Installing the Router

This chapter guides you through the installation of Cisco 2600 series routers and includes the following sections:

Warning **This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security.** Statement 1017

Warning **Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals.** Statement 43

Warning **This equipment has been designed for connection to TN and IT power systems.** Statement 1007

Warning **To avoid electric shock, do not connect safety extra-low voltage (SELV) circuits to telephone-network voltage (TNV) circuits. LAN ports contain SELV circuits, and WAN ports contain TNV circuits. Some LAN and WAN ports both use RJ-45 connectors. Use caution when connecting cables.** Statement 1021

Warning **This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.** Statement 1024

Warning **Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place.** Statement 1029

Warning **Only trained and qualified personnel should be allowed to install, replace, or service this equipment.** Statement 1030

Warning **To prevent personal injury or damage to the chassis, never attempt to lift or tilt the chassis using the handles on modules (such as power supplies, fans, or cards); these types of handles are not designed to support the weight of the unit.** Statement 1032

Warning **Ultimate disposal of this product should be handled according to all national laws and regulations.** Statement 1040

Note See the "Tools and Equipment for Installation and Maintenance" section on page 2-6 for a list of tools and equipment that might be required for your installation.

Installing Modules, Interface Cards, and Power Supplies

Cisco routers are normally shipped with network modules, WAN interface cards (WICs), voice interface cards (VICs), advanced integration modules (AIMs), and power supplies already installed. If you need to remove or install any of these items, refer to the applicable documents online.

For network modules:

- Quick Start Guide: Network Modules for Cisco 2600 Series, Cisco 3600 Series, and Cisco 3700 Series Routers
- Cisco Network Modules Installation Guide

For WICs and VICs:

- Quick Start Guide: Interface Cards for Cisco 1600, 1700, 2600, 3600, and 3700 Series
- Cisco Interface Cards Installation Guide

For AIMs:

- AIM Installation Quick Start Guide: Cisco 2600, 3600, and 3700 Series
- Installing Advanced Integration Modules in Cisco 2600 Series, Cisco 3600 Series, and Cisco 3700 Series Routers

For internal power supplies:

- Cisco 2600 Series Power Supply Configuration Note
- Installing AC Power Supplies in Cisco 2691 Routers

For external power supplies:

- Cisco RPS Hardware Installation Guide

Note If there are modules, interface cards, or power supplies to be removed or installed, we recommend that you perform the installation or removal before you install the chassis. If a chassis cover must be removed, the chassis may have to be removed from the rack to permit cover removal.

If the required network modules, interface cards, and power supplies are already installed, proceed to the "Setting Up the Chassis" section on page 3-3.

Setting Up the Chassis

You can set the chassis on a desktop, install it in a rack, or mount it on a wall or other flat surface. Use the procedure in this section that best meets the needs of your network. The sections are as follows:

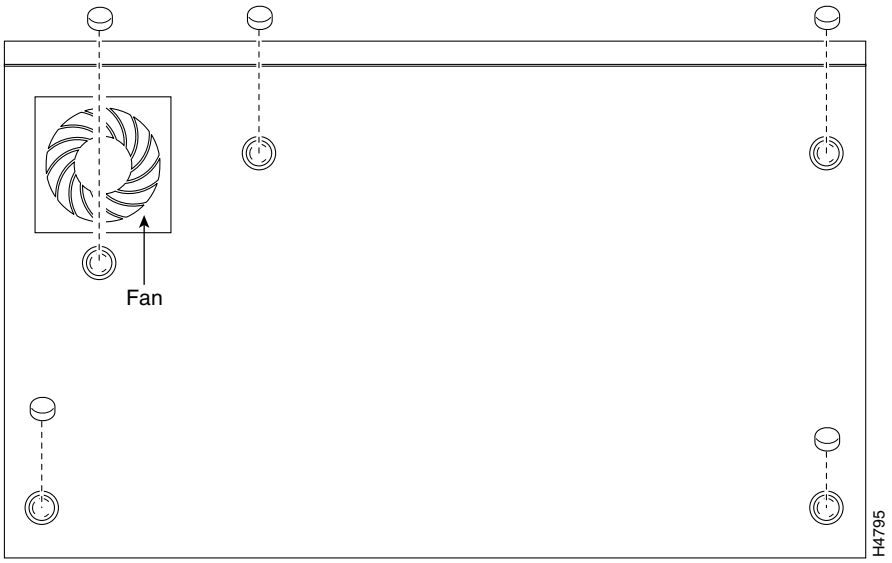
Setting the Chassis on a Desktop

You can place Cisco 2600 series routers on a desktop or shelf. For Cisco 2600 series routers of 1 rack-unit height only, attach the rubber feet supplied in the accessory kit. The procedure is as follows:

Step 1 Place the router upside-down on a smooth, flat surface.

Step 2 Peel the rubber feet from the black adhesive strip and attach them to the five round, recessed areas on the bottom of the chassis. (See Figure 3-1.)

Figure 3-1 Rubber Feet Locations on Cisco 2600 Series Routers of 1-RU Height



Step 3 Place the router top-side up on a flat, smooth, secure surface.

Caution Do not place anything on top of the router that weighs more than 10 pounds (4.5 kg). Excessive weight on top could damage the chassis.

After the router has been installed, you must connect the chassis to a reliable earth ground. For the chassis ground connection procedures, see the "Installing the Chassis Ground Connection" section on page 3-13.

Mounting the Chassis in a Rack

This section describes the procedures for rack-mounting the chassis. Cisco 2600 series routers with a chassis height of 1 rack-unit (1RU) ship with brackets for use with a 19-inch rack or, if specified in your order, optional larger brackets for use with a 23- or 24-inch rack. Cisco 2600 series routers with a chassis height of 2 rack-units (2RU) ship with brackets for use with 19-inch racks and with NEBS/ETSI-compliant brackets for use with 23-inch racks. The brackets are shown in Figure 3-2, Figure 3-3, and Figure 3-4.

Figure 3-2 Brackets for Cisco 261x, Cisco 262x, Cisco 26xxXM, and Cisco 265x Series Routers

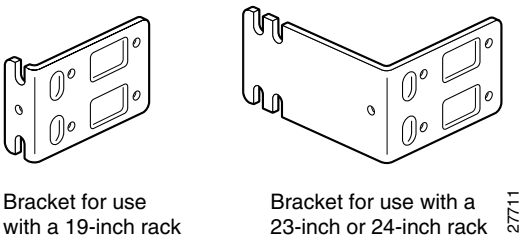


Figure 3-3 Brackets for 19-Inch Rack-Mounting of Routers with 2-RU Height

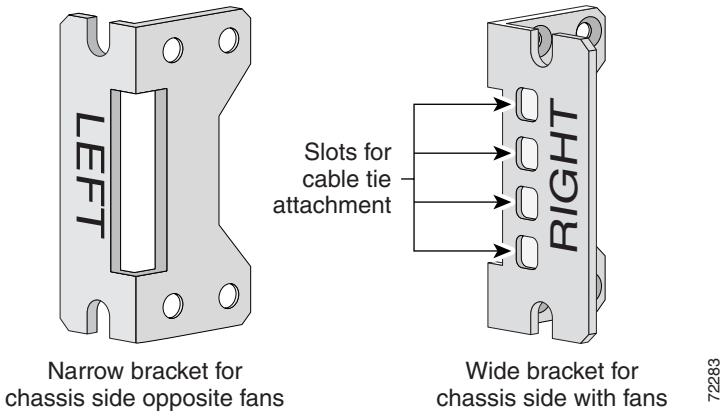
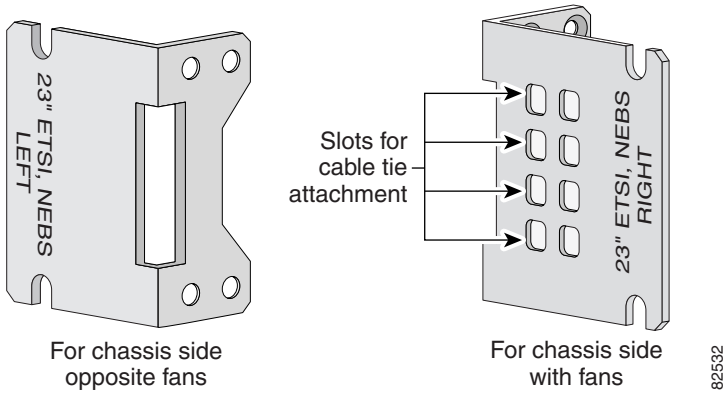


