure 42: Attaching the Mounting Bracket to the Side Panel of the Switch
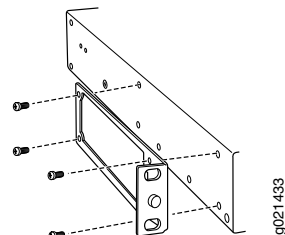
3. Align the bottom holes in the mounting brackets with the holes on the side panels of the switch chassis.

4. Insert mounting screws into the aligned holes. Tighten the screws by using the Phillips (+) screwdriver.

5. 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 by using the Phillips (+) screwdriver.

6. 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 or cabinet

rail. Align the bottom hole in both the mounting brackets with a hole in each rack rail, making sure the chassis is level. See Figure 43 on page 133.

Figure 43: Mounting the Switch on Two Posts of a Rack
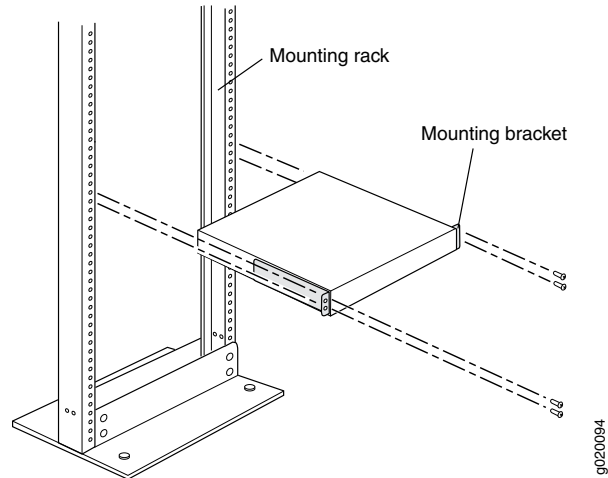
7. Have a second person secure the switch to the rack by using the appropriate screws. Tighten the screws.

8. 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.

NOTE: We recommend that you install cover panels in the unused uplink module and power supply slots.

Related Documentation

- Connecting Earth Ground to an EX Series Switch on page 153
- Connecting AC Power to an EX4300 Switch on page 159
- Connecting DC Power to an EX4300 Switch on page 162
- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 185
- Connecting and Configuring an EX Series Switch (J-Web Procedure) on page 188
- Mounting an EX4300 Switch in a Recessed Position in a Rack or Cabinet on page 137
- Rack-Mounting and Cabinet-Mounting Warnings on page 240

Mounting an EX4300 Switch on Four Posts of a Rack or Cabinet

You can mount an EX4300 switch on four posts of a 19-in. rack or a 19-in. cabinet by using the separately orderable four-post rack-mount kit. (The remainder of this topic uses *rack* to mean *rack* or *cabinet*.)

You can mount the switch on two posts of either a two-post rack or a four-post rack by using the mounting brackets provided with the switch. See "Mounting an EX4300 Switch on Two Posts of a Rack or Cabinet" on page 131.

> **NOTE:** If you need to mount the switch 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.

> **NOTE:**
>
> To ensure that the protective earthing terminal is accessible through the opening in the rear mounting-blade:
>
> - Ensure that the rack is 27.5 in. (70 cm) through 30.5 in. (77.5 cm) deep if you are mounting the switch flush with the rack front on four posts of a rack.
>
> - Ensure that the rack is 29.5 in. (75 cm) through 32.5 in. (82.5 cm) deep if you will mount the switch 2 in. recessed from the rack front.

Before mounting the switch on four posts of a rack:

- Verify that the site meets the requirements described in "Site Preparation Checklist for EX4300 Switches" on page 103.

- 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 225, with particular attention to "Chassis Lifting Guidelines for EX4300 Switches" on page 239.

- Remove the switch from the shipping carton (see "Unpacking an EX4300 Switch" on page 128).

Ensure that you have the following parts and tools available:

- Phillips (+) screwdriver, number 2 (not provided)

- 6 flat-head 4-40 Phillips mounting screws (provided with the four-post rack-mount kit)

- 12 flat-head 4x6-mm Phillips mounting screws (provided with the four-post rack-mount kit)

- One pair each of flush or 2-in.-recess front-mounting brackets (provided with the four-post rack-mount kit)

- One pair of side mounting-rails (provided with the four-post rack-mount kit)

- One pair of rear mounting-blades (provided with the four-post rack-mount kit)

- Screws to secure the chassis and the rear mounting-blades to the rack (not provided)

- Cover panels for uplink module and power supply slots (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. Place the switch on a flat, stable surface.

   NOTE: The four-post rack-mount kit ships with the short front-mounting brackets attached to the side mounting-rails. If you want to recess the switch in the rack, you must unscrew the short front-mounting brackets from the side mounting-rails by using the Phillips (+) screwdriver and attach the long front-mounting brackets to the side mounting-rails.

2. 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 panels.

3. Insert 4x6-mm Phillips flat-head mounting screws into the two aligned holes and tighten the screws by using the screwdriver. Ensure that the remaining four holes in the side mounting-rails are aligned with the four holes in the side panel. See Figure 44 on page 135.

Figure 44: Attaching the Side Mounting-Rail to the Switch Chassis
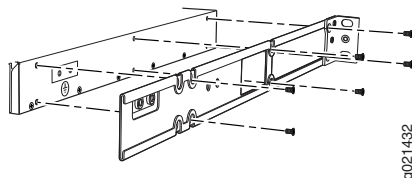
4. Insert the 4x6-mm Phillips flat-head mounting screws into the remaining four holes in the side mounting-rails and tighten the screws by using the screwdriver.

5. 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 45 on page 136.

Figure 45: Mounting the Switch on Front Posts of a Rack
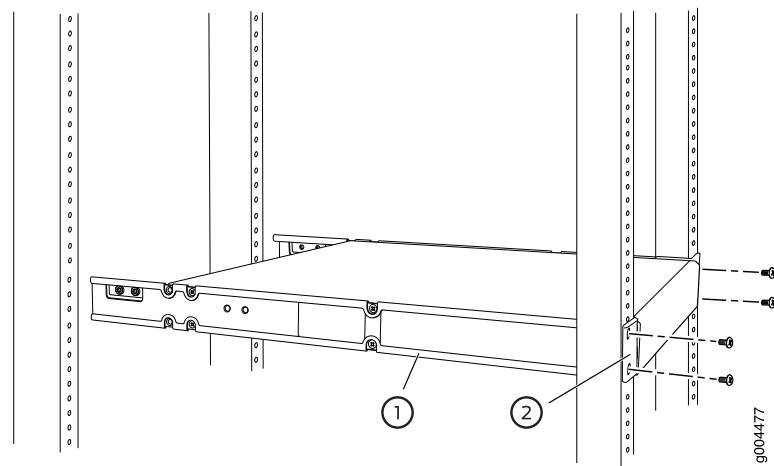
1— Side mounting-rail	2—Front-mounting bracket

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

7. Slide the rear mounting-blades into the side mounting-rails. See .

Figure 46: Sliding the Rear Mounting-Blades into the Side Mounting-Rails
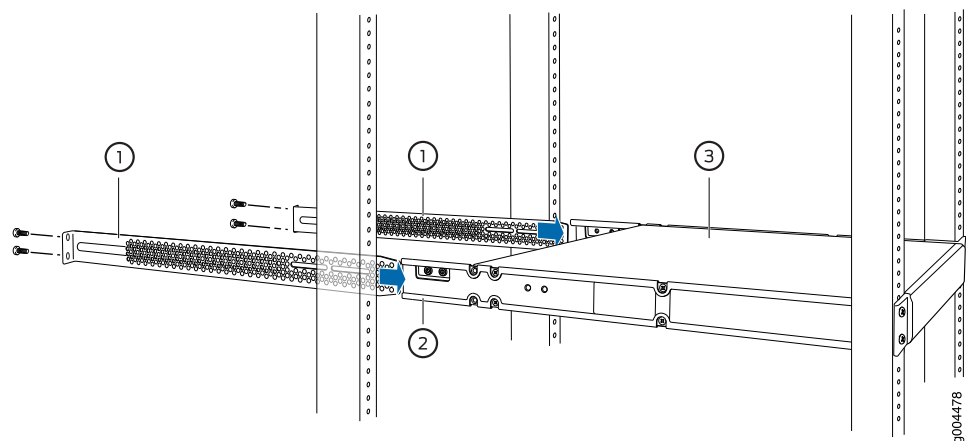
1— Rear mounting-blade	3—Switch
2—Side mounting-rail	

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

9. 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.

> NOTE: We recommend that you install cover panels in the unused uplink module and power supply slots.

- Connecting Earth Ground to an EX Series Switch on page 153

- Connecting AC Power to an EX4300 Switch on page 159

- Connecting DC Power to an EX4300 Switch on page 162

- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 185

- Connecting and Configuring an EX Series Switch (J-Web Procedure) on page 188

- Mounting an EX4300 Switch in a Recessed Position in a Rack or Cabinet on page 137

- Rack-Mounting and Cabinet-Mounting Warnings on page 240

Mounting an EX4300 Switch in a Recessed Position in a Rack or Cabinet

You can mount an EX4300 switch in a recessed position on two posts of either a two-post rack or a four-post rack such that the switch is recessed inside the rack from the rack front by 2 inches. To mount the switch in a recessed position, use the front-mounting brackets provided in the separately orderable four-post rack-mount kit.

Reasons to mount the switch in a recessed position include:

- You are mounting the switch in a cabinet and the cabinet doors do not close completely unless the switch is recessed.

- The switch you are mounting has an uplink module with transceivers installed in it—the transceivers in the uplink module ports protrude from the front of the switch.

To mount the switch in a recessed position, on two-posts or on four-posts, follow the instructions in "Mounting an EX4300 Switch on Two Posts of a Rack or Cabinet" on page 131 or "Mounting an EX4300 Switch on Four Posts of a Rack or Cabinet" on page 133.

- Connecting Earth Ground to an EX Series Switch on page 153
- Rack-Mounting and Cabinet-Mounting Warnings on page 240

Mounting an EX4300 Switch on a Wall

You can mount an EX4300 switch on a wall by using the separately orderable wall-mount kit.

Before mounting the switch on a wall:

- Verify that the site meets the requirements described in "Site Preparation Checklist for EX4300 Switches" on page 103.

- Read "General Safety Guidelines and Warnings" on page 225, with particular attention to "Chassis Lifting Guidelines for EX4300 Switches" on page 239.

- Remove the switch from the shipping carton (see "Unpacking an EX4300 Switch" on page 128).

Ensure that you have the following parts and tools available:

- Phillips (+) screwdriver, number 2 (not provided)

- 2 wall-mount brackets (provided with the wall-mount kit)

- 12 wall-mount bracket screws (provided with the wall-mount kit)

- 4 mounting screws (8-32 x 1.25 in. or M4 x 30 mm) (not provided)

- Cover panels for uplink module and power supply slots (provided)

- Hollow wall anchors capable of supporting the combined weight of two fully loaded switches, up to 33 lb (15 kg) (not included)—if you are mounting the switch in sheetrock (wall board with a gypsum plaster core) or in wall board not backed by wall studs.

WARNING: When mounted in a vertical position, an EX4300 switch must be oriented with the front panel of the chassis pointing down to ensure proper airflow and meet safety requirements in the event of a fire.

NOTE: For easier lifting, install any additional power supplies only after you mount the switch on the wall.

To mount the switch on a wall:

1. Attach the wall-mount brackets to the sides of the chassis by using four of the wall-mount bracket screws on each side (see the representation in Figure 47 on page 138). Use the screwdriver to tighten the screws.

Figure 47: Attaching Wall-Mount Brackets to the Switch Chassis
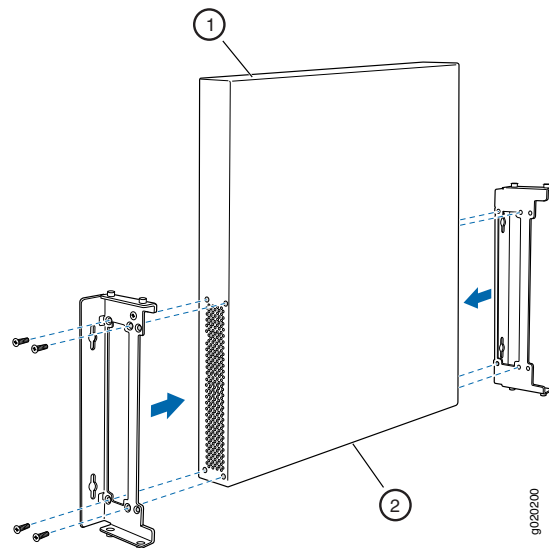
2. If you are mounting two switches together, line the second switch on top of the first and attach it to the mounting brackets by using two wall-mount bracket screws on each side (see the representation in Figure 48 on page 139).

3. Insert the mounting screws in the wall. Insert the top pair of mounting screws 474.35 mm apart, and insert the second pair of mounting screws 151.81 mm directly below the first set.

   If the mounting screws are inserted in a wall board with no stud behind it, you must use dry wall anchors rated to support 75 lb (34 kg). Insert the screws into wall studs wherever possible to provide added support for the chassis.

   Drive the screws only part way in, leaving about 1/4 in. (6 mm) distance between the head of the screw and the wall. Use the screwdriver to drive the screws in.

4. Grasp each side of the switch or switches, lift the switch or switches, and hang the brackets from the mounting screws (see the representation in Figure 48 on page 139).

Figure 48: Mounting the Switch on a Wall
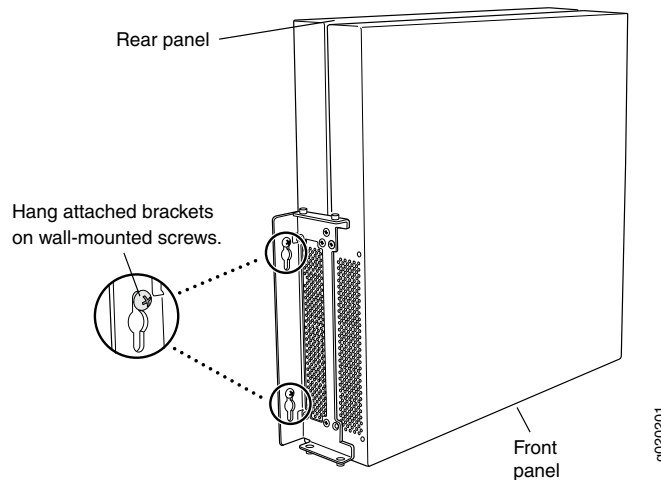
5. Tighten the mounting screws by using the screwdriver.

Related Documentation

- Connecting AC Power to an EX4300 Switch on page 159
- Connecting DC Power to an EX4300 Switch on page 162
- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 185
- Connecting and Configuring an EX Series Switch (J-Web Procedure) on page 188
- Wall-Mounting Warning for EX4300 Switches on page 245

Installing Switch Components

Installing and Removing EX4300 Switch Hardware Components

The EX4300 switch chassis is a rigid sheet-metal structure that houses the hardware components. The field-replaceable units (FRUs) in EX4300 switches are:

- Power supplies
- Fan modules
- Uplink module
- Transceiver

The power supply (AC or DC), fan module, uplink module, and transceivers are hot-removable and hot-insertable: You can remove and replace them without powering off the switch or disrupting switch functions.

