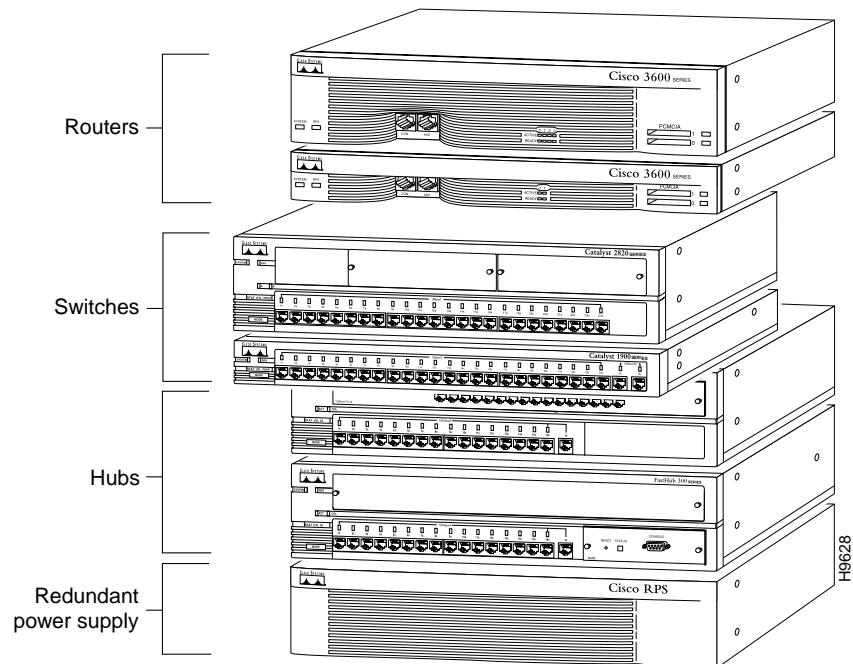# Overview

The Catalyst 2820 and Catalyst 1900 are members of an extended network system of stackable, modular LAN and WAN products that increases LAN performance, connects remote offices and users, and provides secure Internet access.

Figure 1-1   An Extended Network System of Stackable LAN and WAN Products

The Catalyst 2820 Series and Catalyst 1900 Series switches shown in Figure 1-2 are Ethernet switches that provide flexible, high-speed configurations for workgroup applications. The Catalyst 2820 Series and Catalyst 1900 Series switches offer 24 or 12 switched 10BaseT ports and a mix of modular and fixed high-speed connections.

Figure 1-2   Catalyst 2820 Series and Catalyst 1900 Series Switches
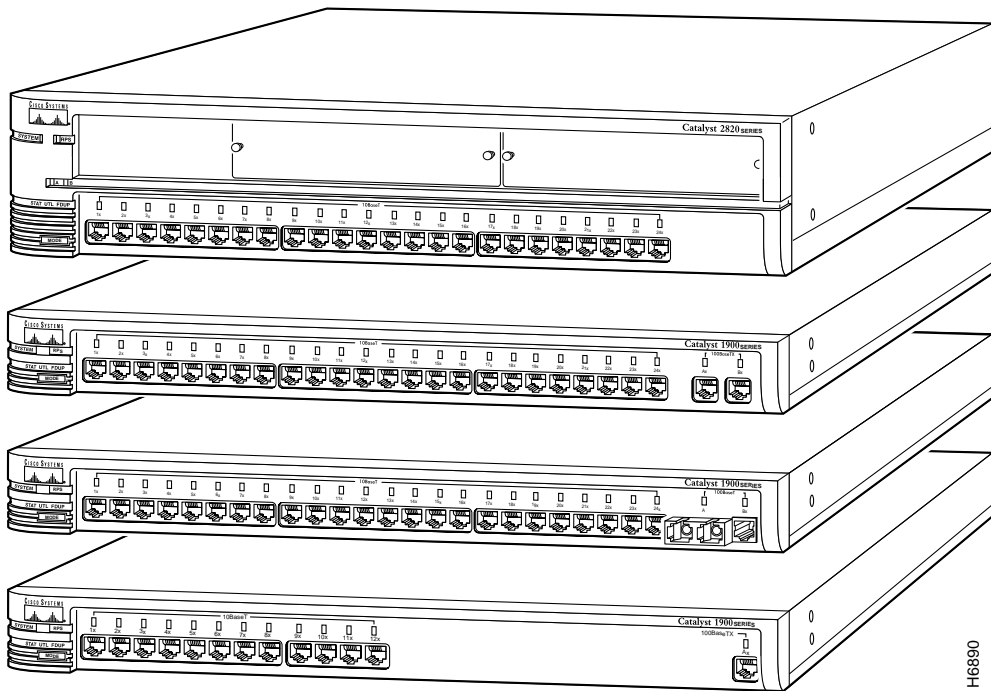
Key Features

