

# Installing the Router

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This chapter guides you through the installation of the router and includes the following sections:

- Required Tools and Parts
- Installing the Rubber Feet
- Rack-Mounting the Chassis
- Wall-Mounting the Chassis
- Making External Connections
- What to Do after Installing the Router Hardware



**Caution** If you plan to place the router on a desk or table, do not place anything on top of the router that weighs in excess of 10 pounds (4.5 kg). Excessive weight on top could damage the chassis.

## Required Tools and Parts

Following are the tools and parts required to install the router:

- Flat-blade screwdrivers: small, 3/16-inch (0.476 cm), and medium, 1/4-inch (0.625 cm)
- ESD-preventive wrist strap
- Rack-mount brackets (used for rack or wall-mounting) and hardware (optional), including screws you must provide for rack and wall-mounting
- One interface cable for each interface you require

In addition, you might need the following external equipment:

- Channel service unit/digital service unit (CSU/DSU) for the serial interfaces.
- Ethernet transceiver (Models 2501, 2503, 2509, 2511, 2513, and 2514).
- Token Ring media attachment unit (MAU) (Models 2502, 2504, 2510, 2512, 2513, and 2515).
- For the Basic Rate Interface (BRI)—Access to an Integrated Services Digital Network (ISDN) through the NT1. The common carrier will provide the NT1 connection worldwide, except in North America, where the NT1 is customer owned.
- Modem for remote configuration (if required).
- Console terminal (configured for 9600 baud, 8 data bits, no parity, and 2 stop bits), if future reconfiguration is desired.

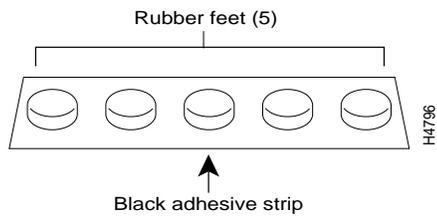
## Installing the Rubber Feet

This section explains how to install the rubber feet on the bottom of the chassis. If you want to rack-mount the chassis, skip this section and proceed with the next section, “Rack-Mounting the Chassis.” If you want to wall-mount the chassis, skip this section and proceed with the section “Wall-Mounting the Chassis” later in this chapter.

Before placing 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.)

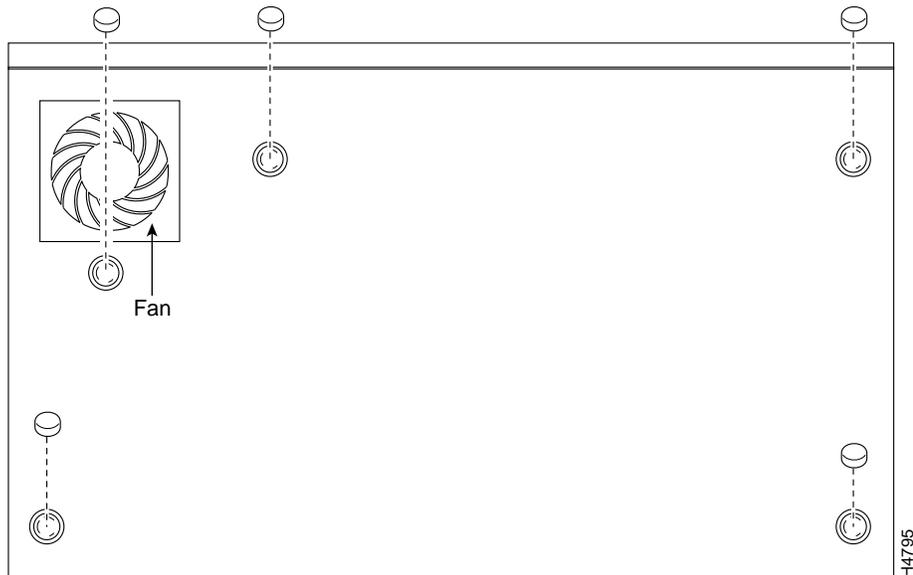
**Figure 3-1** Identifying the Rubber Feet



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

**Step 3** Peel off one of the rubber feet from the black adhesive strip and place it adhesive-side down onto one of the five round recessed areas on the back of the chassis, as shown in Figure 3-2. Repeat this step to install the remaining four feet.

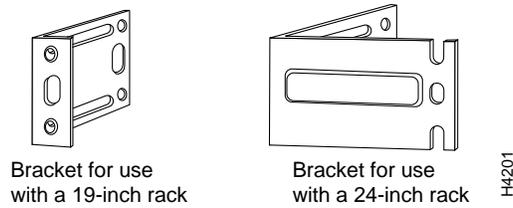
**Figure 3-2** Installing the Rubber Feet



## Rack-Mounting the Chassis

This section describes the procedures for rack-mounting the chassis. Your chassis ships with a bracket for use with a 19-inch rack or, if specified in your order, an optional larger bracket for use with a 24-inch rack. The brackets are shown in Figure 3-3.

