HP ProLiant ML150 Server
Operations and Maintenance Guide

July 2003 (First Edition)
Part Number 343329-001

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Contents

About This Guide

This maintenance and service guide can be used for reference when servicing HP ProLiant ML150 server**.**

WARNING: To reduce the risk of personal injury from electric shock and hazardous energy levels, only authorized service technicians should attempt to repair this equipment. Improper repairs can create conditions that are hazardous.

Audience Assumptions

This guide is for service technicians. HP assumes you are qualified in the servicing of computer equipment and trained in recognizing hazard in products with hazardous energy levels and are familiar with weight and stability precautions for rack installations.

Technician Notes

WARNING: Only authorized technicians trained by HP should attempt to repair this equipment. All troubleshooting and repair procedures are detailed to allow only subassembly/module-level repair. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard.

WARNING: To reduce the risk of personal injury from electric shock and hazardous energy levels, do not exceed the level of repairs specified in these procedures. Because of the complexity of the individual boards and subassemblies, do not attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create conditions that are hazardous.

WARNING: To reduce the risk of electric shock or damage to the equipment:

- **Disconnect power from the system by unplugging all power cords from the power supplies.**
- **Do not disable the power cord grounding plug. The grounding plug is an important safety feature.**
- **Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.**

CAUTION: To properly ventilate the system, you must provide at least 7.6 cm (3.0 in.) of clearance at the front and back of the server.

CAUTION: The computer is designed to be electrically grounded (earthed). To ensure proper operation, plug the AC power cord into a properly grounded AC outlet only.

NOTE: Any indications of component replacement or printed wiring board modifications may void any warranty.

1

Controls and Indicators

This chapter describes the controls, ports, and indicators on the front and rear of the HP ProLiant ML150 server.

Controls and Indicators Location

Please refer to your *HP ProLiant ML150 server Installation Sheet* for the locations of the controls and indicators on the front and rear panels.

Front LED Indicators

Table 1-1: Control Panel Switches and Indicators

Control/Indicator	Description
Power On/Off Switch 	The power switch turns the HP server power On or Off. If sleep states are available, it also transitions between Power On and sleep states. Sleep states are NOS dependent and only available if your NOS supports power management based on the ACPI (Advanced Configuration and Power Interface) standard. Refer to "Applying Power to the HP Server" and "Sleep States (ACPI)" later in this chapter.
Power LED 	• **Steady green** indicates the server is operating normally. • **Off** (unlit) indicates the server is powered off or in standby mode.
Disk Activity LED 	• **Flashing amber** indicates SCSI disk drive activity. • **Off** (unlit) indicates inactive operation.
LAN Link LED 	• **Flashing green** indicates a valid 100/1000 Mbps LAN link. • **Off** (unlit) indicates the server is not connected to LAN.

Hot Swap Hard Drive Indicators

Each of the hot swap hard drives has two LED indicators:

- Status Indicator

  This LED indicates the drive operating condition: normal, warning, or failure.

- Activity Indicator

  This LED indicates the disk drive access activity. This LED indicator is controlled by the disk drive directly. When a drive is accessed, the LED indicator shows a green light.

Table 1-2 and Table 1-3 describe the LED signals used to indicate the operation status of a disk drive.

Table 1-2: Hot Swap Hard Drive Operation Status Conditions

Condition	LED	Signaling	Note
Drive access	Activity	Green (flashing)	Under HDD control*
Drive fault	Status	Amber (solid)	
Drive predictive fault	Status	Amber (flashing)	
Missing management PCA or jumper cable	Status	Amber (solid)	For all HDD on SCSI bus A and/or B
Drive/slot normal (drive present)	Status	Green	Pass through mode
Drive/slot normal (drive not present)	Status	OFF	Pass through mode

*__During disk drive spin-up or a hung-up situation, the activity LED may stay solid green for a long period.__

Table 1-3: Hot Swap Hard Drive LED Indicator

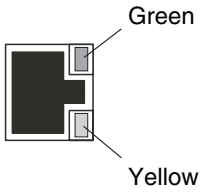
Status LED	Activity Status LED
• **Off**: Normal or unit not powered	• **Off**: Normal
• **Green** (**solid)**: - Normal and under power - I/O activity	• **Green (flashing)**: I/O activity • **Green** (**solid** for more than one minute): Disk spinning up or “hung”
• **Amber (flashing)**: predictive failure	
• **Amber (solid)**: hard drive failure	

Rear Panel

The ports and connectors at the rear are listed below.

- The power connector accepts a standard power cable to connect the HP server with a UPS or the site power source.
- The mouse port accepts a standard mouse with a PS/2 connector.
- The keyboard port accepts a standard keyboard with a PS/2 connector.
- Two USB ports are provided for printers, scanners, and external modems.
- The serial port is a standard serial port.
- The parallel port is a standard parallel port, which supports Extended Capabilities Port (ECP)/Enhanced Parallel Port (EPP).
- The video VGA port is a standard VGA port.
- The LAN port is an embedded controller based on Intel's 82545 10/100/1000 BaseT Fast Ethernet controller. It has an RJ-45 LAN connector and two LEDs to indicate LAN speed and valid connection or activity. Table 1-4 describes the LED indicators.

Table 1-4: LAN Port (RJ-45) LED Indicators

Indicator		Definition
	Green LED **Off** Yellow LED **On**	• **Steady Yellow** indicates a valid 10 Mbps LAN link. • **Flashing Yellow** indicates 10 Mbps LAN activity.
	Green LED **On** Yellow LED **Off**	• **Steady Green** indicates a valid 100 Mbps LAN link. • **Flashing Green** indicates 100 Mbps LAN activity.
	Green LED **On** Yellow LED **On**	• **Steady Green and Yellow** indicates a valid 1000 Mbps LAN link. • **Flashing Green and Yellow** indicates 1000 Mbps LAN activity.

Applying Power to the HP Server

Powering Up the Server

1. Turn on power to the monitor connected to the HP server.

   Turning on the monitor first ensures that video output auto-configures properly as the server boots up.

2. Press the power switch on the front control panel.

   When you press the power switch, the server powers up and loads the operating system. The system runs a set of power-on self tests (POST) during this process. For details refer to Chapter 4, "Troubleshooting."

Powering Down the Server

1. Log off all users and, if necessary, back up files.
   - — Schedule the power down for a time when the server being down will affect the fewest users.
   - — If you will be performing a hardware or software upgrade, be sure the server's data has been backed up.
   - — Follow instructions in your network operating system (NOS) documentation to shut down all networking software and applications.

WARNING: The power supply will continue to provide standby current to the HP server until the power cable is disconnected from the rear panel.

2. Press the power switch on the HP server's control panel when prompted by the operating system.

   Normally this completes the power-down procedure.

Connecting Power to Multiple-Server Configurations

The HP server temporarily draws a large "inrush current" when first connected to an AC power source. The inrush current is much greater than the server's normal operating current and generally, the AC power source can handle the normal inrush current.

