Doc. No. 78-3421-02

Cisco 7200 Series Rack-Mount Installation Instructions

Product Number: ACS-7200-RMK=

This document explains how to install Cisco 7200 series routers in an equipment rack using the rack-mount kit. The rack-mount kit provides hardware for mounting Cisco 7200 series routers in 19-inch Telco-type racks. The kit is shipped with Cisco 7200 series routers and is also available as a field-replaceable unit (FRU).

Note Use this configuration note in conjunction with the *Cisco 72xx Installation and Configuration Guide* that shipped with your Cisco 7200 series router.

This configuration note includes the following sections:

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USA

  - Installing the Chassis in the Rack, page 13
  - Reconnecting Input Power and Powering Up the Router, page 15
- Cisco Connection Online, page 17

Additional Information

The Cisco Internetwork Operating System (Cisco IOS) software running your router contains extensive features and functionality. The effective use of many of these features is easier if you have more information at hand.

Cisco documentation and additional literature are available on a CD-ROM called Cisco Connection Documentation, Enterprise Series, which ships with your chassis. The CD is updated and shipped monthly, so it might be more up to date than printed documentation. To order additional copies of the Cisco Connection Documentation, Enterprise Series CD, contact a Cisco Sales or Customer Service representative. You can also access Cisco technical documentation on the World Wide Web URL http://www.cisco.com.

For additional information on configuring the Cisco 7200 series routers, the following documentation resources are available to you:

- Cisco Connection Documentation, Enterprise Series CD-ROM
- For systems with Cisco IOS Release 11.1(6), a Cisco-approved Release 11.1(6) beta software version, or a later Cisco IOS release, refer to the following modular configuration and modular command reference publications, as appropriate for your configuration:
  - *Configuration Fundamentals Configuration Guide*
  - *Configuration Fundamentals Command Reference*
  - *Wide-Area Networking Configuration Guide*
  - *Wide-Area Networking Command Reference*
  - *Network Protocols Configuration Guide*
  - *Network Protocols Command Reference*
  - *Bridging and IBM Networking Configuration Guide*
  - *Bridging and IBM Networking Command Reference*
  - *Configuration Builder Getting Started Guide*
  - *Troubleshooting Internetworking Systems*
- For hardware installation and maintenance information on the Cisco 7200 series routers, refer to the *Cisco 72xx Installation and Configuration Guide* that shipped with your router.
- To obtain general information about documentation, refer to the section “Cisco Connection Online,” on page 17, or call Customer Service at 800 553-6387 or 408 526-7208. Customer Service hours are 5:00 a.m. to 6:00 p.m. Pacific time, Monday through Friday (excluding Cisco-observed company holidays). You can also send e-mail to cs-rep@cisco.com. You can also refer to the *Cisco Information Packet* that shipped with your router.

Cisco 7200 Series Overview

The Cisco 7200 series consists of the four-slot Cisco 7204 and the six-slot Cisco 7206. The Cisco 7200 series routers support multiprotocol, multimedia routing and bridging with a wide variety of protocols and any combination of Ethernet, Fast Ethernet, Token Ring, Fiber Distributed Data Interface (FDDI), and serial media. Network interfaces reside on port adapters that provide a connection between the routers' three Peripheral Component Interconnect (PCI) buses and external networks. Port adapters can be placed in any available port adapter slot, in any desired combination.

The front of the Cisco 7200 series routers provides access to an Input/Output (I/O) controller and up to four or six network interface port adapters. The I/O controller has a local console port for connecting a data terminal (or data terminal equipment [DTE]) and an auxiliary port for connecting a modem (or other data communications equipment [DCE]) or other devices for configuring and managing the router; two Personal Computer Memory Card International Association (PCMCIA) slots for Flash memory cards; and an optional Fast Ethernet port. The Fast Ethernet port provides a 100-Mbps connection to the network. Figure 1 shows the Cisco 7204. Figure 2 shows the Cisco 7206.

Note The I/O controller is available with or without a Fast Ethernet port. Figure 1 and Figure 2 show an I/O controller with a Fast Ethernet port.