The Catalyst 2820 Series and Catalyst 1900 Series vary in their port configurations but share the same firmware and many features. The possible port configurations are the following:

- The Catalyst 2820 Series has the following port configuration:

  — 24 switched 10BaseT ports

  — 1 switched AUI port

  — 2 high-speed expansion slots supporting 100BaseT and FDDI modules

- The Catalyst 1900 Series has *one* of the following port configurations:

  — 24 switched 10BaseT ports, 1 switched AUI port, and 2 switched 100BaseTX ports

  — 24 switched 10BaseT ports, 1 switched AUI port, and 1 switched 100BaseTX port and 1 switched 100BaseFX port

  — 12 switched 10BaseT ports, 1 switched AUI port, and 1 switched 100BaseTX port

The following features are common to all Catalyst 2820 Series and Catalyst 1900 Series switches:

- Multiple MAC address support:

  — The Catalyst 2820 Series supports a 2048- or, optionally, 8192-address cache shared among all 27 ports.

  — The Catalyst 1900 Series supports a 1024-address cache shared among all 27 ports.

- CollisionFree operation for full-duplex 100BaseT, providing up to 200-Mbps bandwidth and extended distances using fiber-optic cabling.

- CiscoWorks device-management support.

- IEEE 802.1d Spanning-Tree Protocol support with Port Fast option.

- Up to 320-Mbps maximum forwarding bandwidth and 450,000 packets per second (pps) aggregate packet-forwarding rate.

- Shared memory architecture with 3-Mb packet buffer.

- Connection for a redundant power system (RPS).

- Telnet and SNMP support for in-band management and a menu-driven out-of-band management console.

- Support for up to four port-configurable virtual LANs (VLANs).

- Cisco Group Management Protocol (CGMP) to limit flooding of multicast traffic to predefined ports.

- Port security to prevent unauthorized access to the network.

- Broadcast storm control.

- Embedded RMON (four groups).

See the "Concepts" chapter for more information about these features. To implement them via out-of-band management or Telnet, see the "Out-of-Band Management" chapter for more information. If you are using SNMP, the "Standard MIBs and MIB Extensions" section in the "In-Band Management" chapter describes the in-band capabilities of the switch.

10BaseT Ports

The 10BaseT ports shown in Figure 1-3 use RJ-45 connectors to connect to single workstations, 10BaseT hubs, or any 10BaseT-compatible device. The attached devices use standard 10BaseT adapters and wiring. The AUI port, located on the back panel, supports an alternative AUI connection for attachment to a thick coaxial, thin coaxial, or a fiber-optic media transceiver.