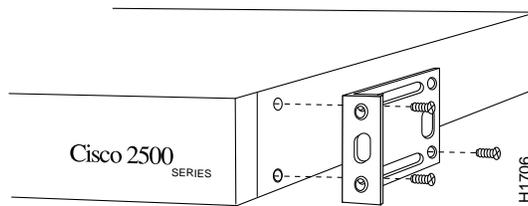
**Figure 3-3 Identifying the Brackets**



### Attaching the Brackets

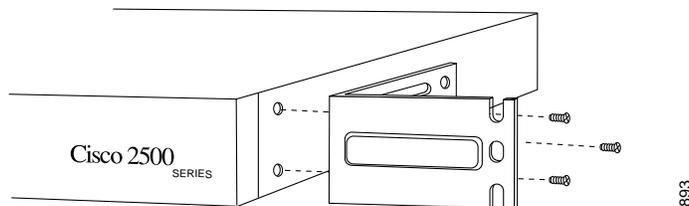
To install the chassis in a rack with the front panel forward, attach the brackets as shown in Figure 3-4 or Figure 3-5.

**Figure 3-4 19-Inch Rack Installation—Front Panel Forward**



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

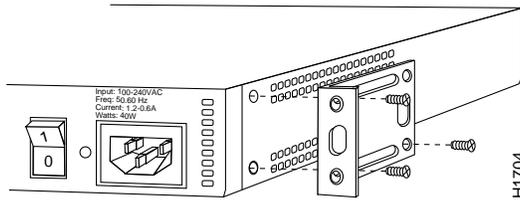
**Figure 3-5 24-Inch Rack Installation—Front Panel Forward**



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

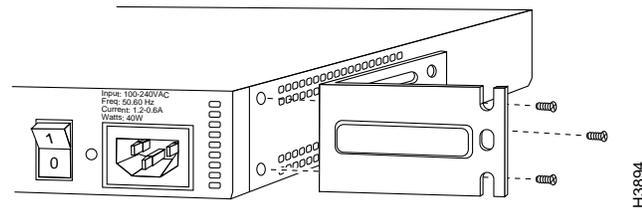
To install the chassis in a rack with the rear panel forward, attach the brackets as shown in Figure 3-6 or Figure 3-7.

**Figure 3-6 19-Inch Rack Installation—Rear Panel Forward**



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

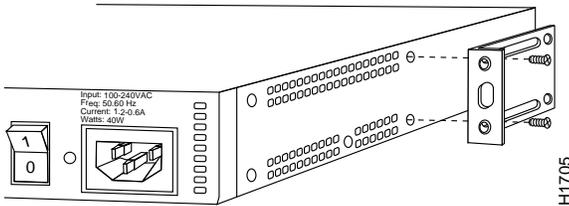
**Figure 3-7 24-Inch Rack Installation—Rear Panel Forward**



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

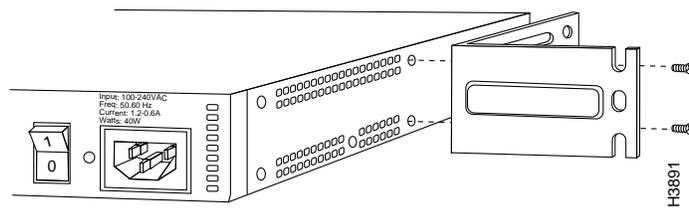
To install the chassis in a center-mount telco rack, attach the brackets as shown in Figure 3-8 or Figure 3-9.

**Figure 3-8 Telco 19-Inch Rack Installation—Rear Panel Forward**



Note: The second bracket attaches to the other side of the chassis.  
The brackets can also be installed with the front panel forward.

**Figure 3-9 Telco 24-Inch Rack Installation—Rear Panel Forward**

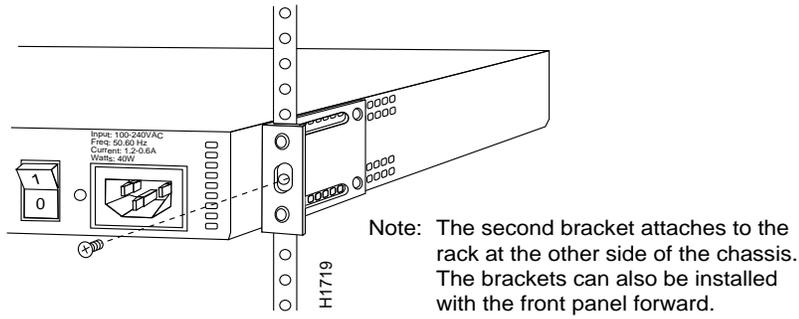


Note: The second bracket attaches to the other side of the chassis.  
The brackets can also be installed with the front panel forward.

