CHAPTER 4

Chassis Installation Procedures for Cisco 1800 Series Routers (Modular)

This chapter tells how to physically set up Cisco 1800 series integrated services routers (ISR) (modular). It contains the following sections:

Cisco 1800 series routers are normally shipped with a complement of components that can be upgraded or replaced to expand and enhance the router's functionality. These components either are inserted internally into the router or are plugged into slots in the router chassis.

Note To see translations of the warnings that appear in this publication, see *Regulatory Compliance and Safety Information for Cisco 1840 Routers*.

Internal Components

The router's internal components include the following:

- SDRAM
- Advanced integration module (AIM)

If you need to remove or upgrade either of these items, follow the procedures given in the *"Installing and Upgrading Internal Modules in Cisco 1800 Series Routers (Modular)"* document.

Plug-In Components

The following components plug into the router chassis:

- WAN interface cards (WICs)
- Voice/WAN interface cards (VWICs), data mode only
- High-speed WICs (HWICs)
- CompactFlash memory card

If you need to remove or install WICs, VWICs, or HWICs, follow the procedures in the *"Installing Interface Cards in Cisco 1800 Series Routers (Modular)"* document.

If you need to remove or upgrade the CompactFlash memory card, follow the procedure in the *"Installing and Replacing CompactFlash Memory Cards on Cisco 1800 Series Routers (Modular)"* document.

Interfaces on the Cisco 1861 Integrated Services Router

The Cisco 1861 Integrated Services Router comes with various possible configurations, based on built-in ports and other hardware features of the Cisco 1861 Integrated Services Router and organized by model.

Table 4-1 lists the labels and descriptions for the WAN, LAN, voice interface card (VIC), and other interfaces, along with the values for these interfaces in the preconfigured router software configuration.

Note In Table 4-1, all slots/ports are numbered right to left, unless otherwise noted.

Table 4-1 Cisco 1861 Integrated Services Router: Interfaces

Description	Label	Value in Software Configuration
Console/Aux port	CONSOLE	—
Fast Ethernet 10/100 expansion port	EXPANSION	FastEthernet0/1/8
Fast Ethernet 10/100 WAN port	WAN	FastEthernet0/0
Fast Ethernet 10/100 Power over Ethernet (PoE) ports	Power over Ethernet, and ACT 0 LNK to ACT 7 LNK	FastEthernet0/1/0 to 0/1/7
FXS (Foreign Exchange Station) ports	FXS, and 0-3	port 0/0/0 to 0/0/3
FXO (Foreign Exchange Office) ports	FXO, and 0-3	port 0/1/0 to 0/1/3
ISDN BRI ports	B0 - B1	Top-to-bottom, port 0/1/0 to 0/1/1
VLAN number for data network	—	Vlan1
VLAN number for voice network	—	Vlan100
Music-on-Hold (MoH) port		voice-port 0/4/0
Compact Flash slot	COMPACT FLASH	flash
(Factory Option) VIC: BRI*	VIC2-2BRI-NT/TE and 0-1	port 0/2/0 to 0/2/1
(Factory Option) VIC: FXO*	VIC2-2FXO and 0-1 VIC2-4FXO and 0-3	port 0/2/0 to 0/2/1 or port 0/2/0 to 0/2/3
(Factory Option) VIC: FXS*	VIC3-2FXS/DID and 0-1 VIC-4FXS/DID and 0-3 VIC3-4FXS/DID and 0-3	port 0/2/0 to 0/2/1 or port 0/2/0 to 0/2/3

* Only one optional VIC can be factory installed in a Cisco 1861 Integrated Services Router.

** The label on the front panel is build-specific. Functionality is unaffected.

Setting Up the Chassis

The Cisco 1841 router and the Cisco 1861 ISR can be installed on a desktop, and can also be mounted on a wall. Select the setup that best meets the needs of your network. These setups are described in the following sections:

- Setting the Chassis on a Desktop, page 4-3
- Rack-Mounting a Cisco 1800 Series Modular-Configuration Router, page 4-3
- Wall-Mounting the Chassis, page 4-6

Caution The front panel bezel must not be removed from the Cisco 1841 router. It is part of the product's enclosure, and must be left in place to prevent damage from foreign objects entering the router, to provide a shield from internal electromagnetic interference (EMI), and to direct the flow of cooling air properly through the chassis.

