CHAPTER 3

Installing the Router

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

Warning **Only trained and qualified personnel should be allowed to install or replace this equipment. To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information* document that accompanied this device.**

Required Tools and Equipment

Installation might require some tools and equipment that are not provided as standard equipment with the router. Following are the tools and parts required for a typical router installation:

- Number 2 Phillips screwdriver.
- Flat-blade screwdrivers: small, 3/16-in. (0.476 cm) and medium, 1/4-in. (0.625 cm).
- Electrostatic discharge (ESD)-preventive wrist strap.
- Screws to secure the rack-mount brackets to the router.
- Grounding lug with attaching screws.
- Cables for connecting a PC or modem to the router (included).
- Cables for connection to the WAN and LAN ports (dependent on configuration):
  - Ethernet 10BASE-T cable for connection to an Ethernet port (included).
  - Ethernet 100BASE-T cable for connection to a Fast Ethernet port (included).
  - Token Ring lobe cable for connection to the Token Ring port (included).

Note For more information on cable specifications, refer to the online document *Cisco Modular Access Router Cabling Specifications* on the Documentation CD-ROM that accompanied your router package and on Cisco.com. For cable ordering information, see "Obtaining Technical Assistance".

- Ethernet 10BASE-T hub or PC with a network interface card for connection to the Ethernet (LAN) port(s).
- Console terminal (an ASCII terminal or a PC running terminal emulation software) configured for 9600 baud, 8 data bits, no parity, and 2 stop bits. A terminal is required unless you are using the AutoInstall procedure. See the "Connecting the Console Terminal and Modem" section on page 3-20 for instructions on connecting a console terminal.
- Modem for connection to the auxiliary port for remote administrative access. (Optional)

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:

Cisco 2600 series routers include the following models:

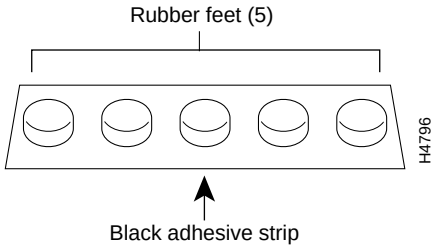
- Cisco 2610 and Cisco 2610XM
- Cisco 2611 and Cisco 2611XM
- Cisco 2612 and Cisco 2613
- Cisco 2620 and Cisco 2620XM
- Cisco 2621 and Cisco 2621XM
- Cisco 2650 and Cisco 2650XM
- Cisco 2651 and Cisco 2651XM
- Cisco 2691

Setting the Chassis on a Desktop

Before setting the router on a desktop, shelf, or other flat, secure surface, perform the following steps to install the rubber feet:

Step 1 Locate the rubber feet on the black adhesive strip that shipped with the chassis. (See Figure 3-1.)

Figure 3-1 Identifying the Rubber Feet



Step 2 Place the router upside down on a smooth, flat surface.

Step 3 Peel off the rubber feet from the black adhesive strip and place them adhesive-side down onto the five round, recessed areas on the bottom of the chassis. (See Figure 3-2 and Figure 3-3.)

Figure 3-2 Rubber Feet Location on Cisco 261x, Cisco 262x, Cisco 26xxXM, and Cisco 265x Series Routers

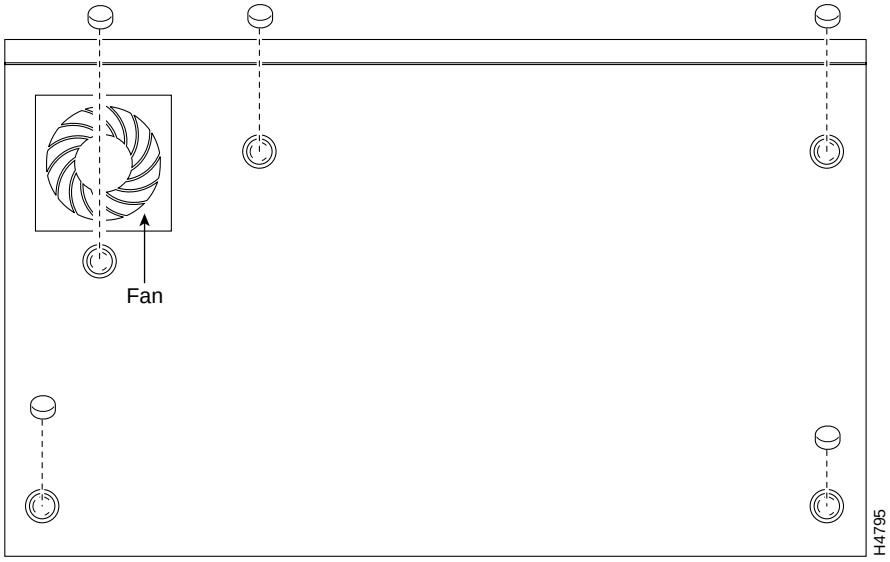
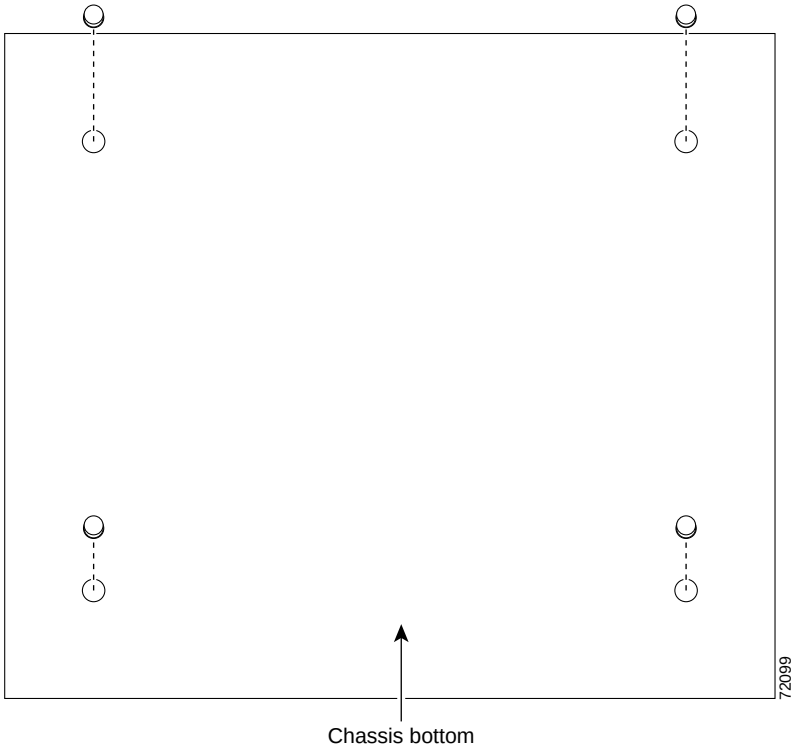


Figure 3-3 Rubber Feet Location on Cisco 2691 Router



Step 4 Place the router right-side up on a flat, smooth, secure surface.

