

Installing and Removing SDRAM and DRAM

This chapter explains how to remove and replace the main memory modules on the network processing engine or network services engine. For the location of the memory module you are replacing, find the illustration that corresponds to your network processing engine or network services engine in [Chapter 2, “SDRAM and DRAM Memory Systems Overview,”](#) the “[Network Processing Engine or Network Services Engine Memory Information](#)” section on page 2-4.

Before you can replace the main memory modules, you need to first complete the following:

- Power down the router.
- Disconnect the router from the power source.
- Remove the power supplies (if needed—Cisco 7200 series routers).
- Remove the network processing engine or network services engine.

After you have removed and replaced the DRAM or SDRAM, complete the procedure by doing the following:

- Replace the network processing engine or network services engine.
- Reconnect the router to the power source.
- Power up the router.



Note

The procedures for removing and replacing the network processing engine or network services engine in Cisco 7200 series routers and in the Cisco AS5800 Universal Access Server router shelf are the same. Therefore, the illustrations and procedures in the following sections apply to Cisco 7200 series routers and the Cisco AS5800 Universal Access Server router shelf unless indicated otherwise.

The tasks for removing and replacing the network processing engine in Cisco uBR7200 series routers are slightly different from the platforms mentioned above. The differences are indicated in the following procedures.

Powering Down the Router



Warning

This unit might have more than one power cord. To prevent the risk of electric shock, disconnect the two power cords before servicing the unit. Statement 14

To power down a Cisco 7200 series router or a Cisco uBR7200 series router, 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 (O) position. Repeat this action if a second power supply is installed in the router.



Note After powering off the router, wait a minimum of 30 seconds before powering it on again.

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 or NPE-G1 or NPE-G2 turn off.
- The LEDs on the port adapters turn off.
- On a Cisco uBR7200 series router, the LEDs on the cable modem cards turn off.

This completes the procedure for powering down a Cisco 7200 series router or Cisco uBR7200 series router.



Caution

When the power switch on a Cisco uBR7200 series power supply is turned to the off (O) position, the power supply will enter a reset cycle for 90 seconds. Wait at least 90 seconds before turning the power switch back to the on (I) position. If you do not wait the full 90 seconds, the power supply will not restart.

Disconnecting Input Power

The following procedures explain how to disconnect input power from a Cisco 7200 series router or a Cisco uBR7200 series router.



Note

After powering off the router, wait a minimum of 30 seconds before powering it on again.

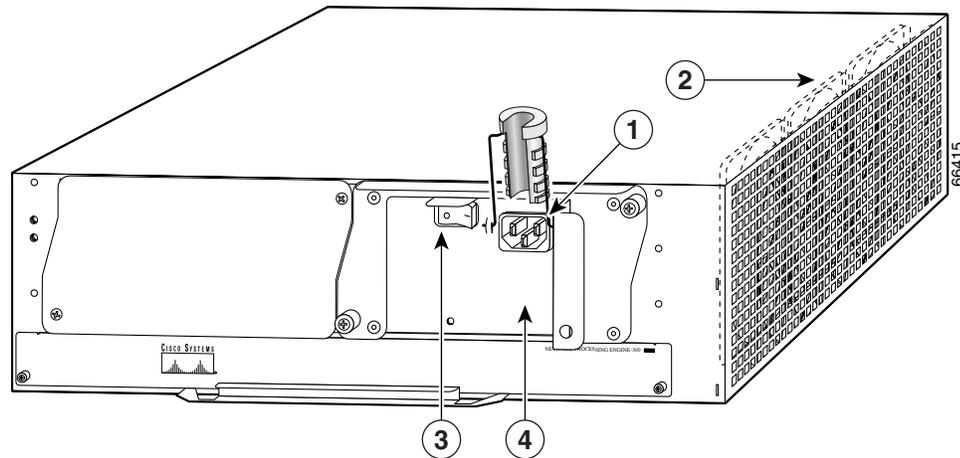
If you have a DC-input power supply installed in your router, proceed to the [“Disconnecting DC-Input Power” section on page 4-4](#). Otherwise, proceed to the next section, [“Disconnecting AC-Input Power.”](#)

Disconnecting AC-Input Power

To disconnect AC-input power from a Cisco 7200 series router or a Cisco uBR7200 series router, complete the following steps:

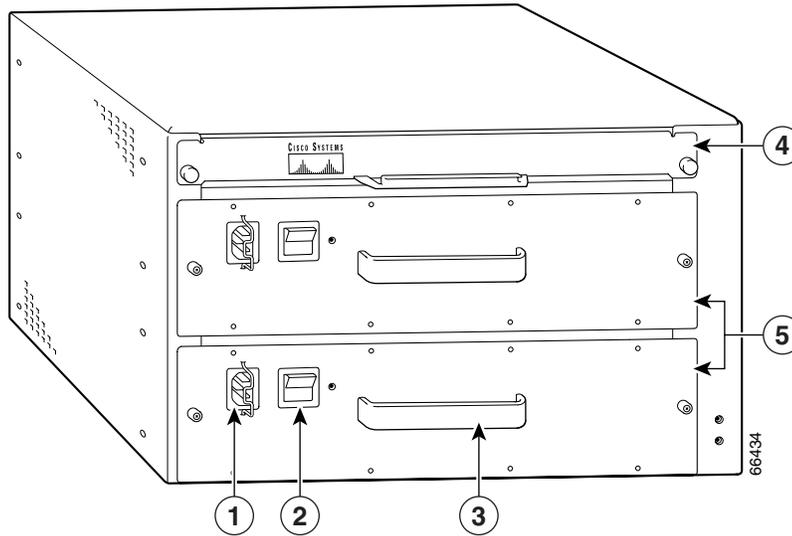
- Step 1** Unplug the input power cable from the power source.
- Step 2** Release the cable-retention clip.
- On a Cisco 7200 series router, push up on the cable-retention clip that secures the input power cable to the router's power supply.
 - On a Cisco uBR7200 series router, push the cable-retention clip to the left.
- Step 3** Unplug the other end of the input power cable from the power supply. (For a Cisco 7200 series router, see [Figure 4-1](#). For a Cisco uBR7200 series router, see [Figure 4-2](#).)

Figure 4-1 Disconnecting Power from a Cisco 7200 Series AC-Input Power Supply



1	AC-input receptacle	3	Power switch
2	Internal fans	4	AC-input power supply

Figure 4-2 Disconnecting Power from a Cisco uBR7200 Series AC-Input Power Supply—Cisco uBR7246 Shown



1	AC-input receptacle	4	Network processing engine
2	Power switch	5	AC-input power supply
3	Handle		

Step 4 Repeat Step 1 through Step 3 if a second power supply is installed.

This completes the procedure for disconnecting AC-input power from a Cisco 7200 series router or a Cisco uBR7200 series router.

Disconnecting DC-Input Power

To disconnect DC-input power from a Cisco 7200 series router or a Cisco uBR7200 series router, use the following procedures.

- For the Cisco uBR7200 series routers, go to the [“Disconnecting Power from the Cisco uBR7200 Series Routers”](#) section on page 4-5.
- For the Cisco 7200 series routers, go to the [“Disconnecting Power from the Cisco 7200 Series Routers”](#) section on page 4-7.



Warning

Before completing any of the following procedures, 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. Statement 322

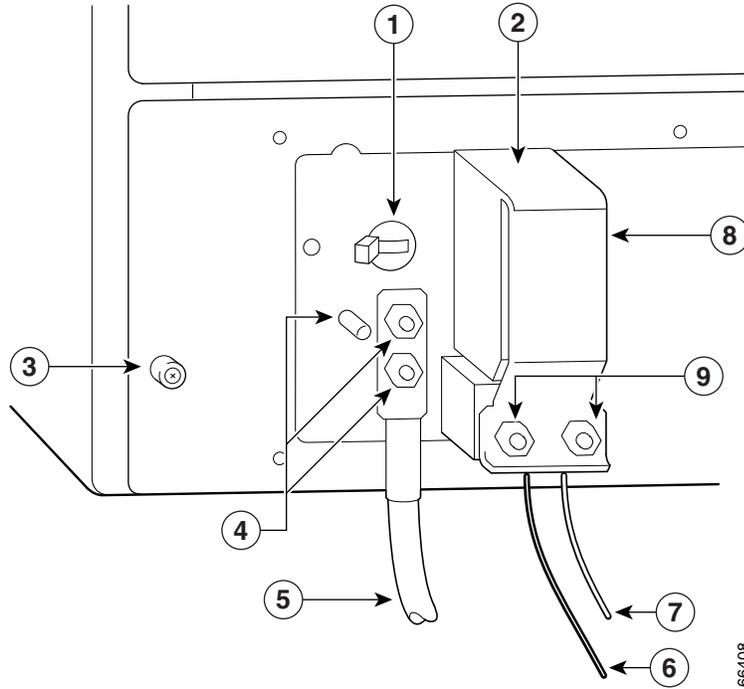


Warning

When installing the unit, the ground connection must always be made first and disconnected last. Statement 202

Disconnecting Power from the Cisco uBR7200 Series Routers

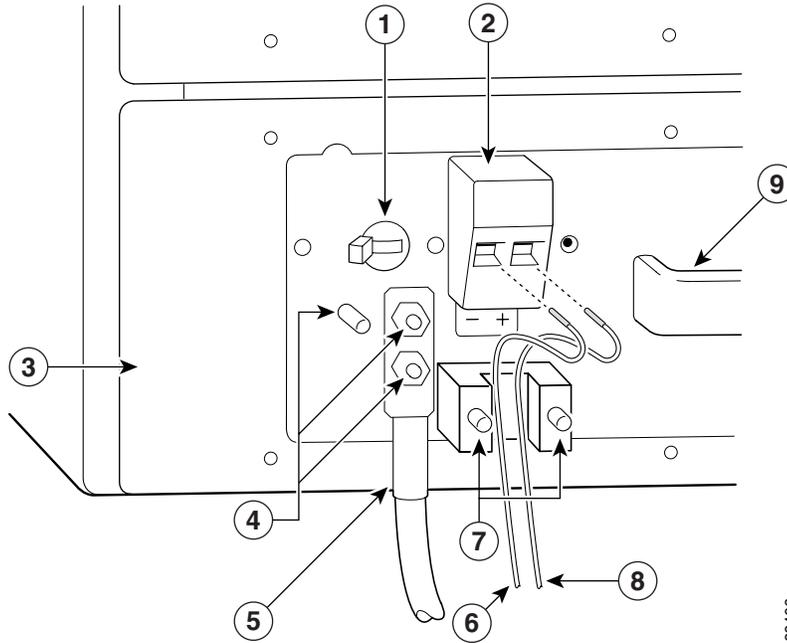
Figure 4-3 Removing the Strain-Relief Cover from a Cisco uBR7200 Series DC-Input Power Supply



1	Power switch	6	-V lead Power receptacle
2	Power receptacle	7	+V lead
3	Captive installation screw	8	Strain-relief cover
4	M5 grounding receptacles	9	M4 nuts
5	M5 grounding lug		

- Step 1** At the rear of the router, check that the power switch on the power supply is in the off (O) position. See [Figure 4-3](#).
- Step 2** Ensure that no current is running through the -V and +V leads. 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.
- Step 3** Remove the strain-relief cover from the Cisco uBR7200 series router power supply. See [Figure 4-3](#).

Figure 4-4 Disconnecting Power from a Cisco uBR7200 Series DC-Input Power Supply



1	Power switch	6	-V lead
2	Power receptacle	7	M4 studs
3	DC power supply	8	+V lead
4	M5 grounding receptacles	9	Handle
5	M5 grounding lug		

- Step 4** Disconnect the -V and +V leads from the power source. You can leave the ground cable connected. Remove the restraints that secure the -V, +V, and ground leads from the Cisco uBR7200 series power supply. Use a 7-mm wrench or nut driver (or adjustable wrench) to loosen and remove the two M4 nuts from the strain-relief cover that secures the -V and +V leads to the power supply faceplate. Remove the strain-relief cover. (See [Figure 4-3](#).)
- Step 5** Disconnect the lead wires from the power supply. Repeat this step for the -V lead only. 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 4-4](#).)