Setting the Chassis on a Desktop

You can place Cisco 1841 routers on a desktop or shelf. The Cisco 1841 router is shipped with the rubber feet attached to the chassis to provide space for air circulation.

To install a chassis on a desktop, table, or other flat surface, place the unit upside-down on a flat surface. Attach the four rubber pads to the recessed areas on the bottom of the unit. Place the unit on a desktop.

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

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

Caution The Cisco 1861 Integrated Services Router installation must allow unrestricted airflow for cooling. For placing the platform on a desktop, keep at least 1 in. (2.54 cm) of clear space beside the cooling inlet and exhaust vents.

Rack-Mounting a Cisco 1800 Series Modular-Configuration Router

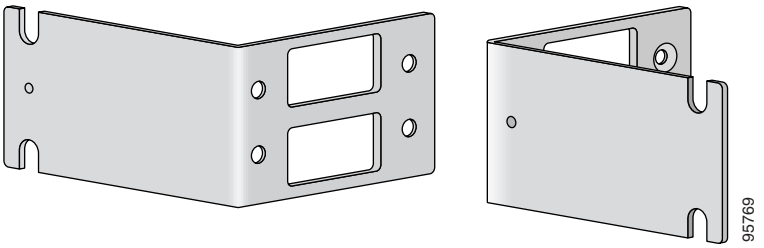
If you are planning to rack-mount the router, rack-mount it before you make the network and power connections. If you need to install any internal modules, such as an expansion DIMM or an inline power supply card, install these prior to rack-mounting.

Note To install a Cisco 1800 series modular-configuration router in a 19-inch rack, use the brackets included in the optional rack-mount kit (SKU: ACS-1841-RM-19=).All Cisco 1841 chassis shipping since Q4FY06 are rack-mountable. Cisco 1841 chassis with the following starting serial numbers have the rack-mount screw holes: FTX1009W0Z3 (United States), FCZ100812UR (Europe, Middle East, and Africa), and FHK100653JL (Asia Pacific).

Note Brackets for 23-inch equipment racks are not available for Cisco 1800 series modular-configuration routers.

Figure 4-1 shows the brackets.

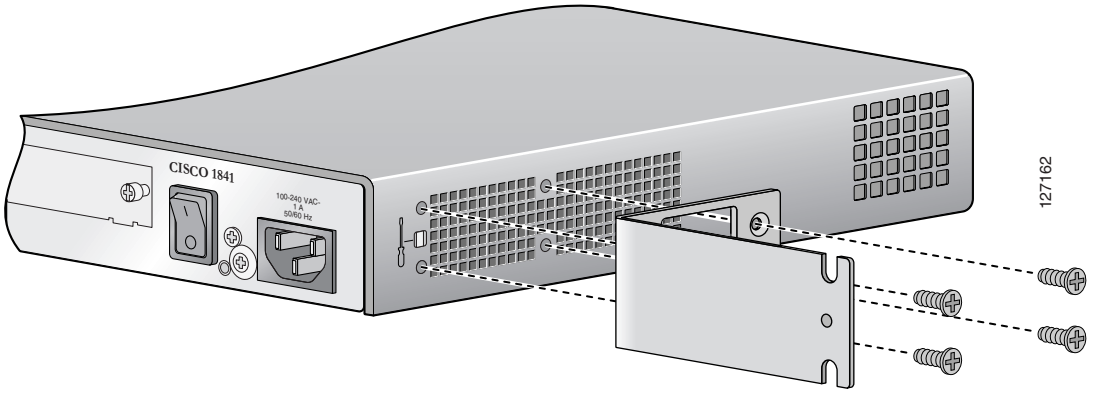
Figure 4-1 Rack-Mounting Brackets



Attaching Rack-Mount Brackets

Use four of the supplied number-8 Phillips flat-head screws to attach each bracket to the router. Figure 4-2 shows how to attach the brackets to the sides of the router with the back panel forward.

Figure 4-2 Attaching Rack-Mounting Brackets to a Cisco 1800 Series Modular-Configuration Router



Installing the Router in a Rack

After you attach the brackets to the router chassis, use the screws provided with the rack to install the chassis in the rack. (See Figure 4-3.) Start with the lower pair of screws first, and rest the brackets on the lower screws while you insert the upper pair of screws.

