Junos® OS for EX Series Ethernet Switches

Power over Ethernet (PoE) Feature Guide for a Mixed EX4600 and EX4300 Virtual Chassis

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Junos® OS for EX Series Ethernet Switches Power over Ethernet (PoE) Feature Guide for a Mixed EX4600 and EX4300 Virtual Chassis
Release 15.1
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Supported Platforms

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

- EX Series

Using the Examples in This Manual

If you want to use the examples in this manual, you can use the **load merge** or the **load merge relative** command. These commands cause the software to merge the incoming configuration into the current candidate configuration. The example does not become active until you commit the candidate configuration.

If the example configuration contains the top level of the hierarchy (or multiple hierarchies), the example is a *full example*. In this case, use the **load merge** command.

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If the example configuration does not start at the top level of the hierarchy, the example is a *snippet*. In this case, use the **load merge relative** command. These procedures are described in the following sections.

Merging a Full Example

To merge a full example, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration example into a text file, save the file with a name, and copy the file to a directory on your routing platform.

   For example, copy the following configuration to a file and name the file **ex-script.conf**. Copy the **ex-script.conf** file to the **/var/tmp** directory on your routing platform.

   ```
   system {
     scripts {
       commit {
         file ex-script.xsl;
       }
     }
   }
   interfaces {
     fxp0 {
       disable;
       unit 0 {
         family inet {
           address 10.0.0.1/24;
         }
       }
     }
   }
   ```

2. Merge the contents of the file into your routing platform configuration by issuing the **load merge** configuration mode command:

   ```
   [edit]
   user@host# load merge /var/tmp/ex-script.conf
   load complete
   ```

Merging a Snippet

To merge a snippet, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration snippet into a text file, save the file with a name, and copy the file to a directory on your routing platform.

   For example, copy the following snippet to a file and name the file **ex-script-snippet.conf**. Copy the **ex-script-snippet.conf** file to the **/var/tmp** directory on your routing platform.

   ```
   commit {
     file ex-script-snippet.xsl; }
   ```

2. Move to the hierarchy level that is relevant for this snippet by issuing the following configuration mode command:

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```
[edit]
user@host# edit system scripts
[edit system scripts]
```

3. Merge the contents of the file into your routing platform configuration by issuing the **load merge relative** configuration mode command:

