# Server Upgrade Guide

## HP 9000 rp4410 and HP 9000 rp4440


**Manufacturing Part Number: A9950-96003**
**First Edition**
**April 2005**

U.S.A.

# Legal Notices

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# Preface

This preface contains the following sections:

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## Intended Audience

This document is intended to provide technical product and support information for authorized service providers, customer system administrators, and HP support personnel.

## What's New?

- Initial release of the HP 9000 rp4410 and HP 9000 rp4440 Upgrade Guide

## Notational Conventions

The following notational conventions are used in this publication.

| | |
|---|---|
| **WARNING** | **A warning lists requirements that you must meet to avoid personal injury.** |

| | |
|---|---|
| **CAUTION** | A caution provides information required to avoid losing data or avoid losing system functionality. |

| | |
|---|---|
| **NOTE** | A note highlights useful information such as restrictions, recommendations, or important details about HP product features. |

- `Commands and options` are represented using `this font`.
- **`Text that you type exactly as shown`** is represented using **`this font`**.
- *`Text to be replaced with text that you supply`* is represented using *`this font`*.

  Example:
  "Enter the `ls -l` *`filename`* command" means you must replace *`filename`* with your own text.
- **Keyboard keys and graphical interface items (such as buttons, tabs, and menu items)** are represented using **this font**.

  Examples:
  The **Control** key, the **OK** button, the **General** tab, the **Options** menu.
- **Menu —> Submenu** represents a menu selection you can perform.

Example:
"Select the **Partition —> Create Partition** action" means you must choose the **Create Partition** menu item from the **Partition** menu.

- `Example screen output` is represented using `this font`.

## Reader Comments and Feedback

HP welcomes your feedback on this publication. Please address your comments to **edit@presskit.rsn.hp.com** and note that you will not receive an immediate reply. All comments are appreciated.

## Related Information

You can find other information on HP server hardware management, Microsoft® Windows®, and diagnostic support tools in the following publications.

#### Web Site for HP Technical Documentation: http://docs.hp.com

The main Web site for HP technical documentation is **http://docs.hp.com**, which has complete information available for free.

#### Server Hardware Information: http://docs.hp.com/hpux/hw/

The **http://docs.hp.com/hpux/hw/** Web site is the systems hardware portion of the docs.hp.com and provides HP nPartition server hardware management details, including site preparation, installation, and more.

#### Windows Operating System Information

You can find information about administration of the Microsoft® Windows® operating system at the following Web sites, among others:

- **http://docs.hp.com/windows_nt/**
- **http://www.microsoft.com/technet/**

#### Diagnostics and Event Monitoring: Hardware Support Tools

Complete information about HP's hardware support tools, including online and offline diagnostics and event monitoring tools, is at the **http://docs.hp.com/hpux/diag/** Web site. This site has manuals, tutorials, FAQs, and other reference material.

#### Web Site for HP Technical Support: http://us-support2.external.hp.com

HP's IT resource center Web site at **http://www.itrc.hp.com/** provides comprehensive support information for IT professionals on a wide variety of topics, including software, hardware, and networking.

#### Books about HP-UX Published by Prentice Hall

The **http://www.hp.com/hpbooks/** Web site lists the HP books that Prentice Hall currently publishes, such as HP-UX books including:

- *HP-UX 11i System Administration Handbook*
  **http://www.hp.com/hpbooks/prentice/ptr_0130600814.html**
- *HP-UX Virtual Partitions*
  **http://www.hp.com/hpbooks/prentice/ptr_0130352128.html**

HP Books are available worldwide through bookstores, online booksellers, and office and computer stores.

## Printing History

The Printing History below identifies the edition dates of this manual. Updates are made to this publication on an unscheduled, *as needed*, basis. The updates will consist of a complete replacement manual and pertinent on-line or CD-ROM documentation.

First Edition . . . . . April 2005

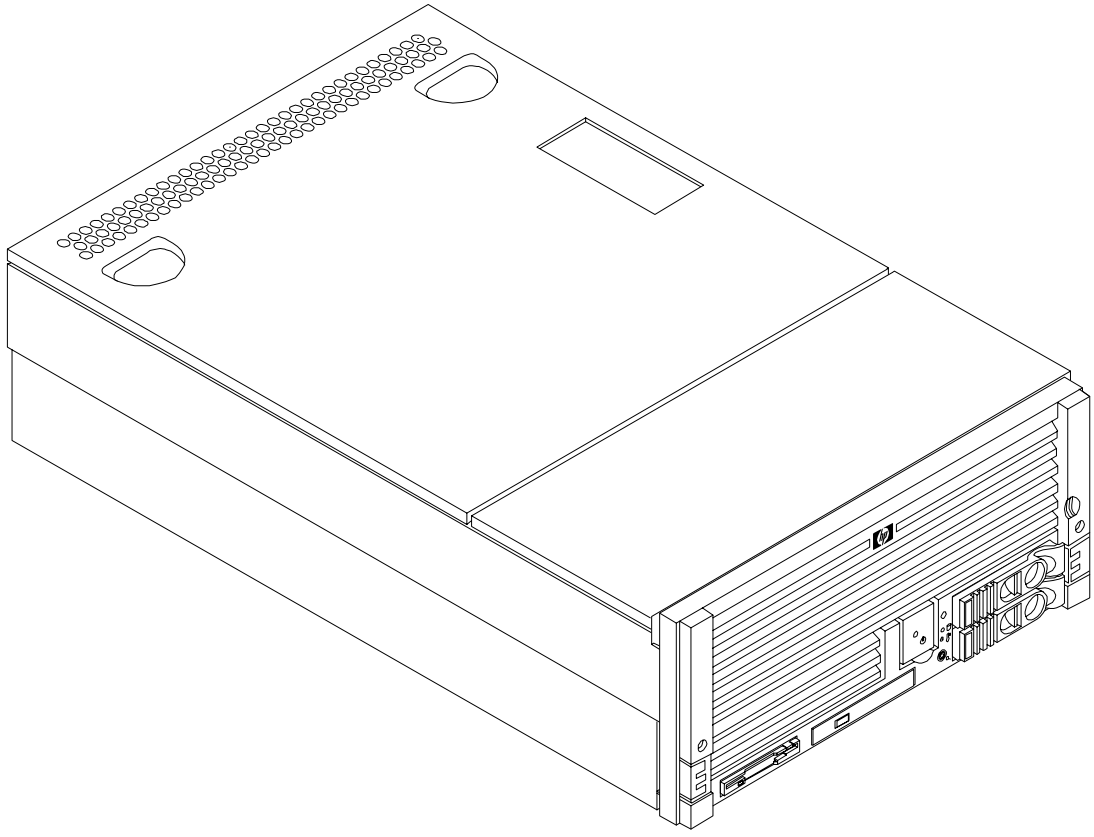
# 1 Overview and Common Procedures—Server Upgrade

## Overview

This guide presents instructions for upgrading the HP 9000 rp4410 and HP 9000 rp4440 servers to more capable configurations. This change enables, replaces, or installs Dual Processor Modules (DPMs) to increase server speed and L2 cache size, or increase overall server capability. Upon completion of this upgrade, your servers are functionally identical to the newest HP 9000 rp44xx server configurations, and may include the use of new processors, more and larger DIMMs, and enhanced software and firmware.

This chapter describes and summarizes the upgrade process, refers you to the appropriate sections of this guide for detailed information, and provides common procedures that are applicable to two or more upgrade procedures. Also included here is information to help you estimate the time required to upgrade your server and details about hardware requirements.

**Figure 1-1 HP 9000 rp4410 and HP 9000 rp4440 Server**



# Processor Upgrade Procedures

This guide describes server upgrades which may be performed individually to increase server capability. In addition, you can perform two or more upgrade procedures together to accomplish greater increases in server capability.

**Table 1-1 HP 9000 rp44xx Server Processor Upgrade Procedures**

| Starting Configuration | Configuration After Upgrade[a] | 800 MHz CPU Based Servers | | 1 GHz CPU Based Servers | | Procedure |
|---|---|---|---|---|---|---|
| **From** | **To** | **32 MB L2 Cache** | **64 MB L2 Cache** | **32 MB L2 Cache** | **64 MB L2 Cache** | |
| Processors with 32 MB L2 cache | Processors with 64 MB L2 cache | NA | Replace existing DPM[b] with DPM AB526A and upgrade firmware | NA | Replace existing DPM with DPM AB527A and upgrade firmware | See Chapter 2 for upgrade instructions |
| HP 9000 rp4410 1-way | HP 9000 rp4410 2-way | NA | Upgrade Kit AB524A | NA | Upgrade Kit AB525A | See Chapter 3 for upgrade instructions |
| HP 9000 rp4410 2-way | HP 9000 rp4410 4-way | NA | Install DPM AB526A | NA | Install DPM AB527A | Install DPM as described in this chapter |
| HP 9000 rp4410 | HP 9000 rp4440 | NA | Upgrade Kit AB559A | NA | Upgrade Kit AB559A | See Chapter 4 for upgrade instructions |
| HP 9000 rp4440 2-way | HP 9000 rp4440 4-way | Install DPM A7125A | Install DPM AB526A | Install DPM A7135A | Install DPM AB527A | Install DPM as described in this chapter |
| HP 9000 rp4440 4-way | HP 9000 rp4440 6-way | Install DPM A7125A | Install DPM AB526A | Install DPM A7135A | Install DPM AB527A | Install DPM as described in this chapter |
| HP 9000 rp4440 6-way | HP 9000 rp4440 8-way | Install DPM A7125A | Install DPM AB526A | Install DPM A7135A | Install DPM AB527A | Install DPM as described in this chapter |

a. If a processor change involves conversion from 32 MB L2 cache to 64 MB L2 cache, system firmware must be updated.
b. DPM - dual processor module.

### Limitations

All processors within a server must have equal speed and identical cache size. This is best verified by using processors with identical part numbers.

# Memory Upgrade Procedures

The standard configuration of the HP 9000 rp4410 or HP 9000 rp4440 server includes a 16-DIMM memory extender board. Memory DIMMs are installed in groups of 4 (quads); and your server may include 4, 8, 12, or 16 DIMMs (up to 4 quads). You may replace all of the DIMMs in any quad or install additional DIMMs as new quads in unused slots (connectors).

An optional 32-DIMM memory extender board is available to replace the 16-DIMM memory extender board in your server. When this optional memory extender board is used, your server may include 4, 8, 12, 16, 20, 24, 28, or 32 DIMMs (up to 8 quads).

### DIMM Slot Fillers

Both the 16- and 32-DIMM extender boards must have DIMM slot filler boards placed over all unfilled DIMM slots. Before you fill DIMM slots with additional memory, you must remove the DIMM slot fillers. All remaining DIMM fillers in unused slots must remain in place to maximize internal cooling. If you remove DIMM slot fillers, set them aside for future use. If you replace existing memory with a smaller number of larger DIMMs, you may need additional DIMM slot fillers. Obtain additional DIMM slot fillers from your HP service representative.

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**NOTE** One DIMM slot filler board covers two adjacent DIMM slots.

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### Limitations

Limitations on DIMM installation are:

- DIMM sizes within a quad must be the same (You can install DIMMs of different sizes in a server but all DIMMs within a quad must be identical size)

### Procedure

See “Common Procedures” on page 17 for memory installation procedures.

## Time Required

Upgrading the HP 9000 rp44xx server might require several hours, depending on preparatory time, and the type and number of upgrades planned. If you perform several upgrades together, you can save preparatory time and improve efficiency. In addition, combining upgrades eliminates the need for multiple system backup and boot cycles. Table 1-2 lists the various upgrades described in this guide, and the approximate time required to perform each upgrade procedure.

**Table 1-2 Time Required for Upgrade Procedures**

| Procedure | Estimated Time Required |
|---|---|
| Replace Dual Processor Module | 30 minutes |
| Upgrade HP 9000 rp4410 1-way server to the 2-way configuration | 1 hour |
| Upgrade HP 9000 rp4410 2-way server to the 4-way configuration (Install a Dual Processor Module) | 15 minutes |
| Upgrade HP 9000 rp4410 server the HP 9000 rp4440 server configuration | 1 hour |
| Upgrade HP 9000 rp4440 2-way server to the 4-way configuration (Install a Dual Processor Module) | 15 minutes |
| Upgrade HP 9000 rp4440 4-way server to the 6-way configuration (Install a Dual Processor Module) | 15 minutes |
| Upgrade HP 9000 rp4440 6-way server to the 8-way configuration (Install a Dual Processor Module) | 15 minutes |
| Replace or install memory DIMMs | 15 minutes |

## Before You Start

You might need some or all of the following items before you upgrade your HP 9000 rp4410 or HP 9000 rp4440 server:

- Upgrade licence for processor upgrades
- Upgrade kit for processor upgrades
- DIMMs for memory upgrades
- DIMM slot fillers for memory upgrades
- Memory extender board for memory upgrades
- Electrically Conductive Field Service Grounding Kit, HP P/N 9300-1155
- Special processor tool kit, HP P/N 5069-5441 for processor upgrades
- Standard tools

# Common Procedures

This section provides information on how to remove and replace server components for the upgrades described in this guide.

# Safety Information

This section describes gaining access, removing, and installing components of the HP 9000 rp4410 and HP 9000 rp4440 server. Use care to prevent injury and equipment damage when performing these procedures. Voltages may be present within the server. Many assemblies are sensitive to damage by electrostatic discharge.

**WARNING** **Ensure that the system is powered down and all power sources have been disconnected from the server prior to working with the server.**

**Voltages are present at various locations within the server whenever an AC power source is connected. This voltage is present even when the main power switch is in the off position.**

**Failure to observe this warning could result in personal injury or damage to equipment.**

Many server components are electrostatic discharge (ESD) sensitive. Use care to prevent equipment damage. Observe the following practices:

- Use an antistatic wrist strap and a grounding mat, such as those included in the Electrically Conductive Field Service Grounding Kit (HP 9300-1155)
- Handle accessory boards and components by the edges only. Do not touch any metal-edge connectors or any electrical components on accessory boards
- Do not wear clothing subject to static charge build-up, such as wool or synthetic materials

# Accessing a Rack Mounted Server

The HP 9000 rp4410 and HP 9000 rp4440 servers are designed to be rack or pedestal mounted. The following procedures describe how to gain access to a rack mounted server.

**WARNING** **Ensure that all anti-tip features (front and rear anti-tip feet installed; adequate ballast properly placed; and so on) are employed prior to extending the server.**

## Extend the Server from the Rack

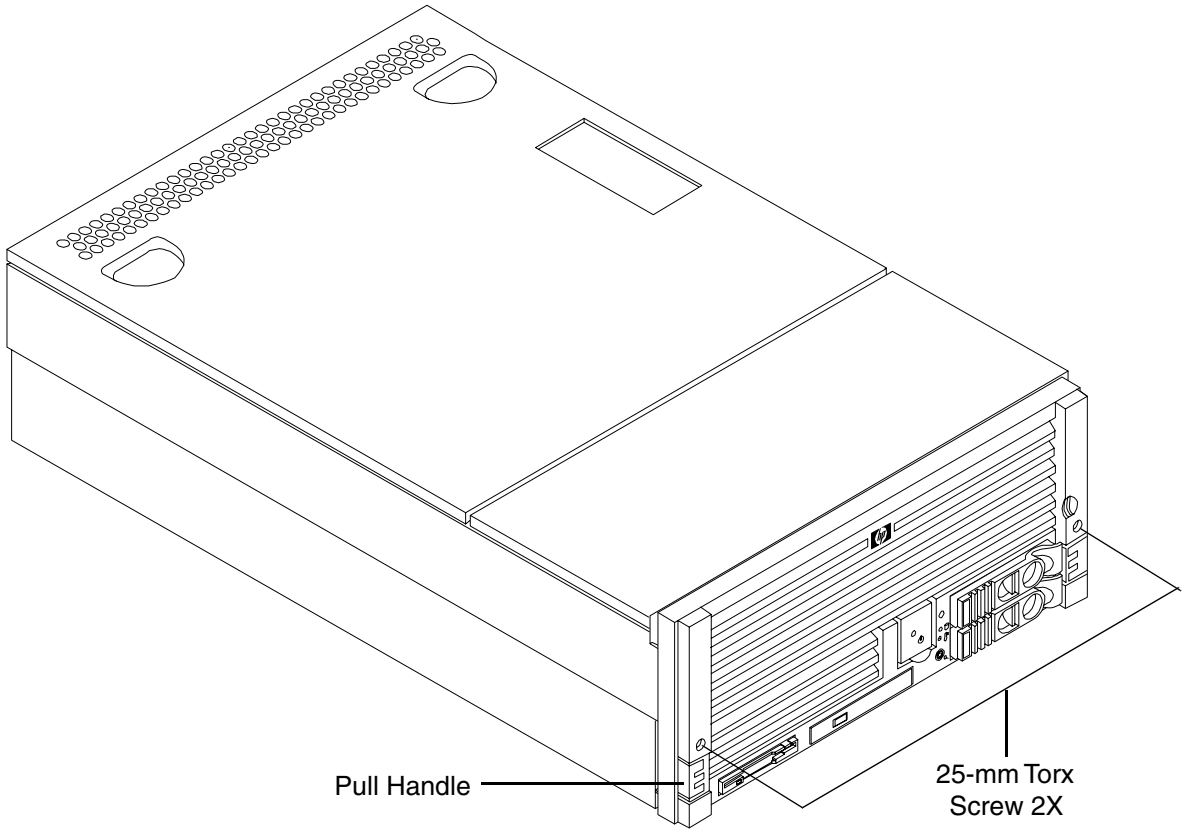
**NOTE** Ensure there is enough area (approximately 1.5 meters [4.5 ft.]) to fully extend the server out of the rack and work on it.

To extend the server from the rack, perform the following steps:

**Step 1.** Remove the T-25 screws that fasten the server to the rack.

**Step 2.** Flip out the two pull handles at either end of the front bezel and slowly pull the unit forward by the handles. The server is fully extended when the rail clips are locked in place. After your server is fully extended, the front and top covers are fully accessible.

**Figure 1-2 Accessing 25-mm Torx Screws and Pull Handles**



## Insert the Server into the Rack

To insert the server into the rack, perform the following steps:

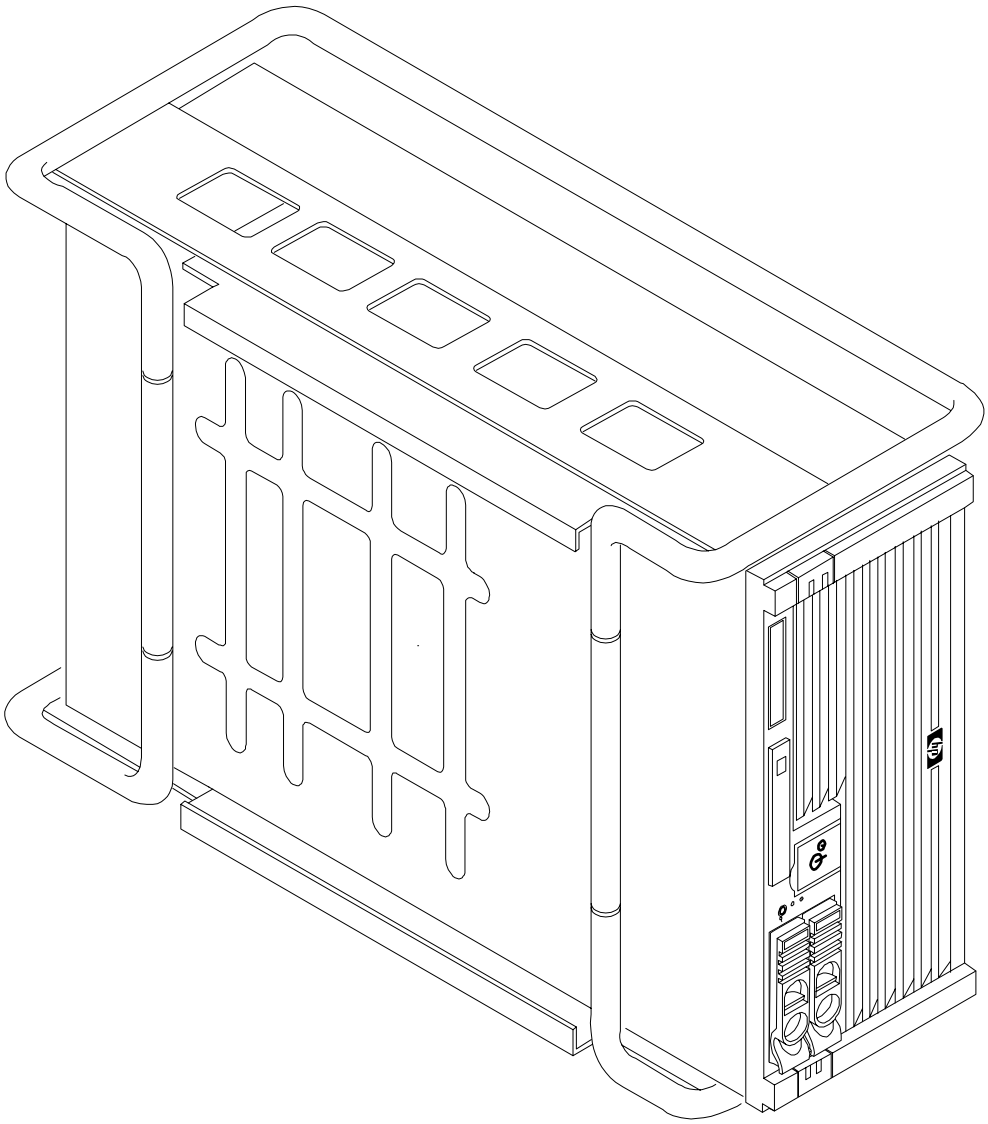
**Step 1.** Press the rail clips on either side of the server inward and push the server into the rack until it stops.

**Step 2.** Replace the T-25 screws that fasten the server to the rack.

## Accessing a Pedestal Mounted Server

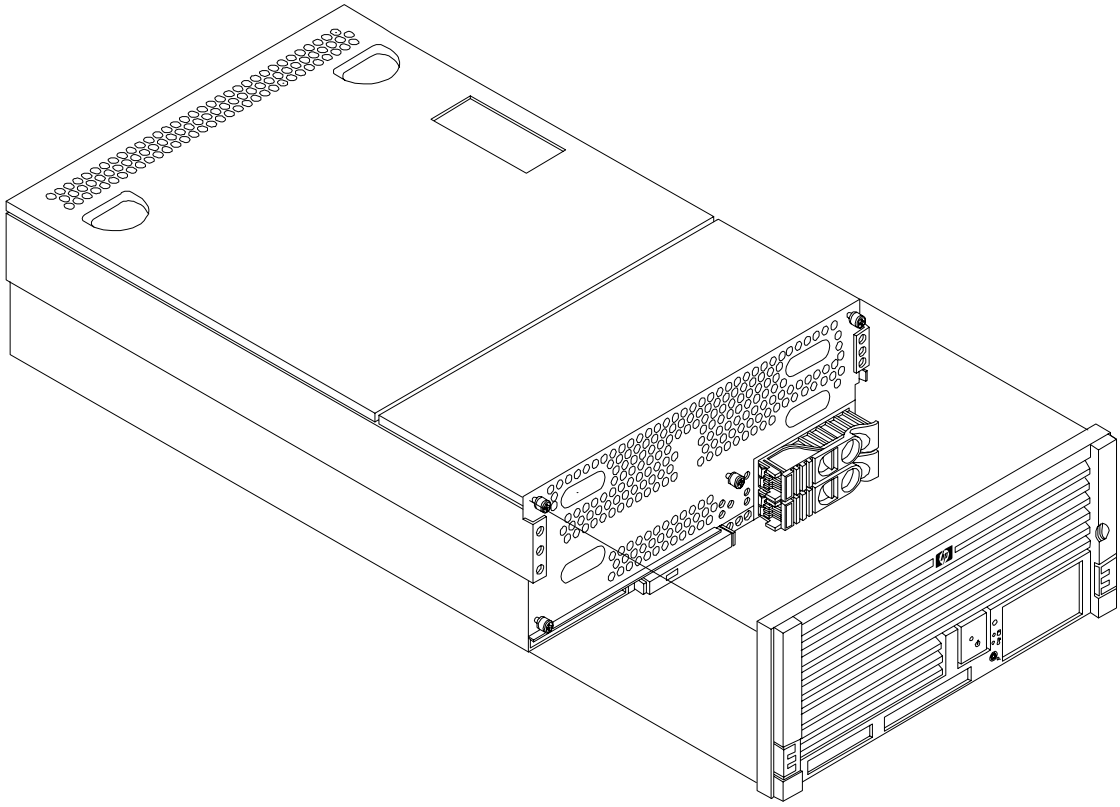
The HP 9000 rp4410 and HP 9000 rp4440 servers are designed to be rack or pedestal mounted. You do not need to remove the pedestal from the HP server to gain access to internal components. The front bezel, front cover, and top cover may be removed with the pedestal attached to the HP server.