Tip The screw slots in the brackets are spaced to line up with every *second* pair of screw holes in the rack. When the correct screw holes are used, the small threaded holes in the brackets line up with unused screw holes in the rack. If the small holes do not line up with the rack holes, you must raise or lower the brackets to the next rack hole.

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:**

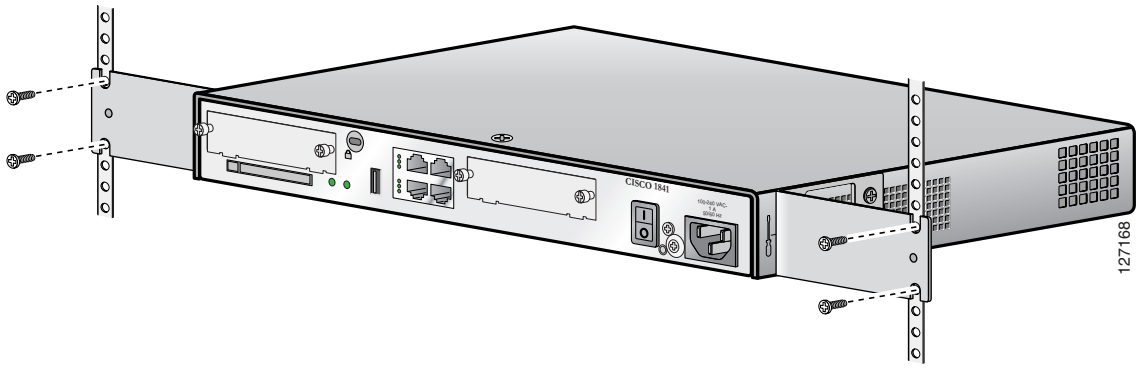
- **This unit should be mounted at the bottom of the rack if it is the only unit in the rack.**
- **When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.**
- **If the rack is provided with stabilizing devices,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

Warning **Take care when connecting units to the supply circuit so that wiring is not overloaded.** Statement 1018

Warning **To prevent the system from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of 50°C (122°F).** Statement 1047

Caution Be sure to leave space above and below each router in a rack, to allow for cooling air circulation.

Figure 4-3 Mounting the Chassis in a Rack (Typical)



Chassis Grounding

After the router has been installed, you must connect the chassis to a reliable earth ground. For the chassis ground connection procedure, see the "Wall-Mounting the Cisco 1861 Integrated Services Router" section on page 4-8.

Wall-Mounting the Chassis

The Cisco 1841 router and the Cisco 1861 ISR can be mounted on a wall.

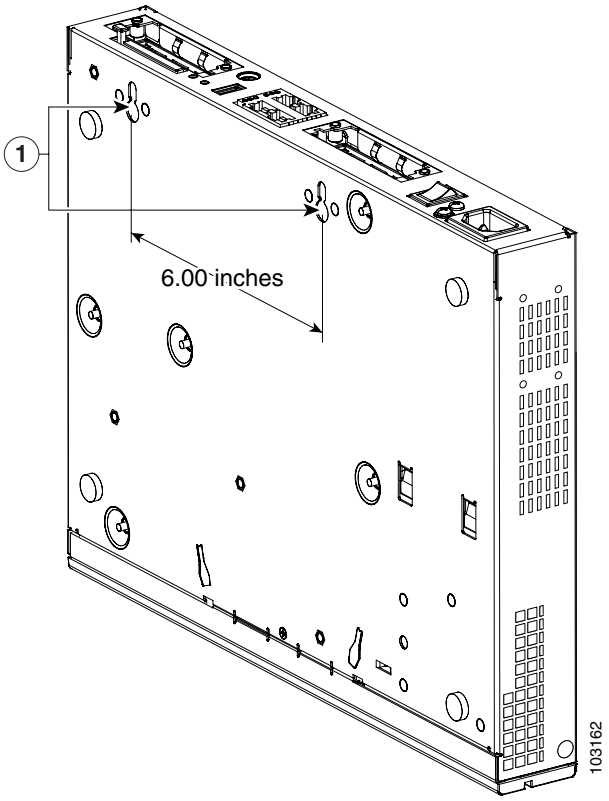
Warning **This unit is intended to be mounted on a wall. Please read the wall mounting instructions carefully before beginning installation. Failure to use the correct hardware or to follow the correct procedures could result in a hazardous situation to people and damage to the system.** Statement 248

Wall-Mounting the Cisco 1841 Router

To mount the Cisco 1841 router on a wall, use two number six, 3/4-inch screws and the mounting features on the bottom of the router. You must provide the screws. We recommend using pan-head or round-head screws.