Figure 1-3   Catalyst 1900 Ports
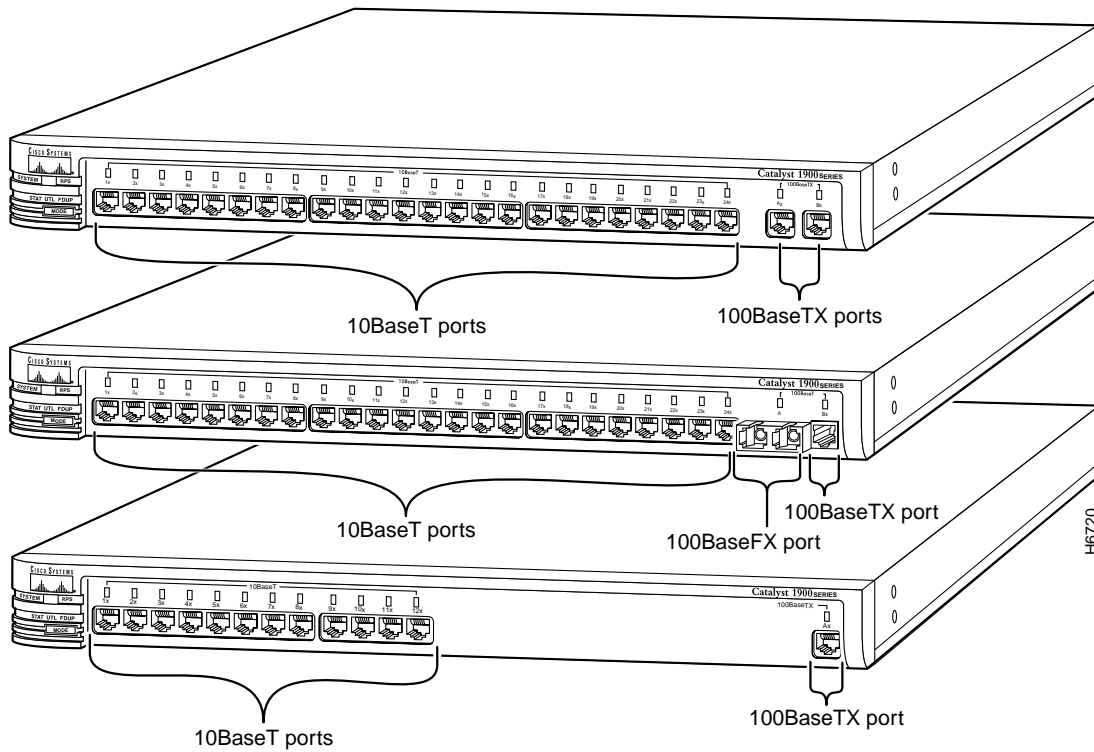

100BaseTX and 100BaseFX Ports

Catalyst 1900 100BaseT ports are internally switched to all other ports and can be set to full or half duplex. As shown in Figure 1-3, the Catalyst 1900 can have several fixed 100BaseT port configurations:

- Two 100BaseTX ports

- One 100BaseTX port and one fixed 100BaseFX port

- One 100BaseTX port

High-Speed Expansion Slots

The Catalyst 2820 (see Figure 1-4) has two high-speed expansion slots that are compatible with Catalyst 2820 field-pluggable modules and provide high-bandwidth connections to backbones, servers, and other high-performance devices. Each expansion slot is internally switched to all other Catalyst 2820 ports.

Figure 1-4   Catalyst 2820 Ports

High-speed expansion slots

10BaseT ports
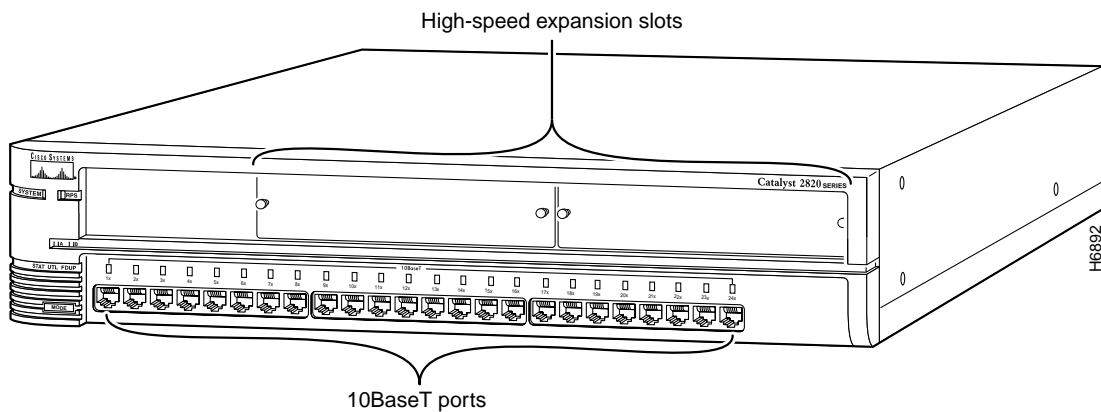
Understanding the LEDs

The Catalyst 2820 Series and Catalyst 1900 Series LEDs enable you to easily monitor network activity and performance. Figure 1-5 and Figure 1-6 show the location of the LEDs.

