CHAPTER 1

Product Overview

The Catalyst 2960 switch—also referred to as *the switch*—is an Ethernet switch to which you can connect devices such as workstations, Cisco Wireless Access Points, Cisco IP Phones, and other network devices including servers, routers, and other switches. This chapter provides a functional overview of the Catalyst 2960 switch. These topics are included:

Features

You can deploy the 24- and 48-port Catalyst 2960 switches as backbone switches, aggregating 10BASE-T, 100BASE-TX, and 1000BASE-T Ethernet traffic from other network devices. The Catalyst 2960 8-port compact switches provide the same Ethernet connectivity, but you can deploy these switches outside of the traditional wiring closet environment, such as in office workspaces and classrooms. See the switch software configuration guide for deployment examples.

Table 1-1 describes the switch model features.

Table 1-1 Catalyst 2960 Switch Model Descriptions

Switch Model	Supported Software Image	Description
Catalyst 2960-8TC-S	LAN-Lite	8 10/100BASE-TX Ethernet ports and 1 dual-purpose port (1 10/100/1000BASE-T copper port and 1 small form-factor pluggable [SFP] module slot); (no fan or RPS port)
Catalyst 2960-24-S	LAN-Lite	24 10/100BASE-TX Ethernet ports (no RPS port or SFP module slot)
Catalyst 2960-Plus 24TC-S	LAN-Lite	24 10/100BASE-TX Ethernet ports and 2 dual-purpose ports (no RPS port)
Catalyst 2960-24TC-S	LAN-Lite	24 10/100BASE-TX Ethernet ports and 2 dual-purpose ports (no RPS port)
Catalyst 2960-Plus 48TC-S	LAN-Lite	48 10/100BASE-TX Ethernet ports and 2 dual-purpose ports (no RPS port)
Catalyst 2960-48TC-S	LAN-Lite	48 10/100BASE-TX Ethernet ports and 2 dual-purpose ports (no RPS port)
Catalyst 2960-48TT-S	LAN Lite	48 10/100BASE-TX ports and 2 10/100/1000 ports (no RPS port or SFP module slot)

Table 1-1 Catalyst 2960 Switch Model Descriptions (continued)

Switch Model	Supported Software Image	Description
Catalyst 2960-Plus 48PST-S	LAN-Lite	48 10/100B SE-TX PoE ports, 2 10/100/1000 ports, and 2 SFP module slots
Catalyst 2960-48PST-S	LAN-Lite	48 10/100BASE-TX PoE ports, 2 10/100/1000 ports, and 2 SFP module slots
Catalyst 2960-Plus 24PC-S	LAN-Lite	24 10/100BASE-TX PoE ports and 2 dual-purpose ports
Catalyst 2960-24PC-S	LAN-Lite	24 10/100BASE-TX PoE ports and 2 dual-purpose ports
Catalyst 2960-Plus 24LC-S	LAN-Lite	24 10/100BASE-TX ports (8 of which are PoE) and 2 dual-purpose ports
Catalyst 2960-24LC-S	LAN-Lite	24 10/100BASE-TX ports (8 of which are PoE) and 2 dual-purpose ports
Catalyst 2960-8TC-L	LAN-Base	8 10/100BASE-TX Ethernet ports and 1 dual-purpose port (no fan or RPS port)
Catalyst 2960G-8TC-L	LAN-Base	7 10/100/100BASE-TX Ethernet ports and 1 dual-purpose port (no fan or RPS port)
Catalyst 2960PD-8TT-L	LAN-Base	8 10/100BASE-TX Ethernet ports and 1 10/100/1000 port that receives power (no fan, RPS port, or SFP module slot)
Catalyst 2960-24LT-L	LAN-Base	24 10/100BASE-TX ports, 8 of which are Power over Ethernet (PoE), and 2 10/100/1000 ports (no SFP module slot)
Catalyst 2960-Plus 24PC-L	LAN-Base	24 10/100BASE-TX PoE ports and 2 dual-purpose ports
Catalyst 2960-24PC-L	LAN-Base	24 10/100BASE-TX PoE ports and 2 dual-purpose ports
Catalyst 2960-Plus 24TC-L	LAN-Base	24 10/100BASE-TX Ethernet ports and 2 dual-purpose ports
Catalyst 2960-24TC-L	LAN-Base	24 10/100BASE-TX Ethernet ports and 2 dual-purpose ports
Catalyst 2960G-24TC-L	LAN-Base	20 10/100/1000BASE-T Ethernet ports and 4 dual-purpose ports
Catalyst 2960-24TT-L	LAN-Base	24 10/100BASE-TX Ethernet ports and 2 10/100/1000BASE-T copper uplink ports (no SFP module slot)
Catalyst 2960-Plus 48PST-L	LAN-Base	48 10/100BASE-TX PoE ports, 2 10/100/1000BASE-T copper ports, and 2 SFP module slots
Catalyst 2960-48PST-L	LAN-Base	48 10/100BASE-TX PoE ports, 2 10/100/1000BASE-T copper ports, and 2 SFP module slots
Catalyst 2960-Plus 48TC-L	LAN-Base	48 10/100BASE-TX Ethernet ports and 2 dual-purpose ports
Catalyst 2960-48TC-L	LAN-Base	48 10/100BASE-TX Ethernet ports and 2 dual-purpose ports
Catalyst 2960G-48TC-L	LAN-Base	44 10/100/1000BASE-T Ethernet ports and 4 dual-purpose ports
Catalyst 2960-48TT-L	LAN-Base	48 10/100BASE-TX Ethernet ports and 2 10/100/1000BASE-T copper uplink ports (no SFP module slot)
Catalyst 2960-Plus 24LC-L	LAN-Base	24 10/100BASE-TX ports (8 of which are PoE) and 2 dual-purpose ports

The Catalyst 2960-8TC-S, 2960-8TC-L, 2960G-8TC-L, and 2960PD-8TT-L switches are smaller than the other Catalyst 2960 switches. They can be mounted with a magnet, have security lock slots, and do not have a fan. See "Catalyst 2960 8-Port Switches" section on page 1-9 for more information. See Chapter 3, "Switch Installation (8-Port Switches)," for the installation instructions for these switch models.

These PoE switches comply with Cisco prestandard PoE and IEEE 802.3af:

- Catalyst 2960-24LC-S
- Catalyst 2960-Plus 24LC-S
- Catalyst 2960-Plus 24LC-L
- Catalyst 2960-24LT-L
- Catalyst 2960-24PC-L
- Catalyst 2960-Plus 24PC-L
- Catalyst 2960-24PC-S
- Catalyst 2960-Plus 24PC-S
- Catalyst 2960-48PST-L
- Catalyst 2960-Plus 48PST-L
- Catalyst 2960-48PST-S
- Catalyst 2960-Plus 48PST-S

These are the SFP modules supported by the switches:

- 1000BASE-CWDM
- 1000BASE-BX
- 1000BASE-LX/LH
- 1000BASE-SX
- 1000BASE-T
- 1000BASE-ZX
- 100BASE-BX
- 100BASE-FX
- 100BASE-LX

The Catalyst 2960-24PC-L, 2960-Plus 24PC-L, 2960-24PC-S, 2960-Plus 24PC-S, 2960-24LC-S,2960-Plus 24LC-S, 2960-Plus 24LC-L, 2960-24TC-L, 2960-Plus 24TC-L, 2960-48TC-L, 2960-Plus 48TC-L, 2960-48PST-L, 2960-Plus 48PST-L, 2960-48PST-S, 2960-Plus 48PST-S, 2960G-24TC-L, and 2960G-48TC-L switches support all the SFP modules.