The wall-mounting features on the router are shown in Figure 4-4.

Figure 4-4 Wall-Mounting Features on the Cisco 1841 Router



1	Wall-mounting features		

To mount the router on a wall or other surface, follow these steps:

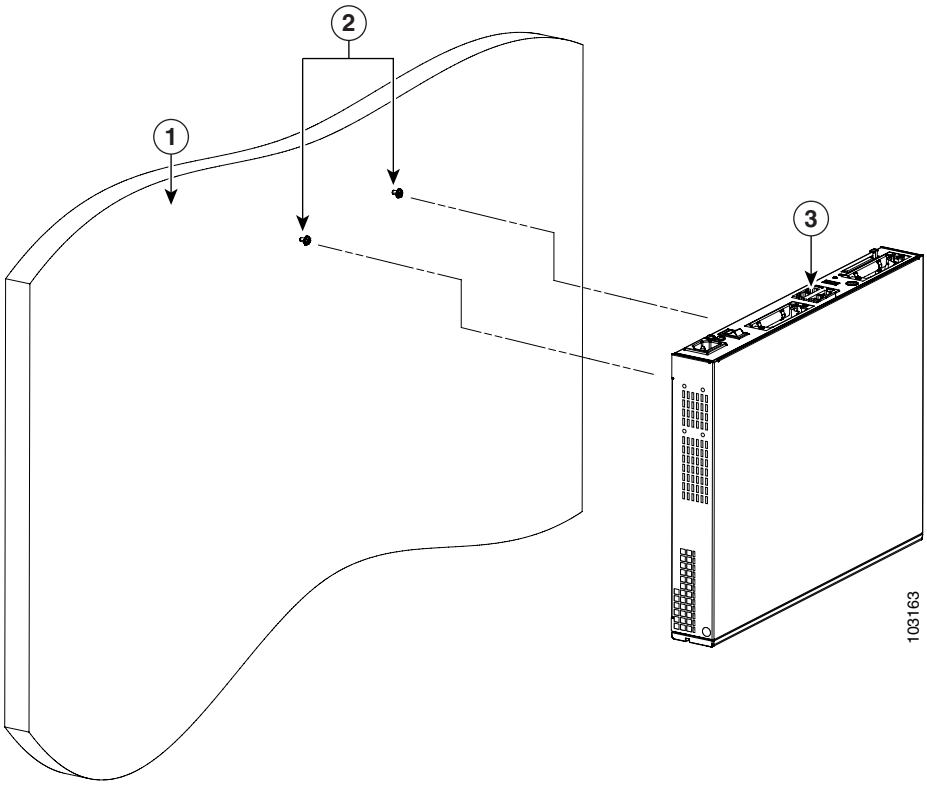
Step 1 Install the two screws 6.00 in. (15.2 cm) horizontally apart on a wall or other vertical surface.

The screws should protrude 0.25 in. (0.6 cm) from the surface of the wall.

Step 2 Remove the rubber feet from the router.

Step 3 Hang the router on the screws, front panel down. This is the appropriate orientation for safe use. See Figure 4-5.

Figure 4-5 Wall-Mounting the Cisco 1841 Router



1	Wall	**3**	Router
2	Mounting screws		

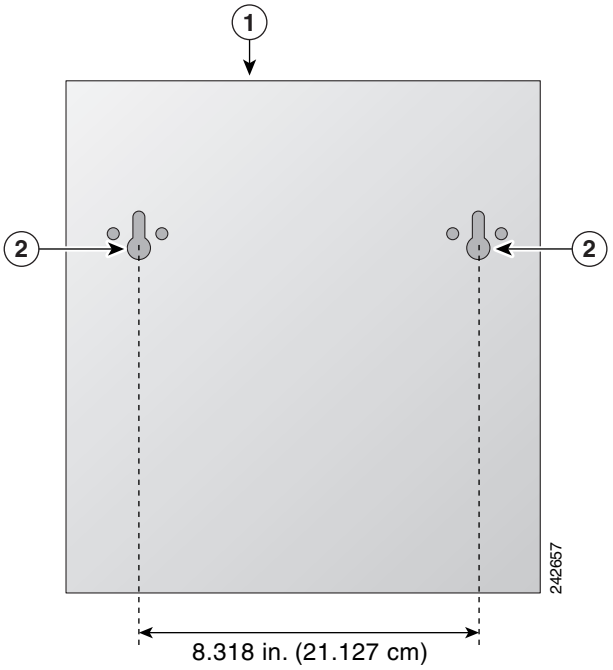
Caution If you install the screws in drywall, use hollow-wall anchors (1/8 in. (31.75 cm) by 5/16 in. (79.38 cm)) to secure the screws. If the screws are not properly anchored, the strain of the cables connected to the router back panel could pull the router from the wall.