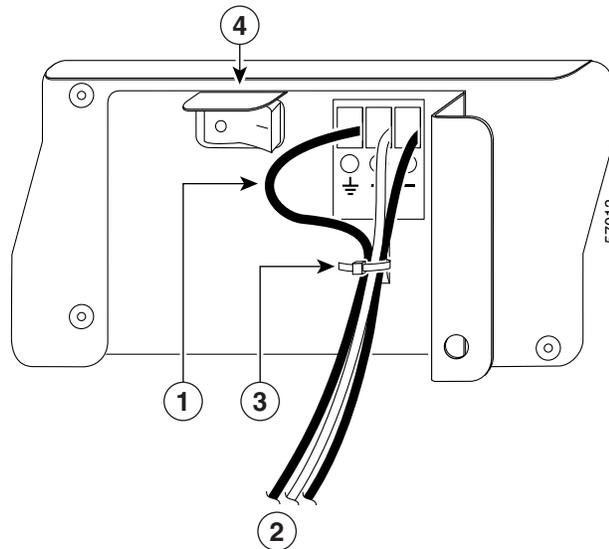
Note The color coding of the DC-input power supply leads depends on the color coding of the DC power source at your site. Typically, green or green/yellow is used for ground. Make certain the lead color coding you choose for the DC-input power supply matches lead color coding used at the DC power source.

- Step 6** Repeat Step 4 through Step 6 if a second power supply is installed.

This completes the procedure for disconnecting DC-input power from a Cisco uBR7200 series router.

Disconnecting Power from the Cisco 7200 Series Routers

Figure 4-5 Disconnecting Power from a Cisco 7200 Series DC-Input Power Supply



1	Ground lead service loop	3	Cable tie
2	DC power leads	4	Power switch

- Step 1** At the rear of the router, check that the power switch on the power supply is in the off (O) position.
- Step 2** Ensure that no current is running through the -V and +V leads. 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.
- Step 3** Remove and save the cable tie that secures the -V, +V, and ground leads to the power supply faceplate.



Note The cable tie that accompanied your Cisco 7200 series DC-input power supply can be removed and replaced on the power supply without the use of a tool. If you secured the DC-input power supply leads to the power supply faceplate using a different type of cable tie, use a wire stripper to cut that cable tie from the power supply.

- Step 4** Use a 3/16-inch flat-blade screwdriver to loosen the screw below the -V lead and the ground lead receptacle, and pull the lead from the connector. (See [Figure 4-5](#).)



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. Make certain the lead color coding you choose for the DC-input power supply matches lead color coding used at the DC power source.

- Step 5** Repeat Step 4 through Step 5 if a second power supply is installed.

This completes the procedure for disconnecting DC-input power from a Cisco 7200 series router.

Removing the Network Processing Engine or Network Services Engine

To remove the network processing engine or network services engine from a Cisco 7200 series router or a Cisco uBR7200 series router, complete the following steps:



Note

The weight of installed power supplies in your Cisco 7200 series router might make it difficult to remove the network processing engine or network services engine. If you have difficulty, consider removing power supplies from the chassis and then removing the network processing engine or network services engine. See the [“Removing and Replacing an AC-Input or DC-Input Power Supply”](#) section on page 4-36 for information on removing and replacing an installed power supply.

This note does not apply to Cisco uBR7200 series routers; the network processing engine is installed above the power supplies in Cisco uBR7200 series routers.

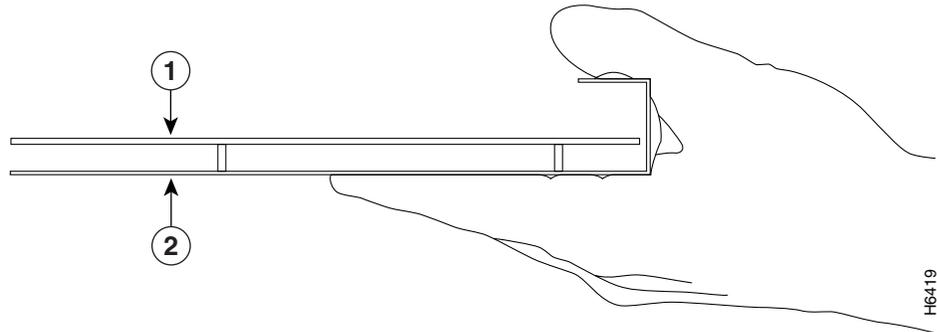
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- Step 1** Power down the router and disconnect its input power cable. See the [“Powering Down the Router”](#) section on page 4-2.
- Step 2** If you are removing an NPE-G1, disconnect the GBIC cables or RJ-45 cables from the interface ports, as well as any console or auxiliary port cables. If you are removing an NPE-G2, disconnect the SFP cables or RJ-45 cables from the interface ports, as well as any console or auxiliary port cables.
- Step 3** If the optional NPE-G1 or NPE-G2 cable-management bracket is installed, remove it. Loosen the captive installation screws, lift the right side of the bracket off the captive installation screw, then slide the left side of the bracket off the other captive installation screw.
- Step 4** Attach an ESD-preventive wrist strap between you and an unfinished chassis surface.
- Step 5** Using a number 2 Phillips or a 3/16-inch flat-blade screwdriver, loosen the two captive installation screws on the faceplate of the network processing engine or network services engine. (For the Cisco 7200 series router, see [Figure 4-7](#). For the Cisco uBR7200 series router, see [Figure 4-8](#).)
- If the router is not installed in a standard 19-inch rack (four-post) or in a two-post, skip to Step 9. 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 6.
- Step 6** Using a 3/16-inch flat-blade screwdriver, loosen the four screws that secure the router to the front mounting strips of the rack.
- Step 7** Position at least one person in front of the rack to support the front underside of the router.
- Step 8** 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 network processing engine or network services engine.
- Step 9** Grasp the network processing engine or network services engine handle and carefully pull the engine from its chassis slot.



Caution

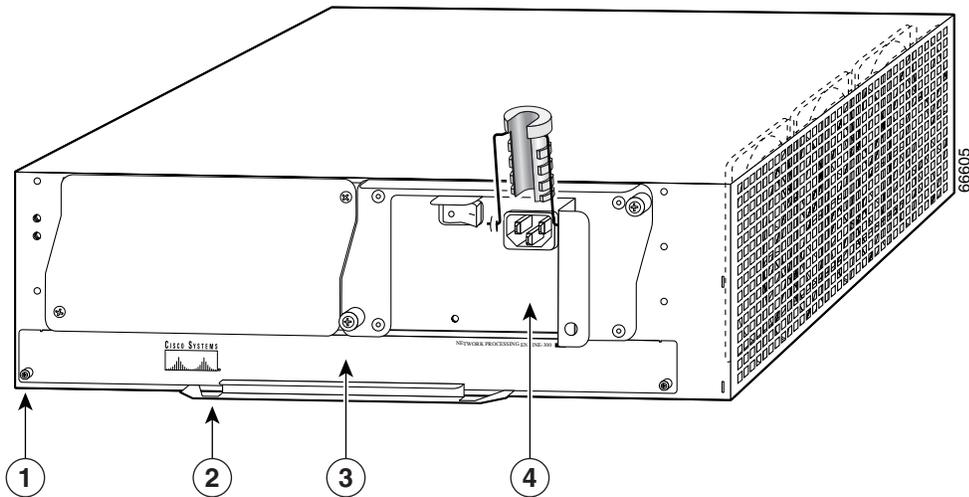
Handle the network processing engine or network services engine by the carrier edges and handle only; never touch the printed circuit board components or connector pins. (See [Figure 4-6](#).)

Figure 4-6 Handling the Network Processing Engine or Network Services Engine



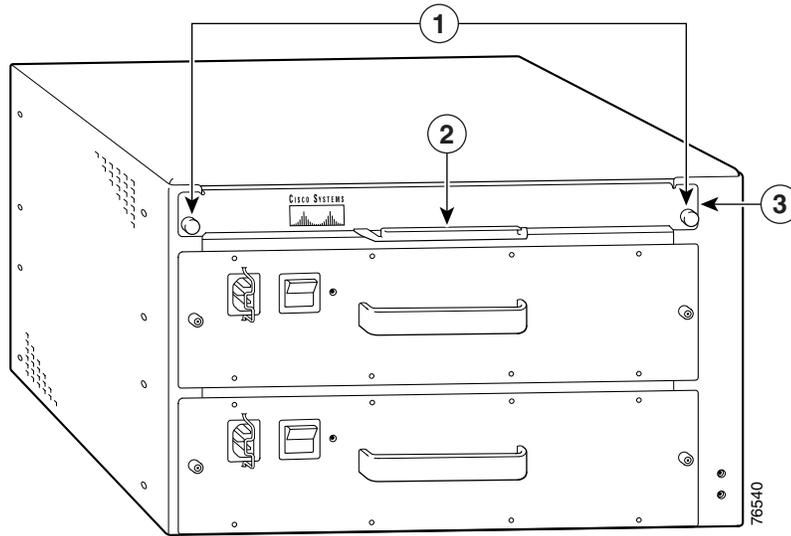
1 Printed circuit board	2 Metal carrier
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Figure 4-7 Cisco 7200 Series Network Processing Engine Captive Installation Screws and Handle



1 Captive installation screw	3 Network processing engine or network services engine
2 Handle	4 AC-input power supply

Figure 4-8 Cisco uBR7200 Series Network Processing Engine Captive Installation Screws and Handle—Cisco uBR7246 Shown



1	Captive installation screws	3	Network processing engine or network services engine
2	Handle		

- Step 10** Place the network processing engine or network services engine on an antistatic surface with its printed circuit board components facing upward.

This completes the procedure for removing the network processing engine or network services engine.

Removing and Replacing SDRAM or DRAM

This section explains how to remove and replace DRAM or SDRAM that is installed on your network processing engine or network services engine.

- For instructions on replacing the SDRAM DIMM for the NPE-G2, go to [“Removing and Replacing the NPE-G2 or UBR7200-NPE-G2 SDRAM DIMM”](#) section on page 4-11.
- For instructions on replacing SDRAM SODIMMs for the NPE-G1, go to the [“Removing and Replacing NPE-G1 and UBR7200-NPE-G1 SDRAM SODIMMs”](#) section on page 4-12.
- For instructions on replacing a SDRAM SODIMM for the NPE-400, go to the [“Removing and Replacing the NPE-400 SDRAM SODIMM”](#) section on page 4-14.
- For instructions on replacing SDRAM DIMMs for the NSE-1, NPE-300, NPE-225, or NPE-175, go to the [“Removing and Replacing SDRAM DIMMs”](#) section on page 4-17.
- For instructions on replacing DRAM SIMMs for the NPE-100, NPE-150 and NPE-200, go to the [“Removing and Replacing DRAM SIMMs”](#) section on page 4-20.

Removing and Replacing the NPE-G2 or UBR7200-NPE-G2 SDRAM DIMM

This section provides a procedure for removing and replacing the DIMM on the NPE-G2.

The synchronous dynamic random-access memory (SDRAM) on the NPE-G2 is contained a dual in-line memory modules (DIMMs) (see [Figure 4-10](#)).

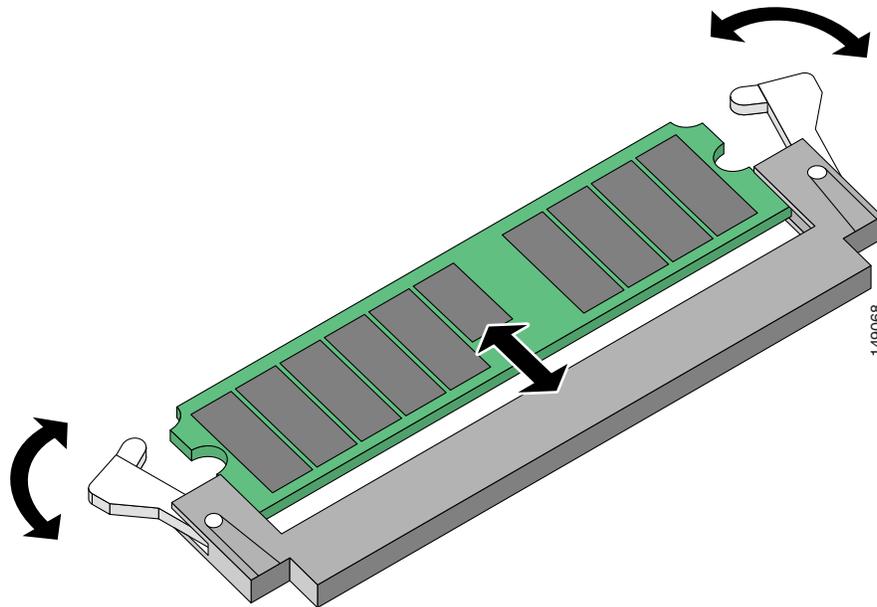
**Note**

Only SDRAM from the Cisco Systems should be used. A Cisco part number appears on the DIMM.