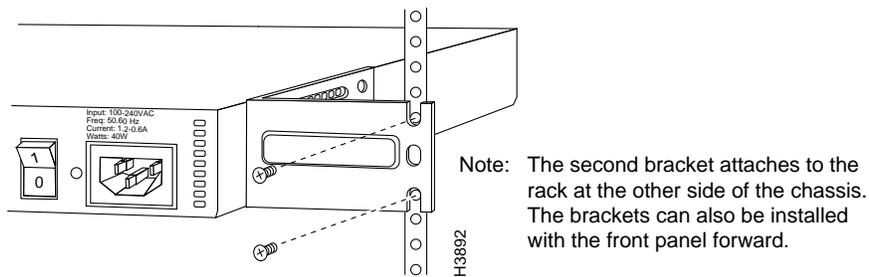
## Installing in a Rack

After the brackets are secured to the chassis, you can rack-mount the chassis. Using the screws you provide, attach the chassis to the rack as shown in Figure 3-10 or Figure 3-11.

**Figure 3-10 Attaching the Chassis to the 19-Inch Rack—Rear Panel Forward**



**Figure 3-11 Attaching the Chassis to the 24-Inch Rack—Rear Panel Forward**



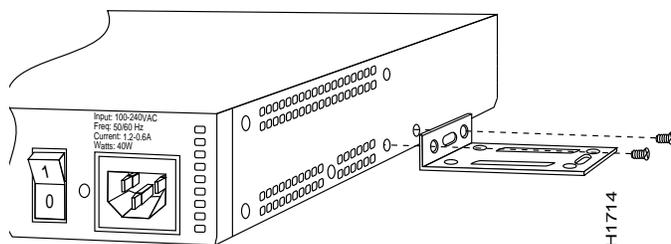
**Caution** If you plan to place the router on a desk or table, do not place anything on top of the router that weighs in excess of 10 pounds (4.5 kg). Excessive weight on top could damage the chassis.

## Wall-Mounting the Chassis

Use the smaller brackets, for use with a 19-inch rack, to wall-mount chassis. The smaller brackets will provide the most stable position for the chassis. To wall-mount the chassis, follow these steps:

**Step 1** Attach the brackets as shown in Figure 3-12.

**Figure 3-12 Attaching the Wall-Mount Brackets**



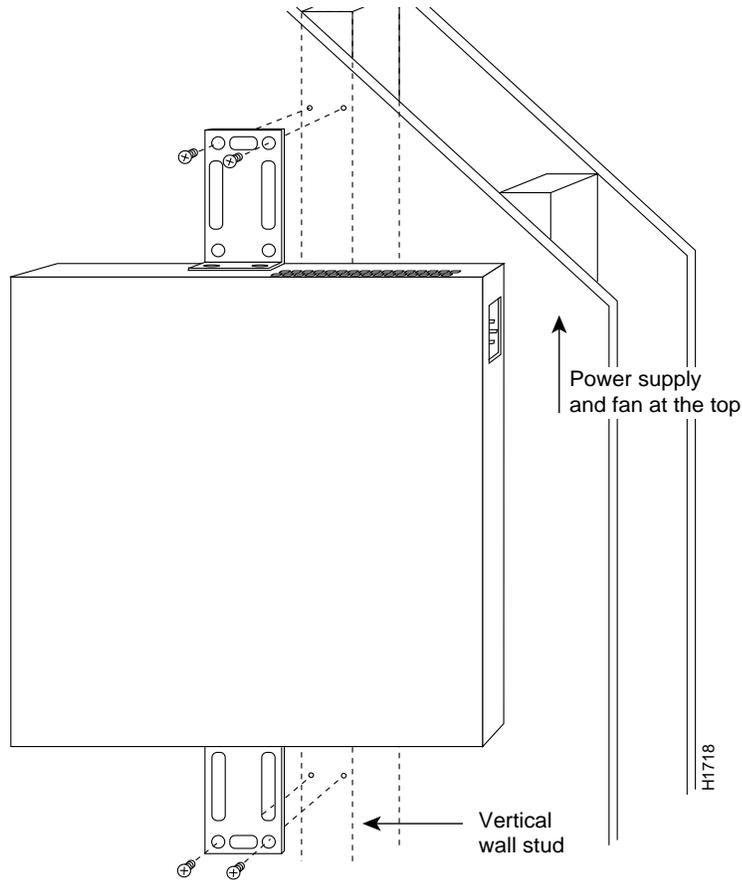
**Step 2** Attach the chassis assembly to the wall as shown in Figure 3-13, using screws and anchors that you provide. We recommend the following:

- For the best support of the chassis and cables, attach the brackets so that the screws align with a vertical wall stud.
- For the best ventilation of the chassis, mount the chassis with the power supply and fan at the top.