**Figure 1-3 Pedestal Mounted HP 9000 rp4410 and HP 9000 rp4440 Servers**



# Front Bezel

**Figure 1-4 Removing and Replacing the Front Bezel**



## Removing the Front Bezel

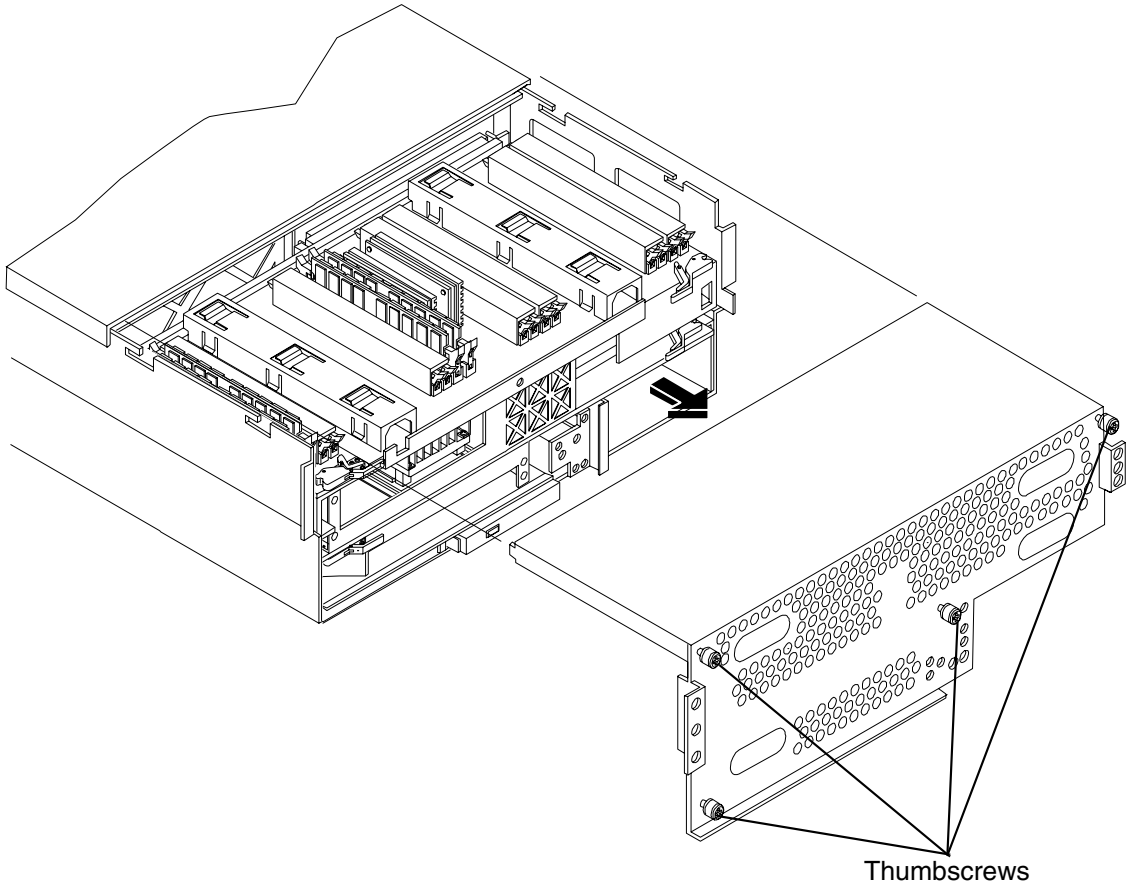
To remove the front bezel, grasp the front bezel at the outer edges and pull straight out.

## Replacing the Front Bezel

To replace the front bezel, hold the bezel in mounting position and push the bezel straight into the chassis until it snaps into place.

# Front Cover

**Figure 1-5 Removing and Replacing the Front Cover**




## Removing the Front Cover

To remove the front cover, perform the following steps:

**WARNING** **Ensure that the system is powered down and all power sources have been disconnected from the server prior to removing the front cover.**

**Voltages are present at various locations within the server whenever an AC power source is connected. This voltage is present even when the main power switch is in the off position.**

**Failure to observe this warning could result in personal injury or damage to equipment.**

**Step 1.** Turn off system power (press the power button) and verify that the power LED is off.

**Step 2.** Disconnect AC power from the rear panel connector.

**Step 3.** If rack mounted, slide the HP server out from the rack until it stops. See “Extend the Server from the Rack” on page 18.

**Step 4.** Remove the front bezel. See “Removing the Front Bezel” on page 20.

**Step 5.** Loosen the four captive thumbscrews that hold the front cover in place.

**Step 6.** Raise the cover slightly, and pull the cover toward the front of the server to free the tabs from the slots in the center of the chassis.

## Replacing the Front Cover

To replace the front cover, perform the following steps:

**Step 1.** Align the tabs at the rear of the front cover with the corresponding slots in the chassis and fully seat the tabs into the slots.

**Step 2.** Tighten the four thumbscrews securely.

**Step 3.** Replace the front bezel. (See “Replacing the Front Bezel” on page 20.)

# Top Cover

## Removing the Top Cover

To remove the top cover, perform the following steps:

**WARNING** **Ensure that the system is powered down and all power sources have been disconnected from the server prior to working with the server.**

**Voltages are present at various locations within the server whenever an AC power source is connected. This voltage is present even when the main power switch is in the off position.**

**Failure to observe this warning could result in personal injury or damage to equipment.**

**Step 1.** Turn off system power (press the Power button) and verify that the power LED is off.

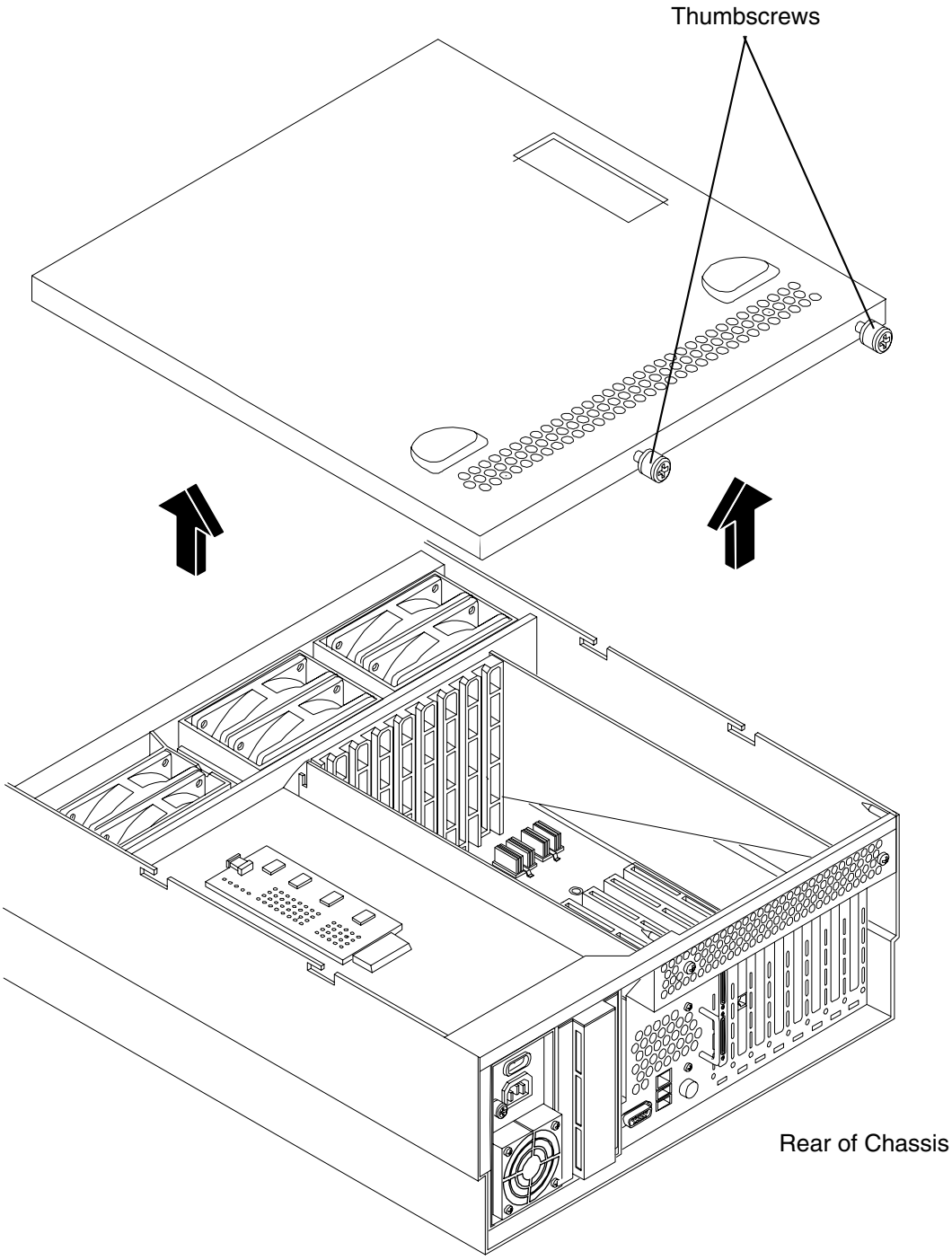
**Step 2.** Disconnect AC power from the rear panel connector.

**Step 3.** If rack mounted, slide the HP server out from the rack until it stops. See “Extend the Server from the Rack” on page 18.

**Step 4.** Loosen the two captive thumbscrews that hold the top cover in place.

**Step 5.** Pull the cover toward the rear of the server to free the tabs from the slots in the center of the chassis and lift it straight up.

**Figure 1-6 Removing and Replacing the Top Cover**



## Replacing the Top Cover

To replace the top cover, perform the following steps:

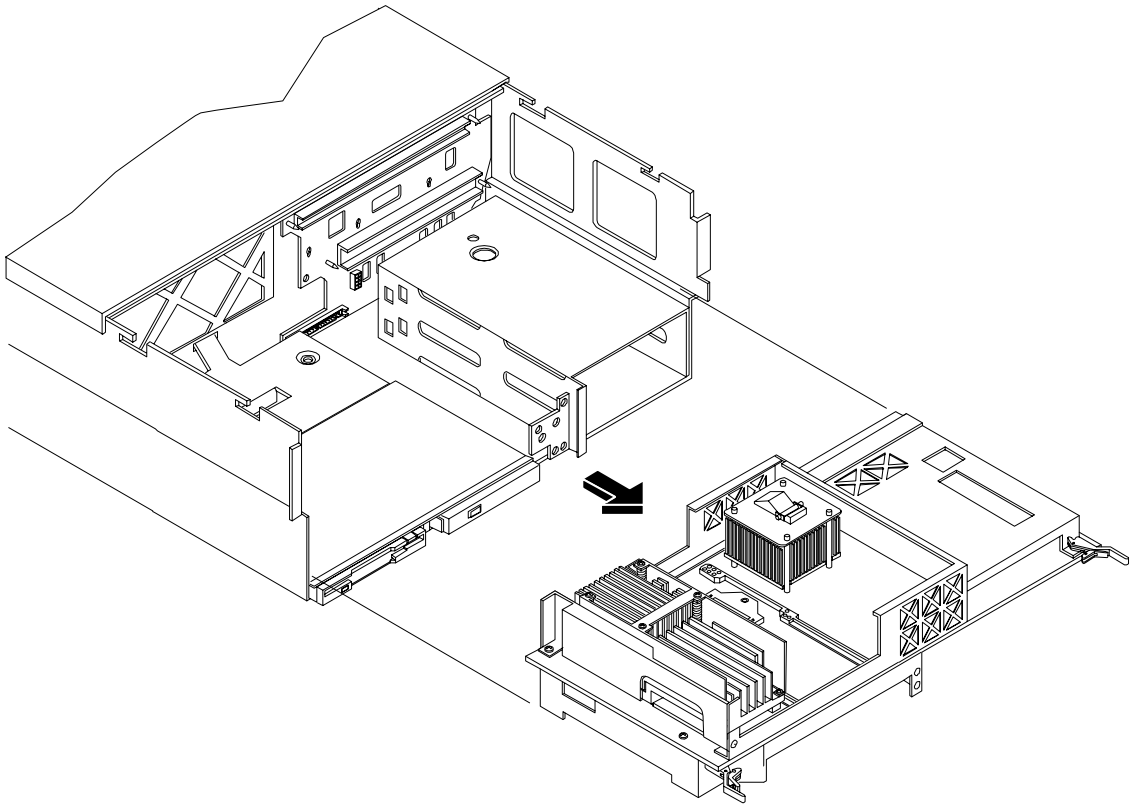
**Step 1.** Align the tabs at the rear of the top cover with the corresponding slots in the chassis and fully seat the tabs into the slots and push forward until it seats.

**Step 2.** Tighten the two thumbscrews securely.

# Processor Extender Board

The processor extender board is located directly behind the front cover, directly beneath the memory extender board.

**Figure 1-7 Processor Extender Board**



## Removing the Processor Extender Board

To remove the processor extender board, perform the following steps:

**WARNING** **Voltages are present at various locations within the server whenever an AC power source is connected. This voltage is present even when the main power switch is in the off position.**

**Ensure that the system is powered down and all power sources have been disconnected from the server prior to removing the processor extender board.**

**Failure to observe this warning could result in personal injury or damage to equipment.**

**Step 1.** Turn off system power (press the power button) and verify that the power LED is off. Disconnect AC power from the rear panel connector.

**Step 2.** If rack mounted, slide the HP server out from the rack until it stops. See “Extend the Server from the Rack” on page 18.

**NOTE** The processor extender board may be removed without removing the HP server from the rack.

**Step 3.** Remove the front bezel. See “Removing the Front Bezel” on page 20.

**Step 4.** Remove the front cover. See “Removing the Front Cover” on page 21.

**Step 5.** Press the latch on the extraction levers located on each side of the processor extender board.

**Step 6.** Pull out on the extraction levers to unplug the processor extender board from the socket located on the midplane riser board.

## Installing the Processor Extender Board

**IMPORTANT** Your processor extender board may be used in Itanium or PA RISC processor based systems. A dip switch is provided to configure processor extender board circuits. Ensure that the PA RISC/IPF dip switch is set to PA RISC for your HP 9000 rp44x0 server. If this switch is incorrectly set, the system will not enter into self test. Refer to the Processor Extender Board section in the *HP 9000 rp4410 and HP 9000 rp4440 Maintenance Guide* for instructions on how to set the dip switch.

To install the processor extender board, perform the following steps:

**Step 1.** Ensure the extraction levers are positioned in the outward, unlocked position.

**Step 2.** Align the processor extender board with the front and rear card guides.

**Step 3.** Slide the processor extender board into the server until it begins to seat in the socket located on the midplane riser board.

**Step 4.** Push the extraction levers inward to the locked position in order to fully seat the processor extender board into the socket on the midplane riser board.

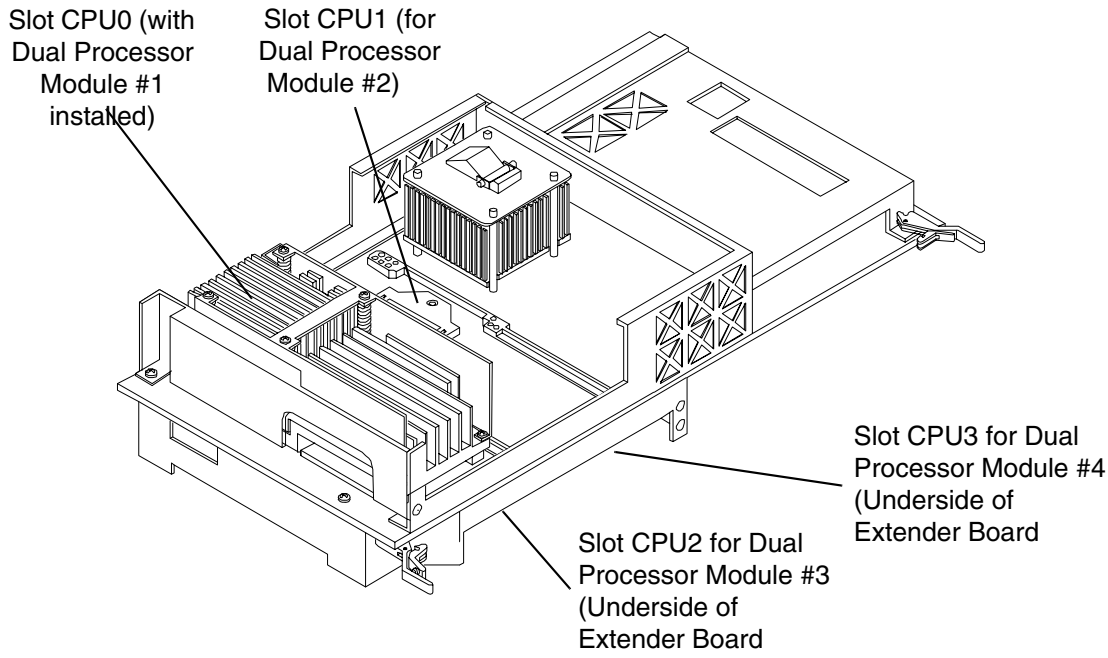
**Step 5.** Replace the front cover. (See “Replacing the Front Cover” on page 22.)

**Step 6.** Replace the front bezel. (See “Replacing the Front Bezel” on page 20.)

# Dual Processor Module

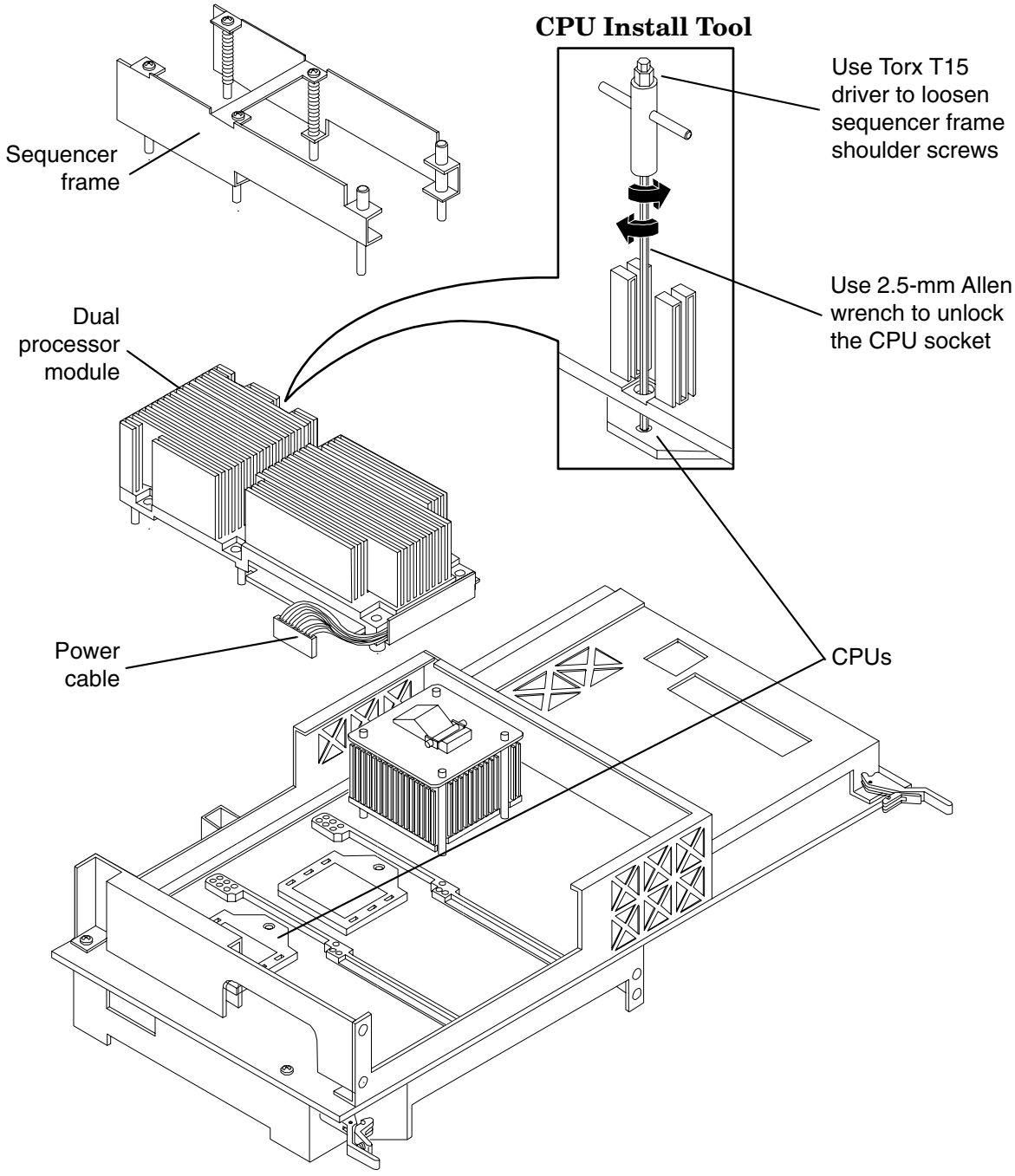
You can install up to four dual processors modules (eight processors) on a processor extender board. The modules are installed on the top and underside of the processor extender board.

**Figure 1-8 Processor Extender Board with One Dual Processor Module**



## Removing a Dual Processor Module from a Processor Extender Board

**Figure 1-9 Removing a Dual Processor Module**




To remove a dual processor module from a processor extender board, perform the following steps:

**Step 1.** Remove the processor extender board from the server. See “Removing the Processor Extender Board” on page 26.

**Step 2.** Unplug the processor power cable from its socket on the extender board.

**Step 3.** Using a CPU install tool (Torx T15 driver), loosen the four T15 shoulder screws and the two knurled thumbscrews that attach the sequencer frame on the heatsink, until the sequencer frame is free.