To prevent ESD damage, handle the DIMM by the card edges only (see [Figure 4-17](#)). Place the removed DIMM on an antistatic mat and store it in an antistatic container.

Follow these steps to remove and insert the DIMM:

Figure 4-9 Removing or Installing the DIMM on the NPE-G2



- Step 1** Remove the DIMM by pressing against the release latches until the DIMM releases.
- Step 2** Gently remove the DIMM from the DIMM socket.
- Step 3** Gently insert a DIMM into the DIMM socket.
- Step 4** Push the release latches until they slip into the notch on the edge of the DIMM, holding it securely in place.

You have finished replacing the SDRAMDIMM. To install the NPE-G2 in the chassis, go to the [“Replacing the Network Processing Engine or Network Services Engine”](#) section on page 4-24.

Removing and Replacing NPE-G1 and UBR7200-NPE-G1 SDRAM SODIMMs

This section provides a procedure for removing and replacing the SODIMMs on the NPE-G1 and UBR7200-NPE-G1.

The synchronous dynamic random-access memory (SDRAM) on the NPE-G1 and UBR7200-NPE-G1 is contained in two small outline dual in-line memory modules (SODIMMs) (see [Figure 4-10](#)). Depending on your system configuration, you might need to upgrade SDRAM. Also, if a system problem is determined to be caused by a SODIMM, a SODIMM replacement might be required.



Note

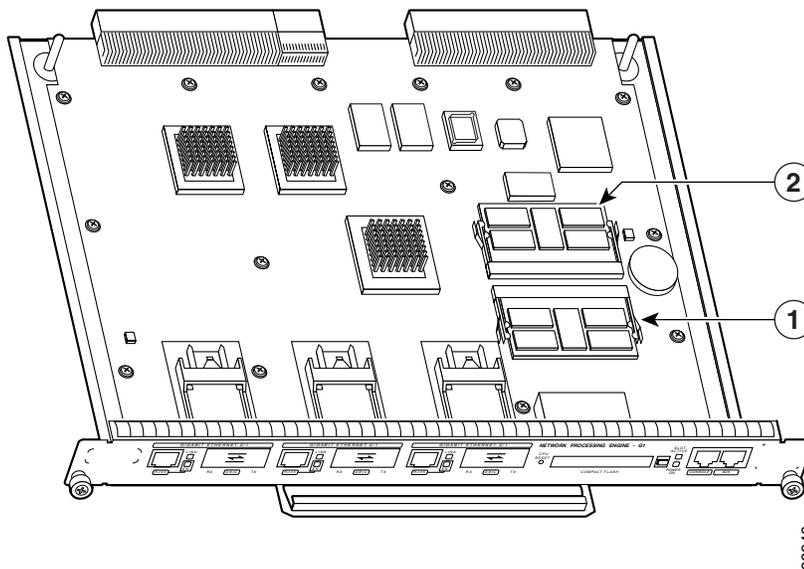
Only SDRAM from Cisco Systems should be used. A Cisco part number appears on the SODIMM.

To prevent ESD damage, handle the SODIMMs by the card edges only (see [Figure 4-14](#)). Place the removed SODIMM on an antistatic mat and store it in an antistatic container.

Removing the NPE-G1 and UBR7200-NPE-G1 SODIMMs

Follow these steps to remove SODIMMs:

Figure 4-10 Locating the SODIMMs on the NPE-G1 and UBR7200-NPE-G1



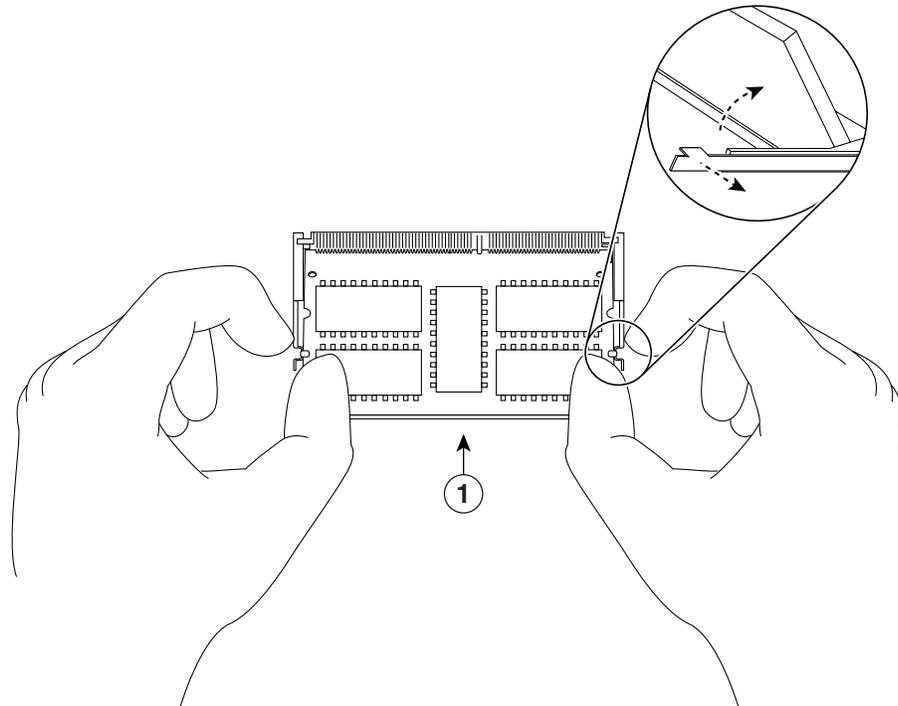
1	SODIMM 1	2	SODIMM 2
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- Step 1** If you have not done so, power off the router.
- Step 2** Remove the network processing engine (NPE) from the system.
- Step 3** Place the NPE on an antistatic mat or pad and ensure that you are wearing an antistatic device, such as a wrist strap.
- Step 4** Locate the SODIMMs on the NPE-G1 or UBR7200-NPE-G1.

**Note**

Both SODIMMs must be of the same size and type, and both SODIMM sockets must be populated.

Figure 4-11 Removing or Installing an SDRAM SODIMM



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1	SODIMM		
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Step 5 Remove the SODIMM you wish to replace by pulling outward on the SODIMM spring latches with your thumbs.

The SODIMM springs up to allow you to easily pull it from the socket.

Step 6 Remove the SODIMM from the socket.

Installing the NPE-G1 or UBR7200-NPE-G1 SODIMM

Step 1 Align the new SODIMM notch with the connector and insert the SODIMM into the socket.

Step 2 Gently press on the SODIMM to lower it until the SODIMM spring latches snap into place.

Step 3 Repeat Step 1 and Step 2 if you are replacing both SODIMMs.

You have finished replacing the SDRAM SODIMMs. To install the NPE-G1 or UBR7200-NPE-G1 in the chassis, go to the [“Replacing the Network Processing Engine or Network Services Engine”](#) section on page 4-24.

Removing and Replacing the NPE-400 SDRAM SODIMM

This section provides a procedure for removing and replacing the SODIMM on the NPE-400.

The synchronous dynamic random-access memory (SDRAM) on the NPE-400 is contained in one small outline dual in-line memory module (SODIMM) (see [Figure 4-12](#)). Depending on your system configuration, you might need to upgrade SDRAM. Also, if a system problem is determined to be caused by a SODIMM, a SODIMM replacement might be required.



Note

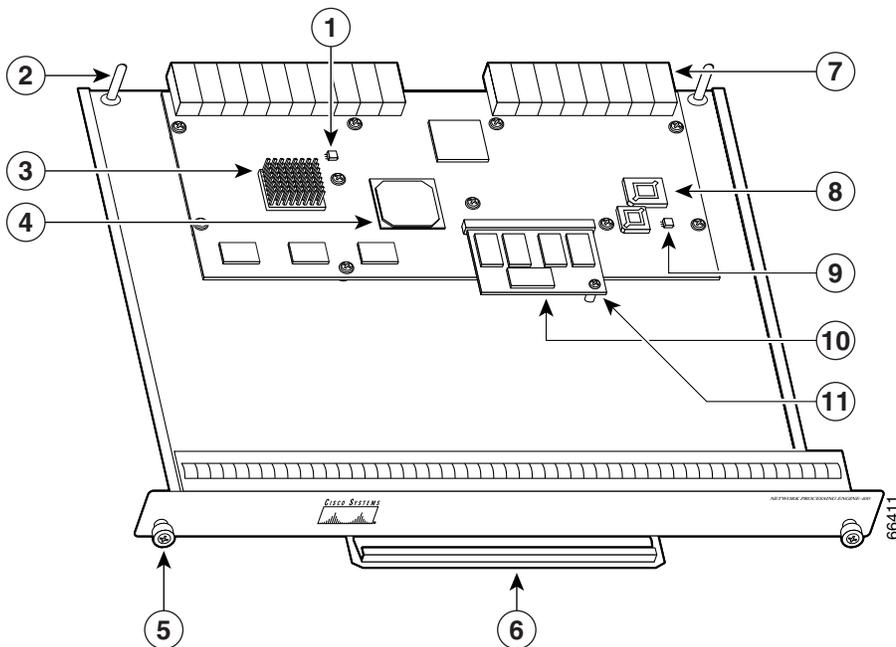
Only SDRAM from Cisco Systems should be used. A Cisco part number appears on the SODIMM.

To prevent ESD damage, handle the SODIMM by the card edges only (see [Figure 4-14](#)). Place the removed SODIMM on an antistatic mat and store it in an antistatic container.

Removing the NPE-400 SDRAM SODIMM

Follow these steps to remove SODIMMs:

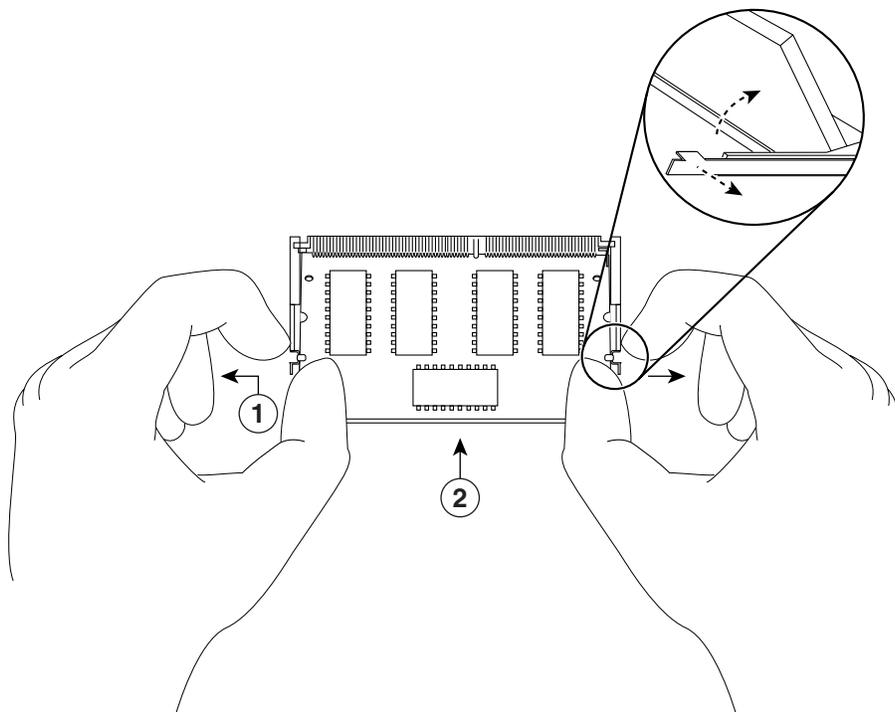
Figure 4-12 Locating the SDRAM SODIMM on the NPE-400



1	Temperature sensor (U31)	7	Midplane connectors
2	Keying post	8	Boot ROM (U7)
3	RM7000 microprocessor	9	Temperature sensor (U6)
4	System controller	10	SODIMM (J1)
5	Captive installation screw	11	Standoff and screw
6	Handle		

- Step 1** If you have not done so, power off the router.
- Step 2** Remove the NPE-400 from the system.
- Step 3** Place the NPE-400 on an antistatic mat or pad and ensure that you are wearing an antistatic device, such as a wrist strap.
- Step 4** Locate the SODIMM.
- Step 5** Locate the standoff and screw on the SODIMM.
- Step 6** Using a Phillips screwdriver, remove the screw from the SODIMM. Keep the screw to install the new SODIMM.
- Step 7** Release the spring latches from the SODIMM, and release the SODIMM from the socket.

