



Text Part Number: 78-5358-03 Rev. B0

Cisco uBR7200 Series Universal Broadband Router 550-Watt DC-Input Power Supply Replacement Instructions

Product Numbers: PWR-UBR7200-DC, PWR-UBR7200-DC=, PWR-UBR7200/2-DC, CHAS-UBR7246VXR=, CHAS-UBR7246=, CHAS-UBR7223=

This document explains how to remove and replace the 550-watt (W) DC-input power supply in the Cisco uBR7200 series universal broadband routers (which consist of the Cisco uBR7246 VXR, Cisco uBR7246, and the Cisco uBR7223). It includes instructions for powering down the router, removing an installed power supply, and installing a new power supply. This document also includes steps for verifying the initialization of the system after you power up a Cisco uBR7200 series router.

Note Use this document in conjunction with the *and Regulatory Compliance and Safety Information for the Cisco uBR7200 Series Universal Broadband Router* that shipped with your Cisco uBR7246 VXR, Cisco uBR7246, or Cisco uBR7223.

The following sections are included in this document:

- If You Need More Information, page 2
- DC-Input Power Supply Overview, page 2
- Installation Prerequisites, page 3
- Removing and Replacing a DC-Input Power Supply, page 8
- Cisco Connection Online, page 21
- Cisco Documentation CD-ROM, page 22

Corporate Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA

Copyright © 1998-1999
Cisco Systems, Inc.
All rights reserved.

If You Need More Information

The Cisco IOS software running on your router contains extensive features and functionality. The effective use of many of these features is easier if you have more information available. For additional information on configuring and maintaining a Cisco uBR7200 series router, the following documentation resources are available:

- For Cisco IOS software configuration information, refer to the modular configuration and modular command reference publications in the Cisco IOS software configuration documentation set that corresponds to the software release installed on your Cisco hardware.

Note You can access Cisco IOS software configuration documentation on the World Wide Web at <http://www.cisco.com>, <http://www-china.cisco.com>, or <http://www-europe.cisco.com>.

- For hardware installation and maintenance information on the Cisco uBR7200 series, refer to the Cisco uBR7200 series universal broadband router
- For international agency compliance, safety, and statutory information for wide-area network (WAN) interfaces for the Cisco uBR7200 series, refer to the *Regulatory Compliance and Safety Information for the* that shipped with your Cisco uBR7200 series universal broadband router
- To obtain general information about documentation, refer to the “Cisco Connection Online” section on page 21, 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 holidays). You can also send e-mail to cs-rep@cisco.com, or you can refer to the *Cisco Information Packet* that shipped with your router.

DC-Input Power Supply Overview

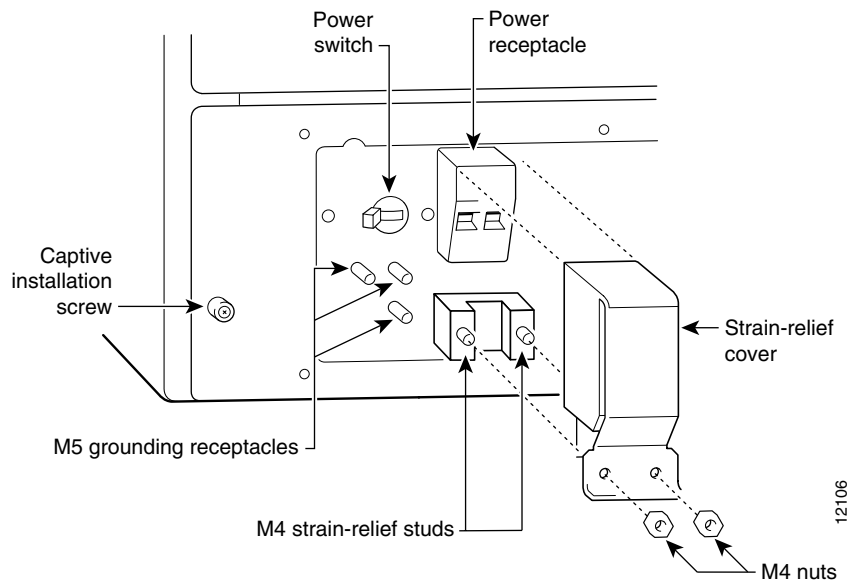
A fully configured Cisco uBR7200 series router comes equipped with one 550W, DC-input power supply. For a Cisco uBR7246 VXR or Cisco uBR7246, an optional, second DC-input power supply can be ordered. The Cisco uBR7200 series operates with one installed power supply; however, the second power supply installed in a Cisco uBR7246 VXR or Cisco uBR7246 provides hot-swappable, load-sharing redundant power.

Note Detailed instructions for handling and replacing the Cisco uBR7200 series AC-input power supplies are contained in the document *Cisco uBR7200 Series Universal Broadband Router 550-Watt AC-Input Power Supply Replacement Instructions* (Part Number 78-4848-05). This document accompanies every 550W AC-input power supply that is shipped from the factory as a field-replaceable unit (FRU). This document is also available on the Documentation CD-ROM and on Cisco Connection Online (CCO).

Do not mix AC-input and DC-input power supplies in the same Cisco uBR7246 VXR or Cisco uBR7246 chassis.

The faceplate of the 550W DC-input power supply has a green OK LED, a power switch, a handle for removing, installing, and handling the power supply, two DC-input power receptacles, two M5 grounding receptacles, a strain-relief cover that attaches to two M4 studs to secure the DC-input power leads, and two captive installation screws. (See Figure 1.)

Figure 1 Cisco uBR7200 Series DC-Input Power Supply Faceplate



The DC-input power supply operates at -48 volts direct current (VDC) input voltage and supplies $+3.5\text{V}$, $+5.2\text{V}$, $+12.2\text{V}$, -12.2V , $+16\text{V}$, and -16V DC power to the router's internal components through the router midplane.