> NOTE: **You must remove a fan module only for replacement.**

See these topics for instructions for installing and removing components:

Installing an AC Power Supply in an EX4300 Switch

The AC power supply in EX4300 switches is a hot-removable and hot-insertable field-replaceable unit (FRU) installed in the rear panel of the switch: You can remove and replace it without powering off the switch or disrupting switch functions.

⚠️ CAUTION: **Do not mix:**

- AC and DC power supplies in the same chassis

- Power supplies with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis.

- Fan modules with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis.

- Power supplies and fan modules with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis.

Before you install an AC power supply in the switch:

- Ensure you understand how to prevent electrostatic discharge (ESD) damage. See "Prevention of Electrostatic Discharge Damage" on page 254.

Ensure that you have the following parts and tools available to install the power supply:

- ESD grounding strap

- Phillips (+) screwdriver, number 2

> *i* NOTE: Each power supply must be connected to a dedicated power source outlet.
>
> The power supply slots are at the right end of the rear panel on 24-port and 48-port switches, and at the left end on 32-port switches.
> Figure 49 on page 143 shows how to install an AC power supply in 24-port or 48-port switches. The procedure is the same for 32-port switches.

To install an AC power supply in the switch:

1. Ensure that you have the correct power supply. The label **AIR IN (AFI)** or **AIR OUT (AFO)** on the power supply must match the label **AIR IN (AFI)** or **AIR OUT (AFO)** on the installed fan module.

2. Attach the ESD grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.

3. If the power supply slot has a cover panel on it, loosen the captive screws on the cover panel by using your fingers or the screwdriver. Hold the captive screw and gently pull it outward to remove the cover panel. Save the cover panel for later use.

4. Taking care not to touch power supply pins, leads, or solder connections, remove the power supply from the bag.

5. Using both hands, place the power supply in the power supply slot on the rear panel of the switch and slide it in until it is fully seated and the ejector lever fits into place.

Figure 49: Installing an AC Power Supply in an EX4300 Switch
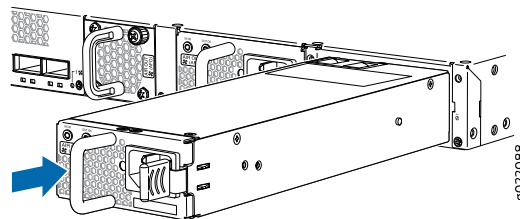
> *i* NOTE: If you have a Juniper J-Care service contract, register any addition, change, or upgrade of hardware components at
> https://www.juniper.net/customers/csc/management/updateinstallbase.jsp .
> Failure to do so can result in significant delays if you need replacement parts. This note applies if you change the type of power supply or add a new type of uplink module. It does not apply if you replace these components with the same type of component.

Related Documentation

- Removing an AC Power Supply from an EX4300 Switch on page 196

- Connecting AC Power to an EX4300 Switch on page 159

- AC Power Supply in EX4300 Switches on page 37

Installing a DC Power Supply in an EX4300 Switch

The DC power supply in EX4300 switches is a hot-removable and hot-insertable field-replaceable unit (FRU) installed in the rear panel of the switch: You can remove and replace it without powering off the switch or disrupting switch functions.

> **CAUTION:** **Do not mix:**
>
> - AC and DC power supplies in the same chassis
>
> - Power supplies with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis.
>
> - Fan modules with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis.
>
> - Power supplies and fan modules with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis.

Before you install a DC power supply in the switch:

- Ensure you understand how to prevent electrostatic discharge (ESD) damage. See "Prevention of Electrostatic Discharge Damage" on page 254.

Ensure that you have the following parts and tools available to install a DC power supply in the switch chassis:

- ESD grounding strap

- Phillips (+) screwdriver, number 2

> **NOTE:** Each power supply must be connected to a dedicated power source outlet.
>
> The power supply slots are at the right end of the rear panel on 24-port and 48-port switches, and at the left end on 32-port switches.
> Figure 50 on page 145 shows how to install a DC power supply in 24-port or 48-port switches. The procedure is the same for 32-port switches.

To install a DC power supply in the switch:

1. Ensure that you have the correct power supply. The label **AIR IN (AFI)** or **AIR OUT (AFO)** on the power supply must match the label **AIR IN (AFI)** or **AIR OUT (AFO)** on the installed fan module.

2. Attach the ESD grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.

3. If the power supply slot has a cover panel on it, loosen the captive screws on the cover panel by using your fingers or the screwdriver. Hold the captive screw and gently pull it outward to remove the cover panel. Save the cover panel for later use.

4. Taking care not to touch power supply pins, leads, or solder connections, remove the power supply from the bag.

5. Using both hands, place the power supply in the power supply slot on the rear panel of the switch and slide it in until it is fully seated and the ejector lever fits into place.

Figure 50: Installing a DC Power Supply in an EX4300 Switch
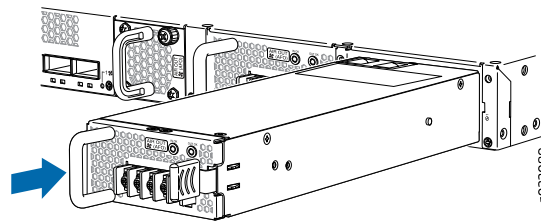
NOTE: If you have a Juniper J-Care service contract, register any addition, change, or upgrade of hardware components at https://www.juniper.net/customers/csc/management/updateinstallbase.jsp . Failure to do so can result in significant delays if you need replacement parts. This note applies if you change the type of power supply or add a new type of uplink module. It does not apply if you replace these components with the same type of component.

Related Documentation

- Removing a DC Power Supply from an EX4300 Switch on page 198
- Connecting DC Power to an EX4300 Switch on page 162
- DC Power Supply in EX4300 Switches on page 45
- EX4300 Switches Hardware Overview on page 3

Installing a Fan Module in an EX4300 Switch

Each fan module is a hot-removable and hot-insertable field-replaceable unit (FRU) installed in the rear panel of the switch: You can remove and replace it without powering off the switch or disrupting switch functions.

CAUTION: Do not mix:

- Fan modules with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis.

- Power supplies with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis.

- Power supplies and fan modules with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis.

- AC and DC power supplies in the same chassis.

Before you install a fan module in the switch:

- Ensure you understand how to prevent electrostatic discharge (ESD) damage. See "Prevention of Electrostatic Discharge Damage" on page 254.

Ensure that you have the following parts and tools available to install a fan module in the switch chassis:

- ESD grounding strap
- Phillips (+) screwdriver, number 2

NOTE: The fan module slots are at the left end of the rear panel on 24-port and 48-port switches, and at the right end on 32-port switches. Figure 51 on page 147 shows how to install a fan module in 24- port or 48-port switches. The procedure is the same for 32-port switches.

1. Ensure that you have the correct fan module. The label **AIR IN (AFI)** or **AIR OUT (AFO)** on the fan module must match the label **AIR IN (AFI)** or **AIR OUT (AFO)** on the installed power supply.

2. Attach the ESD grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.

3. Remove the fan module from its bag.

4. Hold the handle of the fan module with one hand and support the weight of the module with the other hand. Place the fan module in the fan module slot on the rear panel of the switch and slide it in until it is fully seated.

5. Tighten the captive screws on the faceplate of the fan module by using your fingers. If you are unable to tighten the captive screws by using your fingers, use the screwdriver.

Figure 51: Installing a Fan Module in a 24-Port EX4300 Switch
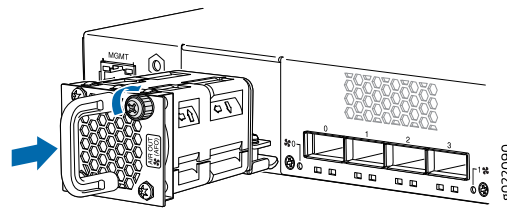
NOTE: If you have a Juniper J-Care service contract, register any addition, change, or upgrade of hardware components at https://www.juniper.net/customers/csc/management/updateinstallbase.jsp . Failure to do so can result in significant delays if you need replacement parts. This note applies if you change the type of power supply or add a new type of uplink module. It does not apply if you replace these components with the same type of component.

Related Documentation

- Removing a Fan Module from an EX4300 Switch on page 201
- Cooling System and Airflow in an EX4300 Switch on page 50
- Field-Replaceable Units in EX4300 Switches on page 36
- EX4300 Switches Hardware Overview on page 3

Installing an Uplink Module in an EX4300 Switch

You can install an uplink module in the front panel of an EX4300 switch. The uplink module in EX4300 switches is a hot-removable and hot-insertable unit (FRU): You can remove and replace it without powering off the switch.

NOTE: If you have set an uplink module port as a Virtual Chassis port (VCP), removing the uplink module breaks the setting. You must reset the port as a VCP after you replace the module. See *Setting an Uplink Port on an EX Series Switch as a Virtual Chassis Port (CLI Procedure)*.

Before you begin installing an uplink module in the switch:

- Ensure that you have taken the necessary precautions to prevent ESD damage (see "Prevention of Electrostatic Discharge Damage" on page 254).

Ensure that you have the following parts and tools available:

- Electrostatic discharge (ESD) grounding strap (If a grounding strap is not available, follow the alternative grounding method described in Step 1 of the following procedure.)
- Phillips (+) screwdriver, number 2

To install an uplink module in the switch (see Figure 52 on page 148, Figure 53 on page 149, and Figure 54 on page 149):

1. Attach the electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.

   If a grounding strap is not available, hold the uplink module in its antistatic bag in one hand and touch the exposed, bare metal of the switch with the other hand to ground yourself and the component.

2. If the uplink module slot has a cover panel on it, loosen both captive screws on the faceplate of the uplink module by using your fingers. If you are unable to unscrew the captive screws by using your fingers, use the screwdriver. Hold both the captive screws and gently pull it outward to remove the cover panel, and save it for later use.

   NOTE: If you are removing an uplink module and installing another uplink module, wait for at least 10 seconds after removing the uplink module before installing the new or the same uplink module. If you do not wait for at least 10 seconds, the interfaces on the uplink module might not come up.

3. Taking care not to touch module components, pins, leads, or solder connections, remove the uplink module from its bag.

   CAUTION: Before you slide the uplink module into the slot on the switch chassis, ensure the uplink module is aligned correctly. Misalignment might cause the pins to bend, making the uplink module unusable.

4. Using both hands, place the module in the empty slot and slide it in gently until it is fully seated.

5. Tighten both the captive screws by using your fingers or the screwdriver.

Figure 52: Installing a 4-Port SFP+ Uplink Module in a 24-Port or 48-Port EX4300 Switch
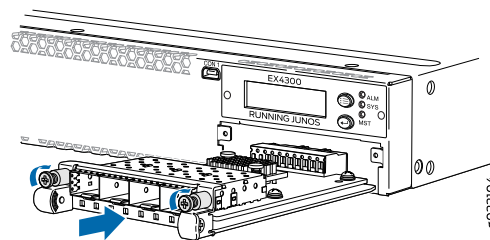
Figure 53: Installing a 2-Port QSFP+ Uplink Module in a 32-Port EX4300 Switch
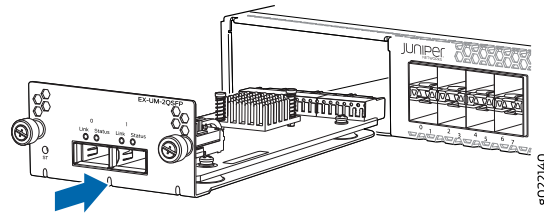
Figure 54: Installing an 8-Port SFP+ Uplink Module in a 32-Port EX4300 Switch
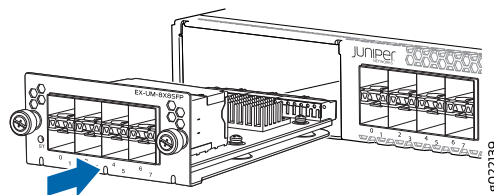
> NOTE: If you have a Juniper J-Care service contract, register any addition, change, or upgrade of hardware components at https://www.juniper.net/customers/csc/management/updateinstallbase.jsp . Failure to do so can result in significant delays if you need replacement parts. This note applies if you change the type of power supply or add a new type of uplink module. It does not apply if you replace these components with the same type of component.

Related Documentation

- Removing an Uplink Module from an EX4300 Switch on page 199

- Installing a Transceiver in an EX Series Switch on page 149

- Installing and Removing EX4300 Switch Hardware Components on page 141

- *Configuring Gigabit Ethernet Interfaces (CLI Procedure)*

- EX4300 Switches Hardware Overview on page 3

Installing a Transceiver in an EX Series Switch

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 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 are having a problem running a Juniper Networks device that is using 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 an EX Series switch, ensure that you have taken the necessary precautions for safe handling of lasers (see "Laser and LED Safety Guidelines and Warnings for Switches" on page 231).

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

Figure 55 on page 151 shows how to install a QSFP+ transceiver. The procedure is the same for all types of transceivers.

To install a transceiver in an EX Series switch:

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 switch 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 55: Installing a Transceiver in an EX Series Switch
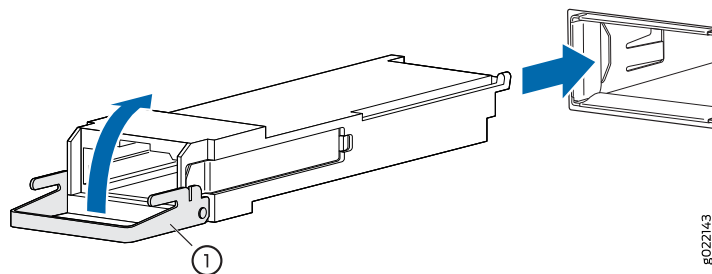
1— Ejector lever	

Related Documentation

- Removing a Transceiver from a Switch on page 203
- Connecting a Fiber-Optic Cable to a Switch on page 174
- *Pluggable Transceivers Supported on EX Series Switches*

Connecting the Switch

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 57 on page 158).

> **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 on page 154
- Special Instructions to Follow Before Connecting Earth Ground to a Switch on page 157
- Connecting Earth Ground to an EX Series Switch on page 158

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

Table 70 on page 154 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 70: 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 chassis	14 AWG (2 mm²), minimum 90ºC 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 chassis	14 AWG (2 mm²), minimum 90ºC 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 157.
EX3300	Rear panel of chassis	14 AWG (2 mm²), minimum 90ºC 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 70: 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 chassis	14 WG (2 mm²), minimum 90ºC 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 157.
EX4300	Left side of chassis	14 AWG (2 mm²), minimum 90ºC 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 157.
EX4500	Left side of chassis	14 AWG (2 mm²), minimum 90ºC 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 157.
EX4550	Left side of chassis	14 AWG (2 mm²), minimum 90ºC 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 157.
EX6210	Rear panel of 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	

Table 70: 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
EX8208	Left side of chassis	6 AWG (13.3 mm²), minimum 60ºC 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	
EX8216	Two earthing terminals: • Left side of chassis • Rear panel of chassis	2 AWG (33.6 mm²), minimum 60ºC 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 157.
EX9204	Rear panel of chassis	One 6 AWG (13.3 mm²), minimum 60ºC 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 chassis	One 6 AWG (13.3 mm²), minimum 60ºC 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 chassis	One 6 AWG (13.3 mm²), minimum 60ºC 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 71 on page 157 lists the special instructions that you might need to follow before connecting earth ground to a switch.