Figure 4-13 Releasing the SODIMM Spring Latches



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1	Spring latches on the release latch	2	SDRAM SODIMM
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- Step 8** When both ends of the SODIMM are released from the socket, grasp the ends of the SODIMM with your thumb and forefinger and pull the SODIMM completely out of the socket. Handle the edges of the SODIMM only; avoid touching the memory module, pins, or traces (the metal *fingers* along the connector edge of the SODIMM).



Caution To prevent ESD damage, handle the SODIMM by the card edges only (see [Figure 4-14](#)). Place the removed SODIMM on an antistatic mat and store it in an antistatic container.

- Step 9** Place the SODIMM in an antistatic container to protect it from ESD damage.

This completes the SODIMM removal procedure. Proceed to the next section to install the new SODIMM.

Installing the NPE-400 SDRAM SODIMM

This section provides a procedure for replacing the SODIMM on the NPE-400.

The synchronous dynamic random-access memory (SDRAM) on the NPE-400 is contained in one small outline dual in-line memory module (SODIMM) (see [Figure 4-14](#)).



Note

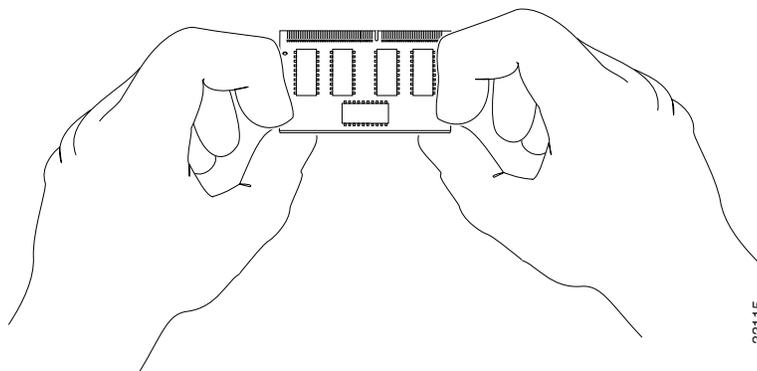
Only SDRAM from Cisco Systems should be used. A Cisco part number appears on the SODIMM.



Caution

SODIMMs are sensitive components that are susceptible to ESD damage. Handle SODIMMs by the edges only; avoid touching the memory modules, pins, or traces (the metal *fingers* along the connector edge of the SODIMM). (See [Figure 4-14](#).)

Figure 4-14 Handling a SODIMM



Follow these steps to install the new SODIMM:

- Step 1** Remove a new SODIMM from the antistatic container.
- Step 2** Hold the SODIMM component-side up, with the connector edge (the metal *fingers*) away from you.
- Step 3** Hold the sides of the SODIMM between your thumb and index finger (see [Figure 4-14](#)).
- Step 4** Tilt the SODIMM to approximately the same angle as the socket, and insert the connector edge into the socket.



Caution

When inserting the SODIMM, use firm but not excessive pressure. If you damage a socket, you will have to return the NPE-400 to the factory for repair.

- Step 5** Press the SODIMM down until it is secured by the spring latches.
- Step 6** When the SODIMM is installed, check both alignment holes on the SODIMM and ensure that the spring latch is visible. If it is not, the SODIMM is not seated properly. If the SODIMM appears misaligned, carefully remove it and reseal it in the socket. Push the SODIMM firmly back into the socket until the spring latches snap into place.

- Step 7** Using a Phillips screwdriver, place and tighten the screw—that you previously removed—through the hole in the SODIMM and into the standoff. Do not overtighten the screw.

**Caution**

When reinstalling the screw, do not overtighten it. Overtightening the screw could physically damage the SODIMM.

This completes the SDRAM SODIMM replacement procedure. To reinstall the NPE-400 in the chassis, see [“Replacing the Network Processing Engine or Network Services Engine” section on page 4-24](#).

Removing and Replacing SDRAM DIMMs

The procedures in this section are required only if you have an NPE-175, NPE-225, NPE-300 or NSE-1 and need to upgrade or replace the SDRAM DIMMs. On the NPE-175, NPE-225, and NSE-1, the SDRAM DIMMs are located in socket U15. The two user-configurable SDRAM DIMMs on the NPE-300 are located in sockets U45 and U44.

**Note**

The NPE-300 contains two banks of SDRAM. Both SDRAM banks are used for all packet memory requirements; however, bank 0 is used exclusively for packet memory and is set at a fixed configuration in the factory.

Bank 1 contains two user-configurable SDRAM slots, DIMM slot 2 and DIMM slot 3. (See [Chapter 2, “SDRAM and DRAM Memory Systems Overview,” Figure 2-5](#).) Both slots in bank 1 can be populated by DIMMs of different sizes; however, the size of the DIMM in slot 2 must be greater than or equal to the size of the DIMM in slot 3, and the size of the DIMM in slot 3 can be zero.

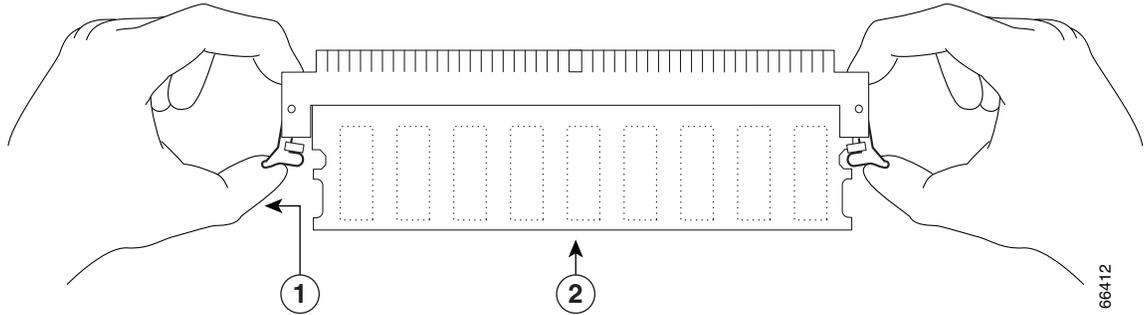
**Note**

Use only SDRAM DIMMs supplied by Cisco Systems.

Removing SDRAM DIMMs

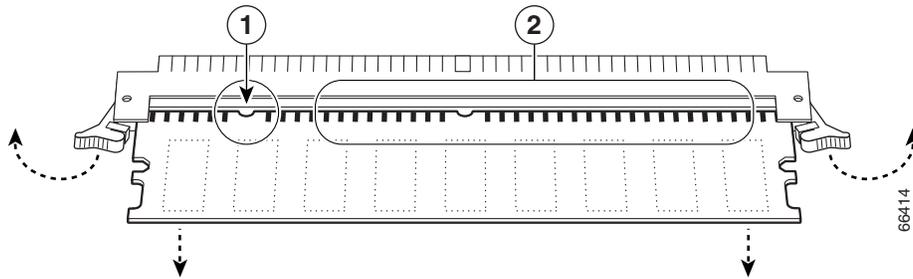
Use the following procedure to remove the existing DIMMs:

- Step 1** Turn off the system power and remove the network processing engine or network services engine from the system. (Follow the steps in the [“Removing the Network Processing Engine or Network Services Engine” section on page 4-8](#).)
- Step 2** Place the network processing engine or network services engine on an antistatic mat or pad and ensure that you are wearing an antistatic device, such as a wrist strap.
- Step 3** Locate the DIMM and position the network processing engine or network services engine so that you are facing the DIMM module you want to remove.
- Step 4** Open the DIMM latches on the DIMM to release the DIMM from the socket. (See [Figure 4-15](#).) The DIMM is under tension in the socket; therefore, the DIMM might be released from the socket with some force.

Figure 4-15 Opening DIMM Latches

1	Release latches	2	SDRAM DIMM
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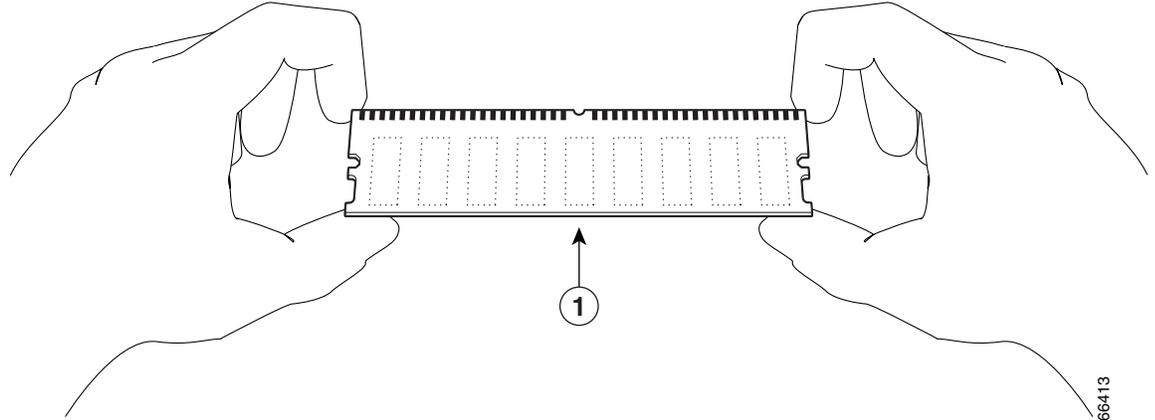
Step 5 With the DIMM latches open, grasp the ends of the DIMM between your thumbs and forefingers and pull the DIMM completely out of the socket. (See [Figure 4-15](#).)

Figure 4-16 Removing the DIMM

1	Notch	2	Metal fingers
----------	-------	----------	---------------

Handle the edges of the DIMM only; avoid touching the memory module, pins, or traces (the metal *fingers* along the connector edge of the DIMM). (See [Figure 4-16](#).)

Figure 4-17 Handling the DIMM



1	SDRAM DIMM
----------	------------

**Caution**

To prevent ESD damage when working with DIMMs: handle the DIMM by the card edges only, place a removed DIMM on an antistatic mat, and store it in an antistatic container.

Step 6

Place the DIMM in an antistatic container to protect it from ESD damage.

This completes the DIMM removal procedure.

Installing SDRAM DIMMs

**Caution**

The DIMM is a sensitive component that is susceptible to ESD damage. Handle the DIMM by the edges only; avoid touching the memory modules, pins, or traces (the metal *fingers* along the connector edge of the DIMM). To prevent ESD damage, handle the DIMM as shown in [Figure 4-17](#).

**Note**

The NPE-300 contains two banks of SDRAM. Both SDRAM banks are used for all packet memory requirements; however, bank 0 is used exclusively for packet memory and is set at a fixed configuration in the factory.

Bank 1 contains two user-configurable SDRAM slots, DIMM slot 2 and DIMM slot 3. (See [Chapter 2](#), “[SDRAM and DRAM Memory Systems Overview](#),” [Figure 2-5](#).) Both slots in bank 1 can be populated by DIMMs of different sizes; however, the size of the DIMM in slot 2 must be greater than or equal to the size of the DIMM in slot 3, and the size of the DIMM in slot 3 can be zero.

With the network processing engine or network services engine in the same orientation as the previous procedure, install the DIMM in the DIMM socket as follows:

Step 1 Remove the new DIMM from its antistatic container.

Step 2 Hold the DIMM between your thumbs and forefingers. (See [Figure 4-17](#).)



Note The 64-MB DIMM should be facing component-side down.

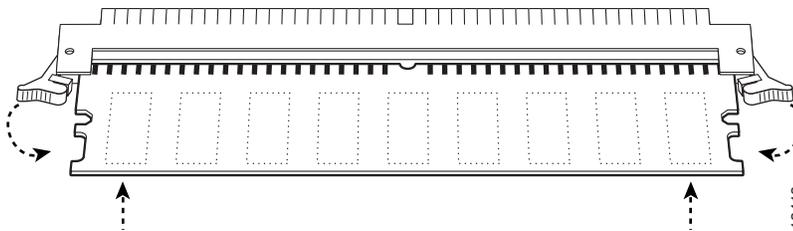
Step 3 Insert the connector edge of the DIMM straight into the socket.



