

HP NetServer LH 6000/6000r Installation Guide



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Hewlett-Packard Company
Network Server Division
Technical Communications/MS 45SLE
10955 Tantau Avenue
Cupertino, California 95014 USA

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Audience Assumptions

The guide is for the person who installs, administers, and troubleshoots LAN servers. Hewlett-Packard Company assumes you are qualified in the servicing of computer equipment and trained in recognizing hazards in products with hazardous energy levels and are familiar with weight and stability precautions for rack installations.

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1 Setting Up the HP NetServer LH 6000/6000r

Installation Guidelines

This Installation Guide is for the LH 6000r rack-mount HP NetServer, and the LH 6000 pedestal HP NetServer.

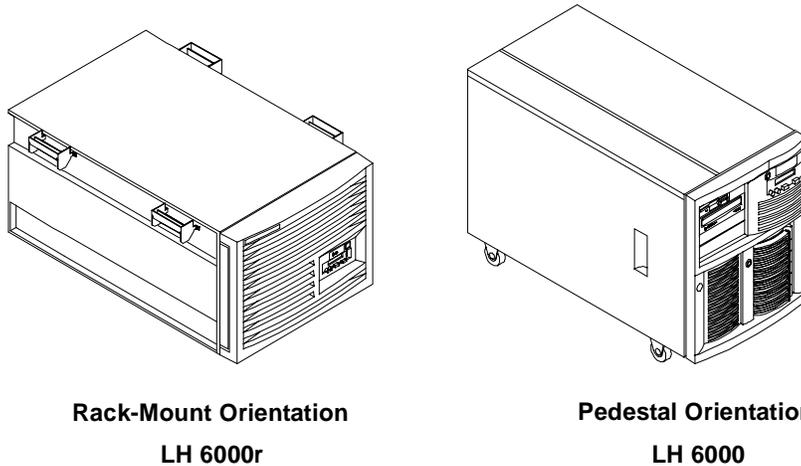


Figure 1-1. HP NetServers

- Observe all warnings and cautions.
- Read this chapter before taking the NetServer out of its box. It lists what to do and in what order. Choose either:
 - ◇ HP NetServer LH 6000r rack-mount installation
 - ◇ HP NetServer LH 6000 pedestal installation
- Unique to the LH 6000r are the:
 - ◇ Bezel hinge and latch
- Use the removable and reusable rack-mounting handles to move and place the LH 6000r in the rack. Remove them only when you have secured the NetServer to the rack slides.

The LH 6000 has a locked bezel; the LH 6000r does not.

Rack Mount Installation

Follow the setup steps in the exact order shown below for a successful rack installation. Skip any steps that do not apply to your installation.

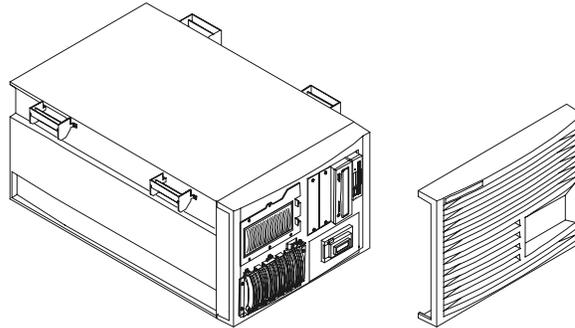


Figure 1-2. LH 6000r (Rack-Mount)

1. As you unpack the shipping box, verify contents against the Contents List included with your HP NetServer. If anything is missing or damaged, call your reseller.

Store the empty boxes and packing material in a safe place. This is especially important if you plan to ship the NetServer elsewhere for final installation.

WARNING

The HP NetServers LH 6000r and LH 6000 each weigh up to 175 pounds (80 kgs). More than one person is required to lift a server. Do not attempt to lift the NetServer by yourself. Failure to observe this warning could result in serious injury, or damage to the HP NetServer.

2. Familiarize yourself with the HP NetServer's controls, indicators, and ports.

Refer to Chapter 2, "Controls, Ports, and Indicators."

3. If you have optional internal items to add to the NetServer (memory, accessory boards, mass storage, or processors), remove covers and the bezel. If not, skip to step 8.

Refer to Chapter 3, "Opening and Closing the HP NetServer."

4. If you have items such as a processor and DIMMs to install, HP recommends that you remove the system board assembly from the server chassis and install them at this time.

Refer to Chapter 5, "Installing Additional Memory," and Chapter 7, "Installing Additional Processors."
5. Install PCI hot-plug and non-hot-plug accessory boards in the HP NetServer.

Refer to Chapter 6, "Installing Additional Boards."
6. Install internal non-hot-swap mass storage devices such as hard drives and tape back-ups into the front of the HP NetServer.

Refer to Chapter 4, "Installing Mass Storage Devices."
7. Reconnect internal cables as needed.

NOTE If you removed the system board assembly, wait to replace it in the chassis until after the server is in the rack. This reduces the weight of the server making it easier to mount.

8. Install the server in the rack.

Refer to Chapter 8, "Installing the HP NetServer in an HP Rack System/E or Rack System/U," or Chapter 13, "Alternative Rack Mounting."
9. If necessary, re-install the system board assembly in the rack-mounted chassis.
10. Replace covers, but not the bezel.

Refer to Chapter 3, "Opening and Closing the HP NetServer."
11. Install hot-swap mass storage devices into the front of the HP NetServer.

Refer to Chapter 4, "Installing Mass Storage Devices."
12. Replace the bezel.

Refer to Chapter 3, "Opening and Closing the HP NetServer."
13. Install additional power supplies at the rear of the HP NetServer.
14. Install the Cable Management Arm to the rear of the rack-mounted HP NetServer.

Refer to Chapter 8, "Installing the HP NetServer in an HP Rack System/E or Rack System/U."

15. Hook up the monitor, keyboard, and mouse.
Refer to Chapter 9, "Connecting the Monitor, Keyboard, and Mouse."
16. Connect external cables.
17. Power up the HP NetServer.
Refer to Chapter 2, "Controls, Ports, and Indicators."
18. Go to the section "Configuring the HP NetServer" at the end of this chapter.

Pedestal Installation

Follow the setup steps in the exact order shown below for a successful pedestal installation. Skip any steps that do not apply to your installation.

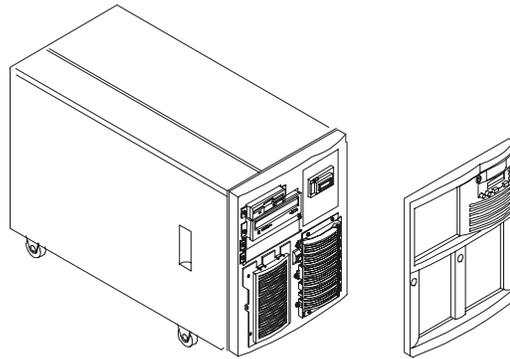


Figure 1-3. LH 6000 (Pedestal)

CAUTION Unlock bezel before removing it.

1. As you unpack the shipping box, verify contents against the Contents List included with your HP NetServer. If anything is missing or damaged, call your reseller.

Store the empty boxes and packing material in a safe place. This is especially important if you plan to ship the NetServer elsewhere for final installation.

CAUTION	The HP NetServers LH 6000r and LH 6000 each weigh up to 180 pounds (82 kgs). More than one person is required to lift a server. Do not attempt to lift the NetServer by yourself. Failure to observe this warning could result in serious injury, or damage to the HP NetServer.
----------------	--

2. Familiarize yourself with the controls, ports and indicators.
Refer to Chapter 2, "Controls, Ports, and Indicators."
3. If you have optional internal items to add to the NetServer (memory, accessory boards, mass storage, or processors), remove covers and the bezel. If not, skip to step 8.
Refer to Chapter 3, "Opening and Closing the HP NetServer."
4. To install a processor and DIMMs, HP recommends that you remove the system board assembly from the server chassis and install them at this time.
Refer to Chapter 5, "Installing Additional Memory," and Chapter 7, "Installing Additional Processors."
5. Install PCI hot-plug and non-hot-plug accessory boards in the HP NetServer.
Refer to Chapter 6, "Installing Additional Boards."
6. Install internal non-hot-swap mass storage devices such as hard drives and tape back-ups into the front of the HP NetServer.
7. Install the system board assembly into the NetServer if you removed it.
8. Install hot-swap mass storage devices into the front of the HP NetServer.
Refer to Chapter 4, "Installing Mass Storage Devices."
9. Reconnect all internal cables.
10. Replace covers and the bezel.
Refer to Chapter 3, "Opening and Closing the HP NetServer."
11. Install additional power supplies at the rear of the HP NetServer.
12. Connect the monitor, keyboard, and mouse.
Refer to Chapter 9, "Connecting the Monitor, Keyboard, and Mouse."
13. Connect external cables.

14. Power up the HP NetServer.

Refer to Chapter 2, "Controls, Ports, and Indicators."

Go to the next section, "Configuring the HP NetServer."

Configuring the HP NetServer

1. Turn on the monitor. Press the power-on button on the HP NetServer, and press the eject button on the CD-ROM drive. Place the *HP NetServer Navigator CD-ROM* in the drive and close the drive. Press the Reset button. If the system fails to restart, follow the instructions on the screen.

NOTE To fully configure the HP NetServer, all the rack components must be cabled and online (though not necessarily installed in the rack.) If printed instructions are required; a local or network printer must be connected.

Refer to Chapter 10, "Configuring the HP NetServer."

2. When HP Navigator starts, you can set the time and date, and change the display language.
3. Read the README File: Select "README File" from the HP Navigator Main Menu. The README file contains the latest information to help you install your HP NetServer.
4. Run DiagTools: To verify the NetServer hardware as shipped, run DiagTools by first creating a DiagTools flexible diskette(s) from the *HP NetServer Navigator CD-ROM*. For more information on how to use DiagTools to detect all processors and memory on the system board, refer to the online *NetServer DiagTools Error Reference and User Guide*.
5. Install *Information Assistant*: It is easier to use *Information Assistant* from a standalone workstation than from the NetServer where you are performing the installation. Install *Information Assistant* from the *HP NetServer Online Documentation CD-ROM*.

Go to Chapter 11, "Information Assistant," for information on how to access your online documentation.

NOTE	Before proceeding with the next steps, determine the storage management mode (HP NetRAID or LVD SCSI) to be used on the NetServer. <ul style="list-style-type: none">• If HP NetRAID is the desired mode, refer to the <i>Integrated HP NetRAID Controller Configuration Guide</i> to plan the RAID configuration.• If LVD SCSI is the desired mode, run Setup Utility to change from the default RAID mode to the LVD SCSI mode.
-------------	--

6. Run Configuration Assistant and Installation Assistant: Select "Configuration and Installation Assistant."
7. Configure Mass Storage. This HP NetServer ships with the hot-swap mass storage device(s) NetRAID enabled. To configure the drive(s), either:
 - ◇ Run HP NetRAID Assistant to configure one or more RAID logical drives. To run HP NetRAID Assistant, select "Execute" from the Configure Disk Array screen. For detailed information on HP NetRAID, refer to the *Integrated HP NetRAID Controller Configuration Guide*.
 - or
 - ◇ Restart the HP NetServer.
 - a. Press function key [F2] when prompted on the boot screen to enter the Setup Utility.
 - b. In the Configuration menu, select Embedded LAN and SCSI Settings.
 - c. Use the space bar to change the SCSI setting from HP NetRAID to LVD SCSI.
 - d. Press function key [F10] to save the configuration and exit the utility program.
 - e. Answer "Yes" to the question "Save Configuration and Exit Now?" The HP NetServer will reboot, and HP Navigator will restart.
8. Select the configuration mode from the next screen. Three configuration modes are available. Refer to Chapter 10, "Configuring the HP NetServer."
9. Choose a NOS. Select the NOS and version to be installed.
10. Select the NOS installation mode: If you select certain versions of Novell NetWare or Microsoft Windows NT Server, you will be asked, "Would you like to use HP's automated mode of NOS installation?"

- ◇ Select "Yes" to choose automated NOS installation for first-time installation of Novell NetWare or Microsoft Windows NT Server on a factory-configured HP NetServer.
- ◇ Select No to use the manual NOS installation if:
 - * You are installing a NOS other than Novell NetWare or Microsoft Windows NT Server.
 - * You have replaced accessory components.
 - * You have replaced HP accessories with non-HP accessories.
- 11. View Configuration Advisories: Read the Configuration Advisories and print them if necessary. Make any changes suggested in the advisories.
- 12. Configure Remote Management: If you plan to manage the HP NetServer LH 6000 remotely, refer to the *HP NetServer Server Management Reference Guide* for instructions. Select "Configure Remote Management" on the Navigator screen to configure Integrated Remote Assistant.
- 13. Show System Information: Select "View System Information" to get information about accessory boards and devices. Select "View Resources" to view used and available system resources.
- 14. Install the NOS: If you selected the HP automated NOS installation process, you will be guided through the process by a series of HP display screens:
 - ◇ Install Utility Partition: This step creates a disk utility partition on the server boot hard disk drive where HP Navigator will copy troubleshooting and other utilities.

NOTE Select "Execute" on the Install Utility Partition screen to install the partition. The utility partition is not available under SCO UnixWare.

- ◇ Execute Card Utilities: Select "Execute" on the Execute Card Utilities screen to run the accessory board configuration utilities.
- ◇ Follow the instructions on the screen and in the network operating system's installation instructions to perform the manual NOS installation.
- ◇ For Manual NOS Installation Only: Before you perform a manual NOS installation, print out instructions and create NOS-specific driver diskette(s), as follows:

- a. Create Drivers Diskette(s): On the Create Drivers Diskette(s) screen, select Create Drivers Diskette(s) to create one or more customized diskettes containing HP drivers and configuration files to use when you install the NOS.
 - b. Print and Read Instructions: On the Show NOS Installation Instructions screen, select "Save to Disk" to copy the NOS installation instructions to disk. Then print them from disk. Read the instructions and follow them to install the NOS.
- ◇ Install NOS:
- * Automated NOS Installation: For certain versions of Novell NetWare or Microsoft Windows NT Server, Configuration Assistant formats and partitions the hard disk drive. Installation Assistant then guides you through the NOS installation and configures the NOS with the appropriate drivers for the HP-bundled configuration or for network interface cards on HP's Tested Configurations.
- or
- * Manual NOS Installation: Follow the instructions on the screen and the network operating system installation instructions that you printed.
 - * If HP NetRAID mode has been selected, you may need to install NetRAID drivers and the NOS specific configuration utility. Refer to Chapter 6, "HP NetRAID Software" of the *Integrated HP NetRAID Controller Configuration Guide*.
15. Install HP TopTools: Refer to the *HP NetServer Server Management Reference Guide* and install HP TopTools.
- If you plan to manage HP NetRAID mode over the network, refer to Chapter 8, "Managing Servers over the Network," of the *Integrated HP NetRAID Controller Configuration Guide*.
16. Refer to Information Assistant on the *HP NetServer Online Documentation CD-ROM*, for further information about your HP NetServer. See Chapter 11, "Information Assistant," for information.
17. Test and troubleshoot as necessary.
- Refer to Chapter 12, "Troubleshooting."
- Your LH 6000r or LH 6000 installation is complete.

Shipping the fully-configured HP NetServer

Label each cable and component to facilitate re-assembly.

- If racked, remove all components from the rack, including external mass storage.
- For both rack-mounted and pedestal HP NetServers, repack the components in the original packing material, and prepare them for shipment.

CAUTION

It is critical to disassemble and repackage all electronic components before reshipment. Electronic components (especially hard disk drives) can sustain damage when shipped in rack enclosures.

2 Controls, Ports, and Indicators

Front View

Figure 2-1 shows the rack-mounted HP NetServer LH 6000r and Figure 2-2 shows the pedestal HP NetServer LH 6000.

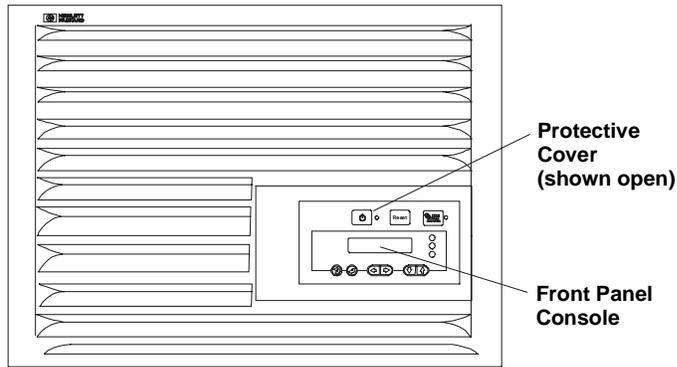


Figure 2-1. LH 6000r Bezel and Front Panel Console

NOTE

A small protective cover is provided on the HP NetServer's front bezel to cover the Power and Reset buttons. This cover can prevent someone from accidentally powering down or resetting the NetServer during normal operation. It can also be easily opened for access to the Power and Reset buttons.

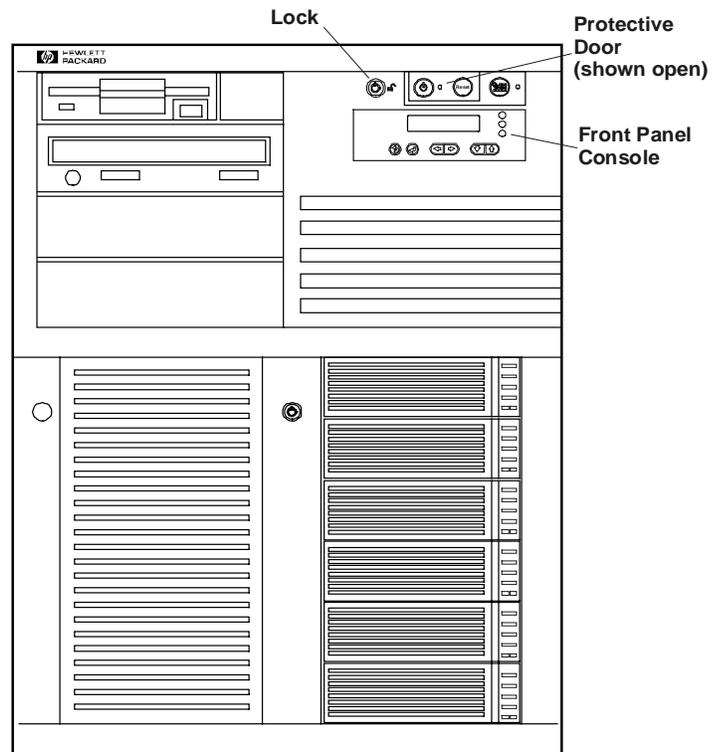


Figure 2-2. LH 6000 Bezel and Front Panel Console

Front Panel Console

Figure 2-3 shows the HP NetServer **LH 6000**'s Front Panel Console (the HP NetServer **LH 6000r** is similar, but has no lock).

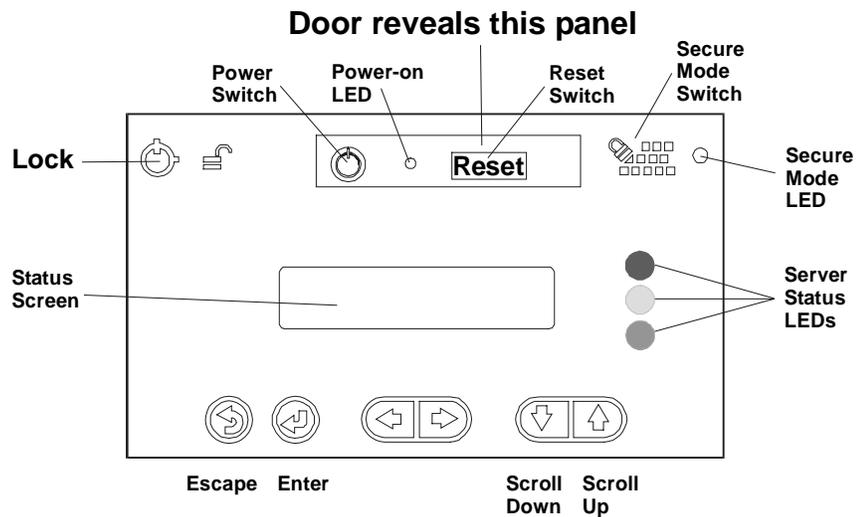
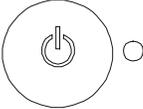


Figure 2-3. Front Panel Console

Table 2-1. Front Panel Console Switch and Indicator Definitions

Control	Description
Lock (LH 6000 only) Locked  Open	Locks system to prevent unauthorized use. Note that locking and unlocking of the enclosure is reported to the system event log (SEL).
DC Power Switch and LED 	Turns the NetServer on and off. This switch is under the protective door on the front panel. Push once to turn on, again to turn off. As long as the AC power is connected to the NetServer, standby power is present. <ul style="list-style-type: none"> • If the LED is steady green, then the NetServer is powered-up. • If the LED is flashing green, the NetServer is in a power-save mode. • If the LED is off, but the two-line display has a message, standby power is present. If the NetServer is set up to go into power-save mode, the power switch is depressed; you must press it for more than four seconds to effect a power down.

Control	Description																				
	Resets the NetServer. This switch may be disabled by Secure mode.																				
Secure Mode Switch and Indicator 	Locks system keyboard, monitor display, and control panel to prevent unauthorized use. Go to the Setup utility security menu to configure this feature. Secure Mode LED illuminates when Secure Mode is enabled.																				
Status screen 	Reports system status. For details, see the following section: "Viewing System Information."																				
Server Status LEDs Red  Yellow  Green 	Three LEDs -- one red, one yellow, one green -- are on the right side of the front panel console. They give you a quick idea of the NetServer's general health. The signals provided reflect the most critical pending event in the system.																				
<table border="1"> <thead> <tr> <th>Red</th> <th>Yellow</th> <th>Green</th> <th>Indicates NetServer Status:</th> </tr> </thead> <tbody> <tr> <td>Off</td> <td>Off</td> <td>Off</td> <td>Main power is off and the NetServer may or may not be on standby power.</td> </tr> <tr> <td>Flashing</td> <td>Off</td> <td>Off</td> <td>Immediate attention required due to a failed component in the NetServer. The NetServer may not be fully operational due to this condition. An audible alarm may also be enabled.</td> </tr> <tr> <td>Off</td> <td>Flashing</td> <td>Off</td> <td>Attention required due to a pre-failure condition. This condition may be caused by a component failure (for example, a redundant fan or power supply) or an open access panel that could lead to a critical component failure, such as a processor module exceeding its operating temperature. If the failed component is redundant, the NetServer may still be operating normally. An audible alarm may also be enabled.</td> </tr> <tr> <td>Off</td> <td>Off</td> <td>On</td> <td>The NetServer is operating normally.</td> </tr> </tbody> </table>	Red	Yellow	Green	Indicates NetServer Status:	Off	Off	Off	Main power is off and the NetServer may or may not be on standby power.	Flashing	Off	Off	Immediate attention required due to a failed component in the NetServer. The NetServer may not be fully operational due to this condition. An audible alarm may also be enabled.	Off	Flashing	Off	Attention required due to a pre-failure condition. This condition may be caused by a component failure (for example, a redundant fan or power supply) or an open access panel that could lead to a critical component failure, such as a processor module exceeding its operating temperature. If the failed component is redundant, the NetServer may still be operating normally. An audible alarm may also be enabled.	Off	Off	On	The NetServer is operating normally.	
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Off	Off	Off	Main power is off and the NetServer may or may not be on standby power.																		
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Off	Off	On	The NetServer is operating normally.																		

Viewing System Information

Use the HP NetServer's status screen to view system configuration information, a log of current and past conditions, replaceable parts information, adjust screen contrast, and more.

Use the controls to choose menus and scroll through screens. Table 2-2 briefly describes the controls.

Table 2-2. Front Panel Console Buttons

Button Name	Description
 Escape	Return to previous menu.
 Enter	Select an item from a menu.
 Down Arrow	Scroll down one line through the current screen or menu.
 Up Arrow	Scroll up one line through the current screen or menu.
 Left Arrow	Decrease contrast (when Adjust Contrast menu selected)
 Right Arrow	Increase contrast (when Adjust Contrast menu selected)

NOTE The front panel console display buttons and menus operate even when the NetServer has powered down or hung, as long as the NetServer is plugged into its power source. During POST (power-on self-test) the buttons and menus are disabled temporarily so that the status screen can display POST and boot messages.

Main Menu

This is the status screen default display:

```
HP NetServer  
LH 6000
```

1. To reach the main menu from this default screen, press the **Enter** button.

NOTE The status screen displays two lines of an entire menu at a time.

This is the entire Main Menu:

```
***Main Menu***  
  
>Event Log  
>FW Info  
>System Info  
>Component Info  
>Service  
>Adjust Contrast
```

Menus beginning with a greater-than symbol (>) indicate sub-menu selections.

2. Use the arrow buttons to move the cursor to your selection and press the Enter button.

A cursor highlights the currently selected line.

3. To return to the Main Menu from one of these selections, press **Escape**.
4. To exit the Main Menu, press **Escape**.

Event Log Menu

The Event Log menu has information about current and resolved events. The menu provides a list of all events currently in the log. These may be errors, or normal system events like a system boot.

1. Select Event Log from the Main Menu.

The first two lines of the log appear on the HP NetServer's front panel display:

```
***Event Log***  
>008^ POWER Unit
```

2. Use the arrow buttons to see the complete list.

This is a sample event log:

```
****Event Log****
>008^ POWER Unit
>007^ Temp Error
>006 CPU Failure
>005 POST Error
>004 Volt Error
>003 CPU Failure
>002^ POWER Unit
>001 System Boot
```

Each line includes a brief summary of a log entry, including the log entry number. An "^" on a log entry means the problem is current.

3. To read the complete log for an event, use the arrow keys to select the entry and press **Enter**.

An example of a complete log, providing details about two events, 001 and 008, appears below.

```
>001 System Boot
Entry #001
07 /22 /99
10 :27 :15
System Boot
Event
>008 POWER Unit
Entry #008
Critical Pending
07 /22 /99
10 :27 :15
Proc. 2 FRB3
Failure
```

4. Use the arrow keys to scroll through the entire log.
5. To return to the Event Log menu, press **Escape**.
6. Press **Escape** again to return to the Main Menu.

FW Info (Firmware Information) Menu

The FW Info menu displays the versions of all firmware components in the system.

1. Select FW Info from the Main Menu.

A display similar to the one shown below appears on the HP NetServer's front panel display.

```
**FW Info**
```

2. Use the arrow buttons to scroll down through the rest of the information.
3. Press **Escape** to return to the Main Menu.

System Info Menu

The System Info menu displays the HP NetServer's configuration information. Information includes the number, speed, and type of CPUs, cache information, and the amount of RAM on each memory board.

1. Select System Info from the Main Menu.

A display similar to this appears on the HP NetServer's status screen.

```
**System Info**
```

```
No. Of CPUs=x
```

2. Use the down-arrow button to scroll through the rest of the information.

A full screen of the display would appear as shown below, but the actual display is still limited by two viewing lines at time.

```
**HW Sys Info**
```

```
No. Of CPUs=x
```

```
CPU speed 500MHz
```

```
CPU type PIII Xeon
```

```
LFT CPU1 stepping xx
```

```
LFT CPU2 stepping xx
```

```
RFT CPU1 stepping xx
```

```
RFT CPU2 stepping xx
```

```
L2 Cache xxxx KB
```

```
Mem slot1 xxxxMB
```

```
Mem slot2 xxxxMB
```

3. Press **Escape** to return to the Main Menu.

Component Info Menu

To see the NetServer chassis' part numbers and serial numbers:

1. Select Component Info from the Main Menu.

A display similar to the one shown below appears on the status screen:

```
*Component Info*
Asset Tag:
```

2. Use the down-arrow button to scroll through the rest of the information.

An example of a full screen display appears below.

```
*Component Info*
Asset Tag:
AAAAAAAAAAAAAAAA
Product Part:
nnnn-nnnn
Product Serial
AAAAAAAAAAAAAAAA
Chassis Part:
nnnn nnnn
Chassis Serial:
AAAAAAAAAAAAAAAA
```

3. Press **Escape** again to return to the Main Menu.

Adjust Contrast Menu

This is the Adjust Contrast display.

```
*Adjust Contrast
== {XXXXXXXX}==
```

1. Decrease contrast by pressing  or .
2. Increase contrast by pressing  or .
3. To save the contrast setting, press **Enter**.

Hard Disk Drive LED Indicators

Each disk drive module has two LED indicators: one for status and one for activity. You can view these LED indicators on the LH 6000 and on the LH 6000r with the bezel open. For more information on hard drives, see Chapter 4, "Installing Mass Storage Devices."

Light pipes on the disk drive modules transmit light to the indicators from LEDs mounted on the hot-swap mass storage cage. Verify that the LED indicators show the correct status and activity for all of the installed disk drives.

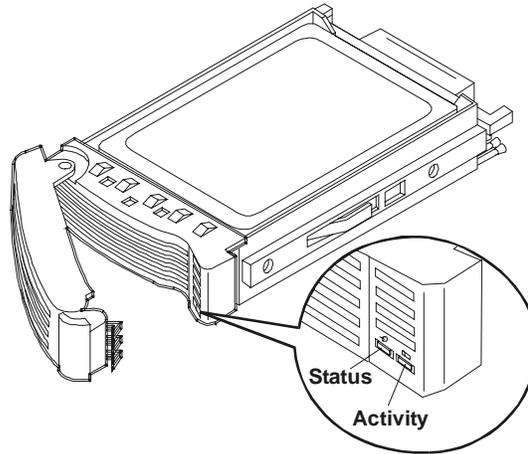


Figure 2-4. Disk Drive LED Indicators

Table 2-3. Disk Drive LED Indicators

Status LED Indicator	Activity LED Indicator
Off: Drive not present, or not connected to the cage	Off: No Drive activity
Green: Drive normal	Green (flashing): Accessing Drive
Amber (flashing): Drive failure predicted	Green (solid for more than one minute): Drive spinning up, or "hung"
Red (fast flashing): Drive fault	
Red (solid): Drive power fault	

Indicators and Controls behind the Front Bezel

The LEDs for these devices are visible only when the bezel is open or removed:

- CD ROM
- DAT
- Flexible Disk Drives
- Internal Hard Disk Drives

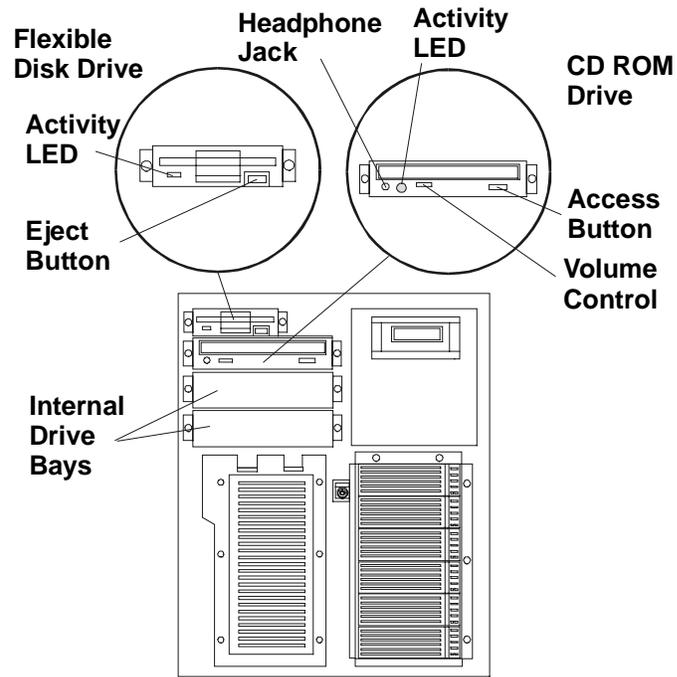


Figure 2-5. Flexible Disk Drive and CD-ROM LEDs

Rear View

The HP NetServer's rear panel includes communication ports, the AC power connectors, and the NetServer's two power supplies cages. Each power supply cage can hold two power supply modules. In addition, all hot plug PCI slots have LED indicators located just above the PCI latch.