Table 71: 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.
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. through 30.5 in. deep for a switch mounted flush with the rack front and 29.5 in. through 32.5 in. deep for a switch mounted 2 in. recessed from the rack front. See Figure 56 on page 157. **Figure 56: Connecting the Grounding Lug to a Switch Mounted on Four Posts of a Rack** <table><tr><td>1— Protective earthing terminal</td><td>3—Grounding lug</td></tr><tr><td>2—Side mounting-rail</td><td>4—Rear mounting-blade</td></tr></table> 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. through 30.5 in. deep for a switch mounted flush with the rack front and 29.5 in. through 32.5 in. deep for a switch mounted 2 in. recessed from the rack front.

Table 71: Special Instructions to Follow Before Connecting Earth Ground to a Switch *(continued)*

Switch	Special Instructions
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. through 30.5 in. deep for a switch mounted flush with the rack front and 29.5 in. through 32.5 in. deep for a switch mounted 2 in. 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. through 30.5 in. deep for a switch mounted flush with the rack front and 29.5 in. through 32.5 in. deep for a switch mounted 2 in. 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 57: Connecting a Grounding Cable to an EX Series Switch
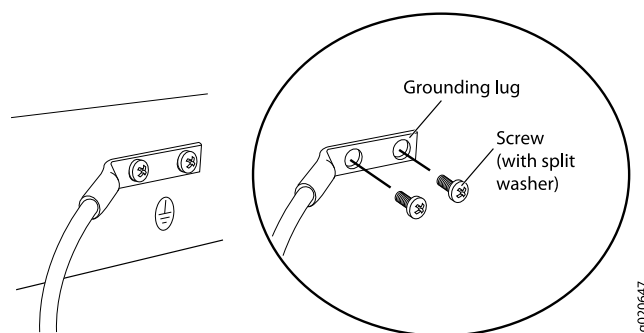
3. Secure the grounding lug to the protective earthing terminal with the washers and screws.

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*

- *Connecting DC Power to an EX2200 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 EX4200 Switch*

- *Connecting DC Power to an EX4200 Switch*

- Connecting AC Power to an EX4300 Switch on page 159

- Connecting DC Power to an EX4300 Switch on page 162

- *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 225

- Grounded Equipment Warning on page 245

Connecting AC Power to an EX4300 Switch

EX4300 switches support 350 W, 715 W, or 1100 W AC power supplies depending on the switch model. After you install at least one power supply, you can connect power to the switch.

CAUTION: **Do not mix:**

- AC and DC power supplies in the same chassis

- Power supplies with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis.

- Fan modules with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis.

- Power supplies and fan modules with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis.

Before you begin connecting AC power to an EX4300 switch:

- Ensure that you have taken the necessary precautions to prevent electrostatic discharge (ESD) damage (see "Prevention of Electrostatic Discharge Damage" on page 254).

- Ensure that you have connected the device chassis to earth ground.

> **CAUTION:** Before you connect power to the switch, a licensed electrician must attach a cable lug to the grounding cable 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 EX4300 switch to earth ground before you connect it 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 153. An EX4300 switch gains 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 an EX4300 Switch" on page 121).

- Install the power supply in the chassis. For instructions on installing a power supply in an EX4300 switch, see "Installing an AC Power Supply in an EX4300 Switch" on page 142.

Ensure that you have the following parts and tools available:

- A power cord appropriate for your geographical location (provided)

> **NOTE:** Each power supply must be connected to a dedicated power source outlet.

To connect AC power to an EX4300 switch:

1. Attach the grounding strap to your bare wrist and to a site ESD point.

   ⓘ NOTE: The power supply slots are at the right end of the rear panel on 24-port and 48-port switches, and at the left end on 32-port switches.Figure 58 on page 161 shows how to connect an AC power cord to an AC power supply installed on 24-port or 48-port EX4300 switches. The procedure is the same for 32-port EX4300 switches.

2. Ensure that the power supplies are fully inserted in the chassis and the latches are secure. If only one power supply is installed, ensure that a cover panel is installed over the second power supply slot.

3. Locate the power cord and power cord retainer shipped with the switch; the cords have plugs appropriate for your geographical location. See "AC Power Cord Specifications for an EX4300 Switch" on page 121.

4. Push the end of the retainer strip into the hole next to the inlet on the power supply face plate until it snaps into place. Ensure that the loop in the retainer strip faces toward the power cord.

5. Press the small tab on the retainer strip to loosen the loop. Slide the loop until you have enough space to insert the power cord coupler into the inlet.

6. Insert the power cord coupler firmly into the inlet.

7. Slide the loop toward the power supply until it is snug against the base of the coupler.

8. Press the tab on the loop and draw out the loop into a tight circle (see Figure 58 on page 161).

Figure 58: Connecting an AC Power Cord to an AC Power Supply in an EX4300 Switch
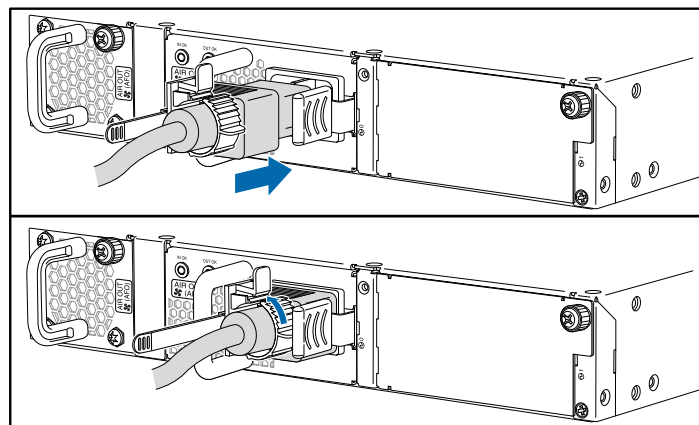
9. If the AC power source outlet has a power switch, set it to the OFF (**O**) position.

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

11. If the AC power source outlet has a power switch, set it to the ON (**I**) position.

12. Verify that the **IN OK** and **OUT OK** LEDs on each power supply are lit green.

If the **OUT OK** LED is lit amber, remove power from the power supply, and replace the power supply (see "Removing an AC Power Supply from an EX4300 Switch" on page 196). Do not remove the power supply until you have a replacement power supply ready: the power supplies or a cover panel must be installed in the switch to ensure proper airflow.

> CAUTION: We recommend that you install either a replacement power supply or a cover panel in the empty power supply slot to prevent chassis overheating and dust accumulation.

Related Documentation
- AC Power Supply in EX4300 Switches on page 37
- AC Power Supply LEDs in EX4300 Switches on page 44

Connecting DC Power to an EX4300 Switch

EX4300 switches can be configured with up to two DC power supplies. After you install at least one power supply, you can connect power to the switch.

> CAUTION: Do not mix:
>
> - AC and DC power supplies in the same chassis
> - Power supplies with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis.
> - Fan modules with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis.
> - Power supplies and fan modules with different airflow labels (**AIR IN (AFI)** and **AIR OUT (AFO)**) in the same chassis.

Before you begin connecting DC power to an EX4300 switch:

- Ensure that you have taken the necessary precautions to prevent electrostatic discharge (ESD) damage (see "Prevention of Electrostatic Discharge Damage" on page 254).
- Ensure that you have connected the switch chassis to earth ground.

> CAUTION: Ensure that you install the power supply module first and then install the DC input wire, before closing input breaker ON.

> CAUTION: Before you connect power to the device, 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 device (for example, by causing a short circuit).

To meet safety and electromagnetic interference (EMI) requirements and to ensure proper operation, you must connect the chassis to earth ground before you connect it 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 153.

- Install the power supply in the chassis. For instructions on installing a DC power supply in an EX4300 switch, see "Installing a DC Power Supply in an EX4300 Switch" on page 144.

Ensure that you have the following parts and tools available:

- DC power source cables (12–14 AWG) with ring lug (Molex 190700067 or equivalent) (not provided)

- Phillips (+) screwdriver, number 2 (not provided)

- Multimeter (not provided)

- A 14 AWG (2 mm²), minimum 90ºC wire grounding cable, or one permitted by the local code, with a Panduit LCC10-14BWL or equivalent grounding lug attached (not provided)

- Two 10-32 x .25 in. screws with #10 split-lock washer (not provided)

- Two #10 flat washers (not provided)

To connect DC power to an EX4300 switch:

1. Attach the grounding strap to your bare wrist and to a site ESD point.

    NOTE: The power supply slots are at the right end of the rear panel on 24-port and 48-port switches, and at the left end on 32-port switches. Figure 59 on page 166 shows how to secure ring lugs to the terminals on the DC power supply installed on 24-port or 48-port EX4300 switches. The procedure is the same for 32-port EX4300 switches.

2. Verify that the DC power cables are correctly labeled before making connections to the power supply. In a typical power distribution scheme where the return is connected to chassis ground at the battery plant, you can use a multimeter to verify the resistance of the −48V and RTN DC cables to chassis ground:

   - The cable with very low resistance (indicating a closed circuit) to chassis ground is positive (+) and will be installed on the V+ (return) DC power input terminal.

   - The cable with very high resistance (indicating an open circuit) to chassis ground is negative (−) and will be installed on the V− (input) DC power input terminal.

> **CAUTION:** You must ensure that power connections maintain the proper polarity. The power source cables might be labeled (+) and (−) to indicate their polarity. There is no standard color coding for DC power cables. The color coding used by the external DC power source at your site determines the color coding for the leads on the power cables that attach to the DC power input terminals on each power supply.

3. Ensure that the input circuit breaker is open so that the voltage across the DC power source cable leads is 0 V and that the cable leads will not become active while you are connecting DC power.

> **NOTE:** The V+ terminals are referred to as +RTN and V− terminals are referred to as −48 V in "DC Power Wiring Sequence Warning" on page 264 and "DC Power Electrical Safety Guidelines" on page 259.

4. Ensure that the power supplies are fully inserted in the chassis.

5. Remove the terminal block cover. The terminal block cover is a piece of clear plastic that snaps into place over the terminal block.

6. 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.

> **NOTE:** The DC power supply has five terminals, two positive terminals labeled V+ and two negative terminals labeled V−, for connecting the power supply to a dedicated DC power source by using the DC power source cables labeled positive (+) and negative (−), and one terminal for connecting the power supply to earth ground (see Figure 59 on page 166). The V+ terminals are shunted internally together, as are the V− terminals to provide parallel current path.

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

8. Place the grounding lug attached to the grounding cable over the earthing terminal on the DC power supply.

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

10. 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.

11. Connect each power supply to the power source. Secure power source cables to the power supplies by screwing the ring lugs attached to the cables to the appropriate terminals by using the screw from the terminals (see Figure 59 on page 166).

- To connect a power supply to a power source:

   a. Secure the ring lug of the positive (+) DC power source cable to one of the + terminals on the DC power supply.

   b. Secure the ring lug of the negative (−) DC power source cable to the − terminal adjacent to the + terminal that you connected to on the DC power supply.

   c. Connect the ground wire to earth ground if the switch is not in a grounded rack.

   d. Tighten the screws on the power supply terminals until they are snug by using the screwdriver. Do not overtighten—apply between 5 lb-in (0.56 Nm) and 6 lb-in (0.68 Nm) of torque to the screws.

   If you have a second installed power supply, connect it in the same way you did the first.

- To connect one 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 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 − terminal adjacent to the + terminal on the DC power supply to which you connected the ring lug of the positive (+) DC power source cable from the first DC power source.

   c. Secure the ring lug of the positive (+) DC power source cable from the second DC power source to the other + 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 − terminal adjacent to the + terminal on the DC power supply to which you connected the ring lug of the positive (+) DC power source cable from the second DC power source.

   e. Connect the ground wire to earth ground if the switch is not in a grounded rack.

   f. Tighten the screws on the power supply terminals on both the power supplies until snug using the screwdriver. Do not overtighten—apply between 8 lb-in. (0.9 Nm) and 9 lb-in. (1.02 Nm) of torque to the screws.

   If you have a second installed power supply, connect it in the same way you did the first.

Figure 59: Securing Ring Lugs to the Terminals on the DC Power Supply
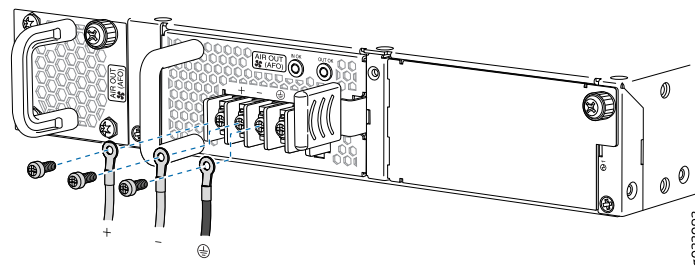
12. Replace the terminal block cover.

13. Close the input circuit breaker.

14. Verify that the **IN OK** and **OUT OK** LEDs on the power supply are lit green and are on steadily.

Related Documentation
- DC Power Supply in EX4300 Switches on page 45
- DC Power Supply LEDs in EX4300 Switches on page 49

Registering Products—Mandatory for Validating SLAs

Register all new Juniper Networks hardware products and changes to an existing installed product on the Juniper Networks website. Registration is mandatory for activating your hardware 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 SLAs for products that do not have registered serial numbers or accurate installation base data.**

Register your products at: https://tools.juniper.net/svcreg/SRegSerialNum.jsp .
Update your installation base at:
https://www.juniper.net/customers/csc/management/updateinstallbase.jsp .

Related Documentation
- Contacting Customer Support to Obtain Return Materials Authorization for Switches on page 218

Connecting EX Series Switches in a Virtual Chassis Fabric

A Juniper Networks Virtual Chassis Fabric (VCF) is constructed using a spine-and-leaf architecture and topology. In the spine-and-leaf architecture, each spine device is interconnected to each leaf device. Supported devices in a VCF are:

- QFX5100-24Q (spine or leaf)

- QFX5100-48S (spine or leaf)

- QFX5100-48T (spine or leaf)

- QFX5100-96S (spine or leaf)

- QFX3600 (leaf)

- QFX3500 (leaf)

- EX4600 (leaf)

- EX4300 (leaf)

Although best practice is to use all QFX5100 switches in the VCF, you can use EX4300 switches as leaf devices.

Installations with QFX3600, QFX3500, and EX4300 as leaf devices in the VCF are called mixed mode. Mixed mode VCF installations can support 32 total devices, of which 4 devices can be configured into the spine devices.

You can install a VCF in a single rack, multiple racks, or in wire closets. You construct a VCF by configuring and then cabling QSFP+ interfaces into Virtual Chassis ports (VCPs).

On EX4300 switches, QSFP+ ports 0 and 1 are configured as VCP by default. Non-channelized QSFP+ interfaces on EX4300 switches can be configured into VCPs. All fixed SFP+ interfaces on EX4300 switches can also be configured into VCPs.