```
[edit system scripts]
user@host# load merge relative /var/tmp/ex-script-snippet.conf
load complete
```

For more information about the **load** command, see CLI Explorer.

Documentation Conventions

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

Table 1: Notice Icons

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

Table 2 on page ix 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**

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

Convention	Description	Examples
`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*
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**.

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

Convention	Description	Examples
> (bold right angle bracket)	Separates levels in a hierarchy of menu selections.	In the configuration editor hierarchy, select **Protocols>Ospf**.

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- Find solutions and answer questions using our Knowledge Base: http://kb.juniper.net/

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- Download the latest versions of software and review release notes: http://www.juniper.net/customers/csc/software/
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- 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.

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CHAPTER 1

Overview

- Understanding PoE on EX Series Switches on page 13

Understanding PoE on EX Series Switches

Power over Ethernet (PoE) enables electric power, along with data, to be passed over a copper Ethernet LAN cable. Powered devices—such as VoIP telephones, wireless access points, video cameras, and point-of-sale devices—that support PoE can receive power safely from the same access ports that are used to connect personal computers to the network. This reduces the amount of wiring in a network, and also eliminates the need to position a powered device near an AC power outlet, making network design more flexible and efficient.

NOTE: **We recommend that you do not connect an enabled PoE port on one switch to an enabled PoE port on a second switch. If there is a large voltage difference between the power supplies of the two switches, the resulting negative current will trigger a fail-safe mechanism that prevents the power sourcing equipment (PSE) from delivering power to the other PoE ports on that switch.**

This topic describes PoE on Juniper Networks EX Series Ethernet Switches.

- PoE, PoE+, and Enhanced PoE on page 13
- PoE Power Allocation on page 15

PoE, PoE+, and Enhanced PoE

PoE was first defined in the IEEE 802.3af standard. In this standard, the amount of power that can be supplied to a powered device is limited to 15.4 W. A later standard, IEEE 802.3at, defined PoE+, which increases the amount of power to 30 W. The PoE+ standard provides support for legacy PoE devices—an IEEE 802.3af powered device can operate normally when connected to IEEE 802.3at (PoE+) power sourcing equipment.

Starting with Juniper Networks Junos operating system (Junos OS) Release 11.1, Juniper Networks provides enhanced PoE on EX3200 and EX4200 switches. Enhanced PoE is a Juniper Networks extension to the IEEE 802.3af standard that provides power of up to 18.6 W per PoE port.

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Table 3 on page 14 lists EX Series switches and line cards and the version of PoE they support.

Table 3: PoE Version Support

Switch or Line Card	PoE Version
EX2200 switch (EX2200-C-12P-2G, EX2200-24P-4G, EX2200-48P-4G models)	PoE+ (IEEE 802.3at) NOTE: Starting with Junos OS Release 12.2R1, PoE commands are enabled on all non-PoE-capable EX2200 switch models. The PoE commands do not provide any meaningful configuration on standalone non-PoE-capable switch models. However, in an EX2200 Virtual Chassis, you can execute PoE commands from a non-PoE-capable master switch to configure PoE on PoE-capable Virtual Chassis members.
EX2300 switch (EX2300-C-12T, EX2300-C-12P, EX2300-24T, EX2300-24P models)	PoE+
EX3200 switch (EX3300-24P, EX3300-24T, EX3300-48P, EX3300-48T models)	Enhanced PoE
EX3300 switch (EX3300-24P, EX3300-48P models)	PoE+ (IEEE 802.3at)
EX3400 switch (EX3400-24T, EX3400-24P, EX3400-48T, EX3400-48T-AFI, EX3400-48P models)	PoE+
EX4200 switch—P and T models (EX4200-24P, EX4200-24T, EX4200-48P, EX4200-48T)	Enhanced PoE
EX4200 switch—PX models (EX4200-24PX and EX4200-48PX)	PoE+ (IEEE 802.3at)
EX4300 switch (EX4300-24P and EX4300-48P)	PoE+ (IEEE 802.3at)
EX6200-48P (48-port PoE+) line card	PoE+ (IEEE 802.3at)
EX8200-2XS-40P (40-port PoE+ with 4-port SFP and 2-port SFP+) line card EX8200-48PL (2-port SFP+ and 48-port PoE+ 20 Gbps) line card	PoE+ (IEEE 802.3at)—Ports 0 through 11, and PoE (IEEE 802.3af)—remaining PoE ports.

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NOTE: This topic and its related topics use the term PoE as a generic term for PoE, PoE+, and enhanced PoE.

PoE Power Allocation

A switch or line card that supports PoE has a PoE controller that keeps track of the PoE power consumption on the switch or line card, and allocates power to the PoE ports. The following factors determine how the PoE controller allocates power to the PoE ports:

- Maximum PoE Power Consumption on page 15
- PoE Power Budget on page 20
- PoE Interface Power Allocation on page 20
- PoE Interface Power Priority on page 22

Maximum PoE Power Consumption

The maximum PoE power consumption is the total amount of power available for the PoE controller to allocate to all of the PoE interfaces. In allocating power, the PoE controller cannot exceed the maximum PoE power consumption.

How the maximum PoE power consumption is determined depends on the switch model:

- Maximum PoE Power Consumption on EX2200, EX3200, EX3300, EX4200, and EX4300 on page 15
- Maximum PoE Power Consumption on EX6200 and EX8200 Switches on page 19

Maximum PoE Power Consumption on EX2200, EX3200, EX3300, EX4200, and EX4300

The maximum PoE power consumption on EX2200, EX3200, EX3300, EX4200, and EX4300 switches depends on the switch model and the capacities of the power supplies installed. To find the maximum PoE power consumption for each switch model, see Table 4 on page 16 for EX2200 switch models, Table 6 on page 16 for EX3200 switch models, Table 7 on page 17 for EX3300 switch models, Table 9 on page 18 for EX4200 switch models, and Table 10 on page 18 for EX4300 switch models.

The maximum PoE power consumption for a switch is displayed in the **Maximum power** field in the output of the **show poe controller** CLI command.

If your switch supports power supplies of different capacities, keep the following points in mind:

- If you change your existing power supply to a lower-capacity power supply, the maximum PoE power consumption might no longer be sufficient to power all the PoE ports on the switch.
- If your switch supports redundant power supplies and you have installed power supplies of different capacities, the maximum PoE power consumption is based on the wattage of the lowest-capacity power supply.
- You cannot increase the number of PoE-capable ports on a switch by installing a power supply that has a higher capacity.

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Table 4 on page 16 lists the EX2200 switch models, number of PoE-enabled ports, power supply ratings, and maximum PoE power consumption.

Table 4: Maximum PoE Power Consumption for EX2200 Switches

Switch Model Number	Number of PoE-Enabled Ports	Power Supply Rating	Maximum PoE Power Consumption
EX2200-C-12T	–	30 W	–
EX2200-C-12P	12	180 W	100 W
EX2200-24T	–	75 W	
EX2200-24P	24	550 W	405 W
EX2200-24T-DC	–	100 W	–
EX2200-48T	–	75 W	–
EX2200-48P	48	550 W	405 W

Table 5 on page 16 lists the EX2300 switch models, number of PoE-enabled ports, power supply ratings, and maximum PoE power consumption.

Table 5: Maximum PoE Power Consumption for EX2300 Switches

Switch Model Number	Number of PoE-Enabled Ports	Power Supply Rating	Maximum PoE Power Consumption
EX2300-24P	24	450 W	370 W
EX2300-24T	–	65 W	–
EX2300-C-12P	12	170 W	124
EX2300-C-12T	-	40 W	-

Table 6 on page 16 lists the EX3200 switch models, number of PoE-enabled ports, power supply ratings, and maximum PoE power consumption.

Table 6: Maximum PoE Power Consumption for EX3200 Switch Models

Switch Model Number	Number of PoE-Enabled Ports	Power Supply Rating	Maximum PoE Power Consumption
EX3200-24T	8	320 W	130 W
EX3200-48T	8	320 W	130 W
EX3200-24P	24	600 W	410 W

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Table 6: Maximum PoE Power Consumption for EX3200 Switch Models *(continued)*

Switch Model Number	Number of PoE-Enabled Ports	Power Supply Rating	Maximum PoE Power Consumption
EX3200-48P	48	930 W	740 W
EX3200-24T-DC	-	190 W	-
EX3200-48T-DC	-	190 W	-

Table 7 on page 17 lists the EX3300 switch models, number of PoE-enabled ports, power supply ratings, and maximum PoE power consumption.

Table 7: Maximum PoE Power Consumption EX3300 Switch Models

Switch Model Number	Number of PoE-Enabled Ports	Power Supply Rating	Maximum PoE Power Consumption
EX3300-24T	–	100 W	–
EX3300-24P	24	550 W	405 W
EX3300-24T-DC	–	100 W	–
EX3300-48T	–	100 W	–
EX3300-48T-BF	–	100 W	–
EX3300-48P	48	900 W	740 W

Table 8 on page 17 lists the EX3400 switch models, number of PoE-enabled ports, power supply ratings, and maximum PoE power consumption.

Table 8: Maximum PoE Power Consumption for EX3400 Switches

Switch Model Number	Number of PoE-Enabled Ports	Power Supply Rating	Maximum PoE Power Consumption
EX3400-48P	48	920 W	• 1440 W with two 920 W power supplies installed • 740 W with one 920 W power supply installed
EX3400-48T	-	150 W	-
EX3400-48T-AFI	–	150 W	-
EX3400-24P	24	600 W	• 720 W with two 600 W power supplies installed • 370 W with one 600 W power supply installed

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Table 8: Maximum PoE Power Consumption for EX3400 Switches *(continued)*

Switch Model Number	Number of PoE-Enabled Ports	Power Supply Rating	Maximum PoE Power Consumption
EX3400-24T	–	150 W	–
EX3400-24T-DC	–	150 W	–

Table 9 on page 18 lists the EX4200 switch models, number of PoE-enabled ports, power supply ratings, and maximum PoE power consumption.

Table 9: Maximum PoE Power Consumption for EX4200 Switch Models

Switch Model Number	Number of PoE-Enabled Ports	Power Supply Rating	Maximum PoE Power Consumption
EX4200-24T	8	320 W	130 W
EX4200-48T	8	320 W	130 W
EX4200-24P	24	600 W	410 W
EX4200-48P	48	930 W	740 W
EX4200-24PX	24	930 W	740 W
EX4200-48PX	48	930 W	740 W
EX4200-24F	-	320 W	-
EX4200-24F-DC	-	190 W	-
EX4200-24T-DC	-	190 W	-
EX4200-48T-DC	-	190 W	-

Table 10 on page 18 lists the EX4300 switch models, number of PoE-enabled ports, power supply ratings, and maximum PoE power consumption.

Table 10: Maximum PoE Power Consumption for EX4300 Switch Models

Switch Model Number	Number of PoE-Enabled Ports	Power Supply Rating	Maximum PoE Power Consumption
EX4300-48P	48	1100 W	900 W
EX4300-48T	0	350 W	-
EX4300-48T-AFI	0	350 W	-
EX4300-24P	24	715 W	565 W

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Table 10: Maximum PoE Power Consumption for EX4300 Switch Models *(continued)*

Switch Model Number	Number of PoE-Enabled Ports	Power Supply Rating	Maximum PoE Power Consumption
EX4300-24T	0	350 W	-
EX4300-48T-DC	0	550 W	-
EX4300-48T-DC-AFI	0	550 W	-

Maximum PoE Power Consumption on EX6200 and EX8200 Switches

For EX6200 and EX8200 switches, each line card that supports PoE has its own PoE controller and maximum PoE power consumption. The maximum PoE power consumption is allocated to the line card by the switch's power management, while PoE power is allocated to the ports on the line card by the PoE controller. Because EX6200 and EX8200 switches can differ in the number and capacity of power supplies installed and in the number and types of line cards installed, the amount of power available for PoE power can vary for switches of the same model.

Power management allocates PoE power to line cards that support PoE only after it has allocated base power to and powered on all line cards. It then allocates the remaining power to the line cards for PoE in order of line card power priority. (In a default configuration, power priority is determined by the line card slot number, with slot 0 having the highest priority.) If the remaining power is insufficient to provide PoE power to all PoE line cards, a low-priority line card might receive no PoE power or partial PoE power.

By default, power management allocates enough PoE power to a line card to power all PoE ports at their maximum supported power. If the powered devices connected to that line card require less power than that, you can configure a smaller maximum PoE power consumption for the line card. For example, power management normally allocates 915 W of PoE power to a 48-port PoE+ 20 Gbps (EX8200-48PL) line card. If the powered devices connected to that line card consume no more than a total of 250 W, you can set the maximum PoE power consumption for the line card to 250 W. Doing so frees 665 W, which then can be used to fulfill the PoE power needs of lower-priority line cards.

You can also configure the power priority of the PoE ports on a line card. If power management is unable to allocate enough power to a line card to meet its maximum PoE power consumption, the line card's PoE controller turns off power to PoE ports in reverse priority order as required to meet the reduced power allocation.

Power management adjusts PoE power allocations as power availability and demand in a switch change. As a general rule, power management allocates power to power on line cards before it allocates PoE power. For example, if you add a line card and there is insufficient power available to power it on, power management reduces the PoE power it provides to line cards, starting with the lowest priority line card, until it frees enough power to power on the new line card. When power management reduces the maximum PoE power consumption for a line card because of insufficient power, it logs a message in the system log.

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Note that the actual power consumed by the powered devices does not affect power management's power allocation for a line card. If you have set the maximum PoE power consumption for a line card to 500 W, power management allocates 500 W even if the powered devices are consuming less power than that. Similarly, the maximum PoE power consumption is not increased if you add additional powered devices—if the powered devices require more than the 500 W maximum that you have configured, lower-priority devices do not receive power.

You can display the switch's power budget maintained by power management, including its PoE power allocations, by using the **show chassis power-budget-statistics** command. You can also display the maximum PoE power consumption for each line card in a switch by using the show poe controller command.

For more information about how power management allocates power, including PoE power, see *Understanding Power Management on EX Series Switches*.

PoE Power Budget

The PoE power budget is the total amount of power that the PoE controller has available to allocate to its PoE ports. The PoE controller cannot exceed its PoE power budget and does not allocate power to a PoE port if the allocation would exceed the PoE power budget.

How the PoE power budget is determined depends on the class of the powered device:

- The power budget calculation for class 0 and class 4 devices is based on actual power consumption. These values are displayed in the **Power consumption** field in the output of the show poe interface CLI command. The power budget is the sum of the power consumption values for all PoE-enabled interfaces.

  NOTE: For Junos OS Releases 12.2R1 through 12.2R5 and 12.3R1 though 12.3R4, the PoE power budget for class 4 devices is based on maximum power.

- The power budget calculation for class 1, class 2 and class 3 devices is based on maximum power. The maximum power for an interface is displayed in the **Max power** field in the output of the show poe interface CLI command. The power budget is the sum of the maximum power values for all PoE-enabled interfaces.

PoE Interface Power Allocation

The maximum power for a PoE interface is the maximum amount of power that can be provided by that interface. If the actual power consumption of a powered device connected to a PoE interface exceeds the maximum power allocated to that interface, the switch turns off power to the interface.

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The maximum power for a PoE interface is allocated by the PoE controller. One of the three methods listed below is used, on a per interface basis, to determine maximum power. The methods are listed in order of priority.

- LLDP Power Negotiation on page 21
- Class PoE Management Mode on page 21
- Static PoE Management Mode on page 22

LLDP Power Negotiation

Link Layer Discovery Protocol (LLDP) power negotiation enables the PoE controller to dynamically allocate power to LLDP-enabled powered devices based on their power needs. The PoE controller allocates to an interface only the power currently required by the connected powered device, and it can allocate the power in small increments.

When the **management** option for PoE is set to **class** and LLDP is enabled (both are default settings), LLDP power negotiation is enabled by default. If you disable LLDP power negotiation or the powered device does not support it, the switch uses the class of the powered device to determine the maximum power for interfaces.

NOTE: **LLDP power negotiation is not supported on EX3200 and EX4200 (except EX4200 PX models) switches.**

Class PoE Management Mode

In the **class** PoE management mode, the maximum power for an interface is determined by the class of the connected powered device. The PoE standards IEEE 802.3af and IEEE 802.3at define classes of powered devices based on the levels of power that they require. Table 11 on page 21 lists the classes of powered devices and associated power levels.

Table 11: Class of Powered Device and Power Levels

Standard	Class	Maximum Power Delivered by PoE Port	Power Range of Powered Device
IEEE 802.3af (PoE) and IEEE 802.3at (PoE+)	0	15.4 W	0.44 through 12.95 W
	1	4.0 W	0.44 through 3.84 W
	2	7.0 W	3.84 through 6.49 W
	3	15.4 W	6.49 through 12.95 W
IEEE 802.3at (PoE+)	4	30.0 W	12.95 through 25.5 W

Because of line loss, the power range of the powered device is less than the maximum power delivered at the PoE port for each class. Line loss is influenced by cable length, cable quality, and other factors and is typically less than 16 percent of the maximum power.

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The powered device communicates to the PoE controller which class it belongs to when it is connected. The PoE controller then allocates to the interface the maximum power required by the class (see Table 11 on page 21). It does not allocate power to an interface until a powered device is connected. **Class 0** is the default class for powered devices that do not provide class information. Class 4 powered devices are supported by PoE ports that support only IEEE 802.3at (PoE+).

By default, when the **management** option is set to **class** and LLDP is enabled, LLDP power negotiation is also enabled on supported switches. See "LLDP Power Negotiation" on page 21 for more information.

Static PoE Management Mode

In the **static** PoE management mode, you specify the maximum power for each PoE interface. The PoE controller then allocates this amount of power to the interface from the maximum PoE power consumption for the switch or line card. For example, if you specify a maximum value of 8.0 W for ge-0/0/3, the PoE controller allocates 8.0 W for this interface out of the maximum power consumption. This amount is allocated to the interface irrespective of whether a powered device is connected to the interface or the connected powered device uses less power than 8.0 W.

Because of line loss, the power received by the powered device can be less than the power available at the PoE port. Table 12 on page 22 shows the maximum power available at a PoE port and the resulting power guaranteed to the powered device.

Table 12: Maximum Power per Port in Static Mode

Switch or Line Card	Maximum Power Delivered by PoE Port	Guaranteed Power to Powered Devices
EX2200 switches, EX3300 switches, EX4200 PX model switches, and EX4300 switches	30 W	25.5 W
EX3200 switches and EX4200 P and T model switches running Junos OS Release 10.4 or earlier	15.4 W	12.95 W
EX3200 switches and EX4200 P and T model switches running Junos OS Release 11.1 or later	18.6 W NOTE: Switches that are upgraded to Junos OS Release 11.1 from a previous release require an upgrade of the PoE controller software to obtain 18.6 W.	15.64 W
EX6200-48P line cards	30 W	25.5 W
EX8200-2XS-40P line cards and EX8200-48PL line cards	30 W (ports 0 through 11) 15.4 W (remaining PoE ports)	25.5 W 12.95 W

PoE Interface Power Priority

You can configure a PoE interface to have a power priority. The power priority determines which interfaces receive power if PoE power demands are greater than the maximum PoE power consumption. If the total power allocated for all interfaces exceeds the

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maximum PoE power consumption, PoE power to lower-priority interfaces is turned off and the power allocated to those interfaces drops to 0. Thus you must set interfaces that connect to critical powered devices, such as security cameras and emergency phones, to high priority.

Among PoE interfaces that have the same assigned priority, power priority is determined by the port number, with lower-numbered ports having higher priority.

For EX6200 and EX8200 switches, interface power priority determines the relative priority of the interfaces on a line card, not on the switch as a whole. The relative priority of interfaces residing on different line cards is determined by line card priority. For example, if line card 1 has a higher power priority than line card 2 and a power shortage occurs, power is removed from the PoE interfaces in this order:

- Low-priority interfaces on line card 2
- High-priority interfaces on line card 2
- Low-priority interfaces on line card 1
- High-priority interfaces on line card 1

You can manually configure PoE interface power priority, or you can enable LLDP power priority, which assigns each interface the power priority provided by the connected LLDP-enabled powered device. Table 13 on page 23 describes how the switch converts LLDP power priorities to switch power priorities.

Table 13: LLDP Power Priority Conversion

LLDP Power Priority	Switch Power Priority
Critical, High	High
Low	Low

NOTE: LLDP power priority requires LLDP power negotiation to be enabled, which is enabled by default when the PoE management option is set to class.

NOTE: LLDP power priority is not supported on EX3200 and EX4200 (except EX4200 PX model) switches.

Related Documentation

- Example: Configuring PoE Interfaces on an EX Series Switch on page 32
- Example: Configuring PoE Interfaces with Different Priorities on an EX Series Switch on page 34
- *Example: Configuring PoE on an EX6200 or EX8200 Switch*
- Upgrading the PoE Controller Software on page 45

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CHAPTER 2

Configuring PoE to Supply Electric Power over Network Interfaces

- Configuring PoE on EX Series Switches (CLI Procedure) on page 25
- Example: Configuring PoE Interfaces on an EX Series Switch on page 32
- Example: Configuring PoE Interfaces with Different Priorities on an EX Series Switch on page 34
- Verifying PoE Configuration and Status (CLI Procedure) on page 39

Configuring PoE on EX Series Switches (CLI Procedure)

Power over Ethernet (PoE) ports on EX Series switches supply electric power over the same ports that are used to connect network devices. These ports enable you to plug in devices that require both network connectivity and electric power, such as VoIP phones, wireless access points, and some IP cameras. This reduces the amount of wiring in a network, and also eliminates the need to position a powered device near an AC power outlet, making network design more flexible and efficient.

This topic describes:

- PoE Configurable Options on page 26
- Configuring the PoE Controller on EX2200, EX3200, EX3300, EX4200, and EX4300 Switches on page 28
- Configuring the PoE Controllers on EX6200 and EX8200 Switches on page 30
- Configuring PoE Interfaces on page 31

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PoE Configurable Options

For EX Series switches that support PoE ports, the factory default configuration enables PoE on the PoE-capable ports, with default settings in effect. You might not have to do any additional configuration if the default settings work for you. Table 14 on page 26 shows the configurable PoE options and their default settings for the PoE controller and for the PoE interfaces.

NOTE: On EX8200 switches, the factory default configuration enables PoE on all interfaces starting at Junos OS Release 11.2. Switches that have been upgraded to Release 11.2 from an earlier release might not have PoE enabled by default. To enable PoE on all PoE-capable ports on a switch, use the **set poe interface all** configuration command.

Table 14: Configurable PoE Options and Default Settings

Option	Default	Description
PoE Controller Options		
guard-band	0 W	Reserves a specified amount of power from the PoE power budget to be used in the case of a spike in PoE power consumption: • Up to 15 W on EX6200 and EX8200 switches • Up to 19 W on all other switches
lldp-priority	Not included in default configuration	When included in the configuration, assigns interfaces the power priority provided by the connected powered device by using Link Layer Discovery Protocol (LLDP) power negotiation rather than the power priority configured on the switch interface. Requires LLDP power negotiation to be enabled.

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Table 14: Configurable PoE Options and Default Settings *(continued)*

Option	Default	Description
management	**class**	Sets the PoE power management mode for the switch or line card. The power management mode determines how power to a PoE interface is allocated: • **class**—In this mode, the power allocated to a PoE interface is determined in one of two ways: ◦ If LLDP power negotiation is enabled, the PoE controller allocates PoE power by using LLDP power negotiation, which enables the PoE controller to dynamically allocate power to LLDP-enabled devices based on their power needs. LLDP power negotiation is enabled by default on supported switches when the **management** option is set to **class**. For information about configuring LLDP power negotiation, see *Configuring LLDP (CLI Procedure)*. ◦ If LLDP power negotiation is disabled or not supported on the powered device or the switch, the maximum power delivered by an interface is determined by the class of the connected powered device. If there is no powered device connected, standard 15.4W power is allocated on the interface. • **static**—The maximum power delivered by an interface is statically configured and is independent of the class of the connected powered device. The maximum power is allocated to the interface even if a powered device is not connected.
maximum-power	**792** W for the EX8200-2XS-40P (40-port PoE+ with 4-port SFP and 2-port SFP+) line card **915** W for the EX8200-48PL (48-port PoE+ 20 Gbps) line card **1440** W for the EX6200-48P (48-port PoE+) line card	(EX6200 and EX8200 switches only) Sets the PoE power budget for the line card: • 37 W through 792 W for the EX8200-2XS-40P line card • 37 W through 915 W for the EX8200-48PL line card • 37 W through 1440 W for the EX6200-48P line card
notification-control	Not included in default configuration	When included in the configuration, enables the PoE controller to send PoE SNMP traps.
Interface Options		
af-mode	Not included in default configuration	(EX6200 switches only) When included in the configuration, restricts a PoE interface to supporting IEEE 802.3af only. The maximum power that can be delivered by the PoE interface is 15.4 W.
disable (Power over Ethernet)	Not included in default configuration	When included in the configuration, disables PoE on the interface. The interface maintains network connectivity but no longer supplies power to a connected powered device. Power is not allocated to the interface.

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Table 14: Configurable PoE Options and Default Settings *(continued)*

Option	Default	Description
maximum-power (Interface)	**30.0** W for interfaces that support PoE+ (IEEE 802.3at) **15.4** W for interfaces that support PoE (IEEE 802.3af)	Sets the maximum power that can be delivered by a PoE interface when the power management mode is **static**: • Up to 30 W for EX2200, EX3300, EX4200, EX4300, EX6200, and EX8200 switches • Up to 18.6 W for EX3200 switches This setting is ignored if the power management mode is **class**. NOTE: The **maximum-power** setting permitted by the CLI might be greater than the maximum power a given PoE port can deliver. For example, the CLI permits you to set any port on an EX8200 line card to 30 W; however, only ports 0 through 11 support 30 W. Similarly, the CLI permits you to set any port on an EX4200 switch to 30 W, but some EX4200 models support only 18.6 W per port. If you configure a **maximum-power** value that is greater than the maximum power supported by a port, the power allocated to the port will be the maximum supported.
priority (Power over Ethernet)	**low**	Sets an interface's power priority to either **low** or **high**. If power is insufficient for all PoE interfaces, the PoE power to low-priority interfaces is shut down before power to high-priority interfaces is shut down. Among interfaces that have the same assigned priority, the power priority is determined by port number, with lower-numbered ports having higher priority. If LLDP power priority is enabled, the switch assigns each interface the power priority provided by the connected LLDP-enabled powered device rather than the interface's configured priority. On EX6200 and EX8200 switches, **priority** determines the interface's power priority relative to the other interfaces on the line card, not the interfaces on the switch as a whole. If power management cannot provide the line card with its full PoE power budget, PoE power to interfaces with low priority is shut down first.
telemetries	Not included in default configuration	When included in the configuration, enables the logging of power consumption records on an interface. Logging occurs every 5 minutes for 1 hour unless you specify a different value for interval (Power over Ethernet) or duration.

Configuring the PoE Controller on EX2200, EX3200, EX3300, EX4200, and EX4300 Switches

To configure the PoE controller on EX2200, EX3200, EX3300, EX4200, and EX4300 switches:

- To change the management mode or to configure a guard band setting for a standalone switch or for all members of an EX3300 Virtual Chassis, an EX4200 Virtual Chassis, an EX4300 Virtual Chassis, or a mixed EX4200 and EX4500 Virtual Chassis that supports PoE:

```
[edit]
user@switch# set poe management mode guard-band watts
```


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For example, to set the management mode to static and to configure a guard band of 15 W:

```
[edit]
user@switch# set poe management static guard-band 15
```

NOTE: If the PoE power budget for the switch is insufficient to provide maximum power to all the PoE ports, we recommend that you do not change the management mode from class to static. If you change the power management mode to static and do not change the other default settings, the PoE controller allocates maximum power to the PoE ports in the order of port number, which means PoE will be disabled on higher-numbered ports when the PoE power budget runs out.

In class mode, on the other hand, the PoE controller does not allocate power to a port until a powered device is connected. The class of the connected device determines the amount of power allocated. Thus in class mode, any PoE port can be used to power a device and all the PoE ports on the switch can be used as long as the combined power demand does not exceed the PoE power budget.

NOTE: On EX3200 and EX4200 switches that support enhanced PoE, you must change the management mode from class to static to take advantage of the higher per-port power limits of enhanced PoE.

- To enable PoE SNMP traps on a standalone switch or on an specific member of a Virtual Chassis:

  ```
  [edit]
  user@switch# set poe notification-control fpc number
  ```

  For example, to enable PoE SNMP traps on a standalone switch or on member 0 of a Virtual Chassis:

  ```
  [edit]
  user@switch# set poe notification-control fpc 0
  ```

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Configuring the PoE Controllers on EX6200 and EX8200 Switches

On EX6200 and EX8200 switches, each line card that supports PoE has its own PoE controller. This means that the PoE controller options are configured separately for each line card.

In addition, each line card has its own separate, configurable PoE power budget. The default power budget for a line card is the amount of power needed to supply all PoE ports on the line card with their maximum supported power. Because there might not be enough power available in a switch to supply each PoE line card with the default PoE power budget, you can configure smaller power budgets for one or more line cards, freeing power for other line cards.

To configure the line card PoE controllers in an EX6200 or EX8200 switch:

- To configure a guard band setting, to change the management mode, or to configure the PoE power budget for a specific line card:

  ```
  [edit]
  user@switch# set poe fpc number  guard-band watts management mode
  maximum-power watts
  ```

  For example, to configure a PoE budget of 350 W and a guard band of 15 W on line card 1:

  ```
  [edit]
  user@switch# set poe fpc 1 guard-band 15 maximum-power 350
  ```

  NOTE: If you configure a PoE power budget for a line card that is smaller than the default power budget, we recommend that you do not change the management mode from class to static. If you change the power management mode to static and do not change the interface default settings, the PoE controller allocates maximum power to the PoE ports in the order of port number. As a result, PoE will be disabled on higher-numbered ports when the PoE power budget runs out.

  In class mode, on the other hand, the PoE controller does not allocate power to a port until a powered device is connected. The class of the connected device determines the amount of power allocated. Thus in class mode, any PoE port can be used to power a device and all the PoE ports on the switch can be used as long as the combined power demand does not exceed the PoE power budget.

- To configure the same guard band value, management mode, or PoE power budget for all line cards in a switch:

  ```
  [edit]
  user@switch# set poe fpc all  guard-band watts management mode maximum-power
   watts
  ```

  For example, to configure a PoE budget of 1000 W and static management mode for all line cards in a switch:

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```
[edit]
user@switch# set poe fpc all management static maximum-power 1000
```

If you configure different settings for a specific line card, those settings override the settings configured with the **fpc all** statement.

- To enable PoE SNMP traps on a line card:

```
[edit]
user@switch# set poe notification-control fpc number
```

For example, to enable PoE SNMP traps on line card 7:

```
[edit]
user@switch# set poe notification-control fpc 7
```

Configuring PoE Interfaces

To configure the PoE interfaces on a switch that supports PoE:

- To configure all PoE interfaces with the same setting or settings:

```
[edit]
user@switch# set poe interface all options
```

For example, to enable telemetry collection on all interfaces, using the default collection duration and interval:

```
[edit]
user@switch# set poe interface all telemetries
```

NOTE: For PoE to be enabled on all PoE-capable interfaces, the configuration must include the interface all statement in the [edit poe] hierarchy level. With the exception of EX8200 switches that were shipped from the factory with a Junos OS release earlier than Release 11.2, the factory default configurations of switches that support PoE include this statement.

- To configure individual PoE interfaces with different settings:

```
[edit]
user@switch# set poe interface interface-name options
```

For example:

```
[edit]
user@switch# set poe interface ge-0/0/0 priority high telemetries duration
 24

[edit]
user@switch# set poe interface ge-0/0/1

[edit]
user@switch# set  poe interface ge-0/0/5 maximum-power 18.6

[edit]
user@switch# set poe interface ge-5/0/7 disable
```

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When you configure an individual interface, its configuration overrides any settings you configure with the **set poe interface all** command. For example, ge-0/0/1 in the preceding example retains the default settings, regardless of any settings configured with the **set poe interface all** command.

Related Documentation

- Example: Configuring PoE Interfaces on an EX Series Switch on page 32
- Example: Configuring PoE Interfaces with Different Priorities on an EX Series Switch on page 34
- *Example: Configuring PoE on an EX6200 or EX8200 Switch*
- Verifying PoE Configuration and Status (CLI Procedure) on page 39
- Understanding PoE on EX Series Switches on page 13

Example: Configuring PoE Interfaces on an EX Series Switch

Power over Ethernet (PoE) ports supply electric power over the same ports that are used to connect network devices and enable you to plug in devices that require both network connectivity and electric power, such as VoIP phones, wireless access points, and some IP cameras. This reduces the amount of wiring in a network, and also eliminates the need to position a powered device near an AC power outlet, making network design more flexible and efficient.

You do not need to configure PoE unless you want to modify the default values or disable PoE on a specific interface.

This example describes a default configuration of PoE interfaces on an EX Series switch:

- Requirements on page 32
- Overview and Topology on page 33
- Configuration on page 33
- Verification on page 34

Requirements

This example uses the following hardware and software components:

- One EX Series switch that supports PoE
- Avaya IP telephones
- Wireless access point
- Junos OS Release 9.0 or later for EX Series switches

Before you configure PoE, be sure you have:

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- Performed the initial switch configuration. See *Connecting and Configuring an EX Series Switch (CLI Procedure)* or *Connecting and Configuring an EX Series Switch (J-Web Procedure)* for details.

Overview and Topology

The topology used in this example consists of a switch that has 24 ports. Eight of the ports support PoE (IEEE 802.3af), which means they provide both network connectivity and electric power for powered devices such as VoIP telephones, wireless access points, and IP security cameras that require 12.95 W or less. The remaining 16 ports provide only network connectivity. You use the standard ports to connect devices that have their own power sources, such as desktop and laptop computers, printers, and servers.
Table 15 on page 33 details the topology used in this configuration example.

Table 15: Components of the PoE Configuration Topology

Property	Settings
Switch hardware	EX Series switch with 24 Gigabit Ethernet ports: 8 PoE interfaces (ge-0/0/0 through ge-0/0/7) and 16 non-PoE interfaces (ge-0/0/8 through ge-0/0/23)
VLAN name	default
Connection to a wireless access point (requires PoE)	ge-0/0/0
Connections to Avaya IP telephones with integrated hubs that allow phone and desktop PC to connect to a single port (requires PoE)	ge-0/0/1 through ge-0/0/7
Direct connections to desktop PCs, file servers, integrated printer/fax/copier machines (no PoE required)	ge-0/0/8 through ge-0/0/20
Unused ports (for future expansion)	ge-0/0/21 through ge-0/0/23

Configuration

To enable the default PoE configuration on the switch:

CLI Quick Configuration

To quickly enable the default configuration on the switch:

Simply connect the powered devices to the PoE ports.

Step-by-Step Procedure

To use the PoE interfaces with default values:

1. Make sure the switch is powered on.
2. Connect the wireless access point to interface ge-0/0/0.
3. Connect the Avaya phones to interfaces ge-0/0/1 through ge-0/0/7.

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Verification

To verify that PoE interfaces have been created and are operational, perform this task:

- Verifying That the PoE Interfaces Have Been Created on page 34

Verifying That the PoE Interfaces Have Been Created

Purpose Verify that the PoE interfaces have been created on the switch.

Action List all the PoE interfaces configured on the switch:

```
user@switch> show poe interface
Interface Admin        Oper       Max       Priority Power              Class
          status       status     power               consumption
 ge-0/0/0 Enabled      ON         15.4W     Low      7.9W                 0
 ge-0/0/1 Enabled      ON         15.4W     Low      3.2W                 2
 ge-0/0/2 Enabled      ON         15.4W     Low      3.2W                 2
 ge-0/0/3 Enabled      ON         15.4W     Low      3.2W                 2
 ge-0/0/4 Enabled      ON         15.4W     Low      3.2W                 2
 ge-0/0/5 Enabled      ON         15.4W     Low      3.2W                 2
 ge-0/0/6 Enabled      ON         15.4W     Low      3.2W                 2
 ge-0/0/7 Enabled      ON         15.4W     Low      3.2W                 2
```

Meaning The **show poe interface** command lists PoE interfaces configured on the switch, with their status, priority, power consumption, and class. This output shows that eight interfaces have been created with default values and are consuming power at the expected rates.

Related Documentation

- Example: Configuring PoE Interfaces with Different Priorities on an EX Series Switch on page 34
- Configuring PoE on EX Series Switches (CLI Procedure) on page 25
- Troubleshooting PoE Interfaces on page 52

Example: Configuring PoE Interfaces with Different Priorities on an EX Series Switch

Power over Ethernet (PoE) ports supply electric power over the same ports that are used to connect network devices. These ports enable you to plug in devices that need both network connectivity and electric power, such as VoIP phones, wireless access points, and some IP cameras.

By default, PoE ports on EX Series switches are set to low power priority. You can configure a PoE port to have a high power priority setting. If a situation arises where there is not sufficient power for all the PoE ports, the available power is directed to the higher priority ports, while power to the lower priority ports is shut down as needed. Thus you must set ports that connect to security cameras, emergency phones, and other high priority powered devices to high-priority.

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This example describes how to configure a few high-priority PoE interfaces.

- Requirements on page 35
- Overview and Topology on page 35
- Configuration on page 36
- Verification on page 38

Requirements

This example uses the following hardware and software components:

- One EX Series switch that supports PoE
- Powered devices—wireless access point, VoIP telephones, and IP security cameras—that require PoE
- Junos OS Release 9.0 or later for EX Series switches

Before you configure PoE, be sure you have:

- Performed the initial switch configuration. See *Connecting and Configuring an EX Series Switch (CLI Procedure)* or *Connecting and Configuring an EX Series Switch (J-Web Procedure)* for details.

Overview and Topology

The topology used in this example consists of a switch that has 24 ports. Eight of the ports support PoE (IEEE 802.3af), which means they provide both network connectivity and electric power for powered devices such as VoIP telephones, wireless access points, and IP security cameras that require 12.95 W or less. The remaining 16 ports provide only network connectivity. You use the standard ports to connect devices that have their own power sources, such as desktop and laptop computers, printers, and servers.
Table 16 on page 35 details the topology used in this configuration example.