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

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 a 19-inch rack. The brackets are shown in Figure 3-4 and Figure 3-5.

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. To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information* document that accompanied this device. The following guidelines are provided to ensure your safety:**

- If the rack contains only one unit, mount the unit at the bottom of the rack.
- If the rack is partially filled, load the rack from the bottom to the top, with the heaviest component at the bottom of the rack.

- If the rack contains stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

Figure 3-4 Brackets for Cisco 261x, Cisco 262x, Cisco 26xxXM, and Cisco 265x Series Routers

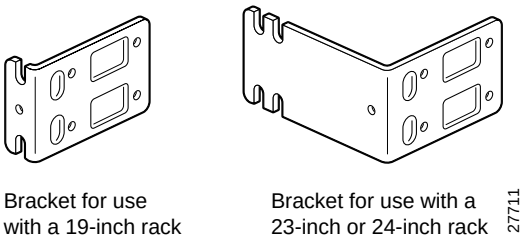
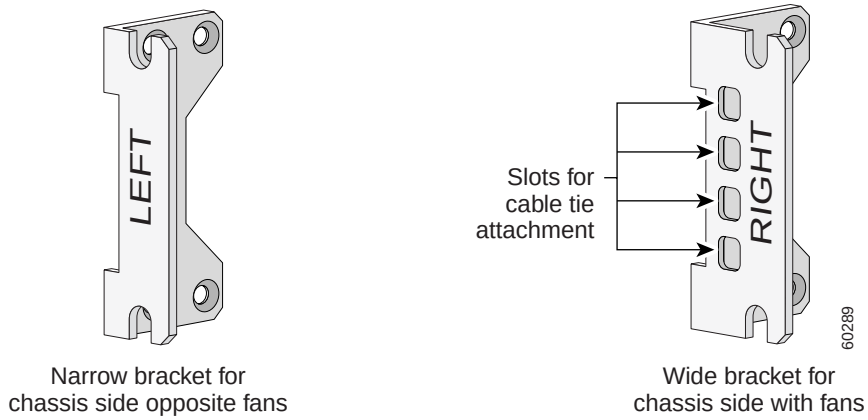


Figure 3-5 Brackets for Cisco 2691 Router



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 3-6 and Figure 3-7)
- With the rear panel forward (see Figure 3-8 and Figure 3-9)
- In a center-mount rack, with the rear panel forward (see Figure 3-10 through Figure 3-12)

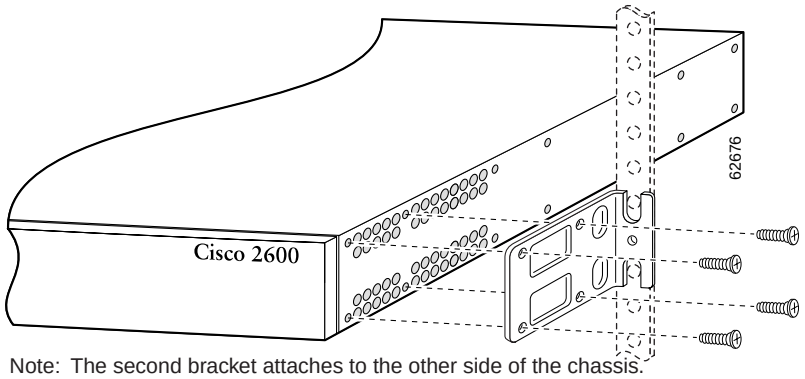
Note Use the screws that came with your router package for attaching the brackets.

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 3-6.)

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 3-7.)

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 3-6 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, the Cisco 2600 series routers will protrude beyond the front of the rack.

Figure 3-7 Bracket Installation—Front Panel Forward (19-Inch Rack with a 17.75-Inch Opening or a 23- or 24-Inch Rack)

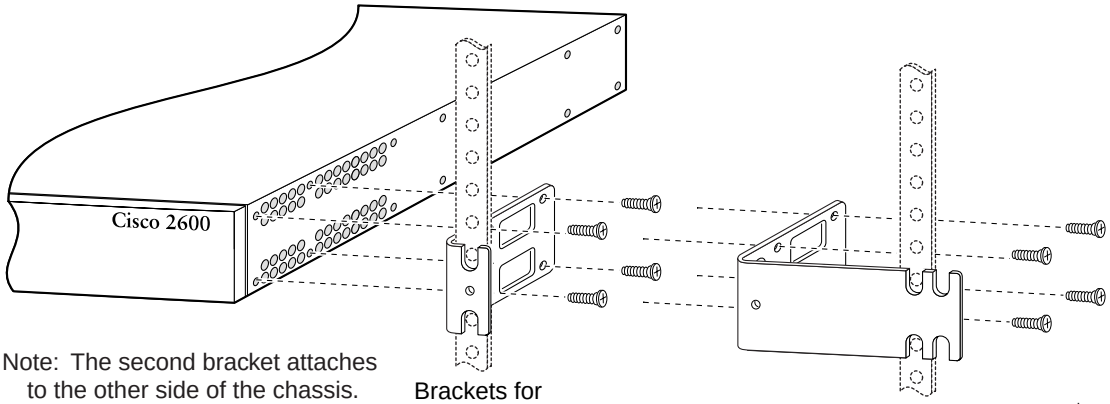


Figure 3-8 Bracket Installation—Rear Panel Forward (19-Inch Rack with a 17.5-Inch Opening)

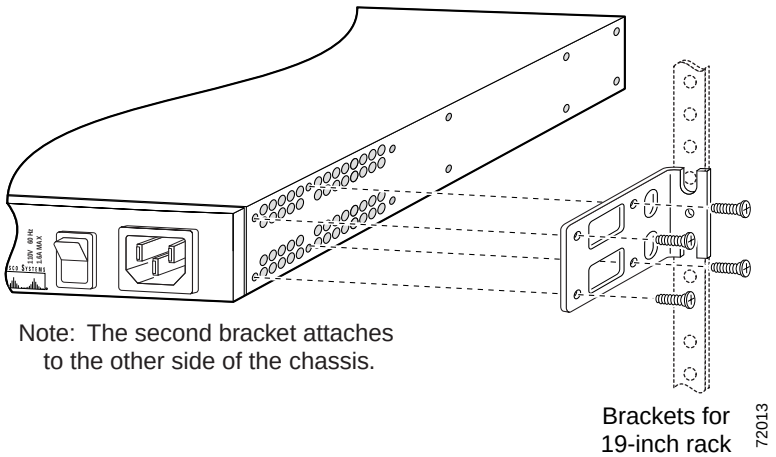


Figure 3-9 Bracket Installation—Rear Panel Forward (19-Inch Rack with a 17.75-Inch Opening or a 23- or 24-Inch Rack)