Figure 3-4 Brackets for 23-Inch Rack-Mounting of Routers with 2-RU Height



Attaching the Brackets to Cisco 261x, Cisco 262x, Cisco 26xxXM, and Cisco 265x Series Routers

To install the chassis in a rack, attach the brackets in one of the following ways:

- With the front panel forward (see Figure 3-5 and Figure 3-6)
- With the rear panel forward (see Figure 3-7 and Figure 3-8)
- In a center-mount rack, with the rear panel forward (see Figure 3-9 through Figure 3-11)

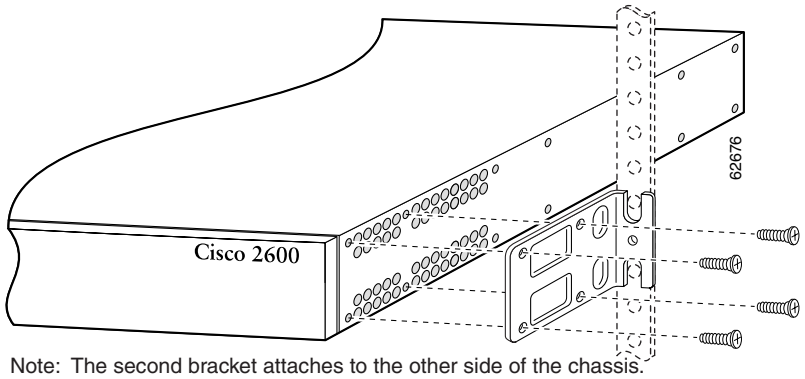
Note Use the screws that came with your router package for attaching the brackets.

Note If you are installing a Cisco 2600 series router in a 19-inch rack with a 17.5-inch opening, orient the rack-mount brackets so that, when installed, they do not increase the width of the chassis. (See Figure 3-5.)

If you are installing a Cisco 2600 series router in a 19-inch rack with a 17.75-inch opening or a 23- or 24-inch rack, orient the rack-mount brackets so that, when installed, they increase the width of the chassis. (See Figure 3-6.)

Note The following illustrations show how to connect the bracket to one side of the chassis. The second bracket connects to the opposite side of the chassis.

Figure 3-5 Bracket Installation—Front Panel Forward (19-Inch Rack with a 17.5-Inch Opening)



Note: The second bracket attaches to the other side of the chassis.

Note When installed in a 19-inch rack with a 17.75-inch opening, Cisco 2600 series routers protrude beyond the front of the rack.

Figure 3-6 Bracket Installation—Front Panel Forward (19-Inch Rack with a 17.75-Inch Opening or a 23- or 24-Inch Rack)

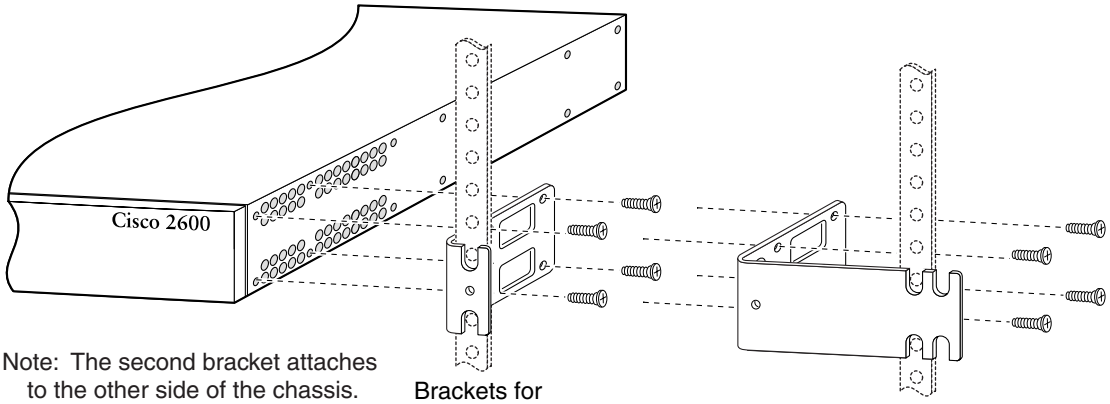


Figure 3-7 Bracket Installation—Rear Panel Forward (19-Inch Rack with a 17.5-Inch Opening)

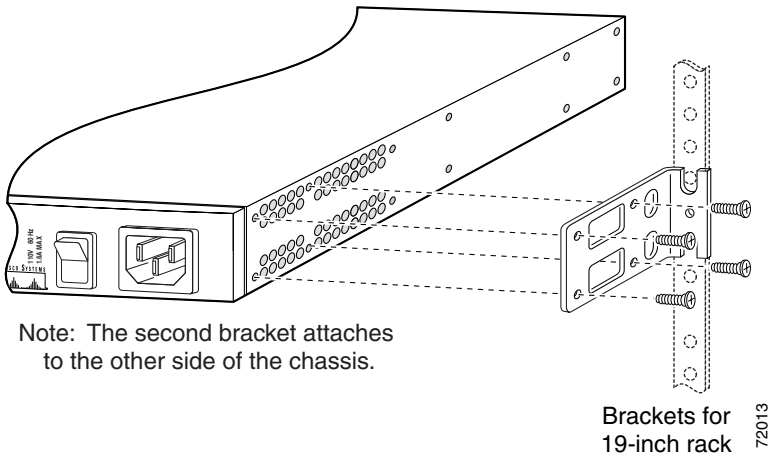


Figure 3-8 Bracket Installation—Rear Panel Forward (19-Inch Rack with a 17.75-Inch Opening or a 23- or 24-Inch Rack)

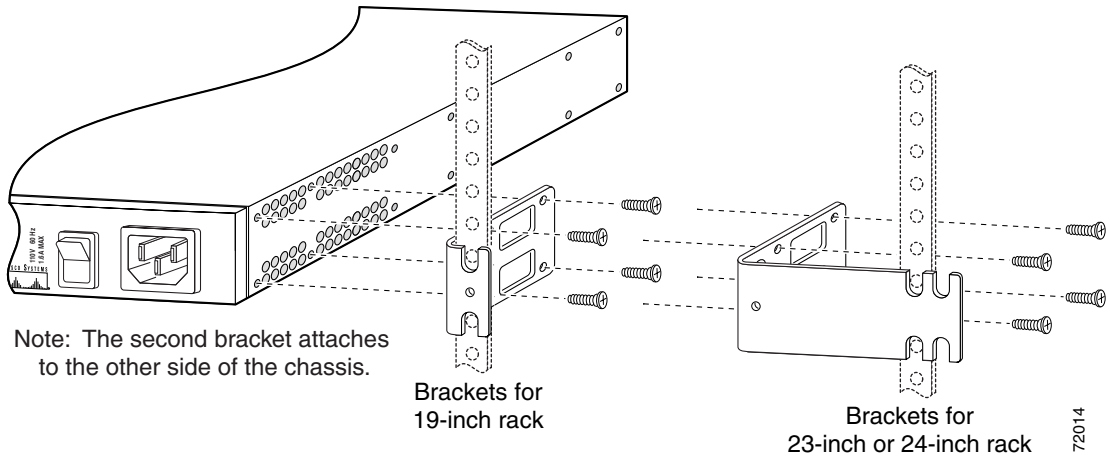


Figure 3-9 Center-Mount Bracket Installation—Rear Panel Forward (19-Inch Rack with a 17.75-Inch Opening or a 23- or 24-Inch Rack)

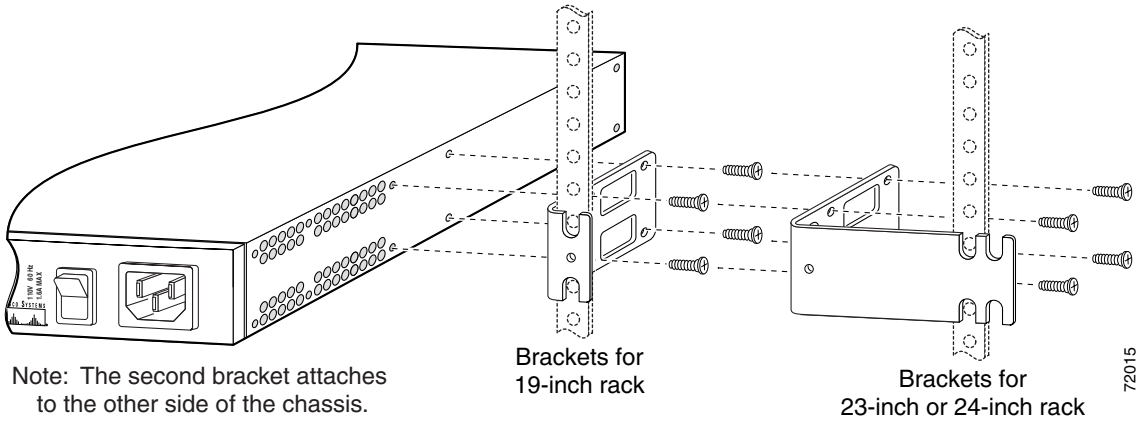


Figure 3-10 Center-Mount Bracket Installation—Rear Panel Forward (19-Inch Rack with a 17.5-Inch Opening or a 23- or 24-Inch Rack)