**Step 4.** Remove the sequencer frame from the heatsink.

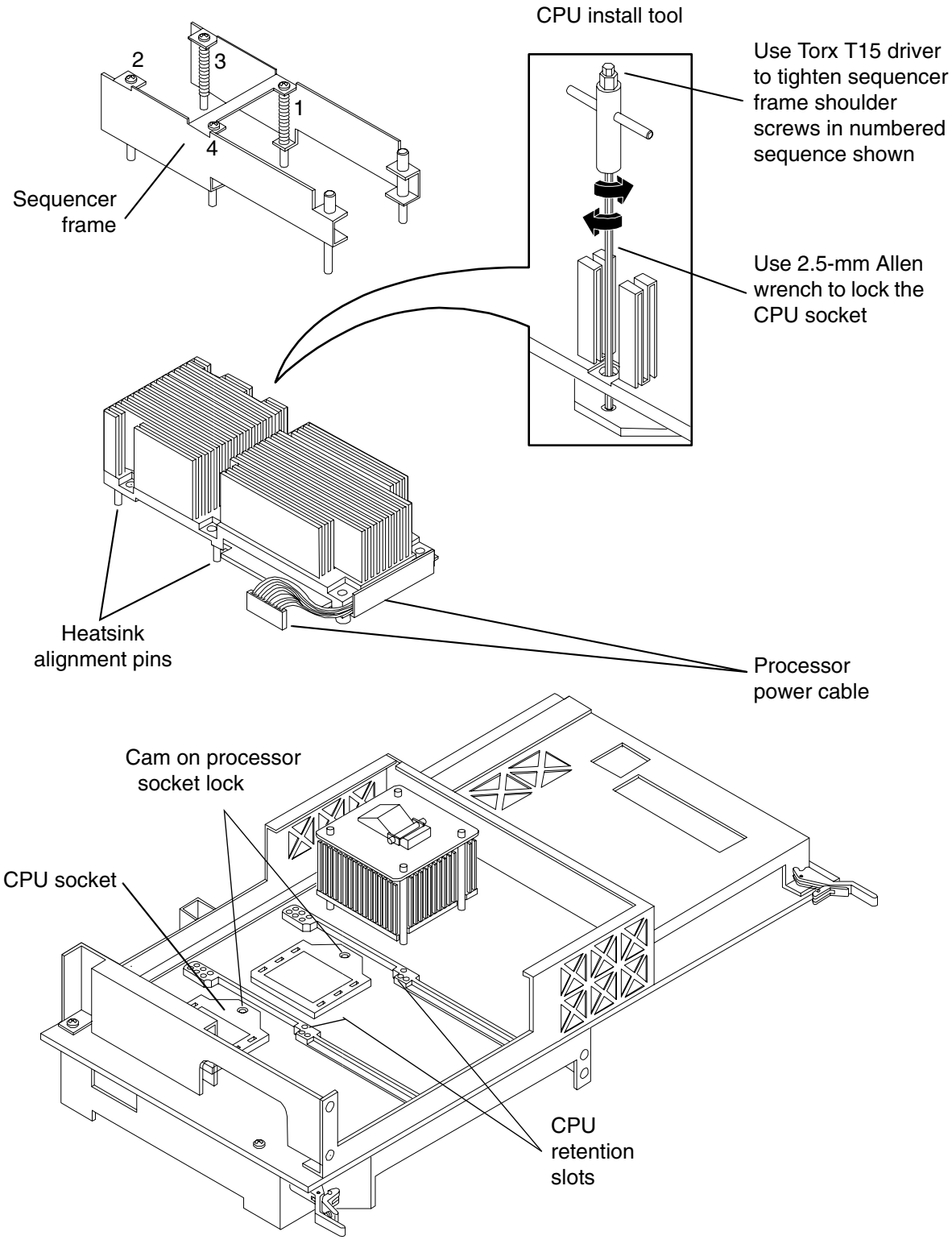
**Step 5.** Using a CPU install tool (2.5-mm driver or Allen wrench), unlock the assembly from the socket by rotating the cam on the socket 180 degrees counterclockwise.

**Step 6.** Ensure the cam on the processor socket lock is in the unlocked, counterclockwise position.

**Step 7.** Carefully remove the processor, from the processor socket. If protective pin covers are available, install the cover(s) on processor connectors to shield connector pins. Place the dual processor module in an anti-static container.

## Installing a Dual Processor Module on a Processor Extender Board

**Figure 1-10 Installing a Dual Processor Module**



**NOTE** Improper dual processor module installation has caused numerous system failures. Read and understand the complete installation procedure before installing a module (Figure 1-10).

You can install up to four dual processor modules on the processor extender board. If you are installing fewer than the maximum number of dual processor modules (one in the HP 9000 rp4410 server or fewer than four in the HP 9000 rp4440 server), you must install them in the designated locations on the processor extender board.

The connectors (slots) on the processor extender board are labeled CPU0 through CPU3. CPU0 and CPU1 connectors are located on the top of the processor extender board and CPU2 and CPU3 connectors are located on the bottom. If you are installing only one dual processor module, you must install it in the CPU0 slot. Similarly, you must install the second dual processor module in the CPU1 slot. You must install the third and fourth dual processor modules in slots CPU2 and CPU3, respectively. The load sequence is described in Table 1-3.

**Table 1-3 Dual Processor Module Load Order**

| Server | Dual Processor Module | Connector /Slot |
|---|---|---|
| rp4410 or rp4440 | 1 | CPU0 |
| rp4410 or rp4440 | 2 | CPU1 |
| rp4440 only | 3 | CPU2 |
| rp4440 only | 4 | CPU3 |

To install a dual processor module on a processor extender board, perform the following steps:

**CAUTION** Ensure that processor speed and cache size are identical for all processors. Failure to observe this caution will result in performance degradation or system failure.

The easiest way to ensure compatibility is the use dual processor modules with identical part numbers.

**Step 1.** Locate the socket (CPU1, CPU2, or CPU3) where you will install the dual processor module (Figure 1-8 and Table 1-3).

**Step 2.** Ensure that the cam on the processor socket lock is in the unlocked, counterclockwise position.

**Step 3.** Remove any protective packaging from the processor module.

**NOTE** Protective covers might be installed to protect connector pins. You can save the covers for future use.

**Step 4.** Carefully lower the dual processor module, without the sequencer frame, onto the processor socket. Align the pins on the bottom of the heatsink to the slots in the retention frame on the extender board. Route the processor power cable under the heatsink such that it will not be pinched between the heatsink and processor extender board. Align the processor socket pins and insert the module pins into the socket.

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**CAUTION** Test the alignment of the module to the socket by gently moving the module back and forth with the palm of your hand—you should feel little or no sideplay. However, because the assembly is not yet tightened, it may tilt slightly toward the center of the extender board—this is acceptable.

---

**CAUTION** Before locking the processor assembly into its socket, ensure that the power cable is not pinched between the heatsink and the sheet metal frame of the extender board. Also, ensure that the two power cable ends attached to the dual processor module do not come unplugged from their sockets when you move the cable into place under the heatsink (Figure 1-11 and Figure 1-12).

**Figure 1-11 Processor Cable Placed Correctly**

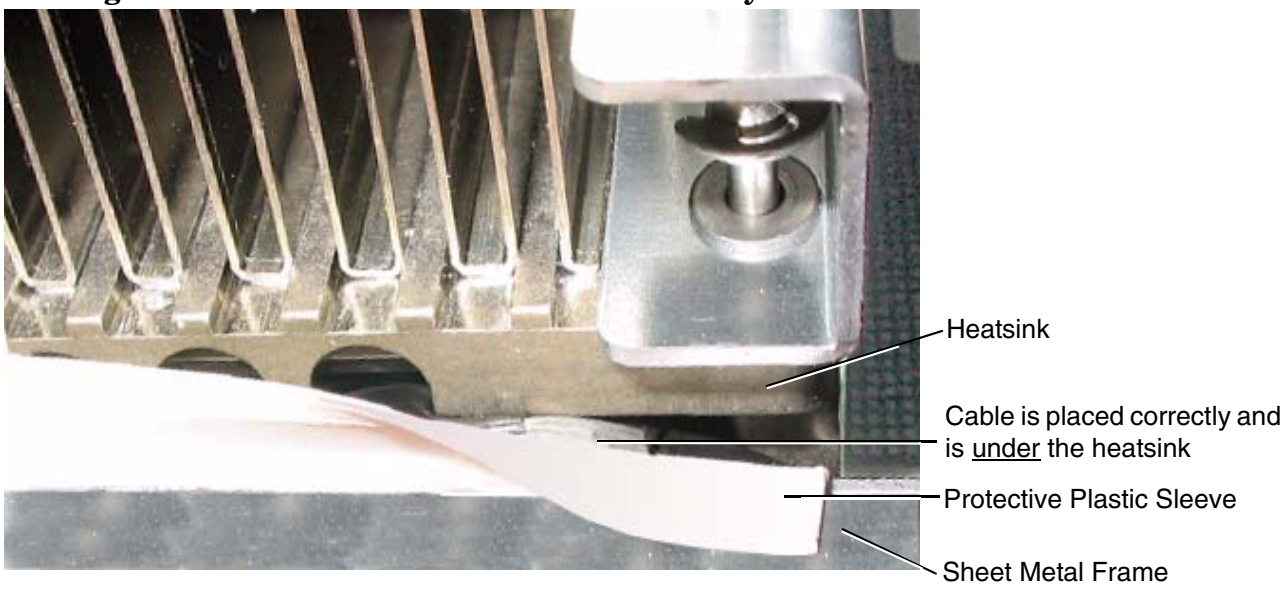
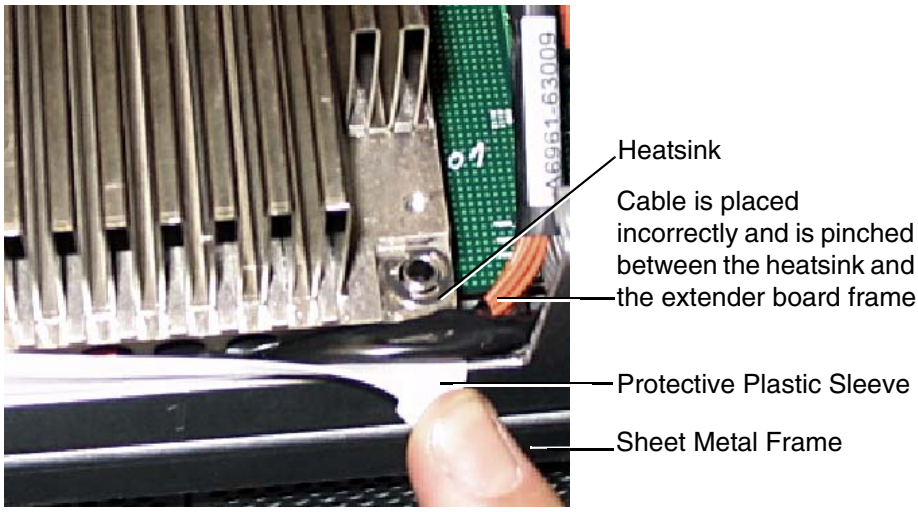



**Figure 1-12 Processor Cable Placed Incorrectly**




**Step 5.** Gently press the dual processor module against the socket and lock the module to the socket by rotating the cam on the socket 180 degrees clockwise. Use a CPU Install tool (or 2.5-mm Allen wrench) to lock the socket.

**CAUTION** When rotating the locking cam, hold the palm of your hand on top of the assembly and exert light pressure. This ensures that the assembly stays flush and level to the socket while it is being tightened.

**Step 6.** Plug the processor cable into its socket on the extender board power connector.

**Step 7.** Place the sequencer frame over the processor.

**Step 8.** Using your fingers, hand tighten the two knurled thumbscrews on the sequencer frame just until the screw stops turning.

**CAUTION** **Do not** tighten the four shoulder screws of the sequencer frame until you have first hand-tightened the two knurled thumbscrews. Do not overtighten the four shoulder screws—they may shear off if overtightened.

**Step 9.** Using a CPU Install tool (Torx T15 driver), tighten the four T15 shoulder screws of the sequencer frame until they just bottom out (do not overtighten). Follow the tightening sequence shown in Figure 1-10, “Installing a Dual Processor Module.”

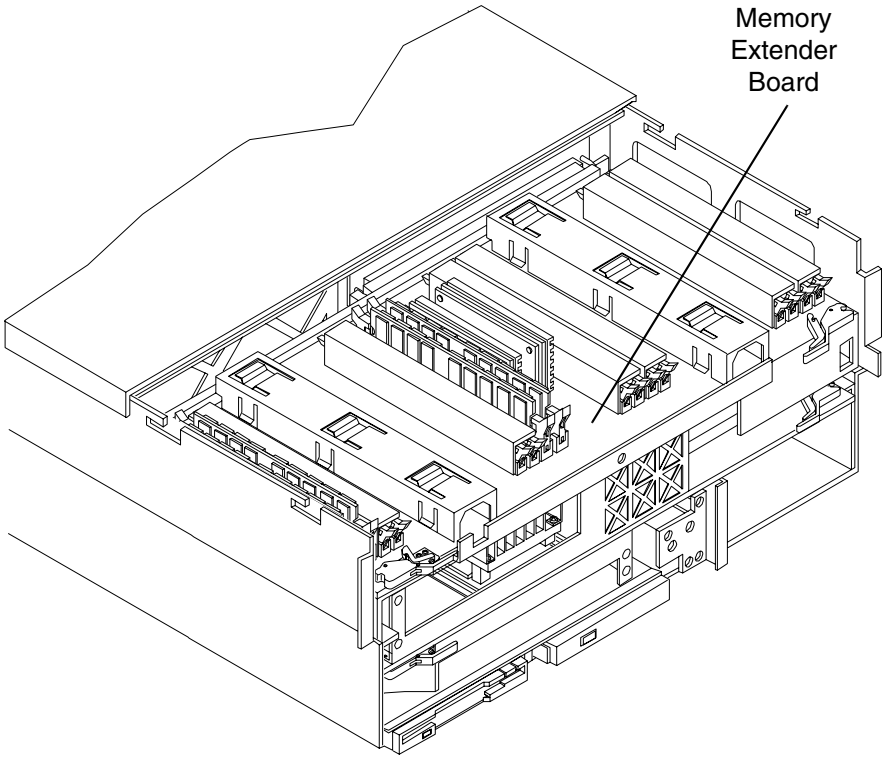
**CAUTION** Do not overtighten the two thumbscrews—they may shear off if overtightened.

**Step 10.** Using the CPU Install tool (Torx T15 driver), tighten the two thumbscrews (do not overtighten). Alternately tighten the thumbscrews in 1/4 turn increments to prevent tilt.

# Memory Extender Board

The memory extender board is located at the top-front of the server, directly behind the front cover.

**Figure 1-13 Memory Extender Board**




## Removing a Memory Extender Board

To remove a memory extender board, perform the following steps:

**WARNING** **Ensure that the system is powered down and all power sources have been disconnected from the server prior to working with the server.**

**Voltages are present at various locations within the server whenever an AC power source is connected. This voltage is present even when the main power switch is in the off position. Ensure that the system is powered down and all power sources have been disconnected from the server prior to removing the memory extender board.**

**Failure to observe this warning could result in personal injury or damage to equipment.**

**CAUTION** Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions could result in damage to the server.

**Step 1.** Turn off system power (press the Power button) and verify that the Power LED is off.

**Step 2.** Disconnect AC power from the rear panel connector.

**Step 3.** If rack mounted, slide the HP server out from the rack until it stops. See “Extend the Server from the Rack” on page 18.

---

**NOTE** The memory extender board may be removed without removing the HP server from the rack.

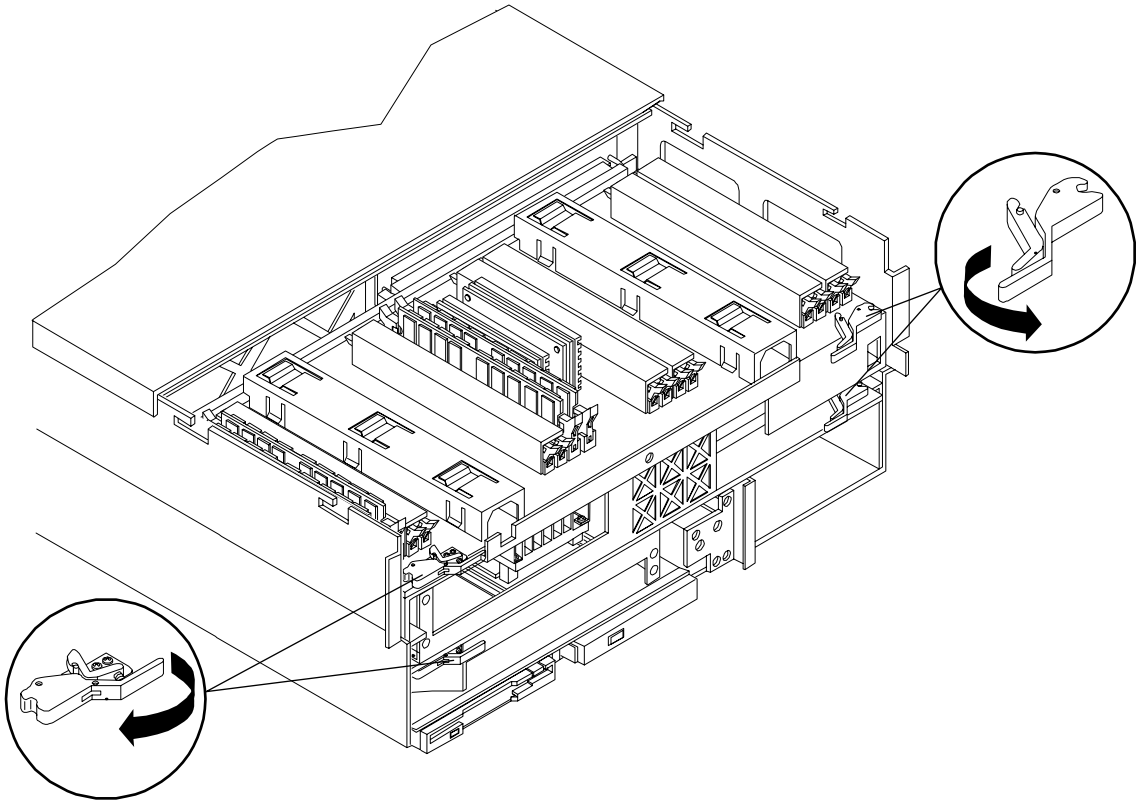
---

**Step 4.** Remove the front bezel from the chassis. (See “Removing the Front Bezel” on page 20.)

**Step 5.** Remove the front cover from the chassis. (See “Removing the Front Cover” on page 21.)

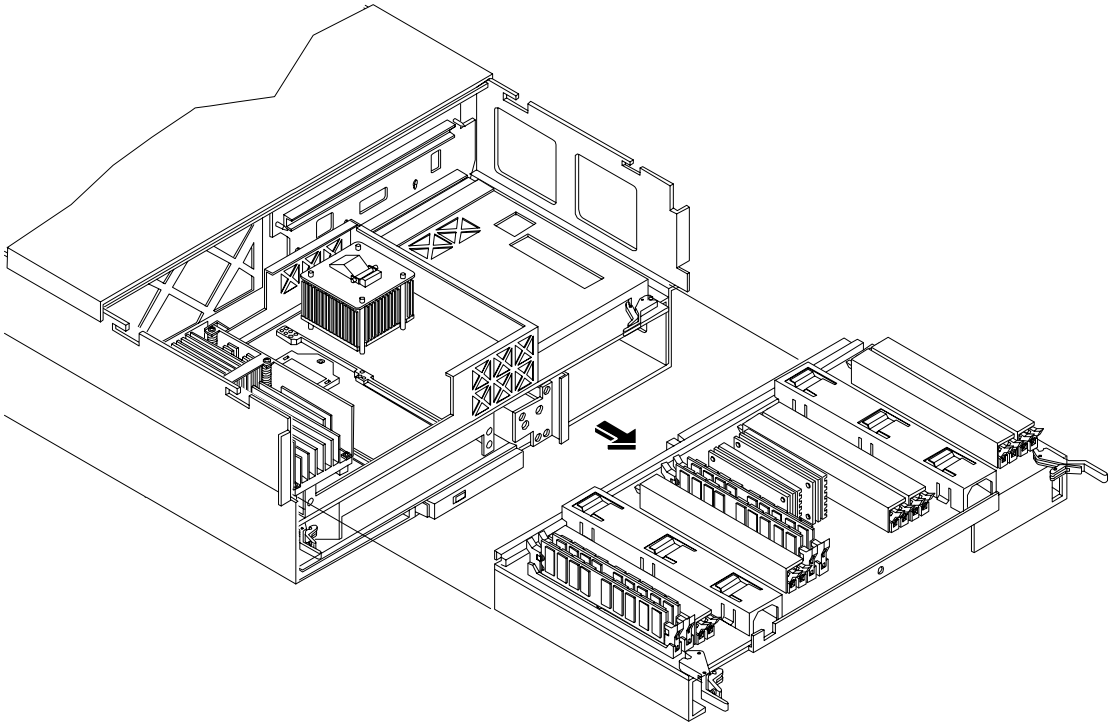
**Step 6.** Press each latch on the two extraction levers located on each side of the memory extender board.

**Figure 1-14 Memory Extender Board Latches**



**Step 7.** Pull on the extraction levers to unplug the memory extender board from the socket located on the midplane riser board and remove the memory extender board from the chassis.

**Figure 1-15 Memory Extender Board Removal**



## Installing a Memory Extender Board

To install a memory extender board, perform the following steps:

**Step 1.** Ensure the extraction levers are positioned in the outward, unlocked position.

**Step 2.** Align the memory extender board with the front and rear chassis guide slots.

**Step 3.** Slide the memory extender board in until it begins to seat in the socket located on the midplane board.

**Step 4.** Push the extraction levers inward to the locked position in order to plug the memory extender board into the midplane riser board.

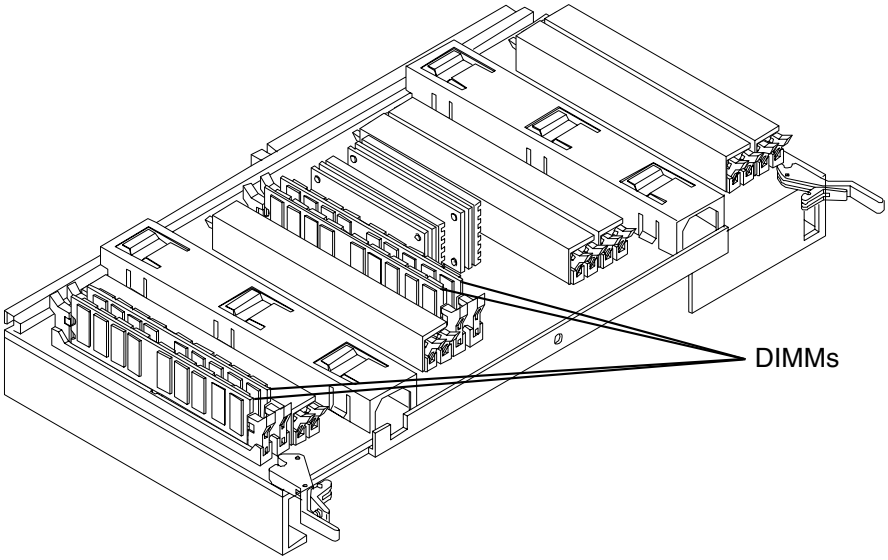
**Step 5.** Replace the front cover. (See “Replacing the Front Cover” on page 22.)

**Step 6.** Replace the front bezel. (See “Replacing the Front Bezel” on page 20.)

# Memory DIMMs

System memory DIMMs are located on the memory extender board.