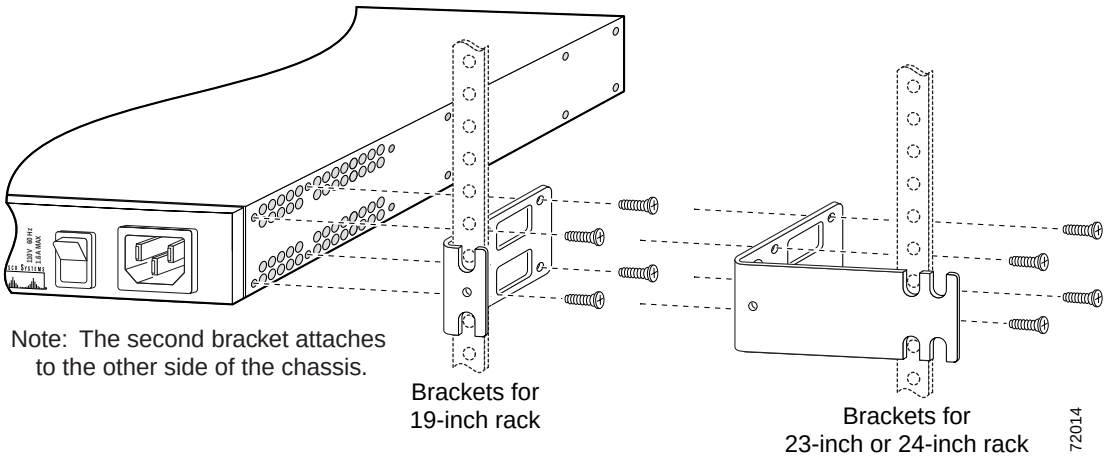


Figure 3-10 Center-Mount Bracket Installation—Rear Panel Forward (19-Inch Rack with a 17.75-Inch Opening or a 23- or 24-Inch Rack)

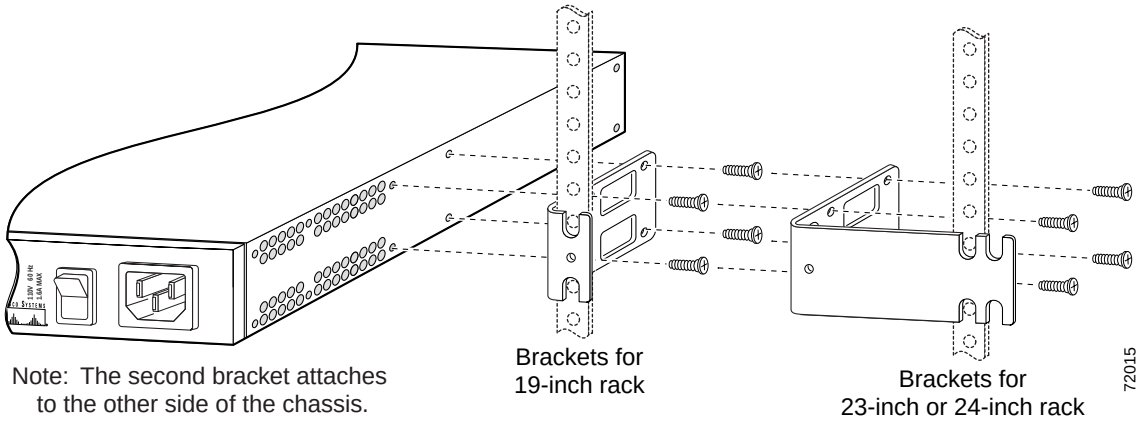


Figure 3-11 Center-Mount Bracket Installation—Rear Panel Forward (19-Inch Rack with a 17.5-Inch Opening or a 23- or 24-Inch Rack)

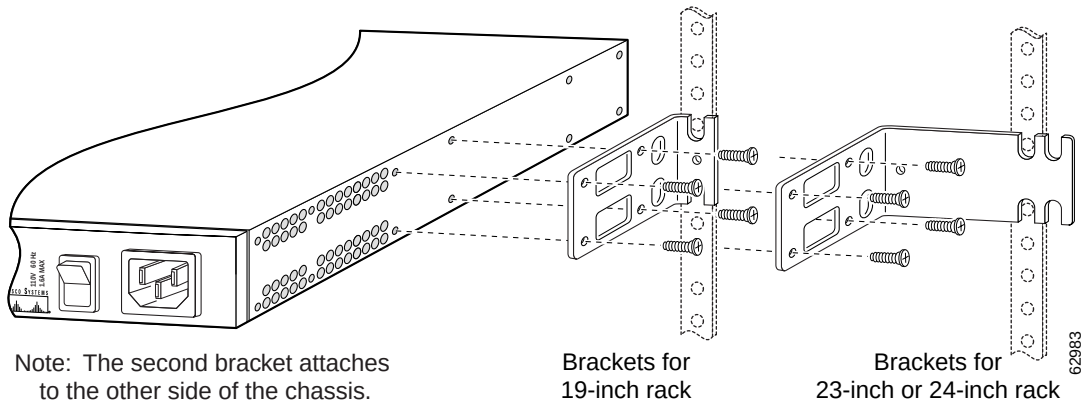
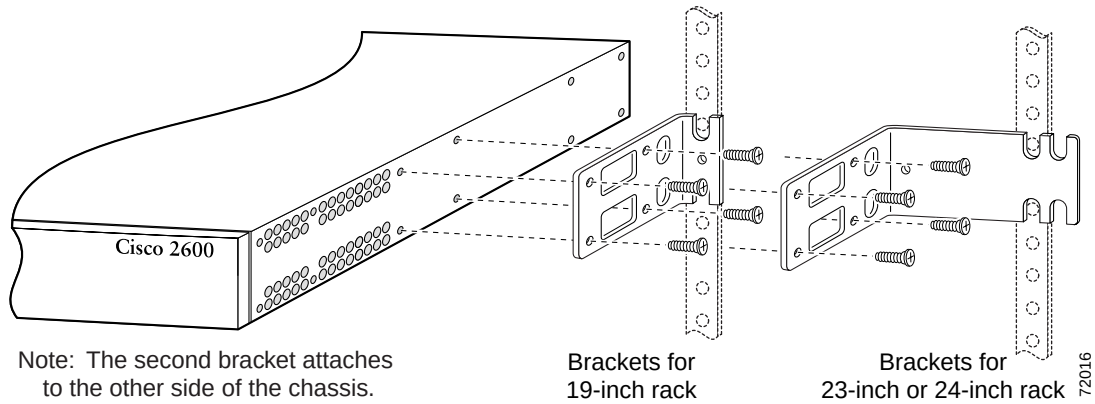


Figure 3-12 Center-Mount Bracket Installation—Front Panel Forward (19-Inch Rack with a 17.5-Inch Opening or a 23- or 24-Inch Rack)



Attaching the Brackets to a Cisco 2691 Router

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

- With the front panel forward (see Figure 3-13.)
- With the rear panel forward (see Figure 3-14.)
- In a center-mount rack (see Figure 3-15 and Figure 3-16.)