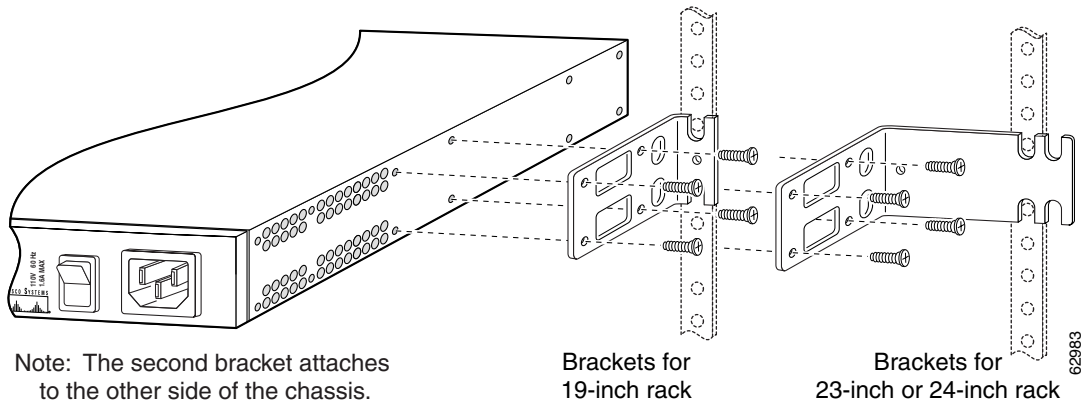
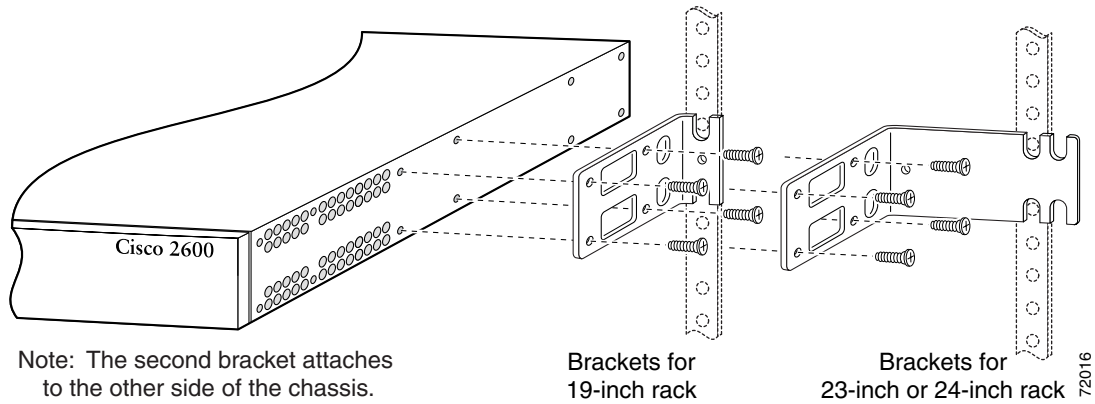


Figure 3-11 Center-Mount Bracket Installation—Front Panel Forward (19-Inch Rack with a 17.5-Inch Opening or a 23- or 24-Inch Rack)



Attaching the Brackets to a Router of 2-RU Height

To install the chassis in a rack, attach the brackets in one of the following ways:

- With the front panel forward (see Figure 3-12)
- With the rear panel forward (see Figure 3-13)
- In a center-mount rack (see Figure 3-14 and Figure 3-15)

Note Use the screws that came with your router package for attaching the brackets.