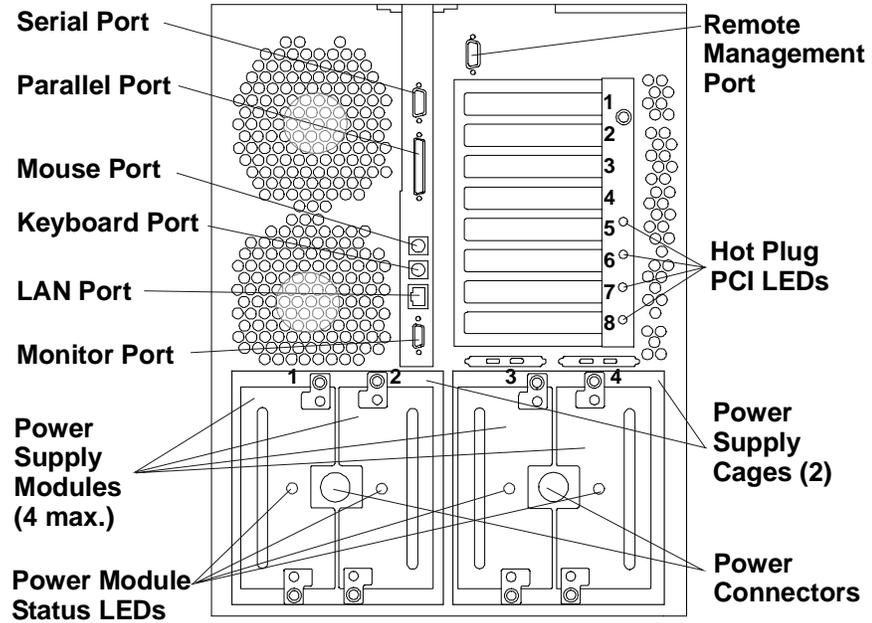


Figure 2-6. Rear Panel of the HP NetServer

LED Indicators at the Rear of the Chassis

PCI Attention LED Indicators

If a hot-plug board needs attention, its LED indicator glows amber.

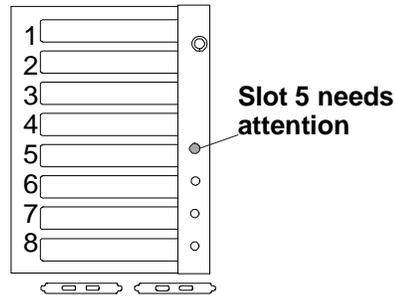


Figure 2-7. Amber Attention LED Indicator

When an amber PCI LED indicator appears, you must remove the cover to see the power LED indicators for each hot-plug PCI slot. See Chapter 3, "Opening and Closing the HP NetServer."

PCI Power LED Indicators (Internal)

Pairs of very small LED indicators are located on the I/O board above each of the hot-plug PCI slots.

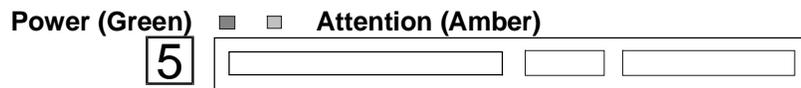


Figure 2-8. Onboard LED Indicators

Light from the small onboard LED indicators is transmitted through the light pipes on the plastic slot ejectors.

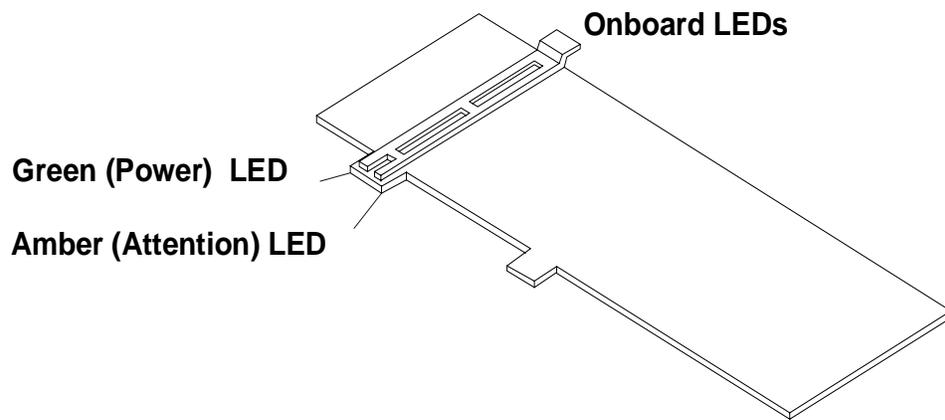


Figure 2-9. Light Pipes Display PCI LED Indicators

PCI Slot LED Indicators

Each hot-plug PCI slot has an amber and a green LED. Table 2-4 interprets the LEDs.

Table 2-4. PCI LED Indicator Status

Amber	Green	Status Indicated	Your Action
Off	On	Power to the slot is on, and the slot is operating normally.	Do not remove the board from the slot.
On	On	Power to the slot is on, but the slot needs attention.	Do not remove the board from the slot.
On	Off	Power to the slot is off. The slot needs attention.	You can safely remove the board from this slot.
Off	Off	Power to the slot is off.	You can safely remove the board from this slot.

For more information on PCI Hot Plug boards, see Chapter 6, "Installing Additional Boards."

Local Area Network (LAN) LEDs

The LAN has LEDs on the connector that provide status information about the LAN. Interpret the LAN LEDs as shown in Table 2-5.

Table 2-5. Local Area Network LED Status

Green LED	Yellow LED	LAN Status:
ON/Flashing	OFF	The LAN is connected and data is being transferred at 10Mbps.
ON/Flashing	ON	The LAN is connected and data is being transferred at 100Mbps.
OFF	OFF	The LAN is not connected or is not operational (see Chapter 12, "Troubleshooting").

Power Supplies

Each NetServer is shipped with three power supply blocks in the standard configuration. An optional fourth power supply block can be added to provide redundancy allowing power supplies to be hot-swapped.

Power Supply Status LEDs

Each power supply block has one green LED. Interpret the green LEDs on the power supplies as shown in Table 2-6.

Table 2-6. Power Supply LED Status

Green LED	NetServer Status:
Steady Green	The system is powered up.
Off	The AC line is unplugged or the power supply has failed (see Chapter 12, "Troubleshooting").

Connecting the HP NetServer to AC Power

When you connect the NetServer to an AC power source, the server temporarily draws additional current. This occurs even when the system is in standby mode. This "inrush current" is much greater than the server's normal operating needs. Generally, your external AC power source can handle the inrush current.

If you install several HP NetServers on one circuit, precautions are necessary. If there is a power failure and power is then restored, all the servers immediately begin to draw inrush current at the same time. If the circuit breakers on the incoming power line have insufficient capacity, they may trip and thus prevent the servers from powering up.

When preparing your site for installation, allow for the additional inrush current. Follow these circuit breaker recommendations before installing the server at your site:

- In North America, use a 20-amp-minimum circuit with one NEMA AB1 class 14B breaker for each 16-amp Power Distribution Unit (PDU).
- In Europe:
 - ◇ For a single HP NetServer in a rack, use a 15-amp-minimum circuit with one IEC MCB C-type breaker for each 16-amp PDU.
 - ◇ For multiple HP NetServers in a rack, use a 15-amp-minimum circuit with one IEC MCB D-type breaker for each 16-amp PDU.

NOTE	Each 16-amp PDU can accommodate a maximum of two HP NetServers.
-------------	---

When the proper power supply is available, connect the NetServer to the AC power source.

Power-Up and Power-Down Procedures

Power-Up Procedure

1. Ensure the NetServer's power cords are connected to a power source and to the power block(s) on the rear panel.
2. Press the power switch.

CAUTION	The power supplies continue to provide standby voltage to the NetServer until the power cords are disconnected.
----------------	---

Power-Down Procedure

Follow this procedure when installing non-hot-swap and non-hot-plug components, such as tape drives and non-hot-plug PCI boards.

1. Log off all users and back-up files.
2. Follow instructions in your network operating system (NOS) documentation to gracefully shut down all networking software and applications.
3. Press the Power switch to shut down the NetServer (see Figure 2-3).

Normally, this completes the procedure.

Sleep States (ACPI)

The HP NetServer supports the ACPI (Advanced Configuration and Power Interface) standard, which is a key component of a NOS's directed power management. The supported features are only available when an ACPI-compliant NOS is installed on the NetServer. The term "sleep state" refers to any of several reduced power consumption states in which normal NOS activity has ceased.

The NetServer supports several sleep states, including a sleep state with a short wake-up time, sometimes referred to as "standby" or "suspend" by various operating systems. In this sleep state the NetServer appears to be off, indicated by no display on the monitor and no activity for the CD-ROM or internal hard drives, however, the power LED is slowly flashing and the fans are operating.

An additional sleep state supported by the NetServer is one with a slower wake-up time, sometimes referred to as "hibernate" by various operating systems. In this sleep state, the NetServer appears to be off as mentioned earlier, but the fans and the power LED are also turned off. This sleep state's unique feature (and the reason for its slower wake-up time) is that the NetServer's state (applications running, screens open, etc.) just prior to hibernate has been saved to disk and must be restored from disk upon wake-up. This method of restoring the NetServer's operation is much faster than rebooting the NetServer, which would require running all the start-up self-tests before starting the NOS.

The NetServer supports certain types of system activity, which is used as wake up events from these sleep states. These wake-up events can be generated from the power button, LAN activity, and scheduled events. The embedded Integrated Remote Assistant also has the capability of waking up the NetServer.

NOTE The HP NetServer's power management policies (transitions between various power states) and the user options are specific to the particular ACPI-compliant NOS installed on the NetServer. If your respective NOS is ACPI-compliant, refer to the power management features in the instructions provided for more information.

The HP NetServer's power button can be configured to initiate a sleep state (Sleep button) or a "soft off" or graceful shutdown of the NOS, rather than an immediate shut down of the power supply. The power button configurations are dependent on the user interface provided by the ACPI-compliant NOS. While power management is under the control of the ACPI-compliant NOS, the HP NetServer's power button is capable of an override in case of non-responsive NOS.

NOTE The HP NetServer power button will force a power down without waiting for the NOS to gracefully shut down, if the power button is pressed and held for more than four seconds.

<p>CAUTION If the power button override is used, there is a strong possibility of corrupted or lost data.</p>
--

3 Opening and Closing the HP NetServer

Introduction

This chapter describes removing and replacing the covers of the rack-mount HP NetServer LH 6000r and the pedestal HP NetServer LH 6000. If the NetServer is not currently installed in a rack, skip to step 6 for the LH 6000r in the following section, "Removing the LH 6000r Rack Mount Covers."

WARNING

Shut down the operating system before removing covers. Disconnect power cords to avoid exposure to high energy levels that may cause burns when parts are short-circuited by metal objects, such as tools or jewelry. Disconnect telephone cables to avoid exposure to shock hazard from telephone ringing voltages.

Wear a grounded wrist strap and use a static-dissipating work surface when handling NetServer components.

Note that the power switch does not turn off the standby power. (Standby power is on when the LCD is backlit.) Disconnect the power cords to turn off standby power.

Tools Required

- Torx 25 Driver (for rack access only)
- Anti-static service kit (3M 8501/8502/8503 or equivalent). This kit includes a static-dissipating work surface, a chassis clip lead, and a wrist strap.

Removing the LH 6000r Rack Mount Covers

CAUTION Do NOT operate the NetServer for more than 30 minutes with any cover (including power supplies and disk drives) removed. Otherwise, damage to system components may result due to improper cooling airflow.

1. Extend the anti-tip foot from under the front of the rack or insure that the anti-tip feature is installed.

WARNING The anti-tip foot must be extended or the anti-tip feature must be installed to prevent the rack and NetServer from tipping over, which could damage the NetServer and injure people.

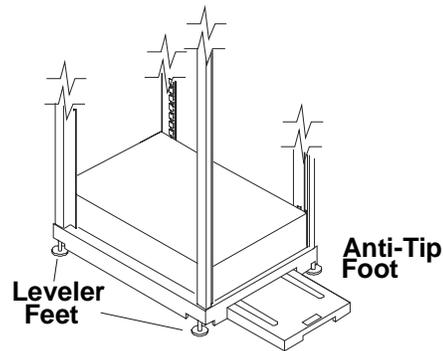


Figure 3-1. Rack Anti-tip Foot

2. Remove the bezel from the front of the NetServer by swinging the bezel open (past 90 degrees) until it releases from the three posts on the bezel hinge (see Figure 3-2).

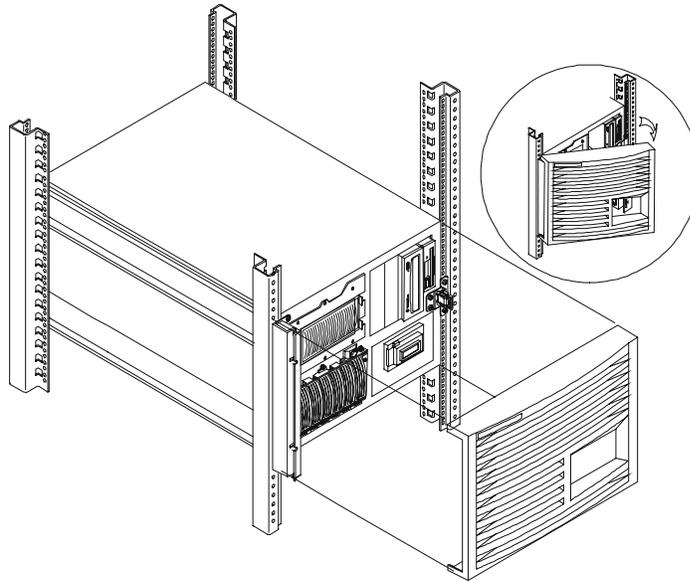


Figure 3-2. Removing the HP NetServer LH 6000r Bezel

3. Do not unscrew the entire hinge or bracket from the NetServer. Use a Torx 25 screwdriver to remove only the four outer screws so that the hinge and the bracket remain attached to the NetServer chassis as shown in Figure 3-3.

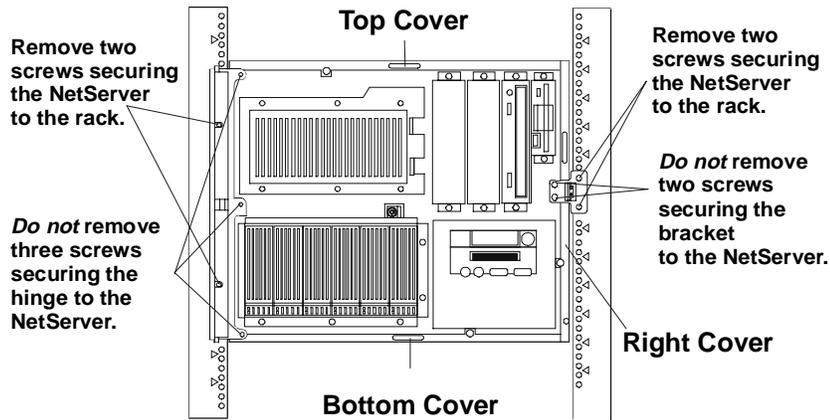


Figure 3-3. Front of LH 6000r - Screw and Cover Locations

- At the rear of the rack, remove the two screws that connect the Z-bracket (if present) to the rear of the NetServer.

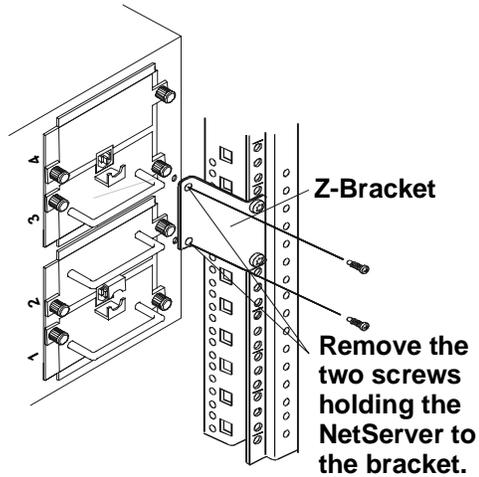


Figure 3-4. Disconnecting the HP NetServer from the Z-Bracket

- At the front of the rack, pull the NetServer forward from the rack until you hear the lockout devices engage with a click.

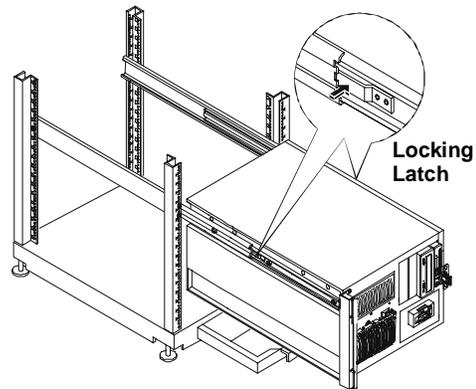


Figure 3-5. Slide Mount Locking Latches

CAUTION

The NetServer covers are heavy. Support them as you remove them, and allow room to move them away from the NetServer and for storage when removed from the NetServer.

- Remove the top cover by loosening the thumbscrew and pulling the cover forward to disengage it. Lift it up and away from the chassis (see Figure 3-6).

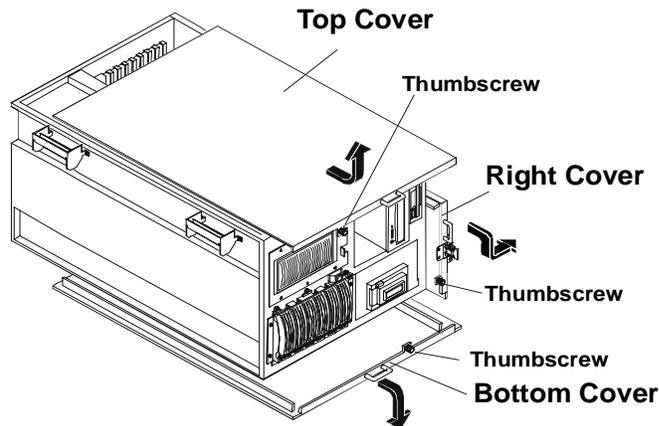


Figure 3-6. HP NetServer LH 6000r Covers

- Remove the right cover by supporting it with your hand, then loosening the thumbscrew and pulling the cover forward, then down to disengage it. Lift it away from the chassis (see Figure 3-6).
- Remove the bottom cover by supporting it with your hand, and loosening the thumbscrew with the other hand. Pull the cover forward to disengage it and catch it as it falls away from the chassis (see Figure 3-6).

Replacing the LH 6000r Rack Mount Covers

- For each of the side covers, insert the two metal tabs, at the end opposite the handle, into the two openings at the top and bottom corners of the chassis. Hold the cover in place, but do not slide the tabs in completely.
- Align the four, widely spaced, metal tabs on the cover's long, top edge against the leftmost edge of the four widely spaced openings on the top of the chassis.
- Hold the top of the cover in this position with one hand, while pressing the bottom edge of the cover with the other hand until the cover is completely flush against the chassis.

4. Check that the four closely spaced metal tabs are in their four openings at the rear of the HP NetServer. The cover is secure when all edges are flush against the chassis and you cannot easily shift it.
5. Gently slide the cover until the back edge snaps into place.
6. Tighten the thumbscrew at the front of the side cover.
7. For the top cover, place the cover onto the chassis. Align the five tabs on the left side of the cover with the slots in the chassis.
8. Slide the top cover back to the rear of the chassis and tighten the thumbscrew.
9. Return the NetServer to the rack. Replace the screws removed from the front and rear.
10. Hold the bezel at 90 degrees to the left side of the NetServer. Snap the bezel clamps onto the hinge posts by pressing the bezel onto the hinge. When the bezel is snapped into place, swing the bezel closed.

Removing the LH 6000 Pedestal Covers

CAUTION	Do NOT operate the NetServer for more than 30 minutes with any cover (including power supplies and disk drives) removed. Otherwise, damage to system components may result due to improper cooling airflow.
----------------	---

1. Unlock the bezel, using the supplied key, and remove the key from the front of the NetServer. The bezel connects to the front of the NetServer chassis with two snap-in connectors at the top front of the chassis and two tabs that fit into two slots on the bottom front of the chassis.
2. To remove the bezel, pull it forward until it unsnaps, then lift the bezel forward and upward from the chassis face (action 2 and 3 of Figure 3-7).

- (1) Unlock the bezel.
- (2) Pull bezel toward you, then
- (3) up and away from the front panel, releasing the tabs from the slots at the bottom of the front panel.

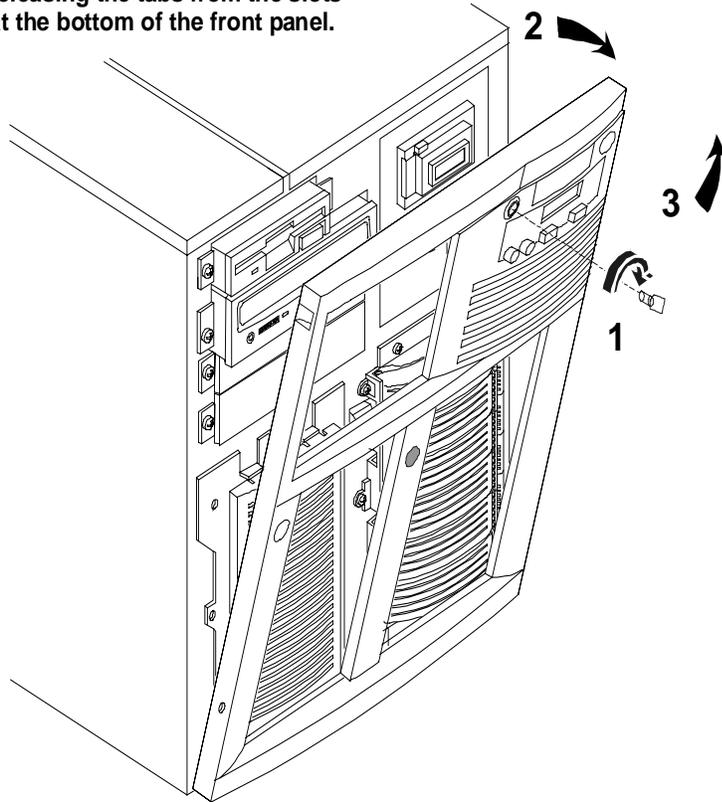


Figure 3-7. Removing the HP NetServer LH 6000 Bezel

CAUTION The NetServer covers are heavy. Support them as you remove them, and allow room to move them away from the NetServer and for storage when removed.

3. Remove the left cover by loosening the thumbscrew and then pulling the cover forward to disengage it. Lift it outward and away from the chassis (see Figure 3-8).

4. Remove the top cover by loosening the thumbscrew, pulling the cover forward and then slightly sideways to disengage it. Lift it up and away from the chassis (see Figure 3-8).
5. Remove the right cover by loosening the thumbscrew and pulling the cover forward to disengage it. Lift it outward and away from the chassis (see Figure 3-8).

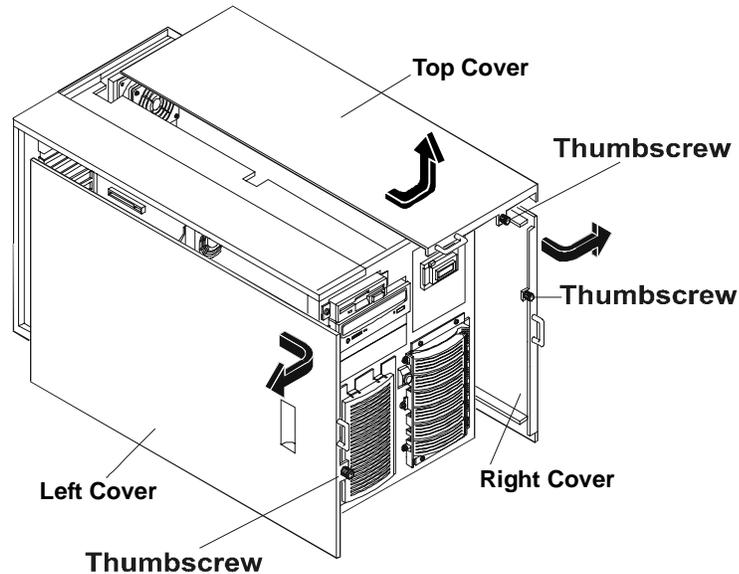


Figure 3-8. HP NetServer LH 6000 Covers

Replacing the LH 6000 Pedestal Covers

1. For each of the side covers, insert the two metal tabs, at the end opposite the handle, into the two openings at the top and bottom corners of the chassis. Hold the cover in place, but do not slide the tabs in completely.
2. Align the four, widely spaced, metal tabs on the cover's long, top edge against the top edge of the four widely spaced openings on the top of the chassis.
3. Hold the top of the cover in this position with one hand, while pressing the bottom edge of the cover with the other hand until the cover is completely flush against the chassis.

4. Check that the four closely spaced metal tabs are in their four openings at the rear of the HP NetServer. The cover is secure when all edges are flush against the chassis and you cannot easily shift it.
5. Gently slide the cover until the rear edge snaps into place.
6. Tighten the thumbscrew at the front of the cover.
7. For the top cover, place the cover onto the chassis. Align the five tabs on the left side of the cover with the slots in the chassis.
8. Slide the top cover back to the rear of the chassis and tighten the thumbscrew.
9. Replace the bezel by placing the two tabs at the bottom of the bezel into the corresponding slots on the chassis and snapping the bezel into position at the top of the chassis.
10. Lock the bezel using the supplied key and remove the key from the front of the NetServer.

4 Installing Mass Storage Devices

Introduction

The HP NetServer standard configuration is:

- One hot-swap mass storage cage (primary)
 - ◊ With requested drives installed
 - ◊ With filler panels in the slots not occupied by drives
- A flexible disk drive
- A CD-ROM 32x drive
- Non-hot-swap mass storage shelves

NOTE You can install a second hot-swap mass storage cage in the NetServer. For information, refer to the *HP NetServer LH 3000/3000r and LH 6000/6000r Mass Storage Upgrade Guide*.

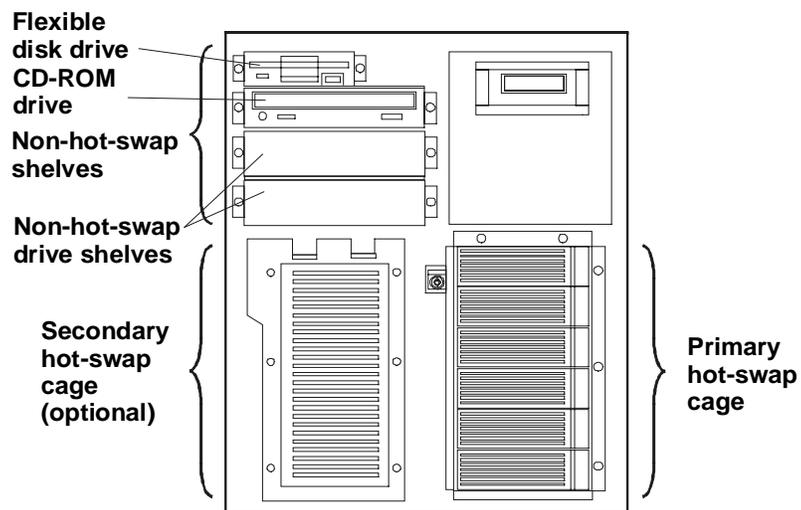


Figure 4-1. Standard Mass Storage Configuration

Mass Storage Guidelines

Read this section prior to installing mass storage drives for a successful installation.

Selecting SCSI Devices

Hot-Swap

Hot-swap mass storage consists of either low profile (1.0-inch) or half-height (1.6-inch) drives. For the hot-swap shelves use only HP LVD SCSI 3.5-inch hard disk drives. HP hot-swap drives come set for LVD SCSI operation and without device ID or termination. Do not change these settings.

Non-Hot-Swap

For the non-hot swap shelves, use 3.5-inch or 5.25-inch single-ended (SE) SCSI devices. This bay supports either two half-height or three low profile devices. You can order HP mounting kits for removable media devices or trays for 3.5-inch hard disk drives (both low profile and half-height). You may use narrow/wide SCSI adapters on these devices.

SCSI Termination

The internal SCSI cable for the non-hot-swap bays is terminated. The cable(s) for the hot-swap storage cage(s) is(are) not terminated. Do not interchange cables.

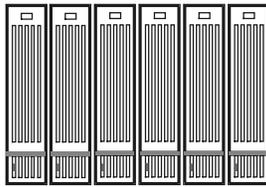
Hot-Swap Cage Configuration

A low profile drive fits within one slot. HP recommends you start configuring at slot 1 (the slot nearest the bottom of the cage) to get optimum loading of the bus.

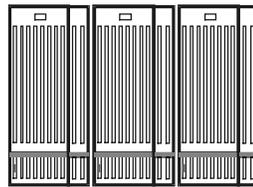
A half-height drive requires most of the space provided by two slots. Use a drive spacer to close up the remaining space.

Figure 4-2 shows primary cage (SCSI A) and Figure 4-3 shows optional secondary cage (SCSI B) configurations for the LH 6000r orientation. In installations where the cage is not fully populated, add drives from the lowest SCSI address (left most drive position) to the highest.

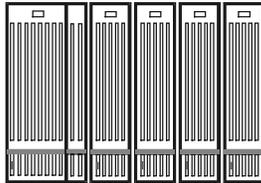
Figure 4-4 shows the configurations for duplex bus operation in the LH 6000r orientation. Duplex bus operation requires the addition of the duplexing accessory.