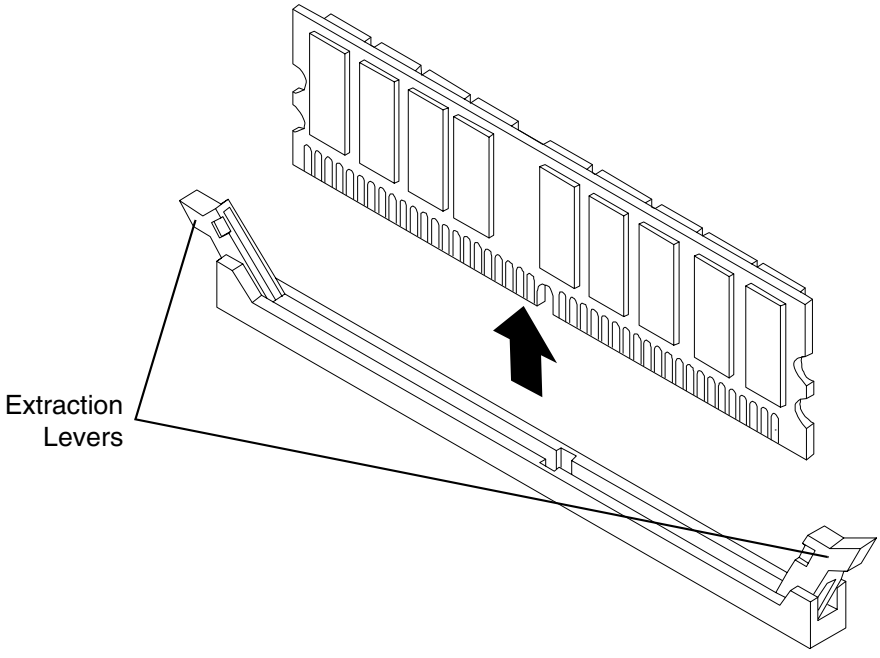
**Figure 1-16 Memory Extender Board DIMM Locations**




## Removing a DIMM

To remove a DIMM, perform the following steps:

**Figure 1-17 Removing a DIMM**



**CAUTION** Always remove the memory extender board from the server before removing DIMM(s). Do not attempt to remove DIMM(s) when the memory extender board is installed in the server.

Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions could result in damage to the server.

**Step 1.** Turn off system power (press the power button) and verify that the power LED is off. Disconnect AC power from the rear panel connector.

**Step 2.** If rack mounted, slide the HP server out from the rack until it stops. See “Extend the Server from the Rack” on page 18.

**NOTE** The memory extender board may be removed without removing the HP server from the rack.

**Step 3.** Remove the front bezel from the chassis. (See “Removing the Front Bezel” on page 20.)

**Step 4.** Remove the memory extender board from the chassis. (See “Removing a Memory Extender Board” on page 36.)

**Step 5.** Identify the DIMM to be removed and push the appropriate extraction levers found on either side of the DIMM slot outward to the open position (Figure 1-17). The DIMM ejects from the slot.

**Step 6.** Remove the DIMM from the socket.

## Installing DIMMs

The HP 9000 rp4410 and HP 9000 rp4440 servers come with a 16-DIMM memory extender board. An optional 32-DIMM memory extender board is available to replace the 16-DIMM memory extender board. You must install the DIMMs on extender boards in groups of four, known as quads. You must fill quads in ascending sequence. (You must fill the first quad before you install DIMMs in the second quad. You must fill the first three quads before you install DIMMs in the fourth quad.) When adding DIMMs, you must use a minimum of four like-sized DIMMs in the next available quad.

### Supported DIMM Sizes

Supported DIMM sizes are 256 MB, 512 MB, 1 GB, 2 GB, and 4 GB. You can use dissimilar DIMM sizes across the entire extender board but all four DIMMs in each quad must match.

### DIMM Slot Fillers

For cooling purposes, you must install DIMM slot fillers over unused slots on 16-DIMM and 32-DIMM extender boards. As you fill DIMM quads with additional memory you must remove the DIMM slot fillers covering the affected slots. All remaining DIMM fillers in unused slots must remain in place to maximize internal cooling. See Table 1-4, “DIMM Filler Requirements for 16-DIMM Extender Board.” See Table 1-5, “DIMM Filler Requirements for 32-DIMM Extender Board.”

**NOTE** One DIMM filler board covers two adjacent DIMM slots. As a general rule, only remove DIMM slot fillers as you add memory and the correct configuration always remains.

**Table 1-4 DIMM Filler Requirements for 16-DIMM Extender Board**

| 16-DIMM Extender Board | |
|---|---|
| **DIMMs Loaded** | **Fillers Required[a]** |
| 4 DIMMs in quad 0 | 6 fillers total:<br>2 fillers in quads 1, 2, and 3<br>(all quads filled) |
| 8 DIMMs in quads 0 and 1 | 4 fillers total:<br>2 fillers in quads 2 and 3<br>(all quads filled) |
| 12 DIMMs in quads 0, 1, and 2 | 2 fillers total:<br>2 fillers in quad 3<br>(all quads filled) |
| 16 DIMMs in quads 0, 1, 2, and 3 | No fillers required |

a. One DIMM filler board covers two adjacent DIMM slots.

**Table 1-5 DIMM Filler Requirements for 32-DIMM Extender Board**

| 32-DIMM Extender Board | |
|---|---|
| **DIMMs Loaded** | **Fillers required[a]** |
| 4 DIMMs in quad 0 | 12 fillers total:<br>2 fillers in quads 1, 3, 4, 5, 6, and 7<br>(quad 2 remains unfilled) |
| 8 DIMMs in quads 0 and 1 | 8 fillers total:<br>2 fillers in quads 4, 5, 6, and 7<br>(quads 2 and 3 remain unfilled) |
| 12 DIMMs in quads 0, 1, and 2 | 8 fillers total:<br>2 fillers in quads 4, 5, 6, and 7<br>(quad 3 remains unfilled) |
| 16 DIMMs in quads 0, 1, 2, and 3 | 8 fillers total:<br>2 fillers in quads 4, 5, 6, and 7<br>(all quads filled) |
| 20 DIMMs in quads 0, 1, 2, 3, and 4 | 4 fillers total:<br>2 fillers in quads 5, 7<br>quad 6 remains unfilled |
| 24 DIMMs in quads 0, 1, 2, 3, 4, and 5 | No fillers required |
| 28 DIMMs in quads 0, 1, 2, 3, 4, 5, and 6 | No fillers required |
| 32 DIMMs in quads 0, 1, 2, 3, 4, 5, 6, and 7 | No fillers required |

a. One DIMM filler board covers two DIMM adjacent slots.

**Figure 1-18 16-DIMM Memory Extender Board Slot IDs**

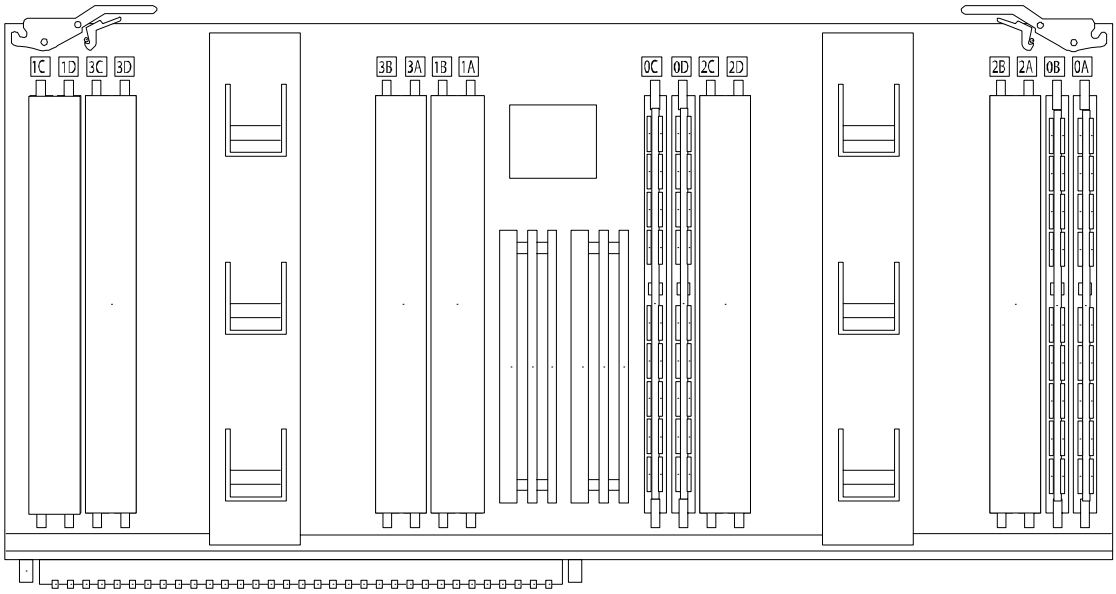
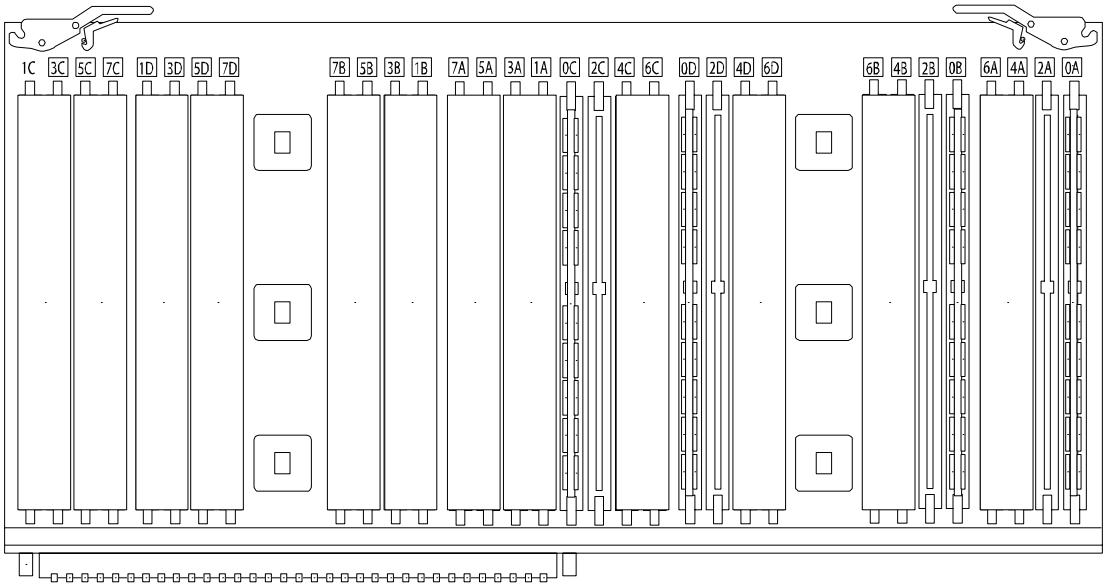


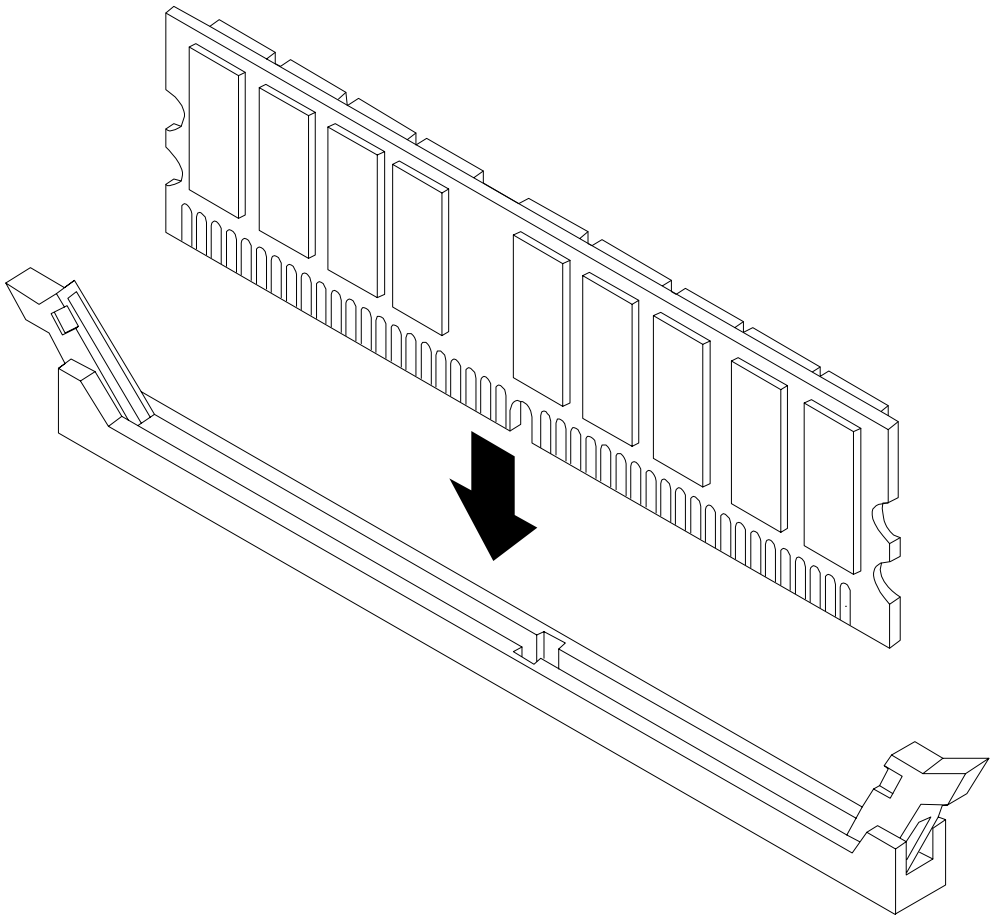

**Figure 1-19 32-DIMM Memory Extender Board Slot IDs**



### Installing DIMMs

To install DIMMs, perform the following steps:

**Figure 1-20 Inserting DIMM into Extender Board Slot**



**Step 1.** Align the DIMM with the socket located on the memory extender board. (Align key in slot with the notch in the DIMM.)

**Step 2.** Gently and evenly push on each side of the DIMM until it seats in the socket. Ensure that the extraction levers are in the closed position.

**Step 3.** Replace the memory extender board. (See “Installing a Memory Extender Board” on page 38.)

**Step 4.** Replace the top cover. (See “Replacing the Front Cover” on page 22.)

**Step 5.** Replace the front bezel. (See “Replacing the Front Bezel” on page 20.)

# 2 Processor Upgrade Procedure

## Introduction

This chapter provides procedures for upgrading HP 9000 rp4410 and HP 9000 rp4440 servers by replacing existing 32 MB cache dual processor modules (DPM) with 64 MB cache DPM. The upgrade to 64 MB cache DPM requires that you upgrade the core I/O as well. This consists of replacing U160 SCSI and single port LAN cards with U320 SCSI and dual port LAN cards.

Included in this chapter are instructions to protect your data, back up the existing operating system (OS) software (in case of an error condition during the update), download new firmware, and install new hardware. After performing these procedures, you are directed to start up your server and resume operation.

## Required Tools

You need an ESD-safe workstation and special tools when replacing a dual processor module. You must use a static-dissipating work surface and a wrist strap. The following tools are required:

- Electrically Conductive Field Service Kit (P/N 9300-1155)
- 1/4 inch flat blade screwdriver
- ACX-15 Torx® screwdriver
- Special processor tool kit, HP P/N 5069-5441

## Back Up Your System

Before replacing a dual processor module, protect yourself by backing up all data and your server OS. In the event of interruptions (for example power failure or interference), it may be necessary to resume operation in the old configuration.

### Back Up Your Data

Back up your data in accordance with local procedures.

### Back Up the Operating System

Always keep a backup copy of the current operating system (OS) available for emergency use.

## Software/Firmware Requirements

Ensure the server meets the minimum software and firmware revisions listed below. Update as necessary.

- HP-UX 11i v1 on HP Integrity servers and HP 9000 servers
- System Firmware greater than 44.21
- Management Processor (MP) firmware greater than E.02.29
- Baseboard Management Controller (BMC) firmware greater than 2.37

## Download Firmware and Shut Down the Server

To download firmware and shut down the server, perform the following steps:

**Step 1.** Make sure that all users are logged off and that the server is not in use.

**Step 2.** Download server firmware. Current revisions of firmware and utilities, together with download instructions are available from your ITRC and from http://www.itrc.hp.com.

**Step 3.** Update the server firmware.

**Step 4.** Turn off the server. Press and hold the power button (on the server front panel) for more than 5 seconds. Verify that the power LED goes off.

**Step 5.** Disconnect the AC power cords from the server rear panel.

### Gain Access to Server Components

To access server components, perform the following steps:

---

**NOTE** See “Common Procedures” on page 17 for detailed instructions to accomplish the following steps.

---

**Step 1.** Extend the server from the rack. (See “Extend the Server from the Rack” on page 18.)

**Step 2.** Remove the front bezel. (See “Removing the Front Bezel” on page 20.)

**Step 3.** Remove the front cover. (See “Removing the Front Cover” on page 21.)

**Step 4.** Remove the top cover. (See “Removing the Top Cover” on page 23.)

**Step 5.** Remove the processor extender board. (See “Removing the Processor Extender Board” on page 26.)

## Replacing the Processor Module(s)

See “Common Procedures” on page 17 for instructions to remove and install dual processor modules. Perform the following steps:

**Step 1.** Replace or install the dual processor module. (See “Installing a Dual Processor Module on a Processor Extender Board” on page 31.)

**Step 2.** Replace or install the processor extender board. (See “Installing the Processor Extender Board” on page 27.)

**Step 3.** Replace the front cover. (See “Replacing the Front Cover” on page 22.)

**Step 4.** Replace the top cover. (See “Replacing the Top Cover” on page 25.)

**Step 5.** Replace the front bezel. (See “Replacing the Front Bezel” on page 20.)

**Step 6.** Insert the server into the rack. (See “Insert the Server into the Rack” on page 19.)

## Remove and Replace the LAN Core I/O Card

The HP Integrity rp44x0 server has two I/O card slots that are dedicated for core I/O cards.

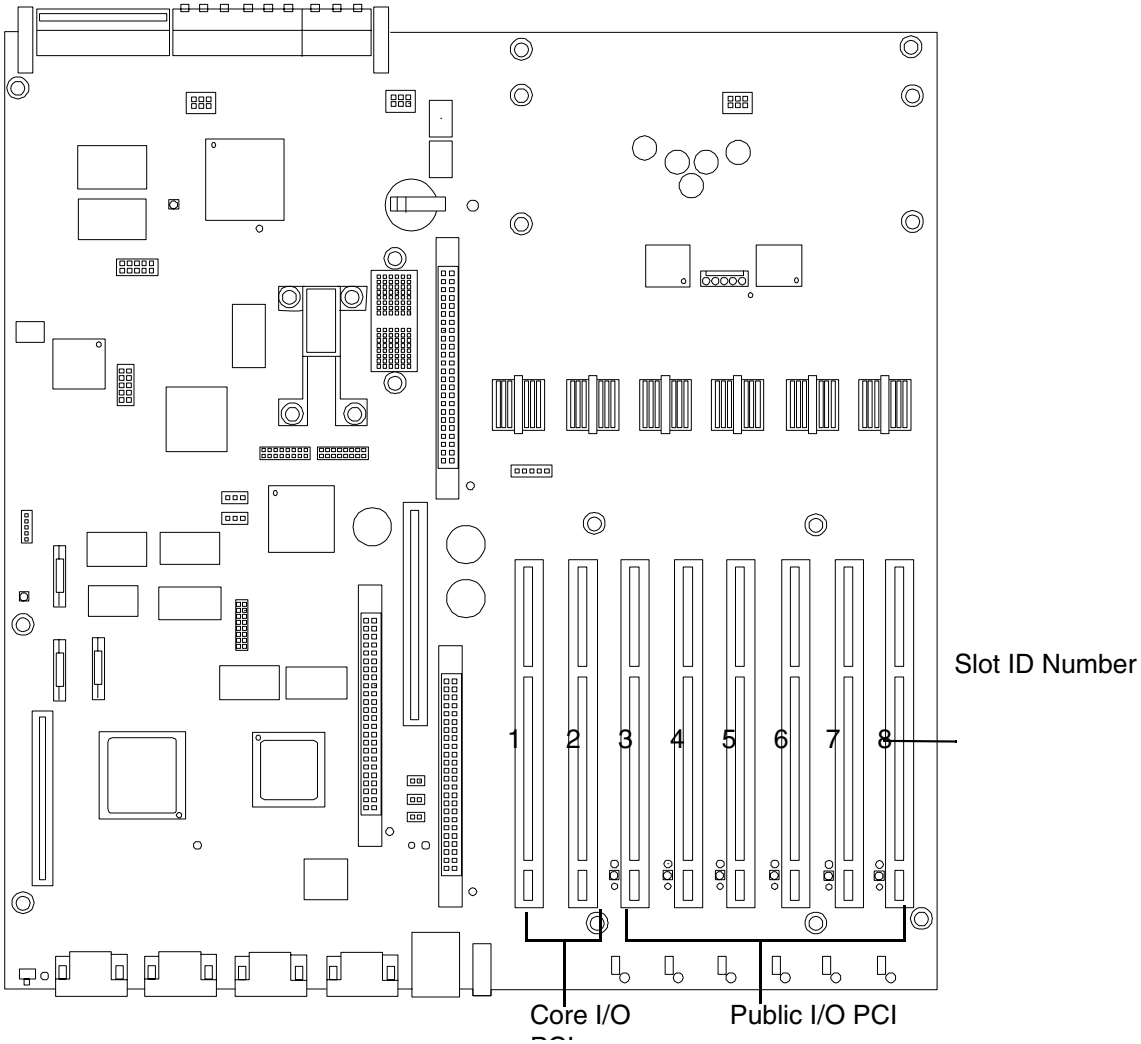
### PCI Slot Locations and Configurations

PCI slots are numbered from 1 through 8 in your HP server (Figure 2-1). The dedicated core I/O card slots are slots 1 and 2.

The following describes configuration requirements for slots 1 and 2:

- PCI slot 1 is dedicated for use by a SCSI host bus adapter (HBA) card. Slot 1 is not hot-plug capable. Additional PCI expansion cards may not be placed in slot 1.
- PCI slot 2 is dedicated for use by a LAN card. Slot 2 is not hot-plug capable. You may not place additional PCI expansion cards in slot 2.