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

Figure 3-13 Bracket Installation—Front Panel Forward (19-Inch Rack)

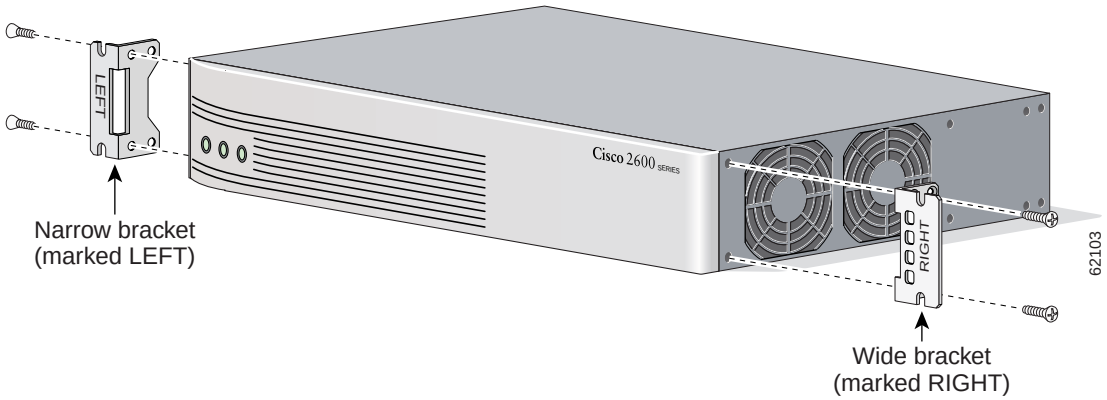


Figure 3-14 Bracket Installation—Rear Panel Forward (19-Inch Rack)

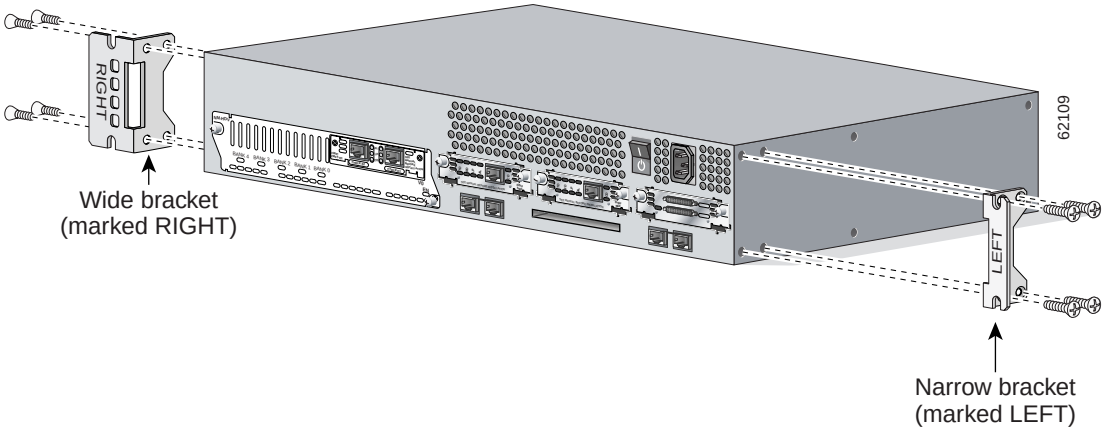


Figure 3-15 Center-Mount Bracket Installation—Front Panel Forward (19-Inch Rack)

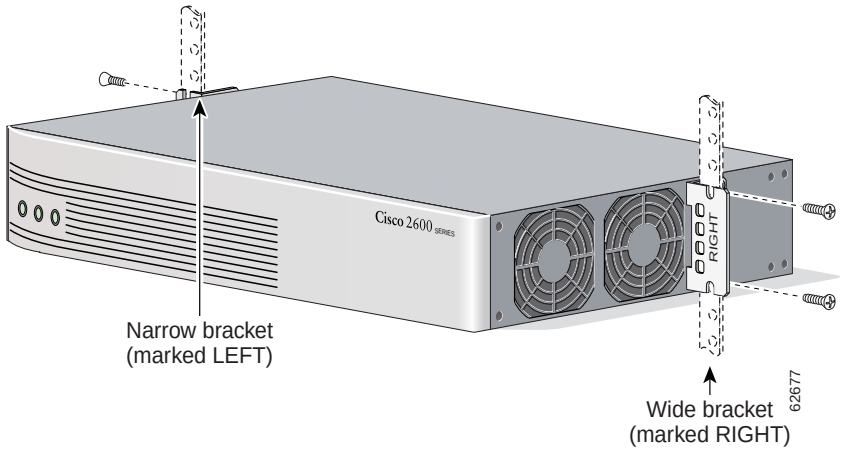
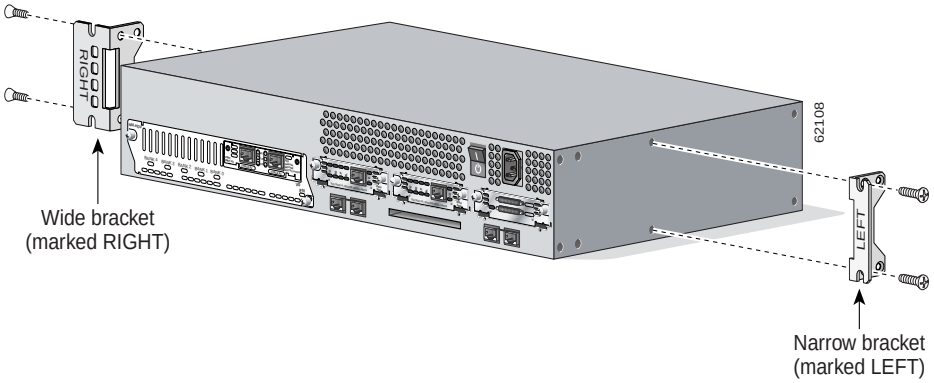


Figure 3-16 Center-Mount Bracket Installation—Rear Panel Forward (19-Inch Rack)



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.

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.

Mounting the Chassis on the Wall

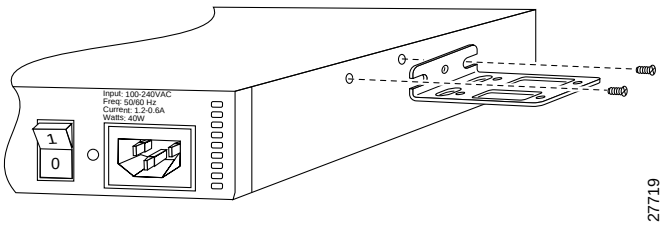
Cisco 2600 series routers with a chassis height of 1RU can be attached to a wall. Mounting a 2RU chassis to a wall is not recommended and brackets are not provided for mounting to a wall.