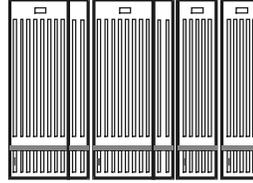
1	2	3	4	5	6	Slot Number
1	2	3	4	5	6	Disk Drive
0	1	2	3	8	9	SCSI Device ID
A	A	A	A	A	A	SCSI Bus ID



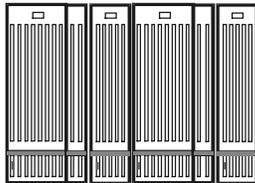
1	2	3	4	5	6	Slot Number
1		2		3		Disk Drive
0		2		8		SCSI Device ID
A		A		A		SCSI Bus ID



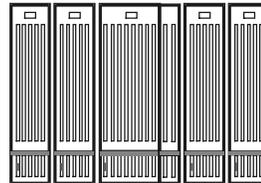
1	2	3	4	5	6	Slot Number
1		2	3	4	5	Disk Drive
0		2	3	8	9	SCSI Device ID
A		A	A	A	A	SCSI Bus ID



1	2	3	4	5	6	Slot Number
1		2		3	4	Disk Drive
0		2		8	9	SCSI Device ID
A		A		A	A	SCSI Bus ID



1	2	3	4	5	6	Slot Number
1		2	3		4	Disk Drive
0		2	3		9	SCSI Device ID
A		A	A		A	SCSI Bus ID



1	2	3	4	5	6	Slot Number
1	2	3	4	5	6	Disk Drive
0	1	2		8	9	SCSI Device ID
A	A	A		A	A	SCSI Bus ID

Figure 4-2. Mass Storage Configurations (Primary Cage)

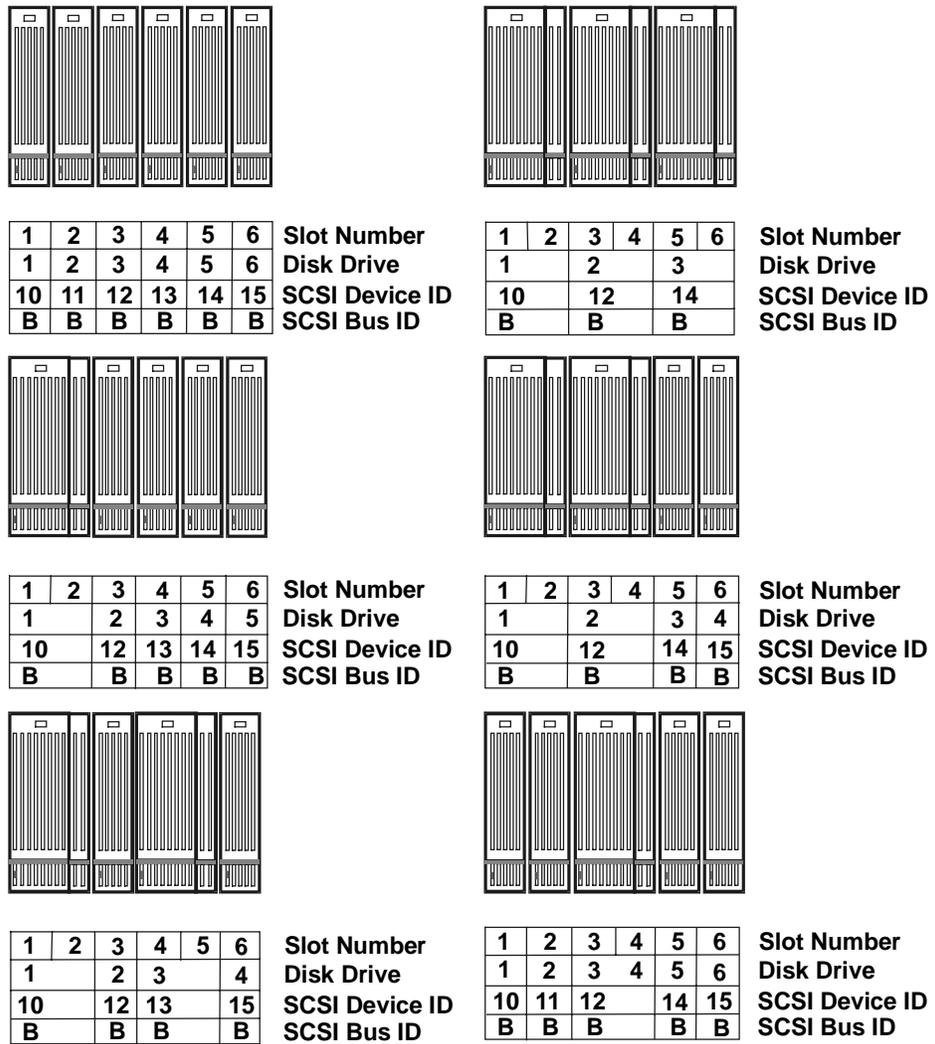


Figure 4-3. Mass Storage Configurations (Optional Secondary Cage)

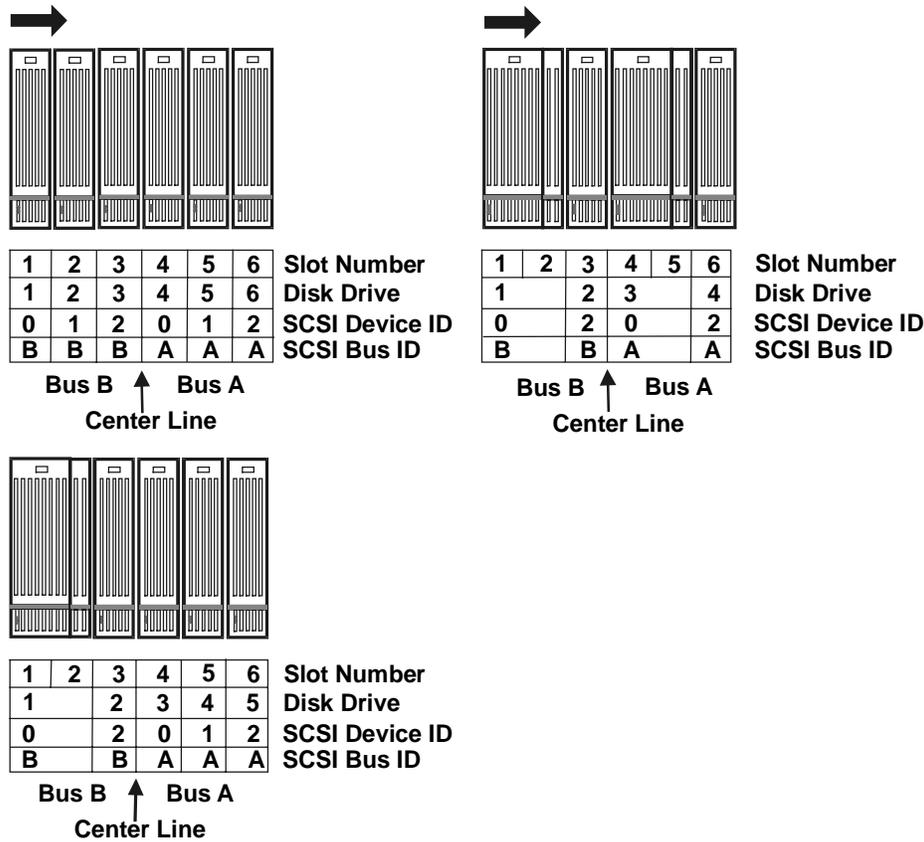


Figure 4-4. Duplex Mass Storage Configurations

Boot Priority

This is the default boot priority for the LH 6000r and LH 6000:

1. IDE CD-ROM drive with a bootable CD-ROM
2. Flexible disk drive with a bootable flexible disk
3. Embedded SCSI controller or integrated HP NetRAID controller.
SCSI channel A precedes channel B. On a SCSI bus, boot order follows the ascending order: 0, 1, 2, 3....
4. PCI boards in slots in descending order: 8, 7, 6, 5, 4, 3, 2, and 1

You can change this boot order using the Setup utility (press [F2] during the boot process. See Chapter 10, "Configuring the HP NetServer."

NOTE Use the Symbios (SCSI) Configuration Utility to configure the HP NetServer to ignore the onboard SCSI channels and to select a different PCI slot for boot devices. Refer to the Symbios (SCSI) Configuration Utility on the *HP NetServer Online Documentation CD-ROM* under *Information Assistant/NetServer LH 6000/LH 6000r/Configure*.

Installing Hot-Swap Mass Storage

The procedure for installing additional hot-swap mass-storage is the same for all HP NetServer versions.

<p>CAUTION Protect the drive from static electricity by leaving it in its anti-static bag until you are ready to install it. Before handling the drive, touch any unpainted metal surface to discharge static electricity. When you remove the drive from the anti-static bag, handle it only by the frame.</p> <p><i>Do not touch</i> the electrical components. Place the drive on the anti-static bag whenever you set it down.</p>

1. Remove necessary filler panels:
 - a. Verify that the drive cage is unlocked prior to removing panels.
 - b. Press in the locking latch and insert your fingers.
 - c. Using your fingers, pull the blue filler panel straight out (see Figure 4-5).

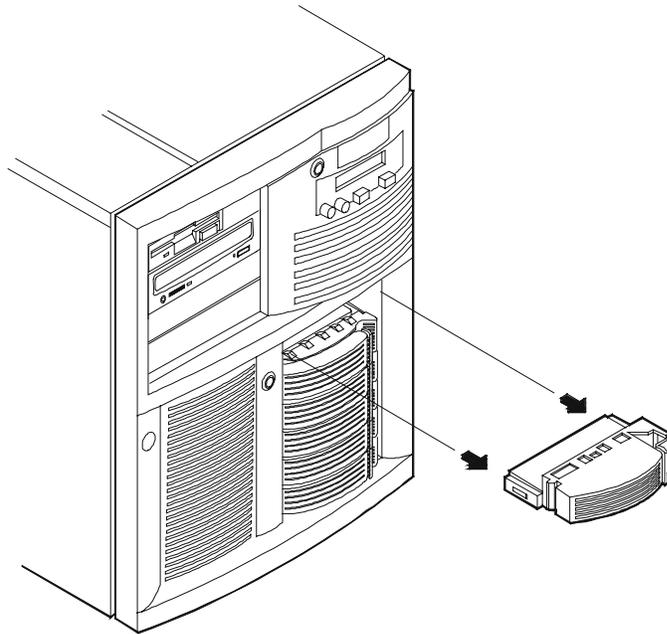


Figure 4-5. Hot-Swap Drive and Filler Panel

CAUTION

When installing more than one drive, do not stack drives on your work surface. Hard disk drives are very susceptible to mechanical shock and can be damaged by a drop as short as one-quarter of an inch. Take care when unpacking and handling the drive. If the drop would crack an egg, it will damage the drive.

2. Drive spacers attach to the disk drive module with four small feet. If you need to remove a drive spacer from a disk drive slot:
 - Slide the drive spacer back, a fraction of an inch away from your body.
 - Tilt up the front of the drive spacer to disengage the front two feet.
 - Pull the drive spacer forward slightly to disengage the back two feet and lift (see Figure 4-6).

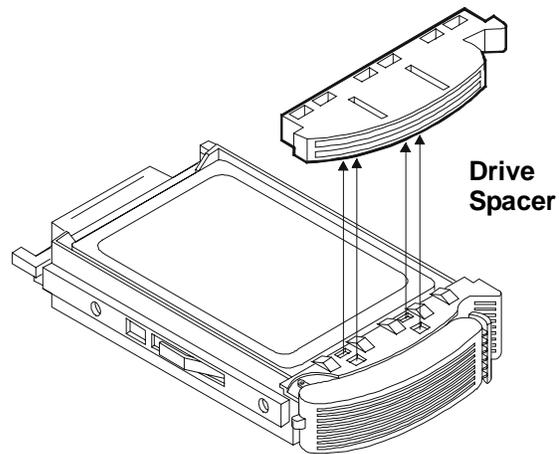


Figure 4-6. Removing the Drive Spacer

3. Open the drive module by pressing in on the locking latch at the end of the drive ejector handle and pulling open the handle.

CAUTION

Be careful when you open the ejector handle. Extreme force can snap off the handle. Be careful not to damage the light pipes as you insert the drive. They are very fragile.

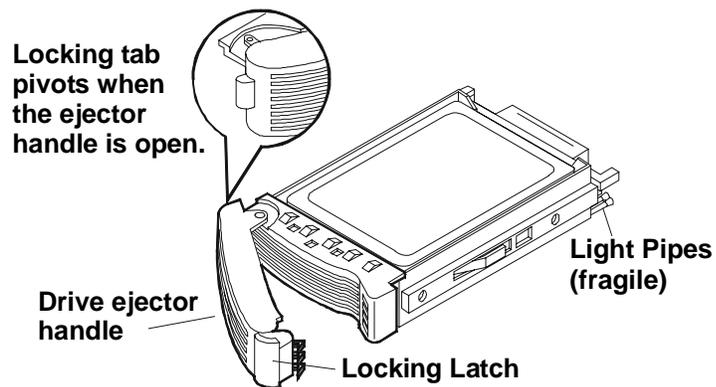


Figure 4-7. Ready Drive for Installation

4. With the drive ejector handle open, gently slide the module into the cage. Stop when you feel resistance.
5. For the LH 6000r, slowly close the ejector handle. Verify that the pin behind the pivot end of the handle engages the hole in the edge of the cage.
6. For the LH 6000, verify that the locking pin behind the pivot end of the handle engages the hole in the chassis (see Figure 4-8).

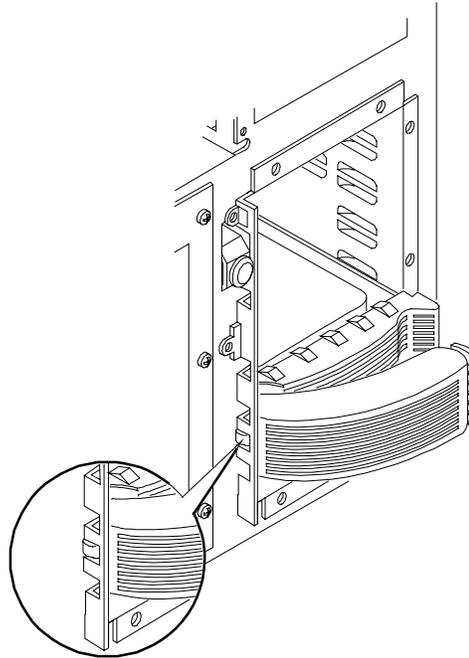


Figure 4-8. Locking Tab Location

7. With even pressure, gently close the ejector handle until the locking latch clicks shut.

NOTE Closing the ejector handle engages the drive with the electrical connector in the hot-swap mass storage cage and seats the drive.

8. If the drive is unseated in the cage after closing the ejector handle, repeat step 5.

Removing a Hot-Swap Hard Disk Drive Module

CAUTION	You must remove the drive slowly to ensure the drive heads <i>are parked prior to removal</i> . Ensure you follow these instructions carefully to prevent handling damage, such as head slaps or head actuator unlocking.
----------------	---

1. To unlock the drive, push the locking latch in and then pull the ejector handle toward you (see Figure 4-7).
2. Gently pull the drive out about an inch to disengage the power connection.
3. Wait about 30 seconds for the drive to stop spinning and the drive heads to park.
4. Use your hand to support the bottom of the drive, while you slowly pull the drive straight out. *Do not allow the drive to fall.*
5. Place the drive in an electrostatic protected container. Do not stack drives.

Installing Non-Hot-Swap Mass Storage

For information on device requirements and options, see the preceding section entitled "Selecting SCSI Devices."

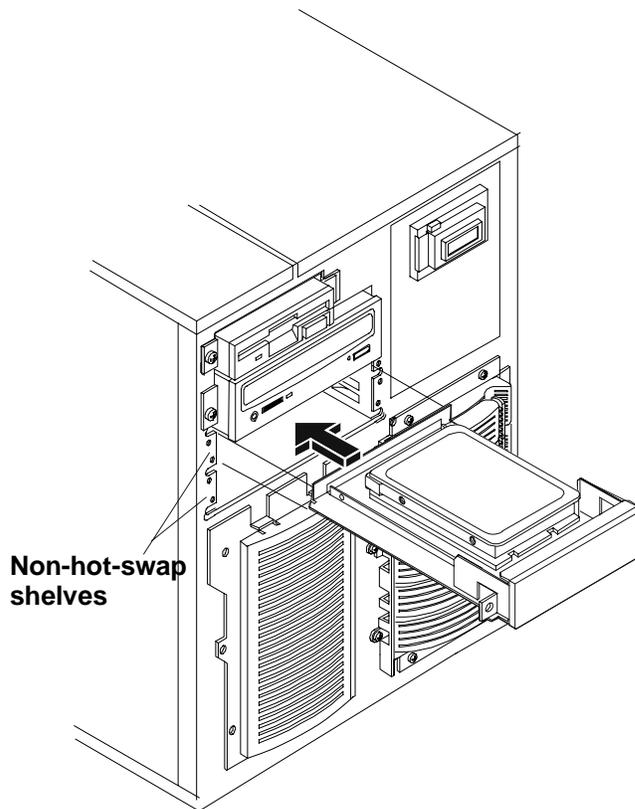


Figure 4-9. Non-Hot-Swap Shelf in LH 6000

CAUTION

Protect the drive from static electricity by leaving it in its anti-static bag until you are ready to install it. Before handling the drive, touch any unpainted metal surface to discharge static electricity. When you remove the drive from the anti-static bag, handle it only by the frame.

Do not touch the electrical components. Place the drive on the anti-static bag whenever you set it down.

When installing more than one drive, do not stack drives on your work surface. Hard disk drives are very susceptible to mechanical shock and can be damaged by a drop as short as one-quarter of an inch. Take care when unpacking and handling the drive. If the drop would crack an egg, it will damage the drive.

To install a non-hot-swap, mass storage device, such as a flexible tape drive, CD-ROM drive, tape back-up drive or hard disk drive.

The installation procedure is the same for the rack-mount and the pedestal NetServers once you gain access to the server.

1. Log off all users and gracefully shut down the network operating system according to directions in your NOS documentation.
2. Power down the NetServer according to the instructions in Chapter 2, "Controls, Ports, and Indicators."
3. Disconnect the power cords and cables and, if necessary, label each one to support re-assembly.

CAUTION	The power supplies will continue to provide standby current to the NetServer until the power cables are disconnected.
----------------	---

4. For both rack-mounted and pedestal models, follow the instructions in Chapter 3, "Opening and Closing the HP NetServer," to gain access to server.
5. Select an available shelf for the device and remove the filler panel.
6. If the device you are installing is the boot device, check the boot priority.
7. Mount the device on a mass storage tray following the directions included with the tray.
8. Slide the module into the shelf opening and secure the tray using the two mounting screws included with the tray.
9. Connect the cable from the power supply and the SE SCSI cable from the I/O board to the device.
10. Follow the procedure in Chapter 3, "Opening and Closing the HP NetServer," for closing up the server.
11. Reconnect power and cables.
12. Restore NetServer to normal operation.

Non-Hot-Swap SCSI Addressing

Each SCSI device must have a unique SCSI address. Each device connected to either of the SCSI connectors must have a unique address (narrow devices may use addresses 0-6; wide devices may use addresses 0-15, except address 7).

Address 5 in the hot-swap cage is reserved for the SAF-TE interface. This address is also excluded when the secondary hot-swap cage is installed.

Connecting SCSI Sub-systems

The second LVD SCSI connector, bus B, can be used to connect to peripheral sub-systems such as the HP RS/12 or DLT tape libraries.

CAUTION	Do not mix high voltage differential (HVD) driver and receiver devices with the SE, LVD (Ultra2), or multi-mode devices on the same SCSI bus.
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Integrated HP NetRAID

The HP NetServer contains an integrated HP NetRAID controller, which puts the power of the HP NetRAID series of DACs (disk array controllers) in the NetServer with no additional hardware.

Refer to the *Integrated HP NetRAID Controller Configuration Guide* for complete information. You can also find the guide on the following HP web site:

<http://www.hp.com/go/netserver>

Secondary Hot-Swap Mass Storage Cage

You can install a second hot-swap mass storage cage in the NetServer. For information, refer to the *HP NetServer LH 3000/3000r and LH 6000/6000r Mass Storage Upgrade Guide*.

Single and Dual SCSI Bus Configuration

You can configure each hot-swap mass storage cage to operate as:

- A single SCSI bus with up to six drives
- Two independent SCSI busses with up to three drives on each buss (requires optional duplex board accessory kit)

The advantage of the dual bus configuration is that you can put the drives for boot and mirror functions on one bus and the drives for data on another.

5 Installing Additional Memory

Introduction

This chapter describes how to add memory to the HP NetServer LH 6000r or the HP NetServer LH 6000. The standard configuration ships with 256 MB of interleaved memory, one 128 MB DIMM in slot 1A and one 128 MB DIMM in slot 1B. Expansion is accomplished by adding pairs of equal size DIMMs in stipulated slots up to the maximum configuration of 8 GB.

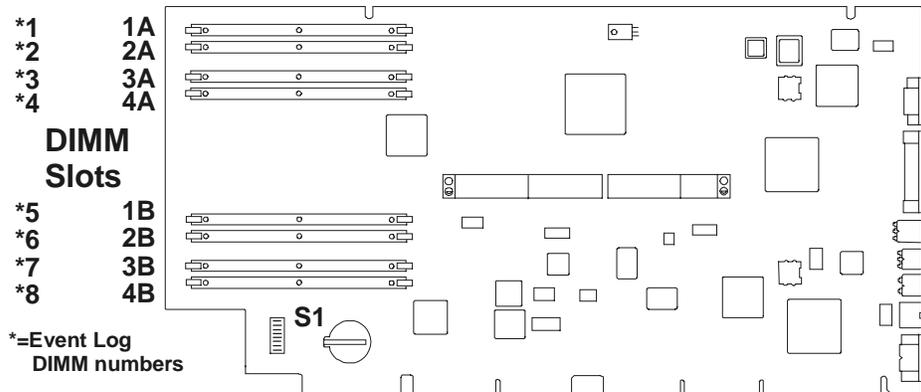


Figure 5-1. DIMM slots on System Board

Memory Guidelines

- Add paired DIMMs of these sizes:
 - ◇ 128 MB
 - ◇ 256 MB
 - ◇ 512 MB
 - ◇ 1 GB
- Memory of equal size must be added in pairs.
- You can mix DIMM sizes. For example, you may place a 1 GB DIMM pair next to a 128 MB DIMM pair.
- Add memory in pairs and in any order to the three remaining slot pairs.
- Maximum configuration is 8 GB.
- Do not rock the DIMM into place, but apply firm and even pressure until it is seated in the slot.
- Use only HP-supported DIMMs.

Installing Memory in the LH 6000r and LH 6000

CAUTION Extend the anti-tip foot from under the front of the rack or insure that the anti-tip feature is installed.

The installation procedure is the same for the rack-mount and the pedestal NetServers once you gain access to the system board assembly.

1. Log off all users and gracefully shut down the network operating system according to directions in your NOS documentation.
2. Power down the NetServer according to the instructions in Chapter 2, "Controls, Ports, and Indicators."

CAUTION The power supplies will continue to provide standby current to the NetServer until the power cables are disconnected.

3. Disconnect the power cords and cables and, if necessary, label each one to support re-assembly.
4. For both rack-mounted and pedestal models, follow the instructions in Chapter 3, "Opening and Closing the HP NetServer," to gain access to the system board assembly.

WARNING Always disconnect the power cords before removing the covers to avoid exposure to high energy levels that may cause burns when parts are short-circuited by metal objects such as tools or jewelry. Disconnect any telephone cables to avoid exposure to shock hazard from telephone ringing voltages.

While you can perform memory installation in the rack or in the pedestal, it is recommended that you remove the system board assembly in order to install components.

NOTE In the LH 6000r, this assembly is under the right cover; in the LH 6000, it is under the top cover.

If you decide to install memory without removing the system board assembly, the DIMM slots region of the system board may be accessed by removing the bottom cover on the rack-mounted NetServer or the right cover on the pedestal NetServer.

5. Remove the two screws securing the system board assembly to the chassis (see Figures 5-2 and 5-3).
6. Unlatch the blue retaining latches to release the assembly.

CAUTION Wear a wrist-strap and use a static-dissipating work surface connected to the chassis when handling components. Ensure the metal of the wrist strap contacts your skin.

7. Pull the assembly out until it clears the chassis guides.

CAUTION The System Board Assembly weighs approximately 20 lbs. (9 kgs). Support it at the bottom as it is removed from the chassis.

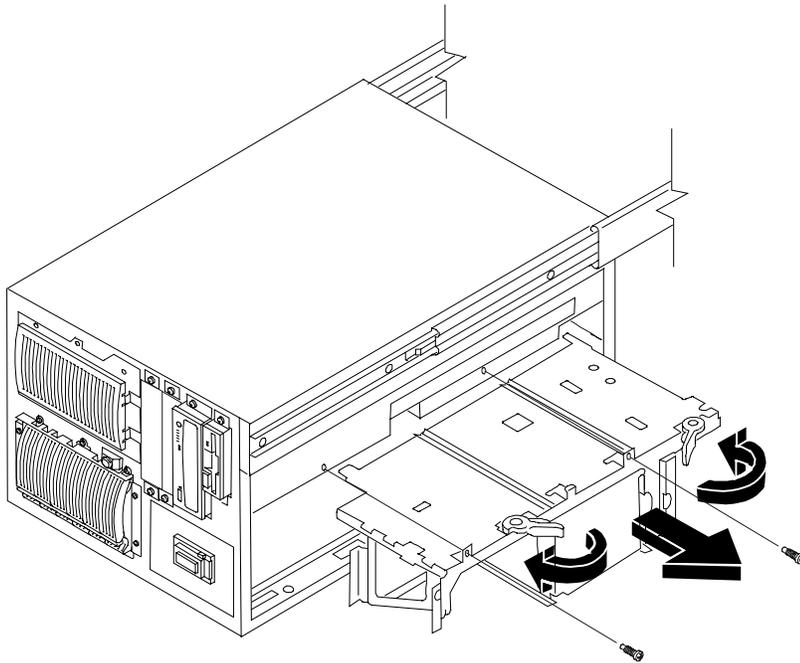


Figure 5-2. Removing the System Board Assembly from the LH 6000r NetServer

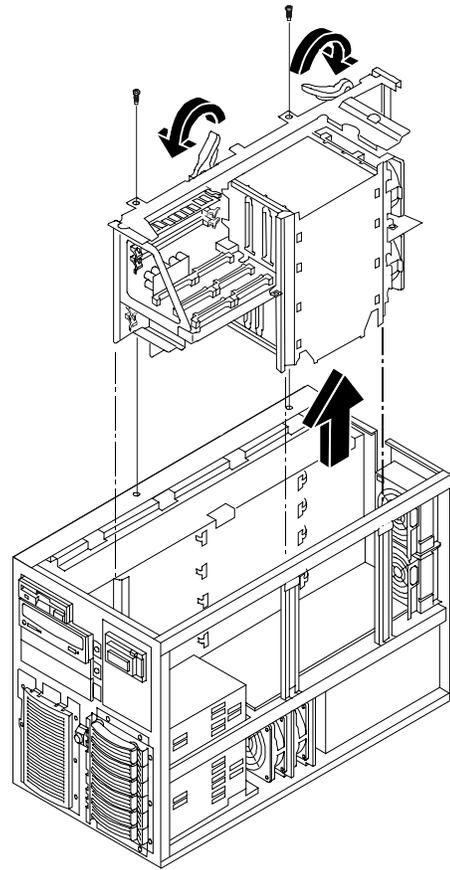


Figure 5-3. Removing the System Board Assembly from the LH 6000 NetServer

CAUTION	The System Board Assembly weighs approximately 20 lbs. (9 kgs). Support it at the bottom as it is removed from the chassis.
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8. Slide the system board assembly from the chassis and place it metal plate side down on an anti-static pad.

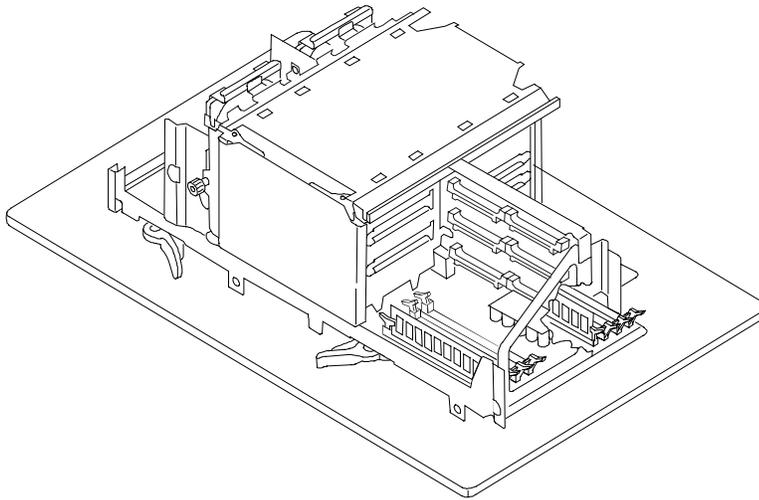


Figure 5-4. System Board Assembly on Grounded Anti-static pad

9. Identify the slot locations for the DIMM pair(s) being added:

Table 5-1. Paired Memory Slots

Slot 1A and Slot 1B
Slot 2A and Slot 2B
Slot 3A and Slot 3B
Slot 4A and Slot 4B

10. Install the DIMM pairs:
- a. Spread the latches outward on each slot receiving a DIMM.
 - b. Remove a DIMM from its anti-static bag, handling the module by its edges.
 - c. Align the notches on the DIMM with the slot keys on the slot (see Figure 5-5).
 - d. Press the DIMM into the slot until the latches close.

CAUTION	<i>Do not rock the DIMM into place, but apply firm and even pressure. If a gap exists between the retaining latches and the DIMM, remove and replace the module until no gap exists.</i>
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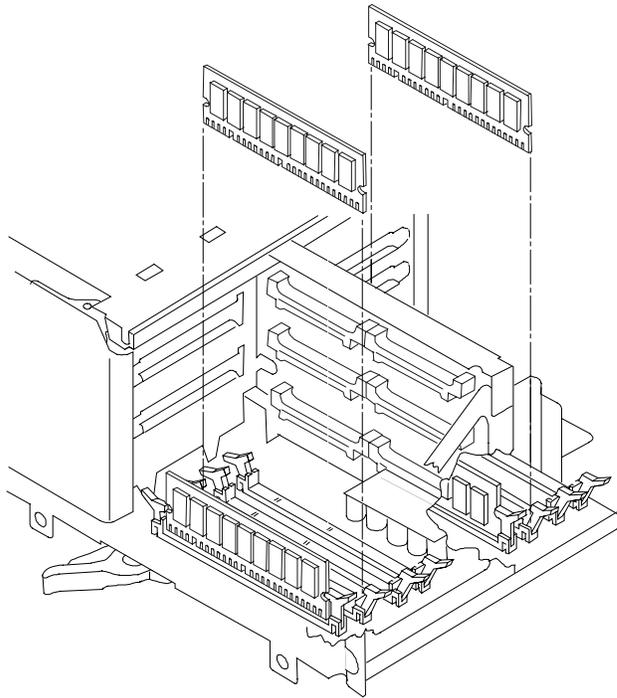


Figure 5-5. Align DIMM Notches with slot keys

NOTE If the latches do not close, repeat until they do.

Repeat step 10 to install all of the DIMMs for your memory configuration.

11. Carefully reinsert the system board assembly into its guides, and reseal it into its slot by rotating the blue latches to the flat, locked position.
12. Replace the two screws securing the system board assembly to the chassis.
13. Follow the procedure in Chapter 3, "Opening and Closing the HP NetServer," for closing up the server.
14. Reconnect power and cables.
15. Restore NetServer to normal operation.

This completes your DIMM installation.

6 Installing Additional Boards

Introduction

This chapter describes how to install accessory boards into the I/O board. The I/O board is located under the top cover of the LH 6000r and under the left cover of the LH 6000. Refer to Chapter 3, "Opening and Closing the HP NetServer," for instructions on removing the covers.

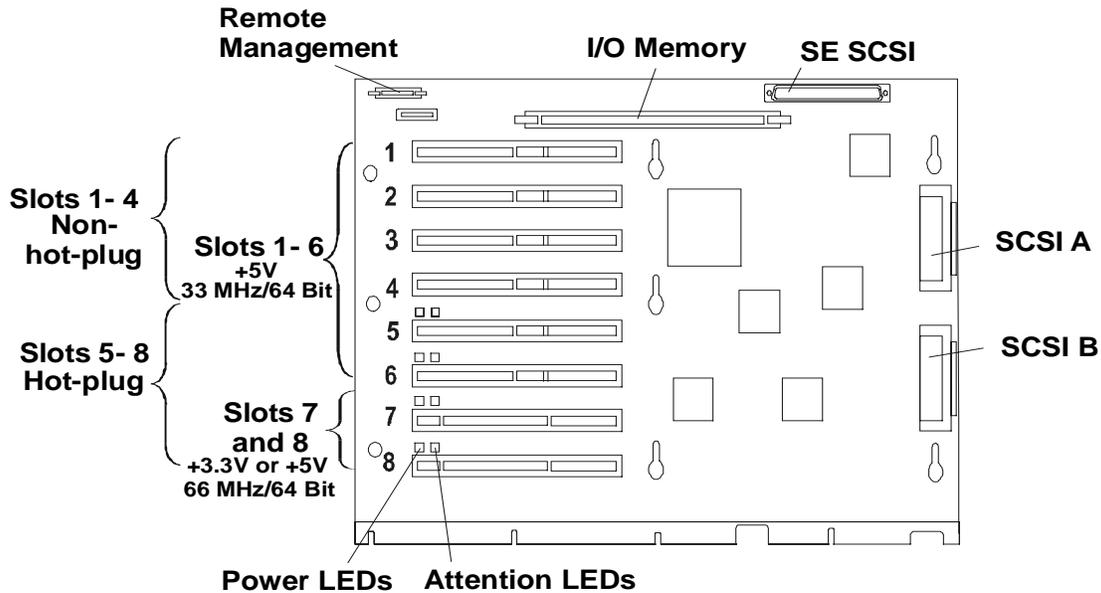


Figure 6-1. I/O Board

The I/O board provides eight slots. All eight slots support standard PCI boards and slots 5, 6, 7, and 8 support PCI boards with the Hot Plug option.

