

Power over Ethernet

- Power over Ethernet, on page 1
- Device Detection and Power Allocation, on page 2
- Configuring Power Over Ethernet, on page 2
- **Configuring Universal PoE**, on page 3
- PoE Debug Commands, on page 4

Power over Ethernet

Power over Ethernet (PoE) is typically used to power up devices such as Access points, IP Cameras and IP Phones connected to the device's Ethernet ports.

The Cisco IR8340 routers support standard Power over Ethernet (PoE), Power over Ethernet Plus (PoE+), Cisco Enhanced Power over Ethernet (EPoE), and Cisco Universal Power over Ethernet (UPoE) on all copper ports. The total PoE available power is 120 W to be shared by the four LAN ports.

The following features are supported:

- UPoE—Supported on LAN port 1 and 2 with a maximum of 60 watts of power on each port
- PoE+—Supported on all PoE ports (LAN port 1-4) with a maximum of 30 watts of power on each port
- PoE—Supported on all PoE ports (LAN port 1-4) with a maximum of 15 watts of power on each port
- Support both Cisco PD and IEEE802.3af/IEEE802.3 on all ports, with DC power disconnected.
- Per port power consumption measurement.
- Ability to specify max power consumption on every port.
- PoE power policing—Comprises the following two modes, which determines the action to take on the interface after a port shuts down because of an inline-power policing violation:
  - **Logging**—An error message is logged to the console and the interface restarts; the device powers up.
  - **Errdisable** (default)—In addition to logging an error message to the console, the interface is placed in an errdisable state so that the device attached to the port does not receive inline-power until you restart the port or configure an errdisable autorecovery mechanism.
- Static power allocation on ports.

- Load Shedding upon PSU removal or failure.

Device Detection and Power Allocation

The router will detect a Cisco Pre-standard or an IEEE-compliant PD when the PoE is enabled and the connected device is not being powered by an AC adapter.

After device detection, the router will determine the power requirements based on power classification class. Depending on the available power in the power budget, the router determines if a port can be powered. The router initially allocates this power when it detects and powers the device. Power negotiation using CDP/LLDP protocols happens thereafter. Supported protocols for power negotiation are CDP for Cisco PD, and LLDP for non-Cisco PDs. Maximum power budget for 1 WAN port at any time is 15.4 W. On reload the PoE ports are powered down until the unit reboots.

Configuring Power Over Ethernet

Each copper port on the router can auto detect one of following connected devices, and supply power to them properly:

- An IEEE 802.3af and IEEE 802.3at compliant power device
- Cisco EPOE and UPOE power device

To configure power over ethernet, use these commands:

Procedure

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enter global configuration mode.
Step 2	**interface** *interface-id* **Example:** `Router(config)# interface gigabitethernet0/1/0`	Specifies the physical port to be configured, and enters interface configuration mode.
Step 3	**power inline** [**auto**| **max** *max-wattage*] **never** **Example:** `Router(config-if)# power inline auto`	Configures the PoE mode on the port. The keywords have these meanings: • Auto—Enables powered-device detection. If enough power is available, automatically allocates power to the PoE port after device detection. This is the default setting. • Max max-wattage—Limits the power allowed on the port. The range for PoE+ ports is 4000 to 30000 mW. The range for

	Command or Action	Purpose
		Cisco UPOE ports is 4000 to 60000 mW. If no value is specified, the maximum is allowed. • Never—Disables device detection, and disable power to the port. **Note** If a port has a Cisco powered device connected to it, do not use the **power inline never** command to configure the port. A false link-up can occur, placing the port into the error-disabled state.
Step 4	**end** **Example:** `router(config-if)# end`	Returns to privileged EXEC mode.

What to do next

Use the following commands to check the PoE port status:

```
Router#show power inline
Available:120.0(w)  Used:70.0(w)  Remaining:50.0(w)
Interface Admin  Oper       Power   Device              Class Max
                            (Watts)
--------- ------ ---------- ------- ------------------- ----- ----
Gi0/1/0   auto   on         30.0    Ieee PD             4     60.0
Gi0/1/1   auto   on         30.0    Ieee PD             4     60.0
Gi0/1/2   auto   on         3.7     IP Phone 7811       1     30.0
Gi0/1/3   auto   on         6.3     IP Phone 7962       2     30.0
--------- ------ ---------- ---------- ---------- ------ -----
Totals:          4    on    70.0

Router#show power inline gigabitEthernet 0/1/0
Interface Admin  Oper       Power   Device              Class Max
                            (Watts)
--------- ------ ---------- ------- ------------------- ----- ----
Gi0/1/0   auto   on         60.0    IR8340-K9           4     60.0
Router#
```

Configuring Universal PoE

Cisco UPOE can provide a maximum of 60Watts power over both signal and spare pairs of RJ45 cable. UPOE capable switch port can enable spare pair and supply power to it through CDP or LLDP negotiations with UPOE power device automatically.

If end-point power device is capable to consume power on both signal and spare pairs but without corresponding CDP/LLDP negotiation mechanism available, following configurations can be used to manually force four-pair on specific port.

Procedure

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enter global configuration mode.
Step 2	**interface** *interface-id* **Example:** `Router(config)# interface gigabitethernet0/1/0`	Specifies the physical port to be configured, and enters interface configuration mode.
Step 3	**power inline four-pair forced** **Example:** `Router(config-if)# power inline four-pair forced`	Forces power enabling on both signal and spare pairs from a switch port.
Step 4	**end** **Example:** `router(config-if)# end`	Returns to privileged EXEC mode.

PoE Debug Commands

The following table shows the PoE debug commands:

Command	Description
debug ilpower controller	Display PoE controller debug messages.
debug ilpower event	Display PoE event debug messages.
debug ilpower port	Display PoE port management debug messages.
debug ilpower powerman	Display PoE power management debug messages.
debug ilpower cdp	Display PoE CDP debug messages.
debug ilpower registries	Display PoE registries debug messages.
debug ilpower scp	Display PoE scp debug messages.