Note Use 19-inch brackets (shown in Figure 3-4) to wall-mount the chassis. The small brackets provide the most stable installation for the chassis.

To wall-mount the chassis:

Step 1 Attach the brackets as shown in Figure 3-17.

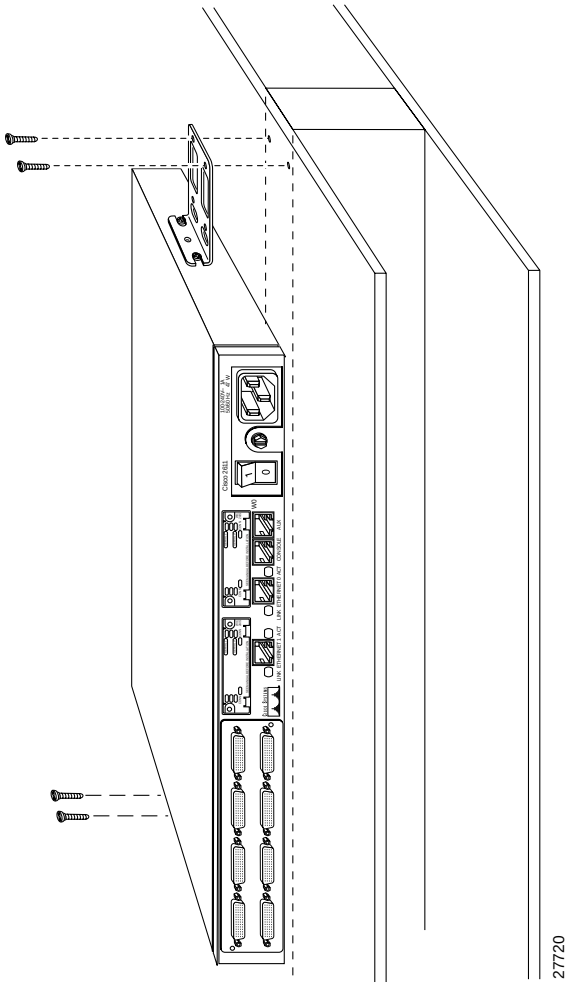
Figure 3-17 Attaching the Wall-Mount Brackets



Step 2 Attach the chassis assembly to the wall as shown in Figure 3-18, using screws and anchors that you provide. We recommend the following:

- For the best support of the chassis and cables, attach the brackets so that the screws align with a vertical wall stud. (See Figure 3-18.) This position will prevent the chassis from pulling away from the wall when cables are attached.
- For the best ventilation of the chassis, mount the chassis with the power supply and fan at the top. Make sure there is clearance between the router and the wall.

Figure 3-18 Mounting the Chassis on the Wall



Connecting the DC Power Supply

Cisco 261x, Cisco 262x, Cisco 26xxXM, and Cisco 265x series routers offer an optional DC power supply. This section describes the DC power supply specifications and wiring.

Warning **This unit is intended for installation in restricted access areas. A restricted access area is where access can only be gained by service personnel through the use of a special tool, lock and key, or other means of security, and is controlled by the authority responsible for the location. To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information* document that accompanied this device.**

DC Power Specifications

The DC power supply is intended for use in DC-operating environments. Table 3-1 lists the power supply specifications.

Table 3-1 DC Power Supply Specifications

Description	Design Specification
Power (input)	65W, –38 to –72 VDC
Wire gauge for power connections	14 AWG[1]

1. AWG = American Wire Gauge.

Wiring the DC Power Supply

If you ordered a router with a DC power supply, follow the directions in this section to wire the terminal block.

Note This product is intended for installation in restricted access areas and is approved for use with 14 AWG copper conductors only. The installation must comply with all applicable codes.

To wire the terminal block:

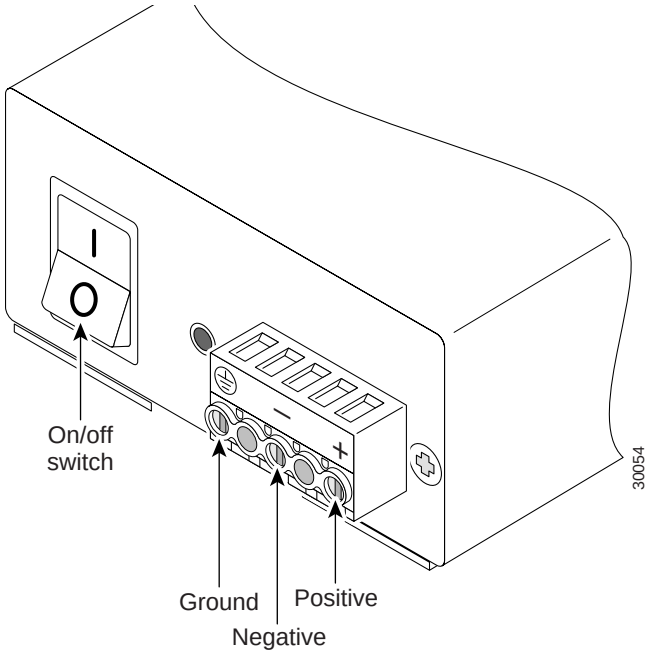
Warning **Before performing any of the following procedures, ensure that power is removed from the DC circuit. To ensure that all power is OFF, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position. To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information* document that accompanied this device.**

Step 1 Using 14 AWG copper wires, rewire the DC-input power source (-38 to -72 VDC).

Step 2 Identify the terminal block receptacles for the ground, positive, and negative power leads. (See Figure 3-19.)

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 block.

Figure 3-19 DC-Input Power Supply Terminal Block

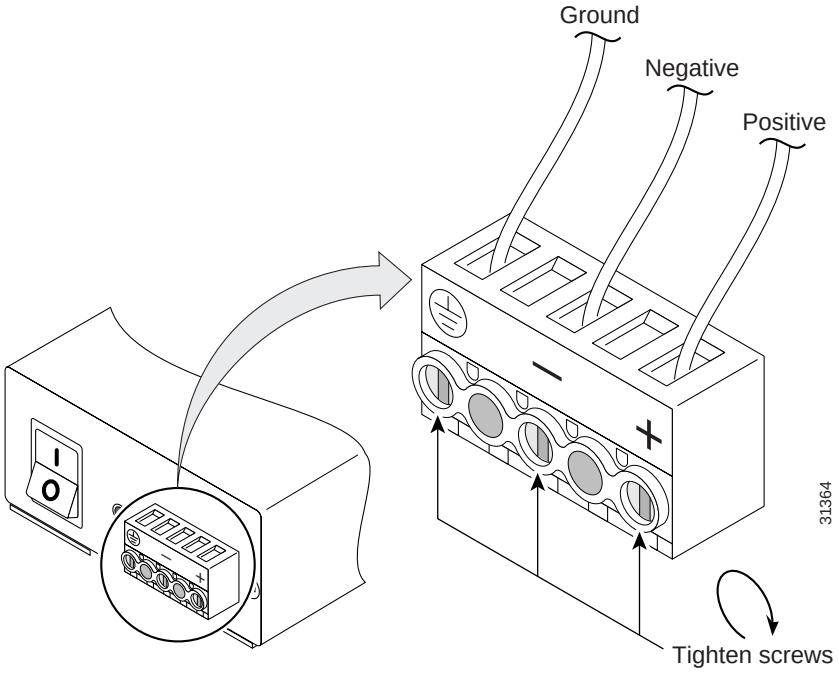


Step 3 Strip 3/16 in. of shielding from the free end of each power lead wire that is attached to the DC-input power supply.