Table 16: Components of the PoE Configuration Topology

Property	Settings
Switch hardware	Switch with 24 Gigabit Ethernet ports: 8 PoE interfaces (ge-0/0/0 through ge-0/0/7) and 16 non-PoE interfaces (ge-0/0/8 through ge-0/0/23)
VLAN name	default
Connection to a wireless access point (requires PoE)	ge-0/0/0
Security IP Cameras (require PoE)	ge-0/0/1 and ge-0/0/2 high
Emergency VoIP phone (requires PoE)	ge-0/0/3 high
VoIP phone in Executive Office (requires PoE)	ge-0/0/4 high
Other VoIP phones (require PoE)	ge-0/0/5 through ge-0/0/7

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Table 16: Components of the PoE Configuration Topology *(continued)*

Property	Settings
Direct connections to desktop PCs, file servers, integrated printer/fax/copier machines (no PoE required)	ge-0/0/8 through ge-0/0/20
Unused ports (for future expansion)	ge-0/0/21 through ge-0/0/23

Configuration

To configure PoE interfaces:

CLI Quick Configuration

By default, PoE interfaces are created for all PoE ports and PoE is enabled. The default priority for PoE interfaces is **low**.

To quickly set some interfaces to high priority and to include descriptions of the interfaces, copy the following commands and paste them into the switch terminal window:

```
[edit]
set poe interface ge-0/0/1 priority high telemetries
set poe interface ge-0/0/2 priority high telemetries
set poe interface ge-0/0/3 priority high telemetries
set poe interface ge-0/0/4 priority high telemetries
set interfaces ge-0/0/0 description "wireless access point"
set interfaces ge-0/0/1 description "security camera front door"
set interfaces ge-0/0/2 description "security camera back door"
set interfaces ge-0/0/3 description "emergency phone"
set interfaces ge-0/0/4 description "Executive Office VoIP phone"
set interfaces ge-0/0/5 description "staff VoIP phone"
set interfaces ge-0/0/6 description "staff VoIP phone"
set interfaces ge-0/0/7 description "staff VoIP phone"
```

Step-by-Step Procedure

To configure PoE interfaces with different priorities:

1. Set the interfaces connected to high-priority powered devices to high priority. Include the **telemetries** statement for the high-priority interfaces, thus enabling the logging of power consumption on those interfaces:

   ```
   [edit poe]
   user@switch# set interface ge-0/0/1 priority high telemetries
   user@switch# set interface ge-0/0/2 priority high telemetries
   user@switch# set interface ge-0/0/3 priority high telemetries
   user@switch# set interface ge-0/0/4 priority high telemetries
   ```

2. Provide descriptions for the PoE interfaces:

   ```
   [edit interfaces]
   user@switch# set ge-0/0/0 description "wireless access point"
   user@switch# set ge-0/0/1 description "security camera front door"
   user@switch# set ge-0/0/2 description "security camera back door"
   user@switch# set ge-0/0/3 description "emergency phone"
   user@switch# set ge-0/0/4 description "Executive Office VoIP phone"
   user@switch# set ge-0/0/5 description "staff VoIP phone"
   user@switch# set ge-0/0/6 description "staff VoIP phone"
   user@switch# set ge-0/0/7 description "staff VoIP phone"
   ```

3. Connect the wireless access point to interface ge-0/0/0. This interface uses the default PoE settings.

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4. Connect the two security cameras to interfaces ge-0/0/1 and ge-0/0/2. These interfaces are set to high priority with telemetries enabled.
5. Connect the emergency VoIP phone to interface ge-0/0/3. This interface is set to high priority with telemetries enabled.
6. Connect the Executive Office VoIP phone to interface ge-0/0/4. This interface is set to high priority with telemetries enabled.
7. Connect the staff VoIP phones to ge-0/0/5, ge-0/0/6, and ge-0/0/7. These interfaces use the default PoE settings.

Results

Check the results of the configuration:

```
[edit]
user@switch# show
interfaces {
    ge-0/0/0 {
        description "wireless access point";
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/0/1 {
        description "security camera front door";
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/0/2 {
        description "security camera back door";
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/0/3 {
        description "emergency phone";
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/0/4 {
        description "Executive Office VoIP phone";
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/0/5 {
        description "staff VoIP phone";
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/0/6 {
        description "staff VoIP phone";
        unit 0 {
```

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```
                family ethernet-switching;
            }
        }
        ge-0/0/7 {
            description "staff VoIP phone";
            unit 0 {
                family ethernet-switching;
            }
        }
    }
    poe {
        interface all;
        interface ge-0/0/1 {
            priority high;
            telemetries;
        }
        interface ge-0/0/2 {
            priority high;
            telemetries;
        }
        interface ge-0/0/3 {
            priority high;
            telemetries;
        }
        interface ge-0/0/4 {
            priority high;
            telemetries;
        }
    }
```

Verification

To verify that PoE interfaces have been created and are operational, perform the following tasks:

- Verifying That the PoE Interfaces Have Been Created with the Correct Priorities on page 38

Verifying That the PoE Interfaces Have Been Created with the Correct Priorities

Purpose Verify that the PoE interfaces on the switch are now set to the correct priority settings.

Action List all the PoE interfaces configured on the switch:

```
user@switch> show poe interface
Interface Admin        Oper       Max       Priority Power             Class
          status       status     power               consumption
 ge-0/0/0 Enabled      ON         15.4W     Low      7.9W                0
 ge-0/0/1 Enabled      ON         15.4W     High     4.8W                0
 ge-0/0/2 Enabled      ON         15.4W     High     4.8W                0
 ge-0/0/3 Enabled      ON         15.4W     High     3.3W                2
 ge-0/0/4 Enabled      ON         15.4W     High     4.7W                2
 ge-0/0/5 Enabled      ON         15.4W     Low      3.2W                2
 ge-0/0/6 Enabled      ON         15.4W     Low      3.3W                2
 ge-0/0/7 Enabled      ON         15.4W     Low      3.3W                2
```

Meaning The **show poe interface** command lists PoE interfaces configured on the switch, with their status, priority, power consumption, and class. This output shows that eight PoE interfaces

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are enabled. Interfaces ge-0/0/1 through ge-0/0/4 are configured as priority **high**. The remaining PoE interfaces are configured with the default priority value of **low**.

Related Documentation

- Example: Configuring PoE Interfaces on an EX Series Switch on page 32
- Configuring PoE on EX Series Switches (CLI Procedure) on page 25
- Troubleshooting PoE Interfaces on page 52

Verifying PoE Configuration and Status (CLI Procedure)

You can verify the Power over Ethernet (PoE) configuration and status on an EX Series switch.

This topic describes how to verify:

- PoE Controller Configuration and Status on page 39
- PoE Interface Configuration and Status on page 40
- PoE SNMP Trap Generation Status on page 41
- PoE Line Card Configuration and Status on page 41

PoE Controller Configuration and Status

Purpose Verify the PoE controller configuration and status, such as the PoE power budget, total PoE power consumption, power management mode, and the supported PoE standard.

Action Enter the following command:

```
user@switch> show poe controller
```

Example output for an EX2200 switch:

```
Controller  Maximum   Power         Guard    Management  Status   Lldp
index       power     consumption   band                          Priority
   0        405.00W   130.00W         19W    Class       AT_MODE  Disabled
```

Example output for an EX8200 switch:

```
Controller  Maximum   Power         Guard    Management  Status       Lldp
index       power     consumption   band                            Priority
   3        540.00W   435.25W         0W     Static      AT/AF COMBO  Disabled
   4        915.00W   627.01W        15W     Class       AT/AF COMBO  Disabled
```

Meaning

- For the EX2200 switch—The switch has a PoE power budget of 405 W, of which 130 W were being used by the PoE ports at the time the command was executed. The **Guard band** field shows that 19 W is reserved out of the PoE power budget to protect against spikes in power demand. The power management mode is class. The PoE ports on the switch support PoE+ (IEEE 802.3at).
- For the EX8200 switch—Line card 3 has a PoE power budget of 540 W, of which 435.25 W were being used by the PoE ports on the line card at the time the command was executed. The management mode for line card 3 is static and the line card has a mix of PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at) ports.

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Line card 4 has a PoE power budget of 915 W, of which 627.01 W were being used by the PoE ports on the line card at the time the command was executed. The **Guard band** field shows that 15 W is reserved out of the PoE power budget to protect against spikes in power demand. The management mode for line card 4 is class and the line card has a mix of PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at) ports.

PoE Interface Configuration and Status

Purpose Verify that PoE interfaces are enabled and set to the correct maximum power and priority settings. Also verify current operational status and power consumption.

Action To view configuration and status for all PoE interfaces, enter:

```
user@switch> show poe interface
Interface Admin        Oper       Max       Priority Power             Class
          status       status     power              consumption
 ge-0/0/0 Enabled      ON         15.4W     Low      7.9W                3
 ge-0/0/1 Enabled      ON         30.0W     High     4.8W                0
 ge-0/0/2 Enabled      ON         30.0W     High     4.8W                0
 ge-0/0/3 Enabled      ON         7.0W      High     3.3W                2
 ge-0/0/4 Enabled      ON         7.0W      Low      3.3W                2
 ge-0/0/5 Enabled      ON         7.0W      Low      3.2W                2
 ge-0/0/6 Enabled      ON         7.0W      Low      3.3W                2
 ge-0/0/7 Enabled      OFF        30.0W     Low      0.0W                not-
applicable
```

To view the configuration and status for the PoE interfaces on an EX6200 or EX8200 line card:

```
user@switch> show poe interface fpc-slot 3
Interface Admin        Oper       Max       Priority Power             Class
          status       status     power              consumption
 ge-3/0/0 Enabled      ON         30.0W     Low      20.3W               4
 ge-3/0/1 Enabled      ON         30.0W     Low      17.8W               4
 ge-3/0/2 Enabled      ON         30.0W     High     16.3W               4
 ge-3/0/3 Enabled      ON         30.0W     High     16.2W               4
 ge-3/0/4 Enabled      ON         30.0W     Low      25.9W               4
 ge-3/0/5 Enabled      ON         30.0W     Low      10.1W               4
 ge-3/0/6 Enabled      ON         30.0W     Low      16.2W               4
 ge-3/0/7 Enabled      ON         30.0W     Low      6.4W                4
 ge-3/0/8 Enabled      ON         30.0W     Low      5.2W                4
 ge-3/0/9 Enabled      ON         30.0W     Low      5.2W                4
ge-3/0/10 Enabled      ON         30.0W     Low      21.5W               4
ge-3/0/11 Enabled      ON         30.0W     Low      21.7W               4
ge-3/0/12 Enabled      ON         15.4W     Low      9.4W                0
ge-3/0/13 Enabled      ON         15.4W     Low      9.4W                0
ge-3/0/14 Enabled      ON         15.4W     Low      9.4W                0
ge-3/0/15 Enabled      ON         15.4W     Low      9.4W                0
ge-3/0/16 Enabled      ON         15.4W     Low      9.4W                0
ge-3/0/17 Enabled      ON         15.4W     Low      9.4W                0
ge-3/0/18 Enabled      ON         15.4W     Low      9.4W                0
ge-3/0/19 Enabled      ON         15.4W     Low      9.4W                0
ge-3/0/20 Enabled      ON         15.4W     Low      9.4W                0
ge-3/0/21 Enabled      ON         15.4W     Low      9.4W                0
ge-3/0/22 Enabled      ON         15.4W     Low      9.4W                0
ge-3/0/23 Enabled      ON         15.4W     Low      9.4W                0
ge-3/0/24 Enabled      ON         15.4W     Low      9.4W                0
ge-3/0/25 Enabled      ON         15.4W     Low      9.4W                0
```


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```
ge-3/0/26 Enabled       ON          15.4W     Low       9.4W                0
ge-3/0/27 Enabled       ON          15.4W     Low       9.4W                0
ge-3/0/28 Enabled       ON          15.4W     Low       7.0W                0
ge-3/0/29 Enabled       ON          15.4W     Low       2.2W                1
ge-3/0/30 Enabled       ON          15.4W     Low       2.2W                1
ge-3/0/31 Enabled       ON          15.4W     Low       2.2W                1
ge-3/0/32 Enabled       ON          15.4W     Low       2.0W                1
ge-3/0/33 Enabled       ON          15.4W     Low       2.0W                1
ge-3/0/34 Enabled       ON          15.4W     Low       2.2W                1
ge-3/0/35 Enabled       ON          15.4W     Low       2.2W                1
ge-3/0/36 Enabled       ON          15.4W     Low       2.2W                1
ge-3/0/37 Enabled       ON          15.4W     Low       2.2W                1
ge-3/0/38 Enabled       ON          15.4W     Low       2.2W                1
ge-3/0/39 Enabled       ON          15.4W     Low       2.2W                1
```

To view configuration and status for a single PoE interface, enter:

```
user@switch> show poe interface ge-0/0/3
PoE interface status:
PoE interface                :  ge-0/0/3
Administrative status        : Enabled
Operational status           :  ON
Power limit on the interface : 7.0W
Priority                     : High
Power consumed               : 3.3W
Class of power device        :   2
PoE Mode                     :   802.3at
```

Meaning The command output shows the status and configuration of interfaces. For example, the interface ge-0/0/3 is administratively enabled. Its operational status is **ON**; that is, the interface is currently delivering power to a connected powered device. The maximum power allocated to the interface is 7.0 W. The interface has a high power priority. At the time the command was executed, the powered device was consuming 3.3 W. The IEEE 802.3af class of the powered device is class 2. If the PoE power management mode is class, the class of the powered device determines the maximum power allocated to the interface, which is 7 W in the case of class 2 devices.