However, if you install several HP servers 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 capability, the breaker may trip and thus prevent the servers from powering up.

When preparing your site for installation, allow for the additional inrush current. Refer to "Power Supply Requirements" in Chapter 7, "Specifications."

Sleep States (ACPI)

The HP server 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 HP server. The term "sleep state" refers to any of several reduced power consumption states in which normal NOS activity has ceased.

The HP server supports several sleep states. One of these is "standby" or "suspend" sleep state, which has a short wake-up time. In this sleep state, the server appears to be off – the monitor appears blank and there is no CD-ROM or SCSI hard drive activity.

The HP server has another sleep state with a slower wake-up time, sometimes referred to as "hibernate" by various operating systems. In this sleep state, the server appears to be off as described earlier, but the fans and the front panel power LED are also turned off. The unique feature of this sleep state (and the reason for its slower wake-up time) is that information about the server's NOS state (open applications, screens, and so on) is saved to disk before the server is placed in the sleep state. Upon wake-up, this information must be restored from the disk. This method of restoring the server's operation is much faster than a complete rebooting of the server. It still requires running all the start-up self-tests before starting the NOS, but loading the NOS and all the previously opened applications is much faster.

The HP server 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 switch, LAN activity, and scheduled events.

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

The HP server's power switch can be configured to initiate a graceful shutdown of the NOS rather than an immediate shutdown of the power supply. The power switch 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 server's power switch is capable of an override in case of a non-responsive NOS.

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

CAUTION: If the power switch override is used, there is a strong possibility that data will be corrupted or lost.

2

Installing and Configuring

Opening and Closing the HP ProLiant ML150 Server

This section describes how to open and close the front bezel, lower bezel, and side panel of the HP ProLiant ML150 server.

WARNING: Before opening the server, always disconnect the power cord and unplug cables. Disconnect the power cord 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 wrist strap and use a static-dissipating work surface connected to the chassis when handling components. Be sure the metal of the wrist strap contacts your skin.

Figure 2-1 shows the HP ProLiant ML150 server, available with SCSI cold swap hard drives and hot swap hard drives.

- The key lock, power switch, and system and LAN status indicators are located within the front upper bezel. Refer to Figure 2-2.
- The SCSI hard drives are accessible from the front lower bezel. Refer to Figure 2-3.
- The system board modules, power supply, fan assembly, and PCI cards are accessible from the side panel. Refer to Figure 2-4.

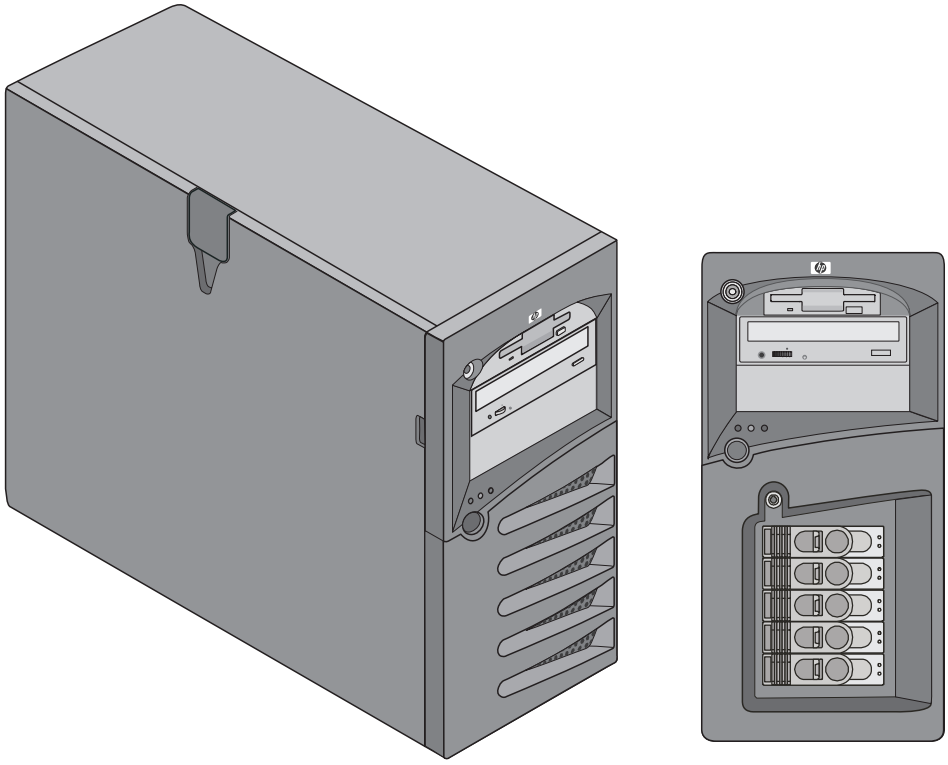


Figure 2-1: HP ProLiant ML150 server enclosure

Opening the Upper Bezel

You need to open the upper bezel to remove and replace the flexible disk drive and CD-ROM drive.

- If you are installing or removing SCSI cold swap hard drives, you must open the upper bezel first before opening the lower bezel.
- If you are installing hardware options, you need only unlock the front bezel; the bezel does not have to be open. The hardware options include accessory boards, DIMMs, and an additional processor, which are accessed through the side panel.

1. Power off the server and disconnect all power cords and any telecommunications cables.
2. Unlock the upper bezel.
3. Hold the bezel at the notch on the side panel and swing the bezel open to the right. Refer to Figure 2-2.

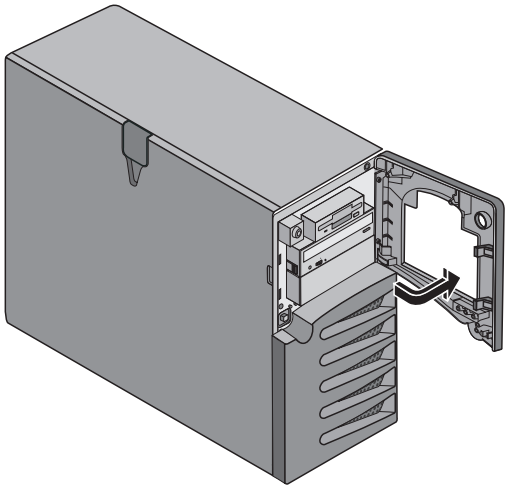


Figure 2-2: Upper bezel (open)

Opening the Lower Bezel (Cold Swap Model)

The only reason to open the lower bezel is to access the SCSI cold swap hard drives.

1. Power off the server and disconnect all power cords and any telecommunications cables.
2. Open the upper bezel.
3. Press down on the two tabs at the top of the lower bezel, pull the bezel toward you, and lower the door. Refer to Figure 2-3.