**Figure 2-1 Slot ID Numbering**




### Removing the LAN Core I/O Card

To remove the LAN core I/O card in slot 2, perform the following steps:

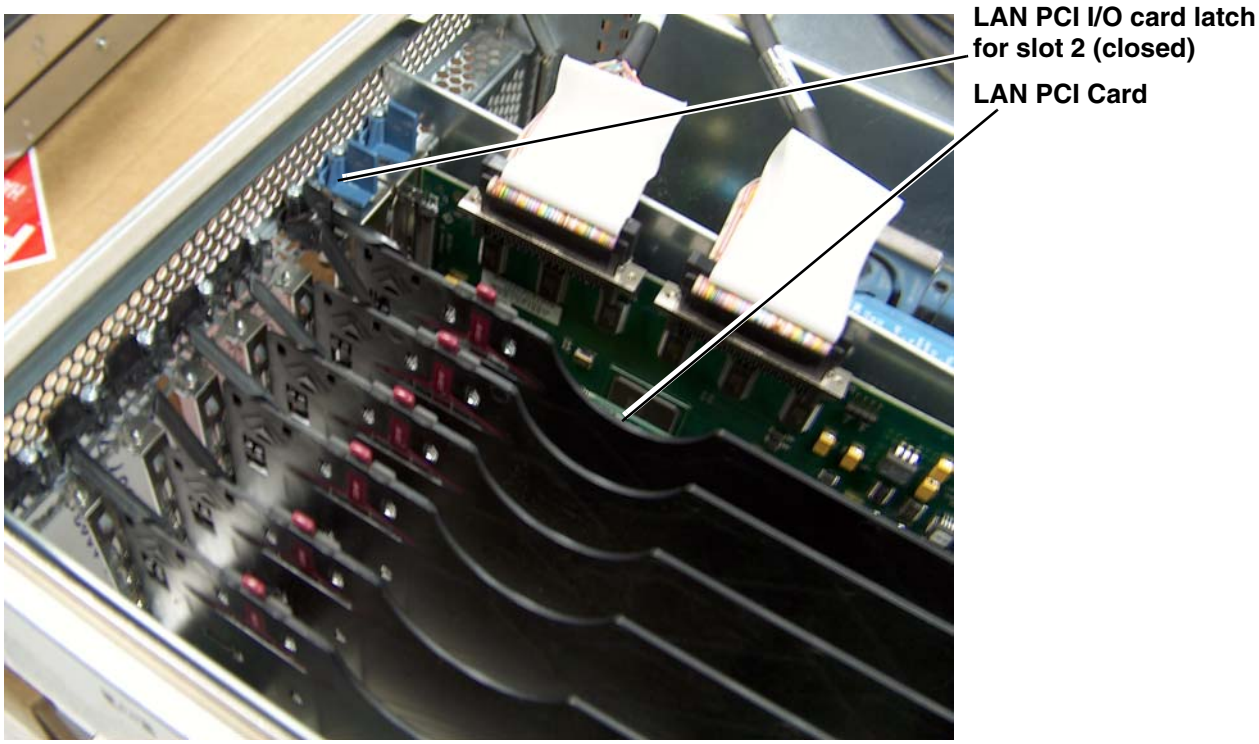
**Step 1.** If rack mounted, slide the HP server out from the rack until it stops. (See “Extend the Server from the Rack” on page 18.)

**Step 2.** Remove the top cover from the chassis. (See “Removing the Top Cover” on page 23.)

**Step 3.** Disconnect any LAN cables connected to the LAN core I/O card.

**Step 4.** Open the blue PCI card latch for slot 2 by twisting it clockwise.

**Figure 2-2 LAN Core I/O Card Latch Location**



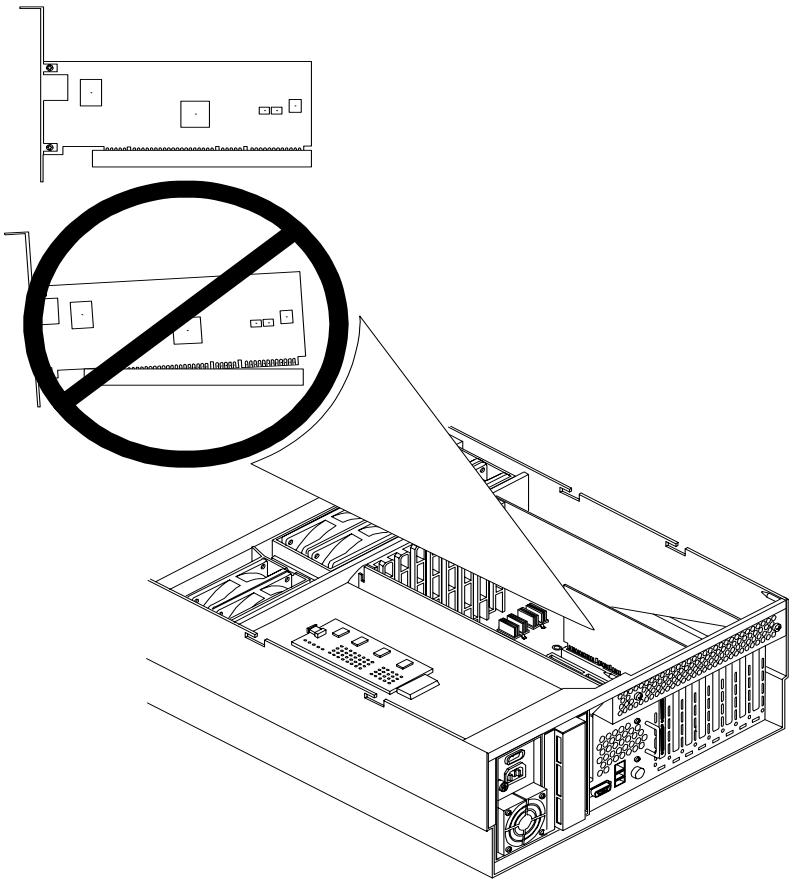

**Step 5.** Remove LAN Core I/O card.

**Step 6.** Replace the LAN core I/O card.

**CAUTION** Always handle I/O cards by their edges. Failure to comply with this precaution may result in damage to the card.

Ensure that you fully seat the card into the slot or the card may be damaged when power is re-applied to the slot.

**Figure 2-3 Inserting LAN I/O Card**



**Step 7.** Close the blue PCI card latch for slot 2 by twisting it counter-clockwise.

**Step 8.** Reconnect the LAN cable(s) to the LAN core I/O card.

**Step 9.** Replace the top cover. (See “Replacing the Top Cover” on page 25.)

**Step 10.** Push the HP server back into the rack until it stops.

## Remove and Replace the SCSI Core I/O Card

The HP 9000 server has two I/O card slots that are dedicated for core I/O cards.

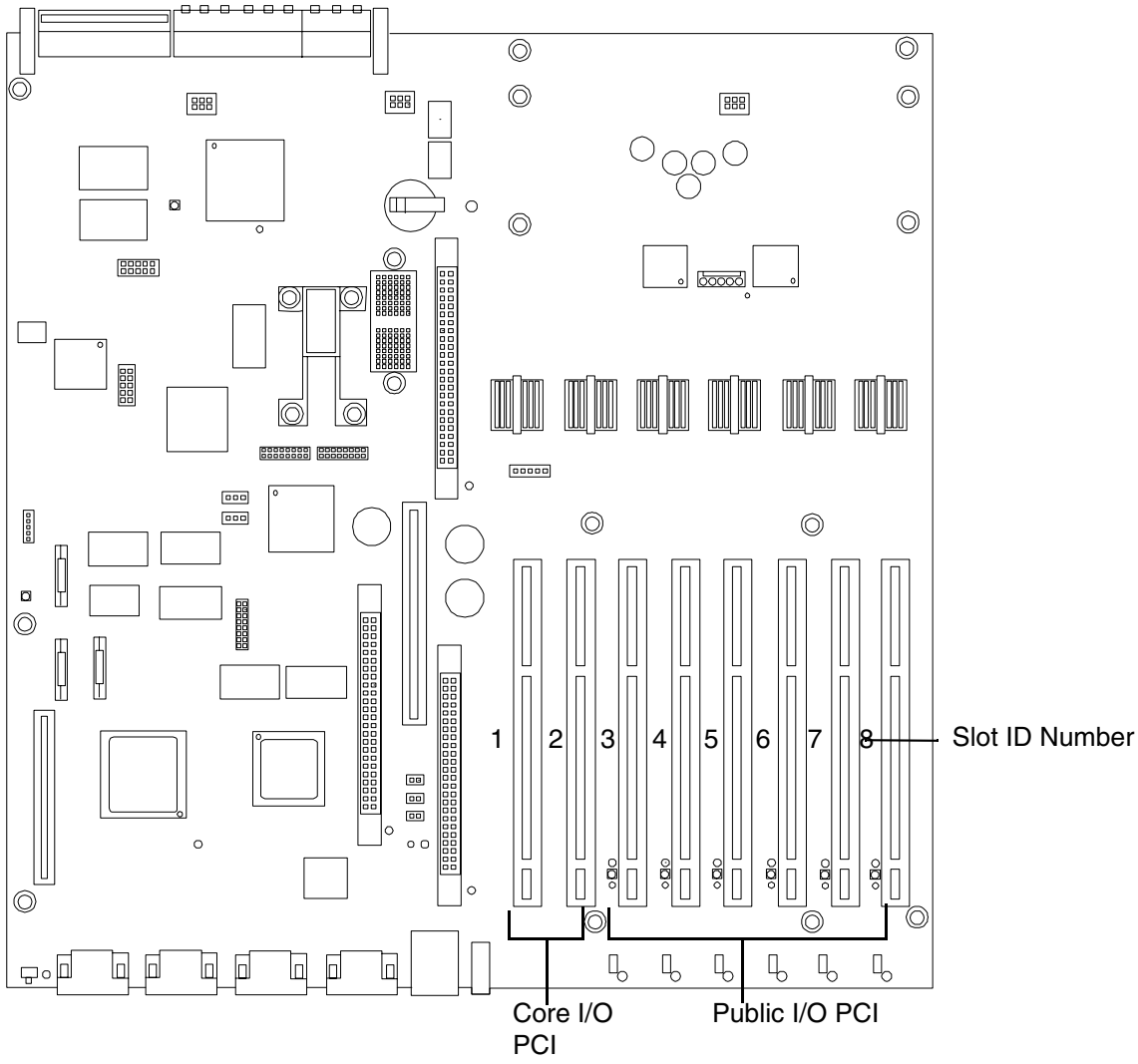
### PCI Slot Locations and Configurations

PCI slots are numbered from 1 through 8 in your HP server (Figure 2-4). The dedicated core I/O card slots are slots 1 and 2.

The following describes configuration requirements for slots 1 and 2:

- PCI slot 1 is dedicated for use by a SCSI host bus adapter (HBA) card. Slot 1 is not hot-plug capable. Additional PCI expansion cards may not be placed in slot 1.
- PCI slot 2 is dedicated for use a LAN card. Slot 2 is not hot-plug capable. Additional PCI expansion cards may not be placed in slot 2.

**Figure 2-4 Slot ID Numbering**




### Removing the SCSI Core I/O Card

To remove the SCSI core I/O card in slot 1, perform the following steps:

**Step 1.** If rack mounted, slide the HP server out from the rack until it stops. (See “Accessing a Rack Mounted Server” on page 18.)

**Step 2.** Remove the top cover from the chassis. (See “Replacing the Top Cover” on page 25.)

**Step 3.** Disconnect any internal and external SCSI cables connected to the SCSI core I/O card.

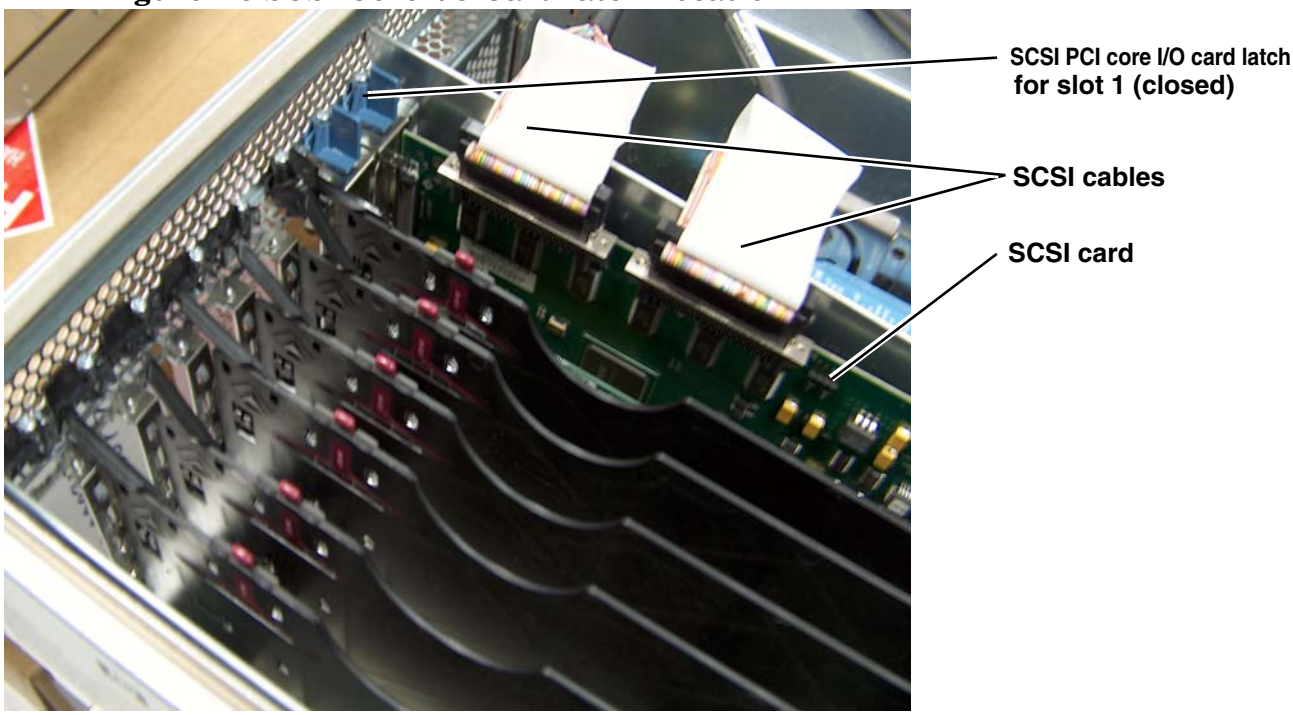
---

**IMPORTANT** Before disconnecting cables, note the cable configuration. Cables must be attached to the correct connectors to ensure proper functionality.

---

**Step 4.** Open the blue PCI card latch for slot 1 by twisting it clockwise.

**Figure 2-5 SCSI Core I/O Card latch Location**



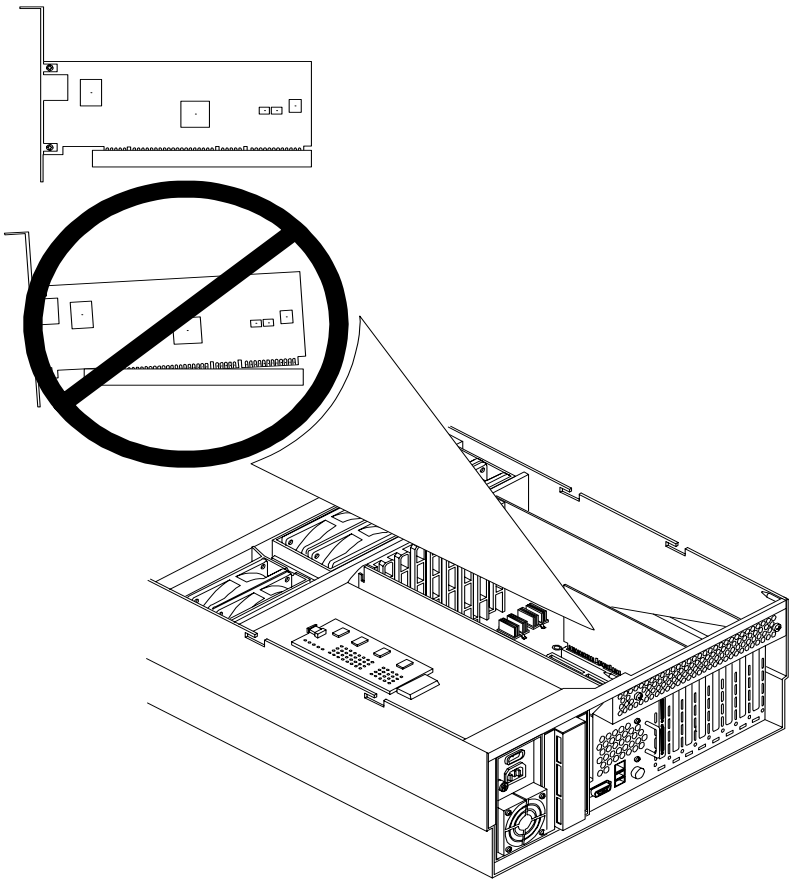

**Step 5.** Remove SCSI core I/O card.

**Step 6.** Replace the SCSI core I/O card.

**CAUTION** Always handle I/O cards by their edges. Failure to comply with this precaution may result in damage to the card.

Ensure that you fully seat the card into the slot or the card may be damaged when power is re-applied to the slot.

**Figure 2-6 Inserting SCSI Core I/O Card**



**Step 7.** Close the blue PCI card latch for slot 1 by twisting it counter-clockwise.

**Step 8.** Reconnect the internal and external SCSI cable(s) to the SCSI core I/O card. Be sure to attach cables to their original connectors.

**Step 9.** Replace the top cover.

**Step 10.** Push the HP server back into the rack until it stops.

## Verification of Upgrade Installation

After completing the upgrade, verify that the sever is ready for operation as follows:

**Step 1.** Reconnect AC power to rear panel connectors.

**Step 2.** Press the front panel power switch to power on the server.

**Step 3.** Wait for completion of the power-on-self-test. Verify that no errors have been detected. If the server fails to power up, check that all processor assembly connectors are correctly seated/connected. (Perform the processor removal and installation procedures in Chapter 1 of this guide to verify processor installation.)

**Step 4.** At the BCH Main Menu, enter **`In PR`** command. Verify that all newly installed processors are recognized and are responding correctly.

---

**NOTE** This example was taken from a 2-way server. The CPU slot and number of logical CPUs information shows one dual-processor module in slot 0.

---

```
PROCESSOR MODULE INFORMATION

                      HVERSION    SVERSION                  Processor
Processor    Speed      Model     Model/Op    CVERSION        State
---------   -------   ---------   ---------   ---------   --------------
    0       1000 MHZ  0x00894      0x0000     3.1        Active
    1       1000 MHZ  0x00894      0x0000     3.1        Idle


Central Bus Speed (in MHZ)   :        200
Software ID (dec)            : 4472419272672358322
Software ID (hex)            : 0x3e1139a1f23f2fb2
Software Capability          : 0x0100
```

**Step 5.** At the BCH Main Menu, enter the **`In CA`** command. Verify that the cache size is correct for all newly installed processors.

```
CACHE INFORMATION

 Processor    Instruction Cache Size    Data Cache Size
-----------   ----------------------   ----------------
     0               67108864                67108864
     1               67108864                67108864
```

**Step 6.** At the BCH Main Menu, enter the **`in io`** command; and verify that the core I/O slots report correctly.

```
IN IO OUTPUT
============
PCI DEVICE INFORMATION
                                Path                Vendor  Device Bus Slot
Description                     (dec)                  Id      Id   #    #
-----------                     -----               ------  ------ --- ----

SCSI bus cntlr                  0/1/1/0             0x1000  0x21    32   1  <-U160 SCSI
SCSI bus cntlr                  0/1/1/1             0x1000  0x21    32   1  <-U160 SCSI
SCSI bus cntlr                  0/1/1/0             0x1000  0x30    32   1  <-U320 SCSI
SCSI bus cntlr                  0/1/1/1             0x1000  0x30    32   1  <-U320 SCSI

Ethernet cntlr                  0/1/2/0             0x14e4  0x1645  32   2  <-1p LAN
Ethernet cntlr                  0/1/2/0             0x8086  0x1079  32   2  <-2p LAN
Ethernet cntlr                  0/1/2/1             0x8086  0x1079  32   2  <-2p LAN


MAPPER OUTPUT
=============
I/O Configuration:
                                                    Type  HW    SW    Revisions
Path       Component Name                           ID    Model Model Hdwr  Firm
---------- ---------------------------------------- ----- ----- ----- ----- -----
0/1/1/0    Symbios SCSI Ultra160 LVD HBA            1000H 0021H 103CH 1340H 01H   <-U160 SCSI
0/1/1/1    Symbios SCSI Ultra160 LVD HBA            1000H 0021H 103CH 1340H 01H   <-U160 SCSI
0/1/1/0    HP A7173A 2 Port Ultra320 SCSI HBA       1000H 0030H 103CH 12C5H 08H   <-U320 SCSI
0/1/1/1    HP A7173A 2 Port Ultra320 SCSI HBA       1000H 0030H 103CH 12C5H 08H   <-U320 SCSI

0/1/2/0    Ethernet Controller                      14E4H 1645H 103CH 128AH 15H   <-1p LAN
0/1/2/0    Ethernet Controller                      8086H 1079H 103CH 12CFH 03H   <-2p LAN
0/1/2/1    Ethernet Controller                      8086H 1079H 103CH 12CFH 03H   <-2p LAN
```

**Step 7.** Initiate the OS. Check for error messages.

**Step 8.** Check the System Event Log for erroneous system events.

# 3 HP 9000 rp4410 1-way Server to HP 9000 rp4410 2-way Server Upgrade Procedure

## Processor Upgrade Procedure

To upgrade your HP 9000 rp4410 1-way server to an HP 9000 rp4410 2-way server you need Processor Upgrade Kit AB524A (for 800 MHz systems) or Processor Upgrade Kit AB525A (for 1 GHz systems). This kit contains the following:

- Read me first
- Upgrade request form
- System upgrade license certificate
- License number label
- Documentation CD

### Preparation

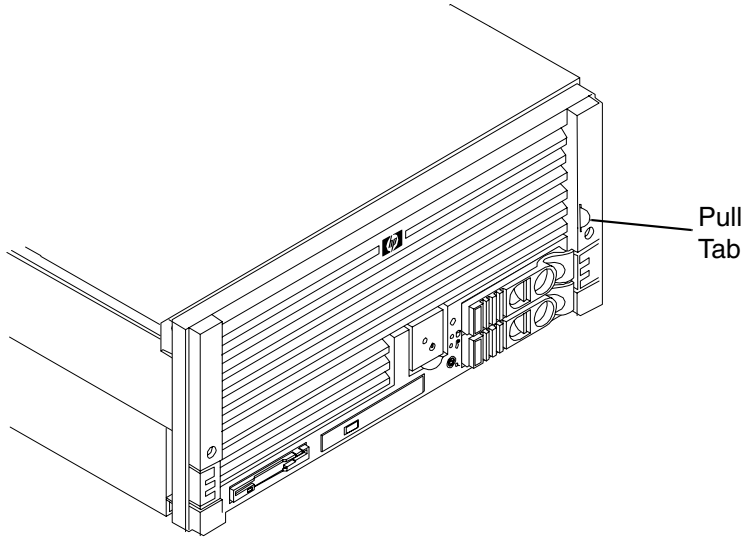
You must complete the following preparations one to three days before the upgrade is to take place. This procedure requires that information is obtained from HP.

**Step 1.** Verify the contents of the upgrade kit with the packing list. Resolve any discrepancies before continuing.

**Step 2.** Locate the system serial number and copy it onto the key request form provided in your upgrade kit. The system serial number can be found in two places:

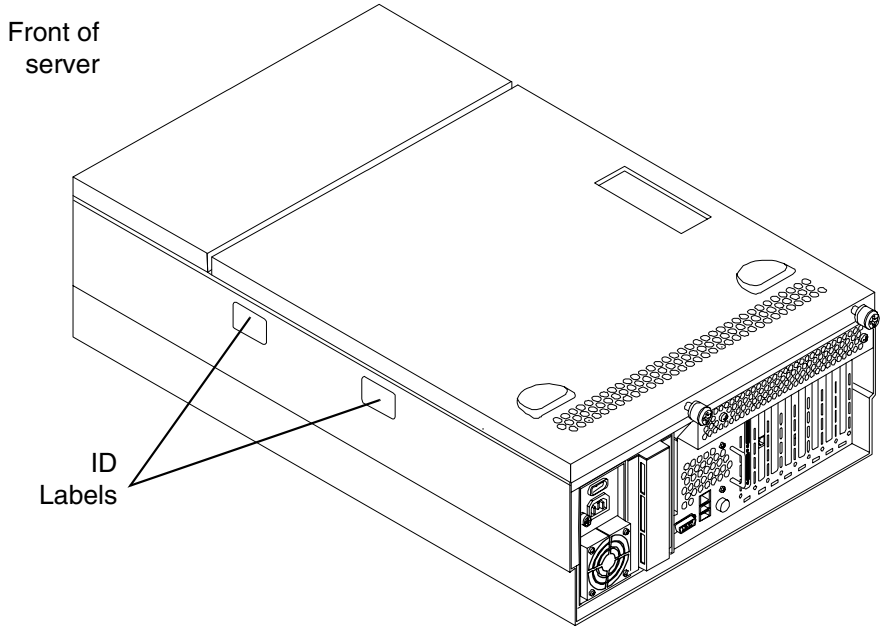
- On the right of the front bezel, locate the removable pull tab. A label containing the system serial number is on the reverse side of the pull tab.