**Caution** To prevent the chassis from pulling away from the wall when cables are attached, align the brackets and screws with a vertical wall stud. (See Figure 3-13.) To ensure adequate ventilation, make sure there is clearance between the router and the wall. Mount the router as shown in Figure 3-13, placing the chassis fan and power supply at the top.

**Figure 3-13** Wall-Mounting the Chassis



## Making External Connections

Following are the procedures for making external connections to the different router, access server, and hub models.

### Connections for Router Models

Figure 3-14 shows the rear panel of the single LAN router (the rear panel of the dual LAN router is similar), with the following connectors:

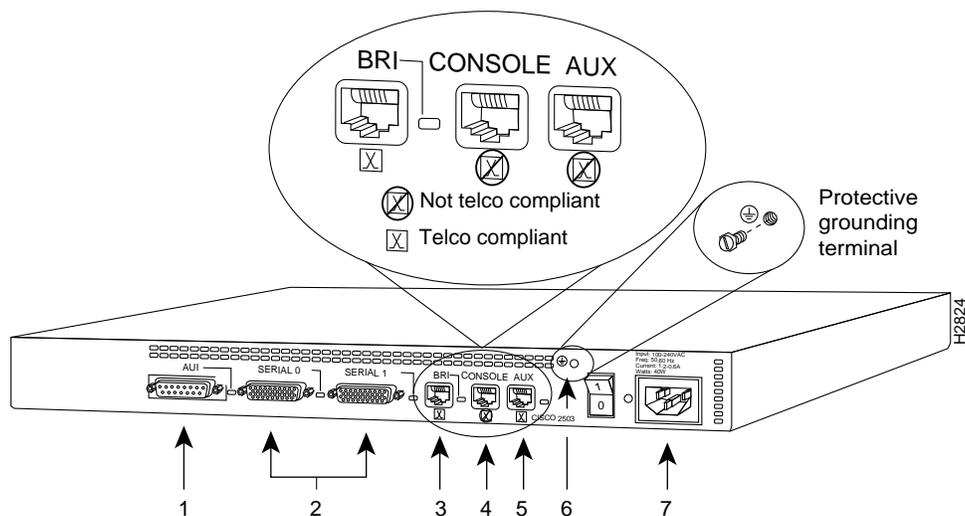
- 1 Ethernet AUI DB-15 (model 2503 shown; models 2501, 2513, and 2514 not shown) or Token Ring DB-9 (models 2502, 2504, 2513, and 2515 not shown) or dual Ethernet AUI DB-15 (model 2514 not shown), dual Token Ring (model 2515 not shown) or single Ethernet and Token Ring (model 2513 not shown)
- 2 Synchronous serial DB-60 (2 connectors—all models)
- 3 BRI RJ-45 (models 2503 and 2504)



**Caution** To prevent damage to the system, make certain you connect the BRI cable to the BRI connector *only* and not to any other RJ-45 connector. The console, auxiliary, asynchronous serial, and BRI ports all use RJ-45 connectors.

- 4 Console RJ-45
- 5 Auxiliary RJ-45
- 6 Protective grounding terminal (requires a M 3.5 thread-forming screw that is not included)
- 7 AC power input

**Figure 3-14 Router Model 2503 Rear Panel—Showing Telco Noncompliance Icons**



## Connections for Hub Models

Figure 3-15 shows the rear panel of a hub with 16 ports (the 8 port model is similar except for the number of hub ports) and the following connectors:

- 1 One or two banks of Ethernet RJ-45
- 2 Synchronous serial DB-60 (2 connectors—all models)
- 3 Console RJ-45
- 4 Auxiliary RJ-45
- 5 Protective grounding terminal (requires an M3.5 thread-forming screw that is not included)
- 6 AC power input