Figure 3-12 Bracket Installation—Front Mounting

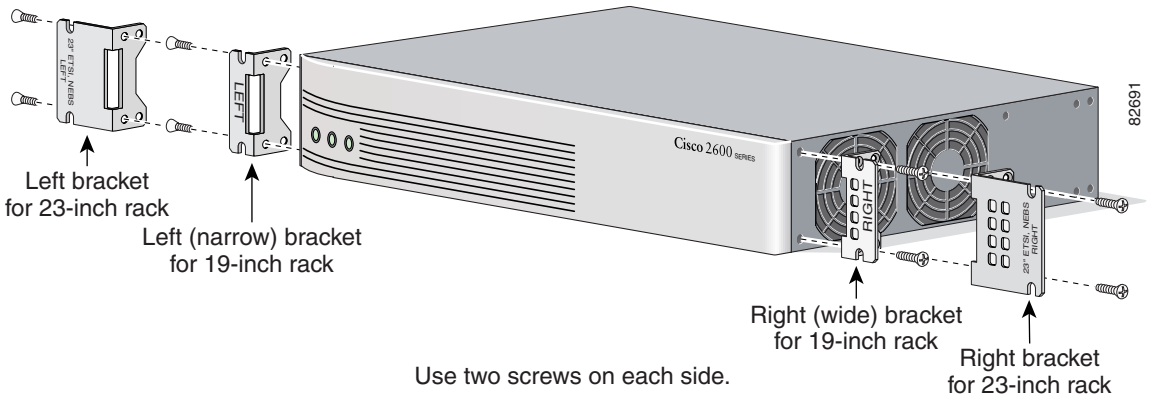


Figure 3-13 Bracket Installation—Rear Mounting

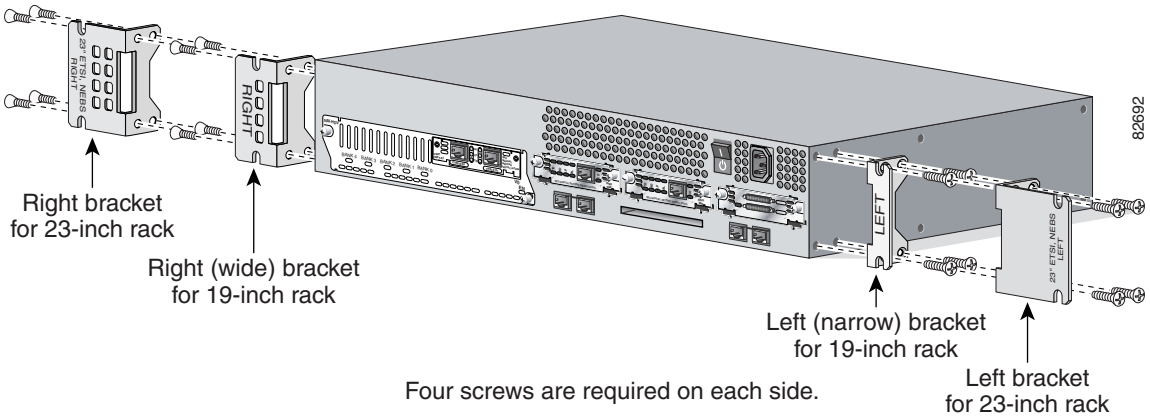


Figure 3-14 Bracket Installation—Center Mounting with Front Panel Forward

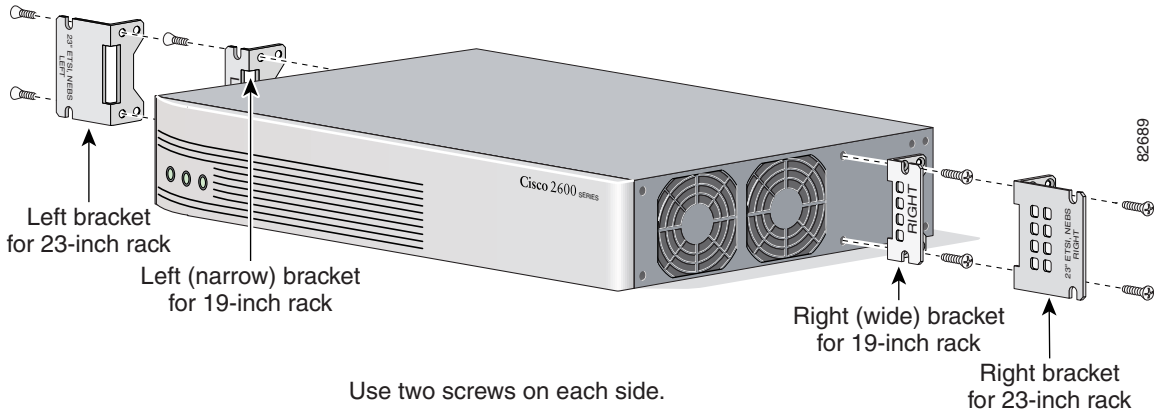
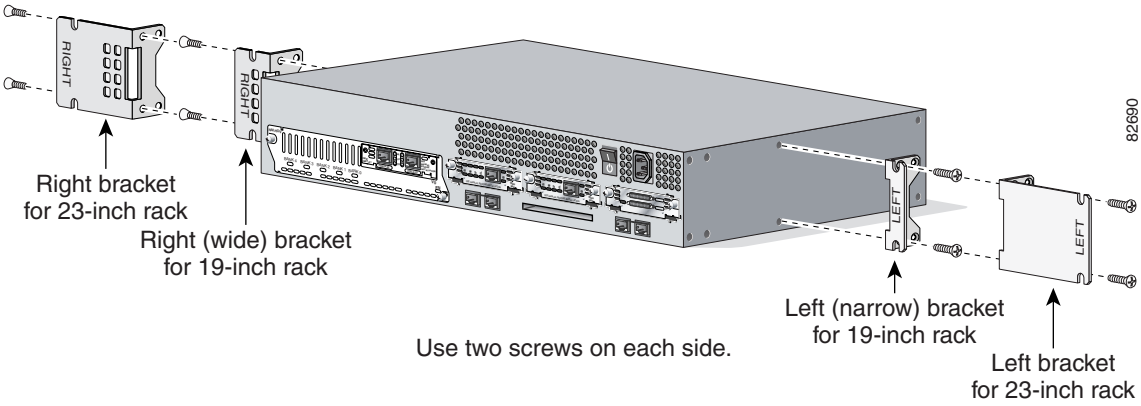


Figure 3-15 Bracket Installation—Center Mounting with Rear Panel Forward



Installing the Router in a Rack

After the brackets are secured to the chassis, you can mount the chassis in a rack. Use the illustrations in the previous section as a guide to attaching the brackets to the rack.

Warning **To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:**

- **This unit should be mounted at the bottom of the rack if it is the only unit in the rack.**
- **When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.**
- **If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.** Statement 1006

To see translations of the warnings that appear in this publication, refer to the *Cisco 2600 Series, Cisco 3600 Series, and Cisco 3700 Series Regulatory Compliance and Safety Information* document that accompanied this device.

Note The screws for attaching the brackets to the rack are not included with the router.

Caution Always use two screws to attach each bracket to the rack.

After the router has been installed, you must connect the chassis to a reliable earth ground. For the chassis ground connection procedures, see the "Installing the Chassis Ground Connection" section on page 3-13.

Mounting the Chassis on the Wall

This section explains how to mount Cisco 2600 series routers with a chassis height of 1RU on a wall. Mounting a 2-RU chassis to a wall is not recommended, and brackets are not provided for mounting to a wall.

Tip When choosing a wall-mounting location, consider cable limitations and wall structure.

Use 19-inch brackets (shown in Figure 3-2) to wall-mount the chassis. The small brackets provide the most stable installation for the chassis. The rubber feet are required to provide spacing between the wall and the router for ventilation and proper cooling.

Attaching Rubber Feet to the Router

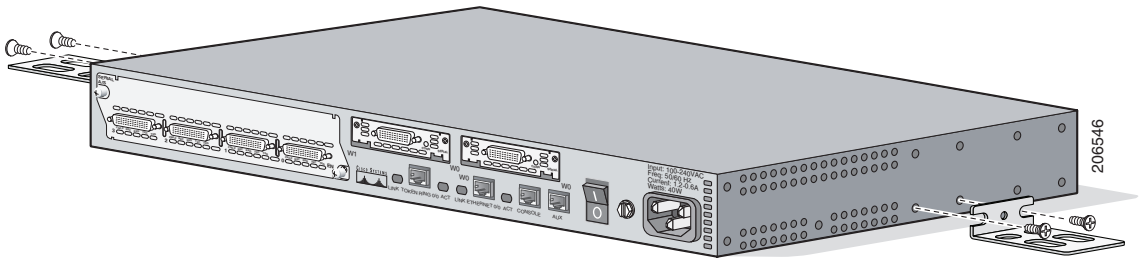
Attach the rubber feet supplied in the accessory kit. See Figure 3-1 on page 3-4 for positioning the rubber feet.

Attaching Wall-Mount Brackets to the Router

To install the router on a wall, first attach the brackets on each side of the chassis as shown in Figure 3-16, using plastic washers and slotted hex-head screws. Position the washers so that the narrow shoulder faces the router chassis.

Note The hex-head screws and plastic washers are used only for wall-mounting the router. For rack-mounting, the brackets are attached using Phillips-head screws, without washers.

Figure 3-16 Attaching the Wall-Mount Brackets

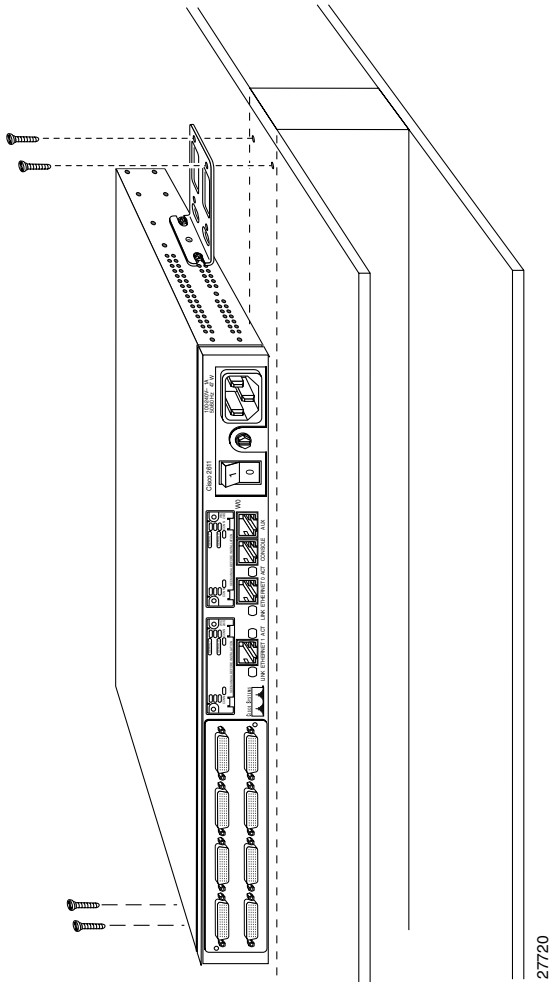


Mounting the Router on the Wall

After fastening the brackets to the chassis, mount the chassis on the wall:

- Orient the front and rear of the chassis vertically.
- Position the end nearest the power cable at the top.
- Align the screws (not included) with a wall stud, or use wall anchors.
- Figure 3-17 shows a typical wall-mounted installation.

Figure 3-17 Mounting the Chassis on the Wall



After the router has been installed, you must connect the chassis to a reliable earth ground. For the chassis ground connection procedures, see the "Installing the Chassis Ground Connection" section on page 3-13.

Installing the Chassis Ground Connection

All Cisco 2600 series router chassis require a reliable earth ground connection. You must connect the chassis to a reliable earth ground; the ground wire must be installed in accordance with local electrical safety standards.

- For NEBS-compliant grounding, use size AWG 6 (13 mm^2) wire and the ground lug provided in the accessory kit.
- For NEC-compliant grounding, use size AWG 14 (2 mm^2) or larger wire and an appropriate user-supplied ring terminal.
- For EN/IEC 60950-compliant grounding, use size AWG 18 (1 mm^2) or larger wire and an appropriate user-supplied ring terminal.

To connect the chassis to a reliable earth ground, perform the following steps:

Step 1 Strip one end of the ground wire to the length required for the ground lug or terminal.

- For the NEBS ground lug—approximately 0.75 in. (20 mm)
- For user-provided ring terminal—as required

Step 2 Crimp the ground wire to the ground lug or ring terminal, using a crimp tool of the appropriate size.