Figure 1 Cisco 7204—Front View

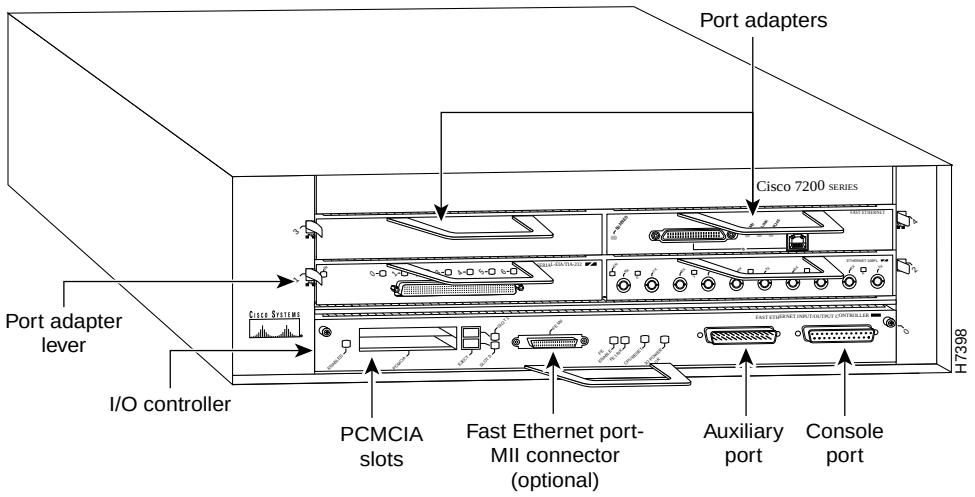
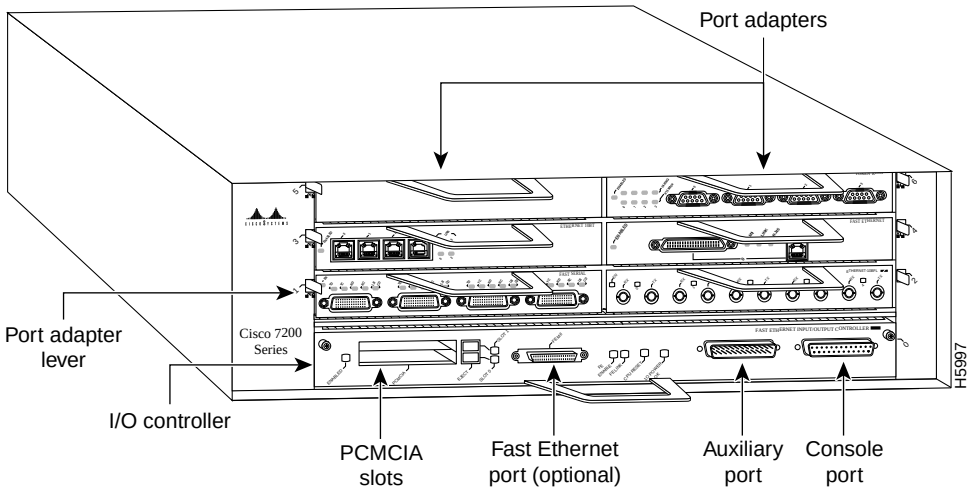


Figure 2 Cisco 7206—Front View

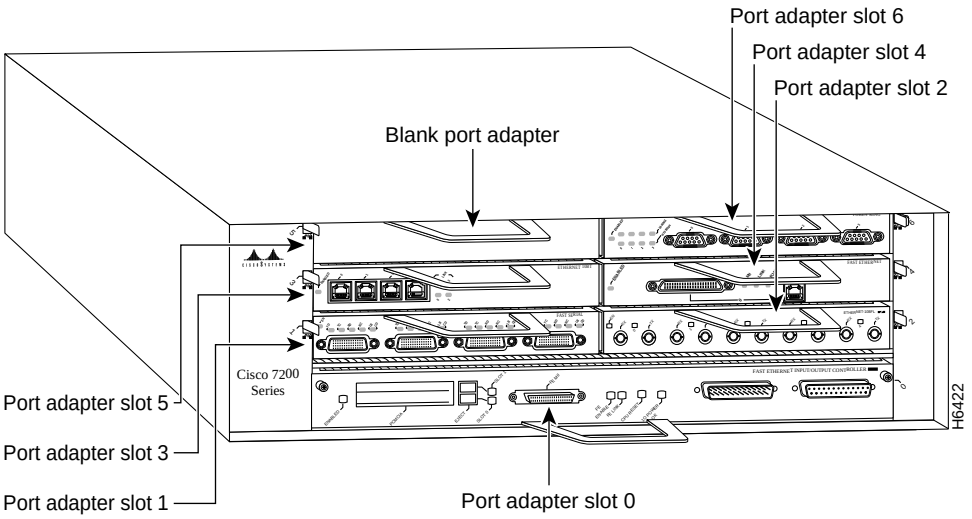


The port adapters installed in the Cisco 7200 series routers are of the same type as those installed on the second-generation Versatile Interface Processors (VIP2s) in the Cisco 7000 family routers. The port adapters installed in the Cisco 7200 series routers support online insertion and removal (OIR).

Port adapter slots in the Cisco 7200 series are numbered from left to right, beginning with port adapter slot 1 and continuing through port adapter slot 4 for the Cisco 7204, and slot 6 for the Cisco 7206. Port adapter slot 0 is the Fast Ethernet port on the I/O controller. Figure 3 shows the port adapter slot numbering for the Cisco 7206.

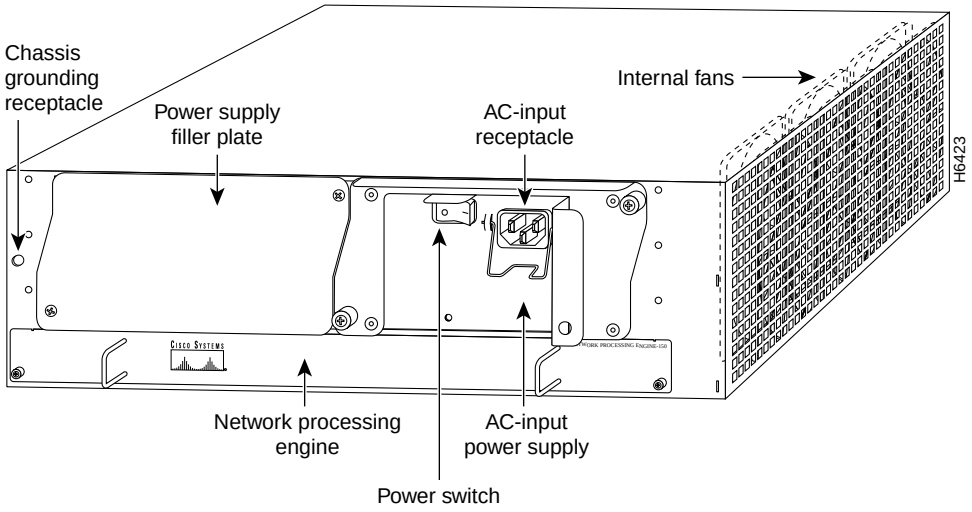
Note In Figure 3, a blank port adapter is installed in port adapter slot 5. To ensure adequate airflow across the router's internal components, ensure that each port adapter slot is filled with either a port adapter or a blank port adapter.