Note Each DC-input power supply has an electrical current rating of 14A, 700 VA. Use a minimum of 12 AWG (4 mm²) wire for the input to each DC-input power supply. The power input must be protected by a 20A circuit breaker or fuse that is in compliance with your local electric regulations.

The power supply handle provides a grip point for pulling the power supply out of the router. (See Figure 2.) The two captive installation screws secure the power supply in the router. Three DC-input leads (-48 , $+48$ [return], and ground) connect the DC-input power supply to the site DC power source.



Caution When the input power to a Cisco uBR7200 series power supply is disconnected or lost, the power supply will enter a reset cycle for 90 seconds. Wait at least 90 seconds or move the power switch from one position to the other to restart the power supply. For example, if the power supply was ON when the power was disconnected or lost, move the power switch to the OFF position then back to the ON position. If you do not wait the full 90 seconds or move the power switch from one position to the other, the power supply will not restart.

Installation Prerequisites

This section provides a list of parts and tools you need to remove and replace the DC-input power supply in the Cisco uBR7200 series. This section also includes safety and ESD-prevention guidelines to help you avoid injury to yourself and damage to the equipment. (See the “Cisco Connection Online” section on page 21 for ordering information.)

Parts and Tools

You need the following tools and parts to remove and replace the DC-input power supply in the Cisco uBR7200 series. If you need additional equipment, contact a service representative for ordering information.

- A new DC-input power supply
- 14 American Wire Gauge (2.08 mm²) cable with at least three conductors rated for at least 140° F (60° C) (for new DC-input power supply installations)
- Standard wire stripper
- Number 2 Phillips screwdriver
- 3/16-inch flat-blade screwdriver
- 8 mm wrench or nut driver, or adjustable wrench (for connecting a grounding lug to a DC-input power supply)
- 7 mm wrench or nut driver, or adjustable wrench (for connecting the DC-input power lead strain-relief cover to a DC-input power supply)
- Tape (for securing the handle of a DC circuit breaker in the OFF position when the DC-input power supply is powered down)

Note If your router is mounted in a 4-post or telco rack, you need at least one other person to assist you with removing the chassis from the rack.

Safety Guidelines

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

Safety Warnings

Safety warnings appear throughout this publication in procedures that, if performed incorrectly, might harm you. A warning symbol precedes each warning statement.



Warning This warning symbol means *danger*. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information* document that accompanied this device.

Waarschuwing Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van standaard maatregelen om ongelukken te voorkomen. Voor vertalingen van de waarschuwingen die in deze publicatie verschijnen, kunt u het document *Regulatory Compliance and Safety Information* (Informatie over naleving van veiligheids- en andere voorschriften) raadplegen dat bij dit toestel is ingesloten.

Varoitus Tämä varoitusmerkki merkitsee vaaraa. Olet tilanteessa, joka voi johtaa ruumiinvammaan. Ennen kuin työskentelet minkään laitteiston parissa, ota selvää sähkökytkentöihin liittyvistä vaaroista ja tavanomaisista onnettomuuksien ehkäisykeinoista. Tässä julkaisussa esiintyvien varoitusten käännökset löydät laitteen mukana olevasta *Regulatory Compliance and Safety Information* -kirjasesta (määräysten noudattaminen ja tietoa turvallisuudesta).

Attention Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant causer des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers posés par les circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions d'avertissements figurant dans cette publication, consultez le document *Regulatory Compliance and Safety Information* (Conformité aux règlements et consignes de sécurité) qui accompagne cet appareil.

Warnung Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu einer Körperverletzung führen könnte. Bevor Sie mit der Arbeit an irgendeinem Gerät beginnen, seien Sie sich der mit elektrischen Stromkreisen verbundenen Gefahren und der Standardpraktiken zur Vermeidung von Unfällen bewußt. Übersetzungen der in dieser Veröffentlichung enthaltenen Warnhinweise finden Sie im Dokument *Regulatory Compliance and Safety Information* (Informationen zu behördlichen Vorschriften und Sicherheit), das zusammen mit diesem Gerät geliefert wurde.

Avvertenza Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di lavorare su qualsiasi apparecchiatura, occorre conoscere i pericoli relativi ai circuiti elettrici ed essere al corrente delle pratiche standard per la prevenzione di incidenti. La traduzione delle avvertenze riportate in questa pubblicazione si trova nel documento *Regulatory Compliance and Safety Information* (Conformità alle norme e informazioni sulla sicurezza) che accompagna questo dispositivo.

Advarsel Dette varselsymbolet betyr fare. Du befinner deg i en situasjon som kan føre til personskade. Før du utfører arbeid på utstyr, må du være oppmerksom på de faremomentene som elektriske kretser innebærer, samt gjøre deg kjent med vanlig praksis når det gjelder å unngå ulykker. Hvis du vil se oversettelser av de advarslene som finnes i denne publikasjonen, kan du se i dokumentet *Regulatory Compliance and Safety Information* (Overholdelse av forskrifter og sikkerhetsinformasjon) som ble levert med denne enheten.

Aviso Este símbolo de aviso indica perigo. Encontra-se numa situação que lhe poderá causar danos físicos. Antes de começar a trabalhar com qualquer equipamento, familiarize-se com os perigos relacionados com circuitos eléctricos, e com quaisquer práticas comuns que possam prevenir possíveis acidentes. Para ver as traduções dos avisos que constam desta publicação, consulte o documento *Regulatory Compliance and Safety Information* (Informação de Segurança e Disposições Reguladoras) que acompanha este dispositivo.