BEST PRACTICE: Use 40-Gigabit QSFP+ ports as VCPs when available.

Figure 60 on page 168 shows two QFX5100-24Q spine devices connected to a QFX5100-48S, QFX3600, QFX3500, and EX4300 leaf devices using all QSFP+ ports as VCPs. A VCF with more than one model in the design is called mixed-mode.

Figure 60: Mixed Mode VCF with a EX4300 Switch
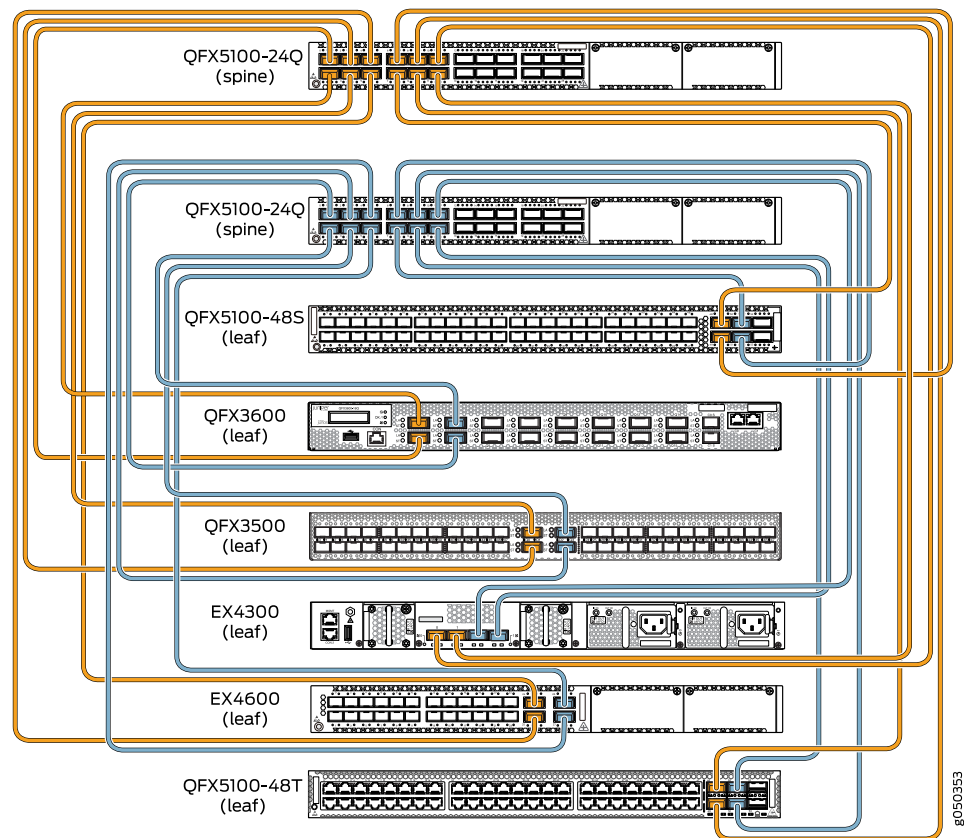
- *Virtual Chassis Fabric Overview*

- *Understanding Virtual Chassis Fabric Components*

- *Understanding EX4300 Virtual Chassis*

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

This topic applies to multiple hardware devices in the EX Series product family, which includes EX Series switches and the XRE200 External Routing Engine.

This topic also applies to OCX1100 switches.

You can monitor and manage these devices by using a dedicated management channel. Each device has a management port with an RJ-45 connector for out-of-band management. Use the management port to connect the switch or external Routing Engine to the management device.

Ensure that you have an Ethernet cable with an RJ-45 connector available. One such cable is provided with the device. Figure 61 on page 169 shows the RJ-45 connector of the Ethernet cable supplied with the device.

Figure 61: Ethernet Cable Connector
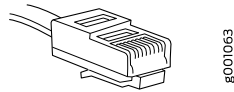
To connect a device to a network for out-of-band management (see
):

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

   For the location of the **MGMT** or **ETHERNET** port on different devices:

   - See *EX2200 Switches Hardware Overview*.

   - See *Rear Panel of an EX3200 Switch*.

   - See *Rear Panel of an EX3300 Switch*.

   - See *Rear Panel of an EX4200 Switch*.

   - See

   - 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*.

   - See *Front Panel of an XRE200 External Routing Engine*.

   - See *OCX1100 Switches Hardware Overview*.

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

Figure 62: Connecting a Switch to a Network for Out-of-Band Management
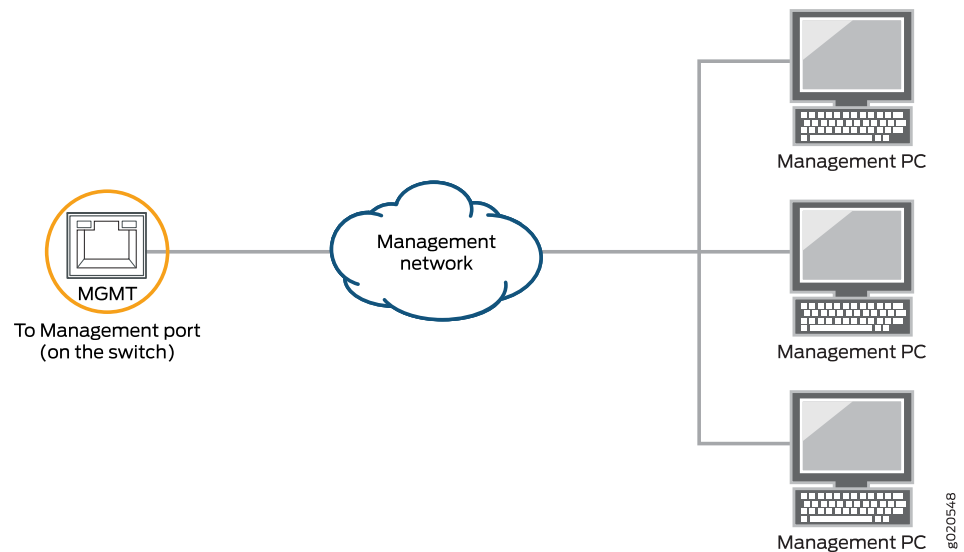
<div align="right">

Related
Documentation

</div>

- Connecting a Switch to a Management Console on page 170

- *Management Port Connector Pinout Information for an EX2200 Switch*

- *Management Port Connector Pinout Information for an EX3200 Switch*

- *Management Port Connector Pinout Information for an EX3300 Switch*

- *Management Port Connector Pinout Information for an EX4200 Switch*

- Management Port Connector Pinout Information for an EX4300 Switch on page 64

- *Management Port Connector Pinout Information for an EX4500 Switch*

- *Management Port Connector Pinout Information for an EX4550 Switch*

- *Management Port Connector Pinout Information for an EX6200 Switch*

- *Management Port Connector Pinout Information for an EX8200 Switch*

- *Management Port Connector Pinout Information for an XRE200 External Routing Engine*

- *Cables Connecting the EX6200 Switch to Management Devices*

- *Cables Connecting the EX8200 Switch to Management Devices*

- *Management Port Connector Pinout Information for an OCX1100 Switch*

Connecting a Switch to a Management Console

This topic applies to multiple hardware devices in the EX Series product family, which includes EX Series switches and the XRE200 External Routing Engine.

This topic also applies to OCX1100 switches.

You can configure and manage these devices by using a dedicated console. Every device has a console port with an RJ-45 connector. Use the console port to connect the device

to the management console or to a console server. The console port accepts a cable with an RJ-45 connector.

Ensure that you have an Ethernet cable with an RJ-45 connector available. An RJ-45 cable and an RJ-45 to DB-9 serial port adapter are supplied with the device.

Figure 63 on page 171 shows the RJ-45 connector of the Ethernet cable supplied with the device.

Figure 63: Ethernet Cable Connector
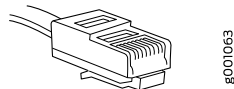
NOTE: If your laptop or PC does not have a DB-9 male connector pin and you want to connect your laptop or PC directly to the device, use a combination of the RJ-45 to DB-9 female adapter supplied with the device and a USB to DB-9 male adapter. You must provide the USB to DB-9 male adapter.

To connect the device to a management console (see Figure 64 on page 172 and Figure 65 on page 172):

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

   For the location of the **CON/CONSOLE** port on different devices:

   - See *EX2200 Switches Hardware Overview*.

   - See *Rear Panel of an EX3200 Switch*.

   - See *Rear Panel of an EX3300 Switch*.

   - See *Rear Panel of an EX4200 Switch*.

   - See "EX4300 Switches Hardware Overview" on page 3

   - 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*.

   - See *Front Panel of an XRE200 External Routing Engine*.

   - See *Management Panel of an EX4600 Switch*

   - *OCX1100 Switches Hardware Overview*

2. Connect the other end of the Ethernet cable into the console server (see Figure 64 on page 172) or management console (see Figure 65 on page 172).

To configure the device from the management console, see "Connecting and Configuring an EX Series Switch (CLI Procedure)" on page 185 or "Connecting and Configuring an EX Series Switch (J-Web Procedure)" on page 188 or *Connecting and Configuring an OCX1100 Switch (CLI Procedure)*.

> *i*   NOTE: EX2200-24T-4G-DC and OCX1100 switches do not support switch connection and configuration through the J-Web interface.

Figure 64: Connecting a Switch to a Management Console Through a Console Server

To Console port (on the switch)   Console server   PC
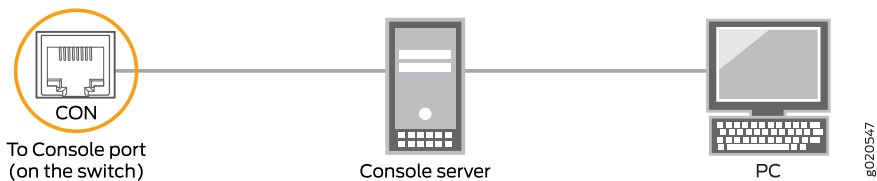
Figure 65: Connecting a Switch Directly to a Management Console

To Console port (on the switch)   Laptop CPU

Related Documentation

- *Configuring the Console Port Type (CLI Procedure)*

- Connecting a Switch to a Network for Out-of-Band Management on page 168

- Console Port Connector Pinout Information for an EX Series Switch on page 62

- *Cables Connecting the EX6200 Switch to Management Devices*

- *Cables Connecting the EX8200 Switch to Management Devices*

- *Console Port Connector Pinout Information for an OCX1100 Switch*

Connecting an EX4300 Switch to a Management Console Using the Mini-USB Type-B Console Port

You can configure and manage EX4300 switches by using the RJ-45 console port or the Mini-USB Type-B console port. However, the console input will be active only on one port at a time—only one port will be set active at a time.

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)*.

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 an EX4300 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 section describes the process of connecting an EX4300 switch to the management console by using the Mini-USB Type-B console port.

For information about configuring and managing an EX4300 switch by using the RJ-45 console port, see "Connecting a Switch to a Management Console" on page 170.

Before you begin connecting an EX4300 switch by using 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 hyper terminal 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:

- 1 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 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 **CON2**) on the switch.

3. Set the Mini-USB Type-B console port as the active console port by using the command **port-type**.
   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 lets you control switch functionality through it.

Related
Documentation

- *Configuring the Console Port Type (CLI Procedure)*

- Connecting a Switch to a Network for Out-of-Band Management on page 168

Connecting a Fiber-Optic Cable to a Switch

EX Series and OCX1100 switches support optical transceivers, which are field-replaceable units (FRUs). You can connect fiber-optic cables to these transceivers.

Before you begin connecting a fiber-optic cable to an optical transceiver installed in a switch, ensure that you have taken the necessary precautions for safe handling of lasers (see "Laser and LED Safety Guidelines and Warnings for Switches" on page 231).

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

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 66 on page 174).

Figure 66: Connecting a Fiber-Optic Cable to an Optical Transceiver Installed in a Switch
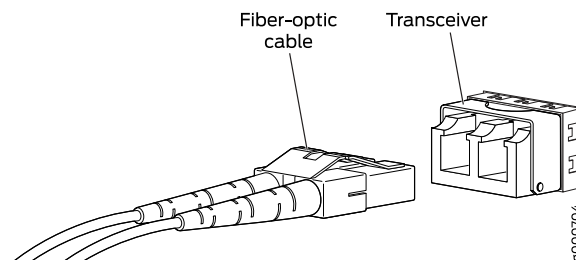
4. Secure the cables so that they are not supporting their own weight. Place excess cable out of the way in a neatly coiled loop. Placing fasteners on a loop helps cables maintain their shape.

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 Switch on page 202

- Installing a Transceiver in an EX Series Switch on page 149

- Maintaining Fiber-Optic Cables in Switches on page 209

- *Pluggable Transceivers Supported on EX Series Switches*

- *Installing a Transceiver in an OCX1100 Switch*

- *Pluggable Transceivers Supported on OCX1100 Switches*

Performing Initial Configuration

EX4300 Default Configuration

Each EX Series switch is programmed with a factory default configuration that contains the values set for each configuration parameter when the switch is shipped. The default configuration file sets values for system parameters such as **syslog** and **commit**, configures Ethernet switching on all interfaces, enables IGMP snooping, and enables the LLDP and RSTP protocols.

The following default configuration file is for an EX4300-24T switch:

> NOTE:
> - The factory default configuration file has more interfaces for models that have more ports.
>
> - The **poe** statement does not appear for models without PoE+ ports.
>
> Interfaces ge-0/0/0 through ge-0/0/23 are network port interfaces. Interfaces ge-0/2/0 through ge-0/2/3 and xe-0/2/0 through xe-0/2/3 are SFP/SFP+ uplink module port interfaces.