Caution When inserting the DIMM, use firm but not excessive pressure. If you damage a socket, you will have to return the NPE or NSE to the factory for repair.

Step 4 Gently push the DIMM into the socket until the socket latches close over the ends of the DIMM. (See [Figure 4-18](#).) If necessary, rock the DIMM gently back and forth to seat it properly.

Figure 4-18 Inserting the DIMM



Step 5 When the DIMM is installed, check to see it is seated properly. If the DIMM appears misaligned, carefully remove it and reseal it in the socket. Push the DIMM firmly back into the socket until first one and then the other latch moves into place.

Step 6 If you have a network processing engine with more than one DIMM socket and are replacing the second DIMM also, repeat Step 1 through Step 5 above.

This completes the DIMM replacement procedure.

Removing and Replacing DRAM SIMMs

The procedures in this section are required only if you have an NPE-100, NPE-150, or NPE-200, and need to upgrade or replace the SDRAM SIMMs.

Removing DRAM SIMMs

To remove the installed DRAM SIMMs, complete the following steps:

- Step 1** Attach an ESD-preventive wrist strap between you and an unpainted router surface.
- Step 2** Place the I/O controller or the network processing engine on an antistatic mat or surface (ensure that you are wearing an antistatic device, such as a wrist strap).
- Step 3** Position the I/O controller or the network processing engine so that the handle is away from you and the edge connector is toward you.
- Step 4** Locate the SIMMs.

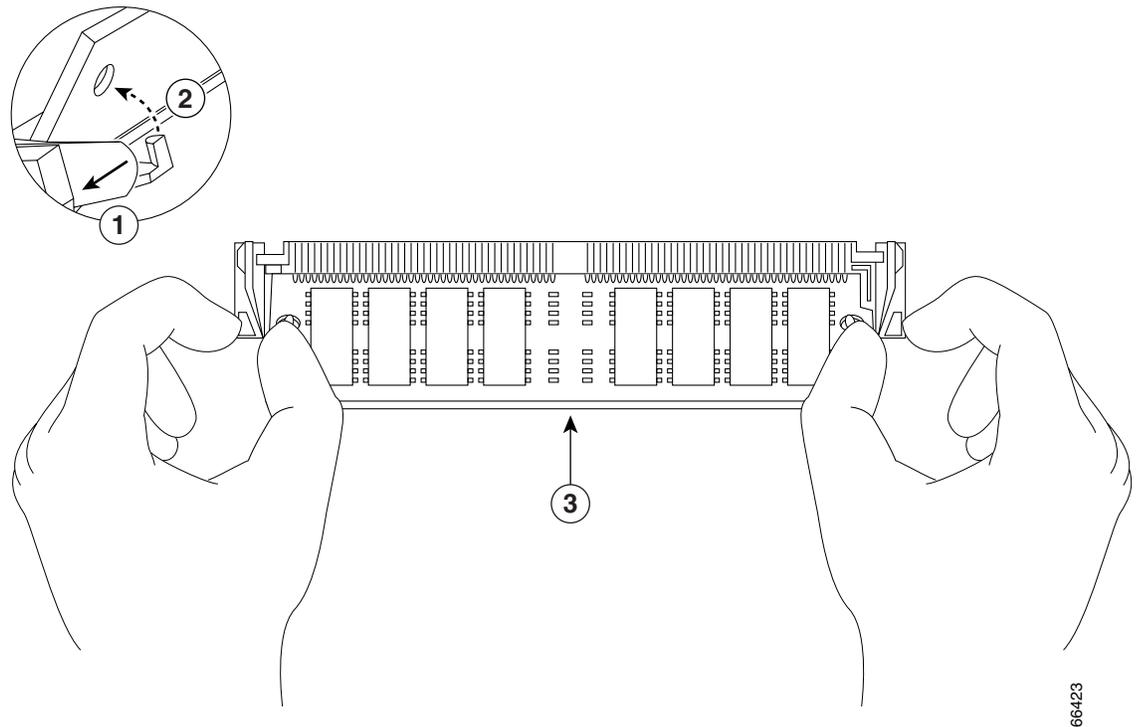
For the location of the memory module you are replacing, find the illustration that corresponds to your network processing engine in [Chapter 2, “SDRAM and DRAM Memory Systems Overview,”](#) the “[Network Processing Engine or Network Services Engine Memory Information](#)” section on page 2-4.



Note SIMMs installed in your system might look different from the SIMMS shown in the following illustrations.

Step 5 Release the spring latches from the SIMM that you want to remove, and release the SIMM from the socket. (See [Figure 4-19.](#))

Figure 4-19 Releasing the SIMM Spring Latches



1	Latch	3	Faceplate edge of the SIMM
2	Latch holes		

Step 6 When both ends of the SIMM are released from the socket, grasp the ends of the SIMM with your thumb and forefinger and pull the SIMM completely out of the socket. Handle the edges of the SIMM only; avoid touching the memory module, pins, or traces (the metal *fingers* on the connector side of the SIMM).

Step 7 Place the SIMM in an antistatic bag to protect it from ESD damage. You can use the SIMMs that you remove in compatible equipment.

Step 8 Repeat Step 4 through Step 7 for the remaining SIMMs.

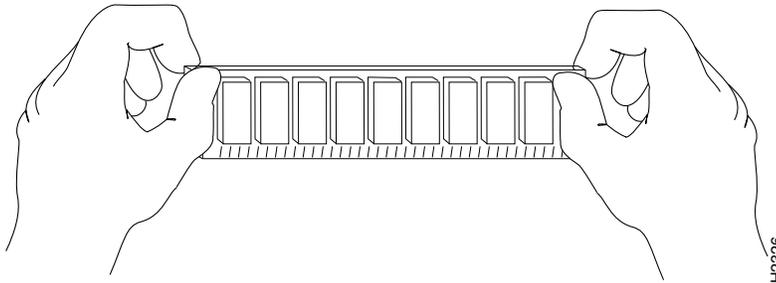
This completes the SIMM removal procedure.

Installing DRAM SIMMs

The DRAM SIMMs on the network processing engine are located in the following sockets:

- U18, U25, U4, and U12 on the NPE-100 and the NPE-150 (See [Chapter 2, “SDRAM and DRAM Memory Systems Overview,”](#) [Figure 2-9](#) and [Figure 2-10](#).)
- U11, U25, U42, and U52 on the NPE-200 (See [Chapter 2, “SDRAM and DRAM Memory Systems Overview,”](#) [Figure 2-8](#).)

Figure 4-20 Handling a SIMM



Caution

Handle SIMMs by the edges only; avoid touching the memory modules, pins, or traces (the metal *fingers* along the connector edge of the SIMM). (See [Figure 4-20](#).)

To install memory SIMMs in the network processing engine, complete the following steps:

Step 1 With the network processing engine in the same orientation as the previous procedure (with the handle away from you and the edge connector toward you), install the first SIMM in the socket farthest from you. Then install the last SIMM in the socket closest to you.

Step 2 Remove a new SIMM from the antistatic bag.

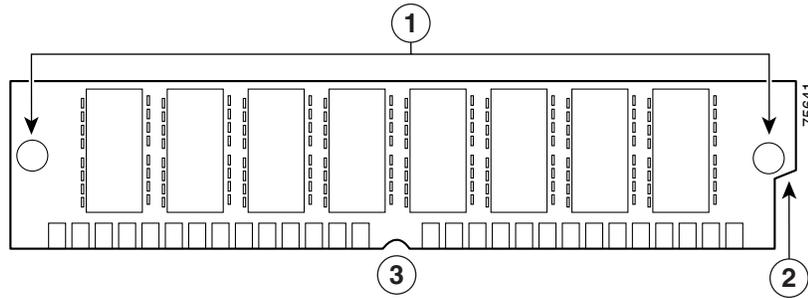


Note

To prevent DRAM errors in the NPE-200, NPE-150, or NPE-100, and to ensure that your system initializes correctly at startup, DRAM bank 0 (sockets U18 and U25, or U11 and U25) *must* contain no fewer than two SIMMs of the same type. You can also install two SIMMs of the same type in bank 1 (sockets U4 and U12, or U42 and U52); however, bank 0 must always contain the two largest SIMMs.

Step 3 Orient the SIMM so its connector edge (the metal *fingers*) is down and the component side is facing you. (See [Figure 4-21](#).)

Figure 4-21 Cisco 7200 Series Main Memory SIMM



1	Alignment holes	3	Connector edge
2	Notch		

- Step 4** Hold the sides of the SIMM between your thumb and index finger. (See [Figure 4-20](#).)
- Step 5** Tilt the SIMM to approximately the same angle as the socket and insert the entire connector edge into the socket.

**Caution**

When inserting SIMMs, use firm but not excessive pressure. If you damage a socket, you must return the I/O controller or the network processing engine to the factory for repair.

- Step 6** Gently push the SIMM into the socket until the spring latches snap over the ends of the SIMM. If necessary, rock the SIMM gently back and forth to seat it properly.
- Step 7** Repeat Step 2 through Step 6 for the remaining SIMMs.
- Step 8** When all SIMMs are installed, check all alignment holes (two on each SIMM) and ensure that the spring latch is visible. If it is not, the SIMM is not seated properly. If any SIMM appears misaligned, carefully remove it and reseat it in the socket. Push the SIMM firmly back into the socket until the spring latches snap into place.

This completes the SIMM replacement procedure. Proceed to the [“Replacing the Network Processing Engine or Network Services Engine”](#) section on page 4-24.

Checking a SDRAM Upgrade or Replacement

If, after a SDRAM upgrade or replacement, the system fails to boot properly, or if the console terminal displays a checksum or memory error, ensure that the SIMM, DIMM, or SODIMM is installed correctly. If necessary, shut down the system and remove the network processing engine or network services engine. Check the SIMM, DIMM, or SODIMM by looking straight down it and then at eye level. The SIMMs or DIMMs should be aligned at the same angle and the same height as others on the board when properly installed. If the SIMM, DIMM, or SODIMM appears to stick out or rest in the socket at an odd angle, remove it and reinsert it. Then replace the network processing engine or network services engine and reboot the system for another installation check.

If after several attempts the system fails to restart properly, contact a service representative for assistance. Before you call, note any error messages, unusual LED states, or other indications that might help solve the problem.

Replacing the Network Processing Engine or Network Services Engine

Check the following chassis compatibility requirements before installing a network processing engine or network services engine in the chassis:

- The NPE-300, NPE-400, NSE-1, NPE-G1 and the NPE-G2 are compatible with the Cisco 7200 VXR routers. The NPE-300, NPE-400, UBR7200-NPE-G1 and the UBR7200-NPE-G2 are compatible with the Cisco 7246VXR router. They cannot be used in the Cisco 7200 series routers (Cisco 7202, Cisco 7204, and Cisco 7206) and the Cisco uBR7246.

To replace the network processing engine or network services engine in the router, complete the following steps:

-
- Step 1** Ensure that the router is powered down and its input power cable is disconnected from the router and the power source. See the [“Powering Down the Router”](#) section on page 4-2.
- Step 2** Attach an ESD-preventive wrist strap between you and an unfinished chassis surface.
- Step 3** Using both hands, grasp the network processing engine or network services engine by its metal carrier edges and orient it so that its printed circuit board components are upward (so that you can see the components).



Caution

Handle the network processing engine or network services engine by the carrier edges and handle only; never touch the printed circuit board components or connector pins.

-
- Step 4** Align the left and the right edge of the network processing engine’s or network services engine’s metal carrier with the chassis slot guides. (For a Cisco 7200 series router, see [Figure 4-22](#). For a Cisco uBR7200 series router, see [Figure 4-23](#).)



Note

The NPE-G2, NPE-G1, NSE-1, NPE-400, and the NPE-300 carrier has metal posts that slide into grooves cut into the Cisco 7200 VXR and Cisco uBR7246VXR network processing engine or network services engine slot. This feature does not alter the installation procedure for the NPE-G1, NPE-G2, NSE-1, NPE-400, or NPE-300. (See [Chapter 2, “SDRAM and DRAM Memory Systems Overview,”](#) [Figure 2-2](#), [Figure 2-3](#), [Figure 2-4](#), or [Figure 2-5](#).)