The I/O board comprises:

- Eight PCI Board slots
- The PCI Hot-Plug LEDs
- The two Ultra-2 SCSI connectors, A and B

- The external storage SE SCSI connector
- The I₂O Memory slot, which contains cache memory used by the embedded RAID controller (Intel i960RN I/O processor) (32 MB standard, which can be upgraded to 64 MB or 128 MB)
- The Remote Management connector, linking the I/O board to the external connector on the rear panel

Guidelines

- Use the respective NOS software utility to:
 - ◊ Ensure the correct software drivers for the PCI boards are loaded
 - ◊ Verify correct operation
- Slots 1, 2, 3, and 4 are non-hot plugs; slots 5, 6, 7, and 8 are hot plugs.
- For optimal performance, add hot-plug boards to slots 7 and 8, which are the fastest slots (66MHz and 64 bit).
- Consider the boot priority prior to installing accessory boards.
- You can configure the NetServer to boot from a PCI accessory board instead of the onboard SCSI channels by putting the board in slot 1.
- You can configure the NetServer to boot from a PCI-based DAC inserted into a PCI slot. Use the Symbios Configuration Utility to select a different PCI slot when scanning for boot devices. Refer to Chapter 10, "Configuring the HP NetServer."
- Slots 7 and 8 accept universal boards. Universal boards automatically switch to accept power from +5.0 or +3.3 VDC.
- Do not attempt to install or remove non-hot plug PCI boards with the NetServer in any kind of sleep state, or a system crash or hang may occur. See Chapter 2, "Controls, Ports, and Indicators," in the "Sleep States" section.
- Some accessory board outputs may exceed U.S. National Electrical code (NFPA 70) Class 2 or power source limits and must use appropriate interconnecting cabling in accordance with the National Electrical Code. (All Hewlett-Packard boards comply with Class 2.)

IRQ Settings

BIOS automatically assigns the IRQs (hardware interrupts) for each PCI slot and embedded device in the NetServer during boot. These assignments trigger the NOS to enable the APIC (Advanced Programmable Interrupt Controller). APIC takes advantage of the expanded set of non-conflicting IRQs for those accessory boards requiring more than one IRQ per slot.

Boot Priority

Some accessory boards have preferred slot locations. If not, consider the boot order when choosing the accessory board slot in which to install the board.

This is the default boot priority for the LH 6000r and LH 6000:

1. IDE CD-ROM drive with a bootable CD-ROM
2. Flexible disk drive with a bootable flexible disk
3. Embedded SCSI controller or integrated HP NetRAID controller
4. PCI boards in slots in descending order: 8, 7, 6, 5, 4, 3, 2, and 1

You can change this boot order using the Setup utility. Press **[F2]** during the boot process as described in Chapter 10, "Configuring the HP Server."

Tested PCI Boards and Drivers

For a list of tested PCI boards, check Configuration Assistant on the *HP NetServer Navigator CD-ROM*, or look for the Hardware Tested Products List link for the LH 6000r and LH 6000 under HP NetServer Service and Support for the NOS used at:

<http://www.hp.com/netserver/support/compatibility/compatibility.asp>

For current PCI Hot Plug information regarding NOS support and the availability of PCI Hot Plug compliant drivers, search for *pcihotplug* on HP's website at:

<http://www.hp.com/netserver/products/LH6000>

Installing Accessory Boards

NOTE To perform a *hot add*, or a *hot replacement* when the HP NetServer is powered up, refer to help information provided on the *HP NetServer Navigator CD-ROM* provided with your NetServer.

Use this procedure to install all PCI accessory boards for the following situations:

- The initial installation of PCI Hot Plug boards
- All PCI boards without hot-plug compliant drivers installed or removed in slots 1 through 8.
- Read the documentation included with each board and follow any special instructions provided.

<p>CAUTION</p>	<p><u>For non-Hot Plug PCIs:</u> To prevent a system crash or hang, never open the PCI latch and retainer of a PCI board with the NetServer powered on. Always turn power off to the NetServer before opening the PCI latch and retainer.</p> <p><u>For Hot Plug PCIs:</u> Only a PCI Hot Plug utility allows you to turn power off to the slot, before opening the PCI latch and retainer with power applied to the NetServer.</p>
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The installation procedure is the same for the rack-mount and the pedestal NetServers once you gain access to the I/O board.

1. Log off all users and gracefully shut down the network operating system according to directions in your NOS documentation.
2. Power down the NetServer according to the instructions in Chapter 2, "Controls, Ports, and Indicators."
3. Disconnect the power cords and cables and, if necessary, label each one to support re-assembly.

<p>CAUTION</p>	<p>The power supplies will continue to provide standby current to the NetServer until the power cables are disconnected.</p>
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- For both rack-mounted and pedestal models, follow the instructions in Chapter 3, "Opening and Closing the HP NetServer," to gain access to the I/O board.

NOTE In the LH 6000r, this assembly is under the top cover; in the LH 6000, it is under the left cover.

- Consider the boot priority before installing any accessory boards.
For details, refer to the topic *Boot Priority* earlier in this chapter. If installing a SCSI controller board, the controller's priority (boot order) is set by the board's slot location.
- Identify the desired slot (1 through 8), before installing the accessory board (see Figure 6-1).

NOTE The PCI slot covers use the PCI hold-down latch and retainer to hold the slot cover in place.

- Release the PCI slot cover by rotating the locking lever clockwise to clear the retainer (see Figure 6-2).
- Remove the PCI slot cover from the NetServer's rear panel, before installing the new board into the slot (see Figure 6-3).
- Lift the retainer and remove the slot cover.
- Remove the PCI front board hold down before installing the new PCI board (see Figure 6-4).

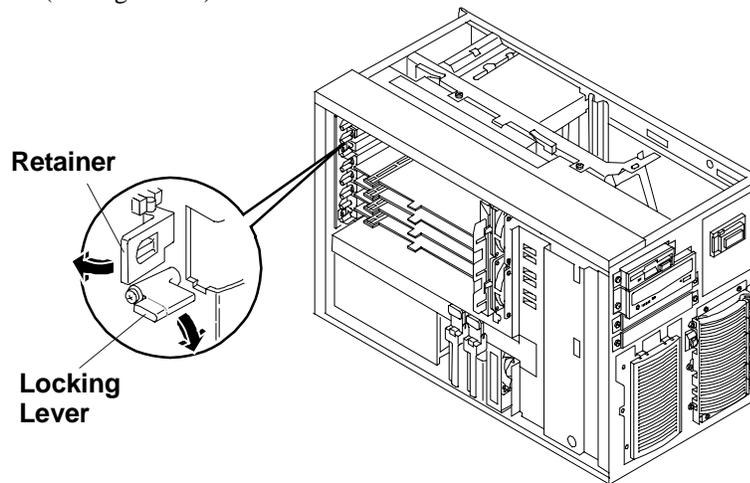


Figure 6-2. Opening the PCI Latch and Retainer

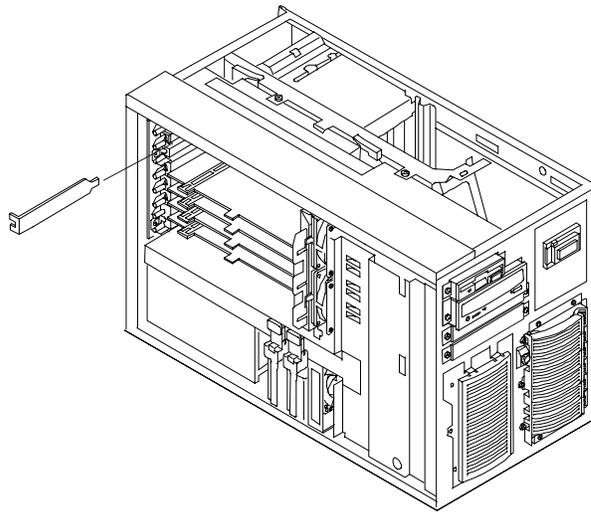


Figure 6-3. Removing a PCI Slot Cover

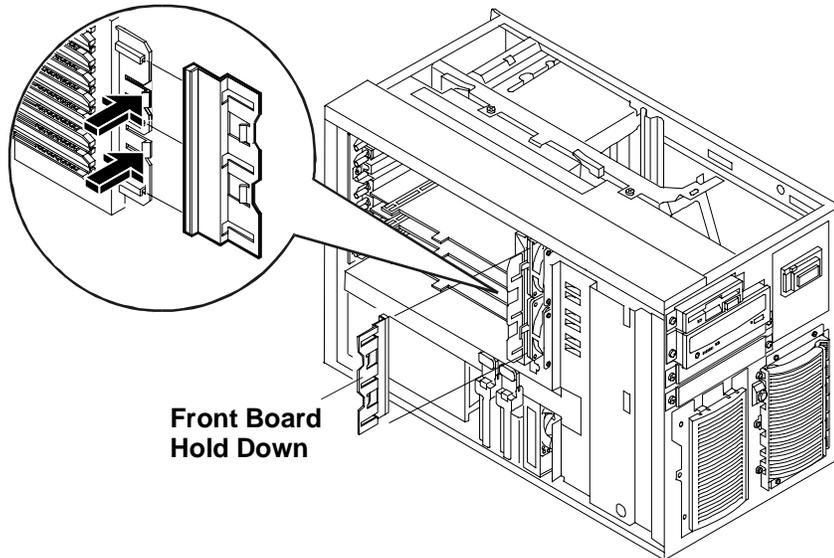


Figure 6-4. Removing Front Board Hold Down

NOTE To prevent intermittent problems, ensure each unused PCI slot has a PCI slot cover. If a PCI board is removed and not re-installed, you must install a PCI slot cover.

<p>CAUTION Do not bend the PCI board to install it into the slot.</p> <p>If the PCI board is full-length, the PCI front board hold-down at the rear of the PCI slot is used to hold the board in place. The front board hold down prevents the board from moving during NetServer transportation and handling.</p>

11. Before installing the PCI board:
 - ◇ Verify there is no handle attached to it, especially if it is a full-length board.
 - ◇ If it has a handle attached, remove the handle before installing the board into the slot.
12. Align the board with its slot, along its full length, and position it into the slot (see Figure 6-5).

NOTE Slots are keyed to prevent a board from going into the wrong slot.

13. Push the PCI board down into its connector in the I/O board.

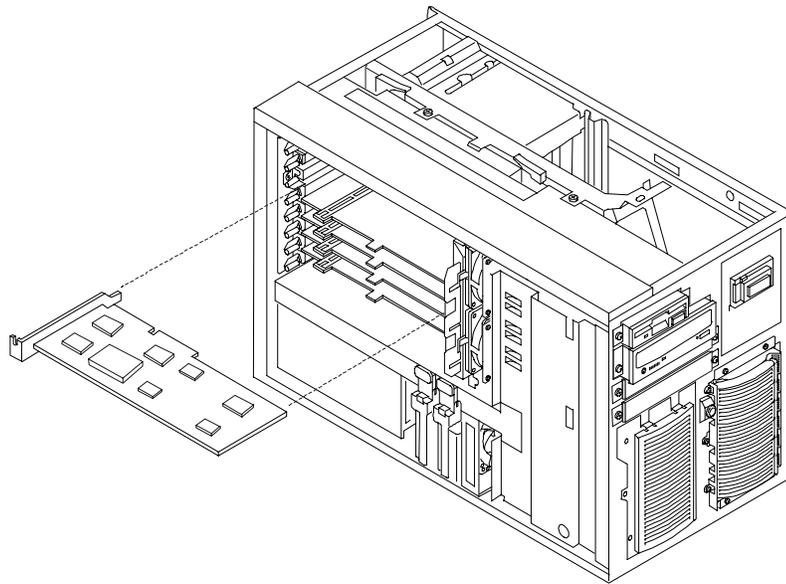


Figure 6-5. Installing an Accessory Board

14. Lower the retainer.
15. Secure the PCI board by rotating the locking lever counter-clockwise to hold the retainer (see Figure 6-3).

NOTE Be sure the PCI latch and retainer close fully so that the slot will power on when the NetServer reboots.

16. Replace the PCI front board hold down.
17. If the installed accessory board requires an external connection, or a connection to the I/O board, ensure the cable is properly attached.
Refer to the accessory board documentation for connection requirements.
18. Follow the procedure in Chapter 3, "Opening and Closing the HP NetServer," for closing up the server.
19. Reconnect power and cables.
20. Power on the HP NetServer according to the respective NOS power up instructions.

NOTE All PCI slots (with the PCI hold-down latch closed) power on and the HP NetServer recognizes all new boards when it reboots, regardless of the presence of a driver or a PCI Hot Plug Utility.

If the PCI board requires a driver (non-hot plug-compliant or hot plug-compliant) that is not loaded during NOS installation, you must load the driver according to the respective NOS's driver installation process before you can use the board. Refer to *PCI Hot Plug Help* on the *HP NetServer Navigator CD-ROM* for more hot-plug information.

21. Use the respective NOS to ensure the correct software drivers for the PCI board are loaded and verify correction operation.

NOTE If the hot-plug compliant driver and the Hot Plug Utility are not loaded during the configuration process (NOS installation), you will not be able to use the Hot Plug option until the utility and drivers are loaded. Refer to the respective NOS Hot Plug Help files to load the Hot Plug Utility and hot plug compliant drivers and then initialize the driver(s) if it is not done automatically.

22. Restore the HP NetServer to normal operation.

PCI Hot Plug Boards

The PCI Hot Plug option is NOS dependent. To use the Hot Plug option, the PCI board must have a hot-plug compliant driver and a Hot Plug Utility for the respective NOS. The Hot Plug Utility is used to turn power off/on to the PCI slot, while the NetServer continues to operate.

If the hot-plug compliant driver and the Hot Plug Utility are not loaded during the configuration process (NOS installation), you will not be able to use the Hot Plug option. Refer to the respective NOS Hot Plug Help files for instructions on loading the Hot Plug Utility and hot-plug compliant drivers, load then initialize the driver(s) if it is not done automatically.

For current PCI Hot Plug information regarding NOS support and the availability of PCI Hot Plug compliant drivers, search for *PCI Hot Plug* on HP's web site at:

<http://netserver.hp.com/netserver/products/>

To access the PCI Hot Plug Replacement procedures for the respective NOS, you must have the *HP NetServer Navigator CD-ROM* provided with the HP NetServer LH 6000.

To view the respective Hot Plug Replacement (NOS) procedures:

1. Insert the *HP NetServer Navigator CD-ROM* into a CD drive.
2. Select *NetServers LH-Series* button.
3. Scroll down to and select *NetServer LH 6000* in the list.
4. Select *Install*.
5. Select *Installing Accessory Boards*.
6. Select the appropriate *Hot Plug Replacement* topic.

NOTE	To perform a <i>hot add</i> , or a <i>hot replacement</i> when the HP NetServer is powered up, refer to the PCI Hot Plug Help file on the <i>HP NetServer Navigator CD-ROM</i> .
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Removing a Hot Plug Board

To remove a hot-plug board from the HP NetServer which has not been powered up:

1. Make sure power is off and follow the instructions for accessing the I/O board.
2. Open the PCI hold-down latch.
3. Pull the gray plastic slot ejector (see Figure 6-6) out until you feel resistance (about three-eighths of an inch, or 10mm).

This releases the hot-plug board from the I/O board connector.

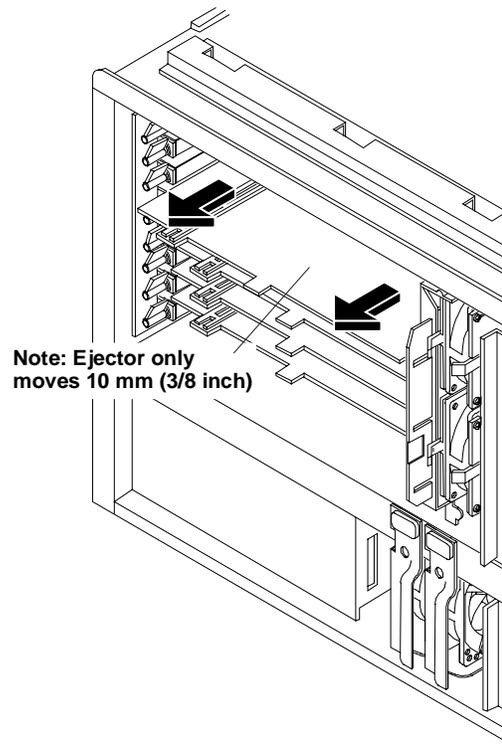


Figure 6-6. Removing a Hot Plug Board

4. Remove the hot-plug board.
5. Either replace the hot-plug board or reinstall the slot cover.
6. Close the PCI hold-down latch.

7 Installing Additional Processors

Introduction

The HP NetServer LH 6000 and the HP NetServer LH 6000r support up to six processors and accompanying voltage regulation modules (VRMs) on the system board assembly. The HP NetServer LH 6000 and the HP NetServer LH 6000r ship with one processor and an accompanying voltage regulation module (VRM) in the initial slots (Slot 1).

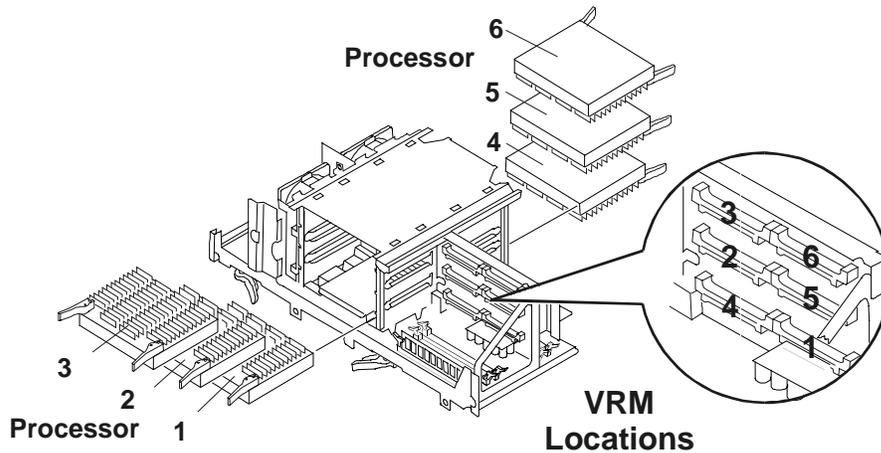


Figure 7-1. Processor and VRM Locations

Configuration Guidelines

- Use only processor upgrade kits with the same HP product number. This ensures the processor type, clock speed, and cache size match, and that the processor stepping is compatible.
- Be sure that the VRM and the processor module associated with it are installed in the proper slots.

CAUTION	Do not remove the processor from its bag until you are ready to install it. Make sure the bag remains sealed.
----------------	---

CAUTION Before you remove a processor from the anti-static container, touch a grounded, unpainted metal surface on the HP NetServer to discharge static electricity.

Do not change the processor speed switches as this can result in unreliable or intermittent performance, and data integrity may also be at risk.

Installing the Processor

The installation procedure is the same for the rack-mount and the pedestal NetServer once you gain access to the system board assembly.

1. Log off all users and gracefully shut down the network operating system according to directions in your NOS documentation.
2. Power down the NetServer according to the instructions in Chapter 2, "Controls, Ports, and Indicators."
3. Disconnect the power cords and cables and, if necessary, label each one to support re-assembly.

CAUTION The power supplies will continue to provide standby current to the NetServer until the power cable is disconnected.

4. For both rack-mounted and pedestal models, follow the instructions in Chapter 3, "Opening and Closing the HP NetServer," to gain access to the system board assembly.

NOTE In the LH 6000r, this assembly is under the right cover; in the LH 6000, it is under the top cover.

5. Remove the system board assembly from the chassis.

CAUTION The System Board Assembly weighs approximately 20 lbs. (9 kgs). Support it at the bottom as it is removed from the chassis.

CAUTION Wear a wrist-strap and use a static-dissipating work surface connected to the chassis when handling components. Ensure the metal of the wrist strap contacts your skin.

6. Place the system board assembly on an anti-static pad.
7. Unpack the processor shipping box and check the contents against its packing list.

CAUTION Do not remove the processor from its bag until you are ready to install it. Make sure the bag remains sealed.

8. Loosen the thumbscrew and open the access cover to the processor slots (see Figure 7-2).

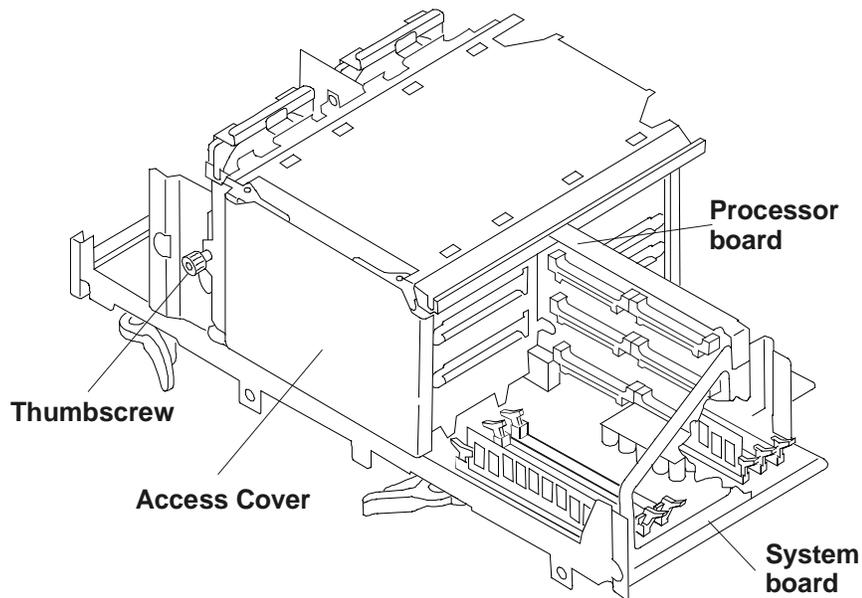


Figure 7-2. Access to the Processors

9. Remove the processor to be added from the sealed bag.
10. Open the latches and remove the slot terminator/baffle from the next available slot as shown in Figure 7-3.
11. Open the latches on top of the processor.

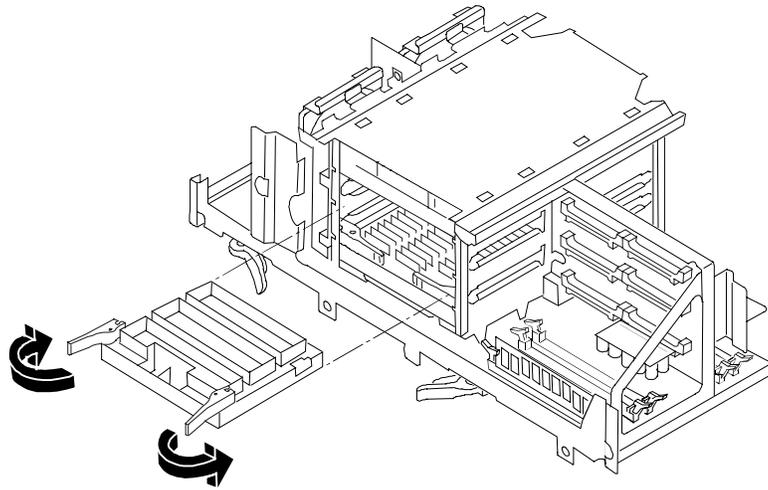


Figure 7-3. Open the Latches

12. Align the processor being added over the next available slot so that the heat sink faces away from the system board for processors 1, 2, and 3, and towards the system board for processors 4, 5, and 6.
13. Gently push down on the processor being added until it is fully seated.
14. Rotate the retaining latches to seat the processor firmly in the connector.
15. Close the access covers to the processor slots and tighten the thumbscrew (see Figure 7-2).
16. Install the corresponding VRM by aligning the VRM with the slot. Note that the component side of the VRM will face toward the system board.

CAUTION	Push down on the printed circuit of the VRM -- do not push down on the VRM components.
----------------	--

17. Gently insert the VRM into the slot (see Figure 7-4).

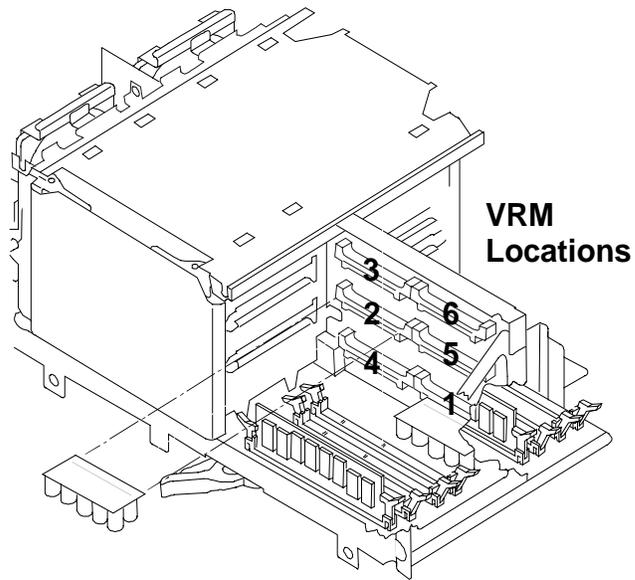


Figure 7-4. Insert the VRM

18. Re-install the system board assembly into the chassis (see Figure 7-5).

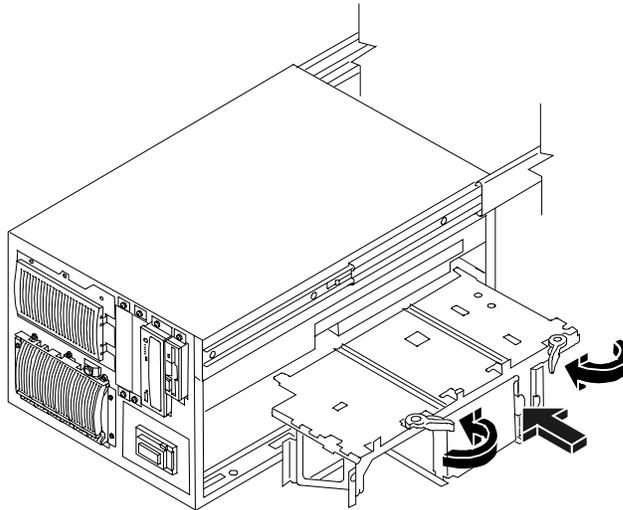


Figure 7-5. Install the System Board Assembly.

19. Reconnect cables and power cords to the NetServer.
20. Follow the procedure in Chapter 3, "Opening and Closing the HP NetServer," for closing up the server.
21. Restore HP NetServer to normal operation.

Setting the Processor Speed

1. Determine the processor speed setting from Table 7-1.

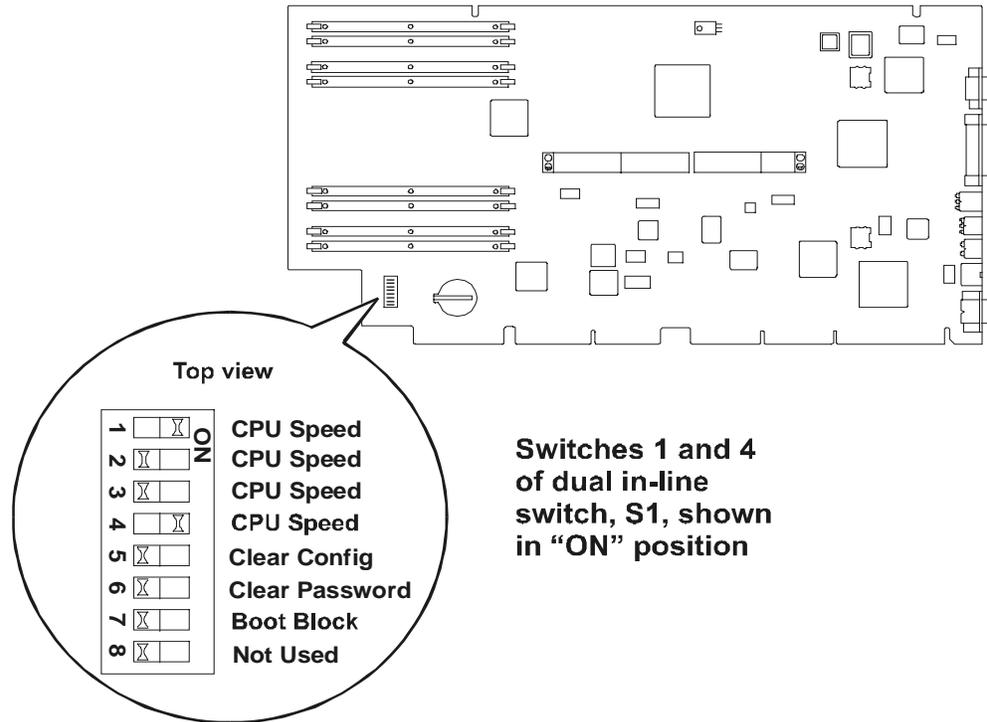


Figure 7-6. Location of Configuration Switch on System Board

2. Set the speed switches of the configuration switch as listed in Table 7-1. (Use a small, flat-blade screwdriver or similar tool.)

Table 7-1. Configuration Switches – CPU Speed

Speed	Switch 1	Switch 2	Switch 3	Switch 4
550 MHz	ON	OFF	OFF	OFF
600 MHz	OFF	ON	ON	ON
650 MHz	OFF	ON	ON	OFF
700 MHz	OFF	ON	OFF	ON
750 MHz	OFF	ON	OFF	OFF

Table 7-2. Configuration Switches S5-S8

Switch	Function	To Enable
Switch 5	Clear Configuration	ON (normally OFF)
Switch 6	Clear Password	ON (normally OFF)
Switch 7	Boot Block	ON (normally OFF)
Switch 8	Not Used	N/A (normally OFF)

NOTE Some processor speeds listed in Table 7-1 may not be supported. For the latest support information, visit the HP web site:
<http://www.hp.com/go/netserver>

Upgrading the Firmware

Load the *HP NetServer Navigator CD-ROM* and then power on the LH 6000r and LH 6000. Follow instructions to ensure that the BIOS is up-to-date.

NOTE You are not required to use the *HP NetServer Navigator CD-ROM* to reconfigure your system after installing the new processor. The NetServer detects the additional processors automatically. However, HP recommends using the *HP NetServer Navigator CD-ROM* that comes with the processor upgrade kit to ensure you have the latest drivers and information.

Testing the Processor

After you power on the HP NetServer, check boot messages to see whether or not the system detects the additional processor. If boot messages indicate that the additional processor has not been found, check the installation of the processor and the VRM and verify that the speed and cache size are correct.

Re-installing the NOS

You may have to re-install your Network Operating System in order to use the additional processor. If you have gone from a single-processor to multi-processor configuration, check your NOS documentation or the README First file and Configuration Advisor utilities on the *HP NetServer Navigator CD-ROM*.

This completes the installation of the additional processor.

Removing a Processor Module

Use the same procedure as above, and simply remove the processor module rather than add it. Be sure to remove the associated VRM and keep it with the processor.