Step 4 Insert the three power leads into the slotted wire receptacles on the terminal block. (See Figure 3-20.)

Warning **The illustration shows the DC power supply terminal block. The proper wiring sequence is ground to ground, positive to positive (line to L), and negative to negative (neutral to N). Note that the ground wire should always be connected first and disconnected last. To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information* document that accompanied this device.**

Figure 3-20 DC-Input Power Supply Connections



Step 5 Tighten the three screws to secure the power leads in the terminal block. (See Figure 3-20.)

Caution Do not overtorque the terminal block captive thumbscrew or terminal block contact screws. The recommended torque is 8.2 ± 0.4 in.-lb.

Step 6 After wiring the DC power supply, remove the tape from the circuit breaker switch handle and reinstate power by moving the handle of the circuit breaker to the ON position.

Grounding the Chassis

Warning **Units must have a permanent ground connection in addition to the power ground wire. A grounding lug must be installed to ensure proper electrical protection.**

Follow this procedure to attach the grounding lug to your router chassis:

Step 1 Turn OFF power to the router. Remove all network interface cables, including telephone cables, from the rear panel.

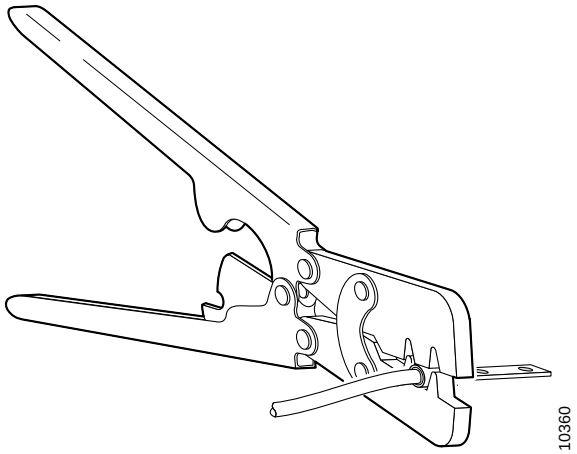
The following warning applies to routers that use a DC power supply:

Warning **Before working on a chassis or working near power supplies, unplug the power cord on AC units; disconnect the power at the circuit breaker on DC units. To see translations of the various warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information* document that accompanied this device.**

Step 2 Strip one end of the 6-AWG wire to expose approximately 0.75 in. (20 mm).

Step 3 Crimp the grounding lug around the wire. (See Figure 3-21.)

Figure 3-21 Crimping the Lug Around the Wire



Step 4 Use the number 2 Phillips screwdriver to fasten the grounding lug to the chassis. (See Figure 3-22 or Figure 3-23.)

Figure 3-22 Attaching the Grounding Lug on Cisco 261x, Cisco 262x, Cisco 26xxXM, and Cisco 265x Routers

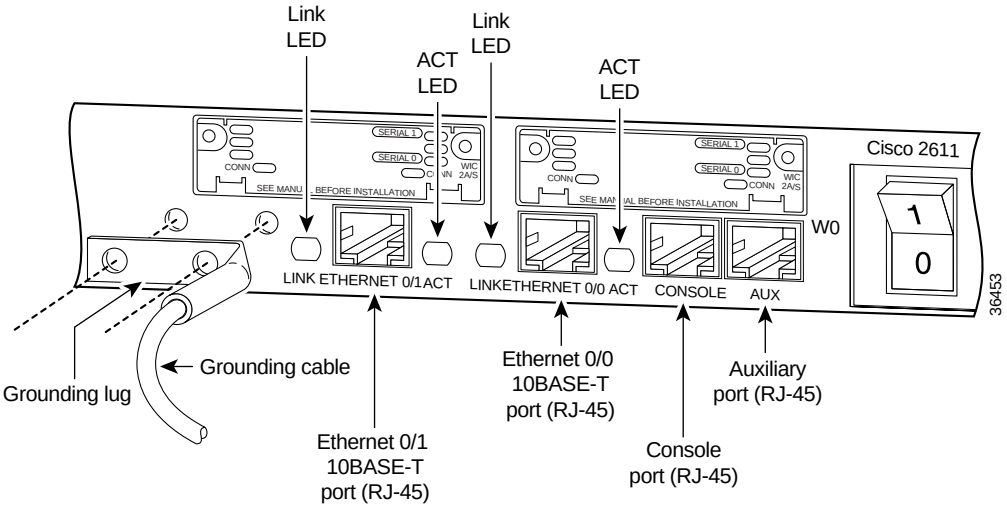
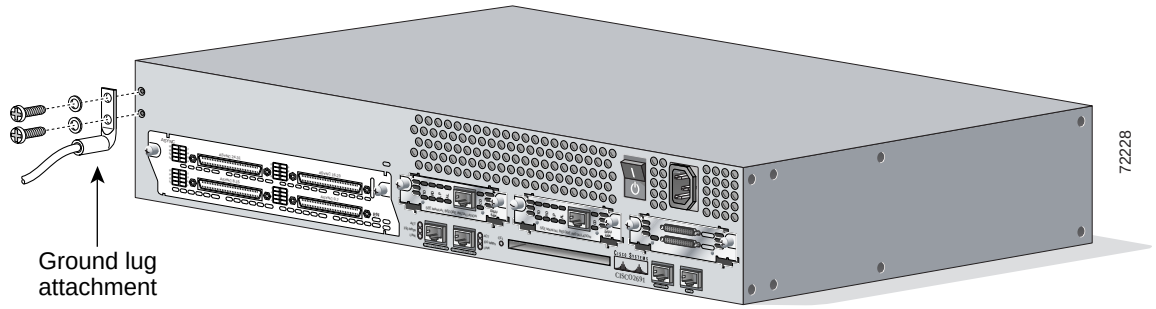


Figure 3-23 Attaching Grounding Lug on Cisco 2691



Step 5 Connect the other end of the ground lug wire to a grounding point at your site.

Step 6 Reconnect power and interface cables.