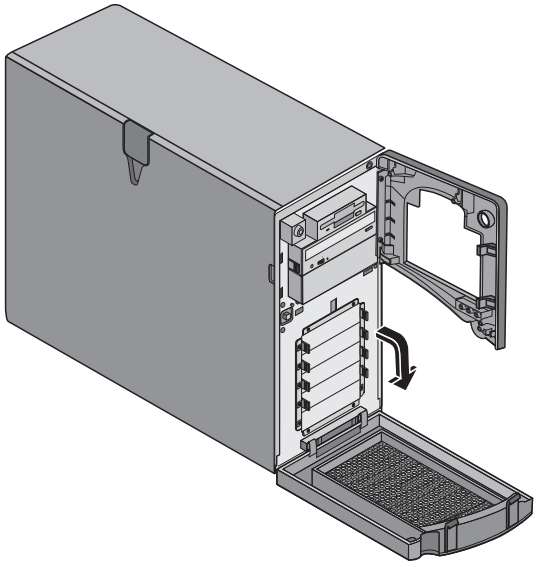


Figure 2-3: Lower bezel (open)

Opening the Side Panel

The power supply and fan can be installed and removed through the side panel. The user can also access the CPU, system board, memory DIMMs, and all SCSI and IDE cables and power cords.

1. Power off the server and disconnect all power cords and any telecommunications cables.
2. Unlock the upper bezel.
3. Lift the latch and open the panel. Refer to Figure 2-4.

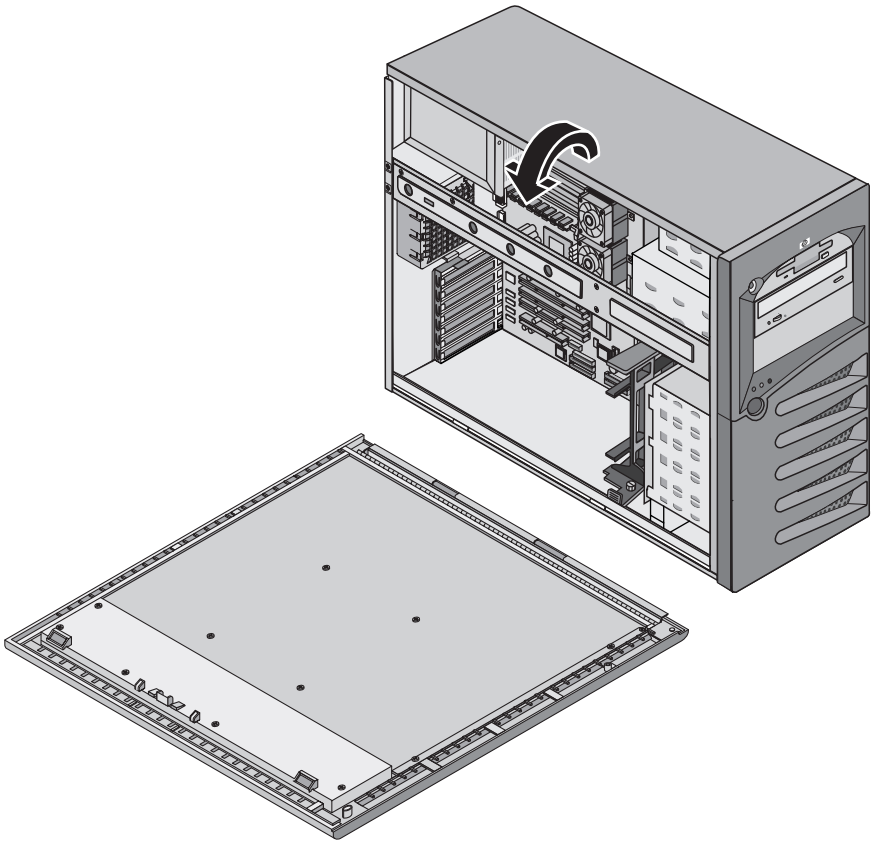


Figure 2-4: Side panel (open)

4. To remove the panel, lift up the panel from its track.

Mass Storage

The HP ProLiant ML150 server comes standard with an IDE CD-ROM and a flexible disk drive with some configuration of SCSI hard drives. The internal mass storage can hold up to five SCSI hard drives with cabling provided.

This section describes how to install the internal mass storage devices.

Mass Storage Configuration

Table 2-1 lists the number and types of mass storage devices that may be installed in the HP ProLiant ML150 server.

Table 2-1: Mass Storage Device Types

Interface Types	Max Number of Devices	Installed Devices and Addresses
Flexible disk drive	1	Factory installed flexible disk
Primary IDE	1	Factory installed CD-ROM drive (IDE connector)
Ultra-320 SCSI Channel A	up to 15 *	Control of up to 15 external SCSI devices
Ultra-320 SCSI Channel B	up to 5*	Up to 5 SCSI hard drives (addresses = ID 0, 1, 2, 3, 8) Embedded SCSI controller (address = ID 7)
***Both SCSI channels (A and B) can each support up to 15 devices; however, there are only enough internal storage shelves for five hard drives and one optional tape backup device. Channel A is used to control external SCSI devices or internal backup tape.**		

Guidelines

General Guidelines

- Be careful when unpacking and handling the disk drives.

  The hard drives are very susceptible to mechanical shock and can be easily damaged by a drop as short as one-quarter of an inch. If the drop would crack an egg, it will damage the drive.

- Do not stack drives.
- Do not use high voltage differential (HVD) SCSI devices on any of the SCSI channels or damage will occur. Use only Single-Ended (SE) or Low-Voltage Differential (LVD) devices.
- The server is internally limited to 5 hard drives.

  The flexible disk drive and CD-ROM drive, which are standard on all models of the HP ProLiant ML150 server, occupy shelves 8 and 7 respectively. Refer to Figure 2-5 and Figure 2-6

IDE Devices

- The embedded IDE controller is an Enhanced-IDE dual channel controller. Refer to "System Board Layout" in Chapter 7, "Specifications."
- The IDE CD-ROM uses only one connector on the cable from the IDE channel (Primary IDE) connector.

SCSI Device Selection

- Be sure the SCSI devices you install in both cold swap and hot swap-drive bays do not have terminations installed. The cold swap SCSI drives are connected to a terminated cable and the hot swap cage provides the termination for any unused slots in the cage.
- Use only LVD SCSI 3.5 inch hard drives for the cold swap and hot swap drive cages.
- The embedded dual-channel Ultra-320 SCSI controller includes connectors for SCSI channels A and B.
- Channel B typically is used for cabling the factory installed hard drives, which may consists of five SCSI drives.

SCSI Drive Addressing

- The drives in the hot swap cage are automatically assigned SCSI addresses by the HP server.
- The cold swap SCSI devices use SCSI IDs from 0 through 15, with the following restrictions:
  - — Narrow SCSI devices must be addressed 0 through 6.
  - — Wide SCSI devices may be addressed 0 through 15, except for ID 7, which is held by the SCSI controller.