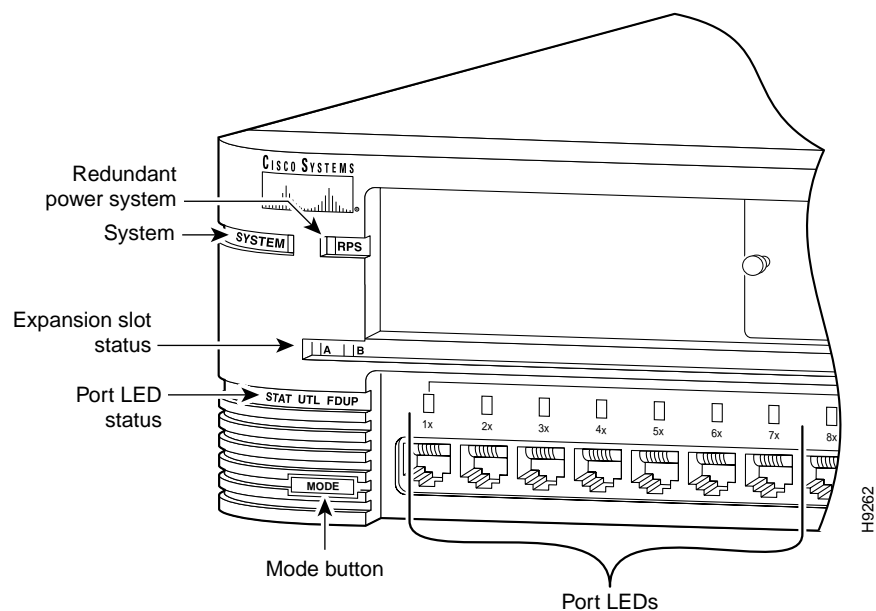**Figure 1-5   Catalyst 2820 LEDs**

Figure 1-6   Catalyst 1900 LEDs

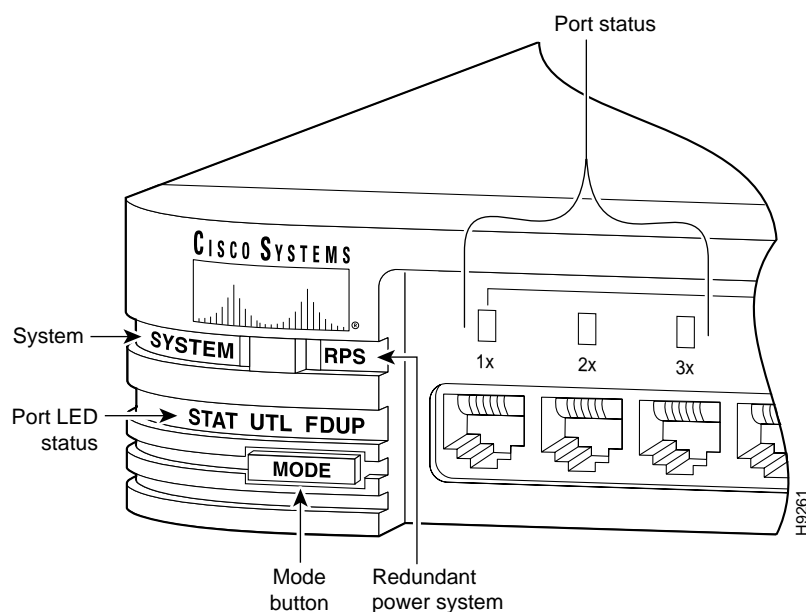## System LED

This LED indicates whether the system is receiving power and functioning properly. Table 1-1 provides a description of the LED colors and their meanings.

Table 1-1   System LED

Visual Indication	System Status
Off	System is not powered up.
Green	System is operating normally.
Amber	System is receiving power but is not functioning properly.

Redundant Power System LED

The redundant power system (RPS) LED shows the RPS status, as shown in Table 1-2. When the RPS is in use, turn off the local power supply by unplugging the AC power cord.

Table 1-2   RPS LED

Visual Indication	RPS Status
Off	Off or not installed.
Green	RPS operational.
Flashing green	The RPS and the local power supply are *both* powered up. Only one power source can be supplying power to a unit. If you are using the RPS, the local power cord of the switch must not be plugged in. If you are using the local power supply, the RPS can be connected but must be powered down.
Amber	RPS not operational.