The Catalyst 2960-8TC-S, 2960-24TC-S, 2960-Plus 24TC-S, 2960-48TC-S, and 2960-Plus 48TC-S switches support only 1000BASE-LX/LH, 1000BASE-SX, and 100BASE-FX SFP modules.

The Catalyst 2960-8TC-L, 2960G-8TC-L, and 2960-8TC-S switches do not support the 1000BASE-T or GLC-GE-100FX SFP modules.

For specific information about which SFP modules are supported on specific switches, see the *Cisco Gigabit Ethernet Transceiver Modules Compatibility Matrix* at this Cisco.com URL:

http://www.cisco.com/en/US/docs/interfaces_modules/transceiver_modules/compatibility/matrix/OL_6981.html

The 1000BASE-T SFP modules operate at 10, 100, or 1000 Mb/s in full-duplex mode or at 10 or 100 Mb/s in half-duplex mode when installed in Catalyst 2960 switches. The 10/100 and 10/100/1000 ports autonegotiate speed and support full-duplex or half-duplex mode.

Some Catalyst 2960 switches have a redundant power system (RPS) connector for an optional Cisco RPS 2300 or Cisco RPS 675 redundant power system that operates on AC input and supplies backup DC power to the switch. See the compatibility matrix documents for the RPS systems on Cisco.com for more information about switch support for the RPS models.

These switches do not have an RPS connector:

- Catalyst 2960-8TC-L
- Catalyst 2960G-8TC-L
- Catalyst 2960-8TC-S
- Catalyst 2960PD-8TT-L
- Catalyst 2960-24-S
- Catalyst 2960-24TC-S
- Catalyst 2960-Plus 24TC-S
- Catalyst 2960-48TT-S
- Catalyst 2960-48TC-S
- Catalyst 2960-Plus 48TC-S

Front Panel Description

These sections describe the switch front panels:

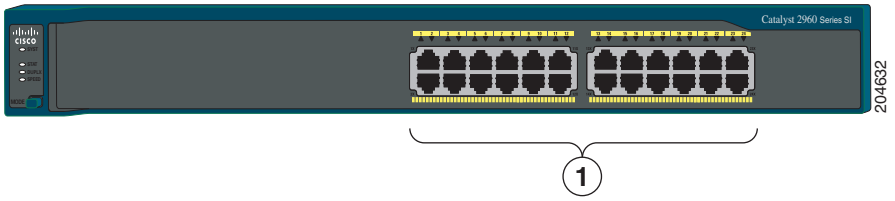
Catalyst 2960 Switch 24- and 48-Port Switches

These sections describe the Catalyst 2960 24- and 48-port switches:

Catalyst 2960-24-S, 2960-Plus 24TC-S, 2960-24TC-S, 2960-Plus 48TC-S, 2960-48TC-S, and 2960-48TT-S Switches

The 10/100 ports on the Catalyst 2960-24-S switch are numbered as follows: The first member of the pair (port 1) is above the second member (port 2), port 3 is above port 4, and so on. See Figure 1-1.

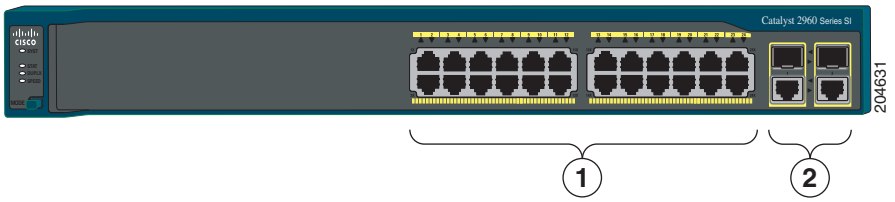
Figure 1-1 Catalyst 2960-24-S Switch Front Panel



1	10/100 ports

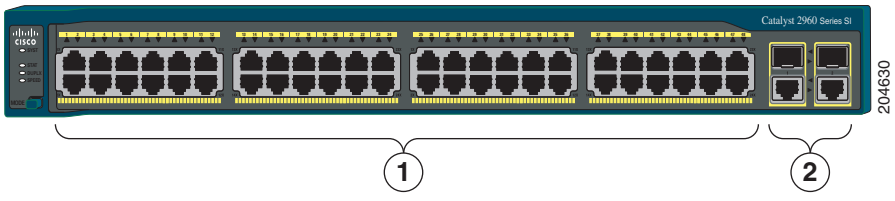
The 10/100 ports on the Catalyst 2960-Plus 24TC-S, 2960-24TC-S, 2960-Plus 48TC-S, and 2960-48TC-S switches are numbered in the same way as the Catalyst 2960-24-S switch. These switches have dual-purpose ports, that is, 10/100/1000 ports 1 and 2 can use either the SFP module or the RJ-45 connector for that port, but not both at the same time. Use the software to set the connector type for these ports. For more information about the dual-purpose port, see the "Dual-Purpose Port" section on page 1-13. See Figure 1-2 and Figure 1-3.

Figure 1-2 Catalyst 2960-Plus 24TC-S and 2960-24TC-S Switch Front Panel



1	10/100 ports	2	Dual-purpose ports

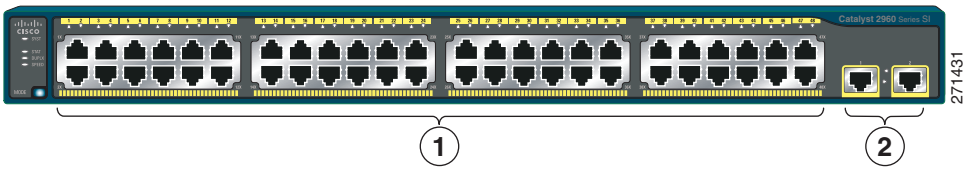
Figure 1-3 Catalyst 2960-Plus 48TC-S and 2960-48TC-S Switch Front Panel



1	10/100 ports	2	Dual-purpose ports

The 10/100 ports on the Catalyst 2960-48TT-S switch are numbered as follows: The first member of the pair (port 1) is above the second member (port 2), port 3 is above port 4, and so on. This switch has two 10/100/1000 uplink ports, numbered 1 and 2. The See Figure 1-4.

Figure 1-4 Catalyst 2960-48TT-S Switch Front Panel



1	10/100 ports	**2**	10/100/1000 ports

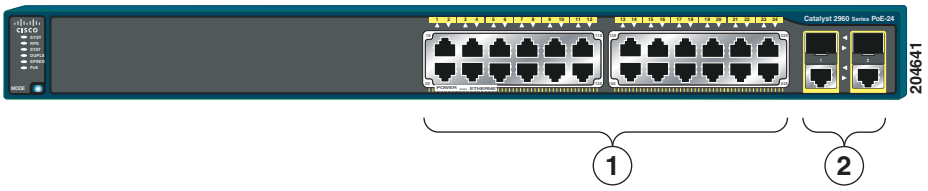
Catalyst 2960-Plus 24PC-L, 2960-24PC-L, 2960-Plus 24PC-S, 2960-24PC-S, 2960-Plus 24LC-L, 2960-Plus 24LC-S, 2960-24LC-S, 2960-Plus 24TC-L, 2960-24TC-L, 2960-Plus 48TC-L, 2960-48TC-L, 2960-24LT-L, 2960-24TT-L, 2960-48TT-L, 2960-Plus 48PST-L, 2960-48PST-L, 2960-Plus 48PST-S, and 2960-48PST-S Switches

The 10/100 ports on the switches are grouped in pairs. The first member of the pair (port 1) is above the second member (port 2), port 3 is above port 4, and so on.