Figure 3 Port Adapter Slot Numbering—Cisco 7206 Shown



The rear of the Cisco 7200 series routers provides access to the network processing engine and up to two 280W, AC-input or DC-input power supplies (refer to Figure 4).

Figure 4 Cisco 7200 Series Router—Rear View



The network processing engine has no external connectors or LEDs. There are two handles for removing and installing the network processing engine and two captive installation screws for securing it to the chassis.

A fully configured Cisco 7200 series router operates with only one installed power supply; however, a second, optional power supply provides hot-swappable, load-sharing, redundant power. The power supply has the router's main power switch and either an AC-input power receptacle, or a hardwired DC-input power cable (depending on the type of installed power supply). Adjacent to the power supply bays there is a 10 x 32-inch chassis ground receptacle that provides a chassis ground connection for ESD equipment or a grounding wire (refer to Figure 4).

Note The Cisco 7200 routers come equipped with either one 280W AC-input or one 280W DC-input power supply; a second 280W AC-input or DC-input power supply is available for the router. Figure 4 shows the rear of a Cisco 7200 series router that is configured with a single 280W AC-input power supply. (A power supply filler plate is installed over the second power supply bay.)

Three internal fans draw cooling air into the chassis interior and across internal components to maintain an acceptable operating temperature (refer to Figure 4). The three fans are enclosed in a tray that is located in the subchassis.

The I/O controller, port adapters, power supplies, and network processing engine slide into their respective chassis slots and connect directly to the router's midplane; there are no internal cables to connect. The midplane distributes DC power from the power supplies to the I/O controller, port adapters, fan tray, and network processing engine.

Installation Prerequisites

This section provides a list of parts and tools you need to rack-mount the Cisco 7200 series routers. This section also includes safety and ESD-prevention guidelines to help you avoid injury to yourself and damage to the equipment.

List of Parts and Tools

Following are the tools and equipment you will need to rack mount the Cisco 7206:

- Number 2 Phillips screwdriver
- 3/16-inch flat-blade screwdriver
- Tape measure (optional)
- Level (optional)

The rack-mount kit includes the following parts:

- Two brackets
- Four M4 x 10-mm Phillips flathead screws to secure the brackets to the chassis
- Eight 10-32 x 3/8-inch slotted binderhead screws to secure the brackets to the rack rails

Safety Guidelines

Following are safety guidelines that you should follow when working with any equipment that connects to electrical power or telephone wiring.

Electrical Equipment Guidelines

Follow these basic guidelines when working with any electrical equipment:

- Before beginning any procedures requiring access to the chassis interior, locate the emergency power-off switch for the room in which you are working.
- Disconnect all power and external cables before moving a chassis.
- Do not work alone when potentially hazardous conditions exist.
- Never assume that power has been disconnected from a circuit; always check.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Carefully examine your work area for possible hazards such as moist floors, ungrounded power extension cables, and missing safety grounds.

Telephone Wiring Guidelines

Use the following guidelines when working with any equipment that is connected to telephone wiring or to other network cabling:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.

- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.

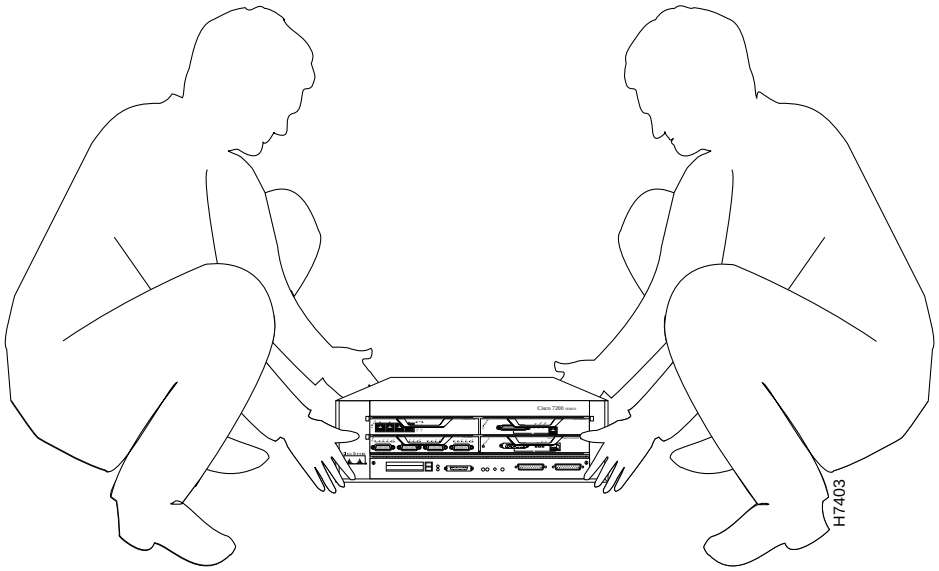
Lifting Safely

A fully configured Cisco 7200 series router weighs approximately 50 pounds. The chassis is not intended to be moved frequently. Before you install the router, ensure that your site is properly prepared, so you can avoid having to move the chassis later to accommodate power sources and network connections.