CAUTION	Replace the removed processor with a terminator/baffle.
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8 Installing the HP NetServer in an HP Rack System/E or Rack System/U

Introduction

This chapter describes how to mount the HP NetServer in an HP Rack System/E or Rack System/U rack. If you have an older HP System rack, see Chapter 13, "Alternative Rack Mounting," for instructions. (If you are mounting the HP NetServer in a non-HP rack, refer to the separate rack-mounting guide for third-party racks. It is packed in the accessories tray in the HP NetServer's shipping box.)

HP NetServer and Rack Components

The HP NetServer LH 6000r requires eight EIA units of space.

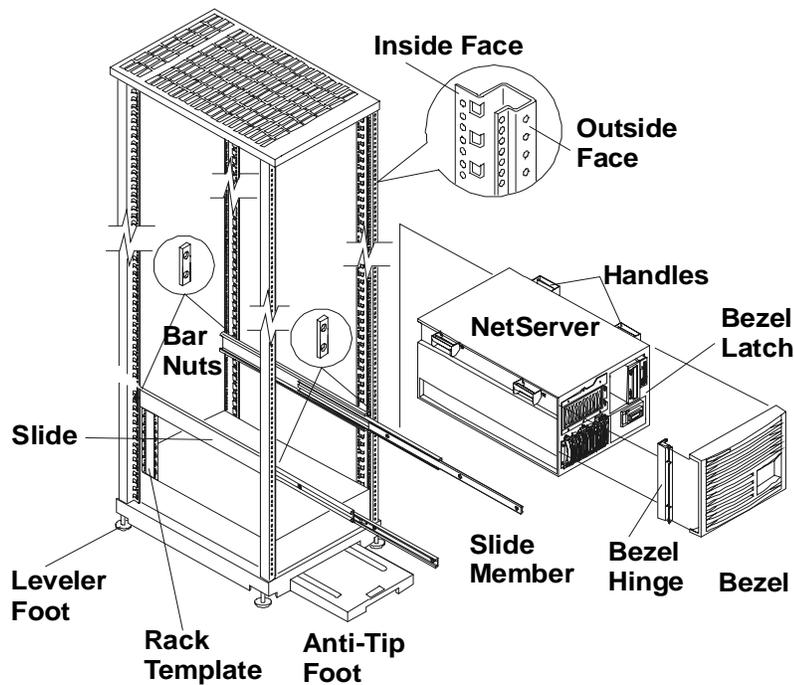


Figure 8-1. Installation Hardware

NOTE The pedestal HP NetServer LH 6000 cannot be rack-installed without a conversion kit. Contact your HP reseller for information about the HP NetServer LH 6000 to LH 6000r Conversion Kit.

Tools Required

The following tools are required to mount the HP NetServer in the rack:

- Torx 15 driver
- Torx 25 driver
- HP NetServer LH 6000r Rack Template
- Tape or a marker pen to mark mounting locations

Rack-mounting Guidelines and Precautions

Observe the following guidelines and safety precautions during the rack-mount installation.

- Extend the rack's anti-tip foot from under the front of the rack or insure that the anti-tip feature is installed (see Figure 8-2) prior to any work on the rack to prevent rack tip-over, equipment damage, and injury.

<p>WARNING Lower the leveler feet at the four corners of the rack to improve stability and prevent the rack from rolling away as devices are inserted into their rack mounts. Failure to use the anti-tip foot/device and leveler feet could result in serious injury.</p>

- Uneven mechanical loading within the rack can cause hazardous conditions. Plan the placement of equipment in the rack to ensure balanced loading.

<p>CAUTION If other rack components are to be mounted in the rack below the HP NetServer, install those components before starting to mount the NetServer.</p>

- ◇ Install components from the bottom up.
- ◇ Place the heaviest components on the bottom of the rack.
- ◇ Use HP Rack Assistant to plan the rack configuration and to check power, weight, and stability of the configured rack. Download HP Rack Assistant from:

<http://netserver.hp.com/netserver/support/>

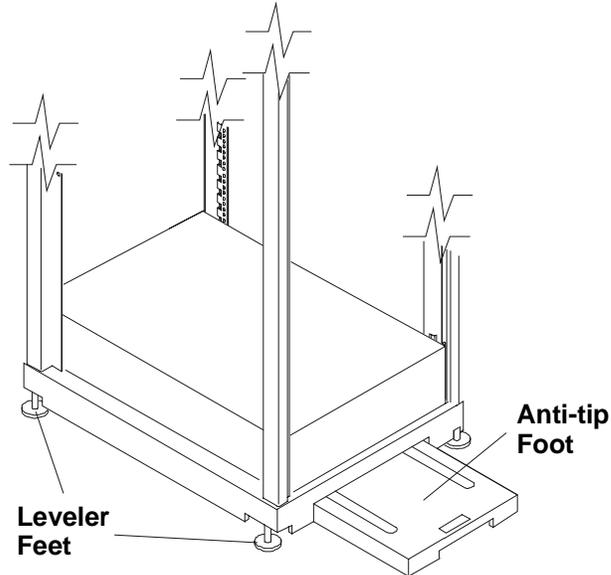


Figure 8-2. Anti-Tip Foot and Leveler Feet

- Install components such as DIMMs and processors into the system board assembly before rack-mounting the NetServer.
- Remove power supplies and hard drives before lifting the HP NetServer.

Always keep the following safety and environmental issues in mind, especially if you install the HP NetServer in a non-HP rack environment:

- **Maximum Recommended Ambient Temperature** - The maximum recommended ambient temperature of the room is 35°C (95° F).
- **Elevated Operating Ambient Temperature** - The ambient operating temperature within a closed or multi-unit rack assembly may exceed the room's ambient temperature. Ensure the temperature within the rack itself does not exceed 35°C (95° F).

- **Reduced Airflow** - As you mount equipment in the rack, make sure that you allow enough airflow for safe operation of the equipment. Observe the minimum clearance dimensions listed in Appendix A, "Specifications."
- **Circuit Overloading** - Make sure that the total configuration of equipment in the rack does not overload the supply circuit. To this end, check the nameplate ratings on all equipment. Consider the effect of circuit overloading on overcurrent protection and supply wiring.
- **Reliable Earth Grounding** - Maintain reliable earth grounding of rack-mounted equipment. Give particular attention to supply connections that are not direct connections to the branch circuit: for example, the use of power strips.

System E/U Characteristics

The illustration below shows the characteristics of the System E and U racks.

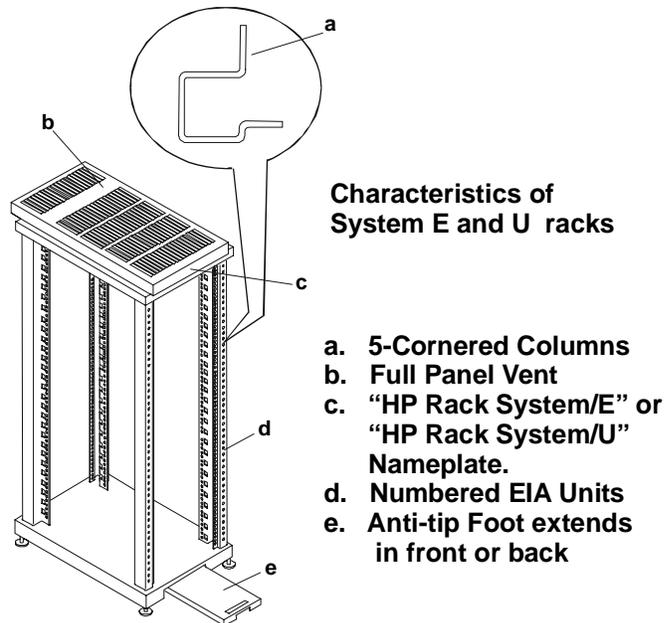


Figure 8-3. HP System/E and System/U Rack Characteristics

HP NetServer Rack Mount Parts List

Make sure that the rack-mount kit that accompanies the HP NetServer contains the following parts:

Table 8-1. Parts for Rack Mount Kit

Quantity	Description
2	Slides
8	Rack Nuts
8	Rack Nut Screws (M5 x 16mm)
6	Screws for Slides (8-32 x ¼ inch)
1	Template

Rack-Mounting the HP NetServer

Install the slides, which hold the HP NetServer in the rack. Do this by first marking a baseline based on where you want the HP NetServer in the rack.

Marking your Front Column Baseline and Slide Mounting Holes

To determine the hole position for rack nuts and bar nuts, which will secure the slides to the rack, mark the slide mounting holes on all columns.

1. Mark the bottom of the HP NetServer at an EIA unit mark on the column.
This is your baseline.

NOTE The EIA unit marks are stamped in the sheet metal of the columns. Use the rack template to mark the correct holes for mounting (on all four columns).

2. Hold the bottom of the rack template at the baseline.
3. Mark the top of HP NetServer (eight EIA units up from the baseline).
4. Mark the slide screw mounting holes (holes 20 and 22 up from the baseline).
5. Mark the remaining columns by repeating steps 1 through 4.

Installing Bezel Rack Nuts

Facing the front of the rack:

1. Install the bezel-latch rack nuts on the right front column (holes 11 and 15 up from the baseline).
2. Install the bezel-hinge rack nuts on the left front column (holes 6 and 19 up from the baseline).
3. Install the Z-bracket rack nuts on the right rear column (holes 9 and 13 up from the baseline).

NOTE

The Z-bracket installation is only required if the NetServer is to be shipped while installed in a rack. The Z-bracket allows the NetServer to be secured to the rear rack column.

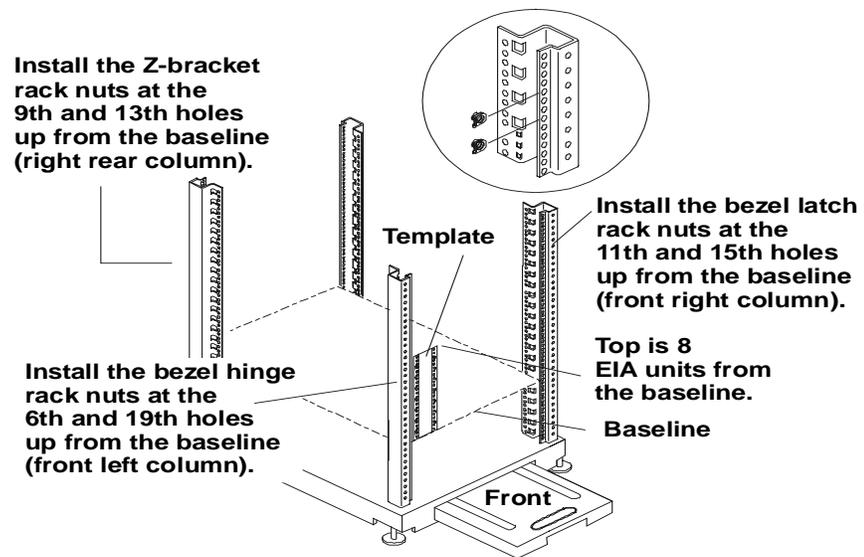


Figure 8-4. Marking the Columns for Rack Nuts

Installing Bar Nuts

The "bar nut" is a two-hole metal bar used to secure the mounting flanges of the slide to the rack columns.

All four mounting brackets on the slides attach behind the outside faces of the columns, using bar nuts. Use the template (or if you no longer have it, count) and mark the twentieth and twenty-second holes up from the baseline on each column. These holes correspond to the bottom hole of the eighth EIA unit (and the middle hole of the seventh EIA unit) above the baseline (see Figure 8-5).

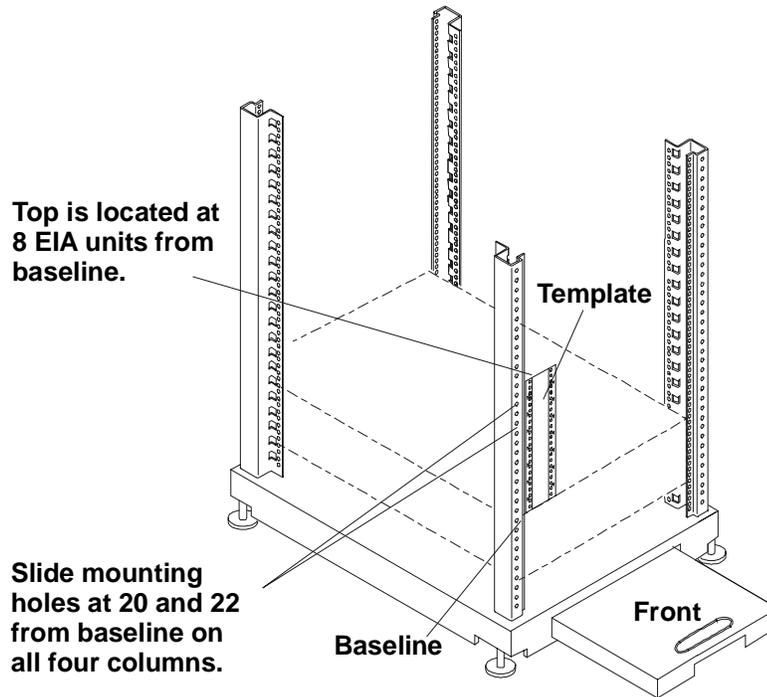


Figure 8-5. Marking the Rack Columns for Bar Nuts

The bar nut is placed behind the outside face of the column, at the height determined with the template, or by counting.

1. Insert two screws through the marked holes on the front columns.
2. Start (but do not tighten) two screws through the face of the bar nut. Install the bar nuts on all four-rack columns.

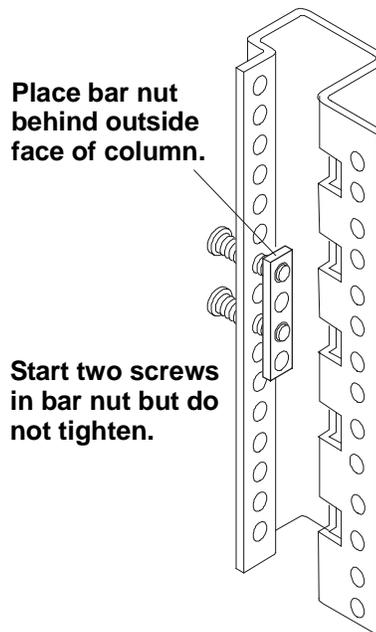


Figure 8-6. Attach Bar Nuts

The slots in the mounting flange allow you to insert the flange in place behind the outside face but in front of the bar nut.

The mounting flanges are then positioned behind the column face, but in front of the bar nuts.

Attaching the Slides

The slides have mounting flanges at each end (see Figure 8-7). The mounting flange is inserted between the column and the bar nut.

The slots in the mounting flange allow you to insert the flange in place behind the outside face but in front of the bar nut.

The mounting flanges are then positioned behind the column face, but in front of the bar nuts.

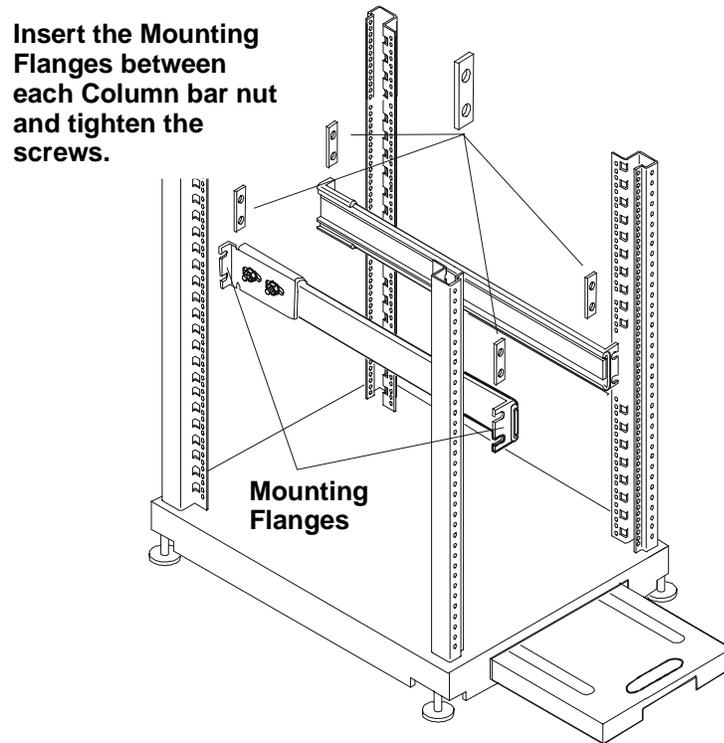


Figure 8-7. Positioning the Slides

1. Hold the slide so the slide members extend out the front of the rack.
2. Insert the slide front and rear mounting flanges between the column and bar nuts. Press the slide firmly against each rack column (see Figure 8-8).

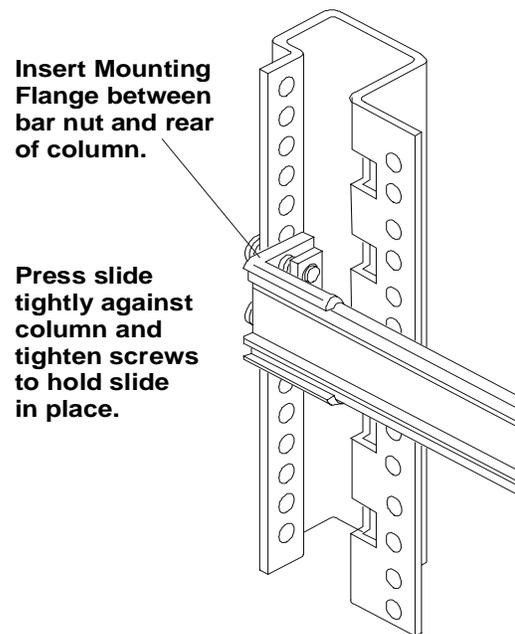


Figure 8-8. Securing Slide to the Rack Column

3. Tighten both screws into the mounting flanges of each end of each slide.
4. Tighten both nuts on each slide rail to prevent the slide from slipping positions.

Installing the NetServer

The following steps require lifting the HP NetServer with the mounting handles and sliding the slide members through the handles to secure it to the slides installed in the rack.

WARNING Extend the anti-tip foot from under the front of the rack or insure that the anti-tip feature is installed and lower all leveler feet to stabilize the rack before mounting rack components. Failure to use the anti-tip foot/device and leveler feet could result in serious injury.

1. Lower the four rack leveler feet to the floor, lifting the rack off the rack wheels (see Figure 8-9).
2. Fully extend the anti-tip foot from the front of the rack.

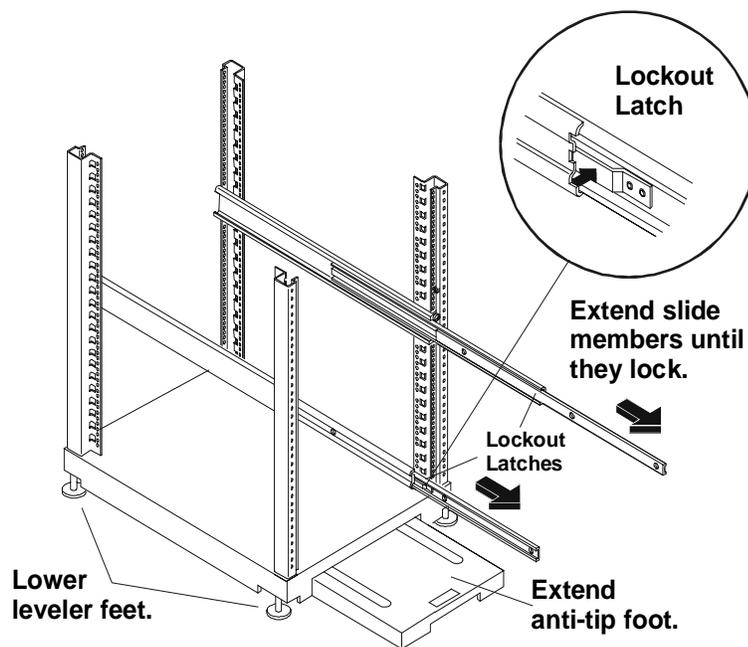


Figure 8-9. Preparing the Rack for HP NetServer Installation

3. Extend the slides until you hear a click, indicating they are locked.

NOTE The slide members do not come apart and cannot be removed.

4. Remove power supplies and hard disk drives from the server to reduce the total weight to be lifted.

WARNING Two people are required to move or lift the NetServer. The HP NetServer LH 6000r weighs up to 175 pounds (80 kg.) when fully loaded.

5. Lift the HP NetServer by the handles until the handles are above the extended slide members (see Figure 8-10).
6. Move the HP NetServer toward the rack, between the slide members, until all four HP NetServer handles are over the slide members.

CAUTION The HP NetServer must be moved horizontally onto the extended slides. You cannot lower it onto the slides.

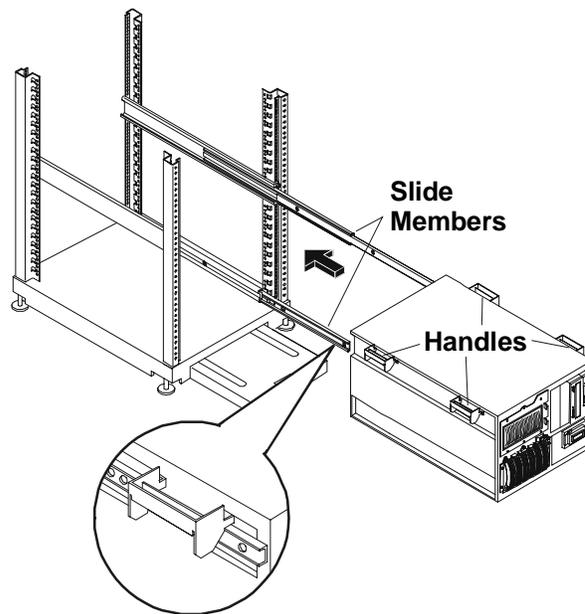


Figure 8-10. Mounting the HP NetServer on the Slides

7. Rest the HP NetServer handles on the slides and then line up the mounting holes in the HP NetServer chassis with the screw holes in the slides (see Figure 8-11).

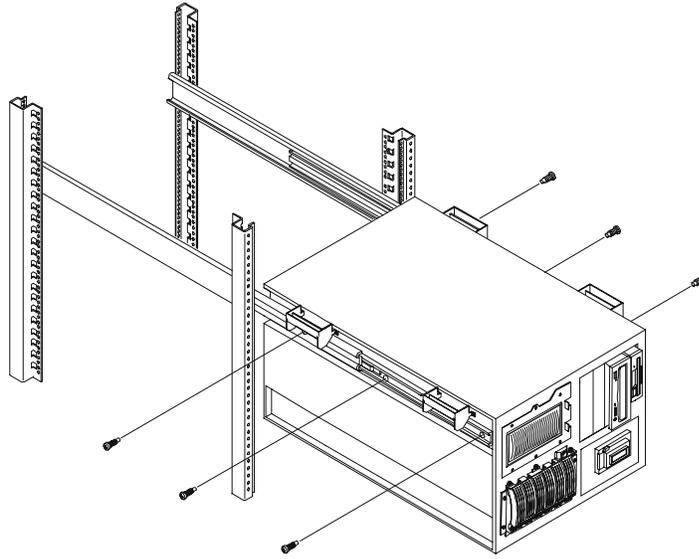


Figure 8-11. Securing the HP NetServer to the Slides

8. Insert three screws through each slide member into the HP NetServer. Tighten all screws securely.
9. Remove the two screws from each handle and remove the handles (see Figure 8-12).

NOTE Save the handles and screws for future removal and reshipping of the NetServer.

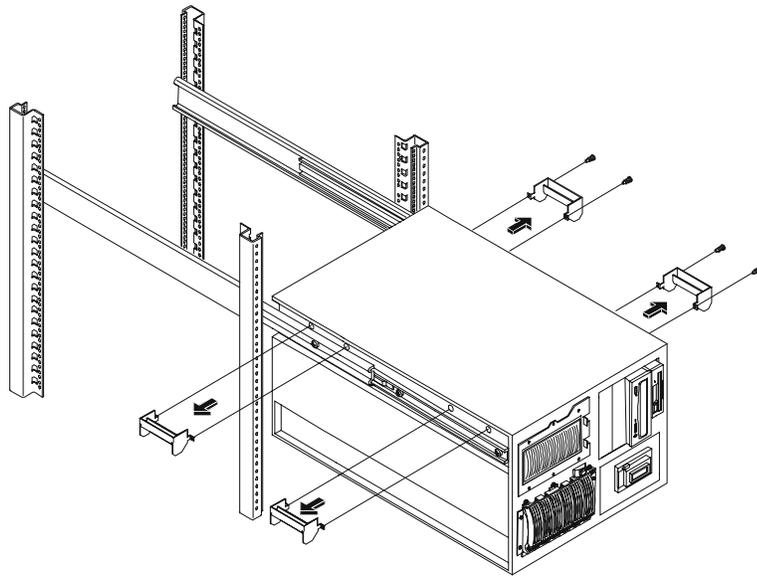


Figure 8-12. Removing Mounting Handles

Securing the HP NetServer to the Rack

Complete the following steps to secure the HP NetServer to the rack and install the front bezel.

1. Attach the bezel hinge to the HP NetServer with three screws through the right edge of the bezel hinge and into the left front of the HP NetServer (see Figure 8-13).
2. Attach the bezel latch to the right side of the HP NetServer with two screws.
3. Depress the slide lockout latches, and push the HP NetServer completely into the rack (see Figure 8-14).

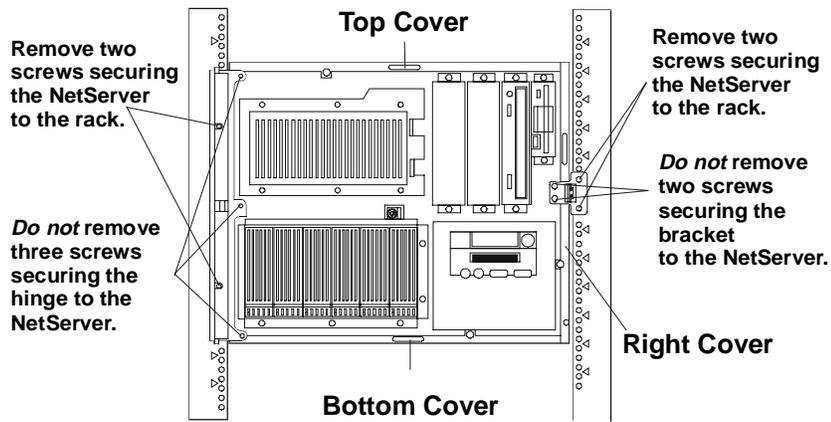


Figure 8-13. Bezel Hinge and Latch

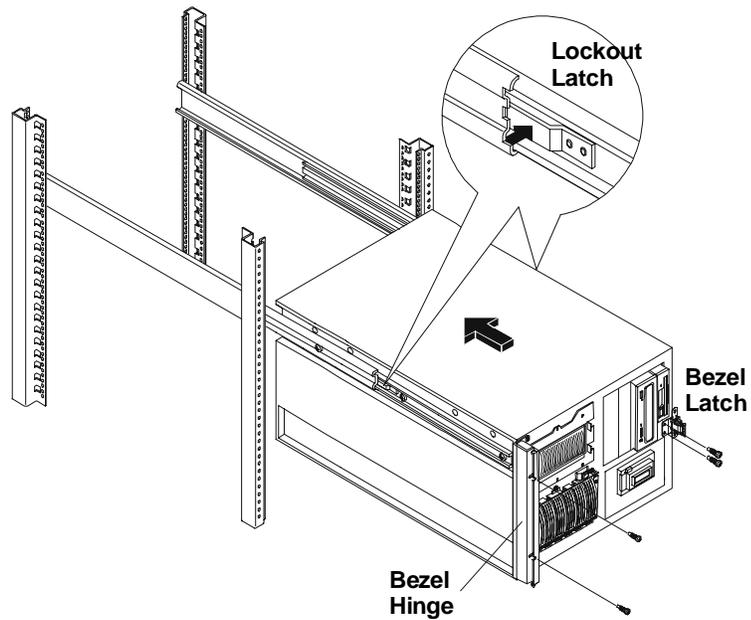


Figure 8-14. Slide Lockout Releases

4. Install two screws through the bezel hinge into the rack nuts on the left column of the rack (see Figure 8-15).

5. Install two screws through the bezel latch into the rack nuts on the right column of the rack (see Figure 8-15).

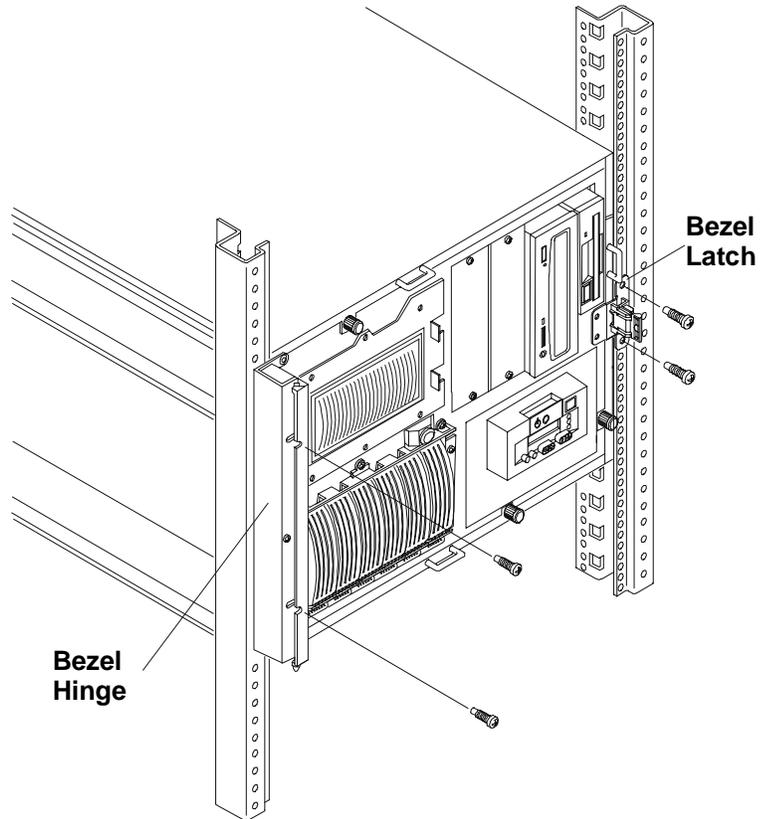


Figure 8-15. Securing the HP NetServer to the Rack

6. Snap the bezel on the bezel hinge and swing the bezel closed engaging the bezel latch. The bezel swings open to access the HP NetServer internal mass storage cage (see Figure 8-16).

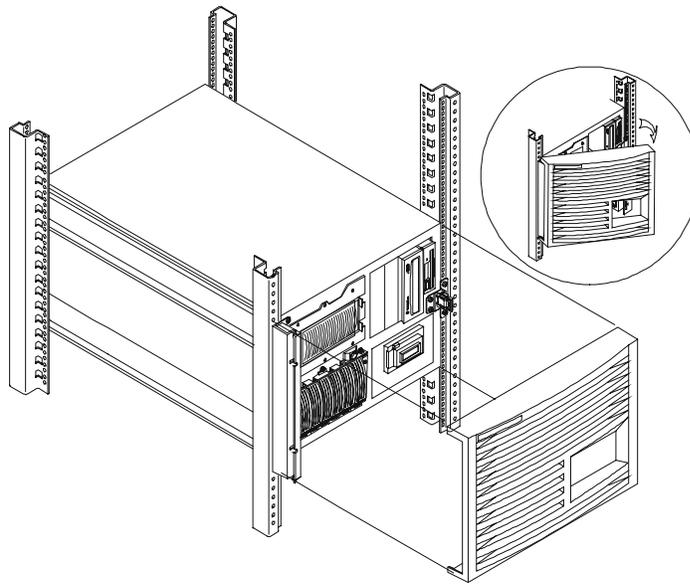


Figure 8-16. Installing the Bezel

7. Slide the anti-tip foot into the rack.
8. Return to the *HP NetServer Rack Installation Road Map* to complete the rack installation.