Step 3 Attach the ground lug or ring terminal to the chassis as shown in Figure 3-18, Figure 3-19, Figure 3-20, or Figure 3-21. For the ground lug, use the two screws with captive locking washers provided. For a ring terminal, use one of the screws provided. Use a number 2 Phillips screwdriver, and tighten the screws to a torque of 8 to 10 in-lb (0.9 to 1.1 N-m).

Step 4 Connect the other end of the ground wire to a suitable grounding point at your site.

Figure 3-18 NEBS-Compliant Chassis Ground Connection Using Ground Lug, 1-RU Chassis

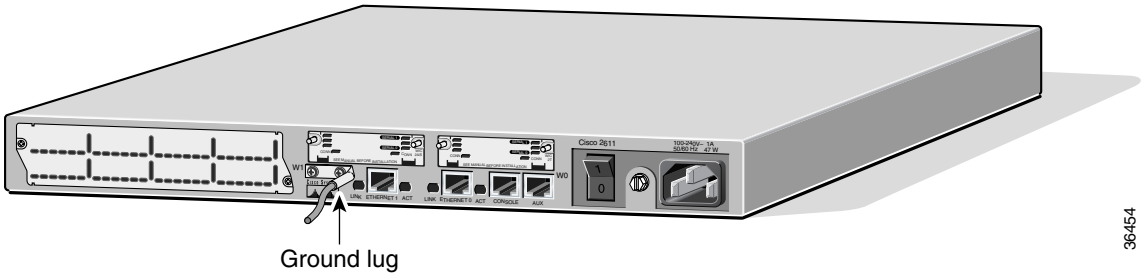


Figure 3-19 Chassis Ground Connection Using Ring Terminal, 1-RU Chassis

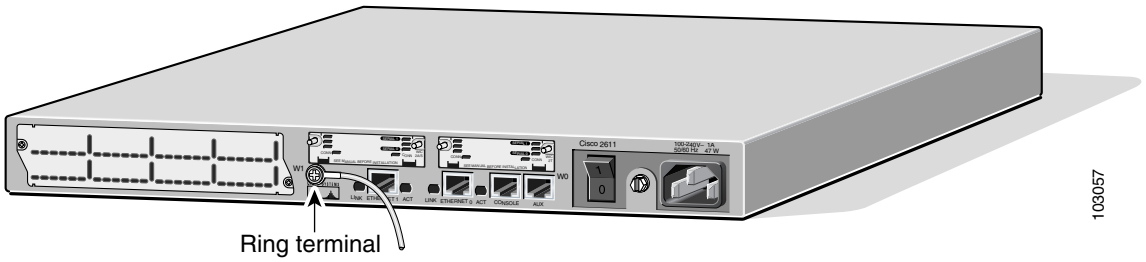


Figure 3-20 NEBS-Compliant Chassis Ground Connection Using Ground Lug, Cisco 2691

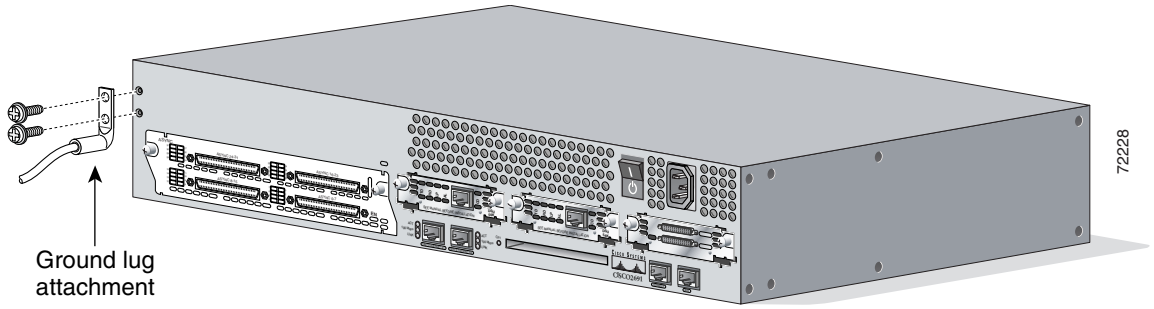
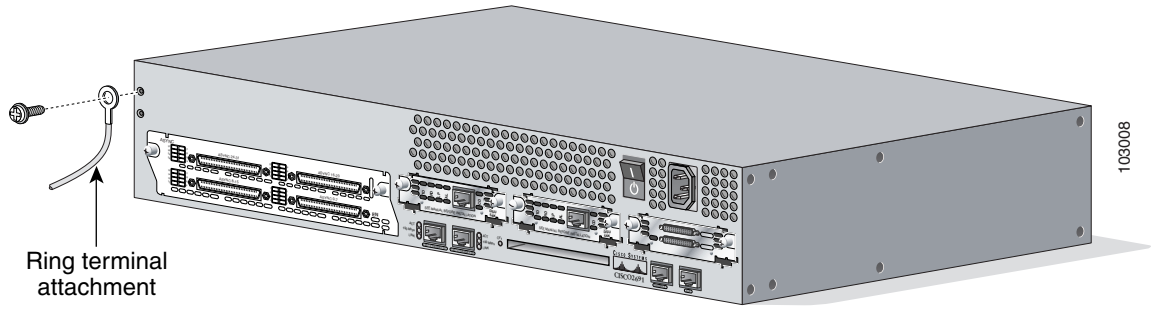


Figure 3-21 Ground Connection Using Ring Terminal, Cisco 2691



After the router has been installed and properly grounded, you can connect the power wiring; the WAN, LAN, and voice cables; and the cables for administrative access, as required for your installation. For cable connection procedures, see the "Power Connections" section on page 3-15, the "Connecting WAN, LAN, and Voice Cables" section on page 3-18, and the "Connecting to a Console Terminal or Modem" section on page 3-20.

Power Connections

Warning **Read the installation instructions before connecting the system to the power source.** Statement 1004

Warning **Do not work on the system, or connect or disconnect cables during periods of lightning activity.** Statement 1001

Note The installation must comply with all required electrical codes applicable at the installation site.

This section explains how to connect AC or DC power to Cisco 2600 series routers. It covers the following topics:

Connecting Routers to AC Power

If your router uses AC power, connect it to a 15 A, 120 VAC (10 A, 240 VAC) circuit with overcurrent protection.

Note The input voltage tolerance limits for AC power are 85 and 264 VAC.

Warning **AC connected units must have a permanent ground connection in addition to the power cable ground wire. NEBS-compliant grounding satisfies this requirement.** Statement 284

Warning **This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 15A, 120VAC (10A, 240VAC).** Statement 1005

Connecting Routers to a DC-Input Power Supply

If your router has a DC-input power supply, follow the directions in this section for proper wiring.

Warning **This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 15A, 60VDC.** Statement 1005

Warning **Use copper conductors only.** Statement 1025

DC Wiring Requirements

Table 3-1 summarizes the wiring requirements for Cisco 2600 series routers with a DC-input power supply.

Note For installations compliant with the National Electric Code, AWG 14 (2.0 mm^2) wire is required for DC input and safety ground wire.

Table 3-1 DC Wiring Requirements for Cisco 2600 Series Routers

Router	DC Input	DC Input Wire Size[1]	Safety Ground Wire Size	Overcurrent Protection
Cisco 2600 with 1-RU chassis height	–48 to –60 VDC, 4 A[2]	AWG 18 (1.0 mm^2)	AWG 14 (2.0 mm^2)	15 A maximum
Cisco 2691	24 - 36 V, 8 A, positive or negative, single or dual sources[3]	AWG 18 (1.0 mm^2)	AWG 14 (2.0 mm^2)	15 A maximum
	36 - 60 V, 4 A, positive or negative, single or dual sources	AWG 18 (1.0 mm^2)	AWG 14 (2.0 mm^2))	15 A maximum

1. See the note above this table for National Electric Code wire size requirements.
2. The input voltage tolerance limits for nominal 48-V power supplies are 38 and 72 VDC.
3. The input voltage tolerance limits for nominal 24/48-V power supplies are 18 and 72 VDC.

Wiring Procedure for DC Input

To connect the router to a DC power source, perform this procedure:

Step 1 Remove power from the DC circuit. To ensure that power is removed from the DC circuit, locate the circuit breaker for the DC circuit, switch the circuit breaker to the OFF position, and tape the circuit-breaker switch in the OFF position.

Warning **Before performing any of the following procedures, ensure that power is removed from the DC circuit.** Statement 1003

Tip Secure all power cabling when installing this unit to avoid disturbing field-wiring connections.

Step 2 Strip the wires to the appropriate length for the terminal block on the power supply.