Whenever you lift the chassis or any heavy object, follow these guidelines (see Figure 5):

- Always disconnect all external cables before lifting or moving the chassis.
- Do not attempt to lift the chassis by yourself; have someone assist you.
- Ensure that your footing is solid, and balance the weight of the object between your feet.
- Lift the chassis slowly; never move suddenly or twist your body as you lift.
- Keep your back straight and lift with your legs, not your back. If you must bend down to lift the chassis, bend at the knees, not at the waist, to reduce the strain on your lower back muscles.
- Lift the chassis from the bottom; grasp the underside of the chassis exterior with both hands.

Figure 5 Lifting the Chassis—Cisco 7204 Shown

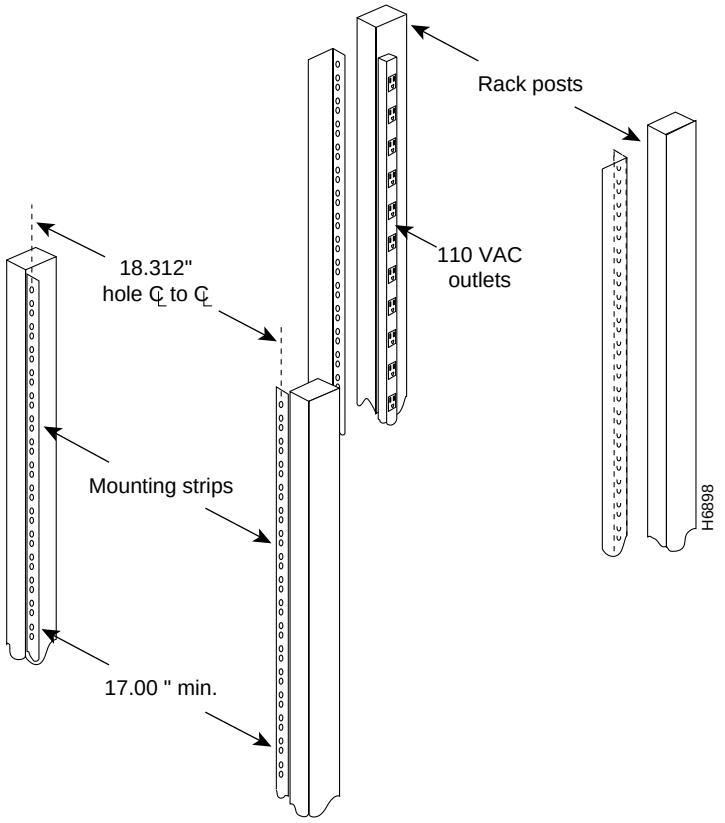


Equipment Rack Considerations

The rack-mounting hardware included with your Cisco 7200 series router is suitable for most 19-inch equipment racks and Telco-type racks. Some equipment racks provide a power strip along the length of one of the mounting strips. Figure 6 shows a typical 19-inch equipment rack with a power strip along one of the back posts.

If your rack has a power strip, consider the position of the strip when planning fastener points and ensure that you will be able to pull port adapters and other FRUs straight out of their respective slots. If the power strip does impair a rear rack-mount installation, remove the power strip before installing the router in the rack, then replace it after the chassis is installed.

Figure 6 Typical 19-Inch Equipment Rack Posts and Mounting Strips



To use the rack-mounting hardware provided with your Cisco 7200 series router, consider the following guidelines:

- To mount the router between two posts or rails using the brackets, the inner clearance (the width between the *inner* sides of the two posts or rails) must be at least 17.00 inches (43.18 cm).
- The height of the chassis is 5.25 inches (13.34 cm)
- When mounting the router in four-post or Telco-type racks, be sure to use all the screws and brackets provided to secure the chassis to the rack posts.

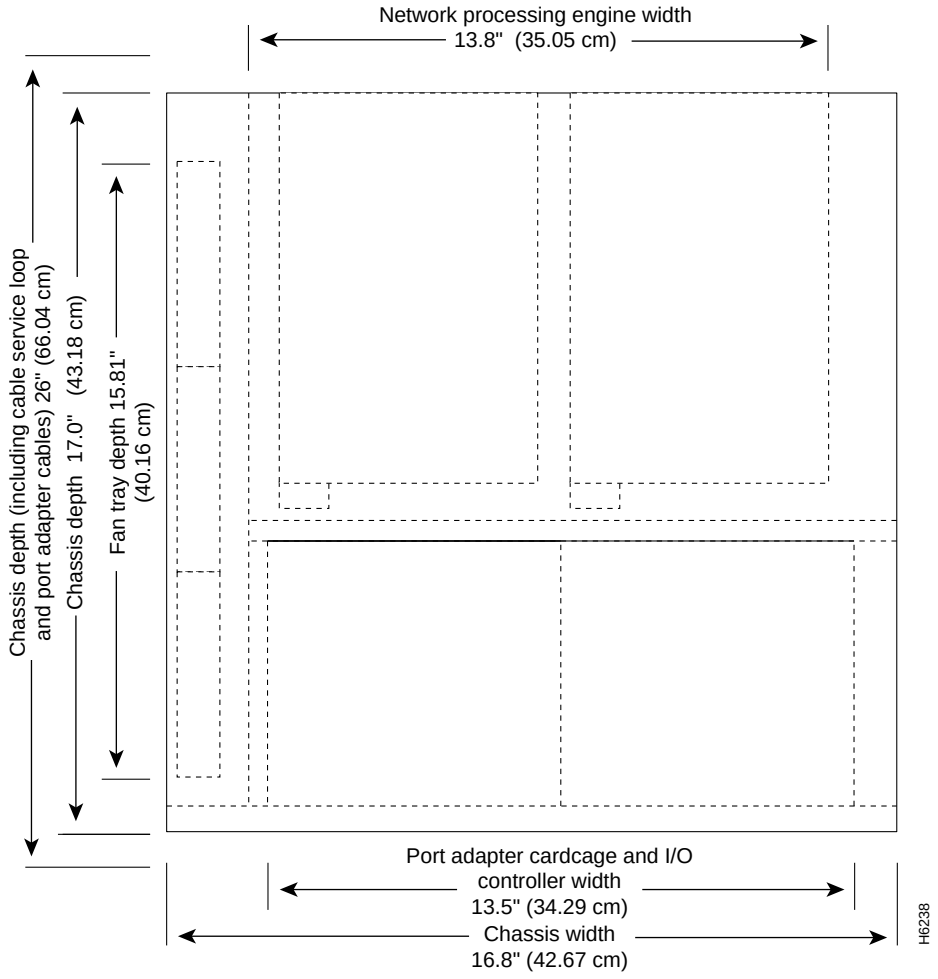
When planning your rack installation, consider the following guidelines:

- Install the router in an open rack whenever possible. If installation in an enclosed rack is unavoidable, ensure that the rack has adequate ventilation.
- If you plan to use an equipment shelf, ensure that the shelf is constructed to support the weight and dimensions of the chassis. Figure 7 shows the chassis footprint, which you will need if you are designing a customized shelf. We recommend that you use the rack-mount kit designed for your Cisco 7200 series router.

- Allow sufficient clearance around the rack for maintenance. If the rack is mobile, you can push it back near a wall or cabinet for normal operation and pull it out when necessary for maintenance (installing or moving port adapters, connecting cables, or replacing or upgrading components). Otherwise, allow 19 inches (48.3 cm) of clearance to remove Cisco 7200 series router FRUs.
- Maintain a minimum clearance of three inches on the left and right of the chassis for the cooling air inlet and exhaust vents, respectively. Avoid placing the router in an overly congested rack or directly next to another equipment rack; otherwise, the heated exhaust air from other equipment can enter the inlet air vents and cause an overtemperature condition inside the router.
- Always install heavier equipment in the lower half of a rack to maintain a low center of gravity and prevent the rack from falling over.
- If you use Telco-type racks, be sure that the rack is bolted to the floor and secured because in these types of installations only one end of the chassis mounts to the two rack posts with the brackets. Ensure that the weight of the chassis does not make the rack unstable.

Caution To prevent chassis overheating, never install your Cisco 7200 series router in an enclosed rack or room that is not properly ventilated or air conditioned.

Figure 7 Cisco 7200 Series Router Footprint and Outer Dimensions



Rack-Mounting Cisco 7200 Series Routers

The chassis mounts to two rack posts with brackets that attach to the sides of the chassis. The following sections explain the procedure for rack-mounting the Cisco 7200 series routers. It involves the following tasks:

- Powering Down the Router and Disconnecting AC Input Power (if necessary)
- Installing the Brackets on the Chassis
- Installing the Chassis in the Rack
- Reconnecting Input Power and Powering Up the Router

These tasks are described in detail in the following subsections.

Note The tasks for rack-mounting the Cisco 7204 and the Cisco 7206 are the same. Therefore, the illustrations in the following sections show the Cisco 7206, unless indicated otherwise.

Powering Down the Router and Disconnecting AC Input Power (if necessary)

If your Cisco 7200 series router is already installed on a tabletop or workbench, you must power down the router and disconnect input power before attempting the rack-mount procedure. If your router is not installed on a tabletop or workbench, proceed to the following section "Installing the Brackets on the Chassis."

To power down a Cisco 7200 series router that has an installed AC-input power supply, complete the following steps:

Note Before powering down the router, use the **copy running-config startup-config** command to save the router's running configuration to nonvolatile memory.

Step 1 Facing the rear of the router, place the power switch (on the power supply) in the OFF (0) position. Repeat this action if a second power supply is installed in the router.

Step 2 Observe the following items:

- The green OK LED on the power supply turns off
- The fans stop operating
- The LEDs on the I/O controller turn off
- The LEDs on the port adapters turn off

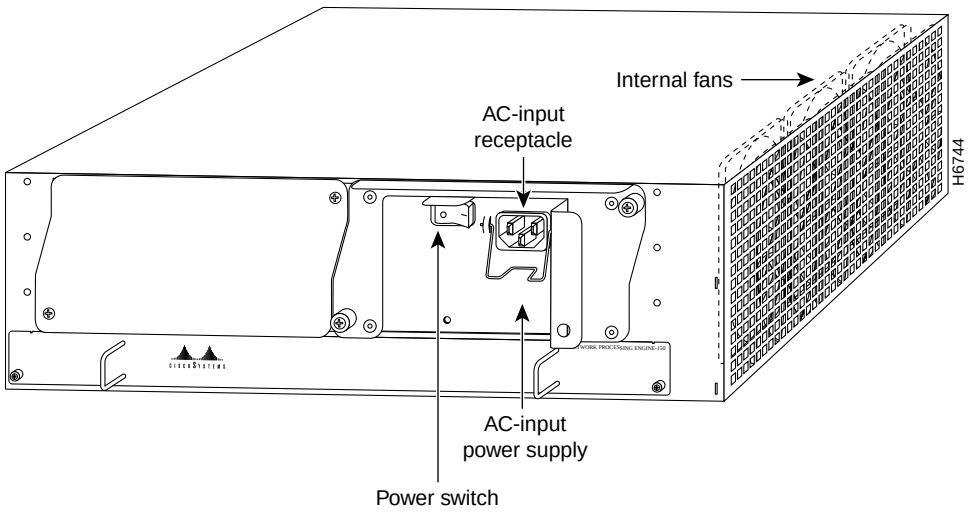
To disconnect AC input power to a Cisco 7200 series router, complete the following steps:

Step 1 Unplug the input power cable from the power source.