**Figure 3-15 Router Hub Model 2507 Rear Panel**

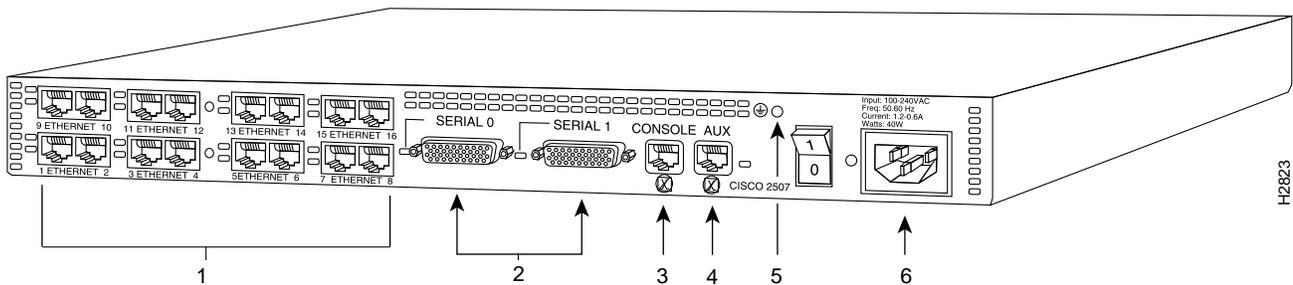
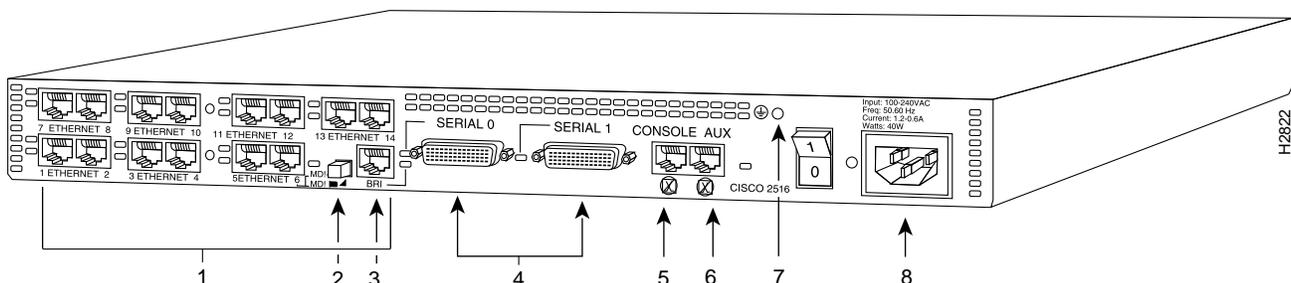


Figure 3-16 shows the rear panel of a hub with 14 ports (model 2516) and the following connectors:

- 1 Two banks of Ethernet RJ-45
- 2 MDI/MDI-X Switch
- 3 BRI Port
- 4 Synchronous serial DB-60 (2 connectors—all models)
- 5 Console RJ-45
- 6 Auxiliary RJ-45
- 7 Protective grounding terminal (requires an M3.5 thread-forming screw that is not included)
- 8 AC power input

**Figure 3-16 Router Hub Model 2516 Rear Panel**

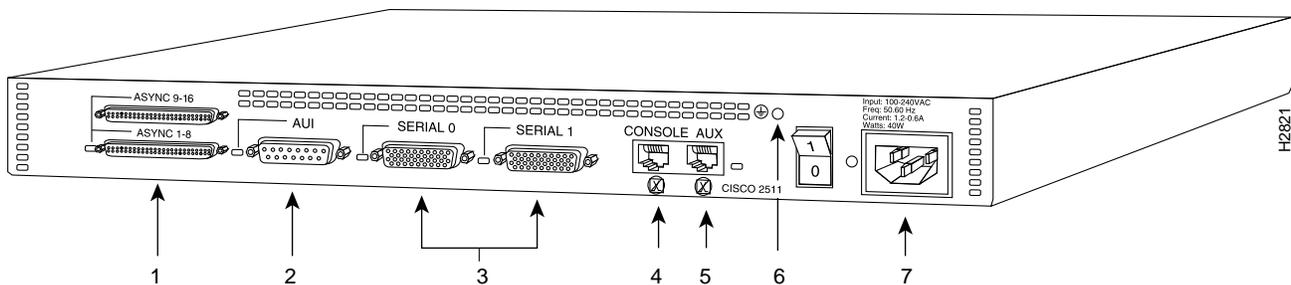


## Connections for Access Server Models

Figure 3-17 shows the rear panel of an access server, with two SCSI ports supporting 16 asynchronous ports (the 8-port model is similar except for the number of SCSI ports) and the following connectors:

- 1 One or two 68-pin SCSI connectors (uses breakout cable for 8 ports per connector)
- 2 Ethernet AUI DB-15 (model 2511 shown, model 2509 not shown) or Token Ring DB-9 (models 2510 and 2512 not shown)
- 3 Synchronous serial DB-60 (2 connectors—all models)
- 4 Console RJ-45
- 5 Auxiliary RJ-45
- 6 Protective grounding terminal (requires an M3.5 thread-forming screw that is not included)
- 7 AC power input

Figure 3-17 Access Server Model 2511 Rear Panel



If you are installing the router in the European Community, Italy, or the United Kingdom, refer to the *Cisco 2500 Series Public Network Certification* publication for information about connection prerequisites and related safety warnings.