Wall-Mounting the Cisco 1861 Integrated Services Router

The Cisco 1861 Integrated Services Router has two keyholes on the bottom of the chassis for mounting the unit on a wall or other vertical surface. The power supply is mounted to the wall by using the wall-mount bracket.

Figure 4-6 shows the bottom of the Cisco 1861 Integrated Services Router and the locations of the wall-mount holes.

Figure 4-6 Wall-Mount Holes on Bottom of Cisco 1861 Integrated Services Router



1	Front panel	**2**	Mounting-screw holes

To mount the router on a wall or other surface, follow these steps:

Step 1 Align the mounting-screw holes with a wall stud, or use wall anchors.

a. For attaching to a wall stud, use two #10 wood screws (round- or pan-head) with #10 washers, or two #10 washer-head screws. The screws must be long enough to penetrate at least 3/4 in. (20 mm) into the supporting wood or into a metal wall stud.

b. For hollow-wall mounting, the wall must be at least 1/2 in. (12.7 mm) thick. Use two wall anchors with washers. The wall anchors and washers must be a size suitable for the wall to which they are mounted.

Step 2 Position the chassis on the wall.

a. Orient the front and back of the chassis vertically.

b. The unit must be oriented with the front panel (TNV connection side) facing up and the connection to the power cord facing down.

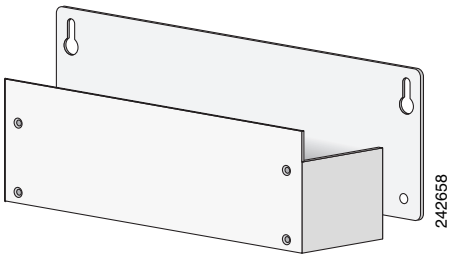
Step 3 Align the mounting-screw holes with a wall stud, or use wall anchors.

a. For attaching to a wall stud, use two #10 wood screws (round- or pan-head) with #10 washers, or two #10 washer-head screws. The screws must be long enough to penetrate at least 3/4 inch (20 mm) into supporting wood or into a metal wall stud.

b. For hollow-wall mounting, the wall must be at least 1/2 in. (12.7 mm) thick. Use two wall anchors with washers. Wall anchors and washers must be a size suitable for the wall to which they are mounted.

Figure 4-7 shows the wall-mount bracket for the power supply and the mounting-screw holes on the back of the bracket.

Figure 4-7 Wall-Mount Bracket for Power Supply



Step 4 Position the power supply in the bracket.

a. Orient the front and back of the power supply vertically.

b. Position the end nearest the power cable at the top.

Rack-Mounting the Cisco 1861 Integrated Services Router

To attach the brackets to the Cisco 1861 Integrated Services Router, perform the following steps.

Caution Do not overtorque the screws. The recommended torque is 6 to 8 in-lb (0.7 to 0.9 N-m).

Step 1 Attach the mounting brackets to the Cisco 1861 Integrated Services Router chassis as shown in Figure 4-8, using the screws provided. Use four screws on each side. Use a number 2 Phillips screwdriver to install the bracket screws on both sides of the chassis.