¡Advertencia! Este símbolo de aviso significa peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considerar los riesgos que entraña la corriente eléctrica y familiarizarse con los procedimientos estándar de prevención de accidentes. Para ver una traducción de las advertencias que aparecen en esta publicación, consultar el documento titulado *Regulatory Compliance and Safety Information* (Información sobre seguridad y conformidad con las disposiciones reglamentarias) que se acompaña con este dispositivo.

Warning! Denna varningssymbol signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanligt förfarande för att förebygga skador. Se förklaringar av de varningar som förekommer i denna publikation i dokumentet *Regulatory Compliance and Safety Information* (Efterrettelse av föreskrifter och säkerhetsinformation), vilket medföljer denna anordning.

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 if 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.
- A 20A DC circuit breaker is recommended for the DC-input power source. This circuit breaker should protect against short-circuit and overcurrent faults in accordance with United States National Electrical Code NFPA 70 (United States), Canadian Electrical Code, part I, C22.1 (Canada), and IEC 364 (other countries).
- Only a DC power source that complies with the Safety Extra-Low Voltage (SELV) requirements in UL 1950, CSA 950, EN 60950, and IEC950 can be connected to the DC-input power supply.
- A readily accessible disconnect device must be incorporated in the fixed wiring.
- This unit is to be installed in a restricted access area in accordance with articles 110-16, 110-17, and 110-18 of the National Electric Code, ANSI/NFPA 70.

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.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) damages equipment and impairs electrical circuitry. ESD occurs when printed circuit boards are improperly handled and results in complete or intermittent failures.

The I/O controller, network processing engine, cable modem cards, and port adapters consist of a printed circuit board that is fixed in a metal carrier. Electromagnetic interference (EMI) shielding, connectors, and a handle are integral components of the carrier. Handle the I/O controller, network processing engine, cable modem cards, and port adapters by the carrier edges and handle only; never touch the printed circuit board components or connector pins.

Although the metal carrier helps to protect the printed circuit boards from ESD, wear a preventive antistatic strap whenever handling the network processing engine, I/O controller, cable modem cards, or port adapters. Ensure that the strap makes good skin contact and connect the strap's clip to an unpainted chassis surface to safely channel unwanted ESD voltages to ground. If no wrist strap is available, ground yourself by touching the unpainted metal part of the chassis.



Caution Make sure to tighten the captive installation screws on the network processing engine, cable modem cards, and the I/O controller (use a number 2 Phillips screwdriver). These screws prevent accidental removal, provide proper grounding for the router, and help to ensure that the network processing engine, cable modem cards, and the I/O controller are properly seated in the router midplane.

Following are guidelines for preventing ESD damage:

- Always use an ESD wrist strap or ankle strap when installing or replacing the I/O controller, network processing engine, or port adapters. Ensure that the ESD strap makes contact with your skin.
- Handle the I/O controller, network processing engine, or port adapters by the metal carrier edges and handles only; avoid touching the printed circuit board components or any connector pins.
- When removing the I/O controller, network processing engine, or port adapters, place them on an antistatic surface with the printed circuit board components facing upward, or in a static shielding bag. If you are returning an I/O controller, network processing engine, or port adapter to the factory, immediately place it in a static shielding bag.



Caution Periodically check the resistance value of the antistatic strap. The measurement should be within the range of 1 and 10 megohm (Mohm).

Ensuring Easy Access to the Router

If your Cisco uBR7200 series router is installed in a standard 19-inch-wide, 4-post equipment rack or telco-type equipment rack, cables from other equipment in the rack might obstruct access to the rear of the router. Also, rack power strips or other permanent fixtures might obstruct access to the router. Review the following guidelines to ensure easy access to the rear of the router when it is installed in a rack. If the router is not installed in a rack, or if you already have clear access to the rear of the router, proceed to the “Removing and Replacing a DC-Input Power Supply” section on page 8.

Use the following guidelines to ensure easy access to the rear of the router when it is installed in a rack:

- Ensure that you have at least 3 to 4 feet of working space at the rear of the router.
- If cables from other equipment in the rack fall in front of the rear side of the router, carefully gather the cables (using care not to strain them) and use cable ties to anchor them away from the rear of the router.
- If access to the rear of the router is partially blocked by a power strip or some other permanent rack fixture, detach the router from the rack and carefully slide it forward until there is enough clearance to remove the power supply, the fan tray, the network processing engine, and the subchassis from the router. Detailed steps for detaching the router from the rack are contained in the following section “Removing and Replacing a DC-Input Power Supply.”



Caution Make sure that at least one other person is available to support the front of the router as you slide it out from the rack and, if necessary, to continue to support it while you remove and insert the power supply, network processing engine, or subchassis.

Removing and Replacing a DC-Input Power Supply

The following sections explain how to remove and replace a DC-input power supply in a Cisco uBR7200 series router for a single power supply configuration and a dual power supply configuration.

Single Power Supply Configuration

Removing and replacing the DC-input power supply in a single power supply configuration involves the following tasks:

- Powering Down the Router
- Disconnecting DC-Input Power
- Removing the DC-Input Power Supply
- Replacing the DC-Input Power Supply
- Reconnecting DC-Input Power
- Powering Up the Router

These tasks are described in detail in the following subsections.

Powering Down the Router

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 goes off.
 - The fans stop operating.
 - The LEDs on the I/O controller go off.
 - The LEDs on the port adapters go off.
 - The LEDs on the cable modem cards go off.
- Step 3** Turn OFF the power source and disconnect the –48V and +48V leads from the power source. You can leave the ground cable connected.

This completes the procedure for powering down the router. Proceed to the following section “Disconnecting DC-Input Power.”

Disconnecting DC-Input Power



Warning Before completing any of the following tasks, and to prevent short-circuit or shock hazards, 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.



Warning When installing the unit, the ground connection must always be made first and disconnected last.