  The cold swap SCSI devices are all connected to the same cable, which is terminated and connected to one SCSI controller. Each SCSI device connected to the cold swap device connector must have a unique address.

SCSI Device Installation Order

NOTE: The boot drive must be in the bottom slot.

- Add cold swap hard drives starting from the bottom drive cage in the HP ProLiant ML150 server.
- Add hot swap hard drives starting from the bottom of the drive cage in the HP ProLiant ML150 server.

  Use spare filler panels and spare carriers available in the chassis to close up the front of the cold swap or hot swap mass storage cage. If there are gaps in the cage, the drives may not receive the proper ventilation and could suffer thermal damage.

Boot Priority

This section details the HP server's boot order by highest to lowest priority. The embedded SCSI controller consists of two channels, A and B. Channel A typically is used to control the external SCSI devices. Channel B typically is used to control the SCSI hard drives (5). On each SCSI channel, the controller scans for a boot device starting at device ID 0 and works through the ID numbers. The server's embedded controller is always SCSI ID 7. If an optional SCSI backup tape drive is used it takes address ID 4.

The server's boot order should be considered when selecting a boot device. This is especially important if you are installing a board that requires a higher priority in the boot order. The board's boot priority is set by its slot location in the boot order.

By default the server searches for boot devices in this order:

1. Flexible disk drive
2. IDE CD-ROM drive
3. Embedded SCSI B channel (SCSI drives)
4. Embedded LAN

For information about booting off of a hard disk connected to an accessory board, refer to "Installing a Disk Array Controller Board" later in this chapter.

NOTE: The boot order can be changed using the server's (BIOS) Setup Utility and the SCSISelect Utility. Refer to "BIOS Setup Utility" later in this chapter.

Replacing a Flexible Disk Drive

WARNING: Always wear a wrist strap and use a static-dissipating work surface connected to the chassis when handling components. Be sure the metal of the wrist strap contacts your skin.

The flexible disk, CD-ROM, and optional disk do not have protective shields; they are ESD sensitive. Caution must be taken when removing them to avoid electrical shock. Install and remove connectors carefully, and avoid displacing any of the pins.

Use the following steps to replace a flexible disk drive (FDD):

1. If the server is operating, log off all users, back up files, and power down the server.
2. Disconnect the power cord and any external cables connected to the server. If necessary, label each one to expedite re-assembly.
3. Open the upper bezel and side panel.
4. Press the two latches of the drive inward and slide the drive out far enough to expose the connectors.
5. Disconnect the power and signal cable connectors.
6. Hold the disk by its sides and gently slide the drive out of the chassis. Refer to Figure 2-5.

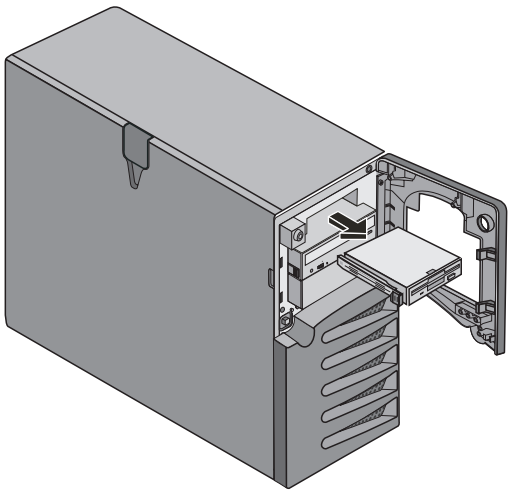


Figure 2-5: Removing flexible disk drive

7. Connect the power and signal cable to the new drive.
8. Gently slide the drive into the opening until the eject mechanism clicks.

   Watch the cable inside the side panel so it does not get pinched.
9. Close the upper bezel and side panel.
10. Reconnect the external cables and power cord.
11. Power up the server and return to normal operation.

Replacing a CD-ROM Drive

WARNING: Always wear a wrist strap and use a static-dissipating work surface connected to the chassis when handling components. Be sure the metal of the wrist strap contacts your skin.

The flexible disk, CD-ROM, and optional disk do not have protective shields; they are ESD sensitive. Caution must be taken when removing them to avoid electrical shock. Install and remove connectors carefully, and avoid displacing any of the pins.

Use the following steps to replace a CD-ROM drive:

1. If the server is operating, log off all users, back up files, and power down the server.
2. Disconnect the power cord and any external cables connected to the server. If necessary, label each one to expedite re-assembly.
3. Open the upper bezel and side panel.
4. Disconnect the power and signal cable connector from inside the side panel.
5. Press the two latches of the drive inward and, holding the disk by its sides, gently slide the drive out of the chassis. Refer to Figure 2-6.

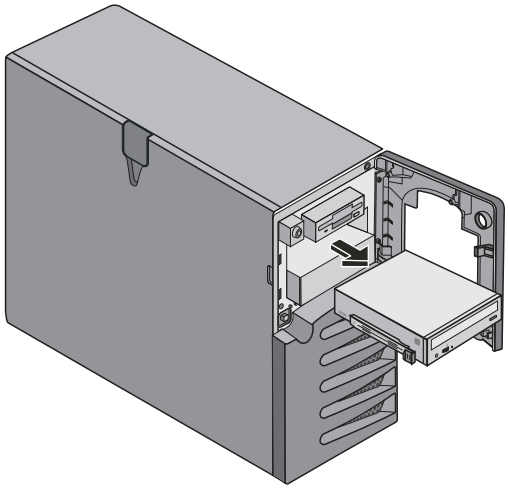


Figure 2-6: Removing the CD-ROM drive

6. Gently slide the new drive into the opening until the eject mechanism clicks.
7. Connect the power and signal cable to the new drive.
8. Close the upper bezel and side panel.
9. Reconnect the external cables and power cord.
10. Power up the server and return to normal operation.

Installing Cold Swap Hard Drives

Use the following steps to install cold swap hard drives:

1. If the server is operating, log off all users, back up files, and power down the server.
2. Disconnect the power cord and any external cables connected to the server. If necessary, label each one to expedite re-assembly.

WARNING: The power supply will continue to provide standby current to the HP server until the power cord is disconnected.

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.

3. Open the side panel, the upper bezel, and then the lower bezel.
4. Using both hands, hold the ejector arms of the filler panel in the desired drive slot and press inward while pulling the filler panel towards you.
5. Attach the rails to the sides of the drive. Refer to Figure 2-7.
   a. Take the rail labeled “R” and insert one of its two hooks into the hole on the right side of the drive. Insert the other hook into the other hole on the side of the drive. You may need to insert the second hook with force.
   b. Take the other rail labeled “L” and attach it to the left side of the drive in the same way.