The PoE Mode field indicates that the interface supports IEEE 802.3at.

PoE SNMP Trap Generation Status

Purpose Verify the status of the notification-control option, which determines whether or not PoE SNMP traps are enabled.

Action Enter the following command:

```
user@switch> show poe notification-control
FPC slot             Notification-control-status
    0                    OFF
```

Meaning PoE SNMP traps are not enabled.

PoE Line Card Configuration and Status

Purpose Verify the PoE configuration and status for line cards on an EX6200 or EX8200 switch, such as the PoE power allocation and priority for each line card.

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Action Enter the following command:

```
user@switch> show chassis power-budget-statistics
```

Example output for an EX6200 switch:

```
       PSU  0     (EX6200-PWR-AC2500)                :    2500 W   Online
       PSU  1     (EX6200-PWR-AC2500)                :    2500 W   Online
       PSU  2     (EX6200-PWR-AC2500)                :    2500 W   Online
       PSU  3     (EX6200-PWR-AC2500)                :    2500 W   Online
       Total Power supplied by all Online PSUs  :   10000 W
       Power Redundancy Configuration           :     N+1
       Power Reserved for the Chassis           :     500 W
 Fan Tray Statistics            Base power    Power Used
 FTC  0                         :     300 W      43.04 W
 FPC Statistics                  Base power   Power Used   PoE power   Priority

 FPC  1   (EX6200-48P)          :     220 W      49.47 W      1440 W       1
 FPC  2   (EX6200-48P)          :     220 W      47.20 W       800 W       2
 FPC  3   (EX6200-48P)          :     220 W    1493.57 W      1440 W       0
 FPC  4   (EX6200-SRE64-4XS)    :     100 W      51.38 W         0 W       0
 FPC  5   (EX6200-SRE64-4XS)    :     100 W      50.28 W         0 W       0
 FPC  6   (EX6200-48P)          :     220 W      49.38 W       800 W       6
 FPC  8   (EX6200-48P)          :     220 W      61.41 W      1440 W       9
 FPC  9   (EX6200-48T)          :     150 W      12.49 W         0 W       9

       Total (non-PoE) Power allocated          :    1750 W
       Total Power allocated for PoE            :    5920 W
       Power Available (Redundant case)         :    5750 W
       Total Power Available                    :    2515 W
```

Example output for an EX8200 switch:

```
  PSU  0     (EX8200-AC2K)                :    2000 W  Online
  PSU  1     (EX8200-AC2K)                :    2000 W  Online
  PSU  2     (EX8200-AC2K)                :    2000 W  Online
  PSU  3     (EX8200-AC2K)                :    2000 W  online
  PSU  4     (EX8200-AC2K)                :    2000 W  Online
  Total Power supplied by all Online PSUs  :   10000 W
  Power Redundancy Configuration           :     N+1
  Power Reserved for the Chassis           :    2400 W
  FPC Statistics                            Base power    PoE power   Priority

  FPC  1   (EX8200-48T)                    :     350 W          0 W     15
  FPC  5   (EX8200-2XS-40P)                :     387 W        792 W      0
  FPC  9   (EX8200-48PL)                   :     267 W        915 W     15
  FPC  10  (EX8200-2XS-40T)                :     350 W          0 W      1
  FPC  12  (EX8200-48T)                    :     350 W          0 W     15

  Total (non-PoE) Power allocated          :    4104 W
  Total Power allocated for PoE            :    1707 W
  Power Available (Redundant case)         :    3896 W
  Total Power Available                    :    4263 W
```

Meaning

- For the EX6200 switch—The total of the PoE power budgets allocated to the line cards in the switch is 5920 W. This figure includes the 37 W of PoE power always included in the base allocation for each line card that supports PoE. For line cards with PoE ports, the **PoE power** field shows the PoE power budget allocated to each line card, along with the line card priority.

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- For the EX8200 switch—The total of the PoE power budgets allocated to the line cards in the switch is 1707 W. This figure includes the 37 W of PoE power always included in the base allocation for each line card that supports PoE. For line cards with PoE ports, the **PoE power** field shows the PoE power budget allocated to each line card, along with the line card priority.

Related Documentation

-

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CHAPTER 3

Upgrading the PoE Controller Software

- Upgrading the PoE Controller Software on page 45

Upgrading the PoE Controller Software

Each Junos OS image for an EX Series switch that supports PoE contains the most recent version of the PoE controller software at the time the Junos OS image was built. When you upgrade Junos OS on your switch, the new image might contain a more recent version of the PoE controller software than is currently running on the PoE controller. You can upgrade your PoE controller software by requesting that the more recent version of the software contained in the Junos OS image be downloaded to the controller.

NOTE: Powered devices are not guaranteed to receive power while the new software is being downloaded to the PoE controller, a process that can take up to 10 minutes. In addition, during the software download, some PoE operational commands, such as show poe interface, might not show correct output. We recommend that you upgrade your PoE controller software during a regularly scheduled maintenance window.

NOTE: On an EX8200 Virtual Chassis, you cannot execute PoE commands on the XRE200 External Routing Engine. You can execute PoE commands only on the member EX8200 switches. Use the request session member *member-id* command to open a CLI session on a member switch.

This topic covers:

- Determining Whether the PoE Controller Software Needs Upgrading on page 46
- Upgrading the PoE Controller Software on page 46
- Monitoring the Upgrade Progress on page 47

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Determining Whether the PoE Controller Software Needs Upgrading

To determine whether the version of the PoE controller software supplied with Junos OS is more recent than the version of the software currently running on the PoE controller, enter the following command:

```
user@switch> show poe controller
Controller  Maximum   Power         Guard    Management  Status   Lldp
index       power     consumption   band                          Priority
   0**      130.00W   0.00W           0W     Class       AF_MODE  Disabled
  **New PoE software upgrade available.
 Use 'request system firmware upgrade poe fpc-slot <slot>'
 This procedure will take around 10 minutes (recommended to be performed during
maintenance)
```

The **New PoE software upgrade available** text in the output indicates that the PoE controller software is out-of-date and needs to be upgraded.

For Virtual Chassis or switches with PoE line cards, the output of the **show poe controller** command indicates which members of a Virtual Chassis or which PoE line cards have out-of-date PoE controller software:

```
user@switch> show poe controller
Controller  Maximum   Power         Guard    Management   Status      Lldp
index       power     consumption   band                           Priority
   2        130.00W   120.34W         0W     Class        AF_ENHANCE  Disabled
   4**      410.00W   182.80W         0W     Class        AF_MODE     Disabled
  **New PoE software upgrade available.
 Use 'request system firmware upgrade poe fpc-slot slot'
 This procedure will take around 10 minutes (recommended to be performed during
maintenance)
```

In the preceding example, member 4 of the Virtual Chassis has an out-of-date PoE controller software.

NOTE: We recommend that all member switches of a Virtual Chassis or all line cards in a switch run the same version of the PoE controller software.

Upgrading the PoE Controller Software

To upgrade the PoE controller software for a standalone switch with built-in PoE interfaces, enter:

```
user@switch> request system firmware upgrade poe fpc-slot 0
Firmware upgrade initiated. Poe Upgrade takes about 10 minutes
Use 'show poe controller' to get the download status
```

To upgrade the PoE controller software on a specific Virtual Chassis member or line card on a switch, enter:

```
user@switch> request system firmware upgrade poe fpc-slot 8
Firmware upgrade initiated. Poe Upgrade takes about 10 minutes
Use 'show poe controller' to get the download status
```


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To upgrade the PoE controller software on all members of a Virtual Chassis or all line cards on a switch, enter:

```
user@switch> request system firmware upgrade poe fpc-slot all-members
Firmware upgrade initiated. Poe Upgrade takes about 10 minutes
Use 'show poe controller' to get the download status
```

Monitoring the Upgrade Progress

Use the **show poe controller** command to monitor the progress of the controller software upgrade:

```
user@switch> show poe controller
Controller  Maximum   Power         Guard    Management  Status           Lldp
index       power     consumption   band                                 Priority

   0**      130.00W   0.00W          0W               SW_DOWNLOAD(14%)  Disabled

  **New PoE software upgrade available.
 Use 'request system firmware upgrade poe fpc-slot <slot>'
 This procedure will take around 10 minutes (recommended to be performed during
maintenance)
```

The **Status** field is updated during the download process to show the following stages of the download:

- **DOWNLOAD_INIT**
- **SW_DOWNLOAD (*n*%)**

When the software upgrade is complete, the **New PoE software upgrade available** text is no longer displayed for the particular FPC.

NOTE: If you are upgrading the PoE controller software to enable enhanced PoE, the Status field for the controller shows AF_ENHANCE after the upgrade completes, indicating that the controller now supports enhanced PoE. The default maximum power per port is not automatically increased as a result of the upgrade—it is still 15.4 W per port. You must explicitly set the maximum power for a port to 18.6 W. Enhanced PoE is supported in Junos OS Release 11.1 or later on EX3200 switches and on EX4200-P or EX4200-T model switches.

Related Documentation

- Verifying PoE Configuration and Status (CLI Procedure) on page 39
- Understanding PoE on EX Series Switches on page 13

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CHAPTER 4

Monitoring and Troubleshooting PoE

- Monitoring PoE Power Consumption (CLI Procedure) on page 49
- Troubleshooting PoE Interfaces on page 52

Monitoring PoE Power Consumption (CLI Procedure)

You can monitor Power over Ethernet (PoE) power consumption, both for the switch as a whole and for individual PoE interfaces.

This topic describes how to monitor:

- PoE Power Consumption on a Switch on page 49
- Current Power Consumption for PoE Interfaces on page 49
- Power Consumption for PoE Interfaces over Time on page 51

PoE Power Consumption on a Switch

Purpose Determine the current PoE power consumption on a switch.

Action Enter the following command:

```
user@switch> show poe controller
Controller  Maximum   Power         Guard    Management  Status   Lldp
index       power     consumption   band                          Priority
   0        405.00W   130.00W         0W     Class       AT_MODE  Disabled
```

Meaning At the time the command was executed, the PoE interfaces on the switch were consuming 130 W out of the PoE power budget of 405 W.

Current Power Consumption for PoE Interfaces

Purpose Determine the current power consumption for individual PoE interfaces.

Action To monitor the power consumption of all PoE interfaces on the switch, use the following command:

```
user@switch> show poe interface
Interface Admin        Oper        Max       Priority Power             Class
          status       status      power               consumption
 ge-0/0/0 Enabled       ON        15.4W     Low      7.4W                0
 ge-0/0/1 Enabled       ON        15.4W     High     12.0W               0
```

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```
 ge-0/0/2 Enabled       ON         15.4W     Low      12.4W              0
 ge-0/0/3 Enabled       ON         7.0W      Low      5.3W               2
 ge-0/0/4 Enabled       ON         4.0W      Low      4.0W               1
 ge-0/0/5 Enabled       ON         7.0W      Low      6.1W               2
 ge-0/0/6 Enabled       ON         15.4W     Low      12.3W              3
 ge-0/0/7 Disabled     Disabled    0.0W      Low      0.0W               not-
applicable
```

To monitor the power consumption of the PoE interfaces on a specific EX6200 or EX8200 line card, use the following command:

```
user@switch> show poe interface fpc-slot 3
Interface Admin        Oper        Max       Priority Power             Class
          status       status      power               consumption
 ge-3/0/0 Enabled       ON         30.0W     Low      20.3W                4
 ge-3/0/1 Enabled       ON         30.0W     Low      17.8W                4
 ge-3/0/2 Enabled       ON         30.0W     High     16.3W                4
 ge-3/0/3 Enabled       ON         30.0W     High     16.2W                4
 ge-3/0/4 Enabled       ON         30.0W     Low      25.9W                4
 ge-3/0/5 Enabled       ON         30.0W     Low      10.1W                4
 ge-3/0/6 Enabled       ON         30.0W     Low      16.2W                4
 ge-3/0/7 Enabled       ON         30.0W     Low      6.4W                 4
 ge-3/0/8 Enabled       ON         30.0W     Low      5.2W                 4
 ge-3/0/9 Enabled       ON         30.0W     Low      5.2W                 4
ge-3/0/10 Enabled       ON         30.0W     Low      21.5W                4
ge-3/0/11 Enabled       ON         30.0W     Low      21.7W                4
ge-3/0/12 Enabled       ON         15.4W     Low      9.4W                 0
ge-3/0/13 Enabled       ON         15.4W     Low      9.4W                 0
ge-3/0/14 Enabled       ON         15.4W     Low      9.4W                 0
ge-3/0/15 Enabled       ON         15.4W     Low      9.4W                 0
ge-3/0/16 Enabled       ON         15.4W     Low      9.4W                 0
ge-3/0/17 Enabled       ON         15.4W     Low      9.4W                 0
ge-3/0/18 Enabled       ON         15.4W     Low      9.4W                 0
ge-3/0/19 Enabled       ON         15.4W     Low      9.4W                 0
ge-3/0/20 Enabled       ON         15.4W     Low      9.4W                 0
ge-3/0/21 Enabled       ON         15.4W     Low      9.4W                 0
ge-3/0/22 Enabled       ON         15.4W     Low      9.4W                 0
ge-3/0/23 Enabled       ON         15.4W     Low      9.4W                 0
ge-3/0/24 Enabled       ON         15.4W     Low      9.4W                 0
ge-3/0/25 Enabled       ON         15.4W     Low      9.4W                 0
ge-3/0/26 Enabled       ON         15.4W     Low      9.4W                 0
ge-3/0/27 Enabled       ON         15.4W     Low      9.4W                 0
ge-3/0/28 Enabled       ON         15.4W     Low      7.0W                 0
ge-3/0/29 Enabled       ON         15.4W     Low      2.2W                 1
ge-3/0/30 Enabled       ON         15.4W     Low      2.2W                 1
ge-3/0/31 Enabled       ON         15.4W     Low      2.2W                 1
ge-3/0/32 Enabled       ON         15.4W     Low      2.0W                 1
ge-3/0/33 Enabled       ON         15.4W     Low      2.0W                 1
ge-3/0/34 Enabled       ON         15.4W     Low      2.2W                 1
ge-3/0/35 Enabled       ON         15.4W     Low      2.2W                 1
ge-3/0/36 Enabled       ON         15.4W     Low      2.2W                 1
ge-3/0/37 Enabled       ON         15.4W     Low      2.2W                 1
ge-3/0/38 Enabled       ON         15.4W     Low      2.2W                 1
ge-3/0/39 Enabled       ON         15.4W     Low      2.2W                 1
```

To monitor the power consumption of an individual PoE interface (for example, ge-0/0/3), use the following command:

```
user@switch> show poe interface ge-0/0/3
PoE interface status:
PoE interface               :  ge-0/0/3
```


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```
Administrative status        : Enabled
Operational status           :  ON
Power limit on the interface : 7.0W
Priority                     : Low
Power consumed               : 5.3W
Class of power device        :   2
PoE Mode                     : 802.3at
```

Meaning At the time the command was executed, the individual PoE ports were consuming the amount of power shown. For example, interface ge-0/0/3 was consuming 5.3 W at the time the command was executed.