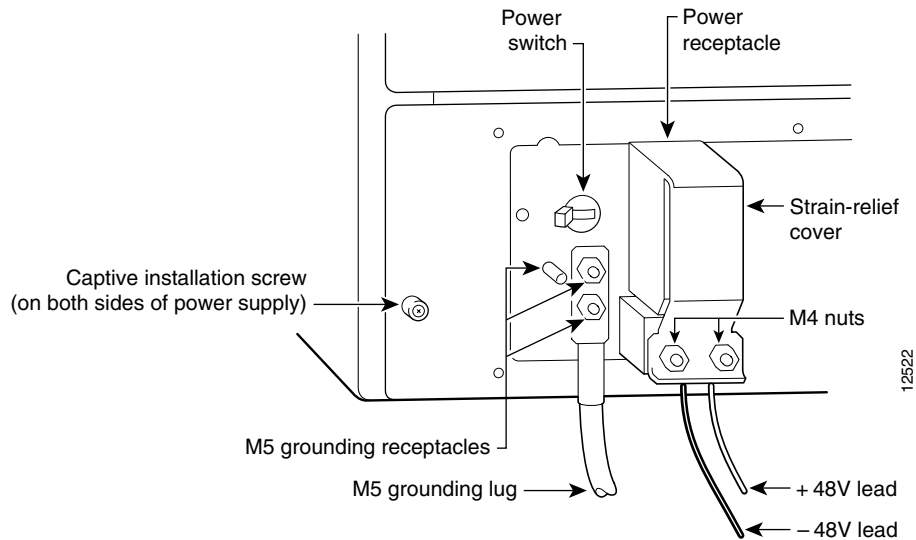
Warning Do not touch the power supply when the power cord is connected. For systems with a power switch, line voltages are present within the power supply even when the power switch is off and the power cord is connected. For systems without a power switch, line voltages are present within the power supply when the power cord is connected.



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

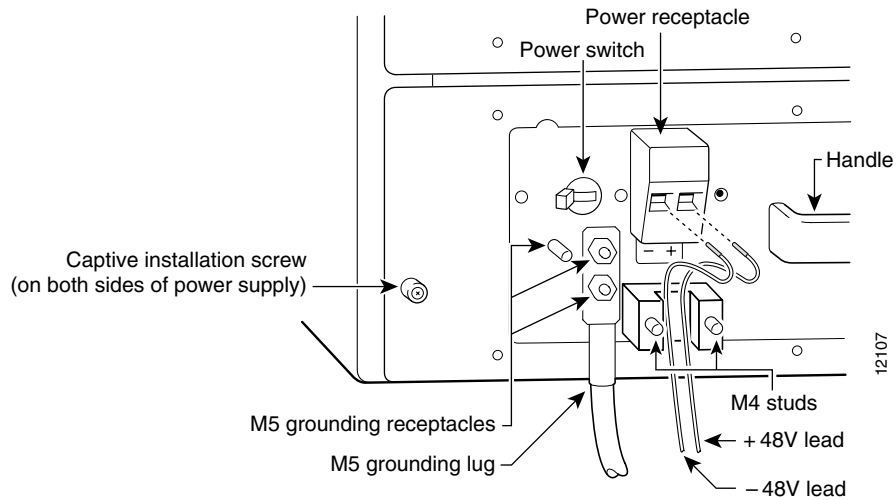
- Step 1** Ensure that the –48V and +48V leads are disconnected from the power source.
- Step 2** Using a 7 mm wrench or nut driver (or adjustable wrench), loosen and remove the two M4 nuts from the strain-relief cover that secures the –48V and +48V leads to the power supply faceplate. (See Figure 2.)

Figure 2 Removing the Strain-Relief Cover from a Cisco uBR7200 Series DC-Input Power Supply



Step 3 Using a 3/16-inch flat-blade screwdriver, loosen the screw below the +48V lead receptacle and pull the lead from the connector. (See Figure 3.) Repeat this step for the -48V lead.

Figure 3 Disconnecting Power from a Cisco uBR7200 Series DC-Input Power Supply



Step 4 Using an 8 mm wrench or nut driver (or adjustable wrench), loosen and remove the two M5 nuts that secure the two-hole-grounding lug to the grounding receptacle, and pull the grounding lug and lead from the receptacle. (See Figure 3.)

Note The color coding of the DC-input power supply leads depends on the color coding of the DC power source at your site. Typically, green or green/yellow is used for ground, black is used for +48V (return), and red or white is used for -48V. Make certain the lead color coding you choose for the DC-input power supply matches the lead color coding used at the DC power source.

This completes the procedure for disconnecting DC-input power. Proceed to the following section “Removing the DC-Input Power Supply.”

Removing the DC-Input Power Supply

Step 1 Using a number 2 Phillips screwdriver, loosen the two captive screws on the faceplate of the power supply. (See Figure 3.)

Note If you are removing a power supply filler plate to prepare for installing a second power supply, make sure you remove both the filler plate and its attached air dam from the second power supply bay.

If the router is not installed in a standard 4-post or telco rack, skip to Step 5. If the router is installed in a rack, determine if any permanent rack fixtures, such as a power strip, are obstructing access to the power supply. If a rack fixture is obstructing access to the power supply, proceed to Step 2, otherwise, proceed to Step 5.

Step 2 Using a 3/16-inch flat-blade screwdriver, loosen the screws that secure the router to the front mounting strips of the rack.

Step 3 Position at least one other person in front of the rack to support the front underside of the router.

Step 4 From the rear of the rack, carefully push the front of the router out of the rack until there is enough clearance to remove the power supply.

Step 5 Grasp the power supply handle and pull the DC-input power supply from the router.