When you commit changes to the configuration, a new configuration file is created, which becomes the active configuration. You can always revert to the factory default configuration. See *Reverting to the Default Factory Configuration for the EX Series Switch*.

```
system {
    auto-snapshot;
    syslog {
        user * {
            any emergency;
        }
        file messages {
            any notice;
            authorization info;
```

```
            }
          file interactive-commands {
            interactive-commands any;
          }
        }
      commit {
        factory-settings {
          reset-virtual-chassis-configuration;
          reset-chassis-lcd-menu;
        }
      }
    }
  interfaces {
    ge-0/0/0 {
      unit 0 {
        family ethernet-switching;
          vlan {
            members default;
          }
          storm-control default;
        }
      }
    }
    ge-0/0/1 {
      unit 0 {
        family ethernet-switching;
          vlan {
            members default;
          }
          storm-control default;
        }
      }
    }
    ge-0/0/2 {
      unit 0 {
        family ethernet-switching;
          vlan {
            members default;
          }
          storm-control default;
        }
      }
    }
    ge-0/0/3 {
      unit 0 {
        family ethernet-switching;
          vlan {
            members default;
          }
          storm-control default;
        }
      }
    }
    ge-0/0/4 {
      unit 0 {
        family ethernet-switching;
```

```
                vlan {
                    members default;
                }
                storm-control default;
            }
        }
    }
    ge-0/0/5 {
        unit 0 {
            family ethernet-switching;
                vlan {
                    members default;
                }
                storm-control default;
            }
        }
    }
    ge-0/0/6 {
        unit 0 {
            family ethernet-switching;
                vlan {
                    members default;
                }
                storm-control default;
            }
        }
    }
    ge-0/0/7 {
        unit 0 {
            family ethernet-switching;
                vlan {
                    members default;
                }
                storm-control default;
            }
        }
    }
    ge-0/0/8 {
        unit 0 {
            family ethernet-switching;
                vlan {
                    members default;
                }
                storm-control default;
            }
        }
    }
    ge-0/0/9 {
        unit 0 {
            family ethernet-switching;
                vlan {
                    members default;
                }
                storm-control default;
            }
        }
```

```
                    }
                    ge-0/0/10 {
                        unit 0 {
                            family ethernet-switching;
                                vlan {
                                    members default;
                                }
                                storm-control default;
                            }
                        }
                    }
                    ge-0/0/11 {
                        unit 0 {
                            family ethernet-switching;
                                vlan {
                                    members default;
                                }
                                storm-control default;
                            }
                        }
                    }
                    ge-0/0/12 {
                        unit 0 {
                            family ethernet-switching;
                                vlan {
                                    members default;
                                }
                                storm-control default;
                            }
                        }
                    }
                    ge-0/0/13 {
                        unit 0 {
                            family ethernet-switching;
                                vlan {
                                    members default;
                                }
                                storm-control default;
                            }
                        }
                    }
                    ge-0/0/14 {
                        unit 0 {
                            family ethernet-switching;
                                vlan {
                                    members default;
                                }
                                storm-control default;
                            }
                        }
                    }
                    ge-0/0/15 {
                        unit 0 {
                            family ethernet-switching;
                                vlan {
                                    members default;
```

```
                }
                storm-control default;
            }
        }
    }
    ge-0/0/16 {
        unit 0 {
            family ethernet-switching;
            vlan {
                members default;
            }
            storm-control default;
        }
    }
    ge-0/0/17 {
        unit 0 {
            family ethernet-switching;
            vlan {
                members default;
            }
            storm-control default;
        }
    }
    ge-0/0/18 {
        unit 0 {
            family ethernet-switching;
            vlan {
                members default;
            }
            storm-control default;
        }
    }
    ge-0/0/19 {
        unit 0 {
            family ethernet-switching;
            vlan {
                members default;
            }
            storm-control default;
        }
    }
    ge-0/0/20 {
        unit 0 {
            family ethernet-switching;
            vlan {
                members default;
            }
            storm-control default;
        }
    }
    ge-0/0/21 {
```

```
                unit 0 {
                  family ethernet-switching;
                    vlan {
                      members default;
                    }
                    storm-control default;
                }
              }
            }
            ge-0/0/22 {
              unit 0 {
                family ethernet-switching;
                  vlan {
                    members default;
                  }
                  storm-control default;
                }
              }
            }
            ge-0/0/23 {
              unit 0 {
                family ethernet-switching;
                  vlan {
                    members default;
                  }
                  storm-control default;
                }
              }
            }
            ge-0/2/0 {
              unit 0 {
                family ethernet-switching;
                  vlan {
                    members default;
                  }
                  storm-control default;
                }
              }
            }
            xe-0/2/0 {
              unit 0 {
                family ethernet-switching;
                  vlan {
                    members default;
                  }
                  storm-control default;
                }
              }
            }
            ge-0/2/1 {
              unit 0 {
                family ethernet-switching;
                  vlan {
                    members default;
                  }
                  storm-control default;
```

```
                  }
                }
              }
              xe-0/2/1 {
                unit 0 {
                  family ethernet-switching;
                    vlan {
                      members default;
                    }
                    storm-control default;
                  }
                }
              }
              ge-0/2/2 {
                unit 0 {
                  family ethernet-switching;
                    vlan {
                      members default;
                    }
                    storm-control default;
                  }
                }
              }
              xe-0/2/2 {
                unit 0 {
                  family ethernet-switching;
                    vlan {
                      members default;
                    }
                    storm-control default;
                  }
                }
              }
              ge-0/2/3 {
                unit 0 {
                  family ethernet-switching;
                    vlan {
                      members default;
                    }
                    storm-control default;
                  }
                }
              }
              xe-0/2/3 {
                unit 0 {
                  family ethernet-switching;
                    vlan {
                      members default;
                    }
                    storm-control default;
                  }
                }
              }
            }
            forwarding-options {
              storm-control-profiles default {
```

```
                        all;
                    }
                }
                protocols {
                    lldp {
                        interface all;
                    }
                    lldp-med {
                        interface all;
                    }
                    igmp-snooping {
                        vlan default;
                    }
                    rstp;
                        interface ge-0/0/0;
                        interface ge-0/0/1;
                        interface ge-0/0/2;
                        interface ge-0/0/3;
                        interface ge-0/0/4;
                        interface ge-0/0/5;
                        interface ge-0/0/6;
                        interface ge-0/0/7;
                        interface ge-0/0/8;
                        interface ge-0/0/9;
                        interface ge-0/0/10;
                        interface ge-0/0/11;
                        interface ge-0/0/12;
                        interface ge-0/0/13;
                        interface ge-0/0/14;
                        interface ge-0/0/15;
                        interface ge-0/0/16;
                        interface ge-0/0/17;
                        interface ge-0/0/18;
                        interface ge-0/0/19;
                        interface ge-0/0/20;
                        interface ge-0/0/21;
                        interface ge-0/0/22;
                        interface ge-0/0/23;
                        interface ge-0/0/24;
                        interface ge-0/0/25;
                        interface ge-0/0/26;
                        interface ge-0/0/27;
                        interface ge-0/0/28;
                        interface ge-0/0/29;
                        interface ge-0/0/30;
                        interface ge-0/0/31;
                        interface ge-0/0/32;
                        interface ge-0/0/33;
                        interface ge-0/0/34;
                        interface ge-0/0/35;
                        interface ge-0/0/36;
                        interface ge-0/0/37;
                        interface ge-0/0/38;
                        interface ge-0/0/39;
                        interface ge-0/0/40;
                        interface ge-0/0/41;
```

```
                       interface ge-0/0/42;
                       interface ge-0/0/43;
                       interface ge-0/0/44;
                       interface ge-0/0/45;
                       interface ge-0/0/46;
                       interface ge-0/0/47;
                       interface ge-0/2/0;
                       interface xe-0/2/0;
                       interface ge-0/2/1;
                       interface xe-0/2/1;
                       interface ge-0/2/2;
                       interface xe-0/2/2;
                       interface ge-0/2/3;
                       interface xe-0/2/3;
                   }
               }
               vlans {
                   default {
                       vlan-id 1;
                   }
               }
               poe {
                   interface-all;
               }
```

Related
Documentation

- *Reverting to the Default Factory Configuration for the EX Series Switch*

- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 185

- Connecting and Configuring an EX Series Switch (J-Web Procedure) on page 188

- *Understanding Configuration Files for EX Series Switches*

- *EX Series Switches Interfaces Overview*

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. The RJ-45 cable and 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*.

   - See *Rear Panel of an EX3200 Switch*.

   - See *Rear Panel of an EX3300 Switch*.

   - See *Rear Panel of an EX4200 Switch*.

   - See "EX4300 Switches Hardware Overview" on page 3

   - 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, EX4300, and EX4550 switches, you can also use the Mini-USB Type-B console port to connect to a laptop or PC.
   >
   > - For EX2200-C switches, see *Connecting an EX2200 Switch to a Management Console Using Mini-USB Type-B Console Port*.
   >
   > - For EX4300 switches, see "Connecting an EX4300 Switch to a Management Console Using the Mini-USB Type-B Console Port" on page 172.
   >
   > - For EX4550 switches, see *Connecting an EX4550 Switch to a Management Console Using the Mini-USB Type-B Console Port*.

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

3. Enter the hostname. This is optional.

4. Enter the root password you plan to use for this device. You are prompted to re-enter the root password.

5. Enter **yes** to enable services like Telnet and SSH. By default, Telnet is not enabled and SSH is enabled.

> NOTE: When Telnet is enabled, you will not be able to log in to an EX Series switch through Telnet by using **root** credentials. Root login is supported only for SSH access.

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 default VLAN.

  - Create a new VLAN—If you select this option, you are prompted to 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*. 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 188

- *Installing and Connecting an EX2200 Switch*

- *Installing and Connecting an EX3200 Switch*

- *Installing and Connecting an EX3300 Switch*

- *Installing and Connecting an EX4200 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: EX2200-24T-4G-DC switches do not support switch connection and configuration through J-Web procedure.

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 67 on page 189 or Figure 68 on page 189):

Figure 67: LCD Panel in an EX3200, EX4200, EX4500, EX4550, or EX8200 Switch
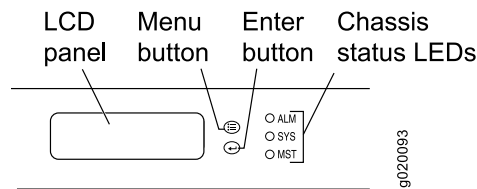
Figure 68: LCD Panel in an EX4300 Switch

1—LCD panel	3—LCD panel Menu button
2—LCD panel Enter button	4—Chassis status LEDs
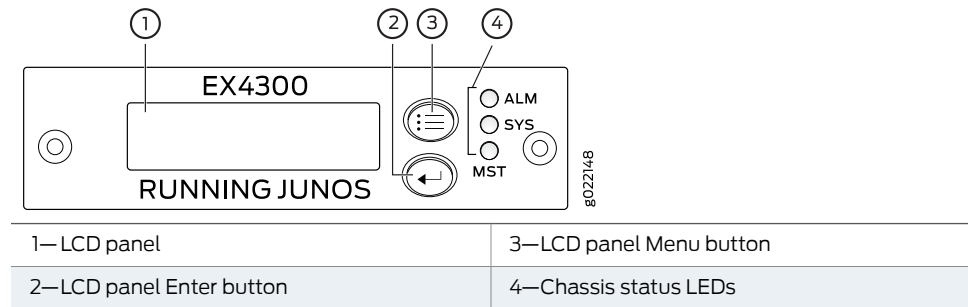
   1. Press the **Menu** button until you see **MAINTENANCE MENU**. Then press the **Enter** button.

   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 185

- *Installing and Connecting an EX2200 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 on page 127

- *Installing and Connecting an EX4500 Switch*

- *Installing and Connecting an EX4550 Switch*

- *Installing and Connecting an EX6210 Switch*

- *Installing and Connecting an EX8208 Switch*

- *Installing and Connecting an EX8216 Switch*

PART 4

Removing Switch Components

Removing Switch Components

Installing and Removing EX4300 Switch Hardware Components

The EX4300 switch chassis is a rigid sheet-metal structure that houses the hardware components. The field-replaceable units (FRUs) in EX4300 switches are:

- Power supplies
- Fan modules
- Uplink module
- Transceiver

The power supply (AC or DC), fan module, uplink module, and transceivers are hot-removable and hot-insertable: You can remove and replace them without powering off the switch or disrupting switch functions.

> NOTE: **You must remove a fan module only for replacement.**

See these topics for instructions for installing and removing components:

- Installing an AC Power Supply in an EX4300 Switch on page 142
- Removing an AC Power Supply from an EX4300 Switch on page 196
- Installing a DC Power Supply in an EX4300 Switch on page 144
- Removing a DC Power Supply from an EX4300 Switch on page 198
- Installing a Fan Module in an EX4300 Switch on page 145

- Removing a Fan Module from an EX4300 Switch on page 201

- Installing an Uplink Module in an EX4300 Switch on page 147

- Removing an Uplink Module from an EX4300 Switch on page 199

- Installing a Transceiver in an EX Series Switch on page 149

- Removing a Transceiver from a Switch on page 203

Related Documentation
- Cooling System and Airflow in an EX4300 Switch on page 50

- AC Power Supply in EX4300 Switches on page 37

- DC Power Supply in EX4300 Switches on page 45

- Uplink Modules in EX4300 Switches on page 55

- Pluggable Transceivers Supported on EX4300 Switches on page 70

Removing an AC Power Supply from an EX4300 Switch

The power supplies in EX4300 switches are hot-removable and hot-insertable field-replaceable units (FRUs) installed in the rear panel of the switch: You can remove and replace them without powering off the switch or disrupting switch functions.

Before you remove a power supply from an EX4300 switch, ensure that you have taken the necessary precautions to prevent electrostatic discharge (ESD) damage (see "Prevention of Electrostatic Discharge Damage" on page 254).

Ensure that you have the following parts and tools available to remove a power supply from an EX4300 switch:

- ESD grounding strap

- Phillips (+) screwdriver, number 2 (not provided)

- Antistatic bag or an antistatic mat

- Replacement power supply or a cover panel for the power supply slot

> ⚠ CAUTION: We recommend that you install either a replacement power supply or a cover panel in the empty power supply slot to prevent chassis overheating and dust accumulation.

> ℹ NOTE: The power supply slots are at the right end of the rear panel on 24-port and 48-port switches, and at the left end on 32-port switches. Figure 69 on page 197 shows how to remove an AC power supply from 24-port or 48-port switches. The procedure is the same for 32-port switches.

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

2. Attach the ESD grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.

> ⓘ NOTE: If only one power supply is installed in your EX4300 switch, you need to power off the switch before removing the power supply.

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

4. Gently pull out the male end of the power cord connected to the power source outlet.

5. Remove the power cord from the power supply faceplate by detaching the power cord retainer and gently pulling out the female end of the power cord connected to the power supply faceplate.

6. Slide the ejector lever toward the left until the power supply is unseated.

7. Grasp the power supply handle and pull firmly to slide the power supply halfway out of the chassis.

8. Place one hand under the power supply to support it and slide it completely out of the chassis. Take care not to touch power supply components, pins, leads, or solder connections.

9. Place the power supply in the antistatic bag or on the antistatic mat placed on a flat, stable surface.

10. If you are not replacing the power supply, install the cover panel over the slot.

Figure 69: Removing an AC Power Supply from an EX4300 Switch
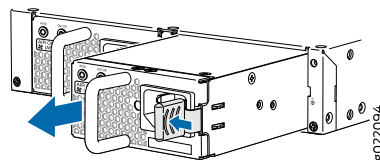
Related Documentation

- Installing an AC Power Supply in an EX4300 Switch on page 142
- Installing and Removing EX4300 Switch Hardware Components on page 141
- AC Power Supply Specifications for EX4300 Switches on page 119
- Field-Replaceable Units in EX4300 Switches on page 36
- AC Power Cord Specifications for an EX4300 Switch on page 121
- EX4300 Switches Hardware Overview on page 3

Removing a DC Power Supply from an EX4300 Switch

The power supply in EX4300 switches is a hot-removable and hot-insertable field-replaceable unit (FRU) installed in the rear panel of the switch: You can remove and replace it without powering off the switch or disrupting switch functions.

Before you begin removing a power supply from the switch:

- Ensure you understand how to prevent electrostatic discharge (ESD) damage. See "Prevention of Electrostatic Discharge Damage" on page 254.

Ensure that you have the following parts and tools available to remove the power supply from the switch chassis:

- ESD grounding strap

- Phillips (+) screwdriver, number 2

- An antistatic bag or an antistatic mat

- Replacement power supply or a cover panel for the power supply slot

CAUTION: We recommend that you install either a replacement power supply or a cover panel in the empty power supply slot to prevent chassis overheating and dust accumulation.