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**Note** If you are installing a model 2501, 2503, 2509, 2511, 2513, or 2514 *and* your Ethernet connection requires jackscrews, remove the slide-latch assembly from the AUI connector and attach the jackscrews provided.

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## Connecting the DC-Input Power Supply

This section describes the Cisco 2500 series direct current (DC) power supply specifications and wiring. This procedure covers the following information:

- DC Power Specifications
- Wiring the DC-Input Power Supply

### DC Power Specifications

The Cisco 2500 DC-input power supply is intended for use in DC operating environments. Table 3-1 lists the power supply specifications.

**Table 3-1 Cisco 2500 DC-Input Power Supply Specifications**

Description	Design Specification
Power	40W, -40 to -72 VDC
Wire gauge for power connections	14 AWG <sup>1</sup>

1. AWG=American Wire Gauge.

### Wiring the DC-Input Power Supply

If you ordered a Cisco 2500 series router with a DC-input power supply, follow the directions in this section for proper wiring. Figure 3-18 shows the rear of the DC-input power supply (Model 2501-DC).



**Warning** Before conducting 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.

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**Note** The installation must comply with all applicable codes.

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**Note** This product is intended for installation in restricted access areas and is approved for use with copper conductors only.

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Figure 3-18 Cisco 2500 Series DC-Input Power Supply—Rear View

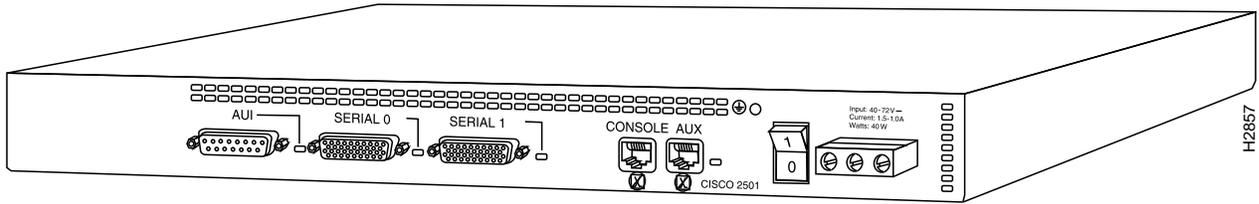


Figure 3-19 shows the DC-input power supply terminal block. Follow these procedures for wiring the terminal block:

- Step 1** Attach the appropriate lugs at the wire end of the power supply cord.
- Step 2** Wire the DC-input power supply to the terminal block as shown in Figure 3-19. The proper wiring sequence is ground to ground, positive to positive, and negative to negative.



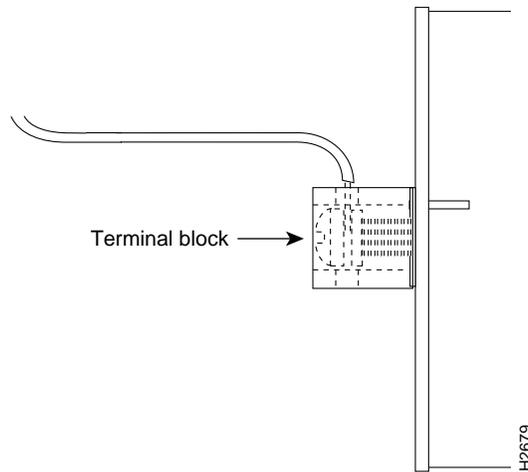
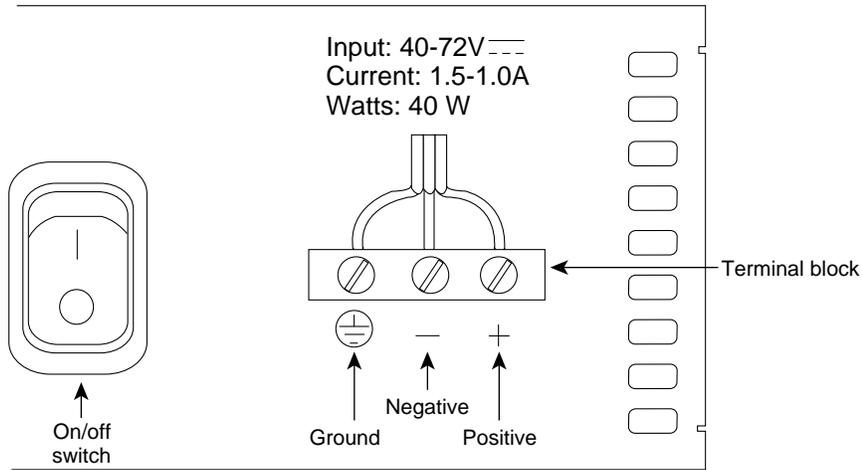
**Caution** Do not overtorque the terminal block captive thumbscrew or terminal block contact screws. The recommended torque is 8.2 0.4 inch-lb.