Caution To maintain agency compliance requirements and meet EMI emissions standards for the Cisco uBR7246 with a single power supply, the power supply filler plate and its attached air dam must remain in the power supply adjacent to the installed power supply. Do not remove this filler plate or the attached air dam from the router unless you intend to install a redundant power supply.

This completes the procedure for removing the DC-input power supply from a Cisco uBR7200 series router. Proceed to the following section “Replacing the DC-Input Power Supply.”

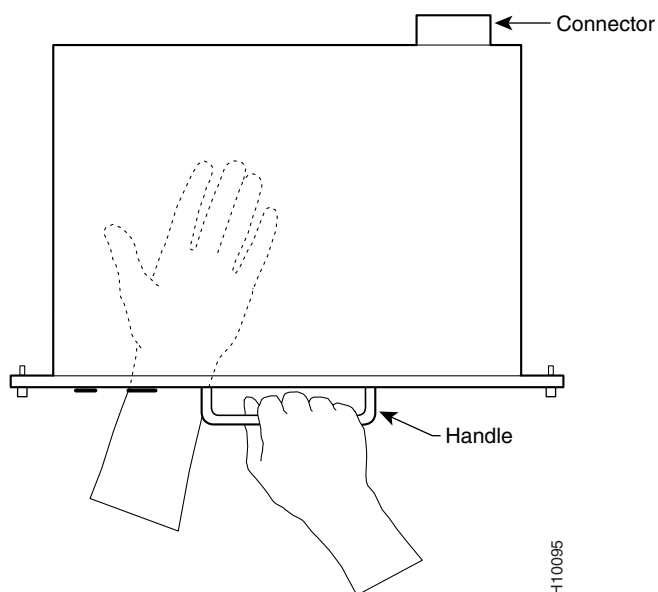
Replacing the DC-Input Power Supply

Step 1 Make sure the power switch on the power supply is in the OFF (0) position.

Note If you are adding a second power supply to a Cisco uBR7246 VXR or Cisco uBR7246 that previously only had one power supply installed, make sure the power supply filler plate and its attached air dam have been removed from the power supply bay.

Step 2 Grasp the power supply handle with one hand, and place your other hand underneath the power supply for support. (See Figure 4.)

Figure 4 Holding the DC-Input Power Supply



Step 3 Align the power supply to the power supply bay.

Step 4 Slide the power supply completely into the power supply bay until its faceplate is flush with the router's rear panel.



Caution When inserting a power supply into the router, do not use unnecessary force; slamming the power supply into the bay can damage the connectors on the rear of the supply and on the midplane.

Step 5 Seat the power supply in the router by tightening the captive screws with a number 2 Phillips screwdriver.

Note The power supply is not fully seated in the router midplane until you tighten the captive installation screws.

- Step 6** If there is no second power supply, replace the filler plate and its attached air dam on the empty power supply bay. Using a number 2 Phillips screwdriver, tighten the filler plate's captive screws.
- Step 7** If you pushed the router from the rack, slowly guide the router back into the rack.
- Step 8** Use a 3/16-inch flat-blade screwdriver to tighten the screws that secure the router to the front mounting strips of the rack.



Caution To maintain agency compliance requirements and meet EMI emissions standards for the Cisco uBR7246 VXR and Cisco uBR7246 with a single power supply, the power supply filler plate and its attached air dam must remain in the power supply adjacent to the installed power supply. Do not remove this filler plate or the air dam from the router unless you intend to install a redundant power supply.

This completes the procedures for replacing a power supply in the router. Proceed to the following section "Reconnecting DC-Input Power."

Reconnecting DC-Input Power

The following procedures explain how to reconnect DC-input power to a Cisco uBR7200 series, power up the router, and verify a successful system boot.

Note The color coding of the DC-input power supply leads depends on the color coding of the DC power source at your site. Typically, green or green/yellow is used for ground, black is used for +48V (return), and red or white is used for -48V. Make certain the lead color coding you choose for the DC-input power supply matches lead color coding used at the DC power source.



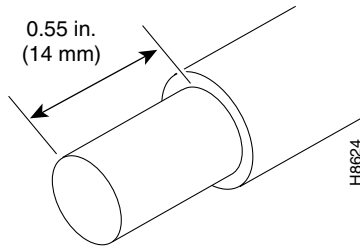
Warning Before completing any of the following steps, and to prevent short-circuit or shock hazards, ensure that power is removed from the DC circuit. To ensure that all power is OFF, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position.



Warning When installing the unit, the ground connection must always be made first and disconnected last.

- Step 1** Ensure that the -48V and +48V leads are disconnected from the power source.
- Step 2** At the rear of the router, check that the power switch on the power supply is in the OFF (0) position.
- Step 3** Connect the two-hole grounding lug on the grounding lead to the M5 grounding receptacles with the M5 nuts. Tighten the nuts using an 8 mm wrench or nut driver (or adjustable wrench). (See Figure 6.)
- Step 4** If necessary, use a wire stripper to strip approximately 0.55 inch (14 mm) from the -48V and +48V leads. (See Figure 5.)