Do not align the network processing engine’s or network service engine’s metal carrier between the slot guides. Doing so will damage components on the engine’s printed circuit board as you slide the network processing engine or network services engine into its chassis slot.

Figure 4-22 *Aligning the Network Processing Engine between the Slot Guides in Cisco 7200 Series Router*

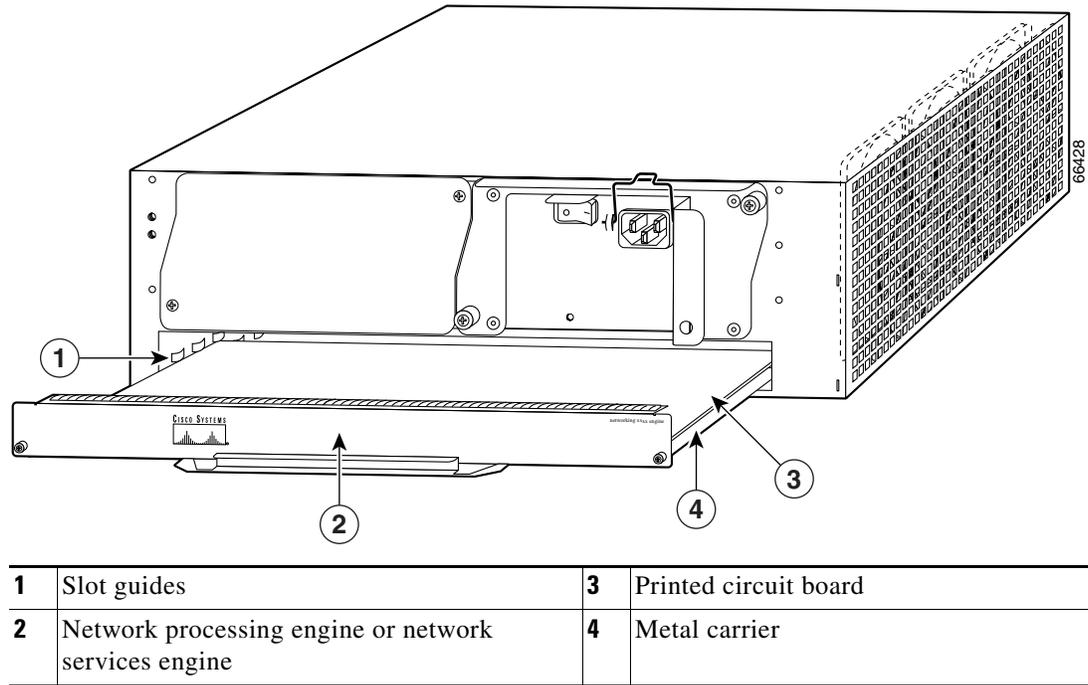
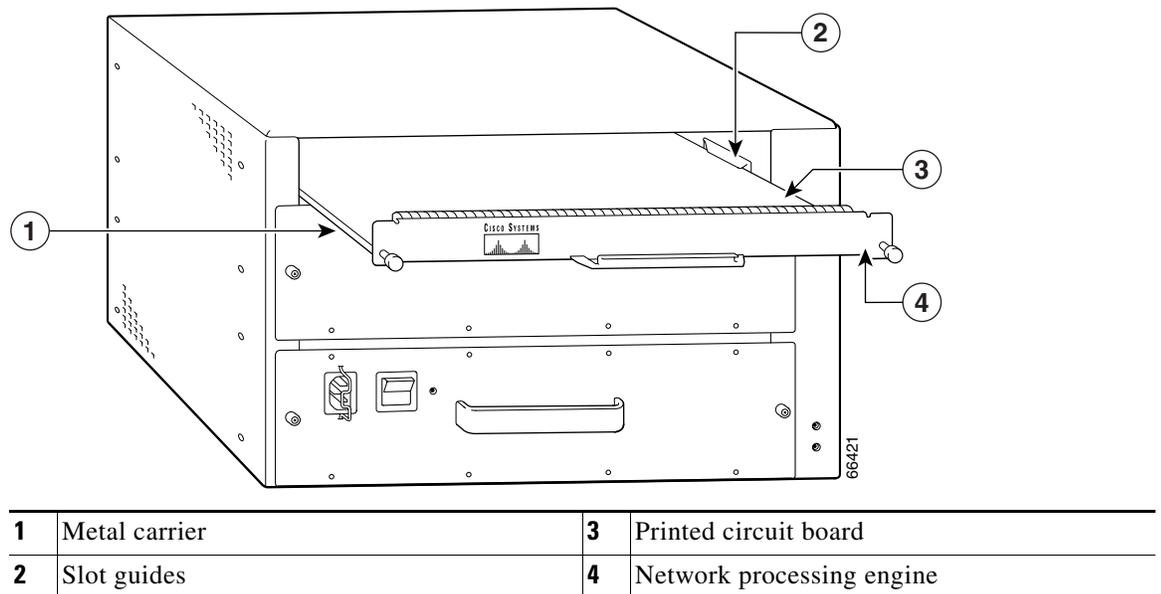
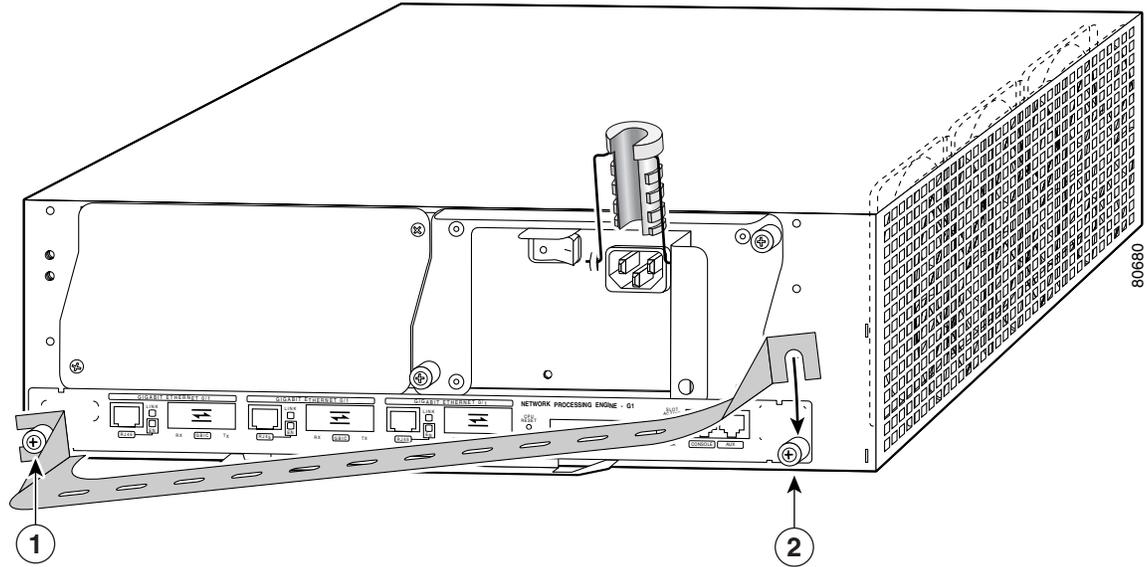


Figure 4-23 *Aligning the Network Processing Engine between the Slot Guides in Cisco uBR7200 Series Routers—Cisco uBR7246 Shown*



- Step 5** Gently slide the network processing engine or network services engine all the way into its chassis slot until you feel the connectors make contact with the router midplane.
- Step 6** Seat the network processing engine or network services engine in the router midplane by tightening its captive installation screws with a number 2 Phillips or a 3/16-inch flat-blade screwdriver.

Figure 4-24 Installing the NPE-G1 Cable-Management Bracket



1	Captive installation screw	2	Captive installation screw
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- Step 7** If you are replacing the NPE-G1 or NPE-G2 cable-management bracket, slide the left side of the bracket over the loosened left captive installation screw. Then rotate the bracket down and over the right captive installation screw. Tighten both installation screws.



Note The network processing engine or network services engine is not fully seated in the router midplane until you tighten its captive installation screws.

- Step 8** If you removed power supplies from the router, replace the power supplies. (See the [“Removing and Replacing an AC-Input or DC-Input Power Supply”](#) section on page 4-36 when replacing an AC-input or DC-input power supply in a Cisco 7200 series router.)
- Step 9** If you pushed the front of the router out of the rack, slowly guide the router back into the rack.
- Step 10** Use a 3/16-inch flat-blade screwdriver to tighten the four screws that secure the router to the front mounting strips of the rack.

This completes the procedure for replacing the network processing engine or network services engine in a Cisco 7200 series router or a Cisco uBR7200 series router.

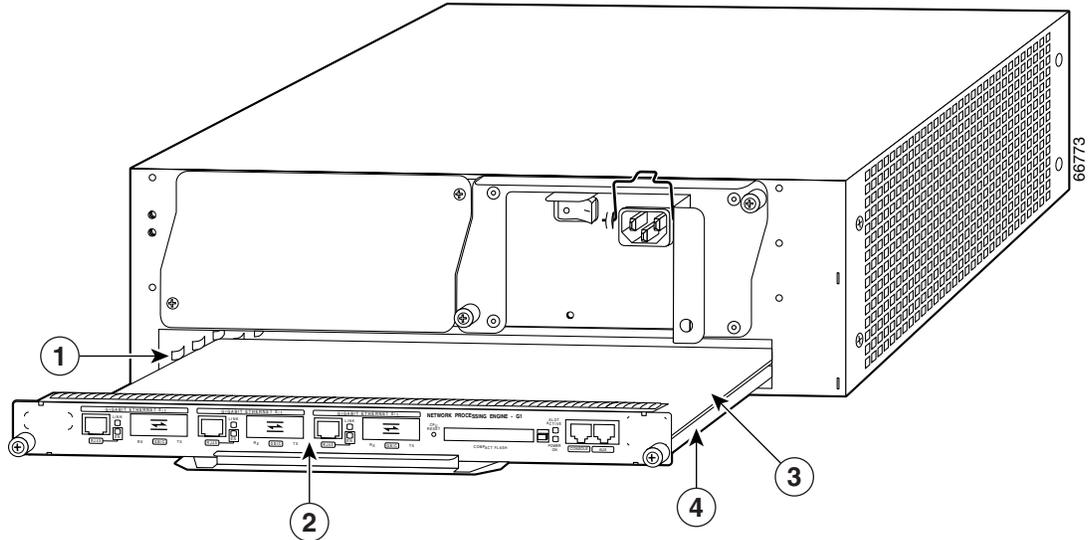
Installing the Network Processing Engine or Network Services Engine

To install the network processing engine (NPE) or network services engine (NSE) in the router, complete the following steps:

- Step 1** Ensure that the router is powered down and the input power cable is disconnected from the router and the power source. See the [“Powering Down the Router”](#) section on page 4-2.

- Step 2** Attach an ESD-preventive wrist strap between you and an unfinished chassis surface.
- Step 3** Using both hands, grasp the NPE or NSE by its metal carrier edges and orient it so that its printed circuit board components are upward. (See [Figure 4-25](#).)

Figure 4-25 Aligning the NPE -G1 Between the Slot Guides on a Cisco 7200 VXR Series Router



1	Slot guides	3	Printed circuit board
2	NPE-G1	4	Metal carrier



Caution

Handle the NPE or NSE by the carrier edges and handle only; never touch the printed circuit board components or connector pins.

- Step 4** If you have an NPE-G1, NPE-G2, UBR7200-NPE-G1, or UBR7200-NPE-G2 go to Step 5. If you do not, go to the [“Connecting Input Power and Powering Up the Router”](#) section on page 4-27.
- Step 5** Reattach any interface, console, or auxiliary cables to the NPE-G1, UBR7200-NPE-G1, NPE-G2, or UBR7200-NPE-G2 and run the cables through the cable-management brackets, if installed.

This completes the steps for installing the network processing engine or network services engine.

Connecting Input Power and Powering Up the Router

The following procedures explain how to reconnect input power to a Cisco 7200 series router or a Cisco uBR7200 series router, power up the router, and verify a successful system boot.