Attaching the Cable Management Arm

The Cable Management Arm for the HP NetServer LH 6000r can only be mounted on HP Systems racks. The HP NetServer Cable Management Arm allows the cables, including the power cords, to move in and out with the HP NetServer chassis on its slides without being accidentally disconnected (see Figure 8-17).

WARNING	Before sliding out the HP NetServer, ensure the anti-tip foot from under the front of the rack is extended or the anti-tip feature is installed. A tip-over hazard exists, so never slide more than one component out of the rack at a time.
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1. Ensure the HP NetServer is pushed all the way into the rack.
2. At the rear of the NetServer, place rack nuts on the left column in the 17th and 18th holes above the baseline of the HP NetServer (see Figure 8-17).

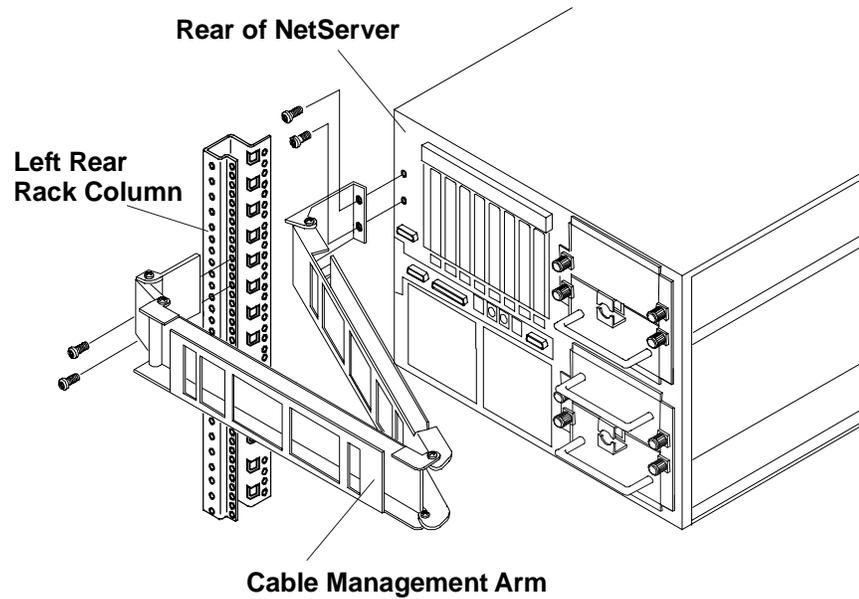


Figure 8-17. Attaching the Cable Management Arm

3. Install the two 6-32 Torx T-15 screws in the two threaded holes on the rear of the NetServer.
4. Orient the cable management arm as shown in Figure 8-17.
5. Install the flange over the 6-32 screws and tighten them.
6. Attach the other flange of the cable arm to the rear column of the rack with the two M-5 Torx T-25 screws, included with the arm.
7. Extend the HP NetServer out of the rack to ensure the Cable Management Arm moves with the chassis without binding.
8. Slide the HP NetServer back into the rack.
9. At the front of the rack, insert the screws through the flanges into the rack nuts and secure the HP NetServer to the front rack columns with a Torx T-25 driver.

Each of the HP NetServer's two front flanges have two slots, which should line up with the rack nuts previously mounted on the rack columns.

10. Plug the HP NetServer's power cables and all available data cables into the back of the HP NetServer.

Refer to the *HP NetServer LH 6000r Rack Assembly and Cabling Reference Guide* for information about cable dressing and routing.

Attaching the Z-bracket for shipping

Should it be necessary to ship the system with the HP NetServer in place within the rack, the Z-bracket should be attached to secure the HP NetServer to the rack while shipping.

1. Attach the Z-brackets to the rear columns with two Torx screws, using the Torx T-25 driver. Fasten the bracket to the HP NetServer with two Torx screws (see Figure 8-18).
2. Secure the cable management arm to the right side rack column using the cable tie provided in the Z-bracket kit.
3. Use the original packaging, saved during installation, for packing and shipping.

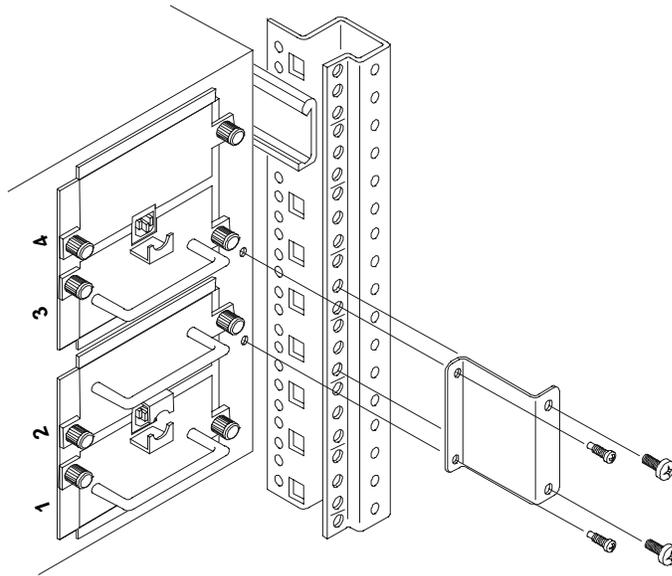


Figure 8-18. Attaching the Z-bracket to the HP NetServer and Rear Column

9 Connecting the Monitor, Keyboard, and Mouse

Connect the monitor, keyboard, and mouse cables to the appropriate connectors on the rear of the chassis.

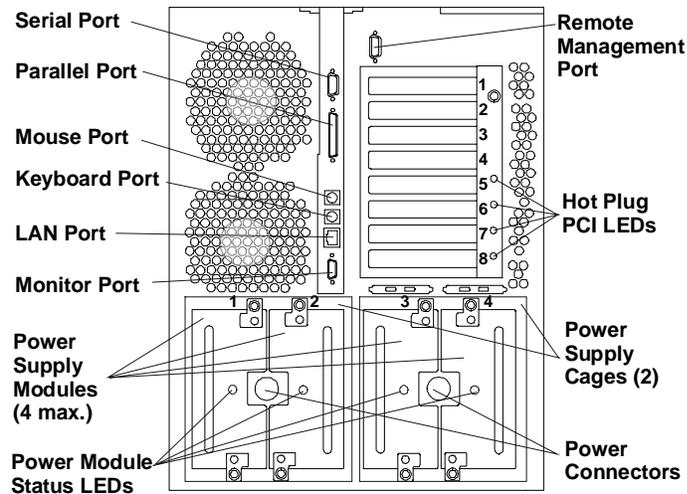


Figure 9-1. Rear View of LH 6000/LH 6000r

NOTE If you have installed your HP NetServer LH 6000r into a rack, refer to the *HP NetServer LH 6000r Rack Cabling Reference Guide* for instructions on how to cable the NetServer to external connections.

The HP NetServer performs a diagnostic test when it is connected to an external power source, and then performs another test when the power switch is turned on.

If an error condition occurs, note any error code appearing on the front panel. Refer to the error messages in Chapter 12, "Troubleshooting."

10 Configuring the HP NetServer

Introduction

This chapter describes:

- Configuring the HP NetServer
- Installing the Network Operating System (NOS)

NOTE	The HP NetServer ships with NetRAID as the default. If you plan to configure mass storage as LVD SCSI, use Setup Utility to change the Configuration/Embedded LAN and SCSI Settings to Enable LVD SCSI prior to installing the NOS.
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Run the Setup utility to do the following:

- For HP NetServer LH 6000/6000r, use the Setup utility to put SCSI channels A and B under control of the integrated HP NetRAID controller and to verify the boot device priority and the priority of various hard disk drive controllers within the boot device priority.

Start Setup Utility

1. Turn on power to the HP NetServer and display monitor.

If you receive an error message during the boot process, refer to Chapter 12, "Troubleshooting," or the online help. Some power-up (boot) messages are routine.

NOTE The message "Configuration of NVRAM and drives mismatch" indicates that configuration information in the integrated HP NetRAID controller's NVRAM differs from configuration information in hard disk drives.

Do the following to clear configuration information from integrated HP NetRAID NVRAM:

1. Press **Ctrl+M** to start the HP NetRAID Express Tools utility.
 2. On the Tools Management Menu, choose **Configure**.
 3. On the Configure menu, choose **Clear Configuration**.
 - If the question "Clear Configuration?" is displayed, answer **Yes**. Then press any key to continue, and go to Step 4 in this note.
 - If the message "No Existing Configuration to Clear" is displayed, press **Esc** to return to the Configuration menu, choose **New Configuration**, and answer **Yes** to the question "Proceed?". When the scan finishes, all drives are shown in the Ready state. Press **Enter** to end the array, and answer **Yes** to the question "Save Configuration?". When "Configuration is Saved" is displayed, press any key.
 4. To exit HP NetRAID Express Tools, press **ESC** repeatedly until the Exit? box appears. Choose **YES** to exit. Then press **Ctrl+Alt+Del** to restart the NetServer.
-

2. As soon as you see the message

Press <F2> to enter SETUP

on the display monitor, press the **F2** function key.

NOTE If you wait too long to press the **F2** function key, you may not be able to enter the Setup utility, even though the message "Press <F2> to enter SETUP" is still displayed. If this happens, restart the HP NetServer and press the **F2** function key as soon as the message appears.

3. If a power-on password has been set, provide it when prompted.
4. When the Setup Utility menu is first displayed, the Configuration menu is also displayed. (If the Configuration menu is not displayed, use the left arrow key to highlight **Configuration** on the Main menu.)

The system time and system date are displayed. If either needs to be changed, use the down arrow on the keyboard to highlight the item. Then follow the instructions on the screen.

Verify Boot Order

5. On the Configuration menu, use the up and down arrows to highlight **Boot Settings**, and press **Enter** to choose it.
6. On the Boot Settings submenu, use the up and down arrows to highlight **Boot Device Priority**, and press **Enter** to choose it.
7. The Boot Device Priority list displays the order in which device types will be searched for a bootable device.

If you need to change the priorities, follow the on-screen instructions.

When the boot device priorities are correct, press **Esc** to return to the Boot Settings submenu.

8. On the Boot Settings submenu, use the up and down arrows to highlight **Hard Drive Priority**, and press **Enter** to choose it.
9. The Hard Drive Priority list displays the order in which hard disk drive controllers will be searched for a bootable device.

If you need to change the priorities, follow the on-screen instructions.

When the hard drive priorities are correct, press **Esc** twice to return to the Configuration menu.

Enable LVD SCSI

10. On the Configuration menu, use the down arrow key to highlight **Embedded LAN and SCSI Settings**. Then press **Enter**.
11. The Embedded LAN and SCSI Settings submenu is displayed. If **HP NetRAID/LVD SCSI** is not already highlighted, use the up and down arrows to highlight it.

Read the values in the brackets to determine whether LVD SCSI is enabled.

- ◇ **Enable LVD SCSI** indicates that LVD SCSI is enabled and HP NetRAID is disabled. This is the correct setting for non-RAID operation of the mass storage cages connected to SCSI A and B on the I/O board.
- ◇ **Enable HP NetRAID** indicates that HP NetRAID is enabled to provide RAID operation of the mass storage cages connected to SCSI A and B on the I/O board. This is the default value.

CAUTION

If your HP NetServer was previously operating in non-RAID mode (Enable LVD SCSI), changing to RAID mode (Enable HP NetRAID) could cause data loss. Be sure your data is backed up before you change to RAID mode.

If your HP NetServer was previously operating in RAID mode (Enable HP NetRAID), changing to non-RAID mode (Enable LVD SCSI) could cause data loss. Be sure your data is backed up before you change to non-RAID mode.

If the value is not **Enable LVD SCSI**, use the +/- keys to change it to **Enable LVD SCSI**. This change will take effect when the HP NetServer restarts.

Exit Setup Utility

12. Press the **F10** function key to save and exit.
13. In the Setup Confirmation dialog box, press **Enter** to answer "Yes" to the question, "Save configuration changes and exit now?" The HP NetServer will restart.

HP NetServer Navigator CD-ROM

Use the *HP NetServer Navigator CD-ROM* (Navigator) to perform configuration tasks or view online system documentation. There are two ways to do this.

Server Mode - You autorun the Navigator CD-ROM on your NetServer to perform the configuration tasks. Server Mode is the mode you use to initially setup and configure your HP NetServer. Using this mode you can set the system language, time, date, and set resources for installed accessories and run utility and troubleshooting software.

Resource Mode - The Resource Mode of operation allows any user to 'autoplay' the Navigator CD in any Windows 95/98 or NT client. This mode provides access

to the Diskette Library and to reference materials to help plan the HP NetServer installation. To setup and configure the server, use Server Mode instead of Resource Mode.

The Resource Mode of operation allows the user to access several key informational areas, such as: Creation of Driver Diskettes, NOS Installation Instructions, Configuration Advisories, Tested Product Lists, Server Registration and access to the HP Support Web page, if you have Internet access.

Also, the Resource Mode of operation comes with a FAQ (Frequently Asked Questions) file to help users find quick answers to questions regarding the HP NetServer Navigator.

Using a Separate Workstation to View Navigator Information – Resource Mode

If you are unable to boot your NetServer, you can use the Resource Mode of the Navigator CD-ROM to run the Navigator from another PC or workstation. You can then view many of the administration functions and create diskettes containing necessary tools and drivers.

1. Insert the CD-ROM in the CD drive of a desktop or laptop computer. If the autorun feature is on, your Navigator CD-ROM program will run. If the autorun feature is turned off on your computer, do this:
 - a. Go to RUN.
 - b. Enter **D:\launch32.exe**, where D: is the address of the CD-ROM.
 - c. Press **Enter** or **Return**. The CD-ROM program will then run.
2. Choose the model of your HP NetServer.
3. Choose the desired NOS to be configured on your NetServer.
4. Review "What's New on the CD." You can save the text to a flexible diskette and print the information for future reference.
5. Review "System README." This file provides up-to-date system information that was not available at the time the documentation was published. You can save the text to a flexible diskette and print the information for future reference.
6. Review "Guide to Configure NetServer." Use this source to learn about applicable compatibility issues and get the latest list of HP-tested peripherals and accessories (see the Tested Configurations in Guide to Configure NetServer).

7. Review "Diskette Library." You can review the current diskette library by title and version numbers and create diskette(s) that contain the necessary tools and drivers.
8. Review "Troubleshooting." Information is provided in a list of Frequently Asked Questions (FAQs). Links are provided to the Diskette Library for creation of a bootable DiagTools diskette and to an information page about the HP Support web page. This site can additionally be accessed at:
`http://www.hp.com/netserver/support/`
9. Review "Product Registration." Provides an information page about registration of your HP NetServer Navigator product. Web linkage is provided and the site can additionally be accessed at:
`https://www.eci.hp.com/epack2/ww/dmo.htm`
10. Review "HP Server Management Solutions." Use this source for information about HP Manageability Solutions for increased server availability and easier remote administration.

Release Notes

To ensure that you have the latest versions of the HP NetServer Navigator software, obtain the current *HP NetServer Navigator CD-ROM* Release Notes. The Release Notes are updated for each new release of the CD-ROM.

The Release Notes briefly describe the following for each release:

- Major changes to the CD-ROM for the current release
- Version number
- Release date
- Part number of the *HP NetServer Navigator CD-ROM*
- Document Number

Status Report

The Status Report for your specific *HP NetServer Navigator CD-ROM* describes in detail any software updates between this version of the CD-ROM and the previous version.

To obtain Release Notes or a Status Report, go to:

`http://netserver.hp.com/netserver/support/compatibility/nav_cd/navigator.asp`

For status report, use the four-digit Document ID Number printed on the disk; for example, 7754.

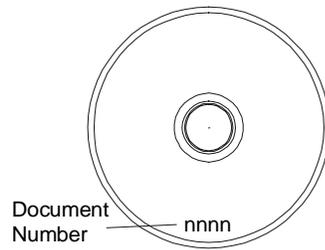


Figure 10-1. Location of Document Number on Navigator CD

Using the Navigator CD-ROM on the NetServer – Server Mode

1. Press the power-on button.
2. Press the CD-ROM drive eject button.
3. Place the *HP NetServer Navigator CD-ROM* in the drive and press the eject button again to close the drive.

NOTE Using the low profile CD-ROM drive is slightly different than full-height units. The disk drawer will spring out only part way when you push the eject button. You must manually pull the drawer open and manually close it after inserting a CD-ROM.

4. If the CD-ROM fails to autorun, follow the diagnostic instructions on the screen.
5. Go to the HP Navigator main menu.

NOTE If this is the first time you are using Navigator, you are prompted to set the language, time, and date. The Main menu will appear after the information is entered.

6. If the language needs to be changed, select **User Preferences** and the language you want.

You can also change the language of the BIOS, but this is only available when in the BIOS Setup Utility.

7. Select **README File**. Review the Table of Contents for pertinent topics. This file includes recent information that was not included in the printed documentation.

HP NetServer Navigator CD-ROM Main Menu

The *HP NetServer Navigator CD-ROM* Main Menu provides access to modules where you can perform configuration tasks or read online system documentation.

Menu buttons are provided for the following modules:

- README File
- Configuration Assistant and Installation Assistant
- HP Management Solutions
- Information Assistant
- HP NetServer Utilities
- User Preferences

README File

This file includes recent information that was not included in the printed documentation. Review the Table of Contents for pertinent topics.

Configuration Assistant and Installation Assistant

Configuration Assistant guides you through the steps necessary to configure the HP NetServer. You can view configuration advisories and change your hardware if necessary.

Three methods of configuration are available: Express, Custom, and Replicate.

Installation Assistant guides you through the NOS installation and configures the NOS with the appropriate drivers. If Configuration Assistant and Installation Assistant detects that a newer version of the BIOS is available on the *HP NetServer Navigator CD-ROM* it will prompt you to update the BIOS.

Before you run Configuration Assistant and Installation Assistant, you may need to run the Symbios Configuration Utility and the Setup Utility to do the following:

- Verify or modify SCSI host adapter settings.
- Format low-level SCSI disks or verify SCSI disk media by running the Symbios Configuration utility.

For more information on the utilities, go to the Setup Utility section later in this chapter.

Running Configuration Assistant and Installation Assistant

Insert the *HP NetServer Navigator CD-ROM* into the CD-ROM drive. If the system fails to start, follow the instructions on the screen.

1. Set language, time, and date, if necessary.
2. Go to the HP NetServer Navigator main menu and select **Configuration Assistant and Installation Assistant**.
3. Follow the on-screen instructions to continue installation on the NetServer.

Three methods of configuration are available: Express, Custom, and Replicate.

Express Configuration

Express configuration is the preferred method of configuring your NetServer since it leads you through the configuration process in sequence and offers default selections. Express configuration includes the following steps:

- Update System BIOS:

This step appears if Configuration Assistant detects a newer version of the BIOS available on the *HP NetServer Navigator CD-ROM*. You must update your BIOS to the newest version if you want to continue in Express mode. You can also change the language the BIOS displays.

- Select NOS:

You will be asked to select the NOS and version you plan to install.

- Select NOS Installation Mode:

For certain versions of Novell NetWare and Microsoft Windows NT Server, you will be asked;

```
Would you like to use HP's automated mode of
NOS installation?
```

- ◇ Select **Yes** for automated NOS installation.

Perform an automated NOS installation for first-time installation of Novell NetWare or Microsoft Windows NT Server on a factory-configured NetServer.

Automated NOS installation will guide you through the NOS installation, set up the hard disk drive, and configure your NOS with appropriate drivers for HP-bundled configurations.

This installation also loads the Local Support Tool onto Windows NT or NetWare systems. The Local Support Tool is a stand-alone support tool accessed directly from the NetServer. It gives you information to help you manage the NetServer.

- ◇ Select **No** for manual NOS installation.

Perform a manual NOS installation if you are installing a NOS other than certain versions of Novell NetWare or Microsoft Windows NT Server, or if you have replaced any HP components.

For Manual NOS Installation *Only*: Before you perform a manual NOS installation, you must print instructions and manually create NOS-specific driver diskettes as follows:

- ◇ **Create Drivers Diskette(s)**: On the Create Drivers Diskette(s) screen, select **Create Drivers Diskette(s)** to create one or more customized diskettes containing HP drivers and configuration files to use when you install the NOS.
- ◇ **Print and Read Instructions**: On the Show NOS Installation Instructions screen, select **Save to Disk** to copy the NOS Installation Instructions to disk. Then print them out from the disk. Read the instructions and follow them to install the NOS.

- View Configuration Advisories:

Read the configuration advisories and print them if necessary. You can change your hardware at this time to conform to the advisories.

- Configure Remote Management:

This utility configures the Integrated Remote Management device for remote management. It enables remote, dial-up HP NetServer management.

To configure Integrated Remote Assistant, select **Configure Remote Management** on the Configure Remote Management screen.

- Show System Information:

Use this screen to display information about standard and accessory boards and devices in the system, as well as the used and available system resources.

- ◇ Select **View Hardware Inventory** on the Show System Information screen to display information about standard and accessory boards and devices in the system.
- ◇ Select **View Resources** on the Show System Information screen to display used and available system resources such as memory ranges, I/O port ranges, DMA channels, and interrupt (IRQ) levels.

- Configure Disk Array:

This configures your HP disk array. Refer to the *Integrated HP NetRAID Controller Configuration Guide*.

NOTE When you configure an array, the default cache mode is write-through. For write-back mode, install the optional battery back-up accessory.

- Install Utility Partition:

This step creates an 32 MB DOS-based utility partition on the NetServer hard disk where HP Navigator will copy DiagTools, the BIOS Update utility, the Event Log Report utility, the Disk Array utility, the NIC Configuration utility, the Integrated Remote Assistant utilities, troubleshooting utilities, and other utilities. A Utility Partition is not available for SCO UnixWare.

Select **Execute** on the Install Utility Partition screen.

- Execute Card Utilities:

Use this function, when Configuration Assistant detects installed boards, which have additional configuration utilities on the HP NetServer Navigator CD-ROM. By selecting **Execute** on the Execute Board Utilities screen, you can execute these utilities to complete the configuration of the boards.

Custom Configuration

Only select **Custom** if you are experienced in NetServer configuration and have a preferred sequence of steps, or if you prefer to configure your system one component at a time. In Custom configuration mode, you perform the same configuration steps as provided in Express configuration mode, but these may be done in any order.

After you have selected the NOS, NOS version, and NOS installation mode (automated or manual), and after you have viewed the Configuration Advisories, the Custom Configuration screen displays the following menu:

Essential Steps

- **Configure Remote Management:**
This executes the Integrated Remote Assistant configuration utility.
- **Configure Disk Array:**
This configures your HP disk array, but requires you to fill out the Disk Array Configuration Worksheet, before proceeding. Click **Help** for more details.
- **Execute Card Utilities:**
This executes the available configuration utilities for installed cards.
- **Create Drivers Diskette(s):**
SCSI IDE HP NetRAID Adapter and video adapter drivers for MS Windows NT 4.0 on HP NetServers.

Recommended Steps

- **Update System BIOS:**
This utility will update the system BIOS. The utility partition, if installed, will also be updated.
- **Install/Update Utility Partition:**
Installs utility partition to the boot or system drive. This is not available under SCO UnixWare.
- **Show System Information:**
Shows hardware inventory and system resource (interrupts, I/O space) allocation.
- **Show NOS Installation Instructions:**
Select this option to save a copy of NOS installation instructions to diskette and to print it out.

Replicate Configuration

In Replicate configuration mode, you can save a copy of your current system configuration or load a previously saved configuration. This method saves time when configuring multiple, identical systems. Select **Replicate** on the Configuration Assistant menu.

NOS Installation

The NOS installation process, whether automated or manual, is the same in Custom configuration as in Express configuration.

- Automated NOS Installation:

For certain versions of Novell NetWare or Microsoft Windows NT Server, Configuration Assistant partitions and formats the hard disk drive, and Installation Assistant guides you through the NOS installation and configures the NOS with the appropriate drivers for the HP-bundled configuration.

- For Manual NOS Installation Only:

Before you perform a manual NOS installation, you must manually create NOS-specific driver diskettes and print instructions, as follows:

- ◇ Create Driver Diskette(s): On the Create Driver Diskette(s) screen, select **Create Driver Diskette(s)** to create one or more customized diskettes containing HP drivers and configuration files to use when installing the NOS.
- ◇ Print and Read Instructions: You may already have done this directly from the Custom Configuration menu option **Show NOS Installation Instructions**. If not, on the Show NOS Installation Instructions screen, select **Save to Disk** to copy the NOS Installation Instructions to disk. Then print them out from the disk. Read the instructions and then follow them to manually install the NOS.

HP Management Solutions

HP Management Solutions is a comprehensive suite of utilities, applications, and built-in features to manage multiple HP NetServers locally or from remote locations. If you are unfamiliar with these products or concepts:

- Go to the Management Web site on the HP Web Site at:
<http://netserver.hp.com/netserver/products/management>

To view information on HP TopTools and all HP NetServer management options for your NetServer.

- Read the *HP NetServer Server Management Reference Guide* included with your NetServer. This guide covers TopTools and all other HP NetServer management utilities and options for the HP NetServer.
- On the *HP NetServer Navigator CD-ROM*, select **HP Management Solutions** on the main menu. View demonstrations of HP Remote Assistant and other third-party management applications.

TopTools for Servers

HP TopTools for Servers is new browser-based management software that provides remote administration and monitoring of critical HP NetServer components. TopTools provides vital information for the fastest troubleshooting and proactive management of NetServers. Processors, memory, storage, and NICs are a few examples of the components managed by TopTools.

Some of the features of TopTools include:

- Notification of problems with key hardware components including memory, disk drives, SCSI controllers, NICs, and power supplies, as well as problems with temperature and voltage
- Unified event log to review a complete history of HP NetServer activity
- Predictive disk problem warning backed by HP pre-failure warranty replacement
- Disk capacity threshold alert and usage tracking
- View critical HP NetServer inventory information such as the BIOS version, driver and firmware versions, PCI slot contents, and serial and parallel ports
- Easy linkage with leading management platforms including HP OpenView Network Node Manager and Workgroup Node Manager
- Support for DMI 2.0, which provides the same Desktop Management Interface inventory information for NetServers as for desktop PCs

TopTools is included with every NetServer L series HP NetServer and should be installed to help your service provider troubleshoot your system. TopTools is located on *HP TopTools CD-ROM* included with the system.

- See the *HP NetServer Management Reference Guide* for detailed installation instructions.
- You can also download the TopTools software and documentation from the NetServer Web Site at:

<http://www.hp.com/toptools>

Click on the words Download Now on the left-hand side of the screen.

TopTools Remote Control

TopTools Remote Control is a management function bundled with the HP NetServer and embedded into the System board. It enables remote LAN or modem-based server management and alerting through a pager or e-mail for improved remote administration of your NetServer.

TopTools Remote Control provides:

- Remote monitoring of critical HP NetServer components, regardless of system state
- Troubleshooting and problem resolution, regardless of system state
- Pager or e-mail notification of critical HP NetServer events to alert you of problems
- The Event Log
- Server reset and power control
- Remote system BIOS or TopTools Remote Control update
- Password and dial-back security
- Text console redirection of the HP NetServer console
- Full graphics console redirection of Microsoft Windows NT Servers across the network or over a modem connection using Symantec's pcANYWHERE32 software (included with the system)

See the *HP TopTools Remote Control User Guide* for details.

PcANYWHERE32

pcANYWHERE32 is remote-control graphics-redirection software from Symantec Corporation that allows you to take control of Microsoft Windows NT Servers across the network or over a modem. Refer to the *HP NetServer Documentation CD-ROM* for details, or the *HP TopTools Remote Control User Guide*.

NetServer Utilities

NetServer Utilities menu provides access to the following utilities:

- **DiagTools:** An easy-to-use hardware diagnostic for system verification, burn-in, and rapid troubleshooting.

NOTE

HP recommends using the HP DiagTools utility to verify all NetServer functions are operating correctly, after completing all the configuration topics. The HP DiagTools utility also generates a text file containing the hardware detected and the DiagTools test results. This text file, called a support ticket, should be saved to a diskette and used for future reference, especially by your support provider.

- **Event Log Report Utility:** Displays all logged HP NetServer management events, Power-On Self Test (POST) errors and other system events.
- **Diskette Library:** Allows you to conveniently generate a flexible diskette for any utility or driver available on the HP NetServer Navigator CD-ROM. For example, you can create flexible diskettes for the following utilities and drivers: BIOS Update, HP NetServer Assistant, PowerWise Assistant, DiagTools, and NOS Drivers.
- **Print or View Information:** Allows you to print or view the current system configuration including details of which boards are detected in the system and which resources are allocated to the boards.
- **Change User Preferences:** Lets you change the language used by the HP Navigator CD-ROM, and the system date and time.

Setup Utility

The HP NetServer has a Setup Utility (BIOS) in read-only memory. The utility features several system configuration and housekeeping options, including security and system console characteristics.

The following sections tell how to access the Setup Utility, and how to perform selected tasks.

Starting the Setup Utility

To reach the Setup Utility, boot or reboot the system. After the first boot messages are displayed, this prompt appears:

```
Press <F2> to enter SETUP
```

Press **F2** while the prompt is displayed. More boot messages appear, followed by the message *Entering Setup...* After the embedded (Symbios) SCSI Configuration initialization and the Optional ROM scan both finish, the menu bar of the Setup Utility appears.

If you do not press **F2**, the HP NetServer boots normally.

Menu Bar

The Setup Utility menu provides access to several submenus. The menu choices are:

- **Configuration** – Sets the system time and date, or select from the following options:
 - ◇ Integrated I/O Port Settings – Use this menu to enable/disable and then set the base I/O address and IRQs of the two serial ports, Serial Port A and Management port and set the parallel port's parameters, including its mode (output only, bi-directional, or DMA channel).
 - ◇ PCI Device Settings – Use this menu to disable Smart Interrupt Routing and manually set the PCI board's IRQs. This menu also includes setting the IRQ Locking feature for the embedded SCSI channels and the embedded LAN connection.
 - ◇ Boot Settings – Use this menu to check the flexible disk drive, display the NetServer's configuration at boot time, skip certain tests during the boot process to speed up boot time, or change the (default) boot order, including device type, network boot, and hard drive boot order.

- ◇ I₂O Settings – Use this menu to set the maximum number of I₂O drives (4), the message timeout multiplier (1 to 1000), the pause interval during POST, or start the IRTOS (I₂O Real Time Operating System) manually.
- ◇ Embedded LAN & SCSI Settings – Use this menu to:
 - * Change between HP NetRAID (default) and LVD SCSI modes.
 - * Set the Embedded NIC to enable, disable, or enable as a boot device (Boot ROM Enabled).

If the embedded NIC is enabled as a boot device, boot ROMs for enabled SCSI devices cannot be loaded.
 - * Enable and disable the Wake-On-LAN feature.
- ◇ Keyboard & Mouse Settings – Use this menu to set the parameters of the keyboard, including NumLock, and set the PS/2 mouse to Auto (detect)/Enabled/Disabled. Disabling the mouse frees up IRQ 12, but prevents any installed PS/2 mouse from functioning.
- ◇ Flexible Disk & IDE Settings – Use this menu to enable/disable the local bus IDE drive. Use this menu to change the flexible disk type or add an IDE hard drive to HP NetServer's configuration. This would include selecting the hard drive's characteristics, manually or automatically, and selecting which drive would be the Primary Master or Slave, the CD-ROM or the IDE hard drive.
- ◇ Processor/Memory Settings – Use this menu to enable the processor module's serial number (if supported) being read by firmware, enable memory caching, and/or add an extended memory gap in system address space.
- **Security** – Two submenus are provided.
 - ◇ Power-On Password – Sets the administrator and user passwords and sets the system requirement for a password after booting.