NOTE: The power supply slots are at the right end of the rear panel on 24-port and 48-port switches, and at the left end on 32-port switches. Figure 70 on page 199 shows how to remove a DC power supply from 24-port or 48-port switches. The procedure is the same for 32-port switches.

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

2. Attach the ESD grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.

3. Make sure that the voltage across the DC power source cables leads is 0 V and that there is no chance that the cables might become active during the removal process.

4. Remove the plastic cover from the input terminals by sliding the cover either to the left or right.

5. Unscrew the locking screws counterclockwise by using the screwdriver.

6. Remove the cable lugs from the input DC terminals.

7. Slide the ejector lever toward the left until the power supply is unseated.

8. Grasp the power supply handle and pull firmly to slide the power supply halfway out of the chassis.

9. Taking care not to touch power supply pins, leads, or solder connections, place one hand under the power supply to support it. Grasp the power supply handle with your other hand and pull the power supply completely out of the chassis.

10. Place the power supply in the antistatic bag or on the antistatic mat placed on a flat, stable surface.

11. If you are not replacing the power supply, install the cover panel over the slot.

Figure 70: Removing a DC Power Supply from an EX4300 Switch
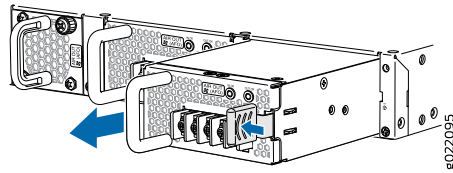
Related Documentation
- Installing a DC Power Supply in an EX4300 Switch on page 144
- DC Power Supply in EX4300 Switches on page 45
- EX4300 Switches Hardware Overview on page 3

Removing an Uplink Module from an EX4300 Switch

The uplink module in EX4300 switches is hot-removable and hot-insertable field-replaceable unit (FRU): You can remove and replace it without powering off the switch or disrupting switch functions.

Before you begin removing an uplink module from the switch:

- Ensure that you have taken the necessary precautions to prevent electrostatic discharge (ESD) damage (see "Prevention of Electrostatic Discharge Damage" on page 254).

- If there are any transceivers installed in the uplink module, remove them before you remove the uplink module. For instructions on removing transceivers, see "Removing a Transceiver from a Switch" on page 203.

Ensure that you have the following parts and tools available:

- ESD grounding strap
- Phillips (+) screwdriver, number 2
- A replacement uplink module or cover panel
- An antistatic bag or antistatic mat

CAUTION: We recommend that you install either a replacement uplink module or a cover panel in the empty module slot to prevent chassis overheating and dust accumulation.

To remove an uplink module from the switch (see Figure 71 on page 200, Figure 72 on page 200, and Figure 73 on page 201):

1. Take the uplink module offline by issuing the following CLI command:

   user@switch> **request chassis pic offline fpc-slot** *slot-number* **pic-slot** *slot-number*

2. Attach the ESD grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.

3. Loosen both captive screws on the faceplate of the uplink module by using your fingers. If you are unable to unscrew the captive screws by using your fingers, use the screwdriver.

4. Hold both the ejector handles and gently pull the uplink module toward you and out of the module slot.

5. Place the uplink module in an antistatic bag or on an antistatic mat placed on a flat, stable surface.

6. If you are not replacing the uplink module, install the cover panel over the slot.

> ⓘ NOTE: After you have removed an uplink module, wait for at least 5 seconds before you install an uplink module. If you do not wait for at least 5 seconds, the interfaces on the uplink module might not come up.

Figure 71: Removing a 4-Port SFP+ Uplink Module from a 24-Port or 48-Port EX4300 Switch
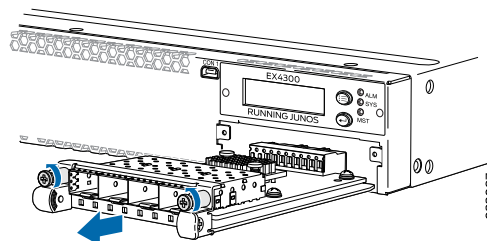
Figure 72: Removing a 2-Port QSFP+ Uplink Module from a 32-Port EX4300 Switch
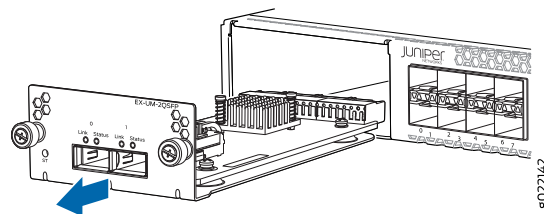
Figure 73: Removing an 8-Port SFP+ Uplink Module from a 32-Port EX4300 Switch
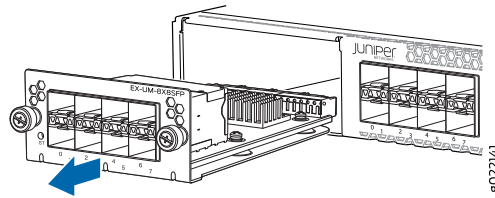
Related Documentation

- Installing an Uplink Module in an EX4300 Switch on page 147
- Installing and Removing EX4300 Switch Hardware Components on page 141
- Field-Replaceable Units in EX4300 Switches on page 36
- EX4300 Switches Hardware Overview on page 3

Removing a Fan Module from an EX4300 Switch

The fan module in EX4300 switches is a hot-removable and hot-insertable field-replaceable unit (FRU) installed in the rear panel of the switch: You can remove and replace it without powering off the switch or disrupting switch functions.

Ensure that you have the following parts and tools available:

- Phillips (+) screwdriver, number 2
- An antistatic bag or an antistatic mat
- A replacement fan module

> **NOTE:** The fan module slots are at the left end of the rear panel on 24-port and 48-port switches, and at the right end on 32-port switches.
> Figure 74 on page 202 shows how to remove a fan module from 24- port or 48-port switches. The procedure is the same for 32-port switches.

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

2. Loosen the captive screws on the front faceplate of the fan module by using your fingers. If you are unable to loosen the captive screws by using your fingers, use the screwdriver.

> **WARNING:** To prevent injury, do not touch the fan with your hands or any tools as you slide the fan module out of the chassis—the fan might still be running.

3. Grasp the handle on the fan module and pull it firmly to slide the fan module out of the chassis.

4. Place the fan module in the antistatic bag or on the antistatic mat placed on a flat, stable surface.

5. Install the replacement fan.

6. Tighten the captive screws on the faceplate of the fan module by using your fingers. If you are unable to tighten the captive screws by using your fingers, use the screwdriver.

Figure 74: Removing a Fan Module from an EX4300 Switch
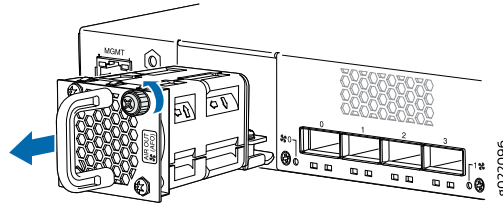
NOTE: Both the fan modules must be installed and operational for optimal functioning of the switch.

Related Documentation

- Installing a Fan Module in an EX4300 Switch on page 145
- Installing and Removing EX4300 Switch Hardware Components on page 141
- Cooling System and Airflow in an EX4300 Switch on page 50
- Field-Replaceable Units in EX4300 Switches on page 36
- EX4300 Switches Hardware Overview on page 3

Disconnecting a Fiber-Optic Cable from a Switch

EX Series switches and OCX1100 switches 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 installed in a switch, ensure that you have taken the necessary precautions for safe handling of lasers. See "Laser and LED Safety Guidelines and Warnings for Switches" on page 231.

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 switch:

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

    ```
    [edit interfaces]
    user@switch# 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 to a Switch on page 174

- Removing a Transceiver from a Switch on page 203

- Maintaining Fiber-Optic Cables in Switches on page 209

- *Pluggable Transceivers Supported on EX Series Switches*

- *Pluggable Transceivers Supported on OCX1100 Switches*

Removing a Transceiver from a Switch

The transceivers for EX Series switches and OCX1100 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 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 switch, ensure that you have taken the necessary precautions for safe handling of lasers (see "Laser and LED Safety Guidelines and Warnings for Switches" on page 231).

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 75 on page 205 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 switch:

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 Switch" on page 202). 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 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 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.

Figure 75: Removing a Transceiver from a Switch
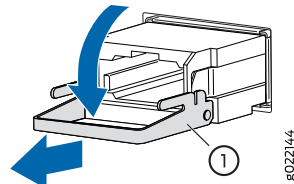
1— Ejector lever	

5. 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.

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

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

8. Place the dust cover over the empty port.

Related Documentation

- Installing a Transceiver in an EX Series Switch on page 149

- *Pluggable Transceivers Supported on EX Series Switches*

- *Installing a Transceiver in an OCX1100 Switch*

- *Pluggable Transceivers Supported on OCX1100 Switches*

Switch and Component Maintenance

CHAPTER 13

Routine Maintenance

Maintaining Fiber-Optic Cables in Switches

Fiber-optic cables connect to optical transceivers that are installed in EX Series switches and OCX1100 switches.

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 is not supporting 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. Micro-deposits 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 to a Switch on page 174
- Laser and LED Safety Guidelines and Warnings for Switches on page 231
- *Pluggable Transceivers Supported on EX Series Switches*
- *Pluggable Transceivers Supported on OCX1100 Switches*

PART 6

Returning Hardware

Returning the Switch or Switch Components

Returning an EX4300 Switch or Component for Repair or Replacement

If you need to return an EX4300 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 EX4300 Switch or Component" on page 214.

2. Obtain an Return Materials Authorization (RMA) number from JTAC as described in "Contacting Customer Support to Obtain Return Materials Authorization for Switches" on page 218.

   > **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 EX4300 Switch or Component for Shipping" on page 220.

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

Related Documentation
- EX4300 Switches Hardware Overview on page 3

Locating the Serial Number on an EX4300 Switch or Component

If you are returning a 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 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. See "Installing and Removing EX4300 Switch Hardware Components" on page 141.

- Listing the Switch and Components Details with the CLI on page 214
- Locating the Chassis Serial Number ID Label on an EX4300 Switch on page 215
- Locating the Serial Number ID Labels on FRUs in an EX4300 Switch on page 215

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:

show chassis hardware

The following output lists the switch components and serial numbers for an EX4300-48P switch:

```
user@switch> show chassis hardware
Hardware inventory:
Item              Version  Part number  Serial number   Description
Chassis                                 PD3113060008    EX4300-48P
Routing Engine 0 REV D    650-044930   PD3113060008    EX4300-48P
FPC 0            REV D    650-044930   PD3113060008    EX4300-48P
  CPU                     BUILTIN      BUILTIN         FPC CPU
  PIC 0          REV D    BUILTIN      BUILTIN         48x 10/100/1000 Base-T
  PIC 1          REV D    BUILTIN      BUILTIN         4x 40GE
  PIC 2          REV A0   611-044925   MY3112490109    4x 1G/10G SFP/SFP+
    Xcvr 0       REV 01   740-030658   AD0946A02ZT     SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   AA1212ALZ5E     SFP+-10G-USR
  Power Supply 0 REV 01   740-046871   1EDA2490663     JPSU-1100-AC-AFO-A
  Power Supply 1 REV 01   740-046873   1EDE2430149     JPSU-350-AC-AFO-A
  Fan Tray 0                                           Fan Module, Airflow Out
  (AFO)
  Fan Tray 1                                           Fan Module, Airflow Out
  (AFO)
```

For information about the **show chassis hardware** command, see *show chassis hardware*.

Locating the Chassis Serial Number ID Label on an EX4300 Switch

The serial number ID label is located on the rear panel of the chassis on EX4300 switches. Figure 76 on page 215 shows the location of the serial number ID label on 24-port and 48-port EX4300 switches. Figure 77 on page 215 shows the location of the serial number ID label on 32-port EX4300 switches.

Figure 76: Location of the Serial Number ID Label on 24-Port and 48-Port EX4300 Switches
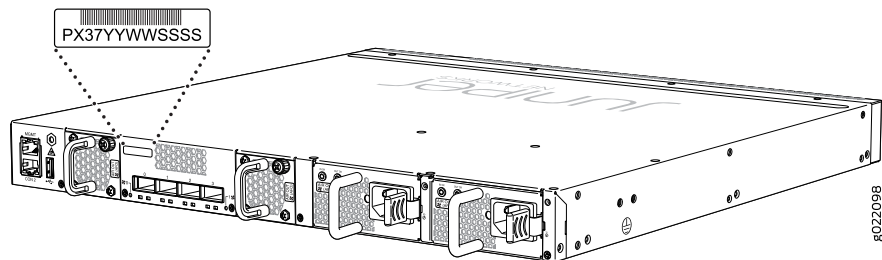
Figure 77: Location of the Serial Number ID Label on 32-Port EX4300 Switches
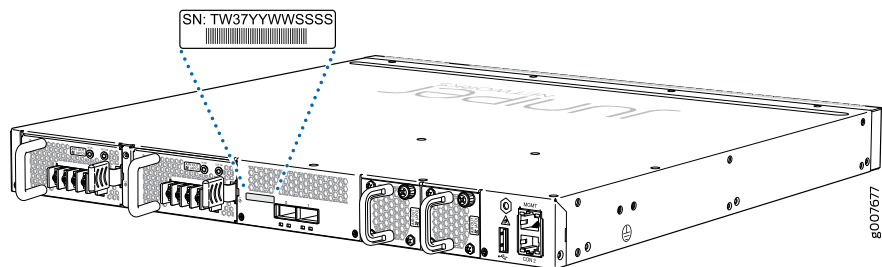
Locating the Serial Number ID Labels on FRUs in an EX4300 Switch

The power supplies, fan modules, and uplink modules, installed in EX4300 switches are field-replaceable units (FRUs).

For each of these FRUs, you must remove the FRU from the switch chassis to see the FRU's serial number ID label.

- *Power Supply*—The serial number ID label is on the top of the power supply. Figure 78 on page 216 shows the location of the serial number ID label on an AC power supply and Figure 79 on page 216 shows the location of the serial number ID label on a DC power supply. See "Removing an AC Power Supply from an EX4300 Switch" on page 196 and "Removing a DC Power Supply from an EX4300 Switch" on page 198.