Expansion Slot Status LEDs

These LEDs show the status of an inserted module, as shown in Table 1-3. Check the LEDs on the module itself for the module port status. The A and B LEDs correspond to the left and right expansion slots, respectively.

Table 1-3   Expansion Slot LEDs

| Visual Indication	Expansion Slot Status
Off	No module is in the slot.
Green	Module is operational.
Flashing green	Module is running POST.
Amber	Module failed POST and is not operational.

Port LEDs

Port LEDs indicate one of the following, depending on the setting you selected using the Mode button:

- Port status (STAT)

- Bandwidth utilization (UTL)

- Full-duplex status (FDUP)

Changing the Mode of the Port LED

To change the mode being displayed by the port LEDs, press the Mode button, as shown in Figure 1-7, to highlight in sequence each of the possibilities: STAT (port status), UTL (bandwidth utilization), and FDUP (full-duplex status). The selected mode remains lit for 30 seconds before returning to the default mode of port status.

Figure 1-7   Changing the LED Mode
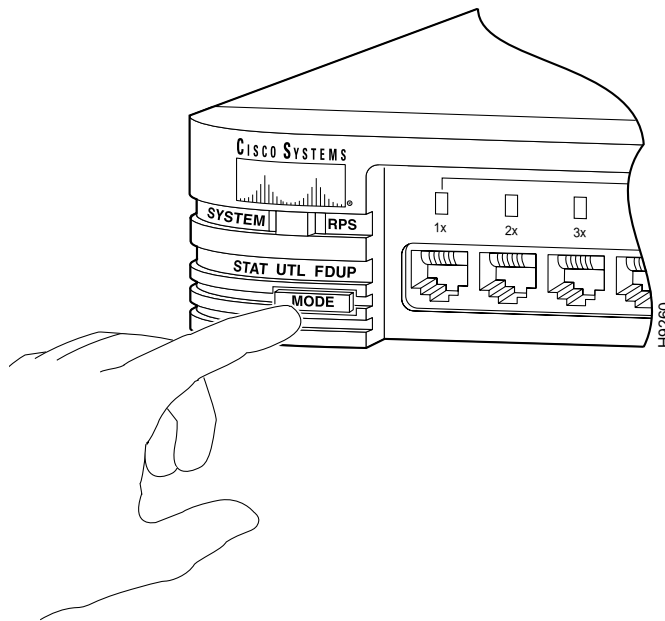
Port Status (STAT)

This LED mode shows the status of switched ports, as shown in Table 1-4.

Table 1-4   Port Status

Visual Indication	Port Status
Off	No link.
Green	Link present.
Flashing green	Activity; port is transmitting or receiving data.
Alternating green-amber	Link fault. Error frames can affect connectivity, and errors such as excessive collisions, CRC errors, and alignment and jabber errors are monitored for a link-fault indication.
Amber	Port is not forwarding. For example, this could be because the port was disabled by management, suspended due to an address violation, or suspended by STP due to the presence of network loops.

Full-Duplex Status (FDUP)

A port configured for full-duplex operation must be connected to another full-duplex port. You can display the full-duplex status of a port, as shown in Table 1-5, by pressing the Mode button and releasing it when FDUP is highlighted.

Table 1-5   Full-Duplex LED

Visual Indication	Full-Duplex Status
Green	Full duplex is operational.
Off	Half duplex is operational.

Utilization LEDs (UTL)

Utilization LEDs show the current and peak bandwidth utilization of the switch. The peak utilization is recorded in the bandwidth-capture interval. The default setting for this interval is 24 hours; it is recorded each night at midnight.

You can change to the utilization mode by pressing the Mode button until UTL is highlighted. Current bandwidth is shown with a series of lit LEDs ending with a rapidly blinking one. Peak bandwidth is indicated by the right-most solidly lit LED.

Change the bandwidth-capture interval with the Bandwidth Usage Report described in the chapter "Out-of-Band Management."

Table 1-6 shows the bandwidth utilization scale for the Catalyst 2820 and Catalyst 1900 with 24 10BaseT ports. Table 1-7 shows the same scale for the Catalyst 1900 version with 12 10BaseT ports.