Step 3 Connect the DC power input wires to the terminal block, as shown in Figure 3-22.

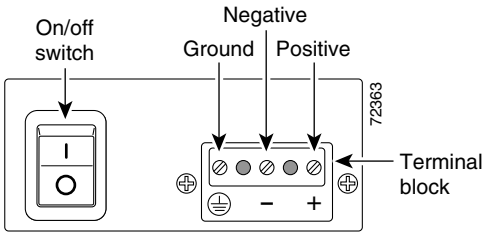
Warning **The illustration shows the DC power supply terminal block. Wire the DC power supply as illustrated. The proper wiring sequence is ground to ground, positive to positive, and negative to negative. The ground wire should always be connected first and disconnected last.** Statement 239

Caution The terminal arrangement on your router may not be identical to the arrangement shown in the figures. You must connect the positive, negative, and ground wires according to the labels on the terminals.

Caution Do not overtorque the terminal block captive thumbscrew or terminal block contact screws. The recommended torque is 8.0 ±0.5 inch-lb (0.93 ±0.05 N-m).

Note The 2600XM DC power supply is reverse connection protected. There are no negative effects if input power leads are connected backwards except that the router will not boot up.

Figure 3-22 DC Power Connections for Cisco 2600 Series Routers (Typical)



Step 4 Secure the wires using cable ties.

Step 5 Turn on power to the DC circuit.

Connecting Routers to the Cisco Redundant Power System

If your router uses the Cisco Redundant Power System (RPS), refer to the *Cisco RPS Hardware Installation Guide* for instructions about the power connections. You can access this document at the location described in the"Obtaining Documentation" section on page xvii.

Connecting WAN, LAN, and Voice Cables

This chapter describes how to connect the WAN, LAN, and voice interface cables. It includes the following sections:

Note One or two Ethernet cables are typically provided with the router. Additional cables and transceivers can be ordered from Cisco. For ordering information, refer to the *Cisco Product Catalog* at http://www.cisco.com/en/US/products/products_catalog_links_launch.html. For cable pinouts, refer to the *Cisco Modular Access Router Cable Specifications* document available online and on the Documentation CD-ROM.

Warning **Do not work on the system, or connect or disconnect cables during periods of lightning activity.** Statement 1001

Ports and Cabling

Table 3-2 summarizes some typical WAN, LAN, and voice connections for Cisco 2600 series routers.

The connections summarized here are also described in detail in the following documents:

- Cisco Modular Access Router Cable Specifications
- Cisco Network Modules Installation Guide
- Cisco Interface Cards Installation Guide

Table 3-2 WAN, LAN, and Voice Connections

Port or Connection	Port Type, Color	Connected To:	Cable
Ethernet	RJ-45, yellow	Ethernet hub or Ethernet switch	Straight-through Ethernet
T1/E1 WAN	RJ-48C/CA81A, blue	T1 or E1 network	RJ-48 T1
Cisco serial	60-pin D-sub	CSU/DSU and serial network or equipment	Cisco serial transition cable that matches the signaling protocol (EIA/TIA-232, EIA/TIA-449, V.35, X.21, or EIA/TIA-530) and the serial port operating mode (DTE or DCE).[1]
Cisco Smart serial	Cisco Smart compact connector, blue	CSU/DSU and serial network or equipment (For WIC-2T and WIC-2A/S only)	
DSL	RJ-11C/CA11A, lavender	Network demarcation device for service provider's DSL interface	RJ-11

Table 3-2 WAN, LAN, and Voice Connections (continued)

Port or Connection	Port Type, Color	Connected To:	Cable
T1 digital voice	RJ-48C/CA81A, tan	Digital PBX	RJ-48 T1 cable
Analog voice FXS	RJ-11, gray	Telephone, fax	RJ-11
Analog voice FXO	RJ-11, pink	Central office, analog PBX	RJ-11
Analog voice E&M	RJ-11, brown	Analog PBX	RJ-11
BRI S/T WAN (external NT1)	RJ-48C/CA81A, orange	NT1 device or private integrated network exchange (PINX)	RJ-48
BRI U WAN (built-in NT1)	RJ-49C/CA11A, red	ISDN network	RJ-49
CT1/PRI	T1	External T1 CSU	DB-15 T1 serial cable
CT1/PRI-CSU	T1	RJ-48C/CA81A interface	RJ-48 straight-through
CE1/PRI	E1	E1 network	DB-15 to BNC, DB-15 to DB-15, DB-15 to twinax, or DB-15 to RJ-45
Token Ring	UTP, purple STP, purple	Token Ring device	RJ-45 Token Ring cable
56/64-kbps DSU/CSU	8-pin modular, blue	RJ-48S interface	RJ-48 straight-through

1. Refer to the *Cisco Modular Access Router Cable Specifications* for information about selecting these cables.

LAN, WAN, and Voice Connection Procedures

Connect each WAN, LAN, and voice cable to the appropriate connector on the chassis or on a network module or interface card.

- Position the cables carefully, so that they do not put strain on the connectors.
- Organize cables in bundles such that cables do not intertwine.
- Inspect the cables to make sure that the routing and bend radiuses are satisfactory. Reposition cables, if necessary.
- Install cable ties in accordance with site requirements.

For cable pinouts, refer to the online document *Cisco Modular Access Router Cable Specifications*.

For more information about connecting and configuring network modules, WAN interface cards, and voice interface cards, refer to the following documents:

- Cisco Network Modules Installation Guide
- Cisco Interface Cards Installation Guide

Connecting to a Console Terminal or Modem

Your router includes asynchronous serial console and auxiliary ports. These ports provide administrative access to your router either locally (with a console terminal) or remotely (with a modem).

Cisco provides the following cables and adapters for connecting your router to a console terminal, PC, or modem:

- One console adapter cable (RJ-45-to-DB-9, blue)
- One modem adapter cable (RJ-45-to-DB-25, black)

This section describes how to connect a console terminal or PC to the console port, and how to connect a modem to the auxiliary port. It contains the following sections:

Note For information on identifying rollover cables, refer to the "Identifying a Rollover Cable" section on page 3-22.

Connecting to the Console Port

To connect a console terminal or a PC running terminal emulation software to the console port on the router, perform the following procedure:

Step 1 Connect the terminal using the blue RJ-45-to-DB-9 adapter cable. (See Figure 3-23.)

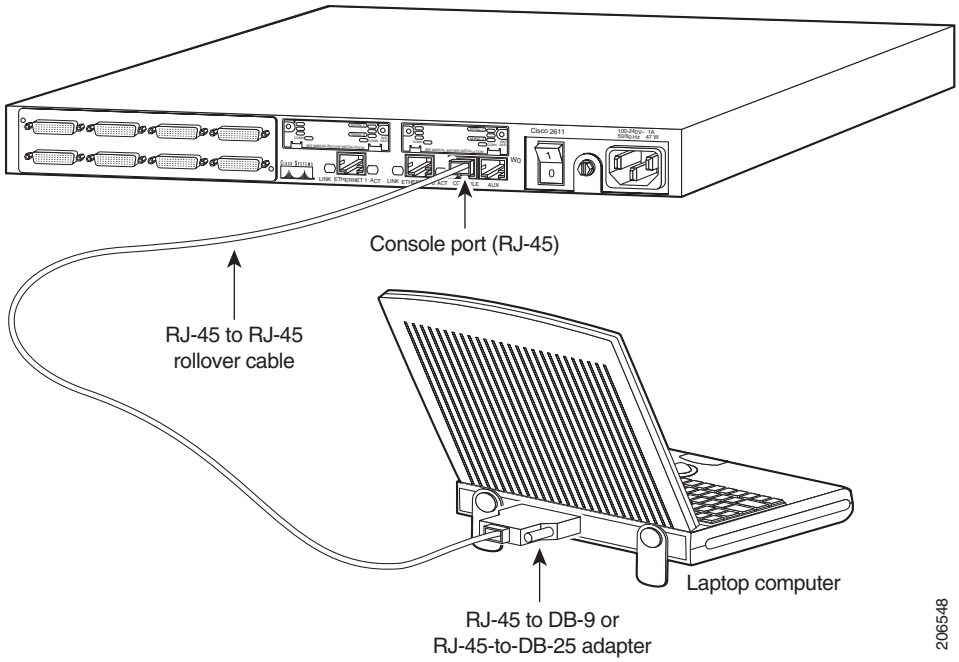
For information about console port pinouts, refer to the *Cisco Modular Access Router Cable Specifications* document available online and on the Documentation CD-ROM.

Note On the Cisco routers, the console port is color-coded blue.