**Caution** Secure the wires so that they will not be disturbed by casual contact. For example, secure the wires to a rack frame using tie wraps.

- Step 3** Remove the tape from the circuit breaker switch handle and restore power by moving the circuit breaker handle to the ON position.

Figure 3-19 DC-Input Power Supply Connections

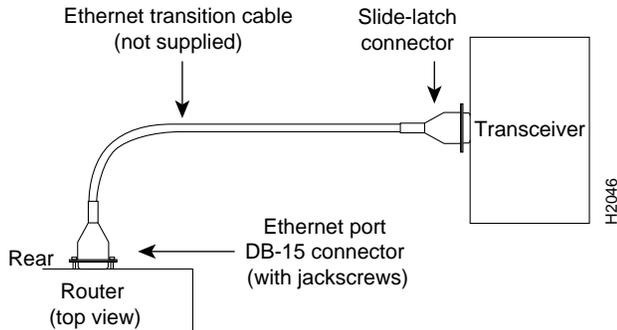


## Connecting to the Network

If your router has an Ethernet port, follow Step 1. If it has a Token Ring port, proceed to Step 3. If your router has both an Ethernet and Token Ring port (model 2515), start with Step 1.

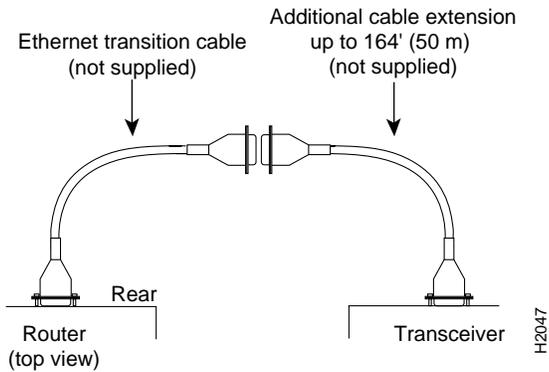
**Step 1** Connect the Ethernet port to the transceiver as shown in Figure 3-20.

**Figure 3-20 Ethernet Transition Cable Connections**



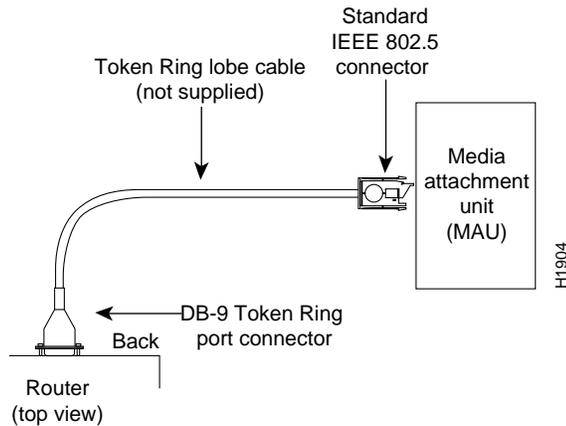
**Step 2** If necessary, extend the Ethernet cable as shown in Figure 3-21, otherwise, proceed to Step 4.

**Figure 3-21 Extending the Transition Cable from the Ethernet Port**



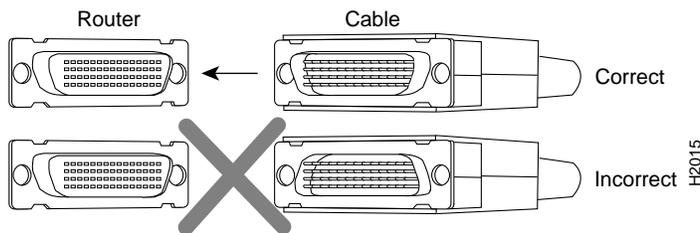
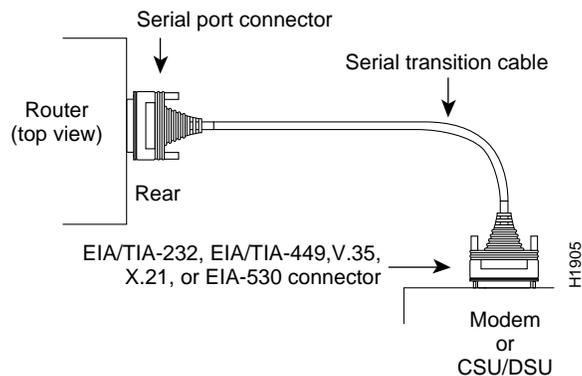
**Step 3** Connect the Token Ring port to the MAU as shown in Figure 3-22.