Power on the Router

Take the following steps to power on the router:

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

Step 1 a. For routers with AC input, plug the router's power cord into a three-terminal, single-phase power source that provides power within the acceptable range.

b. For routers with DC input, follow the instructions in the "Wiring the DC Power Supply" section on page 3-13.

Step 2 Power ON the router. The LED labeled SYSTEM on the front panel is on.

Connecting to a Network

Connecting to a LAN

This section explains how to use the Ethernet and/or Token Ring ports to connect the router to the LAN.

- The basic Ethernet and Token Ring cables required to connect the router to a network are provided with the router. (See Table 3-1.)
- For cable pinouts, refer to the online document *Cisco Modular Access Router Cabling Specifications* on the Documentation CD-ROM that came with your router and on Cisco.com.

Note Although the illustrations in this section show the Cisco 2611 router, the procedures are the same for all of the Cisco 2600 series routers.

Warning **Do not work on the system, or connect or disconnect cables during periods of lightning activity. To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information* document that accompanied this device.**

Table 3-2 Cable Connections for the Cisco 2600 Series Routers

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, light green	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-530) and the serial port operating mode (DTE or DCE). See the *Cisco Modular Access Router Cable Specifications* for information about selecting these cables.
Cisco Smart serial	Cisco Smart compact connector	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
T1 digital voice	RJ-48C/CA81A, black	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, orange	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	RJ-48S interface	RJ-48 straight-through

To connect your router to a network, connect the Ethernet or Token Ring port to a hub or directly to a switch such as a Cisco Catalyst 3900. (See Figure 3-24 or Figure 3-25.)

Figure 3-24 Connecting an Ethernet Hub

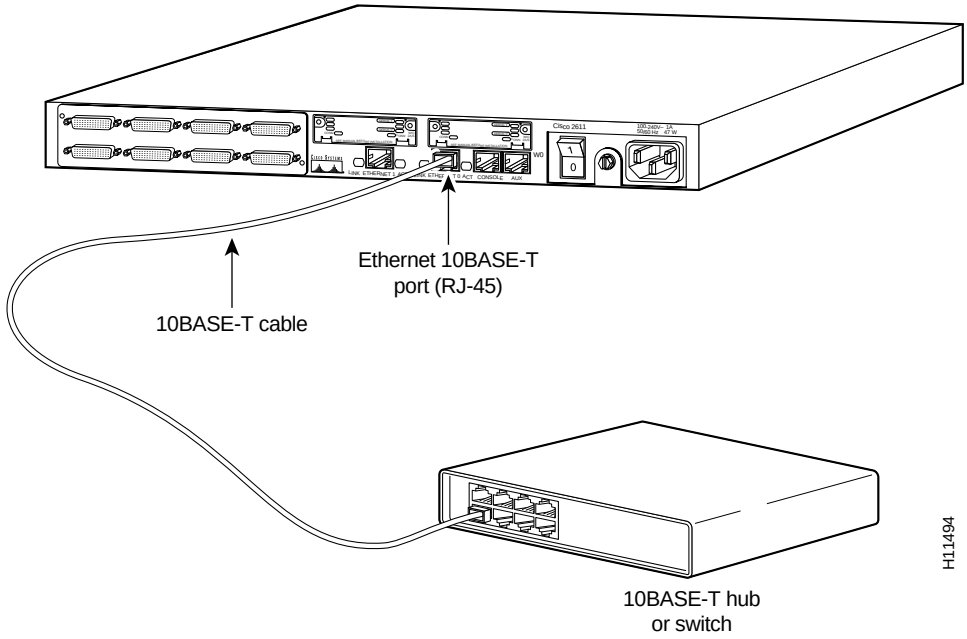
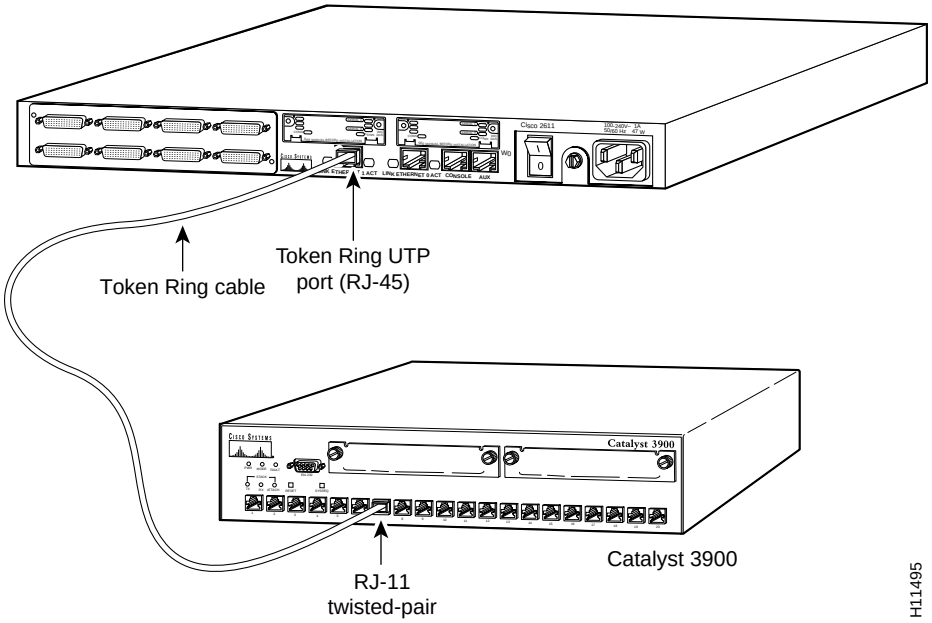


Figure 3-25 Connecting a Switch



Connecting to a WAN

Table 3-2 summarizes the WAN and voice connections for the Cisco 2600 series routers. For more information about connecting and configuring WAN and voice cards, refer to the online document *Cisco WAN Interface Cards Hardware Installation Guide*, available online at Cisco.com and the Documentation CD-ROM that came with your router.