Figure 78: Location of the Serial Number ID Label on an AC Power Supply Used in an EX4300 Switch
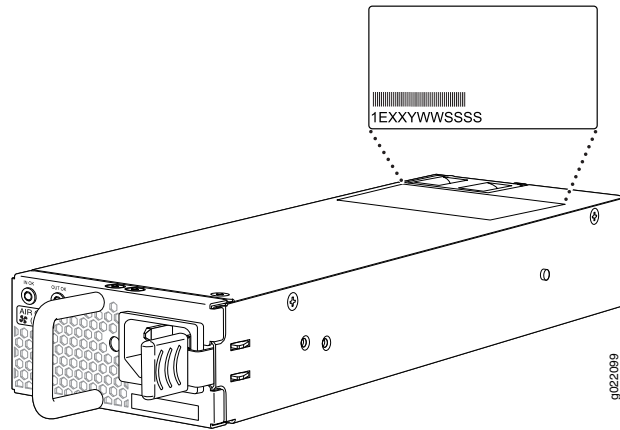
Figure 79: Location of the Serial Number ID Label on a DC Power Supply Used in an EX4300 Switch
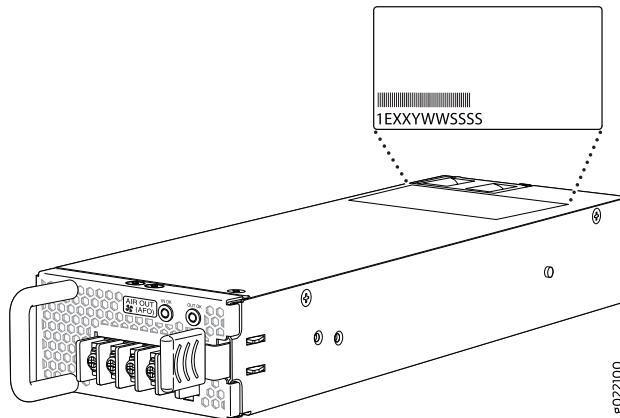
- *Fan module*—The serial number ID label is on the front bottom lip of the fan module. Figure 80 on page 216 shows the location of the serial number ID label. See "Removing a Fan Module from an EX4300 Switch" on page 201.

Figure 80: Location of the Serial Number ID Label on the Fan Module Used in an EX4300 Switch
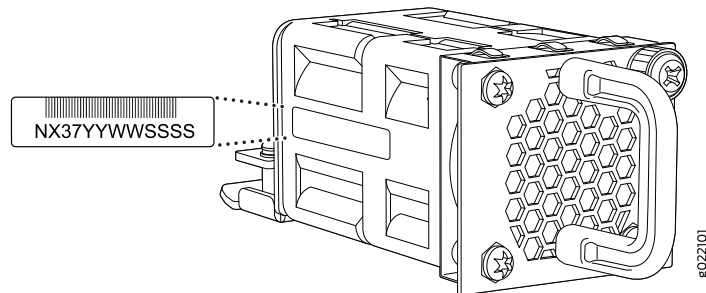
- *Uplink module*—The serial number ID label is on the circuit board. Figure 81 on page 217 shows the location of the serial number ID label on the QSFP+ uplink module, Figure 82 on page 217 shows the location of the serial number ID label on the 4-port SFP+ uplink module, and Figure 83 on page 217 shows the location of the serial number ID label on the 8-port SFP+ uplink module. See "Removing an Uplink Module from an EX4300 Switch" on page 199.

Figure 81: Location of the Serial Number ID Label on the QSFP+ Uplink Module
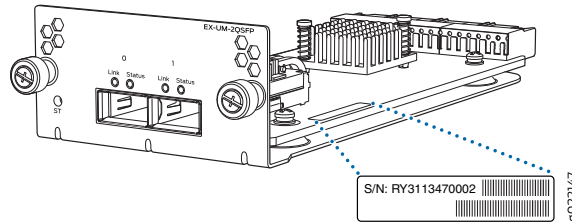
Figure 82: Location of the Serial Number ID Label on the 4-Port SFP+ Uplink Module
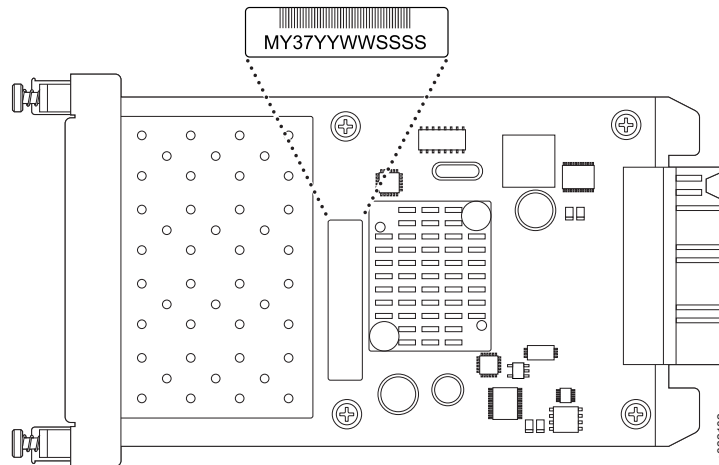
Figure 83: Location of the Serial Number ID Label on the 8-Port SFP+ Uplink Module
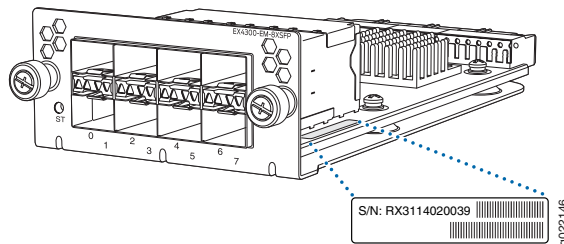
Related Documentation

- Contacting Customer Support to Obtain Return Materials Authorization for Switches on page 218

- Returning an EX4300 Switch or Component for Repair or Replacement on page 213

Contacting Customer Support to Obtain Return Materials Authorization for Switches

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

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

For instructions on locating the serial number of the switch or hardware component you want to return:

- See *Locating the Serial Number on an EX2200 Switch or Component*

- See *Locating the Serial Number on an EX3200 Switch or Component*

- See *Locating the Serial Number on an EX3300 Switch or Component*

- See *Locating the Serial Number on an EX4200 Switch or Component*

- See

- See *Locating the Serial Number on an EX4500 Switch or Component*

- See *Locating the Serial Number on an EX4550 Switch or Component*

- See *Locating the Serial Number on an EX4600 Switch or Component*

- See *Locating the Serial Number on an EX6200 Switch or Component*

- See *Locating the Serial Number on an EX8200 Switch or Component*

- See *Locating the Serial Number on an EX9204 Switch or Component*

- See *Locating the Serial Number on an EX9208 Switch or Component*

- See *Locating the Serial Number on an EX9214 Switch or Component*

- See *Locating the Serial Number on an XRE200 External Routing Engine or Component*

- See *Locating the Serial Number on an EX Series Redundant Power System or Redundant Power System Components*

- See *Locating the Serial Number on an OCX1100 Switch or Component*

Before you request an RMA 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 switch 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

- *Packing an EX2200 Switch or Component for Shipping*

- *Packing an EX3200 Switch or Component for Shipping*

- *Packing an EX3300 Switch or Component for Shipping*

- *Packing an EX4200 Switch or Component for Shipping*

- *Packing an EX4200 Switch or Component for Shipping*

- Packing an EX4300 Switch or Component for Shipping on page 220

- *Packing an EX4500 Switch or Component for Shipping*

- *Packing an EX4550 Switch or Component for Shipping*

- *Packing an EX6200 Switch or Component*

- *Packing an EX8200 Switch or Component*

- *Packing an EX9200 Switch or Component*

- *Packing an EX Series Redundant Power System or Redundant Power System Components for Shipping*

- *Returning an EX2200 Switch or Component for Repair or Replacement*

- *Returning an EX3200 Switch or Component for Repair or Replacement*

- *Returning an EX3300 Switch or Component for Repair or Replacement*

- *Returning an EX4200 Switch or Component for Repair or Replacement*

- Returning an EX4300 Switch or Component for Repair or Replacement on page 213

- *Returning an EX4500 Switch or Component for Repair or Replacement*

- *Returning an EX4550 Switch or Component for Repair or Replacement*

- *Returning an EX6200 Switch or Component for Repair or Replacement*

- *Returning an EX8200 Switch or Component for Repair or Replacement*

- *Returning an EX9200 Switch or Component for Repair or Replacement*

- *Returning an EX Series RPS or RPS Component for Repair or Replacement*

- *Packing an OCX1100 Switch or Component for Shipping*

- *Returning an OCX1100 Switch or Component for Repair or Replacement*

Packing an EX4300 Switch or Component for Shipping

If you are returning an EX4300 switch or component to Juniper Networks for repair or replacement, pack the item as described in this topic.

Before you begin packing the switch or component, ensure you have:

- Followed all the steps listed in "Contacting Customer Support to Obtain Return Materials Authorization for Switches" on page 218.

- 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 Materials Authorization for Switches" on page 218.

- Ensure you understand how to prevent electrostatic discharge (ESD) damage. See "Prevention of Electrostatic Discharge Damage" on page 254.

This topic describes:

1. Packing an EX4300 Switch for Shipping on page 220
2. Packing EX4300 Switch Components for Shipping on page 221

Packing an EX4300 Switch for Shipping

If you need to transport the switch to another location or return the switch to Juniper Networks, you need to pack the switch securely in its original packaging to prevent damage during transportation.

Before you pack the switch:

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 Switch" on page 202.

4. Remove all optical transceivers installed in the switch. See "Removing a Transceiver from a Switch" on page 203.

Ensure that you have the following parts and tools available to pack the switch:

- Phillips (+) screwdriver, number 2

- The original switch packing material (cardboard box, accessory box and its contents, and foam padding)

- ESD grounding strap

- Antistatic bag

> **CAUTION:** Do not pack the switch in anything except its original container or the switch might be damaged in transit.

To pack the switch:

1. If the switch is installed in a rack or cabinet, have one person support the weight of the switch while another person unscrews and removes the mounting screws.

2. Remove the switch from the rack or cabinet and place the switch on a flat, stable surface.

3. Use the screwdriver to remove the rack-mounting brackets from the switch chassis.

4. Place the switch in an antistatic bag.

5. Place the bottom portion of the packaging foam in the shipping carton.

6. Place the switch inside the cavity in the bottom packaging foam.

7. Place the top portion of the packaging foam on top of the switch.

8. If you are returning accessories or field-replaceable units (FRUs) with the switch, pack them as instructed in "Packing EX4300 Switch Components for Shipping" on page 221.

9. Place the accessory box vertically by the rear end of the chassis in the shipping carton.

10. Close the top of the cardboard shipping box and seal it with packing tape.

11. Write the RMA number on the exterior of the box to ensure proper tracking.

Packing EX4300 Switch Components for Shipping

To pack the switch components, follow the instructions here.

Ensure that you have the following parts and tools available:

- Antistatic bag, one for each component

- ESD grounding strap

⚠️ CAUTION: Do not stack switch components. Return individual components in separate boxes if they do not fit together on one level in the shipping box.

To pack the switch components:

- Place individual components in antistatic bags.

- Use the original packing materials if they are available. If the original packing materials are not available, ensure the component is adequately packed to prevent damage during transit. The packing material you use must be able to support the weight of the component.

- Ensure that the components are adequately protected by wrapping them well with packing materials. Pack the component in an oversized box (if the original box is not available) with extra packing material around the unit so that the component is prevented from moving around inside the box.

- Securely tape the box closed.

- Write the RMA number on the exterior of the box to ensure proper tracking.

Related Documentation

- Returning an EX4300 Switch or Component for Repair or Replacement on page 213

- Unpacking an EX4300 Switch on page 128

PART 7

Safety Information

General Safety Information

General Safety Guidelines and Warnings

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 also applies to hardware devices in the QFX Series and to OCX1100 switches.

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 256
- DC Power Electrical Safety Guidelines on page 259
- General Electrical Safety Guidelines and Warnings on page 253
- Maintenance and Operational Safety Guidelines and Warnings on page 246
- Installation Instructions Warning on page 237
- Grounded Equipment Warning on page 245

Definitions of Safety Warning Levels

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 also applies to hardware devices in the QFX Series and to OCX1100 switches.

The documentation uses the following levels of safety warnings (there are two "Warning" formats):

> *i* 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 225
- Installation Instructions Warning on page 237
- Maintenance and Operational Safety Guidelines and Warnings on page 246
- Grounded Equipment Warning on page 245
- Laser and LED Safety Guidelines and Warnings for Switches on page 231
- *Laser and LED Safety Guidelines and Warnings for the QFX Series*
- Warning Statement for Norway and Sweden on page 230

Fire Safety Requirements

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 also applies to hardware devices in the QFX Series and to OCX1100 switches.

In the event of a fire emergency involving switches and other network equipment, 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 switch or other network device provided by Juniper. 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 225
- General Electrical Safety Guidelines and Warnings on page 253
- Action to Take After an Electrical Accident on page 268

Qualified Personnel Warning

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 also applies to hardware devices in the QFX Series and to OCX1100 switches.

> **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 225
- General Electrical Safety Guidelines and Warnings on page 253
- AC Power Electrical Safety Guidelines on page 256
- DC Power Electrical Safety Guidelines on page 259

Warning Statement for Norway and Sweden

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 also applies to hardware devices in the QFX Series and to OCX1100 switches.

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 225

Radiation and Laser Warnings

Laser and LED Safety Guidelines and Warnings for Switches

EX Series switches, OCX1100 switches, and the XRE200 External Routing Engine 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.

 WARNING: **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.

 WARNING: **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.

WARNING: **Waarschuwing** Niet in de straal staren of hem rechtstreeks bekijken met optische instrumenten.

WARNING: **Varoitus** Älä katso säteeseen äläkä tarkastele sitä suoraan optisen laitteen avulla.

WARNING: **Attention** Ne pas fixer le faisceau des yeux, ni l'observer directement à l'aide d'instruments optiques.

WARNING: **Warnung** Nicht direkt in den Strahl blicken und ihn nicht direkt mit optischen Geräten prüfen.

WARNING: **Avvertenza** Non fissare il raggio con gli occhi né usare strumenti ottici per osservarlo direttamente.

WARNING: **Advarsel** Stirr eller se ikke direkte p strlen med optiske instrumenter.

WARNING: **Aviso** Não olhe fixamente para o raio, nem olhe para ele directamente com instrumentos ópticos.

WARNING: **¡Atención!** No mirar fijamente el haz ni observarlo directamente con instrumentos ópticos.

WARNING: **Varning!** Rikta inte blicken in mot strålen och titta inte direkt på den genom optiska instrument.

Radiation from Open Port Apertures Warning

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 also applies to hardware devices in the QFX Series and to OCX1100 switches.

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 225
- Laser and LED Safety Guidelines and Warnings for Switches on page 231
- Installation Instructions Warning on page 237
- Grounded Equipment Warning on page 245
- *Laser and LED Safety Guidelines and Warnings for the QFX Series*

Installation and Maintenance Safety Information

Installation Instructions Warning

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 also applies to hardware devices in the QFX Series and to OCX1100 switches.