Table 1-6   Bandwidth Utilization Scale with 24 10BaseT Ports

Port LEDs	Mbps
1 to 8	0.1 to < 6
9 to 16	6 to < 120
17 to 24	120 to 280

Table 1-7   Bandwidth Utilization Scale with 12 10BaseT Ports

Port LEDs	Mbps
1 to 4	0.1 to < 1.5
5 to 8	1.5 to < 20
9 to 12	20 to 140

Rear Panel

The rear panels, shown in Figure 1-8 and Figure 1-9, contains the following components:

- Power receptacle

  The power supply is an auto-ranging unit supporting input voltages between 100 to 240 VAC. Plug the power cord into the power receptacle located on the rear panel of the switch.

- EIA/TIA-232 connector

  The management console can be run with Telnet or through an ASCII terminal. Use this port to connect the necessary modem or terminal to the switch. See the "Serial RS-232 Connector Pinout" section in the "Technical Specifications" appendix for more information.

Note EIA/TIA-232 was known as the recommended standard RS-232 before its acceptance as a standard by the Electronic Industries Association (EIA) and Telecommunications Industry Association (TIA). Because RS-232 appears on the out-of-band management screens and in the names of supported MIB objects, this manual also uses RS-232.

- Redundant power system connector
- AUI connector
- Reset switch

  Use the reset switch only if the Catalyst 2820 or 1900 does not respond to network management or if packet forwarding has stopped. Resetting the switch has the same effect as turning it off and on. The reset switch is located on the rear panel, as shown in Figure 1-8 and Figure 1-9. Use a paper clip or pen to reach through the hole and reset the switch.

Figure 1-8   Catalyst 1900 Rear Panel

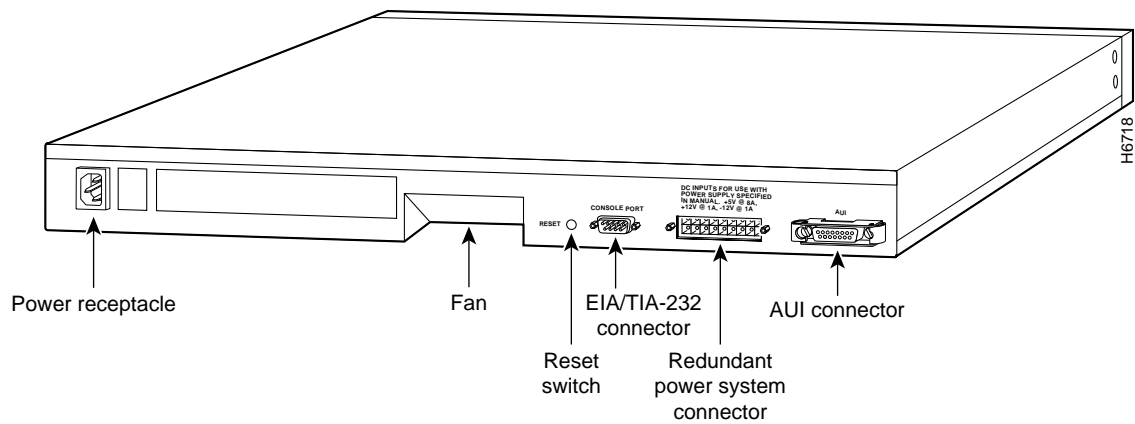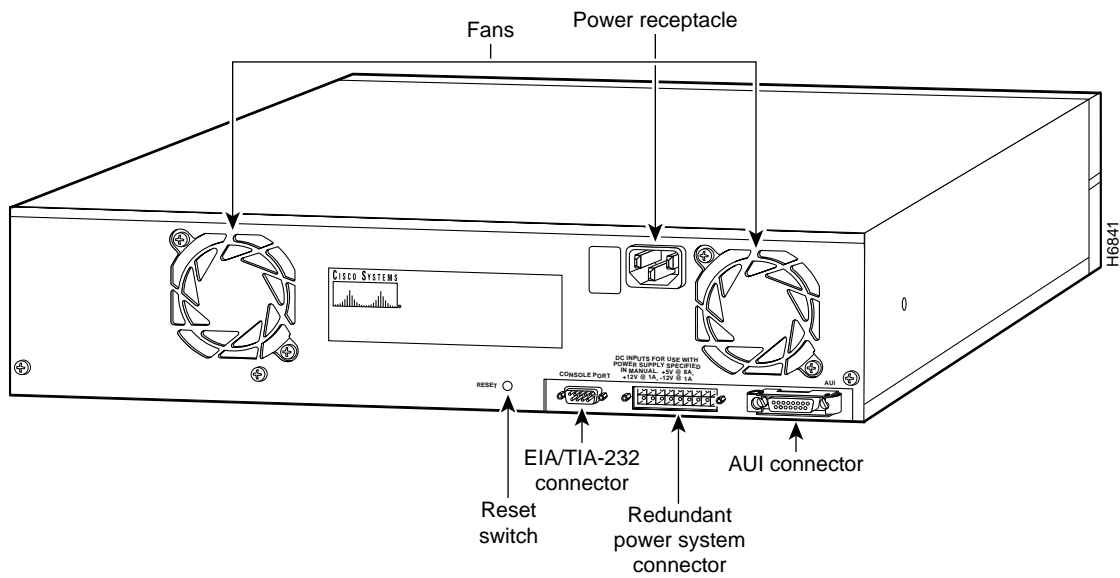Power receptacle