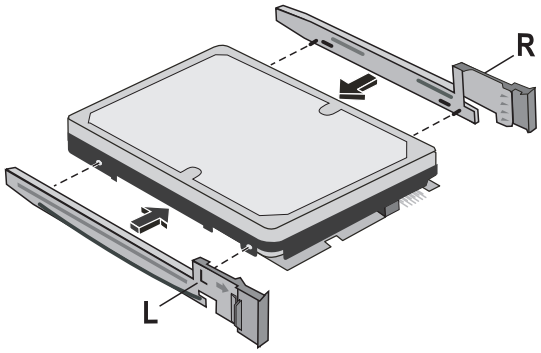


Figure 2-7: Attaching rails to cold swap hard drive

6. Slide the drive with the rails into the slot until you feel resistance, and then press firmly until the drive is fully seated and the latches have fully engaged the chassis.

   Verify that the drive is flush with the other drives. If the drive is not flush, it is not seated properly in the drive slot. Remove the drive and repeat steps 5-7

7. Connect the SCSI hard drive cable and the 4-pin power connector to the hard drive.
8. Close the lower bezel, the upper bezel, and then the side panel.

Removing Cold Swap Hard Drives

1. If the server is operating, log off all users, back up files, and power down the server.
2. Disconnect the power cord and any external cables connected to the server. If necessary, label each one to expedite re-assembly.

WARNING: The power supply will continue to provide standby current to the HP server until the power cord is disconnected.

3. Open the side panel, the upper bezel, and then the lower bezel.
4. Disconnect the SCSI hard drive cable and the 4-pin hard drive power connector from the hard drive.
5. Using both hands, hold the ejector arms of the drive to be removed, and press inward while pulling the drive out towards you.
6. Use your hand to support the bottom of the drive, while you slowly pull the drive straight out. Refer to Figure 2-8.

   Do not allow the drive to fall.

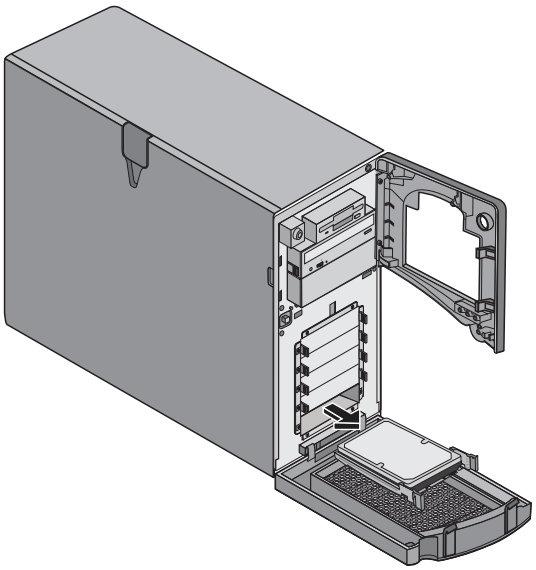


Figure 2-8: Removing cold swap hard drive

7. Place the drive in an electrostatic protected container.

   Do not stack drives.

8. Close the lower bezel, the upper bezel, and then the side panel.

NOTE: If you are not replacing the drive, place a filler panel in the drive slot. Operating the HP server without filler panels in empty SCSI drive slots may cause the HP server to suffer thermal damage.

Installing Hot Swap Hard Drives

Use the following steps to install hot swap hard drives:

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.

1. Unlock the hot swap key lock above the hot swap mass storage.

CAUTION: To prevent snapping off the handle, do not use extreme force when opening it. Open the handle until you feel resistance.

2. Push in the locking latch of the desired hard drive slot and then pull the ejector handle toward you.
3. Pull the ejector handle to slide the hard drive carrier out of the slot.
4. Assemble the hard drive and the carrier. The carrier consists of a rail, a PCA cover, and two support bars. The two support bars should be removed before installing the hard drive. Refer to Figure 2-9.
   a. Remove the two support bars by removing two screws on each side of the carrier. There is no need to separate the PCA cover from the rail.
   b. Place the drive inside the carrier.
   c. Replace two screws to each side of the carrier.

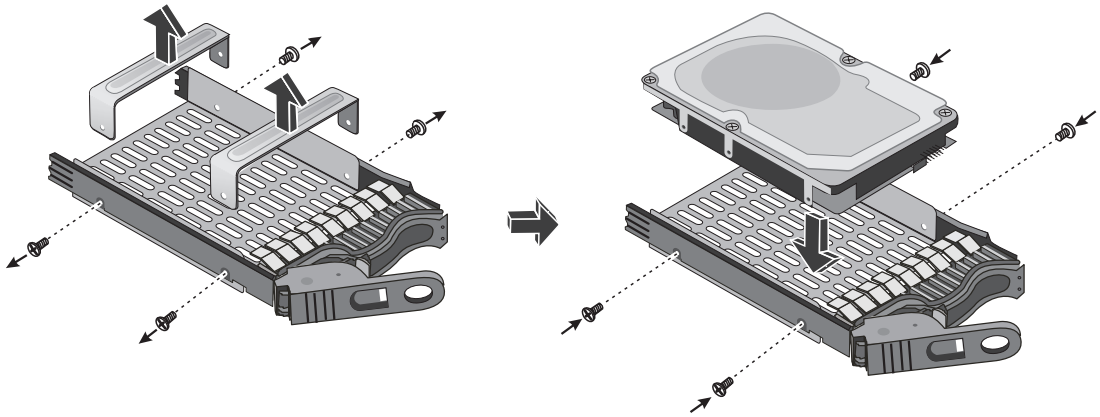


Figure 2-9: Assembling hot swap hard drive and carrier

5. Slide the drive into the slot until you feel resistance, and then press firmly until the drive is fully seated into the connector on the back plane.
6. Verify the hooks behind the pivot end of the handle engage the hole in the edge of the cage.
7. Press the ejector handle in until you feel the latch click into place.

   Closing the ejector handle engages the drive with the electrical connector in the hot swap drive cage and seats the drive.
8. If the drive is unseated in the cage after closing the ejector handle, remove the drive and insert it once again.

   The handle was probably not pulled out far enough, and the locking latch failed to engage the hot swap mass storage cage.

Removing Hot Swap Hard Drives

1. Unlock the hot swap key lock above the hot swap mass storage cage before attempting to remove the drive.
2. To unlock the drive, push the locking latch in and then pull the ejector handle toward you.
3. Gently pull the drive straight out to disengage the connection from the back plane.
4. Wait about 30 seconds for the drive to stop spinning and the drive heads to park.

CAUTION: *You must remove the drive slowly about an inch to disconnect from the back plane and wait 30 seconds for the drive to stop spinning to ensure the drive heads are parked prior to removal.* Be sure you follow these instructions carefully to prevent handling damage, such as head slaps or head actuator unlocking.

5. 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. Refer to Figure 2-10.