The fixed 10/100 ports on the Catalyst 2960-24PC-L and 2960-24PC-S switches are PoE ports. See Figure 1-5 and Figure 1-6.

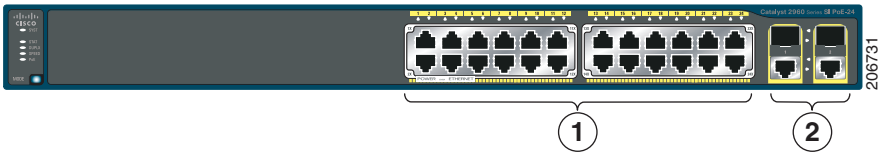
Ports 1 to 8 on the Catalyst 2960-24LC-S switch are PoE ports. See Figure 1-7.

Figure 1-5 Catalyst 2960-Plus 24PC-L and 2960-24PC-L Switch Front Panel



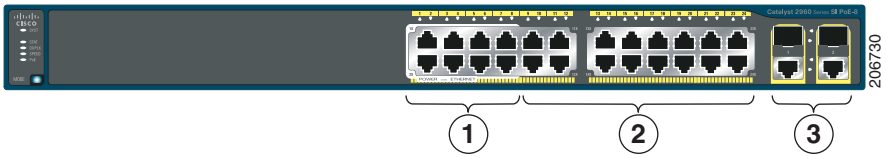
1	10/100 PoE ports	**2**	Dual-purpose ports

Figure 1-6 Catalyst 2960-Plus 24PC-S and 2960-24PC-S Switch Front Panel



1	10/100 PoE ports	**2**	Dual-purpose ports

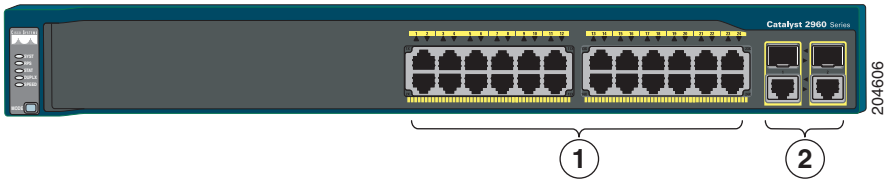
Figure 1-7 Catalyst 2960-Plus 24LC-L and 2960-24LC-S Switch Front Panel



1	10/100 PoE ports	**3**	Dual-purpose ports
2	10/100 ports		

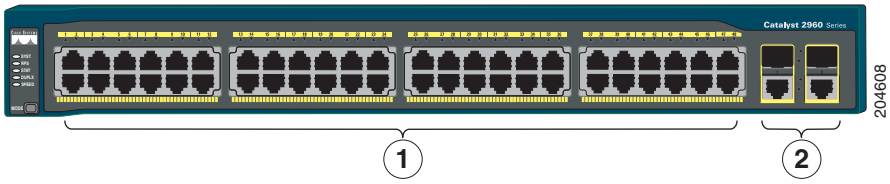
The Catalyst 2960-24TC-L and Catalyst 2960-48TC-L switches have dual-purpose ports, that is, 10/100/1000 ports 1 and 2 can use either the SFP module or the RJ-45 connector for that port, but not both. Use the software to set the connector type for these ports. For more information about the dual-purpose port, see the "Dual-Purpose Port" section on page 1-13. See Figure 1-8 and Figure 1-9.

Figure 1-8 Catalyst 2960-Plus 24TC-L and 2960-24TC-L Switch Front Panel



1	10/100 ports	**2**	Dual-purpose ports

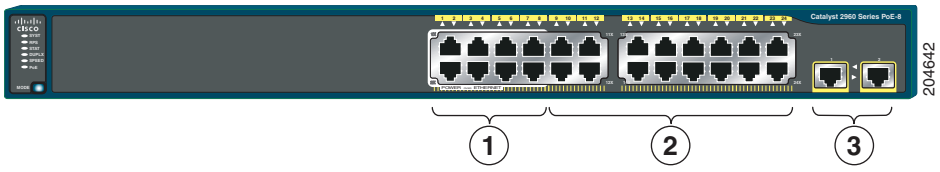
Figure 1-9 Catalyst 2960-Plus 48TC-L and 2960-48TC-L Switch Front Panel



1	10/100 ports	**2**	Dual-purpose ports

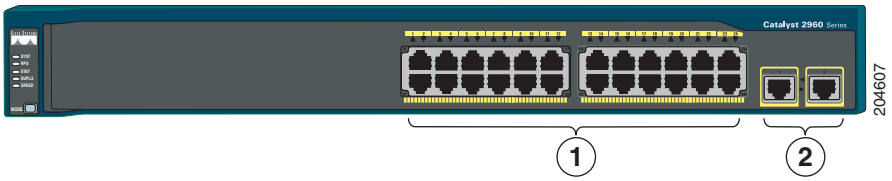
The Catalyst 2960-24LT-L, Catalyst 2960-24TT-L, and Catalyst 2960-48TT-L switches have two 10/100/1000 uplink ports, numbered 1 and 2. Ports 1 to 8 on the Catalyst 2960-24LT-L switch are PoE ports. See Figure 1-10, Figure 1-11, and Figure 1-12.

Figure 1-10 Catalyst 2960-24LT-L Switch Front Panel



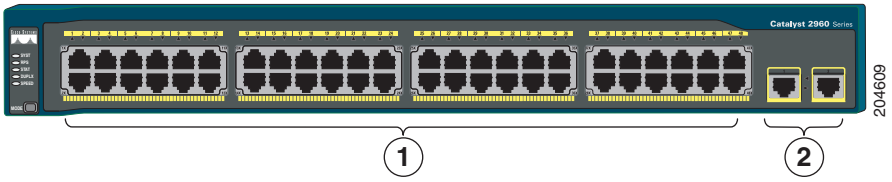
1	10/100 PoE ports	**3**	10/100/1000 uplink ports
2	10/100 ports		

Figure 1-11 Catalyst 2960-24TT-L Switch Front Panel



1	10/100 ports	**2**	10/100/1000 uplink ports

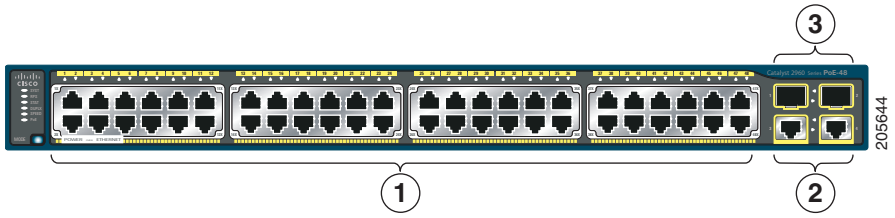
Figure 1-12 Catalyst 2960-48TT-L Switch Front Panel



1	10/100 ports	**2**	10/100/1000 uplink ports

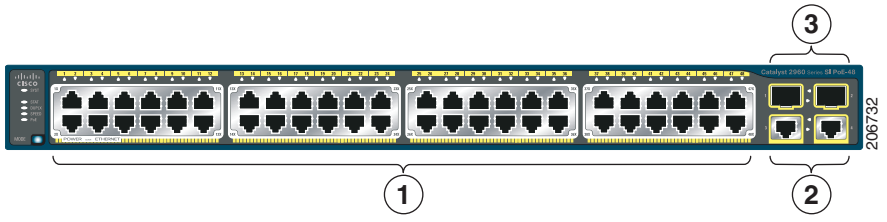
The Catalyst 2960-48PST-L and 2960-48PST-S switches have two SFP module slots (numbered 1 and 2) and two 10/100/1000 uplink ports (numbered 3 and 4). Ports 1 to 48 on the switch are PoE ports. See Figure 1-13 and Figure 1-14.