Figure 5 Stripping the DC-Input Leads

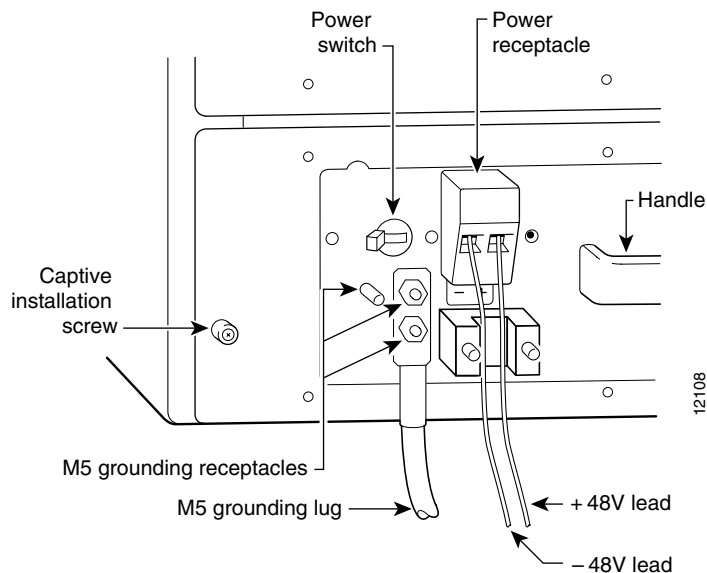


- Step 5** Insert the stripped end of the +48V lead all the way into the +48V lead receptacle and tighten the receptacle screw using the same 3/16-inch flat-blade screwdriver. Repeat Step 5 for the -48V lead.

Note Make sure the entire stripped end of each lead is inserted all the way into its receptacle. If any exposed wire at the stripped end of a lead is visible after inserting the lead into its receptacle, remove the lead from the receptacle, use the wire stripper to cut the stripped end of the lead, and repeat Step 4 through Step 5.

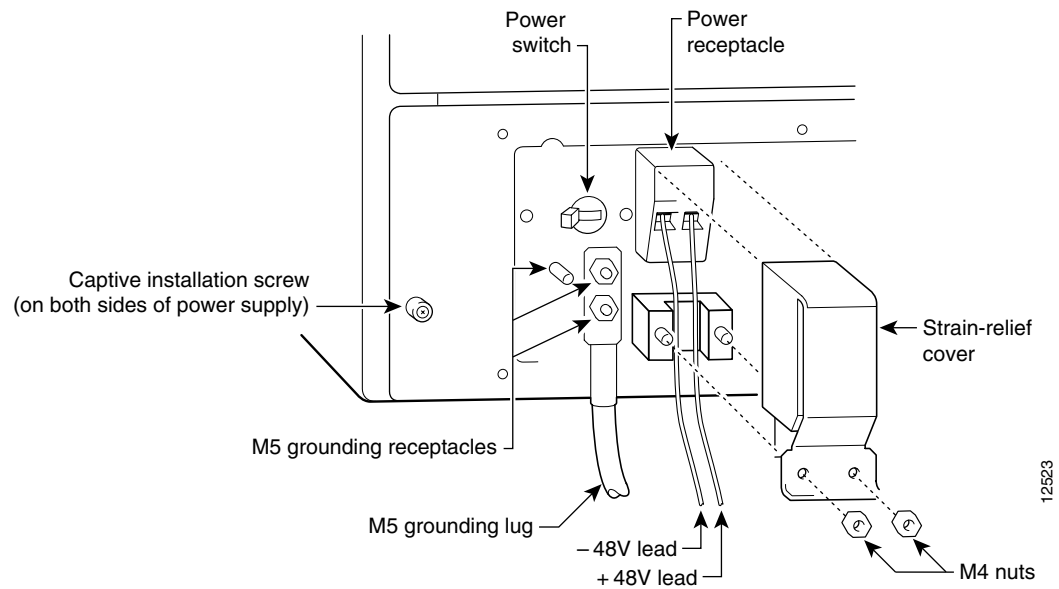
- Step 6** After tightening the receptacle screws and nuts for the ground, +48V, and -48V DC-input leads, run the +48V and -48V leads between the two strain-relief studs on the power supply faceplate. (See Figure 6.)

Figure 6 Connecting DC-Input Power to a Cisco uBR7200 Series



- Step 7** Replace the strain-relief cover over the +48V and -48V leads and secure the cover to the strain-relief studs using the two M4 nuts with a 7 mm wrench or nut driver (or adjustable wrench). (See Figure 7.)

Figure 7 Replacing the Strain-Relief Cover on a Cisco uBR7200 Series DC-Input Power Supply



Step 8 Connect the ground, +48V, and -48V leads to the power source.

Note Each DC-input power supply has an electrical current rating of 14A, 700 VA. Use a minimum of 12 AWG (4 mm²) wire for the input to each DC-input power supply. The power input must be protected by a 20A circuit breaker or fuse that is in compliance with your local electric regulations.

This completes the procedure for connecting DC-input power. Proceed to the following section “Powering Up the Router.”



Warning 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.

Powering Up the Router

- Step 1** Check for the following:
- Each port adapter is inserted in its slot, and the port adapter retention clip is in the locked position.
 - Each cable modem card is inserted in its slot, and its respective captive installation screws are tightened.
 - The network processing engine and the I/O controller are inserted in the respective slots, and the 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).

- All DC leads are connected and secured to the power supply faceplate (the grounding lug is secured to the M5 grounding receptacle, and the +48 and –48 leads are secured behind the strain-relief cover).
- Each DC lead is connected and secured to the power source.
- The tape (that you applied earlier) is removed from the circuit breaker switch handle, and power is restored by moving the circuit breaker handle to the ON position.
- 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 (I) position. Repeat this step if a second power supply is installed in the router. The green OK LED on the power supply goes 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 and cable modem cards go on and off in an irregular sequence. Some might go on, go out, and go on again for a short time. On the I/O controller, the IO Power OK LED goes on immediately.