**Figure 3-1 HP 9000 rp4410 Server Pull Tab Location**




- On the right side of the chassis, as you face the server, locate a label containing the system serial number.

**Figure 3-2 HP 9000 rp4410 Server ID Labels**




**Step 3.** Follow the instructions on your system upgrade license certificate to obtain your upgrade key number.

Contact HP through the Web at: http://licensing.hp.com/welcome.slm. You can fill out the key request form online. (Alternatively, you can fax the key request form to HP. Fax instructions are provided on the system upgrade license certificate.)

**Figure 3-3 Sample HP rp44xx Upgrade 1-2—Way System Upgrade License Certificate for 800 MHz System**

# HP rp44xx Upgrade 1-2way System Upgrade License Certificate

With this certificate Hewlett-Packard provides the customer with the ability to obtain a License File that allows the software to run.
Rights and restrictions on the use, transfer and copying of the software are set forth in the Hewlett-Packard Company's Software License Terms Agreement.

| | | | |
|---|---|---|---|
| HP Order Number | TEST-STRMPK-CL093004 | | |
| License Number | 3HAAHCDCCA3Y | Product Number | AB524A |
| | | Model Number | rp4410 / rp4440 |
| Product Description | 2nd CPU Activation for 800MHz rp44xx | | |

Hewlett-Packard World Wide Licensing Services:

To redeem your license key ON-LINE, 24H a day, 7 days a week :

http://licensing.hp.com

Hewlett-Packard Company
HP Licensing Services North America
Phone: +1(650) 960-5111
or (800) 538-1733
Fax: +1(650) 960-5670
or (800) 541-2633
E-mail: hplicense.na@hp.com
Business hours: Monday to Friday
6:00am - 4:30pm PST

Hewlett-Packard Ireland
HP Licensing Services Ireland
Phone: +353 (0)91 75 40 06
Fax: +353 (0)91 70 10 02
E-mail: codeword_europe@hp.com
Business hours:Monday to Friday
8.30am - 5.30pm GMT

Hewlett-Packard Japan
HP Licensing Services Japan
Phone: 0120.42.1231 (Inside Japan)
or 0426.48.9310 (Inside Japan)
or +81.426.48.9312 (Outside Japan)
Fax: 0120.52.1231 (Inside Japan)
or +81.426.39.4983 (Outside Japan)
E-mail: sw_codeword@hp.com
Business hours: Monday to Friday
9:00am - 5:30pm GMT+9

| If faxing from ... | Dial: | If faxing from ... | Dial: |
|---|---|---|---|
| Belgium | 080019135 | Norway | 80011232 |
| Denmark | 80010935 | Spain | 900973321 |
| Finland | 980013331 | Sweden | 020792141 |
| Germany | 08001819813 | Switzerland | 0800553608 |
| India, Vietnam | +81.426.39.4983* | United Kingdom | 0800897936 |
| Indonesia | 803.81.0209 | All other European countries | +33 476142515* |
| Italy | 800 875165 | All other Asia Pacific countries | +800.2025.1231 |
| Netherlands | 0800229350 | All other countries | +1 6509605670* |
| | | (* non-toll-free numbers) | |

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TEST-STRMPK-CL093004

AB524-96001

**Figure 3-4 Sample HP rp44xx Upgrade 1-2 Way—System Upgrade License Certificate for 1 GHz System**

# HP rp44xx Upgrade 1-2way System Upgrade License Certificate

With this certificate Hewlett-Packard provides the customer with the ability to obtain a License File that allows the software to run.
Rights and restrictions on the use, transfer and copying of the software are set forth in the Hewlett-Packard Company's Software License Terms Agreement.

| | | | |
|---|---|---|---|
| HP Order Number | TEST-STRMPK-CL093004 | | |
| License Number | 37C3HCDC2ADY | Product Number | AB525A |
| | | Model Number | rp4410 / rp4440 |
| Product Description | 2nd CPU Activation for 1GHz rp44xx | | |

Hewlett-Packard World Wide Licensing Services:

To redeem your license key ON-LINE, 24H a day, 7 days a week :

http://licensing.hp.com

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HP Licensing Services North America
Phone: +1(650) 960-5111
or (800) 538-1733
Fax: +1(650) 960-5670
or (800) 541-2633
E-mail: hplicense.na@hp.com
Business hours: Monday to Friday
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Hewlett-Packard Ireland
HP Licensing Services Ireland
Phone: +353 (0)91 75 40 06
Fax: +353 (0)91 70 10 02
E-mail: codeword_europe@hp.com
Business hours:Monday to Friday
8.30am - 5.30pm GMT

Hewlett-Packard Japan
HP Licensing Services Japan
Phone: 0120.42.1231 (Inside Japan)
or 0426.48.9310 (Inside Japan)
or +81.426.48.9312 (Outside Japan)
Fax: 0120.52.1231 (Inside Japan)
or +81.426.39.4983 (Outside Japan)
E-mail: sw_codeword@hp.com
Business hours: Monday to Friday
9:00am - 5:30pm GMT+9

| If faxing from ... | Dial: | If faxing from ... | Dial: |
|---|---|---|---|
| Belgium | 080019135 | Norway | 80011232 |
| Denmark | 80010935 | Spain | 900973321 |
| Finland | 980013331 | Sweden | 020792141 |
| Germany | 08001819813 | Switzerland | 0800553608 |
| India, Vietnam | +81.426.39.4983* | United Kingdom | 0800897936 |
| Indonesia | 803.81.0209 | All other European countries | +33 476142515* |
| Italy | 800 875165 | All other Asia Pacific countries | +800.2025.1231 |
| Netherlands | 0800229350 | All other countries | +1 6509605670* |
| | | (* non-toll-free numbers) | |

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TEST-STRMPK-CL093004

AB525-96001

**Figure 3-5 Sample HP rp44xx Upgrade 1-2 Way—Key Request Form for 800 MHz System**

# HP rp44xx Upgrade 1-2way Key Request Form

HP Order Number TEST-STRMPK-CL093004

License Number 3HAAHCDCCA3Y Country

To have your key generated, you will need to provide the serial number of the system to be upgraded. Please, provide this information below:

System Serial number

Please complete clearly in capital letters

Company Name

Contact Name

Country Code Area Code Local Number

Phone Number

Please choose the way you wish to receive your codeword:

☐ Fax Number

☐ E-mail Address

Date and Signature _____

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TEST-STRMPK-CL093004

AB524-96001

**Figure 3-6 Sample HP rp44xx Upgrade 1-2 Way—Key Request Form for 1 GHz System**

# HP rp44xx Upgrade 1-2way Key Request Form

HP Order Number: TEST-STRMPK-CL093004

License Number: 37C3HCDC2ADY  Country:

To have your key generated, you will need to provide the serial number of the system to be upgraded. Please, provide this information below:

System Serial number:

Please complete clearly in capital letters

Company Name:

Contact Name:

Phone Number: Country Code  Area Code  Local Number

Please choose the way you wish to receive your codeword:

☐ Fax Number

☐ E-mail Address

Date and Signature _____

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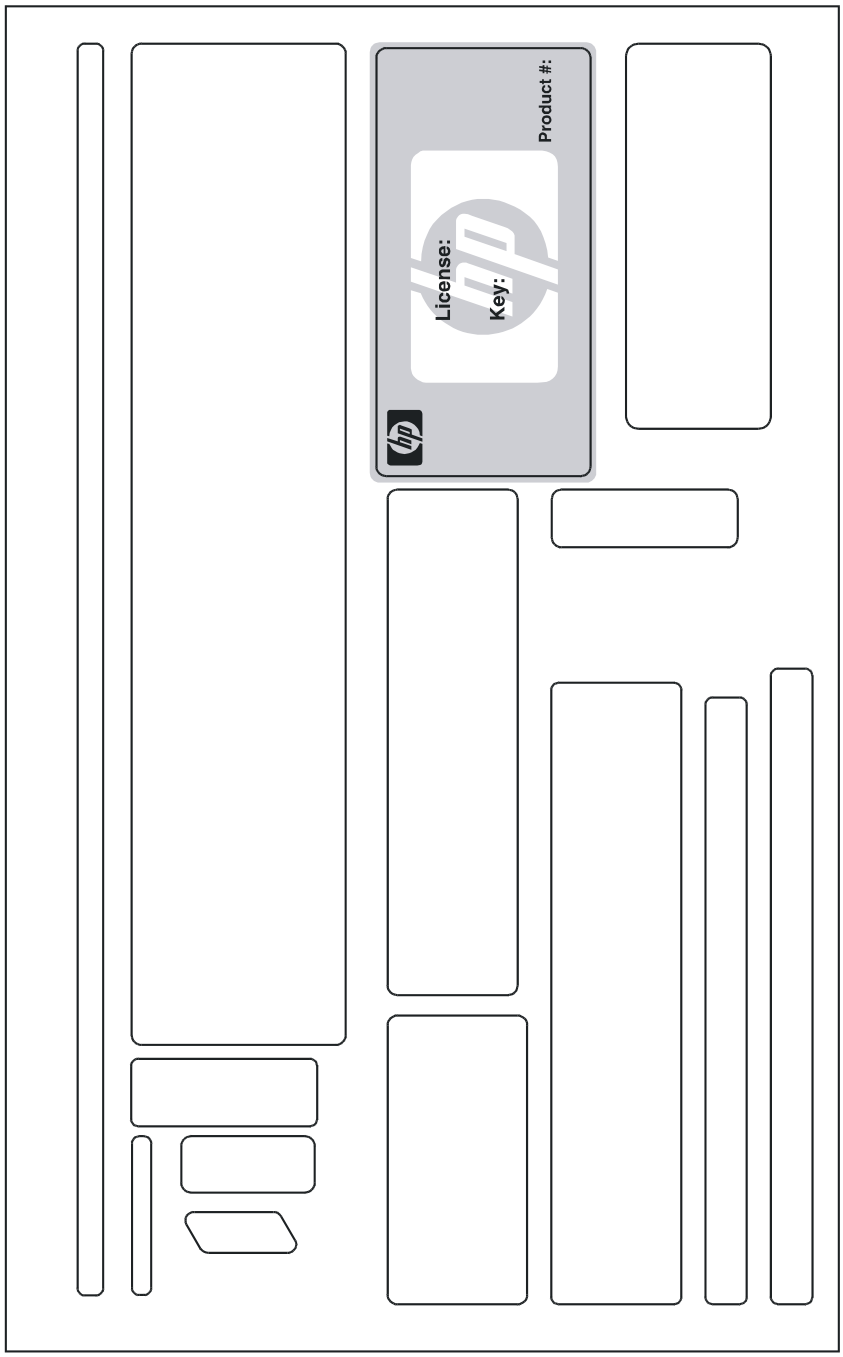
TEST-STRMPK-CL093004

AB525-96001

**Step 4.** Your upgrade kit comes with a set of labels. Copy the key number and the license number onto the system upgrade label. Take upper and lower case sensitivity into account when entering the key number. An example of the label set is shown:

**Figure 3-7 Upgrade Label Set**




You are now ready to begin with the system upgrade.

# Detailed Upgrade Procedure

## Upgrade Procedure Overview

1. Back up the system.
2. Shut the system down.
3. Enter the `upgrade` command.
4. Verify the upgrade.
5. Apply the labels.
6. Boot the server.

## Upgrade Procedure

**Step 1.** Perform a full system backup.

**Step 2.** Shut down and reboot the operating system. Example:

```
shutdown -r 0
```

---

**NOTE** If AUTOBOOT is enabled, the server displays a message indicating:

```
Autoboot enabled, Hit any key within 10 seconds to interrupt the
boot process
```

---

**Step 3.** Interrupt the boot process.

**Step 4.** From the firmware Main Menu, choose the Service Menu. Example:

```
Main Menu: Enter command or menu > service


---- Service Menu ------------------------------------------------------------


     Command                          Description

     -------                          -----------

     CLEARPIM                         Clear (zero) the contents of PIM

     SCSI [option] [<path>] [<val>]   Display or set SCSI controller values

     MemRead <address> [<len>]        Read memory and I/O locations

     PDT [CLEAR]                      Display or clear the PDT

     PIM [<proc>] [HPMC|LPMC|TOC]     Display PIM information

     ProductNum <O|C> [<number>]      Display or set Product Number

     ScRoll [ON|OFF]                  Display or change scrolling ability

     SELftests [ON|OFF]               Enable/disable self test execution
```

```
BOot [PRI|ALT|<path>]            Boot from specified path

DIsplay                          Redisplay the current menu

HElp [<command>]                 Display help for specified command

RESET                            Restart the system

MAin                             Return to Main Menu
```

**Step 5.** Enter **upgrade**. The server responds with a message indicating that this command performs an rp4410-1 way to rp4410-2 way model upgrade and that the server must be reset following the operation. Enter **Y** (yes) to continue. The server prompts you to enter the key number. Enter the key number that you copied onto the system upgrade label. Take upper and lower case sensitivity into account when entering the key number. Example:

```
Service Menu: Enter command > upgrade

System serial number:  USS3915004

Enter key from key certificate for this serial number: 3B567636ACDD


Current system:   9000/800/rp4410#1 PA8900 DC- core

Upgraded system:  9000/800/rp4410 PA8900 DC- Max 4 Core


Do you wish to continue with this change? [y/n]: Y


You must restart the system to complete this change.
```

**NOTE** The `upgrade` command is a hidden command. It will not appear in response to the `ls` (list commands) command in the firmware menus.

**Step 6.** If the key number is accepted, the server displays a message indicating the upgrade was successful and that the system must be reset for the change to take place. If the key was **not** accepted, the server displays a message indicating the key is invalid. Retry the `upgrade` command and re-enter the key value. Check for case sensitivity. If still unsuccessful, contact your HP representative.

**Step 7.** Enter the command `rs` to reset the server. If AUTOBOOT is enabled, the server displays a message: `Autoboot enabled, Hit any key within 10 seconds to interrupt the boot process`. Interrupt the boot process. Example:

```
CM> rs
```

**NOTE** This step must be done for the upgrade to take effect.

**Step 8.** Verify the upgrade. From the server Main Menu, type: **`in pr`**.

Examine the model string value. It should be *9000/800/rp4410*.

Example:

```
Main Menu: Enter command or menu > in pr

Model: hp server . (model string 9000/800/rp4410)

PROCESSOR INFORMATION


                      HVERSION  SVERSION              Processor
  Processor   Speed     Model    Model/Op  CVERSION      State
  ---------  --------  --------  --------  --------  -------------
      0      800  MHz   0x0899    0x0491   3.0      Active
      1      800  MHz   0x0899    0x0491   3.0      Idle
Central Bus Speed (in MHz)  :        200
  Software ID (dec)           : 4471560586272672004
  Software ID (hex)           : 0x3e0e2ca9706b8904
  Software Capability         : 0x01f0
```

**Step 9.** Apply the label that contains the license and key numbers on the reverse side of the pull tab.

---

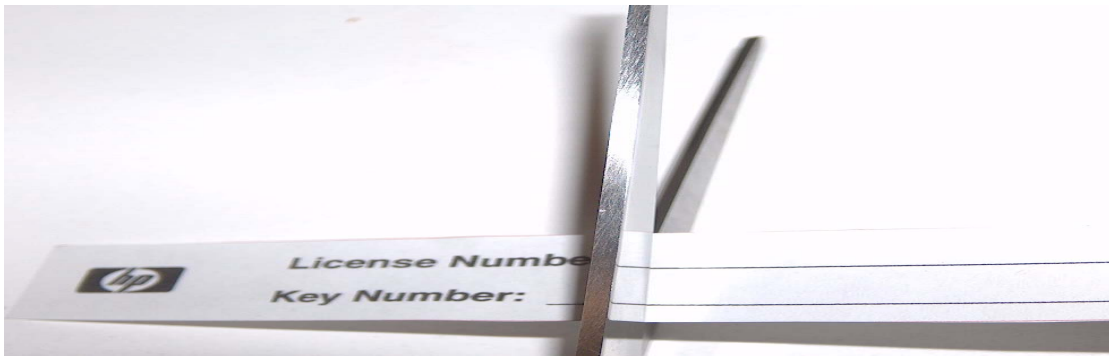
**NOTE** If a license and key numbers label has already been placed on the pull tab, follow the steps below to install a second label.

---

**Figure 3-8 Existing Upgrade Label on Pull Tab**

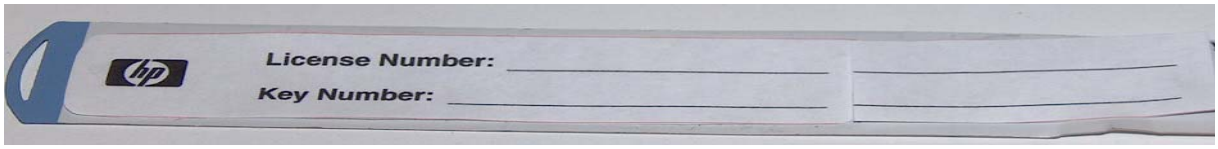

**Step 10.** Trim the second label so that it fits on the pull tab next to the existing label.

**Figure 3-9 Trim Second Label**




**Step 11.** Apply the second label next to the existing label so both labels are visible and you can see the license and key numbers of both labels.

**Figure 3-10 Apply Second Label Next to Existing Label**




**Step 12.** Return the pull tab to its original position.

**Step 13.** Boot the operating system.

## Downgrade Procedure

If you need to downgrade the recently upgraded firmware, follow this procedure:

**Step 1.** Repeat steps 1-4 of the "Detailed Upgrade Procedure" on page 62 to get to the firmware service menu.

**Step 2.** Enter the command `downgrade`. The server displays a message indicating functionality may be lost and that a system reset is necessary to make the change take effect. Enter **`Y`** (yes) to continue. The server responds with a message indicating the command was successful and that the server must be reset for the change to take effect. Example:

```
Service Menu: Enter command > downgrade

System serial number:  USS3915004

Enter key from key certificate for this serial number: 3B567636ACDD


Current system:   9000/800/rp4410 PA8900 DC- Max 4 Core

Downgraded system:  9000/800/rp4410#1 PA8900 DC- 1 Core



Do you wish to continue with this change? [y/n]: Y


You must restart the system to complete this change.
```

---

**NOTE** The `downgrade` command is a hidden command It does not appear in response to the `ls` (list commands) command in the firmware menus.

---

**Step 3.** Enter the command `rs` to reset the server. If AUTOBOOT is enabled, the server displays a message: `Autoboot enabled, Hit any key within 10 seconds to interrupt the boot process`. Interrupt the boot process. Example:

```
CM> rs
```

---

**NOTE** This step must be done for the downgrade to take effect.

---

**Step 4.** Verify the downgrade. From the server Main Menu, type **`in pr`**.

```
Main Menu: Enter command or menu > in pr


   Model: hp server . (model string 9000/800/rp4410#1 )


PROCESSOR INFORMATION
```

```
                      HVERSION  SVERSION              Processor

Processor    Speed     Model    Model/Op  CVERSION      State

---------  --------  --------  --------  --------  -------------

    0      800  MHz   0x0899    0x0491   3.0       Active

    1      800  MHz   0x0899    0x0491   0.0       Stopped:Deconfigured


Central Bus Speed (in MHz)  :        200

Software ID (dec)           : 4471560586272672004

Software ID (hex)           : 0x3e0e2ca9706b8904

Software Capability         : 0x01f0
```

**Step 5.** Restart the operating system.

# 4 HP 9000 rp4410 Server to HP 9000 rp4440 Server Processor Upgrade Procedure

## Processor Upgrade Procedure

**NOTE** The starting condition for this upgrade is an HP 9000 rp4410 2-way system. If you are upgrading a 1-way system, perform the procedures of “Detailed Upgrade Procedure” on page 62.) (HP 9000 rp4410 1-way Server to HP 9000 rp4410 2-way Server Upgrade Procedure) before performing this upgrade.

To upgrade your rp4410 server to an rp4440 server you need the Server Upgrade Kit AB559A. This kit contains the following:

- Read Me First
- Upgrade Key Request Form
- System Upgrade License Certificate
- License Number Label
- Documentation CD

### Preparation

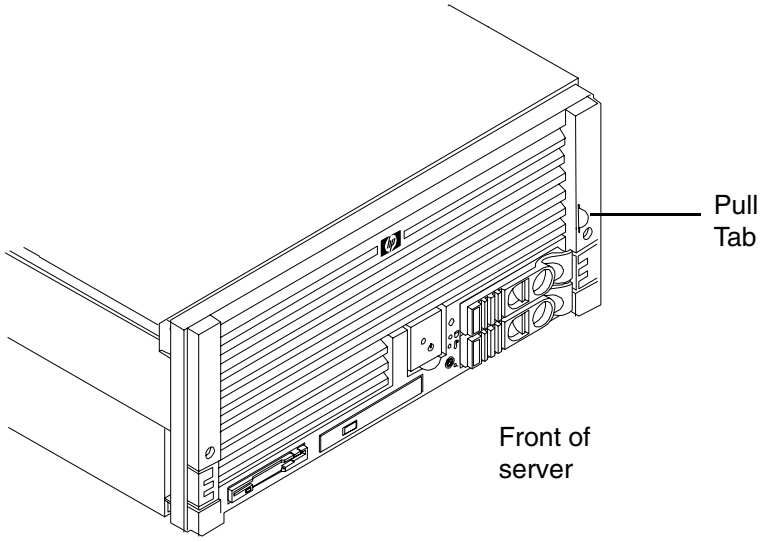
You must complete the following preparations one to three days before the upgrade is to take place. This procedure requires that you obtain information from HP.

**Step 1.** Verify the contents of the upgrade kit with the packing list. Resolve any discrepancies before continuing.

**Step 2.** Locate the system serial number and copy it onto the label provided in your upgrade kit. The system serial number can be found in two places:

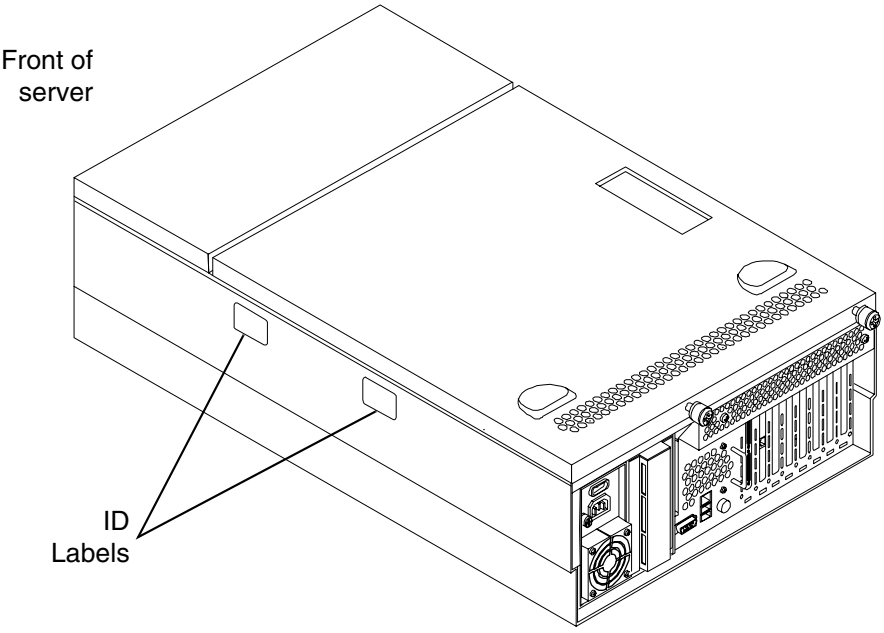
- On the right of the front bezel, locate the removable pull tab. A label containing the system serial number is on the reverse side of the pull tab.