Figure 4-8 Attaching Rack-Mount Brackets to the Cisco 1861 Integrated Services Router

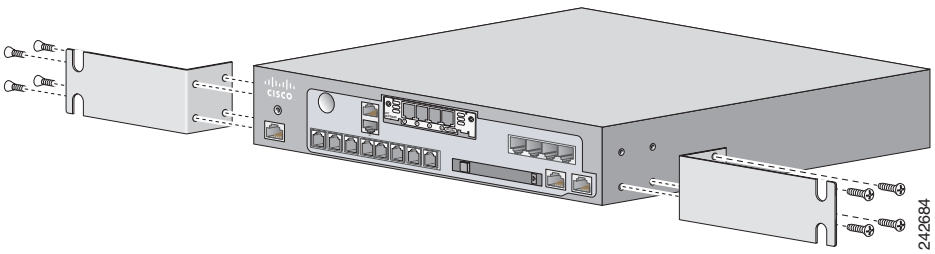
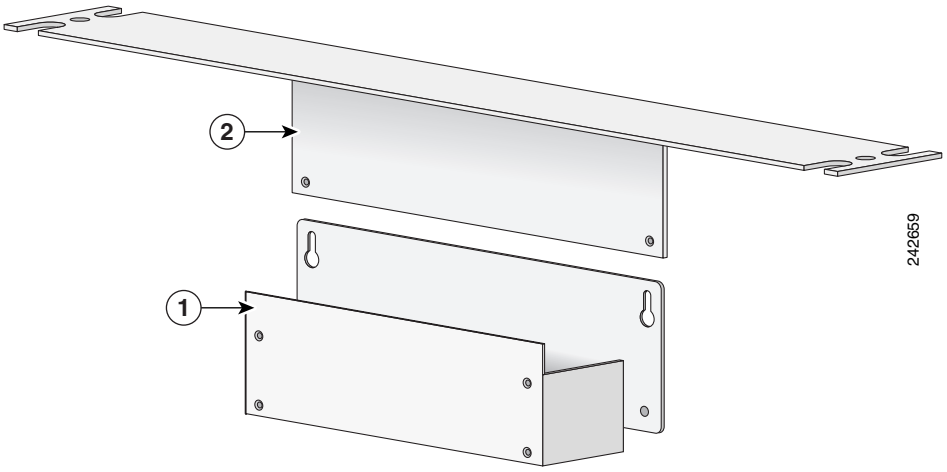


Figure 4-9 shows the brackets in the rack-mount kit for the power supply.

Figure 4-9 Brackets for Rack-Mounting Power Supply



1	Wall-mount bracket	2	Rack-mount bracket

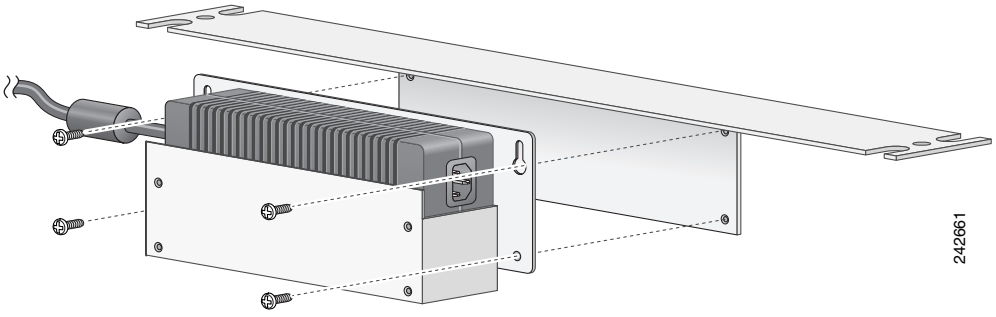
Step 2 Position the power supply in the wall-mount bracket.

a. Orient the front and back of the power supply vertically.

b. Position the end nearest the power cable at the top.

Step 3 Assemble the brackets for rack-mounting the power supply as shown in Figure 4-10, using the four screws provided. Use a number 2 Phillips screwdriver to install the bracket screws.

Figure 4-10 Assembling Rack-Mount Kit for the Power Supply



To mount the chassis and power supply, use two screws for each side (supplied with the rack) to attach the Cisco 1861 ISR with rack-mount brackets, then attach the power supply with rack-mount bracket to a 19-in. rack. Start the lower pair of screws first, resting the brackets on the lower screws while you insert the upper pair of screws.

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

Caution Chassis installation must allow unrestricted airflow for chassis cooling.

Tip The screw slots in the brackets are spaced to line up with every second pair of screw holes in the rack. When the correct screw holes are used, the small threaded holes in the brackets line up with unused screw holes in the rack. If the small holes do not line up with the rack holes, you must raise or lower the brackets to the next rack hole.