**Figure 3-22 Token Ring Cable Connections**



**Step 4** Connect the serial ports to the modem or CSU/DSU as shown in Figure 3-23. Make certain to connect the 60-pin serial port connector as shown.

**Figure 3-23 Serial Cable Connections**



**Step 5** On hub models, connect RJ-45 cables from the Ethernet ports to transceivers. If you have a router model go to Step 9, and if you have a access server, omit this step and continue with Step 6.

**Step 6** On access server models, connect a SCSI-type breakout cable (available from Cisco Systems) to each 68-pin port. If you have a 68-pin-to-RJ-45 breakout cable, use RJ-45-to-DB-25 adapters to connect the breakout cable to your serial devices. Or, if you have a 68-pin-to-DB-25 breakout cable, connect the DB-25 connector directly to your serial devices. Refer to the appendix “Cabling Specifications” for more information. Continue with Step 9.



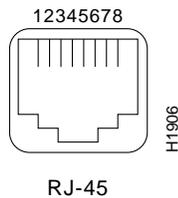
**Caution** Make sure that the SCSI connector on the breakout cable is securely connected to the SCSI connector on the access server. A short could occur which might damage your access server if the connection is disconnected.

**Step 7** The Basic Rate Interface (BRI) port, a female RJ-45 connector on models 2503 and 2504 (see Figure 3-24), is located on the chassis rear panel between the serial 1 and console ports. On the Cisco 2516, the BRI port is located between the serial and Ethernet ports.

On the Cisco 2516, set the MDI/MDI-X switch to MDI-X to configure the hub as a standalone hub. Set the MDI/MDI-X switch to MDI to configure Ethernet port 6 on the hub for connecting to another hub.

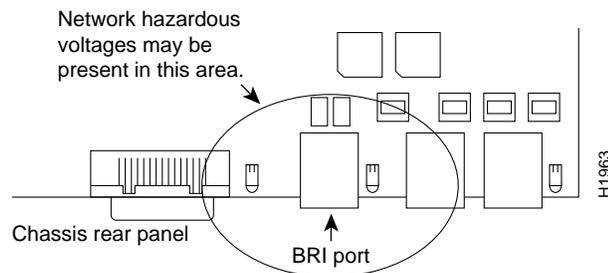
**Step 8** Using the appropriate cable, connect the BRI port to the Integrated Services Digital Network (ISDN) through the NT1. The common carrier will provide the NT1 connection worldwide, except in North America, where the NT1 is customer provided.

**Figure 3-24 BRI Interface Port—RJ-45 Female Connector**



**Warning** Network hazardous voltages are accessible in the BRI cable. If you detach the BRI cable, *detach the end away from the router first to avoid possible electric shock*. Network hazardous voltages also are accessible on the system card in the area of the BRI port (RJ-45 connector), regardless of when power is turned off. (See Figure 3-25.)

**Figure 3-25 Network Hazardous Voltage Area near the BRI Port**



**Step 9** Connect the console and auxiliary ports as required for your method of configuration or if future configuration is desired. Depending on your terminal or modem connections, the console and auxiliary ports may require an RJ-45-to-DB-25 or RJ-45-to-DB-9 adapter (labelled “Terminal”). Your terminal or terminal emulation software should be configured for 9600 baud, 8 data bits, no parity, and 2 stop bits.



**Caution** To prevent damage to the system, make certain you connect the BRI cable to the BRI connector *only* and not to any other RJ-45 connector. The console, auxiliary, and BRI ports all use RJ-45 connectors.

**Step 10** Using an M 3.5 thread-forming screw (not included), attach a ground wire to the protective grounding terminal on the chassis rear panel as required by your installation.  
(See Figure 3-14.)

**Step 11** Connect the power cable between the router and the AC source.

## What to Do after Installing the Router Hardware

After you install the router hardware, the system is ready to be powered on and configured. For information on router software configuration, refer to the appropriate software publications. If you are installing the router in the European Community, Italy, or the United Kingdom, refer to the *Cisco 2500 Public Network Certification* publication that accompanied the chassis for information about connection requirements and related safety warnings.

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**Note** To order UniverCD, Cisco's technical documentation in CD-ROM format, or printed documentation, refer to *Ordering Cisco Documents*, which is in your warranty package.

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