Step 2 Push down on the cable-retention clip that secures the input power cable to the router's power supply.

Step 3 Unplug the other end of input power cable from the power supply. (Refer to Figure 8.)

Figure 8 Disconnecting Power from a Cisco 7200 Series AC-Input Power Supply



Step 4 Repeat Step 2 through Step 1 if a second power supply is installed.

This completes the procedure for powering down the router and disconnecting AC input power. Proceed to the following section “Installing the Brackets on the Chassis.”

Installing the Brackets on the Chassis

Before installing the chassis in the rack, you must install a bracket on each side of the chassis.

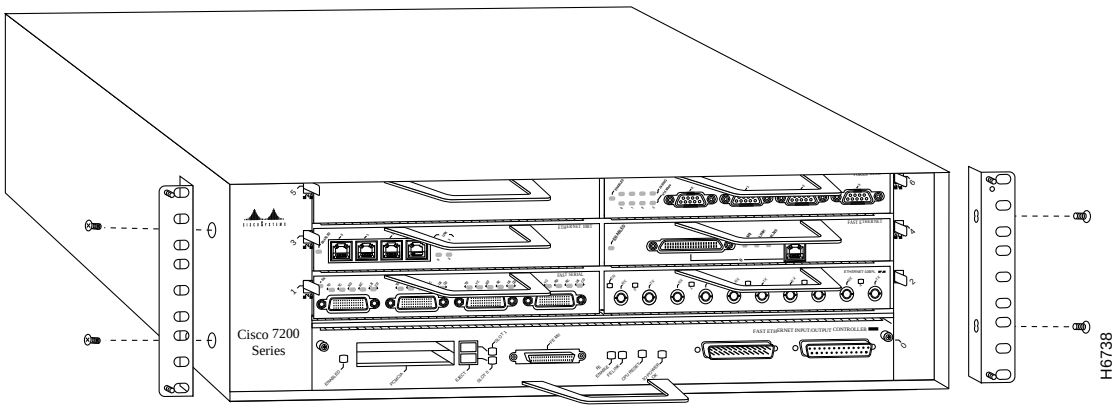
Warning After attaching the brackets, and to avoid injury, we recommend that two people install the chassis in the rack. (One person should support the chassis in the rack while the second person installs the fasteners.)

To install the brackets on the chassis, complete the following steps:

Step 1 Locate the threaded holes in the chassis sides (at the port adapter end of the chassis). (Refer to Figure 9.)

Step 2 Align the first bracket to the right side of the chassis. (The brackets are identical and can be mounted on either side of the chassis.) Hold the bracket in the orientation shown in the Figure 9.

Figure 9 Installing the Brackets on the Chassis—Cisco 7206 Shown



Step 3 Thread two M4 x 10-mm Phillips flathead screws through the bracket and into the side of the chassis. Use a number 2 Phillips screwdriver to tighten the screws.

Step 4 Repeat Step 1 through Step 3 for the other bracket.

Step 5 Proceed to the next section to install the chassis in the rack.

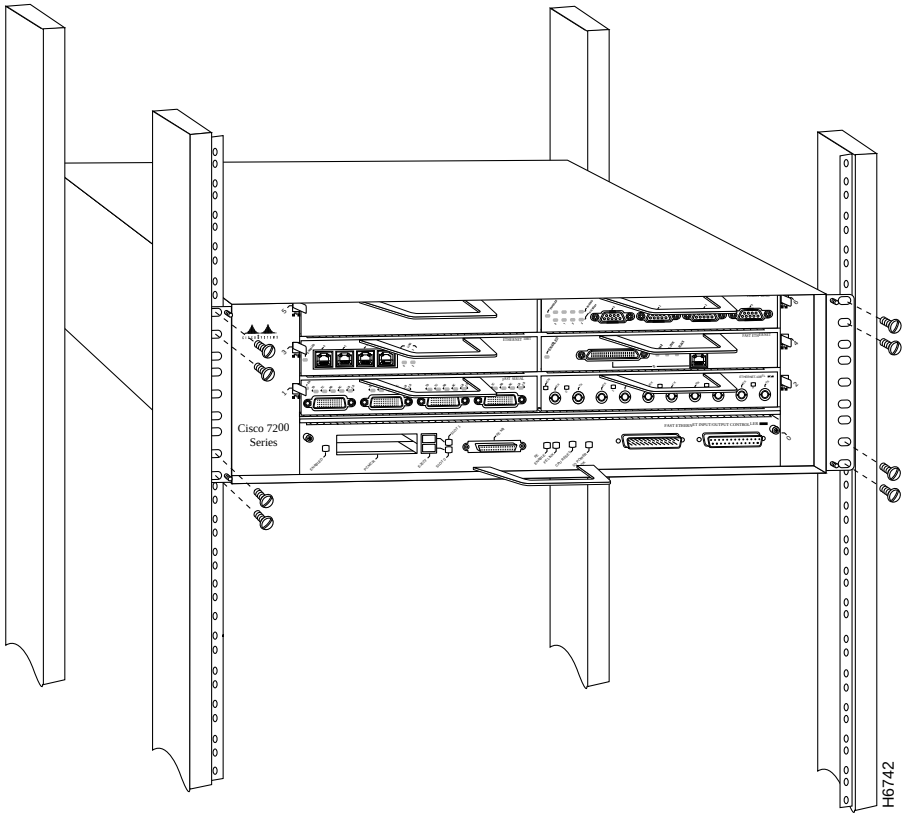
Warning To prevent injury, review the safety precautions in the section “Safety Guidelines” before installing the router in a rack.

