

## Content

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# Chapter 1 PoE Configuration

## 1.1 Introduction to PoE

PoE (Power over Ethernet) is a technology to provide direct currents for some IP-based terminals (such as IP phones, APs of wireless LANs and network cameras) while transmitting data to them. Such DC-receiving devices are called PD (Powered Device). The max distance of reliable power supply provided by PoE is 100 meters.

IEEE 802.3af standard is a new PoE standard, and an extension to the current Ethernet standard by adding new items on power supply via network cables to IEEE 802.3 standard. It is also the first international standard on power distribution. IEEE 802.3at standard is the upgraded version of IEEE 802.3af, the maximum power of each port is 30W. It can meet the requirements of the higher power from PD device.

The application of PoE used to be in two areas: IP phone and 802.11 wireless network, however, along with the development of this technology, many applications with more practical meanings have emerged and benefited from PoE, such as video monitoring, integrated building management solution, and remote video service booth. All these existing and predictably more of such applications arouse needs for switches supporting PoE.

## 1.2 PoE Configuration

The PoE Configuration Task List:

1. Globally enable or disable PoE
2. Globally Set the Max Output Power
3. Globally set power management mode
4. Globally set non-standard PD detection mode
5. Globally enable or disable the allowed high-inrush current when nonstandard PD is powered instantaneously
6. Enable or disable PoE on specified ports
7. Set the max output power on specified ports
8. Set the power priority on specified ports

### 1. Globally Enable or Disable PoE

Command	Explanation
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Global Mode	
<b>power inline enable</b> <b>no power inline enable</b>	Enable/disable PoE globally.

## 2. Globally set the max output power

Command	Explanation
Global Mode	
<b>power inline max &lt;max-wattage&gt;</b> <b>no power inline max</b>	Globally set the max output power of PoE.

## 3. Globally set the power management mode

Command	Explanation
Global Mode	
<b>power inline police enable</b> <b>no power inline police enable</b>	Enable/disable the power priority management policy mode.

## 4. Globally set non-standard PD detection mode

Command	Explanation
Global Mode	
<b>power inline legacy enable</b> <b>no power inline legacy enable</b>	Set whether or not to provide power for non-standard IEEE PD.

## 5. Globally enable or disable the allowed high-inrush current when nonstandard PD is powered instantaneously

Command	Explanation
Global Mode	
<b>power inline high-inrush enable</b> <b>no power inline high-inrush enable</b>	Enable/disable the allowed high-inrush current when nonstandard PD is powered instantaneously.

## 6. Enable or disable PoE on specified ports

Command	Explanation
Port Mode	
<b>power inline enable</b> <b>no power inline enable</b>	Enable/ disable PoE.

### 7. Set the max output power on specified ports

Command	Explanation
Port Mode	
<b>power inline max &lt;max-wattage&gt;</b> <b>no power inline max</b>	Set the max output power on specified ports.

### 8. Set the power priority on specified ports

Command	Explanation
Port Mode	
<b>power inline priority {critical   high   low}</b>	Set the power priority on specified ports.

## 1.3 Typical Application of PoE

### Requirements of Network Deployment

Set the max output power of DCRS-5960-28T-POE to 370W, assuming that the default max power can satisfy the requirements.

Ethernet interface 1/0/2 is connected to an IP phone.

Ethernet interface 1/0/4 is connected to a wireless AP.

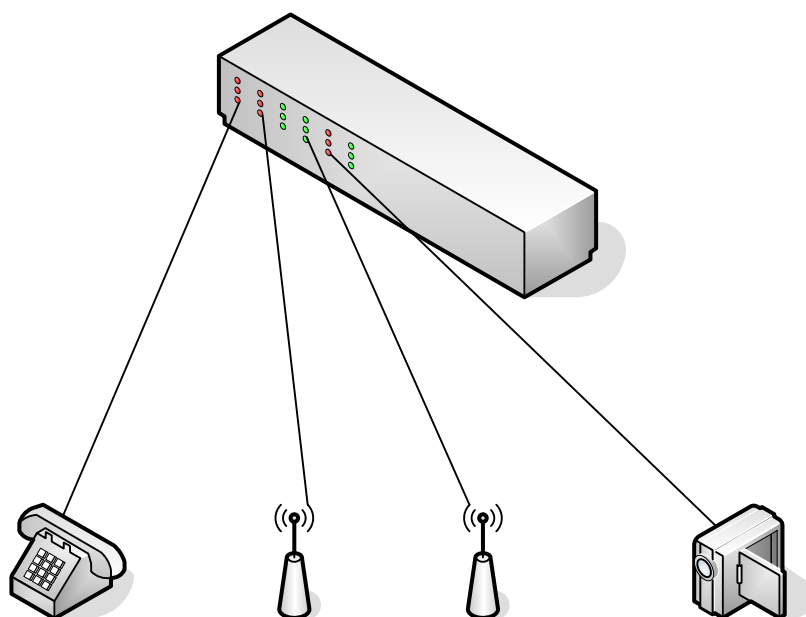
Ethernet interface 1/0/6 is connected to a Bluetooth AP.

Ethernet interface 1/0/8 is connected to a network camera.

The IP phone connected to Ethernet interface has the highest-level power supply priority: critical, which requires the power supply to the newly connected PD being cut off if it causes PSE power-overload (i.e. adopting the priority policy of PD power management).

Power of subordinate AP devices connected to Ethernet interface 1/0/6 should not exceeds 9000mW.

Topology of Network



Configuration Steps:

Globally enable PoE:

```
Switch(Config)# power inline enable
```

Globally set the max power to 370W:

```
Switch(Config)# power inline max 370
```

Globally enable the priority policy of power management:

```
Switch(Config)# power inline police enable
```

Set the priority of Port 1/0/2 to critical:

```
Switch(Config-Ethernet1/0/2)# power inline priority critical
```

Set the max output power of Port 1/0/6 to 9000mW:

```
Switch(Config-Ethernet1/0/6)#power inline max 9000
```

## 1.4 PoE Troubleshooting Help

If problems occur on using PoE, please check:

- ☞ When the global value of Power Remaining is less than 15W, due to the power source protection mechanism, the power supply to new PDs will be cut off in first-come-first-serve mode, while the existing low-priority devices will also be disconnected in priority policy mode. If the Power Remaining is over 15W, say 16W, any newly connected device with a power no more than 15W can get its power supply normally, without affecting other devices. Such a power supply buffer of 15W is designed for power source protection, and calls for special attention.
- ☞ The displayed value of Power might over the value of Max. This involves the

relationship between the displayed power and the actual power, for instance:

The power set on the port: A, represents the actual output PoE power

The displayed power: B, represents the total power of the port (total current  $\times$  total voltage)

The power loss set on the port: C, represents power loss of the internal Sensor ohmic resistance, MosFet etc.

Then:  $B=A+C$

If the power is set as  $A=500\text{mW}$ , according to the following table, the compensating current will be  $I=2.44\text{mA}$  ( $500\text{mW}/50\text{V}=10\text{mA}$  assuming the current working voltage is  $50\text{V}$ ), plus the compensating power  $C=50\text{V} \times 2.44\text{mA} = 122\text{mW}$

$B=A+C=500+122=622\text{mW}$ . So, only when the displayed power reaches  $622\text{mW}$ , the PD will be disconnected

Table:

Max Working Current (mA)	Compensating Current (mA)
50	2.44
100	4.88
150	9.76
200	17.08
250	24.41
350	31.73