Step 5 Observe the initialization process. When the system boot is complete (after 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) uBR7200 Software (uBR7200-I-M), Version 11.3(2)XA1 [smith 100]
Copyright (c) 1986-1998 by cisco Systems, Inc.
Compiled Sun 09-Mar-98 04:10 by smith
```

This completes the procedures for powering up the router. This also completes the procedure for replacing the DC-input power supply in a single Cisco uBR7200 series power supply configuration. If you have questions or need assistance, see the “Cisco Connection Online” section on page 21. Otherwise, if your Cisco uBR7246 VXR or Cisco uBR7246 has a dual power supply configuration, proceed to the next section “Dual Power Supply Configuration in a Cisco uBR7246 VXR or Cisco uBR7246.”

Dual Power Supply Configuration in a Cisco uBR7246 VXR or Cisco uBR7246

Removing and replacing a DC-input power supply in a dual power supply configuration in a Cisco uBR7246 VXR or Cisco uBR7246 involves the following tasks:

- Turning Off the Power Supply
- Disconnecting DC-Input Power
- Removing the DC-Input Power Supply
- Replacing the DC-Input Power Supply
- Reconnecting DC-Input Power
- Turning on the Power Supply

These tasks are described in detail in the following subsections.

Turning Off the Power Supply

- Step 1** Facing the rear of the router, place the power switch (on the power supply) in the OFF (0) position.
- Step 2** Observe the following items:
- The green OK LED on the power supply goes off.
 - The second power supply maintains full system power (the system continues to operate as normal).
- Step 3** Turn off the power source and disconnect the –48V and +48V leads from the power source. You can leave the ground cable connected.

This completes the procedure for turning off the power supply. Proceed to the following section “Disconnecting DC-Input Power.”

Disconnecting DC-Input Power



Warning Before completing any of the following steps, and to prevent short-circuit or shock hazards, 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.



Warning When installing the unit, the ground connection must always be made first and disconnected last.



Warning Do not touch the power supply when the power cord is connected. For systems with a power switch, line voltages are present within the power supply even when the power switch is off and the power cord is connected. For systems without a power switch, line voltages are present within the power supply when the power cord is connected.



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

- Step 1** Ensure that the –48V and +48V leads are disconnected from the power source.
- Step 2** Using a 7 mm wrench or nut driver (or adjustable wrench), loosen and remove the two M4 nuts from the strain-relief cover that secures the –48V and +48V leads to the power supply faceplate. (See Figure 2.)
- Step 3** Using a 3/16-inch flat-blade screwdriver, loosen the screw below the +48V lead receptacle and pull the lead from the connector. (See Figure 3.) Repeat this step for the –48V lead.
- Step 4** Using an 8 mm wrench or nut driver (or adjustable wrench), loosen and remove the two M5 nuts that secure the two-hole-grounding lug to the grounding receptacle, and pull the grounding lug and lead from the receptacle. (See Figure 3.)

Note The color coding of the DC-input power supply leads depends on the color coding of the DC power source at your site. Typically, green or green/yellow is used for ground, black is used for +48V (return), and red or white is used for -48V. Make certain the lead color coding you choose for the DC-input power supply matches the lead color coding used at the DC power source.

This completes the procedure for disconnecting DC input power. Proceed to the “Removing the DC-Input Power Supply” section on page 19.

Removing the DC-Input Power Supply

Step 1 Using a number 2 Phillips screwdriver, loosen the two captive screws on the faceplate of the power supply. (See Figure 3.)

If the router is not installed in a standard 4-post or telco rack, skip to Step 5. If the router is installed in a rack, determine if any permanent rack fixtures, such as a power strip, are obstructing access to the power supply. If a rack fixture is obstructing access to the power supply, proceed with Step 2, otherwise, proceed to Step 5.

Step 2 Use a 3/16-inch flat-blade screwdriver to loosen the screws that secure the router to the front mounting strips of the rack.

Step 3 Position at least one other person in front of the rack to support the front underside of the router.

Step 4 From the rear of the rack, carefully push the front of the router out of the rack until there is enough clearance to remove the power supply from the router.

Step 5 Grasp the power supply handle and pull the DC-input power supply from the router.

This completes the procedure for removing the DC-input power supply. Proceed to the following section “Replacing the DC-Input Power Supply.”

Replacing the DC-Input Power Supply

Step 1 Make sure the power switch on the power supply is in the OFF (0) position.

Step 2 Grasp the power supply handle with one hand and place your other hand underneath the power supply for support. (See Figure 4.)

Note If you are adding a second power supply to a Cisco uBR7246 VXR or Cisco uBR7246 that previously only had one power supply installed, make sure the power supply filler plate and its attached air dam have been removed from the power supply bay.

Step 3 Align the power supply to the power supply bay.

Step 4 Slide the power supply completely into the power supply bay until its faceplate is flush with the router’s rear panel.



Caution When inserting a power supply into the router, do not use unnecessary force; slamming the power supply into the bay can damage the connectors on the rear of the supply and on the midplane.

Step 5 Seat the power supply in the router by tightening its captive screws with a number 2 Phillips screwdriver.

Note The power supply is not fully seated in the router midplane until you tighten its captive installation screws.

Step 6 If you pushed the router forward in the rack, slowly guide the router back into the rack.

- Step 7** Use a 3/16-inch flat-blade screwdriver to tighten the screws that secure the router to front mounting strips of the rack.

This completes the procedures for installing a power supply in the router. Proceed to the following section “Reconnecting DC-Input Power.”

Reconnecting DC-Input Power

The following procedures explain how to reconnect DC-input power to a Cisco uBR7200 series power supply, turn on the power supply, and verify the power supply is operating properly.