Figure 1-13 Catalyst 2960-Plus 48PST-L and 2960-48PST-L Switch Front Panel



1	10/100 PoE ports	**3**	SFP module slots
2	10/100/1000 uplink ports		

Figure 1-14 Catalyst 2960-Plus 48PST-S and 2960-48PST-S Switch Front Panel



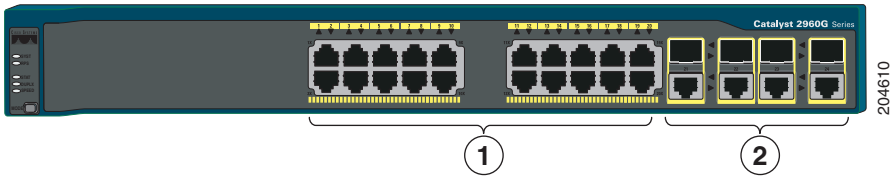
1	10/100 PoE ports	**3**	SFP module slots
2	10/100/1000 uplink ports		

Catalyst 2960G-24TC-L and Catalyst 2960G-48TC-L Switches

The 10/100/1000 ports on the Catalyst 2960G-24TC-L and Catalyst 2960G-48TC-L switches are grouped in pairs. The first member of the pair (port 1) is above the second member (port 2), port 3 is above port 4, and so on. The SFP module slots are numbered 21 to 24 on the Catalyst 2960G-24TC-L switch and 45 to 48 on the Catalyst 2960G-48TC-L switch. See Figure 1-15 and Figure 1-16.

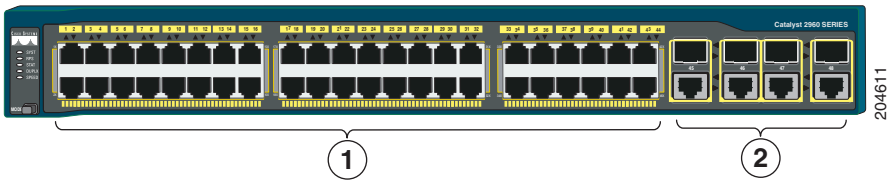
The Catalyst 2960G-24TC-L and Catalyst 2960G-48TC-L switches have dual-purpose ports, meaning ports 21 to 24 or 45 to 48 can use either the SFP module or the RJ-45 connector for that port, but not both. Use the software to set the connector type for these ports. For more information about the dual-purpose port, see the "Dual-Purpose Port" section on page 1-13.

Figure 1-15 Catalyst 2960G-24TC-L Switch Front Panel



1	10/100/1000 ports	2	Dual-purpose ports

Figure 1-16 Catalyst 2960G-48TC-L Switch Front Panel



1	10/100/1000 ports	2	Dual-purpose ports

Catalyst 2960 8-Port Switches

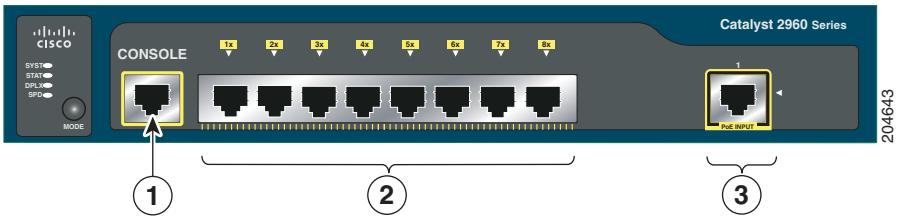
These sections describe the Catalyst 2960 8-port switches:

- Catalyst 2960PD-8TT-L Switch, page 1-9
- Catalyst 2960-8TC-S, Catalyst 2960-8TC-L, and Catalyst 2960G-8TC -L Switches, page 1-10

Catalyst 2960PD-8TT-L Switch

The Catalyst 2960PD-8TT-L (Figure 1-17) switch front panel has a console port, eight 10/100 ports, and a 10/100/1000 uplink port that can receive power from an upstream PoE switch. The switch can also receive power from an optional AC power adapter that is connected through the rear panel.

Figure 1-17 Catalyst 2960PD-8TT-L Switch Front Panel



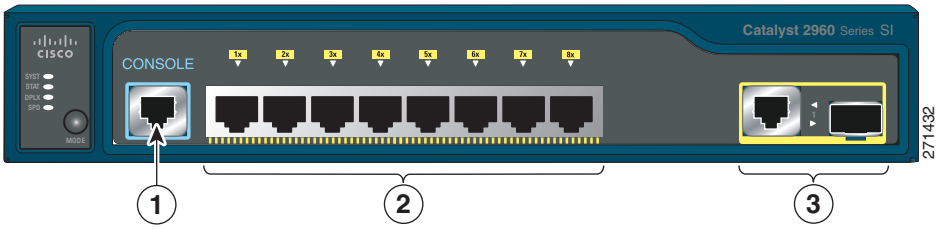
1	Console port	**3**	10/100/1000 power input port
2	10/100 ports		

Catalyst 2960-8TC-S, Catalyst 2960-8TC-L, and Catalyst 2960G-8TC -L Switches

The console ports for the Catalyst 2960-8TC-S, Catalyst 2960-8TC-L, and Catalyst 2960G-8TC-L switches (Figure 1-18 to Figure 1-20) are on the front panels. The switches also have a dual-purpose port that can use either an RJ-45 connector or an SFP module, but not both at the same time. Use the software to set the connector type for these ports.

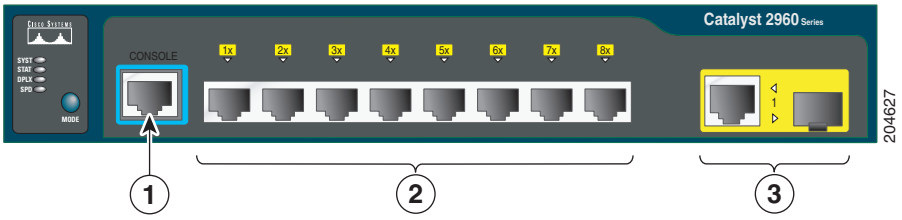
For more information on the dual-purpose port, see the "Dual-Purpose Port" section on page 1-13. For more information on the console port, see the "Console Port" section on page 1-21.