Warning

Read the installation instructions before you connect the system to its power source. Statement 10

If you have a DC-input power supply installed in your router, proceed to the [“Reconnecting DC-Input Power”](#) section on page 4-30. Otherwise, proceed to the next section, [“Reconnecting AC-Input Power.”](#)

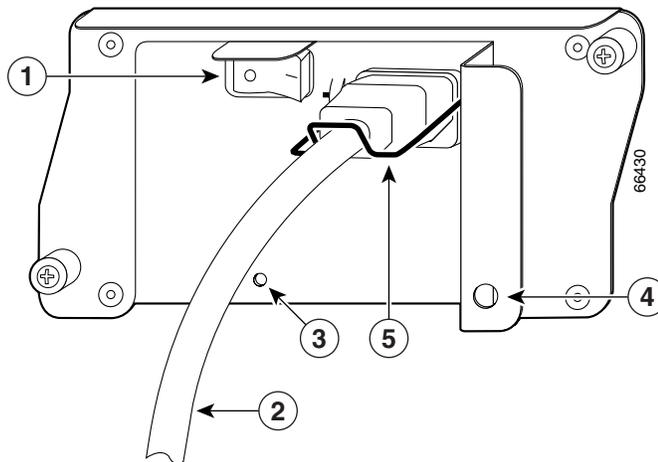
Reconnecting AC-Input Power

To reconnect AC-input power to a Cisco 7200 series router or a Cisco uBR7200 series router, complete the following steps:

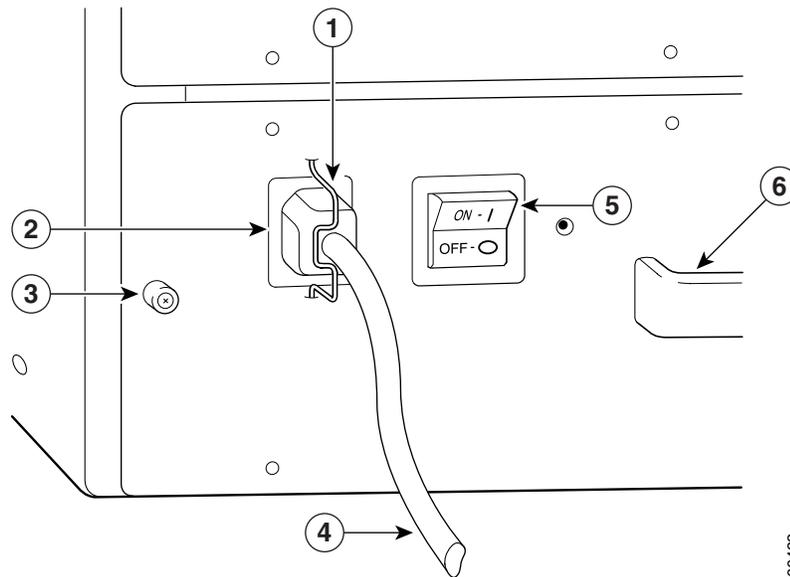
- Step 1** At the rear of the router, check that the power switch on the power supply is in the off (O) position.
- Step 2** Slide the cable-retention clip up (Cisco 7200 series) or to the left (Cisco uBR7200 series), away from the AC receptacle, and plug in the power cable.
- Step 3** Secure the cable in the power supply AC receptacle by sliding the cable-retention clip down (Cisco 7200 series) or to the right (Cisco uBR7200 series) until it snaps around the connector.

The cable-retention clip provides strain relief for the AC power cable. (For a Cisco 7200 series router, see [Figure 4-26](#). For a Cisco uBR7200 series router, see [Figure 4-27](#).)

Figure 4-26 Connecting AC-Input Power to a Cisco 7200 Series Router



1	Power switch	4	Hole for nylon cable tie
2	AC power cable	5	Cable-retention clip
3	POWER OK LED		

Figure 4-27 Connecting AC-Input Power to a Cisco uBR7200 Series Router

1	Cable-retention clip	4	AC power cable
2	Power receptacle	5	Power switch
3	Captive installation screw	6	Handle

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

**Note**

For a Cisco 7200 series router, each AC-input power supply operating at 120 VAC requires a minimum of 5A service.

For a Cisco uBR7200 series router, each AC-input power supply operating at 120 VAC requires a minimum of 7A service.

We recommend powering Cisco 7200 series routers and Cisco uBR7200 series routers from a 120 VAC, 15A receptacle United States (240 VAC, 10A international) at the power source.

Step 5 Repeat Step 1 through Step 4 if a second power supply is installed.

This completes the steps for reconnecting AC-input power to a Cisco 7200 series router or a Cisco uBR7200 series router. Proceed to the [“Powering Up the Router”](#) section on page 4-34.

Reconnecting DC-Input Power

To reconnect DC-input power to a Cisco 7200 series router or a Cisco uBR7200 series router, complete the following steps.



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. 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 procedures, 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. Statement 322



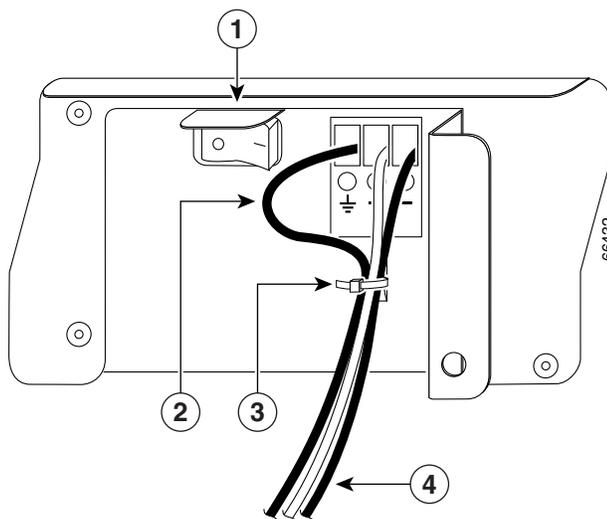
Warning

When installing the unit, the ground connection must always be made first and disconnected last. Statement 202

Step 1 Ensure that the –V and +V leads are carrying no current.

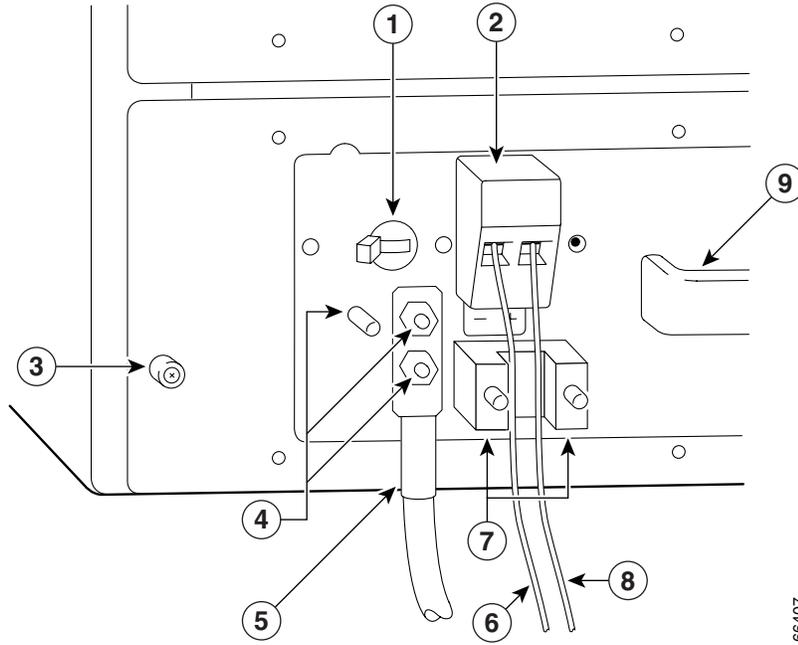
Step 2 At the rear of the router, check that the power switch on the power supply is in the off (O) position. (For a Cisco 7200 series router, see [Figure 4-28](#). For a Cisco uBR7200 series router, see [Figure 4-29](#).)

Figure 4-28 Connecting DC-Input Power to a Cisco 7200 Series Router



1	Power switch	3	Cable tie
2	Ground lead service loop	4	DC power leads

Figure 4-29 Connecting DC-Input Power to a Cisco uBR7200 Series Router

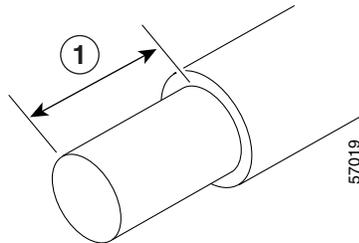


66407

1	Power switch	6	-V lead
2	Power receptacle	7	M4 studs
3	Captive installation screw	8	+V lead
4	M5 grounding receptacles	9	Handle
5	M5 grounding lug		

Step 3 If necessary, use a wire stripper to strip approximately 0.55 in. (14 mm) from the -V, +V, and ground leads. (See [Figure 4-30](#).)

Figure 4-30 Stripping the DC-Input Leads



57019

1	0.55 in. (14 mm)		
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Note The ground lead for the Cisco uBR7200 series DC-input power supply consists of a two-hole grounding lug that connects to an M5 grounding receptacle; you do not need to strip this ground lead.

- Step 4** Insert the ground lead.
- For Cisco 7200 series routers, insert the stripped end of the ground lead all the way into the ground lead receptacle on the DC-input power supply, and tighten the receptacle screw using a 3/16-inch flat-blade screwdriver. (See [Figure 4-28](#).)
 - For Cisco uBR7200 series routers, 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 4-29](#).)
- Step 5** Insert the stripped end of the +V lead all the way into the +V lead receptacle and tighten the receptacle screw using the same 3/16-inch flat-blade screwdriver. Repeat this step for the –V 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 you insert the lead into its receptacle, remove the lead, use the wire stripper to cut the stripped end of the lead, and repeat Step 3 through Step 5.

- Step 6** After tightening the receptacle screw or nuts for the ground, +V, and –V DC-input leads, secure the leads to the power supply faceplate.
- For the Cisco 7200 series, use the cable tie you saved earlier in removing the DC-input leads to secure the three leads.



Note For a Cisco 7200 series router, when securing the ground, +V, and –V DC-input leads to the power supply faceplate, leave a small service loop in the ground lead to ensure that it is the last lead to disconnect from the power supply if a great deal of strain is placed on all three leads. (See [Figure 4-28](#).)

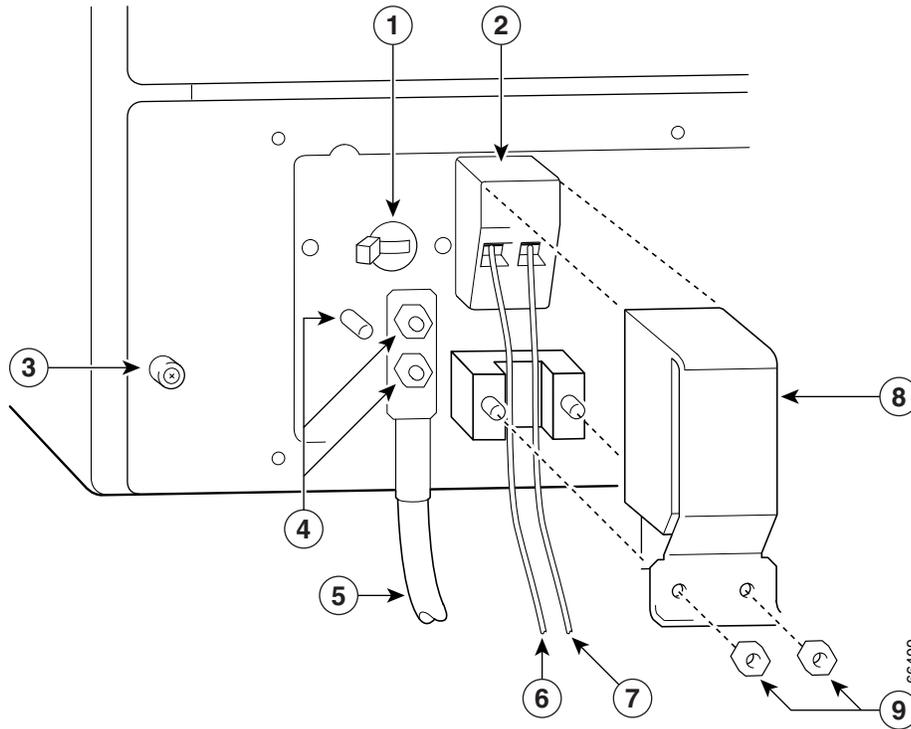
- For a Cisco uBR7200 series router, run the +V and –V leads between the two strain-relief studs on the power supply faceplate. (See [Figure 4-29](#).)