Power Consumption for PoE Interfaces over Time

Purpose Monitor the power consumption of a PoE interface over a period of time. The records collected remain available for future viewing.

You can specify the intervals at which power consumption data is collected, from once every minute to once every 30 minutes. The default is once every 5 minutes. You can also specify the duration over which the records are collected, from 1 hour (default) to 24 hours.

Action To collect historical records of PoE interface power consumption and display those records:

1. Add the telemetries statement to the PoE interface configuration:

   ```
   [edit]
   user@switch# set poe interface ge-0/0/5 telemetries interval 10
   ```

   When you commit the configuration, record collection begins.

2. Display the collected records:

   ```
   user@switch> show poe telemetries interface ge-0/0/5 count all
   Sl No    Timestamp                  Power    Voltage
      1     03-19-2010 13:00:07 UTC  3.9W     50.9V
      2     03-19-2010 12:50:07 UTC  3.9W     50.9V
      3     03-19-2010 12:40:07 UTC  3.9W     50.9V
      4     03-19-2010 12:30:07 UTC  3.9W     50.9V
      5     03-19-2010 12:20:07 UTC  3.9W     50.9V
      6     03-19-2010 12:10:07 UTC  3.9W     50.9V
   ```

To start another session of record collection on the interface, you must delete the existing telemetries configuration on the interface and then reconfigure telemetries. Deleting the telemetries configuration also clears the power consumption history data.

To clear the history of PoE power consumption without deleting the telemetries configuration, use the command clear poe telemetries interface.

Meaning Over the hour in which the PoE power consumption data on ge-0/0/5 was collected, the connected powered device consistently consumed 3.9 W.

Related Documentation

- Configuring PoE on EX Series Switches (CLI Procedure) on page 25

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- Example: Configuring PoE Interfaces on an EX Series Switch on page 32
- Example: Configuring PoE Interfaces with Different Priorities on an EX Series Switch on page 34
- *Example: Configuring PoE on an EX6200 or EX8200 Switch*
- Verifying PoE Configuration and Status (CLI Procedure) on page 39

Troubleshooting PoE Interfaces

Problem **Description:** A Power over Ethernet (PoE) interface is not supplying power to the powered device.

Solution Check for the items shown in Table 17 on page 52.

Table 17: Troubleshooting a PoE Interface

Items to Check	Explanation
Is the switch a full PoE model or a partial PoE model?	If you are using a partial PoE model, only interfaces ge-0/0/0 through ge-0/0/7 can function as PoE ports.
Has PoE capability been disabled for that interface?	Use the show poe interface command to check PoE interface status.
Is the cable properly seated in the port socket?	Check the hardware.
Has the PoE power budget been exceeded for the switch?	Use the show poe controller command to check the PoE power budget and consumption for the switch.
Does the powered device require more power than is available on the interface?	Use the show poe interface command to check the maximum power provided by the interface.
If the telemetries option has been enabled for the interface, check the history of power consumption.	Use the show poe telemetries command to display the history of power consumption.

Related Documentation

- Example: Configuring PoE Interfaces with Different Priorities on an EX Series Switch on page 34
- Verifying PoE Configuration and Status (CLI Procedure) on page 39
- Monitoring PoE Power Consumption (CLI Procedure) on page 49
- Configuring PoE on EX Series Switches (CLI Procedure) on page 25

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CHAPTER 5

Configuration Statements

- [edit poe] Configuration Statement Hierarchy on EX Series Switches on page 53
- disable (Power over Ethernet) on page 55
- duration on page 56
- fpc (Notification Control) on page 57
- guard-band on page 58
- interface (Power over Ethernet) on page 59
- interval (Power over Ethernet) on page 60
- management on page 61
- maximum-power (Interface) on page 62
- notification-control on page 64
- poe on page 65
- priority (Power over Ethernet) on page 66
- telemetries on page 67

[edit poe] Configuration Statement Hierarchy on EX Series Switches

This topic lists supported configuration statements in the **[edit poe]** hierarchy level on EX Series switches.

- *Supported* statements are those that you can use to configure some aspect of a software feature on the switch.
- Not all features are supported on all switch platforms. For detailed information about feature support on specific EX Series switch platforms, see Feature Explorer.

This topic lists:

- Supported Statements in the [edit poe] Hierarchy Level on page 53

Supported Statements in the [edit poe] Hierarchy Level

The following hierarchy shows the **[edit poe]** configuration statements supported on EX Series switches except for EX6200 and EX8200 switches:

```
poe {
```

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```
    guard-band watts;
    interface (all | interface-name) {
      disable;
      maximum-power watts;
      priority (high | low);
      telemetries {
        disable;
        duration hours;
        interval minutes;
      }
    }
    lldp-priority;
    management (class | static);
    notification-control {
      fpc slot-number {
        disable;
      }
    }
}
```

The following hierarchy shows the **[edit poe]** configuration statements supported on EX Series switches for EX6200 and EX8200 switches:

```
poe {
  fpc (all | slot-number) {
    guard-band watts;
    lldp-priority;
    management (class | static);
    maximum-power watts;
  }
  interface (all | interface-name) {
    af-mode;
    disable;
    maximum-power watts;
    priority (high | low);
    telemetries {
      disable;
      duration hours;
      interval minutes;
    }
  }
  notification-control {
    fpc slot-number {
      disable;
    }
  }
}
```

Related Documentation

- Example: Configuring PoE Interfaces with Different Priorities on an EX Series Switch on page 34
- *Example: Configuring PoE on an EX6200 or EX8200 Switch*
- Configuring PoE on EX Series Switches (CLI Procedure) on page 25
- Understanding PoE on EX Series Switches on page 13

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disable (Power over Ethernet)

Syntax disable;

Hierarchy Level [edit poe interface (all | *interface-name*)],
[edit poe interface (all | *interface-name*) telemetries],
[edit poe notification-control fpc *slot-number*]

Release Information Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 12.2 for ACX2000 Universal Access Routers.

Description Disable a PoE interface, disable the collection of power consumption data for a PoE interface, or disable the generation of the PoE SNMP traps. The action of the **disable** statement depends on which statement it is used with:

- When used with **interface**—Disable the PoE capability of this interface. The interface operates as a standard network access interface, and power is no longer allocated to it from the PoE power budget. Although the PoE capability is disabled, the PoE configuration for the interface is retained. To re-enable the PoE capability of this interface, delete the **disable** statement from the **interface** entry in the configuration.
- When used with **telemetries**—Disable the collection of PoE power consumption records for this interface. Any previously collected records are deleted. However, the **telemetries** configuration is retained, including the values for interval and duration. To re-enable record collection, delete the **disable** statement from the **telemetries** entry in the configuration.
- When used with **notification-control**—Disable the generation of PoE SNMP traps. To re-enable PoE traps, delete the **disable** statement from the **notification-control** entry in the configuration.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation
- Example: Configuring PoE Interfaces with Different Priorities on an EX Series Switch on page 34
- Configuring PoE on EX Series Switches (CLI Procedure) on page 25

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duration

Syntax duration *hours*;

Hierarchy Level [edit poe interface (all | *interface-name*) telemetries]

Release Information Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Modify the duration over which data is collected when you are monitoring the power consumption of a PoE interface.

Options ***hours***—Number of hours over which the data is to be collected.

Range: 1 through 24

Default: 1

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Example: Configuring PoE Interfaces with Different Priorities on an EX Series Switch on page 34
- Configuring PoE on EX Series Switches (CLI Procedure) on page 25

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fpc (Notification Control)

Syntax

```
fpc slot-number {
  disable;
}
```

Hierarchy Level [edit poe notification-control]

Release Information Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Enable the specified PoE controller to generate PoE traps.

Default PoE traps are disabled by default.

Options ***slot-number***—Indicates the PoE controller by FPC slot number, where ***slot-number*** is:

- **0**—On an EX2200, EX3200, standalone EX3300, standalone EX4200, or standalone EX4300 switch
- Member ID—On an EX3300, EX4200, or EX4300 switch in a Virtual Chassis
- Line card slot number—On an EX6200 or EX8200 switch

The remaining statement is explained separately.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Configuring PoE on EX Series Switches (CLI Procedure) on page 25

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guard-band

Syntax guard-band *watts*;

Hierarchy Level [edit poe],
[edit poe (all | fpc *slot-number*)]

Release Information Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 12.2 for ACX2000 Universal Access Routers.

Description Reserve a specified amount of power from the PoE power budget for the switch or the line cardin case of a spike in PoE consumption.

Options ***watts***—Amount of power to be reserved in case of a spike in PoE consumption.

Range: 0 through 15 for EX6200 and EX8200 switches and 0 through 19 for ACX2000 routers and all other switches.

Default: 0

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Configuring PoE on EX Series Switches (CLI Procedure) on page 25

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interface (Power over Ethernet)

Syntax

```
interface (all | interface-name) {
  af-mode;
  disable;
  maximum-power watts;
  priority (high | low);
  telemetries {
    disable;
    duration hours;
    interval minutes;
  }
}
```

Hierarchy Level [edit poe]

Release Information Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Specify a PoE interface to be configured.

Options

all—All PoE interfaces on the switch that have not been individually configured for PoE. If a PoE interface has been individually configured, that configuration overrides any settings specified with **all**.

interface-name—Name of the specific interface being configured.

If you use the **interface** statement without any substatements, default values are used for the remaining statements.

The remaining statements are explained separately.

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Example: Configuring PoE Interfaces with Different Priorities on an EX Series Switch on page 34
- Configuring PoE on EX Series Switches (CLI Procedure) on page 25

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interval (Power over Ethernet)

Syntax interval *minutes*;

Hierarchy Level [edit poe interface (all | *interface-name*) telemetries]

Release Information Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Modify the interval at which data is collected when you are monitoring the power consumption of a PoE interface.

Options ***minutes***—Frequency of data collection.

Range: 1 through 30

Default: 5

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Example: Configuring PoE Interfaces with Different Priorities on an EX Series Switch on page 34
- Configuring PoE on EX Series Switches (CLI Procedure) on page 25
- *Configuring PoE (J-Web Procedure)*

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management

Syntax management (class | static | high-power);

Hierarchy Level [edit poe],
[edit poe (all | fpc *slot-number*)]

Release Information Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 12.2 for ACX2000 Universal Access Routers.

Description Designate how the PoE controller allocates power to the PoE interfaces.

Default class

Options

- **class**—The amount of power allocated to the interface is determined by the class of the connected powered device. If no powered device is connected, standard 15.4 W power is allocated to the interface. See "Understanding PoE on EX Series Switches" on page 13 for more information about classes of powered devices.
- **static**—The amount of power allocated to the interface is determined by the value of the maximum-power statement, not the class of the connected powered device. This amount is allocated even when a powered device is not connected to the interface, ensuring that power is available when needed.
- **high-power**—(ACX2000 routers only) ACX2000 PoE interfaces support power delivery of up to 65 W per port using all four pairs of Ethernet RJ45 cables. Traditional PoE ports use only two pairs of Ethernet cable for power delivery. According to the IEEE 802.3af standard, each port can deliver a maximum power of up to 32 W. With **high-power** mode of power delivery over all four pairs, the power sourcing equipment (PSE) has an option to deliver up to 65 W per port, provided the powered devices request this high power over all four pairs of the Ethernet cable. By default, **high-power** mode is not enabled and has to be explicitly enabled. When the PoE controller is configured for **high-power** mode, the PoE controller does not deliver power to normal powered devices that request power over two pairs.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Configuring PoE on EX Series Switches (CLI Procedure) on page 25
- Understanding PoE on EX Series Switches on page 13

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maximum-power (Interface)

Syntax maximum-power *watts*;

Hierarchy Level [edit poe interface (all | *interface-name*)]

Release Information Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 12.2 for ACX2000 routers.

Description Set the maximum amount of power that the switch can supply to the PoE port.

NOTE: Although you can set this value when PoE power management is in class mode, it does not establish the maximum power for the port. Instead, the IEEE 802.3af (PoE) or IEEE 802.3at (PoE+) class of the connected device determines the maximum power for the port.

Options ***watts***—The maximum power in watts that can be supplied to the ports..

For EX2200, EX3300, EX4200, EX4300, EX6200, and EX8200 switches:

Range: 0.0 through 30.0

Default: 15.4 W for ports that support IEEE 802.3af and 30 W for ports that support IEEE 802.3at

For EX3200 switches:

Range: 0.0 through 18.6

Default: 15.4 W

For ACX2000 routers:

Range: 1 through 65 W

Default: 32 W

NOTE: The **maximum-power** setting permitted by the CLI might be greater than the maximum power a given PoE port can deliver. For example, the CLI permits you to set any PoE port on an EX8200 line card to 30 W; however, only ports 0 through 11 support 30 W. Similarly, the CLI permits you to set any PoE port on an EX4200 switch to 30 W, but some models of EX4200 switch support only 18.6 W per port. If you configure a **maximum-power** value that is greater than the maximum power supported by a port, the power allocated to the port will be the maximum supported.

If you use the **all** option to set **maximum-power** to a value greater than 15.4 W on all interfaces on an EX8200 line card, the maximum power allocated to all ports is 15.4 W.

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NOTE: Support for a maximum of 18.6 W per port instead of 15.4 W per port on EX3200 switches and P and T models of EX4200 switch requires Junos OS Release 11.1 or later. In addition to requiring an upgrade of Junos OS to Release 11.1 or later, switches that are running an earlier release of Junos OS release require the PoE controller software be upgraded as described in "Upgrading the PoE Controller Software" on page 45. If the controller software is not upgraded and you set **maximum-power** to a value greater than 15.4 W, the configuration is accepted when you commit it, but the actual power allocated to the port will be 15.4 W.

NOTE: On ACX2000 routers, the power sourcing equipment (PSE) delivers up to 65 W per port, provided the management mode is set to high-power mode, by using the **high-power** option at the **[edit poe management]** hierarchy level. By default, the management mode is set to **static**. In the static mode, the PSE can deliver power up to 32 W.

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Configuring PoE on EX Series Switches (CLI Procedure) on page 25
- management on page 61

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notification-control

Syntax