Figure 1-18 Catalyst 2960-8TC-S Switch Front Panel



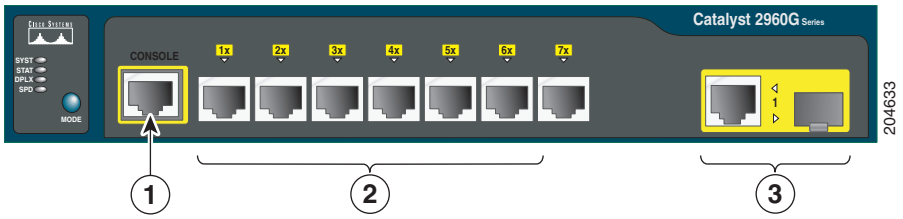
1	Console port	**3**	Dual-purpose port
2	10/100/100 ports		

Figure 1-19 Catalyst 2960-8TC-L Switch Front Panel



1	Console port	**3**	Dual-purpose port
2	10/100/100 ports		

Figure 1-20 Catalyst 2960G-8TC-L Switch Front Panel



1	Console port	**3**	Dual-purpose port
2	10/100/1000 ports		

10/100 Ports

You can set the 10/100 ports to operate at 10 or 100 Mb/s in full-duplex or half-duplex mode. You can also set these ports for speed and duplex autonegotiation. The default setting is autonegotiate. When the port is set to autonegotiate, it senses the speed and duplex settings of the attached device and advertises its own capabilities. If the connected device also supports autonegotiation, the switch port negotiates the best connection (that is, the fastest line speed that both devices support and full-duplex transmission if the attached device supports it) and configures itself accordingly. In all cases, the attached device must be within 328 feet (100 meters).

100BASE-TX traffic requires a Category 5 or higher cable. 10BASE-T traffic can use Category 3 or Category 4 cables.

When you connect the switch to workstations, servers, routers, and Cisco IP Phones, be sure that the cable is a straight-through cable. When you connect the switch to switches or hubs, use a crossover cable. Pinouts for the cables are described in Appendix B, "Connector and Cable Specifications."

You can use the **mdix auto** interface configuration command in the command-line interface (CLI) to enable the auto-MDIX feature. When the auto-MDIX feature is enabled, the switch detects the required cable type for copper Ethernet connections and configures the interfaces accordingly. Therefore, you can use either a crossover or a straight-through cable for connections to a copper 10/100/1000 or 1000BASE-T SFP module port on the switch, regardless of the type of device on the other end of the connection. For configuration information for this feature, see the switch software configuration guide or the switch command reference.

10/100/1000 Ports

You can set the 10/100/1000 ports to operate at 10, 100, or 1000 Mb/s in full-duplex or half-duplex mode. You can also set these ports for speed and duplex autonegotiation. (The default setting is autonegotiate.) When you set the port for autonegotiation, it senses the speed and duplex settings of the attached device and advertises its own capabilities. If the connected device also supports autonegotiation, the switch port negotiates the best connection (that is, the fastest line speed that both devices support and full-duplex transmission if the attached device supports it) and configures itself accordingly. In all cases, the attached device must be within 328 feet (100 meters).

100BASE-TX and 1000BASE-T traffic requires a Category 5 or higher cable. 10BASE-T traffic can use Category 3 or Category 4 cables.

When you connect the switch to workstations, servers, routers, and Cisco IP Phones, be sure that the cable is a straight-through cable. When you connect the switch to switches or hubs, use a crossover cable. When using a straight-through or crossover cable for 1000BASE-T connections, be sure to use a twisted four-pair, Category 5 or higher cable for proper operation. Pinouts for the cables are described in Appendix B, "Connector and Cable Specifications."

You can use the **mdix auto** interface configuration command in the CLI to enable the automatic medium-dependent interface crossover (auto-MDIX) feature. When the auto-MDIX feature is enabled, the switch detects the required cable type for copper Ethernet connections and configures the interfaces accordingly. Therefore, you can use either a crossover or a straight-through cable for connections to a copper 10/100/1000 or 1000BASE-T SFP module port on the switch, regardless of the type of device on the other end of the connection. For configuration information for this feature, see the switch software configuration guide or the switch command reference.

PoE Ports (Only Catalyst 2960 PoE Switches)

This section applies only to the Catalyst 2960-24PC-L, 2960-24LT-L, 2960-24PC-S, 2960-24LC-S, 2960 48PST-L, and 2960-48PST-S switches.

Warning **Voltages that present a shock hazard may exist on Power over Ethernet (PoE) circuits if interconnections are made using uninsulated exposed metal contacts, conductors, or terminals. Avoid using such interconnection methods, unless the exposed metal parts are located within a restricted access location and users and service people who are authorized within the restricted access location are made aware of the hazard. A restricted access area can be accessed only through the use of a special tool, lock and key or other means of security.** Statement 1072

- The 10/100 ports on the Catalyst 2960-Plus 24PC-L, 2960-24PC-L, 2960-Plus 48PST-L, 2960-48PST-L, 2960-Plus 48PST-S, 2960-48PST-S, 2960-Plus 24PC-S, and 2960-24PC-S, switches and ports 1 to 8 of the 10/100 ports on the Catalyst 2960-24LT-L, 2960-Plus 24LC-L, 2960-Plus 24LC-S, and 2960-24LC-S switches provide PoE support for devices that are compliant with IEEE 802.3af. The Cisco prestandard PoE is also supported for Cisco IP Phones and Cisco Aironet Access Points.
- Each of the PoE ports on the Catalyst 2960 switches deliver up to 15.4 W of PoE.

  The Catalyst 2960-Plus 24PC-L, 2960-24PC-L, 2960-Plus 48PST-L, 2960-48PST-L, 2960-Plus 48PST-S, 2960-48PST-S, 2960-Plus 24PC-S, and 2960-24PC-S switches deliver a maximum power output of approximately 370-W PoE power.

  The Catalyst 2960-24LT-L, 2960-Plus 24LC-L, 2960-Plus 24LC-S, and 2960-24LC-S switches deliver a maximum power output of approximately 124-W PoE power.
- On a per-port basis, you can control whether or not a Catalyst 2960 PoE port automatically provides power when an IP phone or an access point is connected. The device manager, Network Assistant, and the CLI provide PoE settings for each 10/100 PoE port:
  - Auto: When you select the Auto setting, the port provides power only if a valid powered device, such as an IEEE 802.3af-compliant powered device, a Cisco prestandard IP phone, or a Cisco prestandard Cisco access point, is connected. The Auto setting is the default.
  - Never: When you select the Never setting, the port does not provide power even if a Cisco IP phone or an access point is connected.

- You also can connect a Cisco IP Phone or Cisco Aironet Access Point to a Catalyst 2960 PoE switch 10/100 port and to an AC power source for redundant power. The powered device might switch to the AC power source as its primary power source upon being connected to it. In that case, the PoE port becomes the backup power source for the powered device.

  If the primary source fails, the second power source becomes the primary power source to the powered device. During the power transfer, an IP phone might reboot or reestablish link with the switch.

For information about configuring and monitoring PoE ports, see the switch software configuration guide. For information about Cisco IP Phones and Cisco Aironet Access Points, see the documentation that came with your IP phone or access point.

Many legacy powered devices, including older Cisco IP phones and access points that do not fully support IEEE 802.3af, might not support PoE when connected to the switches by a crossover cable.

SFP Module Slots

The Catalyst 2960 switches (other than those listed) use Gigabit Ethernet SFP modules for Gigabit uplink connections and 100-Megabit SFP modules for 100-Megabit connections to establish fiber-optic connections. These Catalyst 2960 switches do not have an SFP module slot:

- Catalyst 2960PD-8TT-L
- Catalyst 2960-24LT-L
- Catalyst 2960-24-S
- Catalyst 2960-24TT-L
- Catalyst 2960-48TT-L
- Catalyst 2960-48TT-S

The transceiver modules are field-replaceable, providing the uplink interfaces when you insert an SFP module. You can use the SFP modules for Gigabit uplink connections to other switches. You use fiber-optic cables with LC connectors to connect to a fiber-optic SFP module. You use Category 5 or higher cable with RJ-45 connectors to connect to a copper SFP module.