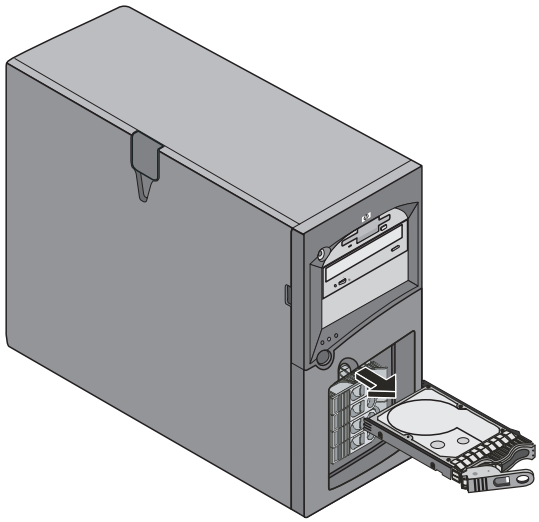


Figure 2-10: Removing hot swap hard drive

6. Place the drive in an electrostatic protected container.

   Do not stack drives.

Memory Modules

CAUTION: Use an 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.

The HP server's main memory is implemented using six memory slots on the system board, which support up to 12 GB (2 GB x 6) of memory. The server uses only 2.5V, 184-pin, PC 2100 266 MHz, registered, ECC, DDR DIMMs and ships with at least one 256 MB DIMM. The embedded video controller is provided with 8 MB standard video memory and cannot be upgraded.

Guidelines

CAUTION: Configurations of 3 or 5 DIMMs are not supported in this system. The server cannot handle a mix of dual channel on first pair(s) and a single channel on the last DIMM.

- The HP ProLiant ML150 server uses only PC 2100 266 MHz, registered, ECC, DDR DIMMs, which are electrically different from the EDO and PC100 SDRAM memory modules used in previous HP server models.
- DIMM sizes supported are 256 MB, 512 MB, 1 GB, and 2 GB, allowing a total of 12 GB maximum system memory (2 GB in each of the 6 DIMM slots).
- Supported DIMM configurations are one single DIMM, one pair (2 DIMMs), two pairs (4 DIMMs), or three pairs (6 DIMMS). Each pair of DIMMs must be the same type and size.
- DIMM sizes may be mixed on the system board and may be loaded in any order. However, HP recommends starting at slot 1 and filling the slots in order with the largest size first: 1, 2, 3, 4, 5, and 6.
- When handling DIMMs, observe anti-static precautions to avoid damage.

Installing Additional DIMMs

1. If the server is operating, log off all users, back up files, and power down the server.
2. Disconnect the power cord and any external cables connected to the server. If necessary, label each one to expedite re-assembly.

WARNING: The power supply will continue to provide standby current to the HP server until the power cord is disconnected.

3. Open the side panel.

NOTE: It is not necessary to remove the system board from the HP server to install the additional DIMM memory.

4. Select a DIMM slot for the desired DIMM. Refer to Figure 2-11.

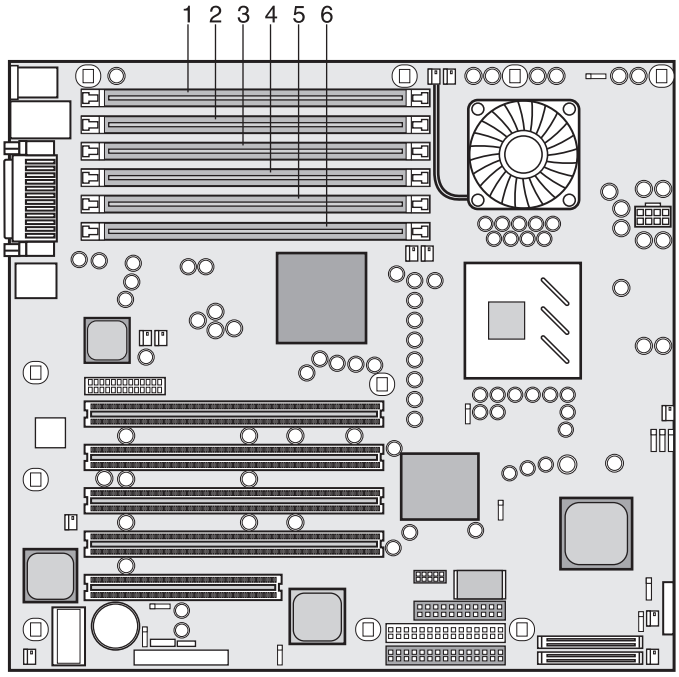


Figure 2-11: DIMM locations on system board

Item	Description
1	DIMM slot 1
2	DIMM slot 2
3	DIMM slot 3
4	DIMM slot 4
5	DIMM slot 5
6	DIMM slot 6

5. Spread the two retaining latches outward to accept the DIMM.
6. Remove the HP DIMM from its protective container, handling the module by its edges.

   If you must lay it down, place it on an anti-static mat.
7. Align the notch on the new DIMM with the key on the DIMM slot. Refer to Figure 2-12.

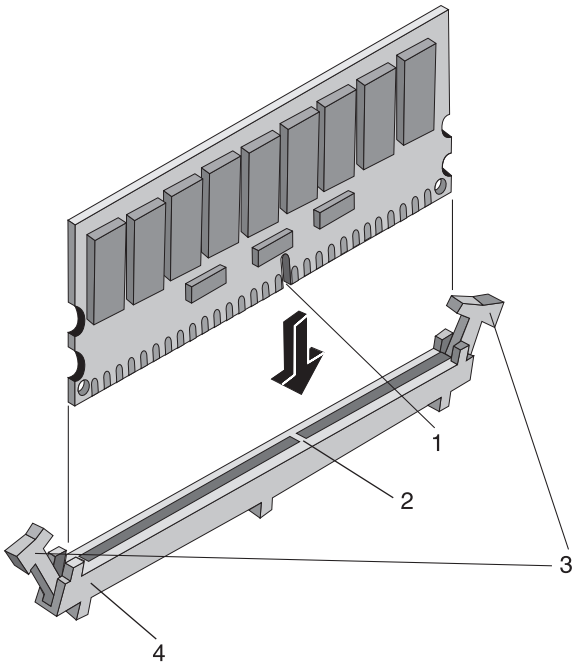


Figure 2-12: DIMM to slot alignment

Item	Description
1	Notch
2	Key
3	Retaining Latches
4	DIMM slot

8. Hold the DIMM at 90 degrees to the system board and press the DIMM firmly and evenly into the slot until the retaining latches close. Refer to Figure 2-13.

   It is important to hold the DIMM firmly with both hands and use even pressure so it will not bend or break the DIMM connector during installation. If the latches do not close, the DIMM is not inserted correctly.

