

PoE and EX-series Switches Overview

Power over Ethernet (PoE) is the implementation of IEEE 802.3af, allowing both data and electric power to pass over a copper Ethernet LAN cable. This technology allows VoIP telephones, wireless access points, video cameras, and point-of-sale devices to safely receive power from the same access ports that are used to connect personal computers to the network.

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Power Management Mode

You can use the power management mode to determine the number of interfaces that can be provided with power. The following two factors constitute the power management mode:

- Per port limit (PPL)—The factor that decides the maximum power consumption permitted on a particular interface. If the power consumption by the powered device exceeds the specified value, PoE is shut down over that interface.
- Power allocated for each interface—The factor that ensures that a certain amount of power is reserved for an individual interface from the total power budget for all interfaces. If at any point the total of the allocated power for all interfaces exceeds the total budget, the lower priority interfaces are turned off and the power allocated for those interfaces drops to 0.

There are two modes of power management:

- Static—In this mode the power allocated for each interface can be configured. The PPL value is the maximum value configured per interface.
- Class—In this mode the power allocation for interfaces is determined based on the class of powered device connected. PPL is the maximum power value of the class of the powered device connected to the interface. The power allocated per interface is the maximum power of the powered device class, except for classes 0 and 3. For class 0 and class 3 powered devices, the momentary power consumption is considered as the power allocated for that interface. Therefore, PPL and power allocated per interface values change based on the powered device connected to the interface.

Classes of Powered Devices

A powered device is classified based on the maximum power that it draws across all input voltages and operational modes. The most common class is 0, in which the switch allows a maximum draw of 15.4 W per port. The switch provides 15.4 W at the port in order to guarantee enough power to run a device, after accounting for line loss. For example, $15.4 \text{ W} - \text{power loss (16 \%)} = 12.95 \text{ W}$. All 802.3af-compliant

powered devices require no more than 12.95 watts. Table 1 lists the classes of powered devices and associated power levels.

Table 1: Class of Powered Device and Power Levels

Class	Usage	Minimum Power Levels Output from PoE Port	Range of Maximum Power Required by the Powered Device
0	Default	15.4 W	0.44 through 12.95 W
1	Optional	4.0 W	0.44 through 3.84 W
2	Optional	7.0 W	6.49 through 12.95 W
3	Optional	15.4 W	6.49 through 12.95 W

Global and Specific PoE Parameters

EX-series switches with PoE ports have a PoE controller. The PoE controller keeps track of the switch's power consumption and distributes the available power to individual PoE ports. You can set the PoE controller to reserve a limited amount of power (up to 19 W) to handle a power spike. The default is that no power is kept on reserve.

The factory default configuration creates a PoE interface for all the PoE ports on the switch. You can specify maximum power, priority, and telemetries for each PoE interface.

- **maximum-power**—This setting defaults to **15.4 W**, which is the maximum power that can be supplied by the switch to the port.
- **priority**—This setting defaults to **low**. If a port is set as high priority and a situation arises where there is not sufficient power for all the PoE ports, the available power is directed to the higher priority port(s). If the switch needs to shut down powered devices because a power supply fails and there is insufficient power, low priority devices are shut down before high priority powered devices. Thus, you should set security cameras and emergency phones and other high priority phones to high priority.
- **telemetries**—This setting allows you to monitor per-port PoE power consumption. It is not included in the default PoE configuration.

Related Topics

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

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