For more information about these SFP modules, see your SFP module documentation or the release notes for your switch software. For more information about cabling requirements, see Appendix B, “Connector and Cable Specifications.”

Dual-Purpose Port

You can configure a dual-purpose port as either a 10/100/1000 port or as an SFP module port. Each port is considered as a single interface with dual front ends—an RJ-45 connector and an SFP module connector. The dual front ends are not redundant interfaces. The switch activates only one connector of the pair at a time.

By default, the switch dynamically selects the interface type that first links up. However, you can use the **media-type interface configuration** command to manually select the RJ-45 connector or the SFP module connector. For information about configuring speed and duplex settings for a dual-purpose uplink, see the software configuration guide.

Each uplink port has two LEDs: one shows the status of the RJ-45 port, and one shows the status of the SFP module port. The port LED is on the active connector.

Power Input Port (Catalyst 2960PD-8TT-L Switch)

The Catalyst 2960PD-8TT-L can receive power from these sources:

1. Through a 10/100/1000 port from an upstream Ethernet switch that provides power (complies with IEEE 802.3af). (See Figure 1-21.)
2. Through an external AC power adapter that connects to the back of the switch. This external power adapter (PWR-A=) is not included with the switch, but you can order it from your Cisco representative. (See Figure 1-22.)

Figure 1-21 Connecting Through a 10/100/1000 Port

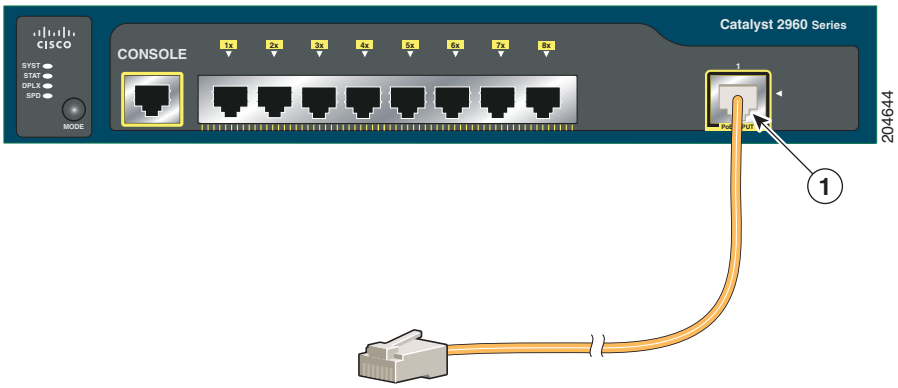
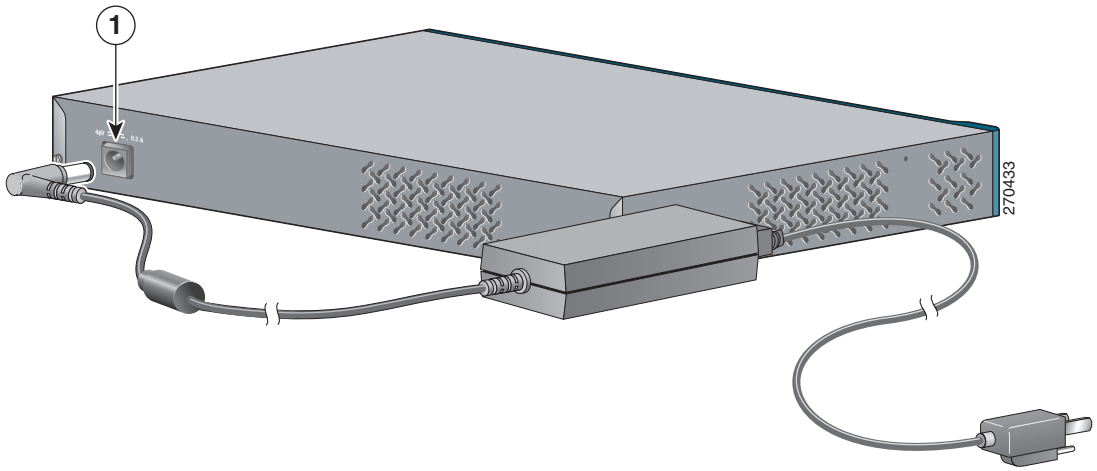


Figure 1-22 Connecting Through an External AC Power Adapter



1	Power adapter port

LEDs

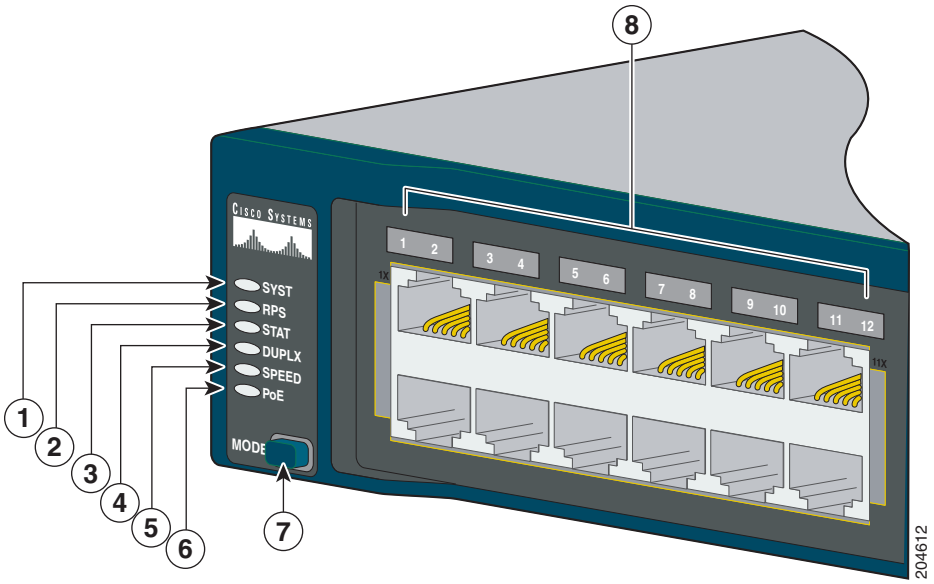
You can use the switch LEDs to monitor switch activity and its performance. Figure 1-23 shows the switch LEDs and the Mode button that you use to select one of the port modes.

All LEDs are visible through the GUI management applications—Network Assistant for multiple switches and the device manager for a single switch. The switch software configuration guide describes how to use the CLI to configure and to monitor individual switches and switch clusters.

Only the Catalyst 2960 PoE switches have a PoE LED.

The four Catalyst 2960 8-port switches and these models do not have an RPS connector or an RPS LED: Catalyst 2960-24-S, Catalyst 2960-Plus 24TC-S, 2960-24TC-S, 2960-48TT-S, 2960-Plus 48TC-S, 2960-48TC-S.

Figure 1-23 Catalyst 2960 Switch LEDs



1	SYST LED	**5**	Speed LED
2	RPS LED	**6**	PoE LED[1]
3	Status LED	**7**	Mode button
4	Duplex LED	**8**	Port LEDs

1. The PoE LED is only on the Catalyst 2960 PoE switches.

System LED

The System LED shows whether the system is receiving power and is functioning properly. Table 1-2 lists the LED colors and their meanings.

Table 1-2 System LED

Color	System Status
Off	System is not powered on.
Green	System is operating normally.
Amber	System is receiving power but is not functioning properly.

RPS LED

The RPS LED shows the RPS status. Table 1-3 lists the LED colors and their meanings.