This completes the procedure for installing the brackets on the chassis. Proceed to the section “Installing the Chassis in the Rack.”

Installing the Chassis in the Rack

After installing the brackets on the chassis, mount the router by securing the brackets to two posts or mounting strips in the rack using the slotted screws provided. Because the brackets support the weight of the entire chassis, be sure to use all eight slotted screws to fasten the two chassis brackets to the rack posts. Figure 10 shows a typical installation in a standard, 19-inch equipment rack with four mounting posts. Figure 11 shows a typical installation in a Telco-type rack, which usually has two center posts and is bolted to the floor. If you are mounting the router in a rack with four posts, use all eight slotted screws to mount the chassis on the front posts.

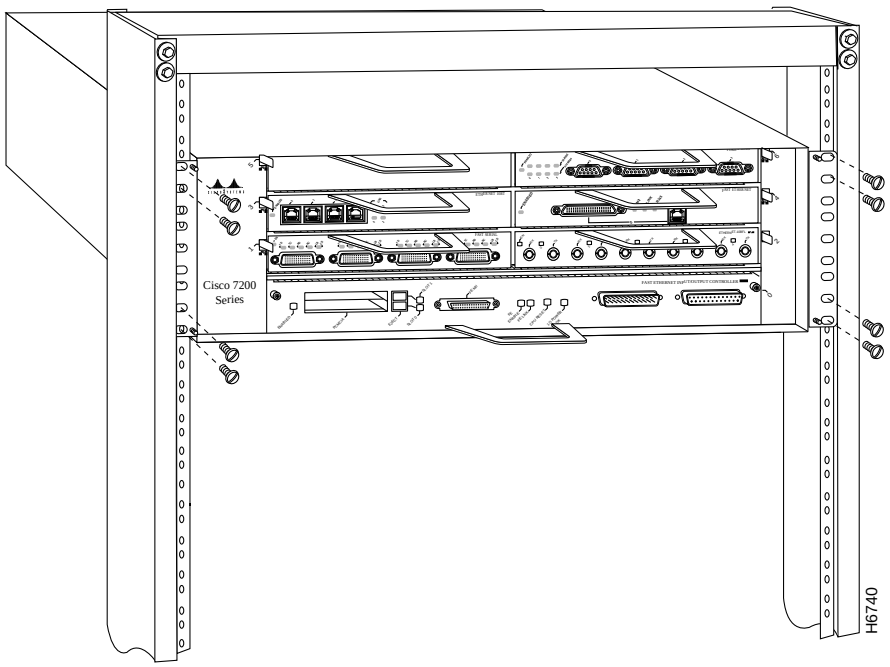
Figure 10 Installing the Chassis in a Four-Post 19-Inch Rack—Cisco 7206 Shown



We recommend that you allow at least one or two inches of vertical clearance between the router and any equipment directly above and below it.

Warning To maintain a low center of gravity, ensure that heavier equipment is installed near the bottom of the rack.

Figure 11 Installing the Chassis in a Telco-Type Rack—Cisco 7206 Shown



Warning To prevent the rack from tipping when installing the router in Telco-type racks, ensure that the rack is bolted to the floor and, if necessary, anchored with appropriate fixtures.

To install the chassis in the rack, complete the following steps:

Step 1 On the chassis, ensure that all captive screws on the network processing engine, the I/O controller, and each power supply are tightened and the port adapter levers are in the locked position.

Step 2 Make sure that your path to the rack is unobstructed. If the rack is on wheels, ensure that the brakes are engaged or that the rack is otherwise stabilized.

Warning To prevent damage to the chassis or personal injury, never attempt to lift or tilt the Cisco 7206 using the port adapter handles or the I/O controller handle; they are not designed to support the weight of the router. *Always* have someone help you when installing your Cisco 7200 series router.

Note *Two people should perform Step 3 through Step 6.*

Step 3 Position the chassis so that the end with the brackets attached is closest to you; then lift the chassis and move it to the rack. To prevent injury, avoid sudden twists or moves.

Step 4 Slide the chassis into the rack, pushing it back until the brackets meet the front mounting strips or posts on both sides of the equipment rack.

Step 5 While keeping the brackets flush against the posts or mounting strips, position the router so the holes in the brackets are aligned with those in the mounting strips.

Step 6 From the front of the rack, insert all eight 10-32 x 3/8 slotted screws (four on each side) through the brackets and into the mounting strip (use the top and bottom bracket holes, as shown in Figure 11). Using a 1/4-inch, flat-blade screwdriver, tighten all the screws.

This completes the procedure for installing the chassis in the rack. Proceed to the following section "Reconnecting Input Power and Powering Up the Router."

Reconnecting Input Power and Powering Up the Router

The following procedures explain how to reconnect AC-input power to a Cisco 7200 series router, power up the router, and verify a successful system boot.