**Figure 4-1 HP 9000 rp4410 Server Pull Tab Location**




- On the right side of the chassis, as you face the server, locate a label containing the system serial number.

**Figure 4-2 HP 9000 rp4410 Server ID Labels**




**Step 3.** Follow the instructions on your system upgrade license certificate to obtain your upgrade key number.

Contact HP through the Web at: http://licensing.hp.com/welcome.slm. Fill out the online key request form. (Alternatively, you can fax the key request form to HP. Fax instructions are provided on the system upgrade license certificate.)

**Figure 4-3 Sample HP rp4410 to rp4440 Upgrade—System License Certificate**

# HP rp4410 to rp4440 Upgrd System Upgrade License Certificate

With this certificate Hewlett-Packard provides the customer with the ability to obtain a License File that allows the software to run.
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| | | | |
|---|---|---|---|
| HP Order Number | TEST-STRMPK-CL093004 | | |
| License Number | DH44HCDCCADY | Product Number | AB559A |
| | | Model Number | rp4440 |
| Product Description | Model rp4410 srvr to rp4440 srvr Upgrade | | |

Hewlett-Packard World Wide Licensing Services:

To redeem your license key ON-LINE, 24H a day, 7 days a week :

http://licensing.hp.com

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HP Licensing Services North America
Phone: +1(650) 960-5111
or (800) 538-1733
Fax: +1(650) 960-5670
or (800) 541-2633
E-mail: hplicense.na@hp.com
Business hours: Monday to Friday
6:00am - 4:30pm PST

Hewlett-Packard Ireland
HP Licensing Services Ireland
Phone: +353 (0)91 75 40 06
Fax: +353 (0)91 70 10 02
E-mail: codeword_europe@hp.com
Business hours:Monday to Friday
8.30am - 5.30pm GMT

Hewlett-Packard Japan
HP Licensing Services Japan
Phone: 0120.42.1231 (Inside Japan)
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or +81.426.48.9312 (Outside Japan)
Fax: 0120.52.1231 (Inside Japan)
or +81.426.39.4983 (Outside Japan)
E-mail: sw_codeword@hp.com
Business hours: Monday to Friday
9:00am - 5:30pm GMT+9

| If faxing from ... | Dial: | If faxing from ... | Dial: |
|---|---|---|---|
| Belgium | 080019135 | Norway | 80011232 |
| Denmark | 80010935 | Spain | 900973321 |
| Finland | 980013331 | Sweden | 020792141 |
| Germany | 08001819813 | Switzerland | 0800553608 |
| India, Vietnam | +81.426.39.4983* | United Kingdom | 0800897936 |
| Indonesia | 803.81.0209 | All other European countries | +33 476142515* |
| Italy | 800 875165 | All other Asia Pacific countries | +800.2025.1231 |
| Netherlands | 0800229350 | All other countries | +1 6509605670* |
| | | (* non-toll-free numbers) | |

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AB559-96001

**Figure 4-4 Sample HP rp4410 to rp4440 Upgrade—Key Request Form**

# HP rp4410 to rp4440 Upgrd Key Request Form

HP Order Number TEST-STRMPK-CL093004

License Number DH44HCDCCADY Country

To have your key generated, you will need to provide the serial number of the system to be upgraded. Please, provide this information below:

System Serial number

Please complete clearly in capital letters

Company Name

Contact Name

Phone Number Country Code Area Code Local Number

Please choose the way you wish to receive your codeword:

☐ Fax Number

☐ E-mail Address

Date and Signature _____

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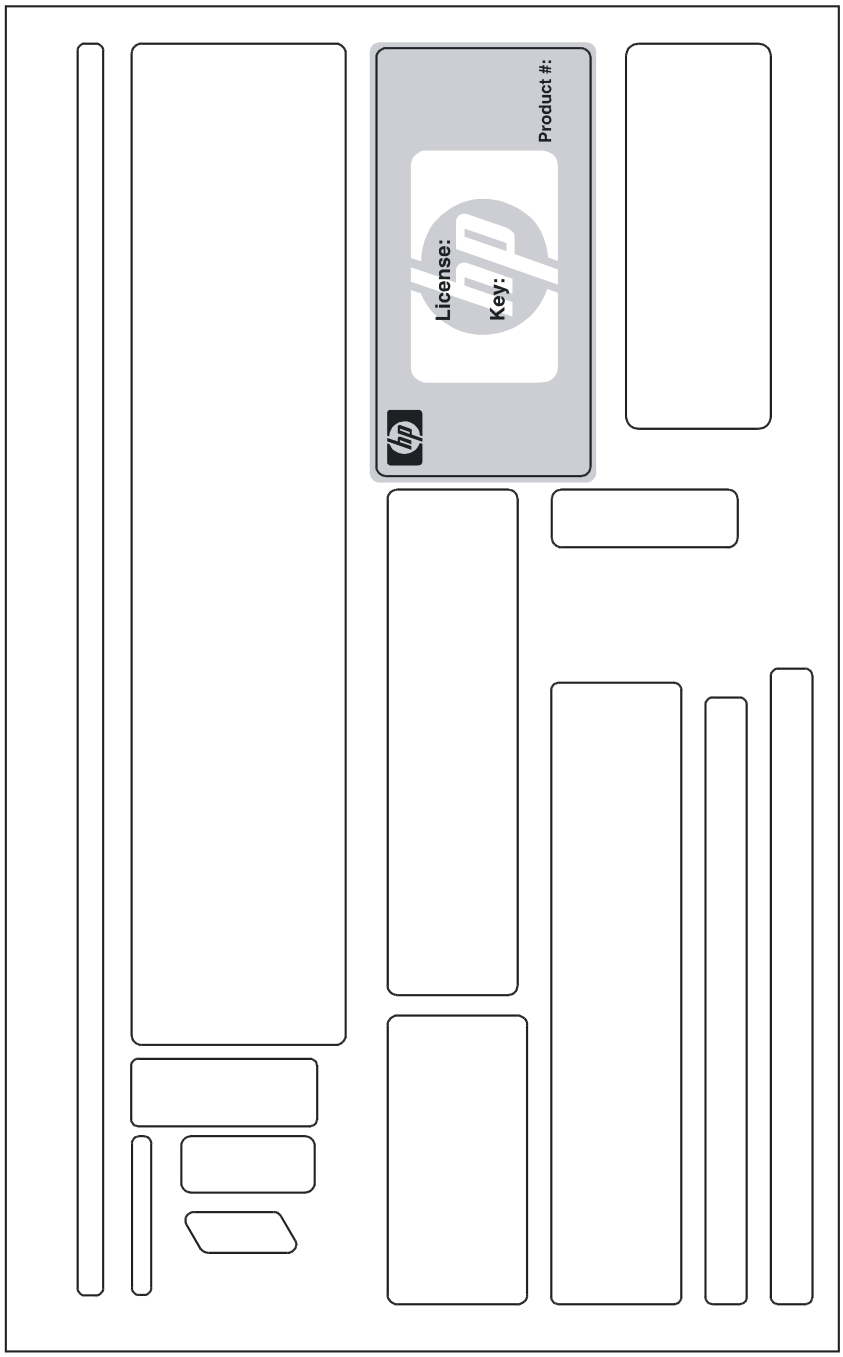
TEST-STRMPK-CL093004

AB559-96001

**Step 4.** Your upgrade kit comes with a set of labels. Copy the key number and the license number onto the system upgrade label. Take upper and lower case sensitivity into account when entering the key number. An example of the label set is shown:

**Figure 4-5 Upgrade Label Set**




You are now ready to begin with the system upgrade.

# Detailed Upgrade Procedure

## Upgrade Procedure Overview

1. Back up the system.
2. Shut the system down.
3. Enter the `upgrade` command.
4. Verify the upgrade.
5. Apply the labels.
6. Install additional components.
7. Boot the server.

## Detailed Upgrade Procedure

**Step 1.** Perform a full system backup.

**Step 2.** Shut down and reboot the operating system. Example:

```
shutdown -r 0
```

---

**NOTE** If AUTOBOOT is enabled, the server displays a message indicating:

```
Autoboot enabled, Hit any key within 10 seconds to interrupt the
boot process
```

---

**Step 3.** Interrupt the boot process.

**Step 4.** From the firmware Main Menu, choose the service menu. Example:

```
Main Menu: Enter command or menu > service


---- Service Menu ------------------------------------------------------------


     Command                          Description

     -------                          -----------

     CLEARPIM                         Clear (zero) the contents of PIM

     SCSI [option] [<path>] [<val>]   Display or set SCSI controller values

     MemRead <address> [<len>]        Read memory and I/O locations

     PDT [CLEAR]                      Display or clear the PDT

     PIM [<proc>] [HPMC|LPMC|TOC]     Display PIM information

     ProductNum <O|C> [<number>]      Display or set Product Number

     ScRoll [ON|OFF]                  Display or change scrolling ability
```

```
SELftests [ON|OFF]                Enable/disable self test execution


BOot [PRI|ALT|<path>]             Boot from specified path

DIsplay                           Redisplay the current menu

HElp [<command>]                  Display help for specified command

RESET                             Restart the system

MAin                              Return to Main Menu
```

**Step 5.** Enter **upgrade**. The server responds with a message indicating that this command performs an rp4410 to rp4440 model upgrade and that the server must be reset following the operation. Enter **Y** (yes) to continue. The server prompts you to enter the key. Enter the key value that you copied onto the system label. Take upper and lower case sensitivity into account when entering the key number. Example:

```
Service Menu: Enter command > upgrade

System serial number:  USS3915004

Enter key from key certificate for this serial number: 3B567636ACDD


Current system:   9000/800/rp4410 PA8900 DC- Max 4 Core

Upgraded system:  9000/800/rp4440 PA8900 DC


Do you wish to continue with this change? [y/n]: Y


You must restart the system to complete this change.
```

**NOTE** The `upgrade` command is a hidden command. It does not appear in response to the `ls` (list commands) command in the firmware menus.

**Step 6.** If the key number is accepted, the server displays a message indicating the upgrade was successful and that the system must be reset for the change to take place. If the key number was **not** accepted, the server displays a message indicating the key was invalid. Retry the `upgrade` command and re-enter the key value. Check for case sensitivity. If still unsuccessful, contact your HP representative.

**Step 7.** Place the second processor into slot 1 on the system board. (See “Installing a Dual Processor Module on a Processor Extender Board” on page 31, and “Installing DIMMs” on page 40.)

**Step 8.** Enter the command `rs` to reset the server. If AUTOBOOT is enabled, the server displays a message: `Autoboot enabled, Hit any key within 10 seconds to interrupt the boot process`. Interrupt the boot process. Example:

```
CM> rs
```

**NOTE** This step must be done for the upgrade to take effect.

Verify the upgrade. From the server Main Menu, type: **in pr**

Examine the model string value. It should be *9000/800/rp4440*.

Example:

```
Main Menu: Enter command or menu > in pr

Model: hp server . (model string 9000/800/rp4440)

PROCESSOR INFORMATION


                      HVERSION  SVERSION              Processor

  Processor   Speed     Model    Model/Op  CVERSION      State

  ---------  --------  --------  --------  --------  -------------

      0      800  MHz   0x0894    0x0491   3.0      Active

      1      800  MHz   0x0894    0x0491   3.0      Idle


 Central Bus Speed (in MHz)  :        200

  Software ID (dec)           : 4471560586272672004

  Software ID (hex)           : 0x3e0e2ca9706b8904

  Software Capability         : 0x01f0
```

**Step 9.** Apply the label containing the system serial number to the reverse side of the pull tab.

**Step 10.** On the front bezel, replace the rp4410 nameplate with the rp4440 nameplate.

**Step 11.** Boot the operating system.

## Downgrade Procedure

If you need to downgrade the recently upgraded server, follow this procedure:

**Step 1.** Repeat steps 1-4 of the Detailed Upgrade Procedure to get to the firmware Service Menu.

**Step 2.** Enter the command `downgrade`. The server displays a message indicating functionality may be lost and that a system reset is necessary to make the change take effect. Enter **`Y`** (yes) to continue. The server responds with a message indicating the command was successful and that the server must be reset for the change to take effect. Example:

```
Service Menu: Enter command > downgrade

System serial number:  USS3915004

Enter key from key certificate for this serial number: 3B567636ACDD


Current system:   9000/800/rp4440 PA8900 DC

Downgraded system:  9000/800/rp4410 PA8900 DC- Max 4Core


Do you wish to continue with this change? [y/n]: Y


You must restart the system to complete this change.
```

---

**NOTE** The `downgrade` command is a hidden command It does not appear in response to the `ls` (list commands) command in the firmware menus.

---

**Step 3.** Remove the additional CPU unit in slot 1 this time. (See “Installing a Dual Processor Module on a Processor Extender Board” on page 31, and “Installing DIMMs” on page 40.)

**Step 4.** Enter the command `rs` to reset the server. If AUTOBOOT is enabled, the server displays a message: `Autoboot enabled, Hit any key within 10 seconds to interrupt the boot process`. Interrupt the boot process. Example:

```
CM> rs
```

---

**NOTE** This step must be done for the downgrade to take effect.

---

**Step 5.** Verify the downgrade. From the server Main Menu, type: `in pr`.

```
Main Menu: Enter command or menu > in pr


   Model: hp server . (model string 9000/800/rp4410)


PROCESSOR INFORMATION
```

```
                        HVERSION  SVERSION              Processor

Processor    Speed       Model    Model/Op  CVERSION      State

---------  --------  --------  --------  --------  -------------

    0      800  MHz   0x0899    0x0491   3.0      Active

    1      800  MHz   0x0899    0x0491   3.0      Idle


Central Bus Speed (in MHz)  :        200

Software ID (dec)           : 4471560586272672004

Software ID (hex)           : 0x3e0e2ca9706b8904

Software Capability         : 0x01f0
```

**Step 6.** Restart the operating system.

# 5 RAID - Smart Array 6402 Card Installation

## Installing the Smart Array 6402 RAID Card

This section provides instructions for installing the HP A9890A PCI-X 2-Channel RAID SA SCSI Controller Card (Smart Array 6402). It also provides instructions for replacing the SCSI backplane/management card (P/N A6961-04075).

**NOTE** If the HP-UX operating system is installed on the embedded drives, you must re-install HP-UX to those drives after installing and configuring the RAID upgrade.

Before installing the Smart Array 6402 card, ensure that the following hardware and software prerequisites are met:

- Check the *RAID-01 HP Smart Array Controller Driver Release Notes* available at http://www.docs.hp.com in the Networking & Communications section for known problems or other information needed for installation.
- Confirm that the Smart Array 6402 controller card and software are supported on the HP Integrity server and I/O slot chosen. Refer to the *Smart Array 6402 Controller Support Matrix* located at http://www.docs.hp.com in the Networking & Communications section for more information.
- Check the HP Integrity server's documentation to determine if additional tools are required for component installation at http://www.docs.hp.com.
- Smart Array 6402 controller card software media is available. It is included on CD or available on the Web through http://www.software.hp.com.
- Confirm that HP-UX super-user privileges are available; they are necessary to complete the installation.
- Confirm that the `/usr/bin`, `/usr/sbin`, and `/sbin` directories are in your PATH by logging in as root and using the `echo $PATH` command.

**NOTE** If you are migrating from the U160 card or the U320 card to the Smart Array card for your core I/O, you need to reinstall the HP-UX 11i v1 or HP-UX 11i v2 operating system.

**CAUTION** Smart Array 6402 cards contain electronic components that can easily be damaged by small amounts of electricity. To avoid damage, follow these guidelines:

- Store cards in their anti-static plastic bags until installation.
- Work in a static-free area.
- Handle cards by the edges only. Do not touch electronic components or electrical traces.
- Use a grounding wrist strap.
- Use a suitable ground—any exposed metal surface on the computer chassis.

## Installing RAID for Simplex Configuration

The RAID card comes pre-configured. You do not have to set any jumpers or connectors.

**NOTE** Do not connect a SCSI cable to an external SCSI port without either disabling the card using OLAR or powering down the system. Adding the SCSI cable by hot-plugging it can cause bus errors, or the card to lock up, and in rare cases, electrical damage.

**Step 1.** Back up data before installing the RAID card.

**Step 2.** Access the core I/O slots. For specific instructions on accessing the core I/O cards, refer to the Remove & Replace section in the *HP 9000 rp4410 and HP 9000 rp4440 Maintenance Guide*. These instructions show you how to open any access panels and covers giving you access to the internal SCSI cabling and the core I/O slots.

**a.** Wait for the system to shut down completely, power off the system, and unplug the power cord.

**b.** Disconnect cable(s) from the SCSI core I/O card in slot 1.

**c.** Remove the SCSI core I/O card from slot 1.

**Step 3.** Install the HP A9890A PCI-X 2-Channel RAID SA SCSI Controller (Smart Array 6402) Card in slot 1.

**Figure 5-1 Inserting the Smart Array 6402 RAID Card**

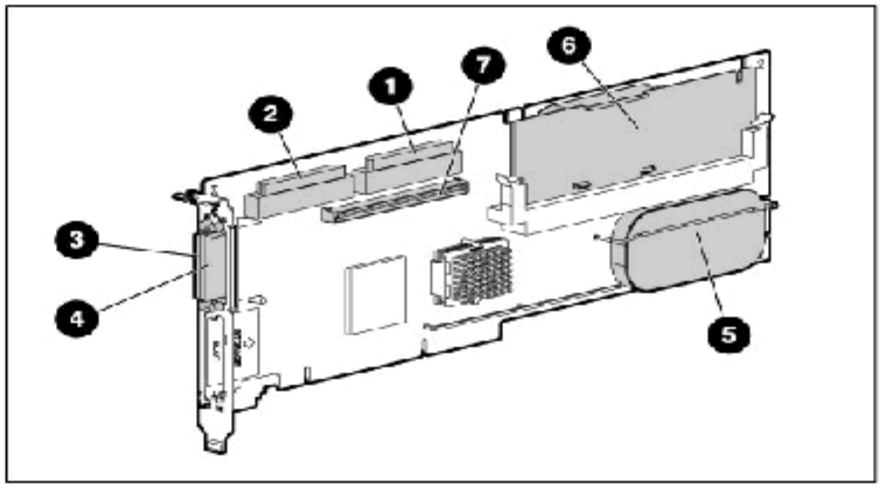



**Table 5-1 RAID Card Components**

| Item ID | Description |
|---|---|
| 1 | Internal SCSI connector, port A1 |
| 2 | Internal SCSI connector, port A2 |
| 3 | External SCSI connector, port A1 |

**Table 5-1 RAID Card Components (Continued)**

| Item ID | Description |
|---|---|
| 4 | External SCSI connector, port A2 |
| 5 | Controller battery |
| 6 | Battery-backed cache module |
| 7 | Connector for expansion board |

**a.** Slide the RAID card edge-connector into slot 1 until it is fully seated.

**b.** Secure the latches.

**Step 4.** Connect SCSI cable A to the internal connector A1 on the RAID card.

**NOTE** Do not connect cable B. External connector A2 is available for external connections.

**Step 5.** Disconnect the cables from the SCSI backplane assembly.

**Step 6.** Remove the SCSI backplane assembly.

**Step 7.** Install new SCSI backplane assembly (P/N A6961-04075).

To remove and replace the SCSI backplane assembly, refer to the Accessing the SCSI Backplane Board section in the *HP 9000 rp4410 and HP 9000 rp4440 Maintenance Guide*.

**Step 8.** Connect SCSI cable A to the SCSI backplane assembly.

**Step 9.** Replace cover, power up, and verify the RAID install.

**a.** At the BCH prompt, enter **`in io`**. The following output displays.

"in io" output

```
I/O MODULE INFORMATION

                        Path   Slot                              IODC
Type                    (dec)  Number    HVERSION  SVERSION  Vers
----                    -----  ------    --------  --------  ----
System bus adapter      0                0x8800    0xc10     0x0
Local bus adapter       0/0    0         0x7830    0xa00     0x0
Local bus adapter       0/1    2         0x7830    0xa00     0x0
Local bus adapter       0/2    7         0x7830    0xa00     0x0
Local bus adapter       0/4    4         0x7830    0xa00     0x0
Local bus adapter       0/5    6         0x7830    0xa00     0x0
Local bus adapter       0/6    8         0x7830    0xa00     0x0

PCI DEVICE INFORMATION
                         Path                 Vendor  Device Bus
Slot
Description              (dec)                   Id      Id   #
#
-----------              -----                ------  ------ --- ---
-
Communications dev       0/0/1/0              0x103c  0x1290  0    0
Comp. ser cntlr          0/0/1/1              0x103c  0x1048  0    0
USB                      0/0/2/0              0x1033  0x35    0    0
USB                      0/0/2/1              0x1033  0x35    0    0
USB                      0/0/2/2              0x1033  0xe0    0    0
IDE cntlr                0/0/3/0              0x1095  0x649   0    0
  RAID cntlr             0/1/1/0/4/0          0xe11   0x46    33   1
<- RAID
PCI-to-PCI bridge        0/1/1/0              0x1014  0x1a7   32   1
<- RAID
Ethernet cntlr           0/1/2/0              0x14e4  0x1645  32   2
```

Mapper Output

```
ODE> run mapper2

*****************************************************************************
******                                                                 ******
******                            MAPPER2                              ******
******                                                                 ******
******       Copyright (C) 2003-2004 by Hewlett-Packard Company        ******
******                       All Rights Reserved                       ******
******                                                                 ******
******   HP shall not be liable for any damages resulting from the     ******
******   use of this program.                                          ******
******                                                                 ******
******                          Version B.00.33                        ******
******                                                                 ******
*****************************************************************************

Type HELP for command information.


STARTING EXECUTION OF MAPPER2

Processor Identification:
    Hardware Model:  884H, Revision: 0
    Software Model:    4H, Revision: 0
    Hardware ID:  0, Software ID:  3561254819 (unsigned decimal)
    HP-UX Model String: 9000/800/rp4440
    Processor Board Revisions:
        CPU - CPU Chip:                    768
        PDC - Processor Dependent Code:    45.5
    Cache and TLB Sizes:
        Instruction Cache:  3276 K bytes, Instruction TLB:     240 entries
        Data Cache:         3276 K bytes, Data TLB:            240 entries
    Co-processors:
        Floating Point Co-processor(s) installed

I/O Configuration:
                                                 Type  HW     SW     Revisions
Path        Component Name                       ID    Model  Model  Hdwr  Firm
----------  ---------------------------------- ----- ----- ----- ----- ----
-
0           Pluto I/O BC McKinley Port           CH    880H  CH     0     0
0/0         Mercury PCI Bridge                   DH    783H  AH     0     0
0/0/1/0     Communications Controller            103CH 1290H 103CH 1291H 01H
0/0/1/1     Serial Controller                    103CH 1048H 103CH 1282H 03H
0/0/2/0     USB Controller                       1033H 0035H 1033H 0035H 41H
0/0/2/1     USB Controller                       1033H 0035H 1033H 0035H 41H
0/0/3/0     IDE Controller                       1095H 0649H 1095H 0649H 02H
0/0/3/0.0.0
              DW-224E                            -     -     -     -
0/1         Mercury PCI Bridge                   DH    783H  AH     0     0
0/1/1/0     PCI->PCI Bridge                      1014H 01A7H 0000H 0000H 02H
<- RAID
```

**Step 10.** Configure logical drive and install operating system. (See “Setting up a Smart Array 6402 Card As a Boot Device” on page 89 for detailed instructions.)