Note The Catalyst 2960 8-port switches, and the Catalyst 2960-24-S, 2960-Plus 24TC-S, 2960-24TC-S, 2960-Plus 48TC-S, 2960-48TC-S, and 2960-48TT-S switches do not have an RPS LED.

Table 1-3 RPS LED

Color	RPS Status
Off	RPS is off or not properly connected.
Green	RPS is connected and ready to provide back-up power, if required.
Blinking green	RPS is connected but is unavailable because it is providing power to another device (redundancy has been allocated to a neighboring device).
Amber	The RPS is in standby mode or in a fault condition. Press the Standby/Active button on the RPS, and the LED should turn green. If it does not, the RPS fan could have failed. Contact Cisco Systems.
Blinking amber	The internal power supply in a switch has failed, and the RPS is providing power to the switch (redundancy has been allocated to this device).

For more information about the Cisco RPS 2300 or the Cisco RPS 675, see the related hardware installation guide for that power system.

Port LEDs and Modes

The port LEDs, as a group or individually, display information about the switch and about the individual ports (Table 1-4):

Table 1-4 Modes for Port LEDs

Selected Mode LED	Port Mode	Description
STAT	Port status	The port status. This is the default mode.
DUPLX	Port duplex mode	The port duplex mode: full duplex or half duplex.
SPEED[1]	Port speed	The port operating speed: 10, 100, or 1000 Mb/s.
PoE[2]	PoE port power	The PoE status.

1. When installed in Catalyst 2960 switches, 1000BASE-T SFP modules can operate at 10, 100, or 1000 Mb/s in full-duplex mode or at 10 or 100 Mb/s in half-duplex mode.
2. The PoE LED is only on the Catalyst 2960 PoE switches.

Even if the PoE mode is not selected, the PoE LED shows PoE problems when they are detected (Table 1-5). The PoE LED applies only to Catalyst 2960 switches that support PoE.

Table 1-5 PoE Mode LED

Color	PoE Status
Off	PoE mode is not selected. None of the 10/100 PoE ports have been denied power or are in a fault condition.
Green	PoE mode is selected, and the PoE status is shown on the port LEDs.
Blinking amber	PoE mode is not selected. At least one of the 10/100 PoE ports has been denied power, or at least one of the ports has a PoE fault.

To select or change a mode, press the Mode button until the desired mode is highlighted. When you change port modes, the meanings of the port LED colors also change. Table 1-6 explains how to interpret the port LED colors in different port modes.

Table 1-6 Meaning of Port LED Colors in Different Modes on the Switch

Port Mode	LED Color	Meaning
STAT (port status)	Off	No link, or port was administratively shut down.
	Green	Link present.
	Blinking green	Activity. Port is sending or receiving data.
	Alternating green-amber	Link fault. Error frames can affect connectivity, and errors such as excessive collisions, cyclic redundancy check (CRC) errors, and alignment and jabber errors are monitored for a link-fault indication.
	Amber	Port is blocked by Spanning Tree Protocol (STP) and is not forwarding data. **Note** After a port is reconfigured, the port LED can remain amber for up to 30 seconds as STP checks the network topology for possible loops.
	Blinking amber	Port is blocked by STP and is not sending or receiving packets.
DUPLX (duplex)	Off	Port is operating in half duplex.
	Green	Port is operating in full duplex.
SPEED	**10/100 and 10/100/1000 ports**	
	Off	Port is operating at 10 Mb/s.
	Green	Port is operating at 100 Mb/s.
	Blinking green	Port is operating at 1000 Mb/s.
	SFP ports	
	Off	Port is operating at 10 Mb/s.
	Green	Port is operating at 100 Mb/s.
	Blinking green	Port is operating at 1000 Mb/s. **Note** When installed in Catalyst 2960 switches, 1000BASE-T SFP modules can operate at 10, 100, or 1000 Mb/s in full-duplex mode or at 10 or 100 Mb/s in half-duplex mode.

Table 1-6 Meaning of Port LED Colors in Different Modes on the Switch (continued)

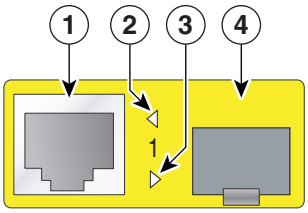
Port Mode	LED Color	Meaning
PoE	Off	PoE is off. If the powered device is receiving power from an AC power source, the PoE port LED is off even if the powered device is connected to the switch port.
	Green	PoE is on. The port LED is green only when the switch port is providing power.
	Alternating green and amber	PoE is denied because providing power to the powered device will exceed the switch power capacity. The Catalyst 2960-Plus 24PC-L, 2960-24PC-L, 2960-Plus 48PST-L, 2960-48PST-L, 2960-Plus 48PST-S, 2960-48PST-S, 2960-Plus 24PC-S, and 2960-24PC-S switches provide up to 370 W of power. The Catalyst 2960-24LT-L, 2960-Plus 24LC-L, 2960-Plus 24LC-S, and 2960-24LC-S switches provide up to 124 W of power.
	Blinking amber	PoE is off due to a fault. **Caution** PoE faults are caused when noncompliant cabling or powered devices are connected to a PoE port. Only standard-compliant cabling can be used to connect Cisco prestandard IP Phones or wireless access points or IEEE 802.3af-compliant devices to PoE ports. You must remove from the network the cable or device that causes a PoE fault.
	Amber	PoE for the port has been disabled. By default, PoE is enabled.

Dual-Purpose Port LEDs

The LEDs on a dual-purpose port show whether an RJ-45 connector is connected to the port, or if an SFP module is installed in the slot. See the example in Figure 1-24. You can configure each port as either a 10/100/1000 port through the RJ-45 connector or as an SFP module, but not both at the same time. The LEDs show how the port is being used (Ethernet or SFP module).

The LED colors have the same meanings as described in Table 1-4 and Table 1-6.

Figure 1-24 Dual-Purpose Port LEDs



1	RJ-45 connector	**3**	SFP module port in-use LED
2	RJ-45 port in-use LED	**4**	SFP module slot

Cable Guard for the Catalyst 2960 8-Port Switches

You can order an optional cable guard to secure cables to the front of the Catalyst 2960-8TC-L, 2960G-8TC-L, 2960-8TC-S, and 2960PD-8TT-L switches and prevent them from being accidentally removed.

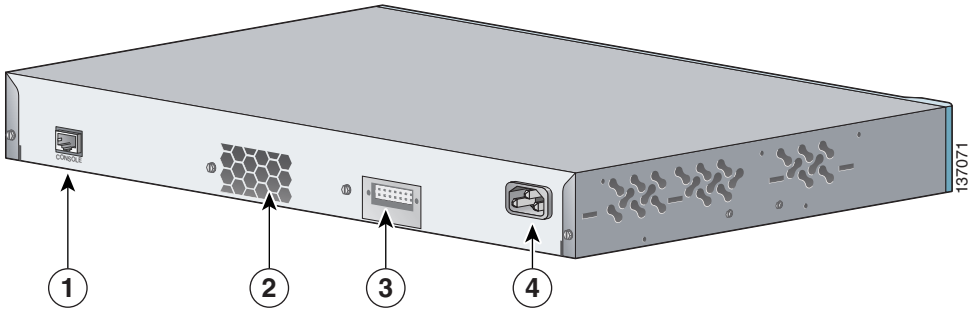
To order a cable guard, contact your Cisco representative using these part numbers:

- CBLGRD-C2960-8TC: Catalyst 2960-8TC-L, 2960-8TC-S, and 2960PD-8TT-L switches
- CBLGRD-C2960G-8TC: Cisco Catalyst 2960G-8TC switch

Rear Panel Description

Depending on the Catalyst 2960 switch model, the switch can have an RJ-45 console port, a fan exhaust, an RPS connector, and an AC power connector (see Figure 1-25 for an example of a Catalyst 2960 rear panel).