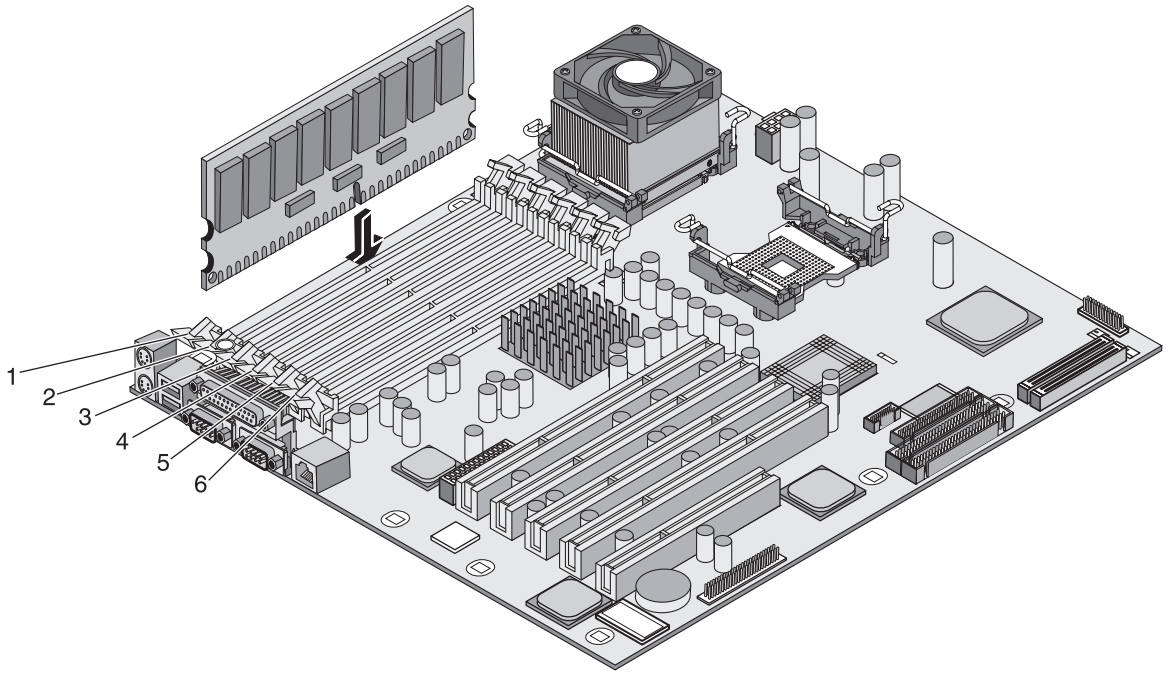


Figure 2-13: DIMM insertion

9. Close the side panel.
10. Reconnect the power cord and all external cables.
11. Power up the server and return to normal operation.

NOTE: If the DIMMs are not seated properly you may get a blank screen.

Removing DIMMs

You may need to remove a DIMM module to downsize your memory configuration or to replace a defective DIMM.

Follow the steps in the preceding section, but instead of installing a DIMM, remove the DIMM by first pushing the retaining latches outwards.

NOTE: If you power up the HP server when there are no DIMMs installed, the system will not boot up and the screen displays blank.

Processors

The HP ProLiant ML150 server ships with at least one processor installed (primary processor socket – CPU 1). Both primary and secondary processor sockets are located on the system board. The voltage regulator modules (VRMs) are embedded in the system board. Refer to Figure 2-14.

CAUTION: Use an anti static service kit (3MTM 8501/8502/8503 or equivalent). This kit includes a static dissipating work surface, a chassis clip lead, and a wrist strap.

Guidelines

The HP ProLiant ML150 server supports speeds of 2.4 GHz and above with a front side bus (FSB) speed of 533 MHz. For the most recent support information, visit the HP website

http:/www.hp.com

and click the support button.

- Both processors must be the same type and have the same product number, which insures the same clock speed, cache size, and FSB speed.
- The processors must operate at the designated speed stated by the product type on the processor.
- Use only processor upgrade kits with the same HP product number. This ensures the processor type, clock speed, and cache size are the same.
- Install the second processor in the secondary slot (CPU 2). Refer to Figure 2-14.

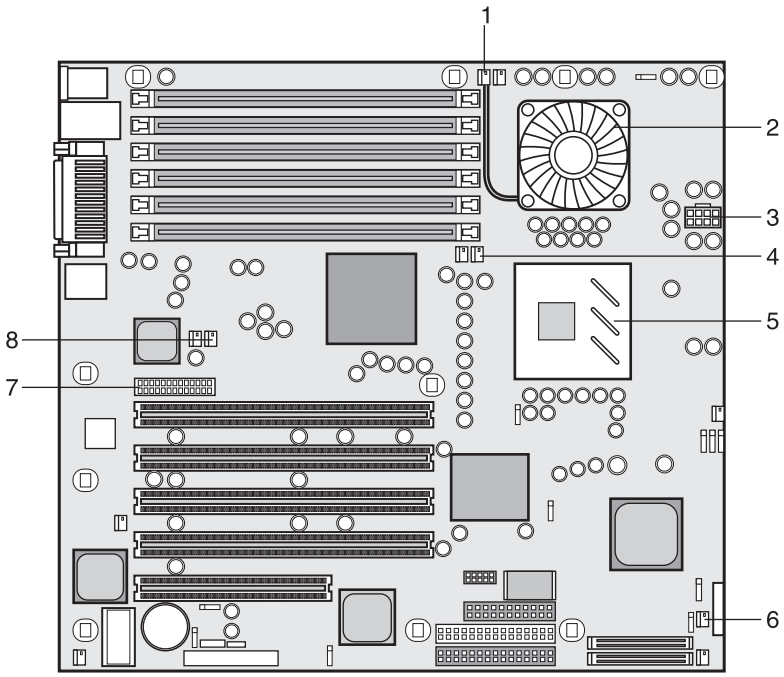


Figure 2-14: System board (top view)

Item	Description
1	CPU 1 fan
2	Processor 1 (CPU 1)
3	8-pin CPU power connector
4	CPU 2 fan
5	Processor 2 (CPU 2)
6	System fan (option)
7	Power connector
8	System fan (option)

Installing a Second Processor

This section provides the instructions for installing a second processor and its heatsink on the system board. Figure 2-14 indicates the location of the primary and secondary processors.

CAUTION: Take the following precautions when installing processors:

- Leave the processor in the anti-static bag until you are ready to install it.
- Wear an anti-static wrist strap and use a static-dissipating work surface or grounding mat connected to the chassis when handling components.
- Before removing a processor from the anti-static bag, touch a grounded, unpainted metal surface to discharge static electricity.

1. Unpack the processor shipping box and check the contents against its packing list.
2. Log off all users, back up files, and shut down the NOS according to the instructions in your NOS documentation.
3. Press the power switch on the HP server control panel when prompted by the operating system.

   Normally, this completes the shutdown procedure.

WARNING: Power supplies continue to provide standby current to the HP server until the power cord is disconnected.

4. Disconnect the AC power cord.
5. Open the side panel and lay the chassis down to gain access to the system board.

NOTE: It is not necessary to remove the system board from the server to install the second processor (CPU 2).

6. Be sure the processor speed of the second processor (CPU 2) is the same as the primary processor.

   If you are upgrading the second processor to a faster processor speed than the primary processor, the primary processor must also be changed. Both processors must have the same product number, which includes the same clock speed, cache size, and FSB speed.