Fan

EIA/TIA-232
connector

Reset
switch

Redundant
power system
connector

AUI connector

H6718

Figure 1-9   Catalyst 2820 Rear Panel

Fans

Power receptacle

H6841

EIA/TIA-232
connector

Reset
switch

Redundant
power system
connector

AUI connector

Configuring and Managing Catalyst 2820 Series and Catalyst 1900 Series Switches

You can configure and manage a Catalyst 2820 Series and Catalyst 1900 Series switch using any SNMP-compatible management station, or you can connect an ASCII terminal to the switch via the EIA/TIA-232 (RS-232) port and use the management console. The management console is also accessible via Telnet. SMT-compatible workstations can support installed Catalyst 2820 FDDI modules.

Using the Management Console

The management console provides a menu-driven interface for configuring and monitoring your network. The application is password-protected and locks out a user who fails to enter the password within a definable number of attempts. In such a case, the network administrator can be alerted via in-band management.

Most of the statistics and information generated by the switch are available through the management console. You can continue to use it even when the network is down.

SNMP Management

The Catalyst 2820 Series and Catalyst 1900 Series are fully manageable by any SNMP-compatible management station.

The products support all pertinent SNMP MIB II variables, the IEEE 802.1d bridge MIB, and a comprehensive set of MIB extensions designed for maximum support of the switch's hub and switching capabilities. The Catalyst 2820 also supports the FDDI MIB and the MIB supporting Catalyst 2820 modules.

Note Catalyst 2820 Series and Catalyst 1900 Series MIB objects are documented in the *Catalyst 2820 Series and Catalyst 1900 Series MIB Reference Manual*. This manual is available on the Documentation CD-ROM.

Supported Network Management Platforms

The Catalyst 2820 and 1900 SNMP MIBs are supplied in ASCII format for compiling into any SNMP network management system using a general MIB browser. You can display switch information from the following network management platforms:

- Castle Rock SNMPc

- Novell NMS

- HP OpenView

- SunNet Manager

The Catalyst 2820 Series and Catalyst 1900 Series switches must be configured for SNMP management. To do this, you need to assign an IP address to the switch using the menu described in "IP Configuration" in the "Out-of-Band Management" chapter. Although the switch will immediately register the IP address the first time you assign it, if you *change* the IP address, it does not take effect until after the switch is reset. You can also use the Bootstrap protocol (BOOTP) described in the "Configuring the Switch for SNMP Management with BOOTP" section in the "In-Band Management" chapter.

CiscoWorks

You can use the CiscoWorks graphical user interface to configure your Catalyst 2820 Series and Catalyst 1900 Series switches and to generate the same statistics that are available through the management console.

Extended Network System Application

A system of routers, switches, and hubs can be combined to create a high-performance network that extends beyond the main office LAN to connect to branch offices, remote sites, mobile users, and the Internet. Figure 1-10 is an application for an extended network system.

Figure 1-10   Catalyst 2820 and 1900 in an Extended Network Application