Note The color coding of the DC-input power supply leads depends on the color coding of the DC power source at your site. Typically, green or green/yellow is used for ground, black is used for +48V (return), and red or white is used for –48V. Make certain the lead color coding you choose for the DC-input power supply matches lead color coding used at the DC power source.



Warning Before completing any of the following steps, and to prevent short-circuit or shock hazards, 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.



Warning When installing the unit, the ground connection must always be made first and disconnected last.

- Step 1** Ensure that the –48V and +48V leads are disconnected from the power source.
- Step 2** At the rear of the router, check that the power switch on the power supply is in the OFF (0) position.
- Step 3** Connect the two-hole grounding lug on the grounding lead to the M5 grounding receptacles with the two M5 nuts. Tighten the nuts using an 8 mm wrench or nut driver (or adjustable wrench). (See Figure 6.)
- Step 4** Using a wire stripper, strip approximately 0.55 inch (14 mm) from the –48V and +48V leads. (See Figure 5.)
- Step 5** Insert the stripped end of the +48V lead all the way into the +48V lead receptacle and tighten the receptacle screw using the same 3/16-inch flat-blade screwdriver. Repeat for the –48V lead.

Note Make sure the entire stripped end of each lead is inserted all the way into its receptacle. If any exposed wire at the stripped end of a lead is visible after inserting the lead into its receptacle, remove the lead from the receptacle, use the wire stripper to cut the stripped end of the lead, and repeat Step 4 through Step 5.

- Step 6** After tightening the receptacle screws and nuts for the ground, +48V, and –48V DC-input leads, run the +48V and –48V leads between the two strain-relief studs on the power supply faceplate. (See Figure 6.)
- Step 7** Replace the strain-relief cover over the +48V and –48V leads and secure the cover to the strain-relief studs using the two M4 nuts with a 7 mm wrench or nut driver (or adjustable wrench). (See Figure 7.)

Step 8 Connect the ground, +48V, and –48V leads to the power source.

Note Each DC-input power supply operating at –48 VDC in North America requires a minimum of 14A, 700 VA service. Each DC-input power supply operating at –60 VDC in the European Community requires a minimum of 12A service. We recommend powering the Cisco uBR7200 series from a minimum 15A receptacle at the power source, which is protected by a 20A circuit breaker or fuse.

This completes the steps for connecting DC input power to a Cisco uBR7200 series. Proceed to the following section “Turning on the Power Supply.”



Warning 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.

Turning on the Power Supply

Step 1 Place the power switch on the newly installed power supply in the ON (I) position.

Step 2 Observe the following:

- The green OK LED on the power supply goes on.
- The system continues to operate as normal.

This completes the procedures for turning on the power supply. This also completes the procedure for removing and replacing the DC-input power supply in a Cisco uBR7200 series. If you have questions or need assistance, see the “Cisco Connection Online” section on page 21.

Cisco Connection Online

Cisco Connection Online (CCO) is Cisco Systems’ primary, real-time support channel. Maintenance customers and partners can self-register on CCO to obtain additional information 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, product documentation, 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 it 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 connection rates up to 28.8 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.

Cisco Documentation CD-ROM

Cisco documentation and additional literature are available on a CD-ROM, which ships with your product. The Documentation CD-ROM, a member of the Cisco Connection Family, is updated monthly; therefore, it might be more up to date than printed documentation. To order additional copies of the Documentation CD-ROM, contact your local sales representative or call customer service. The CD-ROM is available as a single item or as an annual subscription. You can also access Cisco documentation on the World Wide Web at <http://www.cisco.com>, <http://www-china.cisco.com>, or <http://www-europe.cisco.com>.

If you are reading Cisco product documentation on the World Wide Web, you can submit comments electronically. Click **Feedback** on the toolbar and select **Documentation**. After you complete the form, click **Submit** to send it to Cisco. We appreciate your comments.

This document is to be used in conjunction with the *Cisco uBR7246 Universal Broadband Router Installation and Configuration Guide*, *Cisco uBR7223 Universal Broadband Router Installation and Configuration Guide*, *Regulatory Compliance and Safety Information for the Cisco uBR7246 Universal Broadband Router*, and *Regulatory Compliance and Safety Information for the Cisco uBR7223 Universal Broadband Router* publications.

Access Registrar, AccessPath, Any to Any, AtmDirector, CCDA, CCDE, CCDP, CCIE, CCNA, CCNP, CCSI, CD-PAC, the Cisco logo, Cisco Certified Internetwork Expert logo, *CiscoLink*, the Cisco Management Connection logo, the Cisco NetWorks logo, the Cisco Powered Network logo, Cisco Systems Capital, the Cisco Systems Capital logo, Cisco Systems Networking Academy, the Cisco Systems Networking Academy logo, the Cisco Technologies logo, ConnectWay, Fast Step, FireRunner, GigaStack, IGX, Internet Quotient, Kernel Proxy, MGX, MultiPath Data, MultiPath Voice, Natural Network Viewer, NetSonar, Network Registrar, *Packet*, PIX, Point and Click Internetworking, Policy Builder, Precept, Secure Script, ServiceWay, SlideCast, SMARTnet, *The Cell*, TrafficDirector, TransPath, ViewRunner, Virtual Service Node, VisionWay, VlanDirector, WebViewer, Workgroup Director, and Workgroup Stack are trademarks; Changing the Way We Work, Live, Play, and Learn, Empowering the Internet Generation, The Internet Economy, and The New Internet Economy are service marks; and ASIST, BPX, Catalyst, Cisco, Cisco IOS, the Cisco IOS logo, Cisco Systems, the Cisco Systems logo, the Cisco Systems Cisco Press logo, Enterprise/Solver, EtherChannel, EtherSwitch, FastHub, FastLink, FastPAD, FastSwitch, GeoTel, IOS, IP/TV, IPX, LightStream, LightSwitch, MICA, NetRanger, Post-Routing, Pre-Routing, Registrar, StrataView Plus, Stratm, TeleRouter, and VCO are registered trademarks of Cisco Systems, Inc. or its affiliates in the U.S. and certain other countries. All other trademarks mentioned in this document are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any of its resellers. (9910R)

Copyright © 1998-1999, Cisco Systems, Inc.
All rights reserved. Printed in USA.