Step 2 Configure your terminal or PC terminal emulation software for 9600 baud, 8 data bits, no parity, and 1 stop bit.

Note Because hardware flow control is not possible on the console port, we do not recommend that modems be connected to the console port. Modems should be connected only to the auxiliary port.

Figure 3-23 Connecting to a Console Terminal



Connecting to the Auxiliary Port

To connect a modem to the auxiliary port on the router, perform the following procedure:

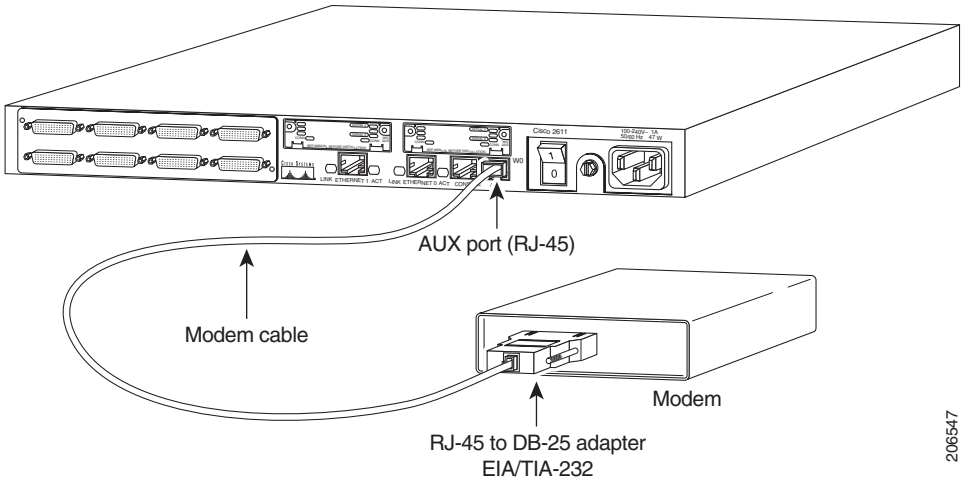
Step 1 Connect a modem to the auxiliary port using the black RJ-45-to-DB-25 adapter cable. (See Figure 3-24.)

For information about auxiliary port pinouts, refer to the *Cisco Modular Access Router Cable Specifications* document available online and on the Documentation CD-ROM.

Note On the Cisco routers, the auxiliary port is color-coded black.

Step 2 Make sure that your modem and the auxiliary port on the router are configured for the same transmission speed (up to 115200 bps is supported) and hardware flow control with Data Carrier Detect (DCD) and Data Terminal Ready (DTR) operations.

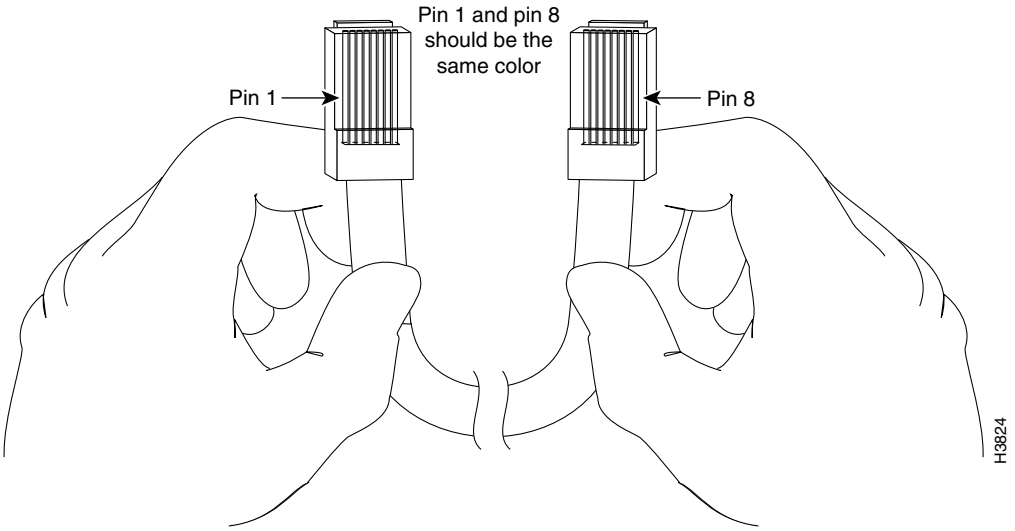
Figure 3-24 Connecting a Modem to the Auxiliary Port



Identifying a Rollover Cable

Use a rollover cable to connect to the asynchronous serial console and auxiliary ports. You can identify a rollover cable by comparing the two modular ends of the cable. Hold the cables side-by-side, with the tab at the back. The wire connected to the pin on the outside of the left plug should be the same color as the wire connected to the pin on the outside of the right plug. (See Figure 3-25.) If your cable came from Cisco, pin 1 will be white on one connector, and pin 8 will be white on the other (a rollover cable reverses pins 1 and 8, 2 and 7, 3 and 6, and 4 and 5).

Figure 3-25 Identifying a Rollover Cable



Powering Up the Router

Warning **The plug-socket combination must be accessible at all times because it serves as the main disconnecting device.** Statement 1019

Caution To ensure adequate cooling, never operate the router unless the unit is completely closed.

This section covers the following topics:

Checklist for Power Up

You are ready to power up the Cisco router if the following steps are completed:

- Chassis is securely mounted.
- Power and interface cables are connected.
- Your PC terminal emulation program is configured for 9600 baud, 8 data bits, 1 stop bit, and no parity.
- You have selected passwords for access control.
- You have determined the IP addresses for the Ethernet and serial interfaces.

Front Panel Indicators

The following indicator LEDs provide power, activity, and status information:

Routers with 1-RU Chassis Height

The following indicator LEDs provide power, activity, and status information:

- POWER (green)—Lit when power is on.
- RPS (green)—
  - Off—No redundant power supply (RPS) is present
  - Blinking —System is booted, RPS is present, RPS failure
  - Continuous on—System is booted, RPS is present, no RPS failure
- ACTIVITY (green)—
  - Slow, steady blinking—System is booting
  - Blinks during system activity, such as interrupts and packet transfers

Routers with 2-RU Chassis Height

The following indicator LEDs provide power, activity, and status information:

- PWR (green)—Lit when power is on.
- SYS/RPS (green)—
  - Rapid blinking (200 ms)—System is booting
  - Slow blinking (1 s)—Redundant power supply (RPS) failure
  - Continuous on—System okay
- ACT (green)—Blinks during system activity, such as interrupts and packet transfers

For more detailed information about the LEDs, see Appendix A, "Troubleshooting."

Power-Up Procedure

To power up your Cisco router and verify that it goes through its initialization and self-test, follow this procedure. When the procedure is finished, the Cisco router is ready to configure.

If you encounter problems when you power on the router, see Appendix A, "Troubleshooting." For information about the ROM monitor and the bootstrap program, see Appendix B, "Using the ROM Monitor." For information about the configuration register, see Appendix C, "Configuration Register."

Note To view the boot sequence through a terminal session, you must have a console connection to the Cisco router *before* it powers up.

Step 1 Make sure that your PC is powered up and connected as described in the "Checklist for Power Up" section on page 3-23.

Step 2 Move the power switch to the ON position.

The following indications appear:

- The green POWER or PWR LED on the front of the chassis comes on.
- The fan operates.

Depending on your installation, Fast Ethernet (0/0, 0/1) and Network Module (Active, Ready) LEDs might also come on.

If you encounter problems when you power up the router, see Appendix A, "Troubleshooting."

Messages begin to appear in your terminal emulation program window.

Caution *Do not press any keys on the keyboard until the messages stop*. Any keys pressed during this time are interpreted as the first command typed when the messages stop, which might cause the router to power off and start over. It takes a few minutes for the messages to stop.

You may see different startup messages:

- If you see the following messages, the router has booted with a configuration file and is ready for initial configuration using Cisco Router and Security Device Manager (SDM).

```
yourname con0 is now available

Press RETURN to get started.
```

If SDM is installed on your router, we recommend using SDM to perform the initial configuration. For configuration procedures using SDM, refer to the quick start guide that shipped with your router.

You can also access the Cisco 2600 series routers quick start guides online at the following URL:

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_mod/cis2600/26xx_qsg/index.htm

- If you see the following messages, the router has booted and is ready for initial configuration using the setup command facility or the command-line interface (CLI).

```
--- System Configuration Dialog ---

At any point you may enter a question mark '?' for help.
Use ctrl-c to abort configuration dialog at any prompt.
Default settings are in square brackets '[]'.

Would you like to enter the initial configuration dialog? [yes/no]:
```

To learn how to use the setup command facility to configure the router, see the "Initial Configuration Using the Setup Command Facility" section on page 3-26. To learn how to use the CLI to configure the router, see the "Initial Configuration Using the CLI (Manual Configuration)" section on page 3-28.