The Administrator password must be set before setting the User password. Once the administrator password is set, the administrator can access and change all fields in the screens.

If the User password is set, the user may only change the system time, date, and user password. The user may view all fields, but can not alter any of the settings.
 - ◇ Hardware Security – Sets the system parameters for operating in Secure Mode.

- **Exit** – Exit the Setup Utility by saving changes or exit without saving changes, which reverts to previous settings.

When you exit, the HP NetServer reboots.

Using the Setup Screens

Online help explains the settings displayed on the Setup Utility screens. Instructions are also provided for navigating between the screens and entering or changing the setup data.

- Press the right-arrow and left-arrow keys to move between selections on the menu bar. The menu bar is present at the top of the main selections.
- Press the up-arrow and down-arrow keys to move between fields on each screen. The currently selected field is highlighted.
- Certain fields ask you to choose from a list of entries. In such cases, press the plus (+) or minus (-) keys repeatedly to display each possible entry, or the **Enter** (or **Return**) key to choose from a pop-up menu.
- Pointers precede some field names. This means the field contains a submenu. To visit the submenu, select it with the arrow keys and press the **Enter** key. The submenu then appears in place of the current screen.
- The **Esc** key is the exit key. If you press the **Esc** key on one of the top-level screens, the Exit menu appears. If you press **Esc** on a submenu, the previous screen appears. When you are making selections from a pop-up menu, use the **Esc** key to close the pop-up without making a selection.

Changing the System Date and Time

To change the HP NetServer's date and time and refer to the following procedure.

1. To reach the Setup Utility, boot or reboot the system and press **F2** when prompted.

Once in the Setup Utility, the menu bar appears at the top of the screen with "Configuration, Security, and Exit" shown. The Configuration menu is the default menu and should be the highlighted selection at the left of the menu bar when the Setup Utility first opens.

2. If necessary, use the left-arrow key to select **Configuration** from the menu bar at the top of the screen.
3. If necessary, use the up-arrow key to move to the **System Time** field.

The "System Time" field is highlighted by default when the "Configuration" menu is selected. This field actually consists of three sub-fields, enclosed in brackets [xx:xx:xx]: hours to the left (24-hour clock), minutes in the middle, and seconds to the right.

4. Type in the hour and press **Enter** to move to the minutes' field.
5. Type in the minutes and press **Enter** again to move to the seconds' field.
6. Type in the seconds and press **Enter**, then use the arrow keys to leave this field.
7. Use the up/down arrow keys to scroll to the **System Date** field and enter the system date in the field.

The dates are entered in the "System Date" field in the same way as the time is entered in the "System Time" field. This field also has three separate sub-fields for month, day, and year enclosed in brackets [xx/xx/xxxx].

8. Type in the month and press **Enter** to move to the day field.
9. Type in the day and press **Enter** again to move to the year field.
10. Type in the year and press **Enter**, and then use the arrow keys to leave this field.
11. Use the right-arrow or left-arrow key to select the **Exit** menu.
12. Choose **Exit Saving Changes** from the list of exit options, then press **Enter**.

A dialog appears and asks you to confirm your decision.

13. Choose **Yes** and then press **Enter**.

Then the HP NetServer reboots.

Setting the HP NetServer's Boot Passwords

The HP NetServer can have separate administrator and user password. The user password is limited in access once booted.

To configure the HP NetServer for passwords and to require a password during boot-up, perform following procedure.

1. If not already in the Setup Utility, boot or reboot the system and press **F2** when prompted.

2. Use the right-arrow or left-arrow key to select **Security** from the menu bar. As soon as it is selected, the following selections for the Security menu appear:

Power-On Password

Hardware Security

NOTE The pointer indicates the presence of a submenu.

3. If necessary, use the arrow key to move to the **Power-On Password** menu selection and press **Enter**.

The Power-On Password is highlighted by default when the Security menu is selected.

The first line in the menu is, "Administrator Password is [Set or Not Set]"

- ◇ If no password has been set, then "Not Set" will appear in the field. If this is the case, then you are not allowed to make any other selections in this menu, until you set an Administrator Password.

The Administrator Password controls access to the Setup Utility and its settings. The User Password has only limited access to the Setup Utility, such as Date, Time, and Password.

- ◇ If "Set" is in the field, then you can change the password or make other selections in the menu. However, you must start with the User Password, but may choose to skip setting the User Password.

NOTE You must set the Administrator Password before changing a User Password or configuring the HP NetServer to boot with a password.

4. Press the **Enter** key to enter a new password or change the old one.

A pop-up menu appears titled, "Set Power-On Password." If no password has been entered, the field:

"Enter New Password: []" is highlighted.

If a previous password has been entered, the field:

"Enter Old Password: []" is highlighted.

5. Enter the password (new or old) in the appropriate field and press **Enter**.

The password is accepted and the next field just below it,

"Re-Enter New Password: []" or

"Enter New Password: []" is highlighted.

For security reasons, the password does not appear on the screen.

6. If necessary, enter the new password in the field:

"Enter New Password: []" .

7. Enter the new password again in the field:

"Re-Enter New Password: []" .

After re-entering the new password a pop-up menu displays asking you to confirm your selection.

NOTE To leave the pop-up menu without entering a password, press the **Esc** key.

8. Choose **Yes** and then press the **Enter** key.

The "Administrator Password is" field changes to "Set" and on the next boot the HP NetServer will requests a password to access the Setup Utility.

9. If you want a password on boot up, you may skip the field :

"User Password is:"

and go directly to "Network Server Mode" in Step 11.

10. If you want to enter a User Password, use the arrow keys to move to the field:

"User Password is:"

and repeat Steps 3-7 for the User Password.

11. Use the arrow keys to move to the field:

"Network Server Mode: [Disabled]" .

12. Press **Enter** to toggle "Disabled" to "Enabled" in the Network Server Mode field.

Setting this mode to Enabled will cause the HP NetServer to prompt for a password when booting from a diskette or a CD-ROM, but will not require

a password when booting from a hard drive. The power-switch and keyboard will remain locked until the password is typed.

13. To use the front panel keyboard lock button, use the arrow keys to move to the field:

"Keyboard Lock [Disabled]" .

14. Press **Enter** to toggle "Disabled" to "Enabled" in the Keyboard Lock field.

Setting this feature enables the keyboard lock button on the front bezel of the HP NetServer. Once enabled, pressing the keyboard lock button will lock the keyboard and mouse until the password is typed. You must set the password before enabling this feature.

15. To add video blanking to the password on boot, use the arrow keys to move to the field:

"Video Blanking [Disabled]" .

16. Press **Enter** to toggle "Disabled" to "Enabled" in the Video Blanking field.

Setting this feature only provides a blank screen on the HP NetServer's Monitor, when the Keyboard Lock or Network Server Mode is also enabled. The screen remains blank until the password is typed and only applies to the monitor connected to the HP NetServer's embedded video connection. As with the other features the Video Blanking is dependent upon, you must set the password before enabling this feature.

17. Select the **Esc** key to exit this menu.
18. Use the right-arrow key to go to the Exit menu.
19. Choose **Exit Saving Changes** from the list of exit options, and then press **Enter**.

A dialog appears and asks you to confirm your decision.

20. Choose **Yes** and then press the **Enter** key.

Then the HP NetServer reboots.

21. To change one of the passwords at a future date, return to the Security menu and repeat Steps 3 through 7 above for one or both passwords.

NOTE The HP NetServer allows you to reset the password by toggling a switch, position 6, in the Configuration Switch on the System board.

Changing Internal Device Boot Priority

You can change the boot priority of the HP NetServer's internal mass storage devices: the CD-ROM, the flexible disk drive (or other removable device), and hard drives connected to the HP NetServer's internal SCSI ports. To do this:

1. Select "Boot Settings" from the Configuration menu, using the down-arrow or up-arrow key, and press **Enter**.

A Boot Settings screen appears, very similar to the following one.

Floppy check: [Disabled]

Summary screen: [Enabled]

Quick Boot mode: [Enabled]

Boot Device Priority

Hard Drive Priority

2. Use the down-arrow key to move to the "Boot Device Priority" field.
3. Press **Enter** to change the order and a list appears very similar to the one below:
 1. [CD-ROM]
 2. [Flexible Disk]
 3. [Hard Drive]
 4. [Network Boot]

The list provides the current boot order of the internal devices, including a NIC connected to a network. If the [Hard Drive] selection is moved to the top of the boot list, the hard drive selected in Steps 5-7 is used to boot the system.

- a. To change the order, use the up- and down-arrow keys to select one of the devices.
 - b. Use the plus (+) or minus (-) keys to move a device up or down the list.
4. Press **Esc** to exit one level to the Boot Settings menu.

This moves you back one level to the Boot Settings list shown in Step 1 above.
 5. To change the hard drive boot order, scroll to "Hard Drive Priority" and press **Enter**.

A hard drive (HD) boot list similar to the one below appears on screen depending on the hard drives and bootable cards (DAC or SCSI controller boards) installed. The system attempts to boot the NOS on the first hard drive (or DAC or SCSI board) found in this list. If no NOS is found, the system tries the next hard drive in the list until a NOS is found.

1. [Bootable Cards]
2. [#30 ID01 LUN0 HP 4.26GB A]
3. [#30 ID02 LUN0 HP 4.26GB A]

6. Use the plus (+) or minus (-) keys to move the desired hard drive (or DAC or SCSI board) to the top of the list.
 - ◇ The HD boot list has a maximum capacity of eight (8) logical drives.
 - ◇ If a bootable Disk Array Controller (DAC) board is used, the RAID array is seen as a single logical drive.
 - ◇ If more than eight logical drives are connected to the HP NetServer, drives 9 and above (including the DAC or SCSI boards and the drives connected to each) will not be recognized by the Setup Utility.
 - ◇ You will not be able to enter the Setup Utility to make changes to these logical drives (including DACs and SCSI boards) during the boot process.
 - ◇ However, these logical devices (including DACs and SCSI boards) will be properly recognized and activated by the respective NOS.
 - ◇ For more information about selection guidelines, refer to Information Assistant on the *HP NetServer Online Documentation CD-ROM*.
7. Press **Esc** to exit the Hard Drive menu.
8. Press **Esc** again to exit the Boot Settings menu.
9. Use the right-arrow key to select the **Exit** menu.
10. Choose "Exit Saving Changes" from the list of exit options, then press **Enter**.

A dialog appears asking you to confirm your decision.
11. Choose "Yes" and press **Enter**.

The HP NetServer then reboots.

Clearing Configuration Settings from CMOS

The Setup Utility does not provide a method of clearing the configuration settings from CMOS from within the Utility. To clear the CMOS of the configuration settings, you must use the configuration switch on the system board.

1. Power down the HP NetServer and gain access to the system board.

Refer to Chapter 3, "Opening and Closing the HP NetServer."

2. On the system board, set switch 5 of the configuration switch from OFF to ON (see Figure 10-2).

To locate the configuration switch on the system board, refer to Chapter 7, "Installing Additional Processors."

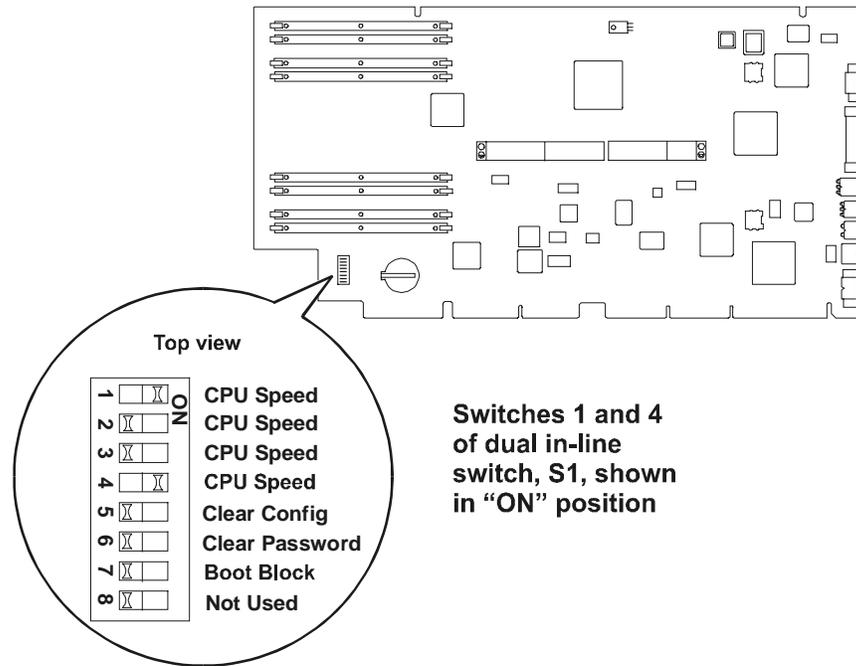


Figure 10-2. System Board Configuration Switch

3. Power up the HP NetServer.

Refer to Chapter 2, "Controls, Ports, and Indicators."

4. Allow the HP NetServer to boot the operating system.

5. Shut down the operating system and power down the HP NetServer.

Refer to Chapter 2, "Controls, Ports, and Indicators."

6. Set switch 5 from ON to OFF on the system board's configuration switch.

7. Replace the cover and power up the HP NetServer.

Refer to Chapter 3, "Opening and Closing the HP NetServer."

Run Symbios Configuration Utility

NOTE	Run the Symbios Configuration utility to do the following: <ul style="list-style-type: none">• To verify that devices on SCSI channels A and B are displayed on the boot screen.• To verify that the controllers of SCSI channels A and B are set "On" to operate.• To verify that both SCSI channels A and B are searched for a bootable drive.• To control the order in which SCSI channels A and B are searched for a bootable drive.
-------------	---

Do the following to run the Symbios Configuration utility:

1. Restart the HP NetServer.

If you receive an error message during the boot process, refer to Chapter 12, "Troubleshooting," or the online help. Some power-up (boot) messages are routine.

2. As soon as you see the message

```
Press Ctrl-C to start Symbios Configuration  
Utility...
```

on the display monitor, press the **Ctrl+C** keys.

NOTE If SCSI A and B on the I/O board are operating in RAID mode, the prompt to press **CTRL+C** is not displayed. To change to non-RAID mode, refer to "Start Setup Utility."

If you wait too long to press the **Ctrl+C** keys, you may not be able to enter the Symbios Configuration utility, even though the message "Press Ctrl-C to start Symbios Configuration Utility..." is still displayed. If this happens, restart the HP NetServer, and press the **Ctrl+C** keys as soon as the message appears.

3. When the Symbios Logic SCSI Configuration Utility Main Menu is displayed, verify that shows **Display=Verbose**. (This means that the non-RAID SCSI devices will be listed on the boot screen.)

If not, use the up and down arrow keys to highlight **Display=Terse**. Press **Enter** to change the setting to **Verbose**.

4. On the Symbios Logic SCSI Configuration Utility Main Menu, verify that the Current Status of all Symbios controllers (adapters) is **On**.

If not, use the up and down arrow keys to highlight **Change Adapter Status**. Press **Enter** to display the Change Status on Next Boot window. Use the up and down arrow keys to highlight the controller, and press **Enter** to change its Next-Boot Status to **On**. Press **Esc** to return to the Main Menu.

5. On the Symbios Logic SCSI Configuration Utility Main Menu, use the up and down arrow keys to highlight **Adapter Boot Order**. Press **Enter** to select it.

6. The Adapter Boot Order screen displays the two SCSI controllers and numbers representing their boot order in the following form:

Boot Order	Bus	DevFunc	Boot Order	Bus	DevFunc
m	SYM53C896	04	28	n	SYM53C896 04 29

where **m** and **n** are the numbers 0 or 1 or a blank.

The number in the **m** position indicates the boot order of the SCSI A controller, and the number in the **n** position indicates the boot order of the SCSI B controller.

- ◇ 0 marks the controller of the SCSI channel searched first for a bootable drive.
- ◇ 1 marks the controller of the SCSI channel searched second for a bootable drive.
- ◇ A blank indicates that the controller's SCSI channel is not searched for a bootable drive.

To add or change a boot order sequence number, use the right and left arrow keys to highlight the controller, and then press **Enter**. Type the new sequence number (0 or 1), and press **Enter**. The boot order sequence number of the other controller will change, if necessary. 0 must be assigned to a controller before 1 can be assigned to the other controller.

To remove a controller from the boot order, use the right and left arrow keys to highlight the controller, and then press **Enter** twice. (This creates a blank.) The boot order sequence number of the other controller will change to 0, if necessary.

7. Press **Esc** to return to the Main Menu. To begin to exit the utility, use the up and down arrow keys to highlight **Quit**, and press **Enter**. When the message

```
Rebooting system to change global settings...
```

```
Press any key
```

is displayed, press any key to exit the Symbios Configuration utility and restart the HP NetServer.

Verify Disk Drive Modules

As the HP NetServer restarts, watch the display monitor to determine whether all the drives you installed have been detected.

NOTE Any SCSI devices controlled by the integrated HP NetRAID controller will NOT be displayed during the boot process.

Any SCSI devices controlled by a SCSI controller without a boot order number will NOT be displayed during the boot process.

11 Information Assistant

Introduction

The *HP NetServer Online Documentation CD-ROM* includes Information Assistant, which contains the entire set of documentation for your HP NetServer.

Information Assistant provides a quick and efficient method of locating information about installing, managing and servicing your HP NetServer. It has complete documentation on the HP NetServer and accessories, important information on your NOS, and reference information, such as functional descriptions and technical papers, to help you better understand your HP NetServer and make choices compatible with your network.

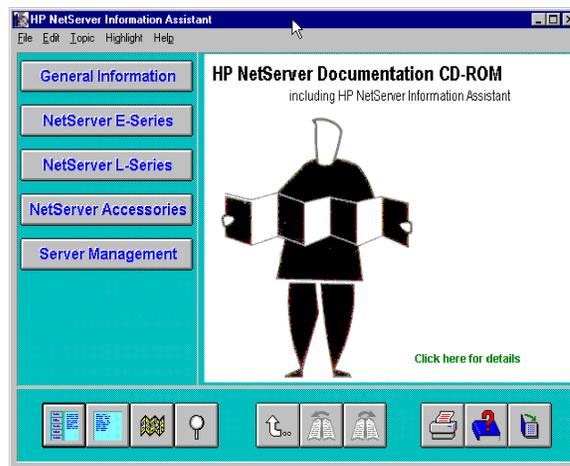


Figure 11-1. Initial Information Assistant Screen

Using Information Assistant

Information Assistant has many features that help you quickly find the information you need. Additional information on how to use each function is provided in the Information Assistant Help system.

General Information

This menu button provides general information about the capabilities of the Information Assistant application. Specific topics are:

- About the HP NetServer Documentation CD-ROM
- Accessing Printable and Localized Files in Information Assistant
- Service and Support

NetServer E-Series

This menu button provides access to the individual NetServer E-Series products. Typical topics provided for each product model are:

- Install
- Configure
- Fix
- Server Management
- Accessories
- Reference Topics
- Glossary

NetServer L-Series

This menu button provides access to the individual NetServer L-Series products. Typical topics provided for each product model are the same as identified for the E-Series. Information about Older NetServer products is also accessible via this button.

NetServer Accessories

This menu button provides access to information about various NetServer accessories. Specific topics are:

- HP NetRAID
- Processor and System
- Memory
- Network Interface Cards (NICs)
- Mass Storage and SCSI

- Rack and Cabling Guides
- Power Supply

Server Management

This menu button provides access to various NetServer management products. Representative topics are:

- HP TopTools
- HP TopTools Remote Control
- HP NetServer Assistant
- HP OpenView

Informational files about some of these products are provided as Adobe Acrobat PDF files.

NOTE

In order to launch and display Adobe Acrobat .PDF files from HP NetServer Information Assistant, you will need to have a .PDF viewer installed on your system. For your convenience, the Adobe Acrobat 3.0 Viewer installation program is included on this CD-ROM in the ACROREAD directory.

Getting Help

Information Assistant provides a help system that explains how to use the application.



Select Help. The Help button displays the help system for Information Assistant. The help system explains how to use Information Assistant to find information.

Finding Information

Information Assistant provides many ways to navigate through its topics and locate information. For example, you can:



Select a topic from the Map. Displays a window with an outline of every module and topic in Information Assistant for the selected product. The Map enables you to view the contents of the Information Assistant in outline format, and to then select a topic.



Search for a word or phrase using Search. Search performs full-text searches for topic text. You can use search operators such as AND, OR, NOT, and NEAR to further narrow your search. The search function works within the selected module.



Select a Product button. The Product button presents a product or group of products for selection.



Select a topic from the Table of Contents. Displays a Table of Contents for the selected product from which a subtopic may be selected for viewing.



Go to a previous topic with Previous button. Displays the previous topic within a module.



Go to the next topic with Next button. Displays the next topic within a module.



Go to a previously viewed topic with Back button. Displays the previous topic viewed. Clicking this button more than once backtracks through topics in the order that they were viewed.



Print. Print the current topic of the product book. After selecting the print option, the Windows Print dialog box appears. Print options vary with the capabilities of your printer.



Exit. Closes the window and exits the application.

You can also navigate between topics by using hot spots and by using the History button to revisit previously viewed topics. For example:

- **Jump to other topics.** Click on hot spots in graphics and text that link to other topics or to more information about the current topic. Hot spot text appears as bold green text. Identify hot spots on graphics by moving the pointer over the graphic. When you position a pointer within a hot spot, the pointer changes to a hand.
- **Return to any previously viewed topic by choosing History from the Topic menu.** As you view topics, Information Assistant keeps a record of where you have been. The History button displays a list of the topics you have viewed, starting with the most recent. Select any topic from this list to return to it.

Copying and Printing Information

You can copy text in Information Assistant for use in other applications, such as word processors, by copying text onto the Windows Clipboard and pasting the text into any Windows application.

To print topics in Information Assistant, use one of the print options on the File drop-down menu. You can choose to print the current topic or all of the topics in a product book.

After selecting the print option, the Windows Print dialog box appears. Print options vary with the capabilities of your printer.

Installing HP Information Assistant Software

HP Information Assistant runs on a PC running Windows 3.1, Windows 95 and above or Windows NT. Install Information Assistant from the *HP NetServer Online Documentation CD-ROM* onto the client system that will manage the NetServer.

The installation program gives you the option of accessing the data files from your hard disk or from the CD-ROM. The default is to access the data files from the CD-ROM. You can copy the data files to your hard disk to improve access time, but this could take up a significant amount of disk space.

Installing from the CD-ROM

This is a 16-bit Windows application that can be run on Windows 3.1 and above. If you are using Windows 95/98 or Windows NT 4.0 and have the AUTORUN feature of your CD-ROM drive enabled, it will automatically start the setup

program. If you have previously installed this new version of *HP NetServer Information Assistant* on your system, it will automatically launch the program.

If you have AUTORUN disabled or are installing this application on other versions of Windows, run the SETUP.EXE program in the INFOASST directory by performing the following steps:

1. Turn on your computer and CD-ROM drive.
2. Run Windows and display the Program Manager.
3. Insert the *HP NetServer Online Documentation CD-ROM* into the CD-ROM drive.
4. From Program Manager, select **Run**.
5. In the RUN window, type the following:

***drive*: \INFOASST\setup**

where *drive* is the letter of the CD-ROM drive.

6. Follow the instructions that appear on your screen.

In Program Manager, the setup utility creates a new program group called HP NetServer Information Asst., with an icon for running the application.

12 Troubleshooting

Troubleshooting Tools

If you are having problems installing your HP NetServer, there are a number of different tools available for troubleshooting

- *HP NetServer Information Assistant* (see Chapter 11) contains the following tools:
 - ◇ Troubleshooting Information
 - ◇ Parts Information
 - ◇ List of Error and Beep Error Messages

WARNING	Before removing the top cover, always disconnect the power cords and unplug telephone cables. Disconnect telephone cables to avoid exposure to shock hazard from telephone ringing voltages. Disconnect the power cords to avoid exposure to high energy levels that may cause burns when parts are short-circuited by metal objects such as tools or jewelry.
----------------	--

- The *HP NetServer Navigator CD-ROM* contains HP NetServer Utilities. At the HP NetServer Navigator Main Menu, select *Access NetServer Utilities* to use the following tools:
 - ◇ **HP DiagTools Utility:** An easy-to-use hardware diagnostic for NetServer verification, burn-in, and rapid troubleshooting. When you select DiagTools from the Utilities menu, you are prompted to insert a diskette. DiagTools is then copied from the CD-ROM to the diskettes. You can also run DiagTools from the utility partition.
 - ◇ **Event Log Report Utility:** Describes server management events and lets you review a list of errors and other system events.

- ◇ **More NetServer Utilities>>Diskette Library:** Enables you to conveniently generate a flexible diskette for any utility available on the *HP NetServer Navigator CD-ROM*. For example, you can create diskettes for the following utilities: BIOS Update, NOS Drivers, and DiagTools.

CAUTION

Do NOT operate the NetServer for more than 30 minutes with any cover (including power supplies and disk drives) removed. Otherwise, damage to system components may result due to improper cooling airflow.

However, you can safely remove the top cover while the NetServer is running to remove and replace PCI Hot Plug boards. For any other service activity requiring access to the processor board or I/O board, power down the NetServer and observe all safety precautions.

- For problems with the disk array controller board, refer to the appropriate HP NetRAID manuals.
- For problems with HP TopTools, refer to the *HP TopTools Administrator Guide* on the HP Web Site at
<http://www.hp.com/toptools>
- For general information on management products, refer to
http://www.hp.com/go/netserver_mgmt
and search for "management."
- For information on troubleshooting disk drives, see the *HP NetServer Disk Drive Troubleshooting Guide*.

Common Installation Problems

The following sections contain general procedures to help you locate installation problems. If you need assistance, it is recommended that you contact your reseller first. If you require assistance from Hewlett-Packard, see the *HP NetServer Warranty and Service/Support Booklet* or refer to the *HP NetServer Online Documentation CD-ROM* included with your product.

Troubleshooting Sequence

To troubleshoot an installation problem, perform the following checks in the order given:

- Check all cable and power connections, including those in the rack, etc.
- Ensure the NetServer is configured properly.

Most NetServer problems are the result of incorrect system and SCSI subsystem configurations.

- ◊ Check the Setup Utility, and the SCSI Configuration Utility.
- ◊ If the HP NetServer is configured with a disk array, check the Disk Array Utility.
- If the error is a network-related problem, determine if the server has enough memory and hard disk drive capacity. Consult your network operating system manual.
- Verify all cables and boards are securely plugged into their appropriate connectors or slots.
- Remove all extra options one at a time, checking its effect on the NetServer.
- Unplug the power cords, wait 20 seconds, plug the power cords in again, and restart the NetServer.
- If you suspect a hardware error, follow these steps:
 - a. Log users off the LAN and power down the server.
 - b. Extend the HP NetServer out of the rack and remove the top cover.
 - c. Simplify the HP NetServer configuration to the minimum required:
 - * Monitor
 - * Keyboard

- * Mouse
 - * 1 hard disk drive and 1 flexible disk drive
 - * 1 CD-ROM
- d. Remove all third-party options, and reinstall each one, one at a time, checking the NetServer after each installation.
 - e. Replace the top cover and reconnect the power cords and other cables.
 - f. Start the NetServer and, if it does not function properly, refer to the following procedures.

If the System Does Not Power On

Follow these steps:

1. Check that all cables and power cords are firmly plugged into their proper receptacles.
2. Check that all parts of the system are turned on and properly adjusted.
3. Verify that the power source is providing the correct voltage and current.
4. If the server is plugged into a switched multiple-outlet box, make sure the switch on the outlet box is turned on.
5. Plug a different electrical device (such as a printer) into the power outlet, and turn it on.
6. Unplug the power cords, wait 20 seconds, plug the power cords in again, and restart the system.

If the System Powers On, but Fails POST

Do one of the following:

- If the system gives a series of beeps, this indicates a system error. Contact HP or your reseller.
- If the system fails POST and an error message appears, refer to the section "Error Messages." If the suggested solutions do not solve the problem, contact HP or your reseller.

If the System Passes POST, but Does Not Function

If an error message appears, read the error message text for actions to take. If the actions do not solve the problem, contact HP or your reseller.

If there is no error message, follow these steps:

1. Check to ensure that the NetServer is configured correctly in the Setup Utility.
2. If the server still does not work, turn it off and remove all external peripherals, except the monitor and keyboard. Test to see if the server now works.
3. If the server still does not work, turn off the monitor, the server, and all external devices, and check the internal hardware, as follows:
 - a. Unplug the power cords and all telephone cables. Remove the NetServer cover.
 - b. Check that all accessory boards are firmly seated in their slots.
 - c. Ensure that all disk drive power and data cables are securely and properly connected. Verify the mass storage configuration with the cabling and switch diagrams shown on the Technical Reference Card, located in a plastic pouch on the interior of the NetServer covers.
 - d. Verify that the DIMMs are firmly seated on the System Board. Verify that added DIMMs are HP DIMMs.
 - e. Replace the NetServer covers, and lock the system.
 - f. Replace all power cords and power cables.
 - g. Turn on the monitor.
 - h. Turn on the server.
 - i. Check for error messages.
4. Copy DiagTools from the *HP NetServer Navigator CD-ROM* to diskette, and run it from diskette.

DiagTools

You can create your own diskette of tools to diagnose components offline. A basic suite of tools checks key NetServer components, and a menu of advanced tests is available for in-depth testing.

DiagTools does not use any tests that write over and destroy user data. The advanced series requires user inputs, and decisions are left to the advanced series.

Use DiagTools to test the following components:

- system board
- memory modules
- flexible disks
- serial ports
- video monitor
- processors
- hard disk packs
- keyboards
- parallel ports
- CD-ROM drives

Use DiagTools to:

- Display a high-level inventory of the system under test
- Save and print a detailed inventory of hardware components
- Conduct a basic test of components listed in the system inventory
- Display "PASSED" or "FAILED" overall results of basic tests
- Record detailed test results of basic system tests
- Display a menu of advanced tests
- Select and run one or a series of advanced tests
- Add the record of results of advanced tests to the record of basic tests
- View a list to locate the meaning of a specific error code
- View one or more steps to help confirm and isolate error conditions
- Browse the Support Ticket, containing detailed inventories and test results
- Add comments to the Support Ticket

If you have TopTools remote management software installed and configured for use with DiagTools, you can accomplish any of the above tasks remotely.

See the online documentation *HP NetServer DiagTools Error Reference and User Guide* for more information on DiagTools.

Error Messages

If you get an error message, insert your *HP NetServer Navigator CD-ROM* into the CD-ROM drive and press the **Reset** button on the front of the NetServer. An Error Message Utility automatically displays the error message and a possible solution.

For a complete list of error messages and solutions see the NetServer Information Assistant program on the *HP NetServer Online Documentation CD-ROM*.

Clearing the System Configuration

You may need to clear the system configuration if a program has corrupted the configuration, or if incorrect settings made in the Setup utility have made the display unreadable.

To clear the system configuration, the procedure is the same for the rack-mount and the pedestal HP NetServers once you gain access to the system board assembly.

1. Log off all users and gracefully shut down the network operating system according to directions in your NOS documentation.
2. Power down the HP NetServer according to the instructions in Chapter 2, "Controls, Ports, and Indicators."
3. Disconnect the power cords and cables and, if necessary, label each one to support re-assembly.

CAUTION	The power supplies will continue to provide standby current to the NetServer until the power cable is disconnected.
----------------	---

4. For both rack-mounted and pedestal models, follow the instructions in Chapter 3, "Opening and Closing the NetServer," to gain access to the system board assembly.

NOTE	In the LH 6000r, this assembly is under the right cover; in the LH 6000, it is under the top cover.
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While you can clear the system configuration in the rack or in the pedestal, it is recommended that you remove the system board assembly to perform configuration changes.

Refer to Figure 12-1 and the Technical Reference Card inside the top cover.