Installing the Chassis Ground Connection

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

Installing the Chassis Ground Connection on the Cisco 1841 Router

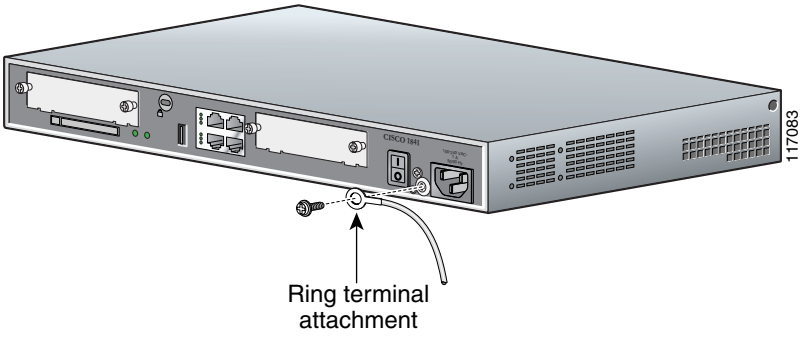
You must connect the chassis to a reliable earth ground, using a ground lug and size 14 AWG (2 mm^2) wire. To install the ground connection for a Cisco 1800 series router, follow these steps:

Step 1 Strip one end of the ground wire to expose approximately 0.75 in. (20 mm) of conductor.

Step 2 Crimp the 14 AWG green ground wire to a UL Listed/CSA certified ring terminal that is suitably sized for the number 6 ground screw provided on the rear panel of the router. The crimping tool should be one that is recommended by the ring lug terminal manufacturer.

Step 3 Attach the ring terminal to the chassis. The attachment points for the Cisco 1841 router are shown in Figure 4-11. Use a number 2 Phillips screwdriver and the screw supplied with the ground lug. Tighten the screw to a torque of 8 to 10 in-lb. (0.9 to 1.1 N-m).

Figure 4-11 Chassis Ground Connection on the Cisco 1841 Router



Step 4 Connect the other end of the ground wire to a known good electrical ground point. Consult with a licensed electrician if you have any questions about the suitability of the ground connection.

After the router is installed and properly grounded, you can connect the WAN and LAN cables as required for your installation. For cable connection procedures, see *"Cable Connection Procedures for Cisco 1800 Series Routers (Modular)"*.

Installing the Chassis Ground Connection on the Cisco 1861 Integrated Services Router

You must connect the chassis to a reliable earth ground; the ground wire must be installed in accordance with local electrical safety standards.

For NEC-compliant grounding, use size 14 AWG (2 mm) or larger copper wire and an appropriate user-supplied ring terminal with an inner diameter of 1/4 in. (5 to 7 mm).

Note The Cisco 1861 Integrated Services Router is not NEBS-compliant.

Warning **This equipment needs to be grounded. Use a green and yellow 14 AWG ground wire to connect the host to earth ground during normal use.** Statement 190

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

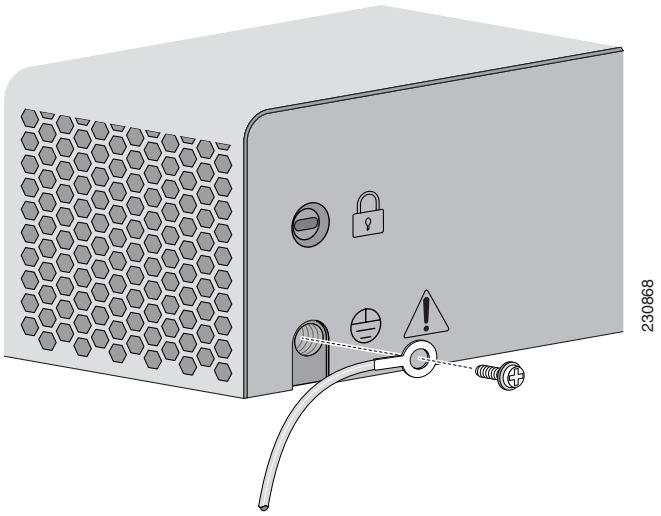
Step 1 Strip one end of the ground wire to the length required for the ground lug or terminal.

- For the ground lug, approximately 0.75 in. (20 mm)
- For the 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 4-12. Tighten the screws to a torque of 8-10 in-lb (0.9-1.1 N-m).

Figure 4-12 Attaching the Ground Wire to the Chassis



Step 4 Connect the other end of the ground wire to a known reliable earth ground point.

Note If there is any doubt as to the reliability of the ground point, contact a licensed electrician for assistance.