Note A service loop is not required in the lead attached to the grounding lug on Cisco uBR7200 series routers because this lead is separate from the +V and –V leads and is secured by two M5 nuts to the M5 receptacles.

- Step 7** For Cisco uBR7200 series routers, replace the strain-relief cover over the +V and –V leads, and using the 7-mm wrench or nut driver (or adjustable wrench), secure the cover to the strain-relief studs with the two M4 nuts. (See [Figure 4-31](#).)

Figure 4-31 Replacing the Strain-Relief Cover on a Cisco uBR7200 Series DC-Input Power Supply



1	Power switch	6	-V lead
2	Power receptacle	7	+V lead
3	Captive installation screw	8	Strain-relief cover
4	M5 grounding receptacles	9	M4 nuts
5	M5 grounding lug		

Step 8 Restore current to the +V and -V leads.



Note

For Cisco 7200 series routers:

- Each DC-input power supply operating at 24 VDC requires a minimum of 19A service.
- Each DC-input power supply operating at 48 VDC requires a minimum of 13A service.
- Each DC-input power supply operating at 60 VDC requires a minimum of 8A service.

For Cisco uBR7200 series routers, each DC-input power supply rating is 14A, 700 volt amperes (VA).

This product relies on the building’s installation for short-circuit (overcurrent) protection. Ensure that a listed and certified fuse or circuit breaker, 35A minimum 60 VDC, is used on all current-carrying conductors. Site wiring and circuit breakers need to be sized to accommodate the maximum values for safety reasons.

Step 9 Repeat Step 1 through Step 8 if a second power supply is installed.

This completes the steps for connecting DC-input power to a Cisco 7200 series router or a Cisco uBR7200 series router.

Powering Up the Router

To power up a Cisco 7200 series router or a Cisco uBR7200 series router that has an installed AC-input or DC-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 or retention clip is in the locked position.
- The network processing engine or network services engine and the I/O controller are inserted in their respective slots, and the captive installation screws are tightened.
- All network interface cables are connected to the port adapters.
- Each cable modem card is inserted in its slot, and its respective captive installation screws are tightened (Cisco uBR7200 series routers only).
- A CompactFlash Disk, Flash Disk, or PC card is installed in its PC card slot (if present).
- Each AC-input power cable is connected and secured with the cable-retention clip (AC-input power supplies only).
- For a Cisco 7200 series router, each DC lead is connected and secured to the power supply faceplate with a cable tie; for a Cisco uBR7200 series router, each DC lead is connected with M4 nuts for the grounding receptacle and the strain-relief cover over the +V and –V leads (DC-input power supplies only).
- Each DC lead is connected and secured to the power source (DC-input power supplies only).
- For installed DC-input power supplies, ensure that 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 (DC-input power supplies only).
- The console terminal is turned on.

**Caution**

When the power switch on a Cisco uBR7200 series power supply is turned to the off (O) position, the power supply will enter a reset cycle for 90 seconds. Wait at least 90 seconds before turning the power switch back to the on (I) position. If you do not wait the full 90 seconds, the power supply will not restart.

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.**Note**

After powering on the router, wait a minimum of 30 seconds before powering it off again.

Verifying a Successful Boot

After you have turned on the power switch, the router boots. If the following steps occur, you have verified that a successful boot process has occurred.



Note After powering off the router, wait a minimum of 30 seconds before powering it on again.

-
- Step 1** Check that the green OK LED on the power supply turns on.
- Step 2** Listen for the fans; you should immediately hear them operating.
- Step 3** During the boot process, observe the system's LEDs. The LEDs on most of the port adapters and the Cisco uBR7200 series cable modem cards 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, on the NPE-G1, the POWER OK LED comes on immediately and stays on, and on the NPE-G2, the PWR OK LED comes on immediately and stays on.
- Step 4** Observe the initialization process. When the system boot is complete (a few seconds), the network processing engine or network services engine begins to initialize the port adapters, Cisco uBR7200 series cable modem cards, 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(17)CA [smith 100]
Copyright (c) 1986-1998 by cisco Systems, Inc.
Compiled Sun 21-Apr-98 04:10 by smith
```

If the system fails to boot properly, or if the console terminal displays a checksum or memory error, check the following:

- Ensure that all SIMMs, DIMMs, or SODIMMs are installed correctly. If necessary, shut down the system and remove the I/O controller or the network processing engine or network services engine. Check the SIMMs, DIMMs, or SODIMMs by looking straight down on them and then at eye level. The SIMMs or DIMMs should all be aligned at the same angle and the same height when properly installed. If a SIMM, DIMM, or SODIMM appears to stick out or rest in the socket at a different angle from the others, remove the SIMM, DIMM, or SODIMM and reinsert it. Then replace the I/O controller or the network processing engine or network services engine and reboot the system for another installation check.
- Each DRAM SIMM bank must contain SIMMs of the same size and speed or the system will not operate. SIMMs must be 60 ns or faster. The speed is silk-screened along one edge of the SIMM.
- Each SDRAM SODIMM bank must contain SODIMMs of the same size and type and both sockets must be populated, or the system will not operate.

If after several attempts the system fails to restart properly, contact a service representative for assistance. Before you call, note any error messages, unusual LED states, or other indications that might help solve the problem.

This completes the procedures for reconnecting input power and powering up the router.

Removing and Replacing an AC-Input or DC-Input Power Supply

The weight of power supplies installed in a Cisco 7200 series router might make it difficult for you to pull the network processing engine or network services engine from its chassis slot. If this is the case, consider removing installed power supplies from the chassis and then removing the network processing engine or network services engine.

The following sections explain how to remove and replace an AC-input or a DC-input power supply in a Cisco 7200 series router.



Note

The network processing engine is installed above the power supplies in a Cisco uBR7200 series router. You do not need to remove the power supplies from a Cisco uBR7200 series router to pull the network processing engine from its chassis slot.



Caution

Do not mix AC- and DC-input power supplies in the same router.

Removing a Power Supply

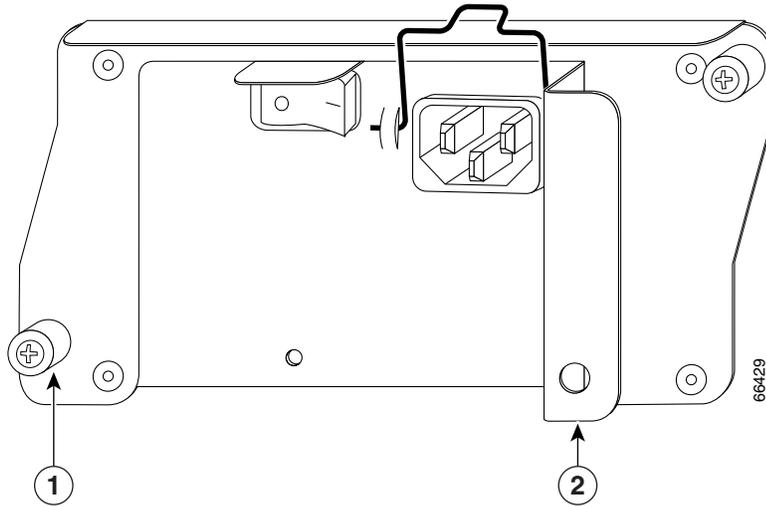
The steps for removing an AC-input or DC-input power supply from a Cisco 7200 series router are the same. The two power supplies share the same dimensions and faceplates, except for the AC-input receptacle on the AC-input power supply and the DC-input lead receptacles on the DC-input power supply.

To remove an AC-input or DC-input power supply from a Cisco 7200 series router, complete the following steps:

- Step 1** Ensure that the power switch on the power supply is in the off (O) position and input power is disconnected from the power supply.
- Step 2** Make sure no current is flowing through the DC -V and +V leads. 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. (See the [“Powering Down the Router”](#) section on page 4-2.)
- Step 3** Using a number 2 Phillips or a 3/16-inch flat-blade screwdriver, loosen the two captive installation screws on the faceplate of the power supply. (See [Figure 4-32](#).)

If the router is not installed in a standard 19-inch, four-post or two-post rack, skip to Step 7. 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 4.

Figure 4-32 Power Supply Captive Installation Screws and Handle—Cisco 7200 Series AC-Input Power Supply Shown



1	Captive installation screw	2	Handle
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- Step 4** Using a 3/16-inch flat-blade screwdriver, loosen the screws that secure the router to the front mounting strips of the rack.
- Step 5** Position at least one person in front of the rack to support the front underside of the router.
- Step 6** 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 7** Grasp the power supply handle and pull the power supply from the router.



Caution To maintain agency compliance requirements and meet EMI emissions standards for the Cisco 7200 series router with a single power supply, the power supply filler plate must remain in the power supply adjacent to the installed power supply. Do not remove this filler plate from the router unless you intend to install a redundant power supply.

- Step 8** Repeat Step 1 through Step 7 for the other installed power supply (if present).

This completes the procedure for removing an AC-input or DC-input power supply from a Cisco 7200 series router. Proceed to the following section, [“Replacing a Power Supply.”](#)

Replacing a Power Supply

To replace an AC-input or DC-input power supply in a Cisco 7200 series router, complete the following steps:

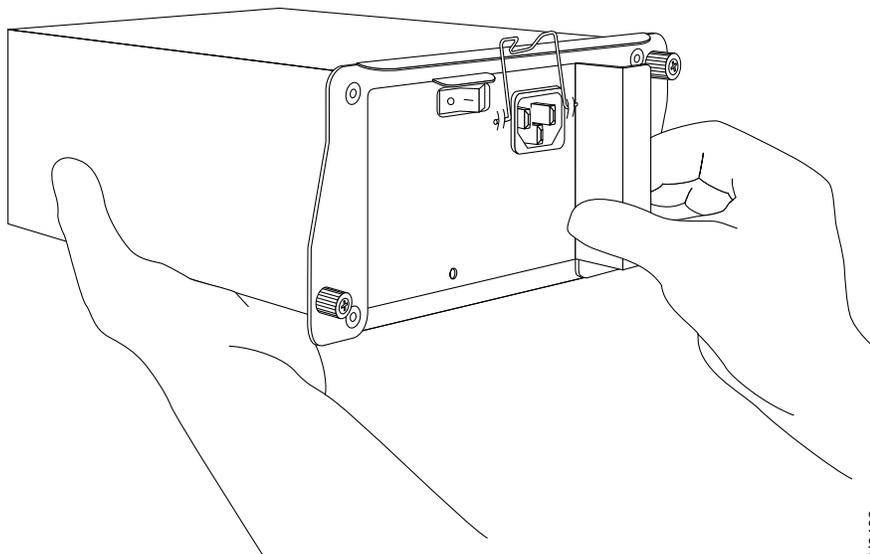
- Step 1** Make sure the power switch on the power supply is in the off (O) position. (See [Figure 4-1](#) for AC and [Figure 4-5](#) for DC.)



Note After powering off the router, wait a minimum of 30 seconds before powering it on again.

- Step 2** Grasp the power supply handle with one hand and place your other hand underneath the power supply for support. (See [Figure 4-33](#).)

Figure 4-33 Holding the Power Supply—Cisco 7200 Series AC-Input Power Supply Shown



- Step 3** Align the power supply with the power supply bay.
- Step 4** Slide the power supply completely into the power supply bay until its faceplate is flush with the rear panel of the router.



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 power supply and on the midplane.

- Step 5** Seat the power supply in the router by tightening its captive installation screws with a number 2 Phillips or a 3/16-inch flat-blade screwdriver.



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

- Step 6** Repeat Step 1 through Step 5 for a second power supply (if present).

- Step 7** If there is no second power supply, replace the filler plate on the empty power supply bay. Using a number 2 Phillips or a 3/16-inch flat-blade screwdriver, tighten the filler plate's captive installation screws.
- Step 8** If you pushed the router out of the rack, slowly guide the router back into the rack.
- Step 9** 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 7200 series routers with a single power supply, the power supply filler plate must remain in the power supply adjacent to the installed power supply. Do not remove this filler plate from the router unless you intend to install a redundant power supply.

This completes the power supply replacement procedure.