```
notification-control {
  fpc slot-number {
    disable;
  }
}
```

Hierarchy Level [edit poe]

Release Information Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Enable or disable the generation of PoE SNMP traps. If PoE SNMP traps are enabled, an SNMP trap is sent whenever a PoE interface is enabled or disabled.

The remaining statements are explained separately.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Example: Configuring PoE Interfaces with Different Priorities on an EX Series Switch on page 34
- Configuring PoE on EX Series Switches (CLI Procedure) on page 25

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poe

Syntax For switches other than EX6200 and EX8200 switches:

```
poe {
  guard-band watts;
  interface (all | interface-name) {
    disable;
    maximum-power watts;
    priority (high | low);
    telemetries {
      disable;
      duration hours;
      interval minutes;
    }
  }
  lldp-priority;
  management (class | static);
  notification-control {
    fpc slot-number {
      disable;
    }
  }
}
```

For EX6200 and EX8200 switches:

```
poe {
  fpc ( all | slot-number) {
    guard-band watts;
    lldp-priority;
    management (class | static);
    maximum-power watts;
  }
  interface (all | interface-name) {
    af-mode;
    disable;
    maximum-power watts;
    priority (high | low);
    telemetries {
      disable;
      duration hours;
      interval minutes;
    }
  }
  notification-control {
    fpc slot-number {
      disable;
    }
  }
}
```

Hierarchy Level [edit]

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Release Information Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Configure PoE options.

The remaining statements are explained separately.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation
- Example: Configuring PoE Interfaces with Different Priorities on an EX Series Switch on page 34
- *Example: Configuring PoE on an EX6200 or EX8200 Switch*
- Configuring PoE on EX Series Switches (CLI Procedure) on page 25

priority (Power over Ethernet)

Syntax priority (low | high);

Hierarchy Level [edit poe interface (all | *interface-name*)]

Release Information Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Set the power priority for individual interfaces when there is insufficient power for all PoE interfaces. If the switch needs to shut down powered devices because PoE demand exceeds the PoE budget, low-priority devices are shut down before high-priority devices. Among interfaces that have the same assigned priority, priority is determined by port number, with lower-numbered ports having higher priority.

Default low

Options
high—Specifies that this interface is to be treated as high-priority in terms of power allocation. If the switch needs to shut down powered devices because PoE demand exceeds the PoE budget, power is not shut down on this interface until it has been shut down on all the low-priority interfaces.

low—Specifies that this interface is to be treated as low-priority in terms of power allocation. If the switch needs to shut down powered devices because PoE demand exceeds the PoE budget, power is shut down on this interface before it is shut down on high-priority interfaces.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation
- Example: Configuring PoE Interfaces with Different Priorities on an EX Series Switch on page 34
- Configuring PoE on EX Series Switches (CLI Procedure) on page 25

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telemetries

Syntax

```
telemetries {
  disable;
  duration hours;
  interval minutes;
}
```

Hierarchy Level [edit poe interface (all | *interface-name*)]

Release Information Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 12.2 for ACX2000 Universal Access Routers.

Description Enable the logging of power consumption of a PoE interface over time.

If you want to log the power consumption of a PoE interface, you must explicitly specify the **telemetries** statement. When you commit the configuration, logging begins, with data being collected at the specified intervals. Logging stops at the end of the specified duration. If you do not specify the **duration** and **interval** statements, data is collected at the default interval of five minute intervals every hour.

The remaining statements are explained separately.

Default Logging of power consumption is disabled.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Example: Configuring PoE Interfaces with Different Priorities on an EX Series Switch on page 34
- Configuring PoE on EX Series Switches (CLI Procedure) on page 25
- **show poe telemetries on page 82**

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CHAPTER 6

Operational Commands

- clear poe telemetries interface
- request system firmware upgrade poe
- show poe controller
- show poe interface
- show poe notification-control
- show poe telemetries

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clear poe telemetries interface

Syntax clear poe telemetries interface
<*interface-name*>

Release Information Command introduced in Junos OS Release 12.1 for EX Series switches.

Description Clear the history of PoE power consumption on the specified interface or on all interfaces. Interfaces that were collecting data will continue to collect.

Options **none**—Clear power consumption records for all PoE interfaces.

interface-name—(Optional) Clear power consumption records for the specified PoE interface.

Required Privilege Level view

Related Documentation
- show poe telemetries on page 82
- show poe interface on page 76
- show poe controller on page 73
- Monitoring PoE Power Consumption (CLI Procedure) on page 49
- Troubleshooting PoE Interfaces on page 52

List of Sample Output clear poe telemetries interface on page 70
clear poe telemetries interface on page 70

Sample Output

This command has no output.

clear poe telemetries interface

```
user@switch> clear poe telemetries interface
```

clear poe telemetries interface

```
user@switch> clear poe telemetries interface ge-0/0/1
```


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request system firmware upgrade poe

Syntax request system firmware upgrade poe fpc-slot (*number* | all-members)

Release Information Command introduced in Junos OS Release 12.1 for EX Series switches.

Description Upgrade the PoE controller software on switches and line cards.

The Junos OS image running on the switch contains a copy of the PoE controller software. This command compares the Junos OS version with the version of the software running on the PoE controller. If the Junos OS version is a more recent version, the command downloads the more recent version to the controller.

For all Virtual Chassis except EX8200 Virtual Chassis, execute this command on the master. The master itself need not support PoE for this command to work—for example, you can execute this command on the master of a mixed EX4200 and EX4500 Virtual Chassis when the master is an EX4500 switch, which does not support PoE. On an EX8200 Virtual Chassis, you must execute this command on the member switch, not the master XRE200 External Routing Engine.

We recommend that all members of a Virtual Chassis run the same version of the PoE controller software.

Upgrading the controller software can take up to 10 minutes. Use the show poe controller command to monitor the progress of the software download.

You cannot downgrade the PoE controller software.

NOTE: When you enter the request system firmware upgrade poe command, a message advises you that the controller software upgrade has started and that it will take about 10 minutes to complete. This message appears even if the FPC you have specified does not have a PoE controller or if the PoE controller software is up-to-date. To determine whether or not the controller software upgrade has actually started, use the show poe controller command.

NOTE: While the upgrade is in progress, power to the powered devices is not guaranteed. We recommend that you upgrade the controller software during a regularly scheduled maintenance window.

Options **fpc-slot (*number* | all-members)**—Upgrade the PoE controller firmware for the Virtual Chassis member or line card specified by ***number***, or for all Virtual Chassis members and line cards, specified by **all-members**.

Required Privilege Level maintenance

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Related Documentation

- show poe controller on page 73
- Upgrading the PoE Controller Software on page 45

List of Sample Output request system firmware upgrade poe (Specific FPC Slot) on page 72

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request system firmware upgrade poe (Specific FPC Slot)

```
user@switch> request system firmware upgrade poe fpc-slot 8
Firmware upgrade initiated. Poe Upgrade takes about 10 minutes
Use 'show poe controller' to get the download status
```


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show poe controller

Syntax **show poe controller**

Release Information Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 12.2 for ACX2000 routers.

Description Display configuration and status of the PoE controllers.

Required Privilege Level view

Related Documentation

- show poe interface on page 76
- request system firmware upgrade poe on page 71
- Verifying PoE Configuration and Status (CLI Procedure) on page 39
- Monitoring PoE Power Consumption (CLI Procedure) on page 49
- Upgrading the PoE Controller Software on page 45

List of Sample Output

show poe controller (EX3200 Switch) on page 74
show poe controller (EX8200 Switch) on page 74
show poe controller (Controller Software Upgrade in Progress) on page 74
show poe controller (ACX2000 Router) on page 75

Output Fields Table 18 on page 73 lists the output fields for the **show poe controller** command. Output fields are listed in the approximate order in which they appear.

Table 18: show poe controller Output Fields

Field Name	Field Description
Controller index	PoE controller number: • 0 for EX2200, EX3200, standalone EX3300, standalone EX4200 switches, standalone EX4300 switches, and ACX2000 routers. • Member ID for switches in an EX3300 Virtual Chassis, EX4200 Virtual Chassis, EX4300 Virtual Chassis, a mixed EX4200 and EX4500 Virtual Chassis. • Slot number for line cards with a PoE controller in an EX6200 or EX8200 switch.
Maximum power	The maximum PoE power consumption for the switch or line card. This is the total amount of power available to the PoE controller to allocate to the PoE ports.
Power consumption	Total amount of power being consumed by the PoE ports at the time the command is executed. This value, which represents actual power consumption, cannot exceed the value for **Maximum power**.
Guard Band	Amount of power that has been placed in reserve for power demand spikes and that cannot be allocated to a PoE interface.

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Table 18: show poe controller Output Fields *(continued)*

Field Name	Field Description
Management	Power management mode: **class** or **static** or **high-power**. NOTE: The mode **high-power** is available on only ACX2000 routers.
Status	Status of the PoE controller: • **AF_ENHANCE**—Controller supports enhanced PoE. The maximum power per PoE port is 18.6 W in static mode (15.4 W in class mode). • **DEVICE FAIL**—Software download to the controller has failed or the PoE controller is not initialized because of a hardware failure. • **DOWNLOAD_INIT**—Software download to the controller is in the initial phase. • **AF_MODE**—Controller supports standard IEEE 802.3af. The maximum power per PoE port is 15.4 W. • **AT/AF COMBO**—Controller supports a mix of standard IEEE 802.3af and IEEE 802.3at (PoE+) ports. The maximum power per port is 30 W for IEEE 802.3at (PoE+) ports and 15.4 W for the IEEE 802.3af ports. • **AT_MODE**—Controller supports IEEE 802.3at (PoE+). The maximum power per PoE port is 30 W. • **SW_DOWNLOAD (*n*%)**—Software download to the controller is in progress.
Lldp Priority	Link Layer Discovery Protocol (LLDP) priority operating state. The state can be **Enabled** or **Disabled**. LLDP priority enables the PoE controller to assign interfaces the power priority provided by the connected powered device by using LLDP power negotiation rather than the power priority configured on the switch interface.

Sample Output

show poe controller (EX3200 Switch)

```
user@switch> show poe controller
Controller  Maximum   Power         Guard    Management  Status       Lldp
index       power     consumption   band                              Priority
   0        130.00W   81.20W         10W     Static      AF_ENHANCE   Disabled
```

show poe controller (EX8200 Switch)

```
user@switch> show poe controller
Controller  Maximum   Power         Guard    Management  Status       Lldp
index       power     consumption   band                              Priority
   0        792.00W   603.50W         0W     Class       AT/AF COMBO  Disabled
   4        915.00W   781.00W         0W     Class       AT/AF COMBO  Disabled
   7        915.00W   0.00W           0W     Class       AT/AF COMBO  Disabled
```

show poe controller (Controller Software Upgrade in Progress)

```
user@switch> show poe controller
Controller  Maximum   Power         Guard    Management  Status           Lldp
index       power     consumption   band                                  Priority

   0        130.00W   0.00W          0W     Static      AF_ENHANCE       Disabled
```


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```
   8**      130.00W   0.00W          0W     Static      SW_DOWNLOAD(10%)  Disabled

  **New PoE software upgrade available.
Use 'request system firmware upgrade poe fpc-slot <slot>'
 This procedure will take around 10 minutes (recommended to be performed during
maintenance)
```

show poe controller (ACX2000 Router)

```
user@host> show poe controller

Controller  Maximum   Power         Guard    Management   Status        Lldp
index       power     consumption   band                               Priority

   0        130.0 W   14.2 W         0 W      high-power   UP
```

show poe interface

Syntax
show poe interface
<fpc-slot ***number*****>**
<interface-name>

Release Information
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 12.2 for ACX2000 routers.

Description
Display the status of PoE interfaces.