Figure 1-25 Catalyst 2960 Switch Rear Panel



1	RJ-45 console port[1]	**3**	RPS connector [2]
2	Fan exhaust[3]	**4**	AC power connector[4]

1. The Catalyst 2960 8-port switches have the console port on the front panel rather than on the rear panel.
2. These Catalyst 2960 switches do not have an RPS connector: Catalyst 8-port switches, 2960-24-S, 2960-Plus 24TC-S, 2960-24TC-S, 2960-Plus 48TC-S, 2960-48TC-S, and 2960-48TT-S switches.
3. The Catalyst 2960 8-port switches do not have a fan.
4. The Catalyst 2960PD-8TT-L switch does not have an AC internal power supply.

Internal Power Supply

All switches other than the Catalyst 2960PD-8TT-L are powered through their internal power supply. The internal power supply is an autoranging unit that supports input voltages between 100 and 240 VAC. Use the supplied AC power cord to connect the AC power connector to an AC power outlet.

Note The Catalyst 2960PD-8TT-L switch does not have a internal power supply. For more information, see "Power Input Port (Catalyst 2960PD-8TT-L Switch)" section on page 1-14.

Cisco RPS

Depending on the switch model, you can connect the switch to either of these Cisco redundant power systems (RPS) to provide backup power if the switch power supply fails:

- "Cisco RPS 2300" section on page 1-20
- "Cisco RPS 675" section on page 1-21

Connect the switch and the Cisco RPS to the same AC power source. Use the RPS connector cable supplied with the RPS to connect the RPS to the switch.

Warning **Attach only the following Cisco RPS model to the RPS receptacle: PWR-RPS2300 / PWR675-AC-RPS-N1** Statement 370

Note These Catalyst 2960 switches do not have an RPS connector: Catalyst 8-port switches, 2960-24-S, 2960-Plus 24TC-S, 2960-24TC-S, 2960-Plus 48TC-S, 2960-48TC-S, 2960-48TT-S, 2960-Plus 48PST-S, 2960-48PST-S, 2960-Plus 24PC-S, 2960-24PC-S, 2960-Plus 24LC-S, and 2960-24LC-S switches.

Note These Catalyst 2960 switches support only the Cisco RPS 2300: Catalyst 2960-24PC-L, 2960-24LT-L, and 2960-48PST-L switches.

For complete information about the Cisco RPS products, including compatibility matrixes listing the supported RPS for each Catalyst 2960 switch, see the RPS documents on Cisco.com:

http://www.cisco.com/en/US/products/ps7148/prod_installation_guides_list.html

Cisco RPS 2300

The Cisco RPS 2300 is a redundant power system that supports six network switches and provides power to one or two failed switches at a time. It automatically senses when the internal power supply of a connected switch fails and provides power to the failed switch, preventing loss of network traffic.

The Cisco RPS 2300 has two output levels: -52 V and 12 V. The total maximum output power depends on the installed power-supply modules.

All supported, connected switches can simultaneously communicate with the RPS 2300. You can configure these RPS 2300 features through the switch software:

- Enable RPS active or standby mode for each connected switch

- Configure switch priority for RPS support
- List the connected switches and the power-supply module sizes
- Obtain reports when a switch is powered by the RPS
- Obtain status reports for the RPS power-supply module
- Read and monitor backup, failure, and exception history

Cisco RPS 675

The Cisco 675 RPS is a redundant power system that supports six network devices and provides power to one failed switch at a time. It automatically senses when the internal power supply of a connected switch fails and provides power to the failed switch, preventing loss of network traffic.

The Cisco RPS 675 has two output levels: –48 V and 12 V. The total maximum output power is 675 W.

Console Port

You can connect the switch to a PC by means of the console port and the supplied RJ-45-to-DB-9 female cable. If you want to connect the switch console port to a terminal, you need to provide an RJ-45-to-DB-25 female DTE adapter. You can order a kit (part number ACS-DSBUASYN=) containing that adapter from Cisco. For console port and adapter pinout information, see the "Connector and Cable Specifications" section on page B-1.

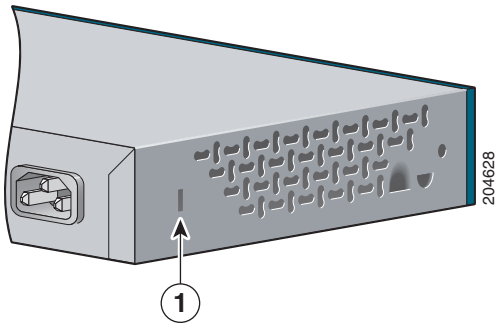
Note The console port on the Catalyst 2960 8-port switches is on the front panel rather than on the rear panel.

Security Slots

The Catalyst 2960 8-port switches have security slots on the left and right side panels. You can install an optional cable lock, such as the type that is used to secure a laptop computer, to secure either or both sides of the switch.

Figure 1-26 shows the slot on a left-side panel.

Figure 1-26 Switch Left Panel



1	Security slot

Management Options

The Catalyst 2960 switches offer several management options:

- Cisco Network Assistant

  Network Assistant is a PC-based network management GUI with centralized management of Cisco LAN switches, core switches, routers, access points, IP phones, and PIX firewalls.

  Network Assistant is available at no cost and can be downloaded from this URL:

  http://www.cisco.com/go/cna

  For information on starting Network Assistant, see the *Getting Started with Cisco Network Assistant* guide on Cisco.com.

- Device manager

  You can use the device manager, which is in the switch memory, to manage individual and standalone switches. Device manager is a web interface that offers quick configuration and monitoring. You can access the device manager from anywhere in your network through a web browser. For more information, see the device manager online help.

- Cisco IOS command-line interface (CLI)

  The switch CLI is based on Cisco IOS software and is enhanced to support desktop-switching features. You can fully configure and monitor the switch and switch cluster members from the CLI. You can access the CLI either by connecting your management station directly to the switch console port or by using Telnet from a remote management station. See the *Catalyst 2960 Switch Command Reference* on Cisco.com for more information.

  For setup instructions that use the CLI, go to Appendix C, "Configuring the Switch with the CLI-Based Setup Program."

- CiscoView application

  The CiscoView device-management application displays the switch image that you can use to set configuration parameters and to view switch status and performance information. The CiscoView application, which you purchase separately, can be a standalone application or part of a Simple Network Management Protocol (SNMP) platform. See the CiscoView documentation for more information.

- SNMP network management

  You can use SNMP management applications such as CiscoWorks LAN Management Solution (LMS) and HP OpenView to configure and manage the switch. You also can manage it from an SNMP-compatible workstation that is running platforms such as HP OpenView or SunNet Manager.

  The Cisco Configuration Engine is a network management device that works with embedded CNS agents in the switch software. You can use Cisco Configuration Engine to automate initial configurations and configuration updates on the switch.

Network Configurations

See the switch software configuration guide on Cisco.com for an explanation of network configuration concepts. The software configuration guide also provides examples of network configurations that use the switch to create dedicated network segments that are interconnected through Gigabit Ethernet connections.