## Installing RAID for Duplex Configuration

This section provides instructions on how to install the RAID duplex card. It also provides instructions for replacing the SCSI backplane assembly (A6961-04075).

**Step 1.** Back up data before installing the RAID card.

**Step 2.** Access the core I/O slots. For specific instructions on accessing the core I/O cards, refer to the Remove & Replace section in the *HP 9000 rp4410 and HP 9000 rp4440 Maintenance Guide*. These instructions show you how to open any access panels and covers giving you access to the internal SCSI cabling and the core I/O slots.

**a.** Wait for the system to shut down completely, power off the system, and unplug the power cord(s).

**b.** Disconnect cable(s) from the SCSI core I/O card in slot 1.

**c.** Remove the SCSI core I/O card from slot 1.

**Step 3.** Install the HP A9890A PCI-X 2-Channel RAID SA SCSI Card (Smart Array 6402) card in slot 1 (Figure 5-1).

**a.** Slide the RAID card edge-connector into slot 1 until it is fully seated.

**b.** Secure the latch.

**Step 4.** Connect SCSI cable A to internal connector A1 on the RAID card.

**Step 5.** Connect SCSI cable B to internal connector A2 on the RAID card.

**Step 6.** Disconnect the cables from the SCSI backplane assembly.

**Step 7.** Remove the SCSI backplane/management assembly. Access the SCSI backplane boards. For specific instructions on accessing the SCSI backplane boards, refer to the Accessing the SCSI Backplane Board section in the *HP 9000 rp4410 and HP 9000 rp4440 Installation Guide*.

**Step 8.** Install new SCSI backplane assembly (P/N A6961-04075). This procedure involves installing a simplex card and a duplex card.

**a.** Lift and remove the SCSI backplane.

**b.** Remove the old SCSI backplane assembly and replace it with the new SCSI backplane/management assembly (P/N A6961-04075).

**c.** Install the new duplex board (P/N A6961-60106). The duplex board is installed in the SCSI connector located nearest the disk drive cage. The duplex board is shipped with a duplex board bracket attached. When the duplex board is properly installed, it is secured to the disk drive cage by the bracket and to the SCSI backplane board by the SCSI connector sockets (Figure 5-2).

---

**NOTE** In simplex mode, both hard disk drives, slot 0 and slot 1, are driven by SCSI channel A. When the duplex board is installed, slot 1 hard disk drive is now driven by SCSI channel B. If HP-UX was previously installed and “whole disk vxfs” was not used, the system will no longer boot. Refer to the *HPUX Installation Guide* for further information.

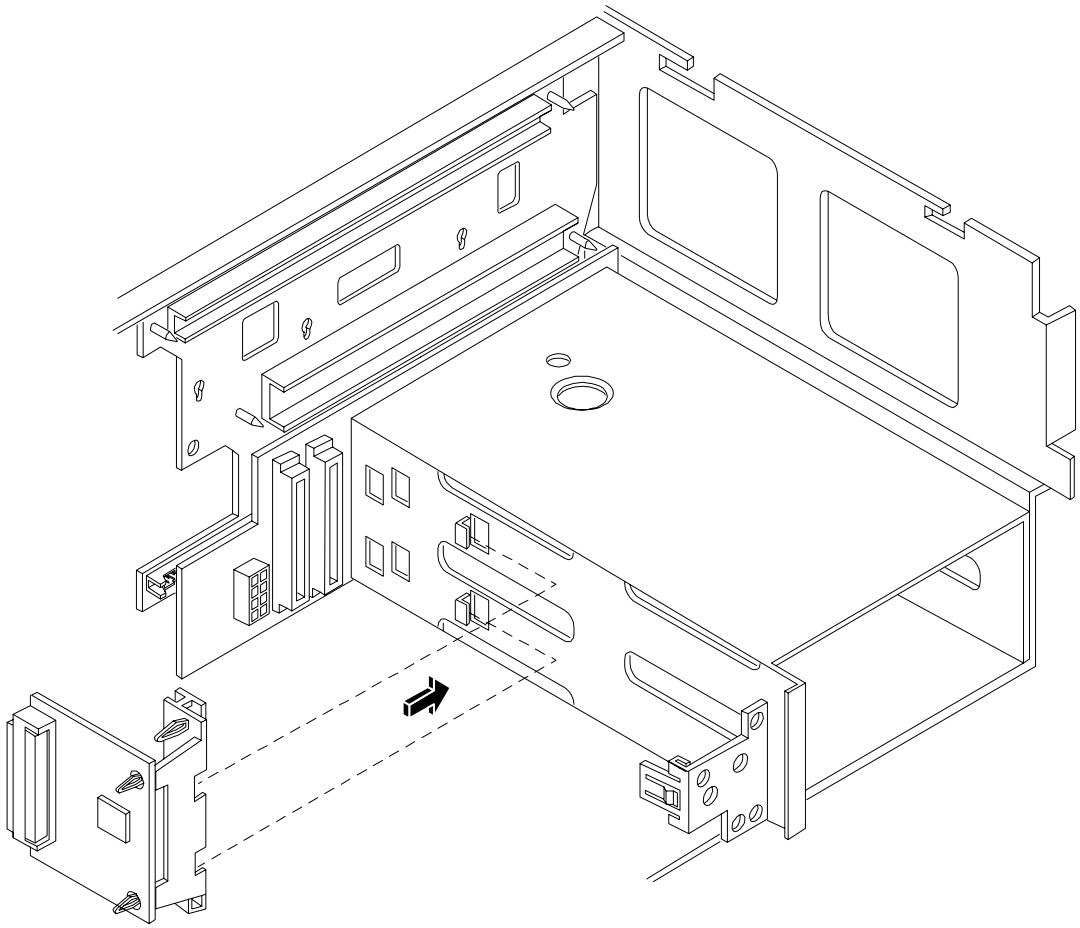
---

- Align the bracket tabs with the slots on the side of the disk drive cage.
- Press the bracket against the disk drive cage until the bracket locks into place.

- Align the connector of the duplex board with the connector on the SCSI backplane.
- Press the board connector into the backplane connector.

**NOTE** When the duplex board is installed properly, the board is secured in the duplex board bracket. The SCSI B cable is connected to the connector at the immediate left of the duplex board.

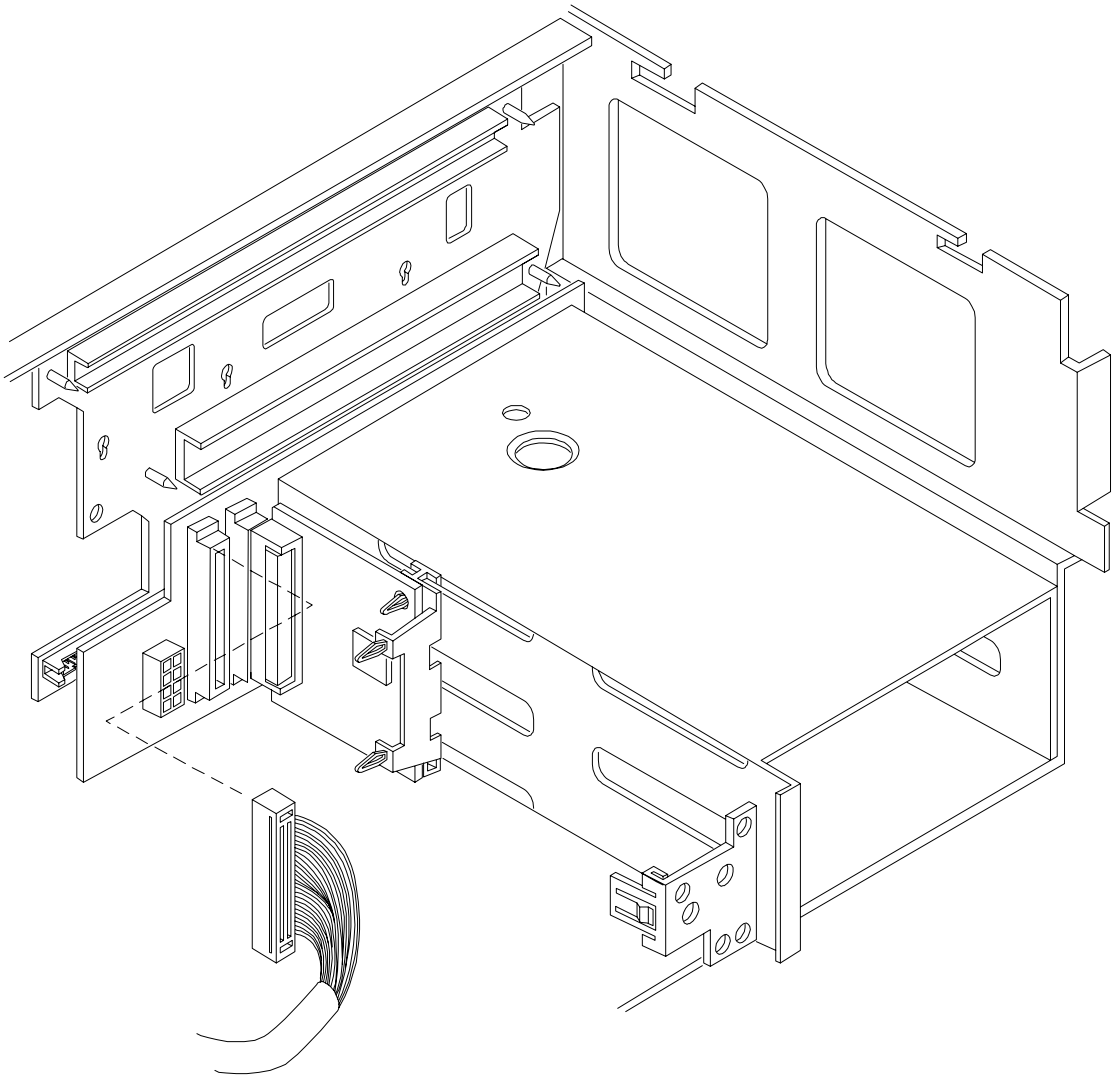
**Figure 5-2 Installing the Duplex Board**



**d.** Install SCSI cable B on the SCSI backplane board (Figure 5-3).

- Release the SCSI cable B from its stowed position within the chassis.
- Plug the SCSI cable B connector into the SCSI connector located on the backplane next to the duplex board installed in the previous step.

**Figure 5-3 Installing SCSI Cable B to the SCSI Backplane**



**Step 9.** Replace cover, power up, and verify the RAID install.

**a.** At the BCH prompt, enter **`in io`**. The following output displays.

**"in io" output**

```
I/O MODULE INFORMATION

                        Path   Slot                              IODC
Type                    (dec)  Number    HVERSION  SVERSION  Vers
----                    -----  ------    --------  --------  ----
System bus adapter      0                0x8800    0xc10     0x0
Local bus adapter       0/0    0         0x7830    0xa00     0x0
Local bus adapter       0/1    2         0x7830    0xa00     0x0
Local bus adapter       0/2    7         0x7830    0xa00     0x0
Local bus adapter       0/4    4         0x7830    0xa00     0x0
Local bus adapter       0/5    6         0x7830    0xa00     0x0
Local bus adapter       0/6    8         0x7830    0xa00     0x0

PCI DEVICE INFORMATION
                              Path                Vendor  Device Bus Slot
Description                   (dec)                  Id      Id   #    #
-----------                   -----               ------  ------ --- ----
Communications dev            0/0/1/0             0x103c  0x1290  0    0
Comp. ser cntlr               0/0/1/1             0x103c  0x1048  0    0
USB                           0/0/2/0             0x1033  0x35    0    0
USB                           0/0/2/1             0x1033  0x35    0    0
USB                           0/0/2/2             0x1033  0xe0    0    0
IDE cntlr                     0/0/3/0             0x1095  0x649   0    0
  RAID cntlr                  0/1/1/0/4/0         0xe11   0x46    33   1    <- RAID
PCI-to-PCI bridge             0/1/1/0             0x1014  0x1a7   32   1    <- RAID
Ethernet cntlr                0/1/2/0             0x14e4  0x1645  32   2
```

**Mapper Output**

```
ODE> run mapper2

*************************************************************************
******                                                             ******
******                          MAPPER2                            ******
******                                                             ******
******      Copyright (C) 2003-2004 by Hewlett-Packard Company     ******
******                     All Rights Reserved                     ******
******                                                             ******
******   HP shall not be liable for any damages resulting from the ******
******   use of this program.                                      ******
******                                                             ******
******                        Version B.00.33                      ******
******                                                             ******
*************************************************************************

Type HELP for command information.


STARTING EXECUTION OF MAPPER2

Processor Identification:
    Hardware Model:  884H, Revision: 0
    Software Model:    4H, Revision: 0
    Hardware ID:  0, Software ID:  3561254819 (unsigned decimal)
    HP-UX Model String: 9000/800/rp4440
    Processor Board Revisions:
        CPU - CPU Chip:                   768
        PDC - Processor Dependent Code:   45.5
    Cache and TLB Sizes:
        Instruction Cache:  3276 K bytes, Instruction TLB:     240 entries
        Data Cache:         3276 K bytes, Data TLB:            240 entries
    Co-processors:
        Floating Point Co-processor(s) installed

I/O Configuration:
                                          Type  HW    SW    Revisions
Path       Component Name                 ID    Model Model Hdwr  Firm
---------- ------------------------------ ----- ----- ----- ----- -----
0          Pluto I/O BC McKinley Port     CH    880H  CH    0     0
0/0        Mercury PCI Bridge             DH    783H  AH    0     0
0/0/1/0    Communications Controller      103CH 1290H 103CH 1291H 01H
0/0/1/1    Serial Controller              103CH 1048H 103CH 1282H 03H
0/0/2/0    USB Controller                 1033H 0035H 1033H 0035H 41H
0/0/2/1    USB Controller                 1033H 0035H 1033H 0035H 41H
0/0/3/0    IDE Controller                 1095H 0649H 1095H 0649H 02H
0/0/3/0.0.0
             DW-224E                      -     -     -     -
0/1        Mercury PCI Bridge             DH    783H  AH    0     0
0/1/1/0    PCI->PCI Bridge                1014H 01A7H 0000H 0000H 02H   <- RAID
0/1/1/0/4/0
           HP PCI-X SmartArray64xx RAID320 HBA 0E11H 0046H 0E11H 409CH 01H   <- RAID
```

**Step 10.** Configure logical drive and install the operating system. (See “Setting up a Smart Array 6402 Card As a Boot Device” on page 89 for detailed instructions.)

**CAUTION** Do not operate the server for long periods without the top cover installed. Operating the server without the top cover results in improper airflow and improper cooling that can lead to thermal damage.

**WARNING** **To reduce the risk of personal injury or damage to the equipment, consult the safety information and user documentation provided with your server before attempting installation.**

## Setting up a Smart Array 6402 Card As a Boot Device

The Smart Array 6402 card can be set up as a boot device.

**NOTE** For PA-RISC systems, use Ignite/UX and saconfig to create the logical drives. For Integrity systems, use the Option ROM Configuration for Arrays (ORCA) to create the logical drives.

### Offline Configuration of HP-UX 11i v1 or HP-UX 11i V2 Using Ignite-UX

To set up a Smart Array 6402 card as a boot device, you must install HP-UX 11i v1 or HP-UX 11i v2 on one of the card's logical drives. Follow this procedure:

**Step 1.** Start Ignite-UX from the HP-UX 11i v1 or HP-UX 11i v2 Core OS Install and Recovery Media. The Ignite-UX `Welcome` screen displays:

```
Welcome to Ignite-UX!
  Use the <tab> key to navigate between fields, and the arrow keys
  within fields.  Use the <return/enter> key to select an item.
  Use the <return/enter> or <space-bar> to pop-up a choices list.  If the
  menus are not clear, select the "Help" item for more information.


  Hardware Summary:          System Model: 9000/800/A500-5X
  +--------------------+----------------+-------------------+ [ Scan Again  ]
  | Disks: 3  (204.6GB) |  Floppies: 0   | LAN cards:   1    |
  | CD/DVDs:        0   |  Tapes:    0   | Memory:    4096Mb |
  | Graphics Ports: 0   |  IO Buses: 7   | CPUs:        1    | [ H/W Details ]
  +--------------------+----------------+-------------------+
                       [      Install HP-UX       ]
                       [   Run a Recovery Shell   ]
                       [    Advanced Options      ]

           [  Reboot  ]                              [  Help  ]
```

**Step 2.** Select `Run a Recovery Shell`. The Recovery Shell screen displays:

```
NOTE:    Creating the second RAM disc and mounting on /dev ...
       * Generating device file for the second ramdisc...
       * Loading mkfs to make a file system...
    version 4 layout
    15625 sectors, 15625 blocks of size 1024, log size 1024 blocks
```

```
    unlimited inodes, largefiles not supported
    15625 data blocks, 14529 free data blocks
    1 allocation units of 32768 blocks, 32768 data blocks
    last allocation unit has 15625 data blocks
       * Loading mount to mount/dev/ram1 file system...
       * Mounting /dev/ram1 file system succeeded!
       * Copying /dev.old files back to /dev succeeds!
       * Loading insf to create disk device files...
       * Creating disk device files...
       * Loading in a shell...
NOTE:    Pushing a shell, you will have to use "reboot" to reboot the system when done.  Use
the "loadfile" command to bring in more commands as you need them.
#
```

**Step 3.** At the recovery shell prompt, enter:

**`loadfile -l INSTCMDS/opt/raidsa/bin/ciss_insf`**

```
# loadfile -l INSTCMDS /opt/raidsa/bin/ciss_insf
```

**Step 4.** Verify that the device file for the Smart Array 6402 card has been created. At the next prompt, enter:

**`/opt/raidsa/bin/ciss_insf`**

.

```
# /opt/raidsa/bin/ciss_insf

Installing special file for Smart Array 6402

/dev/ciss3 installed
```

**Step 5.** At the prompt enter:

**`loadfile -l INSTCMDS /opt/raidsa/bin/saconfig`**

```
# loadfile -l INSTCMDS /opt/raidsa/bin/saconfig
```

**Step 6.** Configure the array(s) and logical drive(s) following the instructions for the **`saconfig`** configuration utility. You must enter the entire path `/opt/raidsa/bin/saconfig /dev/cissX` for `saconfig` to run.

**Step 7.** Once you confirm the logical drive(s) and array(s), exit the recovery shell by entering **`reboot`** at the prompt. The system reboots to the Boot Console Handler (BCH) prompt.

**Step 8.** At the BCH prompt, start Ignite-UX from the HP-UX 11i v1 or HP-UX 11i v2 Core OS Install and Recovery Media. The Ignite-UX `Welcome` screen displays (see **Step 1**).

**Step 9.** Choose `Install HP-UX`.

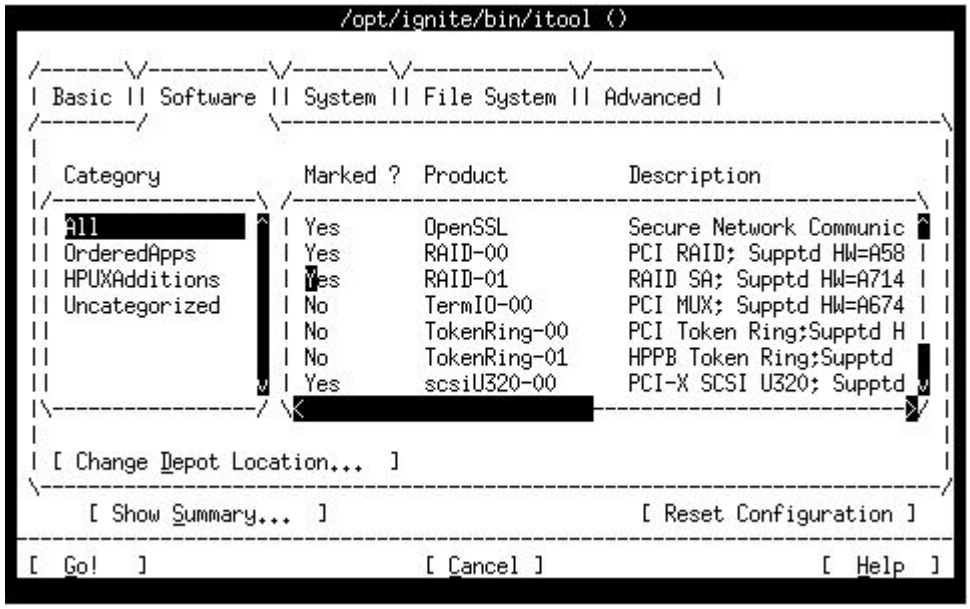
**Step 10.** Choose the kind of installation (Guided or Advanced) you want to do.

The installation starts, and the Ignite-UX graphical interface (GUI) appears.

**Step 11.** Choose the configuration to use according to the HP-UX system you are using.

**Step 12.** Choose the Smart Array 6402 logical drive on which you want to install the HP-UX operating system.

**Step 13.** After starting the Ignite process for OS installation, verify that the Software tab (next to the Basic tab referenced in the previous step) contains the following entry:




**Step 14.** Complete the installation.

**Step 15.** Once the installation is complete, you can boot from that Smart Array 6402 logical drive.

### Using ORCA

This section describes how to use Option Rom Configuration for Arrays (ORCA), a ROM-based configuration utility that runs on all operating systems.

**ORCA Limitations** For the most efficient use of drive space, do not mix drives of different capacities within the same array. The configuration utility treats all physical drives in an array as if they have the same capacity as the smallest drive in the array. The excess capacity of any larger drives is wasted because it is unavailable for data storage.

The probability that an array will experience a drive failure increases with the number of physical drives in the array. If you configure a logical drive with RAID 5, keep the probability of failure low by using no more than 14 physical drives in the array.

**Configuring Your Logical Boot Drive** When using an HP Smart Array card as your boot controller, use the ORCA utility to configure your logical boot drive. You can only access the ORCA utility when the system is booting.

**Step 1.** Press the **F8** key when the prompt appears on the screen during boot to start ORCA and configure your logical boot drive.

**Step 2.** Choose **Create Logical Drive**.

**Step 3.** Use the Arrow keys, Spacebar, and Tab key to navigate around the screen and set up the logical drive, including an online spare drive if one is required.

| | |
|---|---|
| **NOTE** | You cannot use ORCA to configure one spare drive to be shared among several arrays. |

**Step 4.** Press the **Enter** key to accept the settings

**Step 5.** Press the **F8** key to confirm the settings and save the new configuration. After several seconds, the Configuration Saved screen is displayed.

## Configuring the Server for RAID

To complete the installation and set up RAID for your server's internal hot swap drives, follow the instructions in the *HP A9890A Smart Array 6402 Controller Installation Guide* on docs.hp.com.

- Configure your HP Smart Array 6402 controller card in an HP Integrity server. Use HP Smart Array 6402 utilities and command line options from the BCH prompt. The ORCA Utility can only be accessed when the system is booting. Press the F8 key at boot time to start ORCA to configure your RAID array.
- Install operating system-specific HP Smart Array 6402 utilities and software that help you manage your RAID.
- Use operating system-specific HP Smart Array 6402 utilities and software that help you manage your RAID.
- Configure the HP Smart Array 6402 for an external RAID storage system.