Options
none—Display status of all PoE interfaces on the switch or router.

fpc-slot ***number***—(Optional) (EX6200 or EX8200 switches only) Display the status of the PoE interfaces on the specified line card.

interface-name—(Optional) Display the status of a specific PoE interface on the switch.

Required Privilege Level
view

Related Documentation
- show poe controller on page 73
- Verifying PoE Configuration and Status (CLI Procedure) on page 39
- Monitoring PoE Power Consumption (CLI Procedure) on page 49
- Troubleshooting PoE Interfaces on page 52

List of Sample Output
show poe interface on page 77
show poe interface (with LLDP Negotiation) on page 77
show poe interface (Specific Interface) on page 78
show poe interface (Specific FPC Slot) on page 78
show poe interface (Specific Interface on ACX2000 Universal Access Routers) on page 79

Output Fields
Table 19 on page 76 lists the output fields for the **show poe interface** command. Output fields are listed in the approximate order in which they appear.

Table 19: show poe interface Output Fields

Field Name (All Interfaces Output)	Field Name (Single Interface Output)	Field Description
Interface	**PoE Interface**	Interface name.
Admin status	**Administrative status**	Administrative state of the PoE interface: **Enabled** or **Disabled**. If the PoE interface is disabled, it can provide network connectivity, but it cannot provide power to connected devices.

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Table 19: show poe interface Output Fields *(continued)*

Field Name (All Interfaces Output)	Field Name (Single Interface Output)	Field Description
Oper status	**Operational status**	Operational state of the PoE interface: • **ON**—The interface is currently supplying power to a powered device. • **OFF**—PoE is enabled on the interface, but the interface is not currently supplying power to a powered device. • **Disabled**—PoE is disabled on the interface.
Max power	**Power limit on the interface**	Maximum power that can be provided by the interface. An **(L)** next to the value indicates that the value on the port was negotiated by LLDP.
Priority	**Priority**	Interface power priority: either **High** or **Low**. An **(L)** next to the value indicates that the value on the port was negotiated by LLDP.
Power consumption	**Power consumed**	Amount of power being used by the interface at the time the command is executed.
Class	**Class of power device**	IEEE 802.3af (PoE) or IEEE 802.3at (PoE+) class of the powered device. **Class 0** is the default class and is used when the class of the powered device is unknown. If no powered device is connected, this field contains **not applicable**.
	PoE Mode	IEEE PoE standard supported by the interface—either **802.3af** or **802.3at**.

Sample Output

show poe interface

```
user@switch> show poe interface
Interface Admin        Oper       Max       Priority Power             Class
          status       status     power              consumption
 ge-0/0/0 Enabled      ON         15.4W     Low      7.9W              0
 ge-0/0/1 Enabled      ON         15.4W     Low      3.2W              2
 ge-0/0/2 Enabled      ON         15.4W     Low      3.2W              2
 ge-0/0/3 Enabled      ON         15.4W     Low      3.2W              2
 ge-0/0/4 Enabled      ON         15.4W     Low      3.2W              2
 ge-0/0/5 Enabled      ON         15.4W     Low      3.2W              2
 ge-0/0/6 Enabled      ON         15.4W     Low      3.2W              2
 ge-0/0/7 Enabled      ON         15.4W     Low      3.2W              2
```

show poe interface (with LLDP Negotiation)

```
user@switch> show poe interface
Interface    Admin       Oper     Max        Priority       Power          Class
             status      status   power                     consumption
 ge-0/0/0    Enabled      ON      17.5W(L)   Low(L)         16.2W           4
 ge-0/0/1    Enabled      ON      17.5W(L)   Low(L)         16.0W           4
 ge-0/0/2    Enabled      ON      17.5W(L)   High(L)        16.0W           4
 ge-0/0/3    Enabled      ON      17.5W(L)   Low(L)         16.0W           4
 ge-0/0/4    Enabled      ON      10.1W(L)   Low(L)         10.0W           3
```

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```
 ge-0/0/5    Enabled      ON     3.5W(L)    High(L)        3.0W            2
(L) LLDP-negotiated value on the port.
```

show poe interface (Specific Interface)

```
user@switch> show poe interface ge-0/0/3
PoE interface status:
PoE interface                :  ge-0/0/3
Administrative status        : Enabled
Operational status           :  ON
Power limit on the interface : 7.0W
Priority                     : Low
Power consumed               : 5.3W
Class of power device        :   2
PoE Mode                     : 802.3af
```

show poe interface (Specific FPC Slot)

```
user@switch> show poe interface fpc-slot 3
Interface Admin        Oper        Max       Priority Power             Class
          status       status      power               consumption
 ge-3/0/0 Enabled       ON         30.0W     Low      20.3W               4
 ge-3/0/1 Enabled       ON         30.0W     Low      17.8W               4
 ge-3/0/2 Enabled       ON         30.0W     High     16.3W               4
 ge-3/0/3 Enabled       ON         30.0W     High     16.2W               4
 ge-3/0/4 Enabled       ON         30.0W     Low      25.9W               4
 ge-3/0/5 Enabled       ON         30.0W     Low      10.1W               4
 ge-3/0/6 Enabled       ON         30.0W     Low      16.2W               4
 ge-3/0/7 Enabled       ON         30.0W     Low      6.4W                4
 ge-3/0/8 Enabled       ON         30.0W     Low      5.2W                4
 ge-3/0/9 Enabled       ON         30.0W     Low      5.2W                4
ge-3/0/10 Enabled       ON         30.0W     Low      21.5W               4
ge-3/0/11 Enabled       ON         30.0W     Low      21.7W               4
ge-3/0/12 Enabled       ON         15.4W     Low      9.4W                0
ge-3/0/13 Enabled       ON         15.4W     Low      9.4W                0
ge-3/0/14 Enabled       ON         15.4W     Low      9.4W                0
ge-3/0/15 Enabled       ON         15.4W     Low      9.4W                0
ge-3/0/16 Enabled       ON         15.4W     Low      9.4W                0
ge-3/0/17 Enabled       ON         15.4W     Low      9.4W                0
ge-3/0/18 Enabled       ON         15.4W     Low      9.4W                0
ge-3/0/19 Enabled       ON         15.4W     Low      9.4W                0
ge-3/0/20 Enabled       ON         15.4W     Low      9.4W                0
ge-3/0/21 Enabled       ON         15.4W     Low      9.4W                0
ge-3/0/22 Enabled       ON         15.4W     Low      9.4W                0
ge-3/0/23 Enabled       ON         15.4W     Low      9.4W                0
ge-3/0/24 Enabled       ON         15.4W     Low      9.4W                0
ge-3/0/25 Enabled       ON         15.4W     Low      9.4W                0
ge-3/0/26 Enabled       ON         15.4W     Low      9.4W                0
ge-3/0/27 Enabled       ON         15.4W     Low      9.4W                0
ge-3/0/28 Enabled       ON         15.4W     Low      7.0W                0
ge-3/0/29 Enabled       ON         15.4W     Low      2.2W                1
ge-3/0/30 Enabled       ON         15.4W     Low      2.2W                1
ge-3/0/31 Enabled       ON         15.4W     Low      2.2W                1
ge-3/0/32 Enabled       ON         15.4W     Low      2.0W                1
ge-3/0/33 Enabled       ON         15.4W     Low      2.0W                1
ge-3/0/34 Enabled       ON         15.4W     Low      2.2W                1
ge-3/0/35 Enabled       ON         15.4W     Low      2.2W                1
ge-3/0/36 Enabled       ON         15.4W     Low      2.2W                1
ge-3/0/37 Enabled       ON         15.4W     Low      2.2W                1
ge-3/0/38 Enabled       ON         15.4W     Low      2.2W                1
ge-3/0/39 Enabled       ON         15.4W     Low      2.2W                1
```


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show poe interface (Specific Interface on ACX2000 Universal Access Routers)

```
user@host> show poe interface ge-0/1/7
PoE interface status:
PoE interface                : ge-0/1/7
Administrative status        : Enabled
Operational status           : Powered-up
Power limit on the interface : 9.0 W
Priority                     : Low
Power consumed               : 14.2 W
Class of power device        :  4
```

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show poe notification-control

Syntax **show poe notification-control**

Release Information Command introduced in Junos OS Release 9.0 for EX Series switches.

Description Display the state of the PoE notification-control option, which enables or disables PoE SNMP traps.

Required Privilege Level view

Related Documentation

- show poe controller on page 73
- show poe interface on page 76
- Verifying PoE Configuration and Status (CLI Procedure) on page 39

List of Sample Output show poe notification-control on page 81

Output Fields Table 20 on page 80 lists the output fields for the **show poe notification-control** command. Output fields are listed in the approximate order in which they appear.

Table 20: show poe notification-control Output Fields

Field Name	Field Description
FPC slot	FPC slot number: • 0 for a standalone switch • Member ID for a Virtual Chassis
Notification-control-status	Status of notification control: • **ON**—PoE traps are enabled. • **OFF**—PoE traps are disabled.

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Sample Output

show poe notification-control

```
user@switch> show poe notification-control
FPC slot             Notification-control-status
    0                    OFF
```

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show poe telemetries

Syntax

show poe telemetries
<count (all | *number*)>
<interface (all | *interface-name*)>

Release Information

Command introduced in Junos OS Release 9.0 for EX Series switches.

Description

Display a history of power consumption on the specified interface or on all interfaces.

Telemetries must be enabled on the interface before you can display a history of power consumption.

Options

none—Displays all records for all interfaces that have power consumption history data.

count (all | *number*)—(Optional) Specify the number of power consumption records to display. The most recent records are displayed. If you do not specify the count, all available records are displayed.

interface (all | *interface-name*)—(Optional) Display power consumption records for the specified PoE interface or for all PoE interfaces. If you do not specify interfaces, all interfaces are displayed.

Required Privilege Level

view

Related Documentation

- show poe interface on page 76
- show poe controller on page 73
- Monitoring PoE Power Consumption (CLI Procedure) on page 49
- Verifying PoE Configuration and Status (CLI Procedure) on page 39
- Troubleshooting PoE Interfaces on page 52

List of Sample Output

show poe telemetries interface all count on page 83
show poe telemetries interface (Specific Interface) count all on page 83

Output Fields

Table 21 on page 82 lists the output fields for the **show poe telemetries interface** command. Output fields are listed in the approximate order in which they appear.

Table 21: show poe telemetries interface Output Fields

Field Name	Field Description
Interface	Name of the interface.
Sl No	Number of the record for the specified interface. Record number 1 is the most recent.
Timestamp	Date and time when the power-consumption data was gathered.

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Table 21: show poe telemetries interface Output Fields *(continued)*

Field Name	Field Description
Power	Amount of power provided by the specified interface at the time the data was gathered.
Voltage	Maximum voltage provided by the specified interface at the time the data was gathered.

Sample Output

show poe telemetries interface all count

```
user@switch> show poe telemetries interface all count 2
Interface  Sl No    Timestamp                Power    Voltage
 ge-0/0/1     1     03-09-2012 11:52:03 UTC  4.2W     54.9V
              2     03-09-2012 11:47:03 UTC  4.2W     54.8V
 ge-0/0/2     1     03-09-2012 11:52:03 UTC  4.2W     54.9V
              2     03-09-2012 11:47:03 UTC  4.1W     54.8V
 ge-0/0/3     1     03-09-2012 11:52:03 UTC  4.2W     54.9V
              2     03-09-2012 11:47:03 UTC  4.3W     54.8V
 ge-0/0/4     1     03-09-2012 11:52:03 UTC  0.0W     54.9V
              2     03-09-2012 11:47:03 UTC  0.0W     54.8V
 ge-0/0/5     1     03-09-2012 11:52:03 UTC  4.2W     54.9V
              2     03-09-2012 11:47:03 UTC  4.2W     54.8V
 ge-0/0/6     1     03-09-2012 11:52:03 UTC  4.2W     54.9V
              2     03-09-2012 11:47:03 UTC  4.2W     54.8V
 ge-0/0/7     1     03-09-2012 11:52:03 UTC  4.2W     54.9V
```

show poe telemetries interface (Specific Interface) count all

```
user@switch> show poe telemetries interface ge-0/0/0 count all
Sl No    Timestamp                Power    Voltage
   1     01-27-2008 18:19:58 UTC  15.4W     51.6V
   2     01-27-2008 18:18:58 UTC  15.4W     51.6V
   3     01-27-2008 18:17:58 UTC  15.4W     51.6V
   4     01-27-2008 18:16:58 UTC  15.4W     51.6V
   5     01-27-2008 18:15:58 UTC  15.4W     51.6V
   6     01-27-2008 18:14:58 UTC  15.4W     51.6V
   7     01-27-2008 18:13:58 UTC  15.4W     51.6V
   8     01-27-2008 18:12:57 UTC  15.4W     51.6V
   9     01-27-2008 18:11:57 UTC  15.4W     51.6V
  10     01-27-2008 18:10:57 UTC  15.4W     51.6V
  11     01-27-2008 18:09:57 UTC  15.4W     51.6V
  12     01-27-2008 18:08:57 UTC  15.4W     51.6V
  13     01-27-2008 18:07:57 UTC  15.4W     51.6V
  14     01-27-2008 18:06:57 UTC  15.4W     51.6V
  15     01-27-2008 18:05:57 UTC  15.4W     51.6V
  16     01-27-2008 18:04:56 UTC  15.4W     51.6V
  17     01-27-2008 18:03:56 UTC  15.4W     51.6V
  18     01-27-2008 18:02:56 UTC  15.4W     51.6V
  19     01-27-2008 18:01:56 UTC  15.4W     51.6V
  20     01-27-2008 18:00:56 UTC  15.4W     51.6V
  21     01-27-2008 17:59:56 UTC  15.4W     51.6V
```

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