Connecting the Console Terminal and 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 cables and adapters to connect your router to a PC or modem. These will include:

- One RJ-45 console cable (Blue)
- One RJ-45 auxiliary cable (Black)
- One RJ-45-to-DB-9 adapter (Labeled TERMINAL)
- One RJ-45-to-DB-25 adapter (Labeled MODEM)

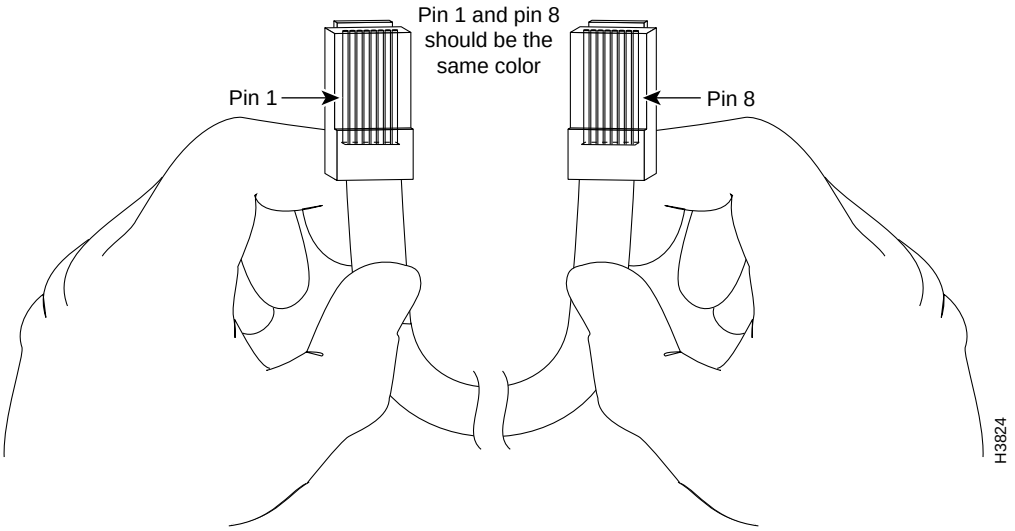
or

- One RJ-45-to-DB-9 adapter cable (Blue)
- One RJ-45-to-DB-25 adapter cable (Black)

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. Holding 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 3-26.)

Figure 3-26 Identifying a Rollover Cable

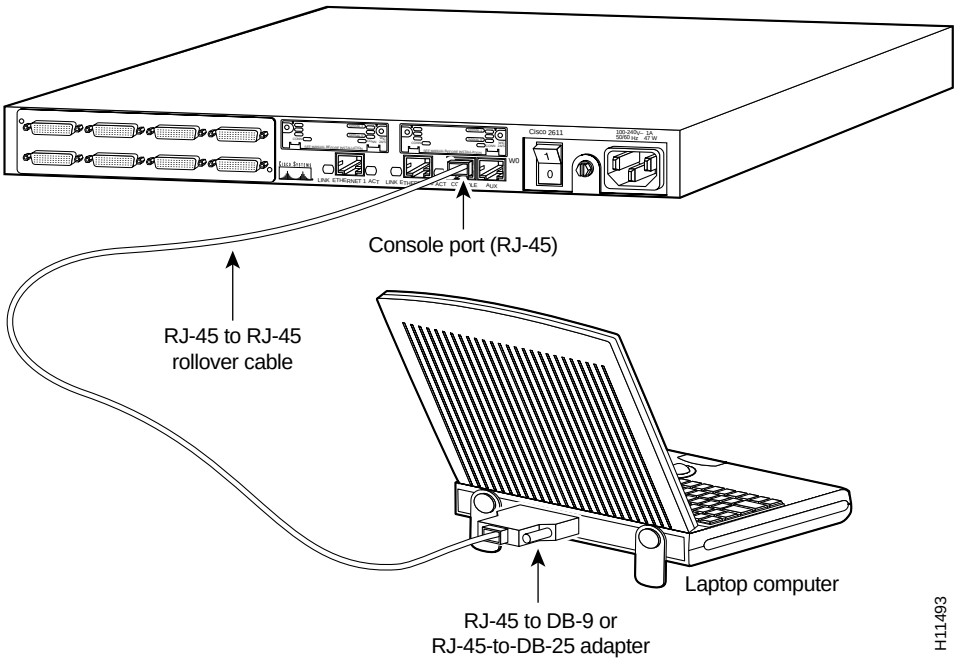


Connecting to the Console Port

To connect a terminal (an ASCII terminal or a PC running terminal emulation software) to the console port on the router:

Step 1 Connect the terminal using the blue RJ-45-to-RJ-45 console cable and an RJ-45-to-DB-9 adapter (labeled TERMINAL) or the blue RJ-45-to-DB-9 adapter cable. (See Figure 3-27.)

Figure 3-27 Connecting a Console Terminal



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

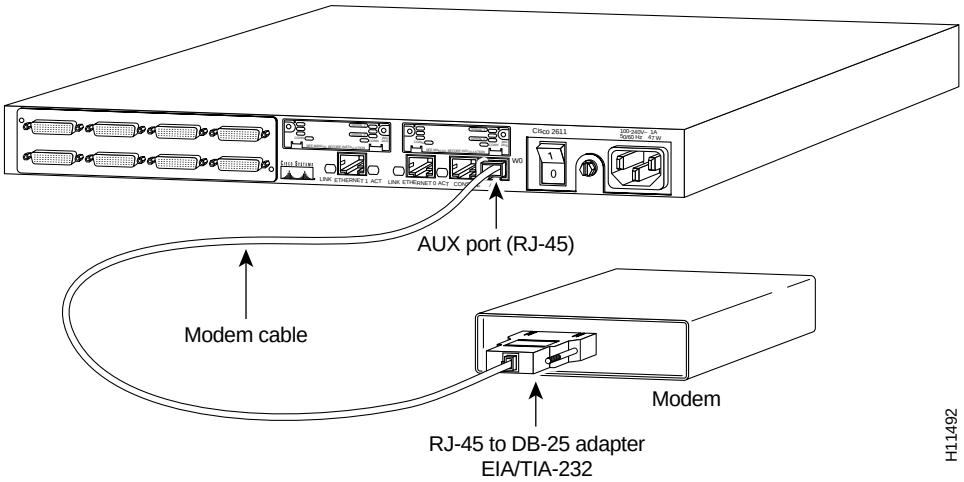
Note For information on console port pinouts, refer to the online document *Cisco Modular Access Router Cabling Specifications* on Cisco.com and the Documentation CD-ROM that accompanied your router.

Connecting a Modem to the Auxiliary Port

To connect a modem to the auxiliary port on the router:

Step 1 Connect a modem to the auxiliary port using the black RJ-45-to-RJ-45 auxiliary cable and the RJ-45-to-DB-25 adapter (labeled MODEM) or the black RJ-45-to-DB-25 adapter cable. (See Figure 3-28.)

Figure 3-28 Connecting a Modem



Step 2 Make sure that your modem and the auxiliary port on the router are configured for the same transmission speed (38400 baud is typical) and hardware flow control with Data Carrier Detect (DCD) and Data Terminal Ready (DTR) operations.

Note For information on auxiliary port pinouts, refer to the online document *Cisco Modular Access Router Cabling Specifications* on the Documentation CD-ROM that accompanied your router package and on Cisco.com.

What to Do After Installing Router Hardware

After you have installed the router, connect the power cable to the rear panel of the router and the power source, and then power it ON. (If the router does not power on, proceed to Appendix A, "Troubleshooting the Router.")

For initial configuration information, use the *Software Configuration Guide* (for Cisco 3600 series and Cisco 2600 series routers) available on Cisco.com and the documentation CD-ROM that accompanied your router.