Note If the `rommon 1>` prompt appears, your system has booted in ROM monitor mode. For information on the ROM monitor, see the router rebooting and ROM monitor information in the *Cisco IOS Configuration Fundamentals Configuration Guide* for your Cisco IOS software release.

Configuring the Router

You can configure your router by using one of the following tools:

- Cisco Router and Security Device Manager. If your router was purchased with a virtual private network (VPN) bundle, Cisco Router and Security Device Manager is installed on the router. See the "Initial Configuration Using SDM" section on page 3-26
- Setup command facility. you can use the setup command facility to prompt you for basic router information. After the configuration file has been created, you can use the CLI or use Cisco Router and Security Device Manager to perform additional configuration. See the "Initial Configuration Using the Setup Command Facility" section on page 3-26.
- Command-line interface (CLI). If you prefer to use the Cisco IOS CLI, see the "Initial Configuration Using the CLI (Manual Configuration)" section on page 3-28 for instructions on how to use the CLI.

Note If you need help with interface and port numbering, see the "Interface Numbering" section on page 1-9.

Initial Configuration Using SDM

If Cisco Router and Security Device Manager has been installed on your router, the following messages appear at the end of the startup sequence:

```
yourname con0 is now available

Press RETURN to get started.
```

For configuration procedures using SDM, refer to the quick start guide that shipped with your router.

You can also access the Cisco 2600 series routers quick start guides online at the following URL:

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_mod/cis2600/26xx_qsg/index.htm

Initial Configuration Using the Setup Command Facility

This section shows how to use the setup command facility to configure a hostname for the router, set passwords, and configure an interface for communication with the management network. If you see the following messages at the end of the startup sequence, the setup command facility has been invoked automatically:

```
--- System Configuration Dialog ---

At any point you may enter a question mark '?' for help.
Use ctrl-c to abort configuration dialog at any prompt.
Default settings are in square brackets '[]'.

Would you like to enter the initial configuration dialog? [yes/no]:
```

The setup command facility prompts you for basic information about your router and network, and it creates an initial configuration file.The prompts vary, depending on your router model, the installed interface modules, and the software image. The following example and the user entries (in **bold**) are shown as examples only.

For a description of the interface numbering, see the "Interface Numbering" section on page 1-9.

Note If you make a mistake while using the setup command facility, you can exit and run the setup command facility again. Press **Ctrl-C**, and enter **setup** at the privileged EXEC mode prompt (`Router#`).

Step 1 To proceed using the setup command facility, enter **yes** when the power-up messages have ended.

```
Would you like to enter the initial configuration dialog? [yes/no]: yes
```

Step 2 When the following messages appear, press **Return** to enter basic management setup:

```
At any point you may enter a question mark '?' for help.
Use ctrl-c to abort configuration dialog at any prompt.
Default settings are in square brackets '[]'.

Basic management setup configures only enough connectivity
for management of the system, extended setup will ask you
to configure each interface on the system

Would you like to enter basic management setup? [yes/no]: yes
```

Step 3 Enter a hostname for the router (this example uses **2600**):

```
Configuring global parameters:

Enter hostname [Router]: 2600
```

Step 4 Enter an enable secret password. This password is encrypted (more secure) and cannot be seen when viewing the configuration:

```
The enable secret is a password used to protect access to
privileged EXEC and configuration modes. This password, after
entered, becomes encrypted in the configuration.
Enter enable secret: xxxxxx
```

Step 5 Enter an enable password that is different from the enable secret password. This password is *not* encrypted (less secure) and can be seen when viewing the configuration:

```
The enable password is used when you do not specify an
enable secret password, with some older software versions, and
some boot images.
Enter enable password: xxxxxx
```

Step 6 Enter the virtual terminal password, which prevents unauthenticated access to the router through ports other than the console port:

```
The virtual terminal password is used to protect
access to the router over a network interface.
Enter virtual terminal password: xxxxxx
```

Step 7 Respond to the following prompts as appropriate for your network:

```
Configure SNMP Network Management? [yes]:
    Community string [public]:
```

Step 8 A summary of the available interfaces is displayed:

Note The interface numbering that appears is dependent on the type of Cisco modular router platform and on the installed interface modules and cards.

```
Current interface summary

Controller Timeslots D-Channel Configurable modes Status
T1 0/0     24        23        pri/channelized    Administratively up

Interface                  IP-Address      OK? Method Status                Prol
FastEthernet0/0            unassigned      NO  unset  up                    up
FastEthernet0/1            unassigned      NO  unset  up                    dow
```

Step 9 Select one of the available interfaces for connecting the router to the management network:

```
Enter interface name used to connect to the
management network from the above interface summary: fastethernet0/0
```

Step 10 Respond to the following prompts as appropriate for your network:

```
Configuring interface FastEthernet0/0:
Use the 100 Base-TX (RJ-45) connector? [yes]: yes
Operate in full-duplex mode? [no]: no
Configure IP on this interface? [yes]: yes
    IP address for this interface: 172.1.2.3
    Subnet mask for this interface [255.255.0.0] : 255.255.0.0
    Class B network is 172.1.0.0, 16 subnet bits; mask is /16
```

Step 11 The configuration is displayed:

```
The following configuration command script was created:

hostname fig
enable secret 5 $1$D5P6$PYx41/lQIASK.HcSbfO5q1
enable password xxxxxx
line vty 0 4
password xxxxxx
snmp-server community public
!
no ip routing

!
interface FastEthernet0/0
no shutdown
media-type 100BaseX
half-duplex
ip address 172.1.2.3 255.255.0.0
!
interface FastEthernet0/1
shutdown
no ip address
!
end
```

Step 12 Respond to the following prompts. Select [2] to save the initial configuration.:

```
[0] Go to the IOS command prompt without saving this config.
[1] Return back to the setup without saving this config.
[2] Save this configuration to nvram and exit.

Enter your selection [2]: 2
Building configuration...
Use the enabled mode 'configure' command to modify this configuration.


Press RETURN to get started!
```

Step 13 The user prompt appears:

```
2600>
```

After you complete the initial configuration tasks, your Cisco router is ready to configure for specific functions. For configuration procedures, refer to the *Software Configuration Guide for Cisco 2600 Series, Cisco 3600 Series, and Cisco 3700 Series Routers*. or the Cisco IOS software configuration documentation. You can access these documents on Cisco.com and on the Documentation CD-ROM.

Initial Configuration Using the CLI (Manual Configuration)

This section shows how to bring up a command-line interface (CLI) prompt for configuration using the CLI, and it directs you to documentation for the CLI configuration.You can use the CLI if you see the following messages at the end of the startup sequence:

```
--- System Configuration Dialog ---

At any point you may enter a question mark '?' for help.
Use ctrl-c to abort configuration dialog at any prompt.
Default settings are in square brackets '[]'.
```

```
Would you like to enter the initial configuration dialog? [yes/no]:
```

Note If these messages do not appear, SDM and a default configuration file have been installed on the router at the factory. To use SDM to configure the router, refer to the quick start guide that shipped with your router. You can also access the Cisco2600 series routers quick start guides online at the following URL:

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_mod/cis2600/26xx_qsg/index.htm

Note To avoid losing work you have completed, be sure to save your configuration occasionally as you proceed. Use the **copy running-config startup-config** command to save the configuration to NVRAM.

Step 1 To proceed with manual configuration using the CLI, enter **no**:

```
Would you like to enter the initial configuration dialog? [yes/no]: no
```

Step 2 Press **Return** to terminate autoinstall and continue with manual configuration:

```
Would you like to terminate autoinstall? [yes] Return

Several messages are displayed, ending with a line similar to the following:
...
Copyright (c) 1986-2000 by cisco Systems, Inc.
Compiled <date> <time> by <person>
```

Step 3 Press **Return** to bring up the `Router>` prompt:

```
...
flashfs[4]: Initialization complete.
Router>
```

Step 4 Enter privileged EXEC mode:

```
Router> enable
Router#
```

For configuration using the CLI, refer to the *Software Configuration Guide for Cisco 2600 Series, Cisco 3600 Series, and Cisco 3700 Series Routers*. or the Cisco IOS software configuration documentation. You can access these documents on Cisco.com and on the Documentation CD-ROM.