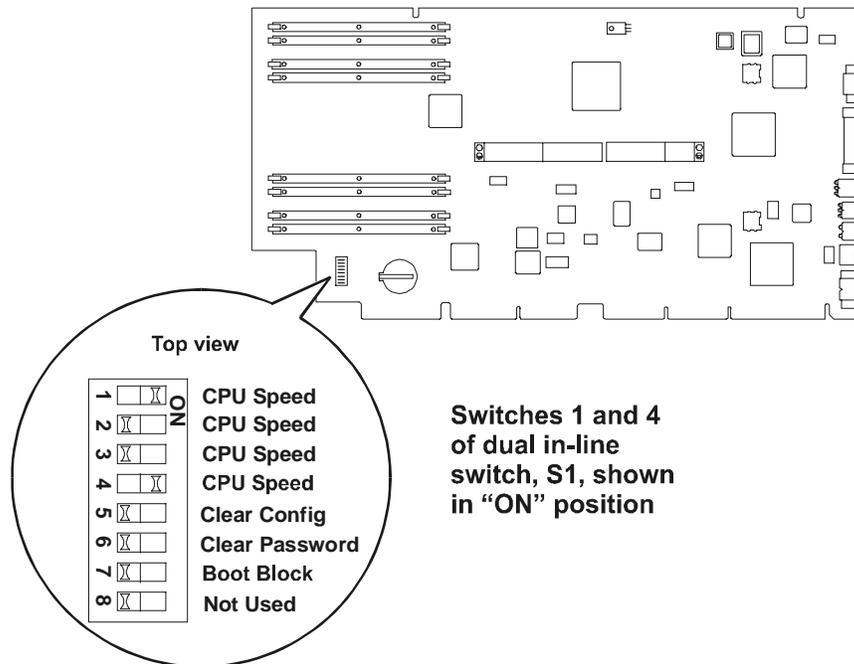


Figure 12-1. System Board Assembly and Configuration Switch

5. Move the configuration memory switch, switch 5 on the system board, to the "ON = CLEAR CONFIG" position.
6. Plug in the power cords, and turn on power to the HP NetServer. The following message appears:

The configuration has been cleared. Set the Clear Config switch to the OFF position before rebooting.
7. Turn off power to the HP NetServer and unplug the power cords.
8. Return switch 5 on the system board to the OFF position.
9. Follow the procedure in Chapter 3, "Opening and Closing the HP NetServer," for closing up the server.
10. Reconnect power and cables.
11. Restore HP NetServer to normal operation.

12. Turn on power to the HP NetServer. The error message may be displayed:
0012-34 : Incorrect System Configuration
13. Press the [F2] function key and answer **Yes** to save the configuration, then exit the Setup utility.

Password Problems

If you have forgotten the password, your HP NetServer will function normally, but you will not be able to change the system configuration settings in the Setup utility.

To reset the password, the procedure is the same for the rack-mount and the pedestal HP NetServers once you gain access to the system board assembly.

1. Log off all users and gracefully shut down the network operating system according to directions in your NOS documentation.
2. Power down the HP NetServer according to the instructions in Chapter 2, "Controls, Ports, and Indicators."
3. Disconnect the power cords and cables and, if necessary, label each one to support re-assembly.

CAUTION	The power supplies will continue to provide standby current to the NetServer until the power cable is disconnected.
----------------	---

4. For both rack-mounted and pedestal models, follow the instructions in Chapter 3, "Opening and Closing the NetServer," to gain access to the system board assembly.

NOTE	In the LH 6000r, this assembly is under the right cover; in the LH 6000, it is under the top cover.
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While you can reset the system password in the rack or in the pedestal, it is recommended that you remove the system board assembly to perform configuration changes.

5. Move switch 6 on the system board (labeled "Clear Password") to the ON position (refer to Figure 12-1).
6. Plug in the power cords. Turn on power to the HP NetServer and allow it to complete its startup routing. The old password will be erased.
7. Turn off power to the HP NetServer. Unplug the power cords.

8. Return switch 6 to the OFF position.
9. Follow the procedure in Chapter 3, "Opening and Closing the HP NetServer," for closing up the server.
10. Reconnect power and cables.
11. Restore HP NetServer to normal operation.
12. If you wish to set the password again, during the power-on system hardware test press the [F2] function key to start the Setup utility.
13. Set the new password in the Security menu.
14. Press the [F10] function key and answer **Yes** to save the configuration, including the new password.
15. Exit the Setup utility.

13 Alternative Rack Mounting

Introduction

This chapter provides the instructions for mounting the HP NetServer in an HP Systems rack. Figure 13-1 shows the Systems rack.

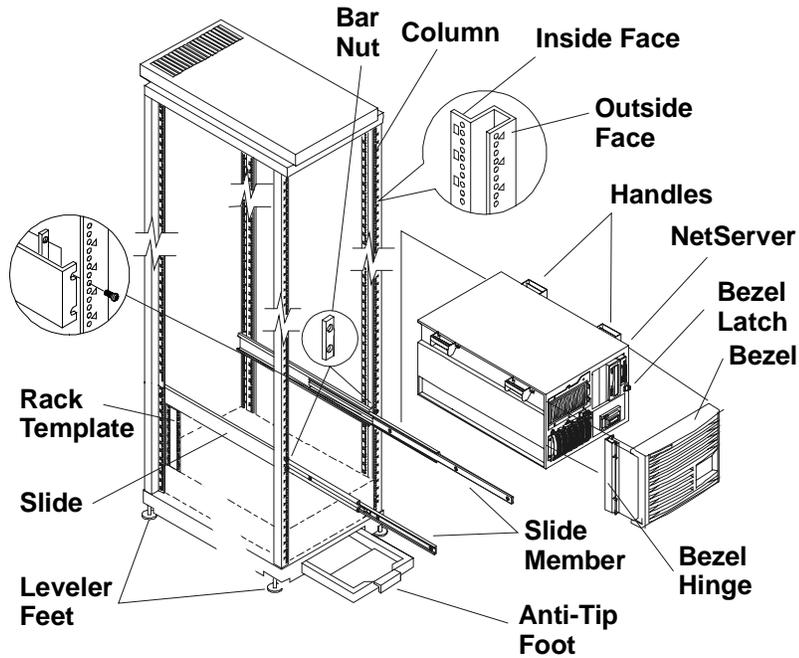


Figure 13-1. Installation Hardware

If you have the newer HP System/E or System/U racks, go to Chapter 8. If you are mounting the HP NetServer in a non-HP rack, see the documentation in the appropriate rack accessory kit.

NOTE The pedestal HP NetServer LH 6000 cannot be rack-installed without a conversion kit. Contact your HP reseller for information about the *HP NetServer LH 6000 to HP NetServer LH 6000r Conversion Kit*.

Rack-mounting Guidelines and Precautions

Observe the following guidelines and safety precautions during the rack-mount installation.

- Extend the rack's anti-tip foot prior to any work on the rack to prevent rack tip-over, equipment damage, and injury.

WARNING	Lower the leveler feet at the four corners of the rack to improve stability and prevent the rack from rolling away as devices are inserted into their rack mounts. Failure to use the anti-tip foot or the anti-tip device and leveler feet could result in serious injury.
----------------	---

- Uneven mechanical loading within the rack can cause hazardous conditions. Plan the placement of equipment in the rack to make sure that this problem does not occur.
 - ◇ Install components from the bottom up.
 - ◇ Place the heaviest components on the bottom of the rack.

CAUTION	If other rack components are to be mounted in the rack below the HP NetServer, install those components before starting to mount the HP NetServer.
----------------	--

- ◇ Use HP Rack Assistant to plan the rack configuration and to check power, weight, and stability of the configured rack. Download HP Rack Assistant from:
<http://netserver.hp.com/netserver/tools>
- Install components such as DIMMs and processors into the system board assembly before rack-mounting the HP NetServer.
- Remove power supplies and hard drives before lifting the HP NetServer.

Always keep the following safety and environmental issues in mind, especially if you install the HP NetServer in a non-HP rack environment:

- **Maximum Recommended Ambient Temperature** - The maximum recommended ambient temperature of the room is 35°C (95°F).
- **Elevated Operating Ambient Temperature** - The ambient operating temperature within a closed or multi-unit rack assembly is likely to exceed

the room's ambient temperature. Ensure the temperature within the rack itself does not exceed 35°C (95°F).

- **Reduced Airflow** - As you mount equipment in the rack, make sure that you allow enough airflow for safe operation of the equipment.
- **Circuit Overloading** - Make sure that the total configuration of equipment in the rack does not overload the supply circuit. To this end, check the nameplate ratings on all equipment. Consider the effect of circuit overloading on overcurrent protection and supply wiring.
- **Reliable Earth Grounding** - Maintain reliable earth grounding of rack-mounted equipment. Give particular attention to supply connections that are not direct connections to the branch circuit: for example, the use of power strips.

Preparing for Installation

You should plan the placement of your HP NetServer LH 6000r and other rack components before proceeding with installation. Proper placement is vital for both safety and operating efficiency.

The rack-optimized HP NetServer LH 6000r fits into 19-inch-wide EIA (Electrical Industry Association) racks. Vertical space in the rack is measured in standard EIA units. One EIA unit is 1.75 inches (44.45 mm). The HP NetServer LH 6000r requires 8 EIA units of space.

STOP!

Read the *HP NetServer Rack Installation Road Map* before installing the HP NetServer LH 6000r. The Roadmap contains important information you need to know for installing components in the rack.

Tools Required

The following tools are required to install the HP NetServer:

- Small adjustable open-end wrench
- Torx T-15 and T-25 drivers
- Hewlett-Packard Systems Rack template
- Tape or a marker pen to mark mounting locations

Installing the Slides

The following steps and illustrations describe how install slides for mounting a HP NetServer.

Marking the Columns

Mark the mounting location of the HP NetServer and mounting holes on each column of the rack as described (see Figure 13-2).

NOTE	The EIA unit marks are stamped in the sheet metal of the columns. Use the rack template to mark the correct holes for mounting (on all four columns).
-------------	---

Marking Front Columns

Mark the slide mounting holes on the front columns.

1. Mark the baseline (bottom) of the HP NetServer at an EIA unit mark on the column.
2. Hold the bottom of the rack template at the baseline. Mark the top of HP NetServer (8 EIA units counted up from the baseline).
3. Mark the slide screw mounting holes (holes 20 and 22 counted up from the baseline).
4. Mark the second front column by repeating steps 1 through 3.

Marking Rear Columns

Mark the slide mounting holes on the inside faces of the rear columns.

1. Mark the baseline (bottom) of the HP NetServer at an EIA unit mark on the column.
2. Hold the bottom of the rack template at the baseline. Mark the top of HP NetServer (8 EIA units counted up from the baseline).
3. Mark the slide mounting hole (hole 21 counted up from the baseline).
4. Mark the second rear column by repeating steps 1 through 3.

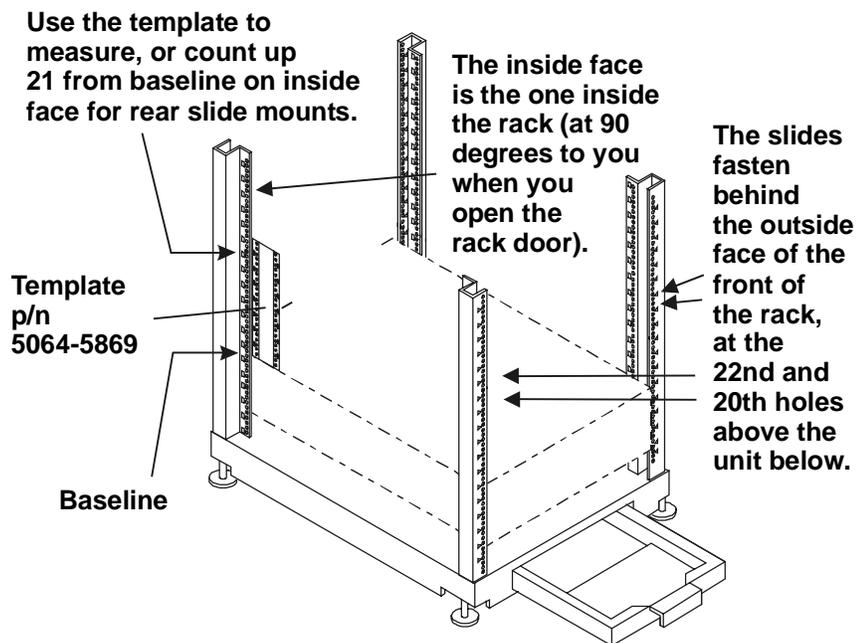


Figure 13-2. Marking the Rack Columns

Installing Rack Nuts

Rack nuts are installed on the front columns to secure the bezel latch and hinge. Use the rack template to locate the mounting holes (see Figure 13-3).

1. Install the bezel latch rack nuts on the right front column (holes 11 and 15 counted up from the baseline).
2. Install the bezel hinge rack nuts on the left front column (holes 6 and 19 counted up from the baseline). Rack nuts are installed on the rear columns to secure the Z-bracket, which is secured to the HP NetServer. Use the rack template to locate the mounting holes (see Figure 13-3).
3. Install the Z-bracket rack nuts on the right rear column (holes 9 and 13 counted up from the baseline).

NOTE The Z-bracket installation is only required if the NetServer is to be shipped while installed in a rack. The Z-bracket allows the NetServer to be secured to the rear rack column.

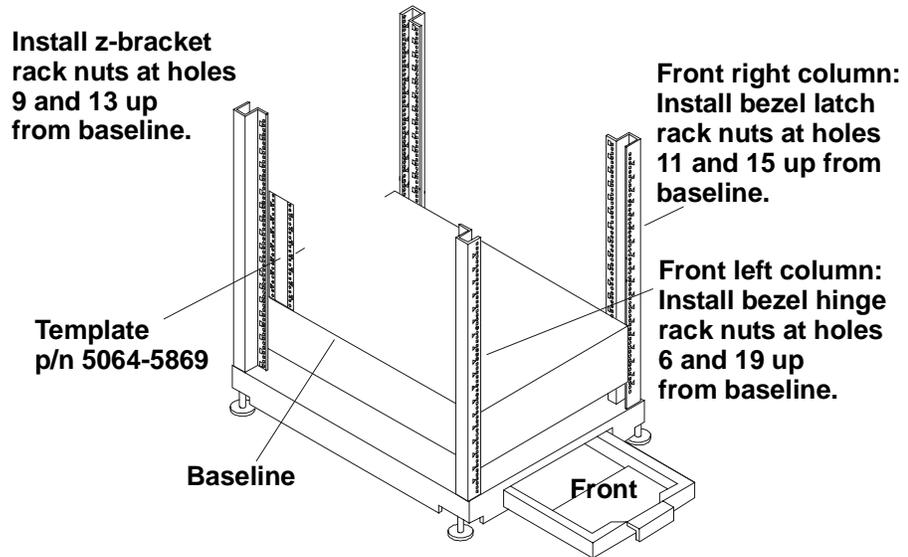


Figure 13-3. Installing Rack Nuts

Installing Bar Nuts

The "bar nut" is a two-hole metal bar used to secure the mounting flanges of the slide to the front columns (see Figure 13-4).

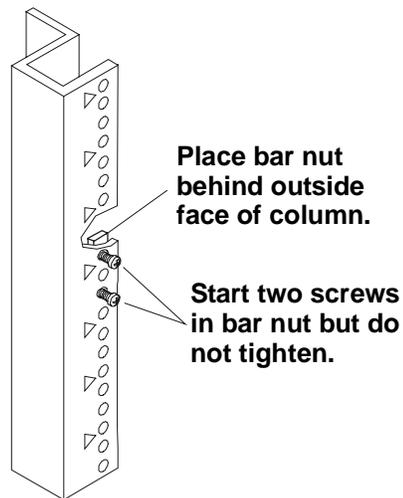


Figure 13-4. Installing Bar Nuts

1. Hold the bar nut behind the outside face of the front column, at the slide screw holes marked earlier. Start (but do not tighten) two screws through the face of the into the bar nut.
2. Install the bar nuts on both front columns.

Attaching the Slides

The following steps describe how to attach the slides to the columns.

1. Remove hex nuts and lock washers securing the removable mounting flange to the slide. Save the hex nuts and lock washers.
2. Remove the removable mounting flange. A large flat blade screwdriver inserted between the flange and the slide at the end of the slide may help in removing the flange. This mounting flange is not required when installing a slide in an HP systems rack.
3. Hold the slide so the slide members extend out the front of the rack (see Figure 13-5).

NOTE The slide members cannot be removed.

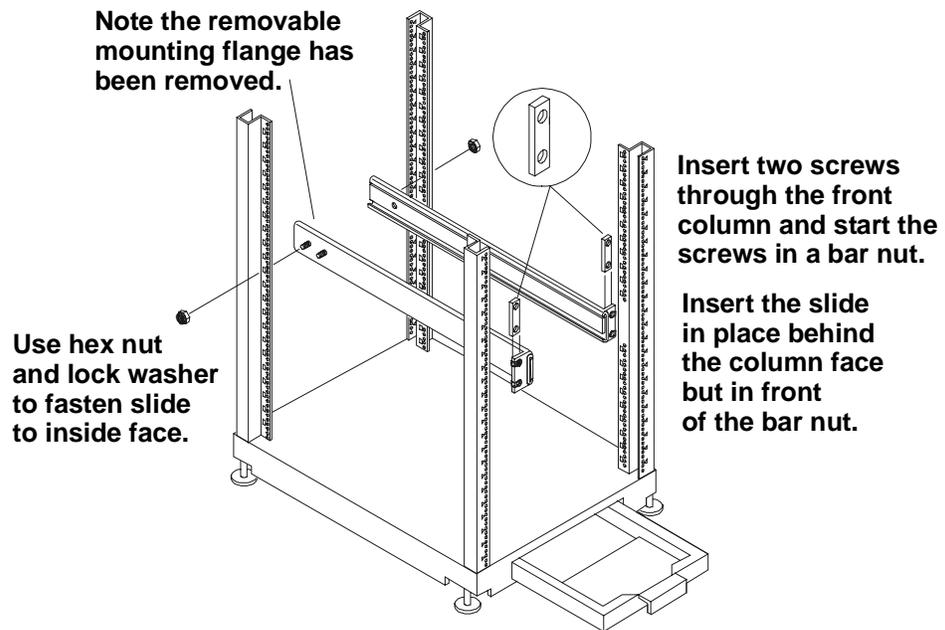


Figure 13-5. Attaching the Slides

4. Insert the slide fixed mounting flange between the column and bar nuts. Press the slide firmly against the front column (see Figure 13-6).

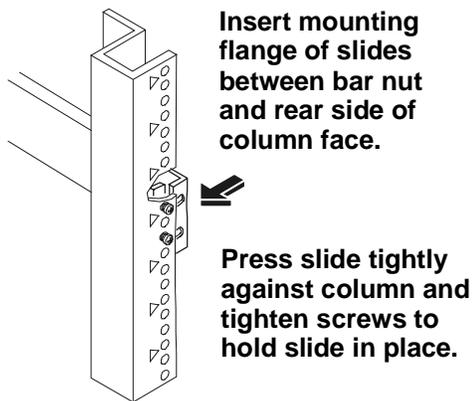


Figure 13-6. Securing the Slide to the Front Column

5. Tighten both screws in the mounting flanges of the slide.

6. Insert the threaded stud on the rear of the slide into the rear column-mounting hole marked earlier.
7. Secure the slide with a hex nut and lock washer saved earlier.
8. Repeat steps 1 through 6 and install the second slide in the rack.

Completing the HP NetServer Installation

Installing the HP NetServer on the slides and securing it to the rack completes the installation of the HP NetServer in the HP Systems rack. Follow the steps beginning in the section *Installing the HP NetServer* in Chapter 8, "Installing the HP NetServer in a HP Rack System/E or Rack System/U," to complete the installation.

A Specifications

The specifications listed below vary if you install a mass storage device in your server that has more stringent environmental limits. Make sure that the operating environment for your server is suitable for all the mass storage devices that you are using.

Video

The video memory used for the HP NetServer LH 6000 or HP NetServer LH 6000r is a 16Mbit (2MB) SGRAM, with architecture of 256K x 32 bit x 2 banks.

2D Video Resolutions

<u>Resolution</u>	<u>256 Colors</u>	<u>65K Colors</u>	<u>16.7M Colors</u>
640 x 480	200Hz	200Hz	200Hz
800 x 600	200Hz	200Hz	160Hz
1024 x 768	150Hz	150Hz	not supported
1152 x 864	120Hz	120Hz	not supported
1280 x 1024	100Hz	100Hz	not supported
1600 x 1200	76Hz	76Hz	not supported

3D Video Resolutions

<u>Resolution</u>	<u>Color Depths</u>
512 x 384	16 bits
640 x 480	16 bits

Environment

Thermal

Temperature

Operating	5° to 35° C (41° to 95° F)
Non-operating	-40° to +65° C (-40° to +149° F)

Humidity

Operating	20% to 80% relative humidity, non-condensing
Non-operating	5% to 95% relative humidity, non-condensing

Altitude

Operating	-30 to 3,045 m (~ 10,000 ft)
Non-operating	-30 to 12,180 m (~ 40,000 ft)

Acoustic Emissions

Sound level (LpA): < 58 dBA

Size

Minimum Clearance

HP NetServer LH 6000

Front	1 m (39 inches)
Sides	2.5 cm (1 inch)
Top	2.5 cm (1 inch)
Back	15 cm (6 inches)

HP NetServer LH 6000r

Front	1 m (39 inches)
Sides	2.5 cm (1 inch)
Top	2.5 cm (1 inch)
Back	15 cm (6 inches)

Weight and Dimensions

NOTE A fully loaded HP NetServer can weigh up to 173 lbs. (78.5 kgs). Follow local regulations, and use one person for every 40 pounds of HP NetServer weight when lifting it.

HP NetServer LH 6000

Height	494.8 mm (19.5 in)
Width	350.5 mm (13.8 in)
Depth	724.2 mm (28.5 in)
Weight	72.6 – 78.5 kg (160 - 173 lb.)

HP NetServer LH 6000r

Height	354.7 mm (14 in)
Width	482.6 mm (19 in)
Depth	749.2 mm (29.5 in)
Weight	72.6 – 78.5 kg (160 - 173 lb.)

Power Requirements

Power Supply Specifications: Three power supplies, plus one for redundancy

Power supply type Wide range, PFC

Input voltages:

Nominal: 100 to 240 VAC, 11.7A/5.6 A at 50/60 Hz

90 to 264 VAC at 47 - 63 Hz

Range:

Power availability: 780 W continuous

Minimum System Requirements

Voltage	Volt/Amps	Amps	Watts
100	1177	11.7	1166
120	1153	9.6	1141
200	1120	5.6	1099
230	1117	4.9	1095

B Regulatory Information

Regulatory Notices - Electromagnetic Compliance

Your HP NetServer may fit into Class A or Class B configuration. Refer to the appropriate information below.

Electromagnetic Compatibility (EMC) requirements have been established in many countries to regulate the radio frequency energy generated by Information Technology Equipment (ITE). This energy is generated during the normal and intended use of this equipment and so it is limited by country regulations to levels intended to minimize potential interference to other electrical equipment, including public safety services.

Two levels of radio frequency energy are allowed according to the type or use of equipment. Class A levels have been established for use in commercial or business environments. Class B levels are lower than the class A requirement and have been established for use in residential environments. Class B levels are also suitable when the environment includes electrically sensitive equipment.

The HP NetServer equipment you have purchased has been provided with a compliance label to indicate where it may be used with reasonable protection to the environment in which it is used. Additional statements are provided below as required by the requirements of international and domestic regulations.

NOTE	Check the label on your product to determine the whether the level is Class A or Class B.
-------------	---

Notice for United States

For Products Labeled "Class A"

This equipment has been tested and found to comply with the limits for Class A digital devices, pursuant to Part 15 of the FCC (Federal Communications Commission) Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user is required to correct the interference at their own expense.

For Products Labeled "Class B"

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

Hewlett-Packard's system tests were conducted with HP-supported peripheral devices and HP shielded cables, such as those you receive with your computer. Changes or modifications not expressly approved by Hewlett-Packard could void the user's authority to operate the equipment. Cables used with this device must be properly shielded to comply with the requirements of the FCC.

Notice for Canada (Industry Canada)

For Products Labeled "Class A"

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

For Products Labeled "Class B"

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Notice for Japan

For Products Labeled "VCCI Class 1"

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると受信障害を引き起こすことがあります。
取り扱い説明書に従って正しい取り扱いをして下さい。

(Translation)

This equipment is in the 1st Class category information technology equipment based on the rules of Voluntary Control Council For Interference by Information Technology Equipment (VCCI). When used in a residential area, radio interference may be caused. In this case, user may be required to take appropriate corrective actions.

For Products Labeled "VCCI Class 2"

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(Translation)

This equipment is in the 2nd Class category information technology equipment based on the rules of Voluntary Control Council For Interference by Information Technology Equipment (VCCI). When used in a residential area, radio interference may be caused. In this case, user may be required to take appropriate corrective actions.

Notice for Korea**For Products Labeled "Class A"**

사용시 안내문 (A급 기기)

이 기기는 업무용으로 전자파장애검정을 받은 기기이오니, 만약 잘못 구입하셨을 때에는 구입한 곳에서 비업무용으로 교환하시기 바랍니다.

(Translation)

User Guide (Class A)

Please note that this equipment has been approved for business purposes with regard to electromagnetic interference. If purchased in error for use in a residential area, you may wish to exchange the equipment where you purchased it.

Notice for Taiwan**Class A Warning Statement**

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Declaration of Conformity (US, EU, Australia)

DECLARATION OF CONFORMITY according to ISO/IEC Guide 22 and EN 45014	
Manufacturer's/Supplier Name:	Hewlett-Packard Company
Manufacturer's/Supplier Address:	10955 Tantau Avenue Cupertino, CA 95014-5040 USA
declares, that the product	
Product Name:	Network Server
Model Number(s):	HP NetServer LH 6000/LH 6000r
Product Options:	ALL
conforms to the following Product Specifications:	
Safety:	IEC 950: 1991+A1, A2, A3, A4 / EN 60950: 1992+A1, A2, A3, A4 GB 4943-1995
EMC:	CISPR 22:1993 +A1, +A2/ EN 55022:1994 +A1, +A2, Class A GB 9254-1988 EN 61000-3-2:1995 - Harmonic Current Emissions EN 61000-3-3:1995 - Voltage Fluctuations and Flicker EN 50082-1:1992 - Generic Immunity IEC 801-2:1991, 4 kV CD, 8 kV AD IEC 801-3:1984, 3 V/m IEC 801-4:1988, 0.5 kV Signal Lines, 1 kV Power Lines FCC Title 47 CFR, Part 15
Supplementary Information:	
1) The product was tested in a typical configuration with Hewlett-Packard peripherals. 2) Models were configured with a network interface board and shielded twisted-pair data cable. 3) The product complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: <ul style="list-style-type: none"> • This device may not cause harmful interference, and • This device must accept any interference received, including interference that may cause undesired operation. 	
The product herewith complies with the requirements of the following directives and carries the CE marking accordingly: <ul style="list-style-type: none"> - EMC Directive 89/336/EEC - Low Voltage Directive 73/23/EEC 	
Cupertino, December 17, 1999	 Regulatory Engineering Manager
North American Contact: Hewlett-Packard Company Product Regulations Manager 3000 Hanover Street, Palo Alto, CA 94304 Phone: 415-857-1501 European Contact: Your local Hewlett-Packard Sales and Service Office or Hewlett-Packard GmbH, Herrenberger Straße 130, D-71034 Böblingen (FAX: + 49-7031-14-3143)	

Regulatory Notices – Product Safety

The following information applies only to HP NetServers with factory-installed components.

CD-ROM and Laser Safety Statements

The following information applies only to HP NetServers with factory-installed drives.

CD-ROM Electrical Safety Statement - United States

WARNING	To prevent fire or shock hazard, do not expose the unit to rain or moisture. To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.
----------------	--

CD-ROM Laser Safety Statements - United States

CAUTION	This CD-ROM mass storage system contains a laser system and is classified as a "Class-1 Laser Product" under a U.S. Department of Health and Human Services (DHHS) Radiation Performance standard according to the Radiation Control for Health and Safety Act of 1968. To ensure proper use of this product, please read this instruction manual carefully and retain for future reference. Should the unit ever require maintenance, contact an authorized service location. Use of controls, adjustments or the performance procedures other than those specified herein may result in hazardous radiation exposure. To prevent direct exposure to laser beam, do not try to open the enclosure.
----------------	---

Laser Safety - Finland**LASERTURVALLISUUS****LUOKAN 1 LASERLAITE****KLASS 1 LASER APPARAT**

LH 6000 - verkkopalvelimeen voidaan asentaa lisävarusteena laitteensisäinen CD-ROM-lukulaite, joka on laserlaite.

Kyseinen CD-ROM-lukulaite on käyttäjän kannalta turvallinen luokan 1 laserlaite. Normaalisissa käytössä lukulaitteen suojakotelo estää laseräteen pääsyn laitteen ulkopuolelle. Laitteen turvallisuusluokka on määritetty standardin EN 60825 (1991) mukaisesti.

Laser Safety - Germany

VORSICHT	Diese Gerät enthält ein Laser-System und ist als "LASER PRODUKT DER KLASSE 1" klassifiziert. Für den richtigen Gebrauch dieses Modells die Bedienungsanleitung sorgfältig durchlesen und als Referenz aufbewahren. Falls Probleme mit diesem Modell auftreten, die nächste "authorisierte Services-Verrtetung" benachrichtigen. Um einen direkten Kontakt mit dem Laserstrahl zu vermeiden, soll das Gehäuse nicht geöffnet werden.
-----------------	---

VORSICHT	Die Verwendung von anderen Steuerungen oder Einstellungen oder das Durchführen von anderen Vorgängen als in der Bedienungsanleitung beschrieben kann gefährliche Strahlenexpositionen zur Folge haben.
-----------------	--

<p>CLASS 1 LASER PRODUCT</p>
<p>LASSER KLASSE 1 PRODUKT</p>

This CD-ROM Drive Unit is classified as a CLASS 1 LASER PRODUCT.

The CLASS 1 LASER PRODUCT label is located on the top of the drive.

Bei diesem CD-ROM-Laufwerk CDU56S handelt es sich um ein Laser-Produkt der Klasse 1. Ein entsprechender Aufkelber mit der Beschriftung LASER KLASSE 1 PRODUKT befindet sich der Obersiete des Geräts.

Battery Statements

This product uses a lithium battery.

Battery Statement – United States

WARNING	<p>Danger of explosion if battery is incorrectly replaced.</p> <p>Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.</p>
----------------	--

Battery Statement – France

AVERTISSEMENT	<p>Il y a danger d'explosion s'il y a remplacement incorrect de la batterie.</p> <p>Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur. Mettre au rebut les batteries usagées conformément aux instructions du fabricant.</p>
----------------------	---

Power Line Harmonic Statement

This statement applies to all models of the HP NetServer LH 6000.

Power Line Harmonic (Japan)

高調波ガイドライン適合品

(Translation)

This product conforms to the Power Line Harmonics guideline.

Noise and Ergonomic Statement

Noise Declaration and Ergonomic Statement - Germany

Sound Pressure: LpA < 58 dB (A)

am Arbeitsplatz, Beobachter Position (workplace, bystander position)
normaler Betrieb (normal operation)
nach DIN 45635 T. 19 (per ISO 7779)

This product has not been evaluated for compliance with the ZH1/618/ISO 9241 ergonomic requirements.

C Service and Support

For all Service and Support information, see the *HP NetServer Warranty and Service/Support Booklet* included with your product.

D Warranty and Software License

Warranty

See the *HP NetServer Warranty and Service/Support Booklet* included with your product for all warranty and service/support information.

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