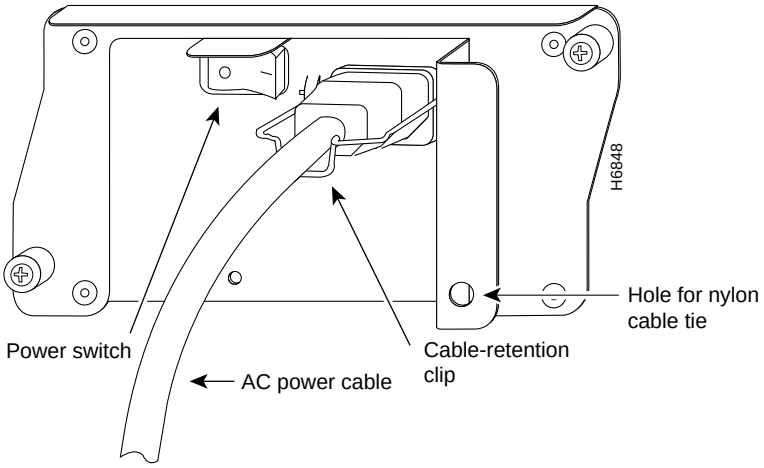
To connect AC-input power to a Cisco 7200 series router, complete the following steps:

Step 1 At the rear of the router, check that the power switch on the power supply is in the OFF (0) position.

Step 2 Slide the cable-retention clip down, away from the AC receptacle, and plug in the power cable.

Step 3 Secure the cable in the power supply AC receptacle by sliding the cable-retention clip up until it snaps around the connector. The cable-retention clip provides strain relief for the AC power cable (refer to Figure 12).

Figure 12 Connecting AC-Input Power to a Cisco 7200 Series Router



Step 4 Plug the AC power supply cable into the AC power source.

Note Each AC-input power supply operating at 120 VAC requires a minimum of 5A service. We recommend powering the Cisco 7200 series routers from a 15A receptacle at the power source.

Step 5 Repeat Step 1 through Step 4 for the second power supply (if present).

This completes the steps for connecting AC input power to a Cisco 7200 series router.

To power up a Cisco 7200 series router that has an installed AC-input power supply, complete the following steps:

Step 1 Check for the following:

- Each port adapter is inserted in its slot and its respective port adapter lever is in the locked position
- The network processing engine and the I/O controller are inserted in their respective slots, and their captive installation screws are tightened
- All network interface cables are connected to the port adapters
- A Flash memory card is installed in its PCMCIA slot (if present)
- Each power cable is connected and secured with the cable-retention clip
- The console terminal is turned on

Step 2 At the rear of the router, place the power switch on the power supply in the ON (|) position. Repeat this step if a second power supply is installed in the router. The green OK LED on the power supply turns on.

Step 3 Listen for the fans; you should immediately hear them operating.

Step 4 During the boot process, observe the system's LEDs. The LEDs on most of the port adapters go on and off in irregular sequence. Some may go on, go out, and go on again for a short time. On the I/O controller, the IO Power OK LED comes on immediately.

Step 5 Observe the initialization process. When the system boot is complete (a few seconds), the network processing engine begins to initialize the port adapters and the I/O controller. During this initialization, the LEDs on each port adapter behave differently (most flash on and off). The enabled LED on each port adapter goes on when initialization is completed, and the console screen displays a script and system banner similar to the following:

```
Cisco Internetwork Operating System Software
IOS (tm) 7200 Software (C7200-J-M), Version 11.1(6)CA [kpfjrgiu 100]
Copyright (c) 1986-1996 by cisco Systems, Inc.
Compiled Sun 21-Apr-96 04:10 by
```

This completes the procedures for connecting input power and powering up the router. This also completes the procedure for rack-mounting the Cisco 7206.

Cisco Connection Online

Cisco Connection Online (CCO), formerly Cisco Information Online (CIO), is Cisco Systems' primary, real-time support channel. Maintenance customers and partners can self-register on CCO to obtain additional content and services.

Available 24 hours a day, 7 days a week, CCO provides a wealth of standard and value-added services to Cisco's customers and business partners. CCO services include product information, software updates, release notes, technical tips, the Bug Navigator, configuration notes, brochures, descriptions of service offerings, and download access to public and authorized files.

CCO serves a wide variety of users through two interfaces that are updated and enhanced simultaneously—a character-based version and a multimedia version that resides on the World Wide Web (WWW). The character-based CCO supports Zmodem, Kermit, Xmodem, FTP, and Internet e-mail, and is excellent for quick access to information over lower bandwidths. The WWW version of CCO provides richly formatted documents with photographs, figures, graphics, and video, as well as hyperlinks to related information.

You can access CCO in the following ways:

- WWW: http://www.cisco.com.
- WWW: http://www-europe.cisco.com.
- WWW: http://www-china.cisco.com.
- Telnet: cco.cisco.com.
- Modem: From North America, 408 526-8070; from Europe, 33 1 64 46 40 82. Use the following terminal settings: VT100 emulation; databits: 8; parity: none; stop bits: 1; and baud rates up to 14.4 kbps.

For a copy of CCO's Frequently Asked Questions (FAQ), contact cco-help@cisco.com. For additional information, contact cco-team@cisco.com.

Note If you are a network administrator and need personal technical assistance with a Cisco product that is under warranty or covered by a maintenance contract, contact Cisco's Technical Assistance Center (TAC) at 800 553-2447, 408 526-7209, or tac@cisco.com. To obtain general information about Cisco Systems, Cisco products, or upgrades, contact 800 553-6387, 408 526-7208, or cs-rep@cisco.com.

This document is to be used in conjunction with the *Cisco 7204 Installation and Configuration Guide* and the *Cisco 7206 Installation and Configuration Guide* publications.

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