> **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 225
- Laser and LED Safety Guidelines and Warnings for Switches on page 231
- *Laser and LED Safety Guidelines and Warnings for the QFX Series*
- Grounded Equipment Warning on page 245
- *Connecting AC Power to an EX2200 Switch*
- *Connecting AC Power to an EX3200 Switch*
- *Connecting AC Power to an EX3300 Switch*
- *Connecting AC Power to an EX4200 Switch*
- Connecting AC Power to an EX4300 Switch on page 159
- *Connecting AC Power to an EX4500 Switch*
- *Connecting AC Power to an EX4550 Switch*
- *Connecting AC Power to an EX4600 Switch*
- *Connecting AC Power to an EX6200 Switch*
- *Connecting AC Power to an EX8200 Switch*
- *Connecting AC Power to an EX9204 Switch*
- *Connecting AC Power to an EX9208 Switch*
- *Connecting AC Power to an EX9214 Switch*
- *Connecting DC Power to an EX2200 Switch*
- *Connecting DC Power to an EX3200 Switch*
- *Connecting DC Power to an EX4200 Switch*
- Connecting DC Power to an EX4300 Switch on page 162
- *Connecting DC Power to an EX4500 Switch*
- *Connecting DC Power to an EX4600 Switch*
- *Connecting DC Power to an EX4550 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 AC Power to an XRE200 External Routing Engine*

- *Connecting DC Power to an XRE200 External Routing Engine*

- *Connecting AC Power to an OCX1100 Switch*

- *Connecting DC Power to an OCX1100 Switch*

- *Connecting AC Power to a QFX3100 Director Device*

- *Connecting AC Power to a QFX3008-I Interconnect Device with Single-Phase Wiring Trays*

- *Connecting AC Power to a QFX3008-I Interconnect Device with Three-Phase Delta Wiring Trays*

- *Connecting AC Power to a QFX3008-I Interconnect Device with Three-Phase Wye Wiring Trays*

- *Connecting AC Power to a QFX3500, QFX3600, or QFX3600-I Device*

- *Connecting DC Power to a QFX3500, QFX3600, or QFX3600-I Device*

- *Connecting AC Power to a QFX5100 Device*

- *Connecting DC Power to a QFX5100 Device*

Chassis Lifting Guidelines for EX4300 Switches

The weight of an EX4300 switch is approximately 13 lb (5.9 kg). Observe the following guidelines for lifting and moving the switch:

- Before moving the switch to a site, ensure that the site meets the power, environmental, and clearance requirements specified in the "Site Preparation Checklist for EX4300 Switches" on page 103.

- Before lifting or moving the switch, 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.

Related Documentation

- General Safety Guidelines and Warnings on page 225

- Installation Instructions Warning on page 237

- Mounting an EX4300 Switch on page 130

Ramp Warning

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 also applies to hardware devices in the QFX Series and to OCX1100 switches.

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 225
- Installation Instructions Warning on page 237
- Grounded Equipment Warning on page 245

Rack-Mounting and Cabinet-Mounting Warnings

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 also applies to hardware devices in the QFX Series and to OCX1100 switches.

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

- *Mounting an EX2200 Switch*
- *Mounting an EX3200 Switch*
- *Mounting an EX3300 Switch*
- *Mounting an EX4200 Switch*
- *Mounting an EX4500 Switch*
- *Mounting an EX4550 Switch*
- *Mounting an EX4600 Switch in a Rack or Cabinet*
- *Mounting an EX6210 Switch on a Rack or Cabinet*
- *Mounting an EX8208 Switch on a Rack or Cabinet*
- *Mounting an EX8216 Switch on a Rack or Cabinet*
- *Mounting an EX9200 Switch on a Rack or Cabinet Using a Mechanical Lift*
- *Mounting an EX9204 Switch on a Rack or Cabinet Without Using a Mechanical Lift*
- *Mounting an EX9208 Switch on a Rack or Cabinet Without Using a Mechanical Lift*
- *Mounting an OCX1100 Switch*
- *Mounting a QFX3100 Director Device on Four Posts in a Rack or Cabinet*
- *Mounting a QFX3100 Director Device on Two Posts in a Rack or Cabinet*
- *Mounting a QFX3008-I Interconnect Device on a Rack or Cabinet Using a Mechanical Lift*

- *Mounting a QFX3600 or QFX3600-I Device on Four Posts in a Rack or Cabinet*

- *Mounting a QFX3600 or QFX3600-I Device on Two Posts in a Rack or Cabinet*

- *Mounting a QFX3500 Device in a Rack or Cabinet*

- *Mounting a QFX5100 Device in a Rack or Cabinet*

Wall-Mounting Warning for EX4300 Switches

⚠️ WARNING: When mounting an EX4300 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.

Related Documentation
- Mounting an EX4300 Switch on a Wall on page 137

Grounded Equipment Warning

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 also applies to hardware devices in the QFX Series and to OCX1100 switches.

⚠️ 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.

Maintenance and Operational Safety Guidelines and Warnings

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 also applies to hardware devices in the QFX Series and to OCX1100 switches.

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 of 104º F (40º C) for EX6200 switches, EX8208 switches, EX8216 switches, QFX Series devices, OCX1100 switches, and XRE200 External Routing Engines and 113º F (45º C) for EX2200, EX3300, EX3200, EX4200, EX4300, EX4500, and EX4550 switches. 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 40º 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 40º 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 40º 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 225
- General Electrical Safety Guidelines and Warnings on page 253
- AC Power Electrical Safety Guidelines on page 256
- DC Power Electrical Safety Guidelines on page 259
- Laser and LED Safety Guidelines and Warnings for Switches on page 231
- *Laser and LED Safety Guidelines and Warnings for the QFX Series*
- Installation Instructions Warning on page 237
- Grounded Equipment Warning on page 245

Power and Electrical Safety Information

General Electrical Safety Guidelines and Warnings

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 also applies to hardware devices in the QFX Series and to OCX1100 switches.

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 switch.

- 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 an equipment that it appears to be damaged.

Related Documentation
- General Safety Guidelines and Warnings on page 225
- AC Power Electrical Safety Guidelines on page 256
- DC Power Electrical Safety Guidelines on page 259

Prevention of Electrostatic Discharge Damage

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 also applies to hardware devices in the QFX Series and to OCX1100 switches.

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 84 on page 255) 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 84 on page 255). If you are returning a component, place it in an antistatic bag before packing it.

Figure 84: Placing a Component into an Antistatic Bag
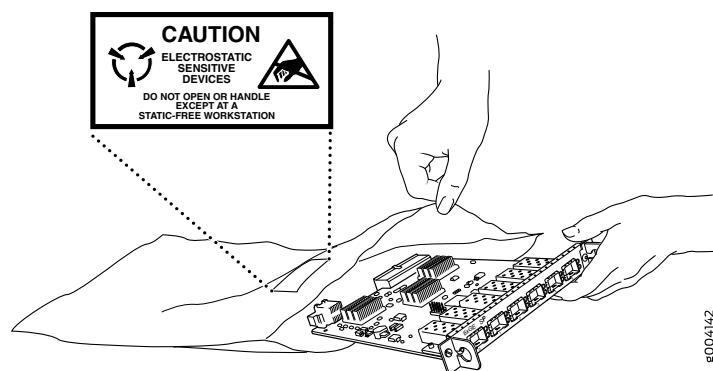
⚠ CAUTION: ANSI/TIA/EIA-568 cables such as Category 5e and Category 6 can get electrostatically charged. To dissipate this charge, always ground the cables to a suitable and safe earth ground before connecting them to the system.

Related Documentation

- General Safety Guidelines and Warnings on page 225
- See *EX2200 Switches Hardware Overview* for the ESD point location.
- See *Rear Panel of an EX3200 Switch* for the ESD point location.
- See *Rear Panel of an EX3300 Switch* for the ESD point location.
- See *Rear Panel of an EX4200 Switch* for the ESD point location.
- See EX4300 Switches Hardware Overview on page 3 for the ESD point location.
- See *Front Panel of an EX4500 Switch* for the ESD point location.
- See *EX4550 Switches Hardware Overview* for the ESD point location.
- See *Chassis Physical Specifications of an EX6210 Switch* for the ESD point location.
- See *Chassis Physical Specifications of an EX8208 Switch* for the ESD point location.
- See *Chassis Physical Specifications of an EX8216 Switch* for the ESD point location.
- See *EX9204 Switch Hardware Overview* for the ESD point location.
- See *EX9208 Switch Hardware Overview* for the ESD point location.
- See *EX9214 Switch Hardware Overview* for the ESD point location.
- See *OCX1100 Switches Hardware Overview* for the ESD point location.
- See *QFX3008-I Interconnect Device Overview* for the ESD point location.
- See *Front Panel of a QFX3500 Device* for the ESD point location.
- See *Front Panel of a QFX3600 Device* for the ESD point location.
- See *Physical Description of a Redundant Power System*
- See *Port Panel of an EX4600 Switch* for the ESD point location.
- See *Port Panel of a QFX5100-48S Device* for the ESD point location.
- See *Port Panel of a QFX5100-24Q Device* for the ESD point location.
- See *Port Panel of a QFX5100-96S Device* for the ESD point location.

AC Power Electrical Safety Guidelines

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 also applies to hardware devices in the QFX Series and to OCX1100 switches.

> **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 225
- General Electrical Safety Guidelines and Warnings on page 253
- Multiple Power Supplies Disconnection Warning on page 267
- *Connecting AC Power to an EX2200 Switch*
- *Connecting AC Power to an EX3200 Switch*
- *Connecting AC Power to an EX3300 Switch*
- *Connecting AC Power to an EX4200 Switch*

- *Connecting AC Power to an EX4500 Switch*

- *Connecting AC Power to an EX4550 Switch*

- *Connecting AC Power to an EX4600 Switch*

- *Connecting AC Power to an EX6200 Switch*

- *Connecting AC Power to an EX8200 Switch*

- *Connecting AC Power to an EX9204 Switch*

- *Connecting AC Power to an EX9208 Switch*

- *Connecting AC Power to an EX9214 Switch*

- *Connecting AC Power to an XRE200 External Routing Engine*

- *Connecting AC Power to an OCX1100 Switch*

- *Connecting AC Power to a QFX3100 Director Device*

- *Connecting AC Power to a QFX3008-I Interconnect Device with Single-Phase Wiring Trays*

- *Connecting AC Power to a QFX3008-I Interconnect Device with Three-Phase Delta Wiring Trays*

- *Connecting AC Power to a QFX3008-I Interconnect Device with Three-Phase Wye Wiring Trays*

- *Connecting AC Power to a QFX3500, QFX3600, or QFX3600-I Device*

- *Connecting AC Power to a QFX5100 Device*

AC Power Disconnection Warning

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 also applies to hardware devices in the QFX Series and to OCX1100 switches.

WARNING: **Before working on the switch or near power supplies, unplug all the power cords from an AC switch.**

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 225
- General Electrical Safety Guidelines and Warnings on page 253
- AC Power Electrical Safety Guidelines on page 256

DC Power Electrical Safety Guidelines

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 and EX3300 switches
>
> - Minimum of 8 A at −48 VDC for EX3200 and EX4200 switches
>
> - Minimum of 20 A at −48 VDC for EX4300, EX4500, and EX4550 switches
>
> - Minimum of 50 A at −48 VDC for EX6210 switches
>
> - Minimum of 60 A at −48 VDC for EX8208 switches
>
> - Minimum of 100 A at −48 VDC for EX8216 switches
>
> - Minimum of 7 A at −48 VDC for QFX3500, EX4600, and QFX5100 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 225
- General Electrical Safety Guidelines and Warnings on page 253
- DC Power Disconnection Warning on page 261
- DC Power Grounding Requirements and Warning on page 263
- DC Power Wiring Sequence Warning on page 264
- DC Power Wiring Terminations Warning on page 266
- *Connecting DC Power to an EX2200 Switch*
- *Connecting DC Power to an EX3200 Switch*
- *Connecting DC Power to an EX4200 Switch*
- Connecting DC Power to an EX4300 Switch on page 162
- *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*

DC Power Disconnection Warning

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.

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 225
- General Electrical Safety Guidelines and Warnings on page 253
- DC Power Electrical Safety Guidelines on page 259
- DC Power Grounding Requirements and Warning on page 263
- DC Power Wiring Sequence Warning on page 264
- DC Power Wiring Terminations Warning on page 266

DC Power Grounding Requirements and Warning

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.

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 225
- General Electrical Safety Guidelines and Warnings on page 253
- DC Power Electrical Safety Guidelines on page 259
- DC Power Disconnection Warning on page 261
- DC Power Wiring Sequence Warning on page 264
- DC Power Wiring Terminations Warning on page 266

DC Power Wiring Sequence Warning

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.

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

DC Power Wiring Terminations Warning

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.

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 225
- General Electrical Safety Guidelines and Warnings on page 253
- DC Power Electrical Safety Guidelines on page 259
- DC Power Disconnection Warning on page 261
- DC Power Grounding Requirements and Warning on page 263
- DC Power Wiring Sequence Warning on page 264

Multiple Power Supplies Disconnection Warning

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 also applies to hardware devices in the QFX Series and to OCX1100 switches.

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 225
- General Electrical Safety Guidelines and Warnings on page 253
- AC Power Electrical Safety Guidelines on page 256
- DC Power Electrical Safety Guidelines on page 259

TN Power Warning

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 also applies to hardware devices in the QFX Series and to OCX1100 switches.

> 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 225
- General Electrical Safety Guidelines and Warnings on page 253
- Grounded Equipment Warning on page 245
- Multiple Power Supplies Disconnection Warning on page 267

Action to Take After an Electrical Accident

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 also applies to hardware devices in the QFX Series and to OCX1100 switches.

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 225
- General Electrical Safety Guidelines and Warnings on page 253
- AC Power Electrical Safety Guidelines on page 256
- DC Power Electrical Safety Guidelines on page 259

PART 8

Compliance Information

Compliance Information

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 274
- Compliance Statements for Acoustic Noise for EX Series Switches on page 278

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 on page 274
- European Community on page 275
- Israel on page 275
- Japan on page 275
- Korea on page 276
- United States on page 276
- FCC Part 15 Statement on page 276
- Nonregulatory Environmental Standards on page 277

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.
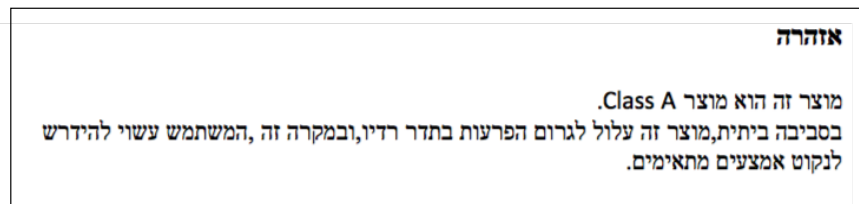
> **CAUTION:** Users should not attempt to make electrical ground connections by themselves, but should contact the appropriate inspection authority or an electrician, as appropriate.

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
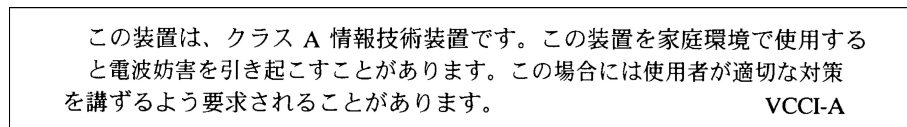
The preceding translates as follows:

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 판
매자 또는 사용자는 이 점을 주의하시기 바라
며, 가정외의 지역에서 사용하는 것을 목적으로
합니다.

Korean Class A Warning

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

  i NOTE: For the EX6200-48P line cards, the intra-building ports must use shielded intra-building cabling or wiring that is grounded at both ends.

- All EX8200 switches

Those switch 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 273

- Compliance Statements for Acoustic Noise for EX Series Switches on page 278

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 273
- Compliance Statements for EMC Requirements for EX Series Switches on page 274