   The supported processors only perform at the rated speed indicated on the processor in the HP server.

7. Open the ZIF (Zero Insertion Force) lever.

   To open the ZIF lever, pull the lever out away from the ZIF socket and rotate it to the vertical position.

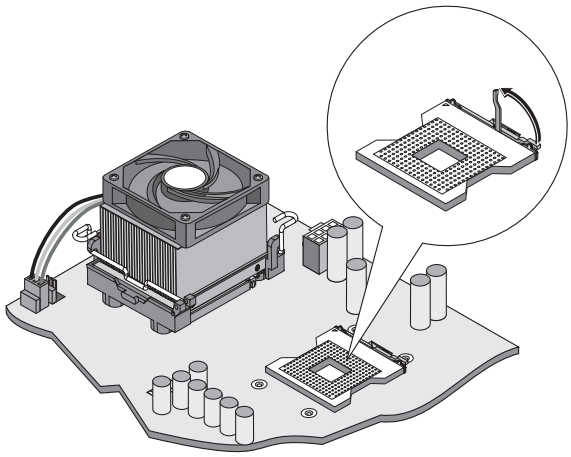


Figure 2-15: Opening the ZIF lever

CAUTION: Be sure you align pin-1 of the processor with pin-1 of the processor socket or pin damage will occur.

8. Align the second processor over the empty processor socket and insert the processor into the socket.
9. Close the ZIF lever to fully seat the processor.

   You should hear the ZIF lever click when it closes properly.

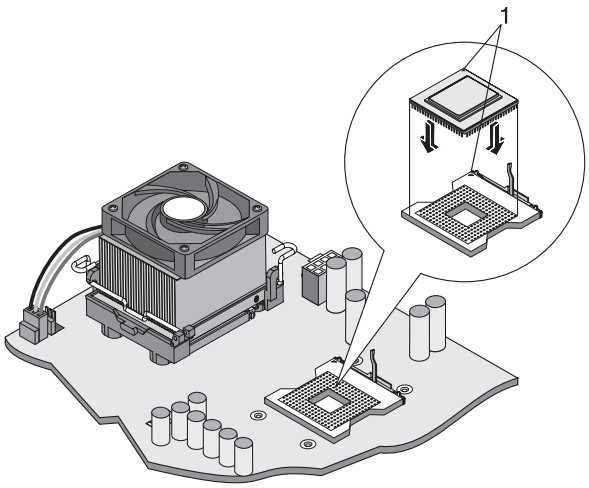


Figure 2-16: Installing processor

Item	Description
1	Pin 1 marker

Installing the Heatsink

Once the processor is installed, the cooling fan-heatsink must be installed on top of the processor. Each processor requires a heatsink, with its cooling fan attached, and a thermal interface material (grease) between the processor and the heatsink. The heatsink is mechanically connected to the processor socket, making contact with processor.

NOTE: Use the heatsinks specified for the processors of different speeds. For more information, refer to the parts list in Chapter 6, "Parts Identification and Parts List".

1. Remove the heatsink-fan assembly from the shipping container, and remove the thermal interface protected cover. Be sure you do not touch the thermal interface material on the bottom of the heatsink.

NOTE: The thermal interface material should not be reused.

CAUTION: Be sure not to collide with the nearby capacitors.

2. Align the heatsink mounting bracket to the holes around the processor socket.
3. Use the two screws to lock the bracket.
4. Repeat the process to mount the other bracket. Refer to Figure 2-17.

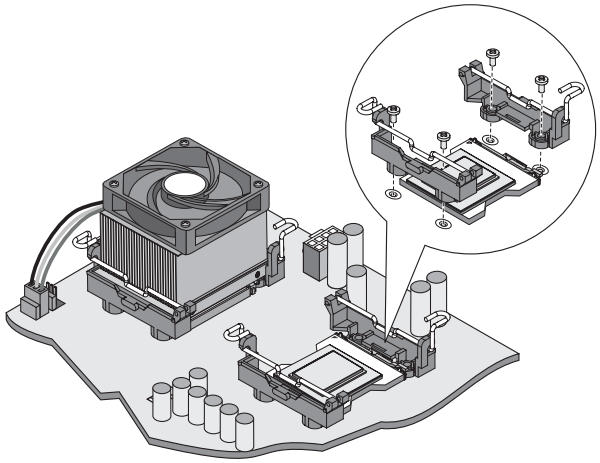


Figure 2-17: Mounting heatsink brackets

5. Open the locking levers on both brackets by pulling the lever out away from the processor socket and rotating it to the vertical position. Then, position the heatsink between the brackets on the processor. Refer to Figure 2-18.

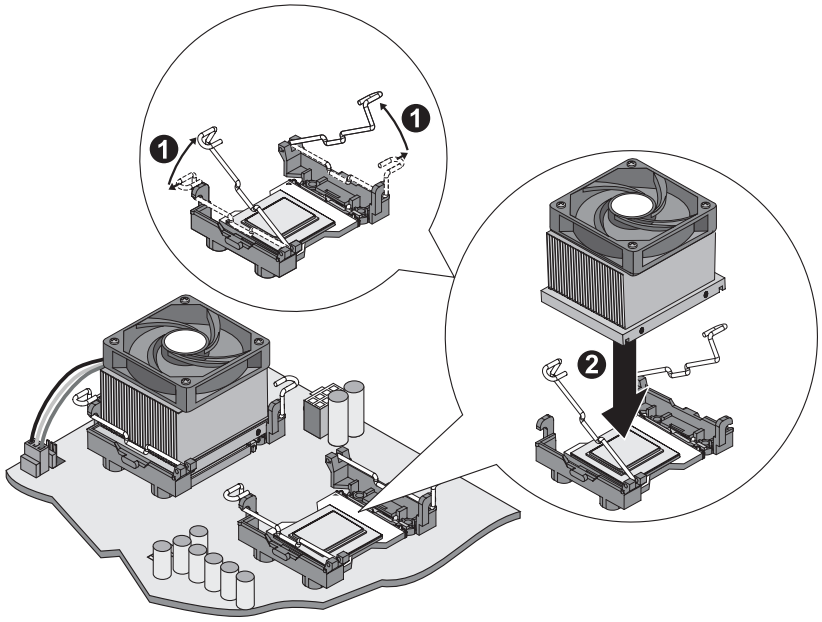


Figure 2-18: Positioning heatsink

6. Close the locking lever on each bracket to secure the heatsink. To close the locking lever, press it down and properly place its handle under the hook on the bracket. Refer to Figure 2-19.

CAUTION: Be sure you have made good contact with the processor to avoid thermal overheating. If you have not made good contact, the processor will overheat within 20 seconds of power on and will shut down, possibly causing damage to the processor.

7. Connect the heatsink's cooling fan connector to the 2nd cooling fan connector (CPU 2 Fan) on the system board. Refer to Figure 2-19.

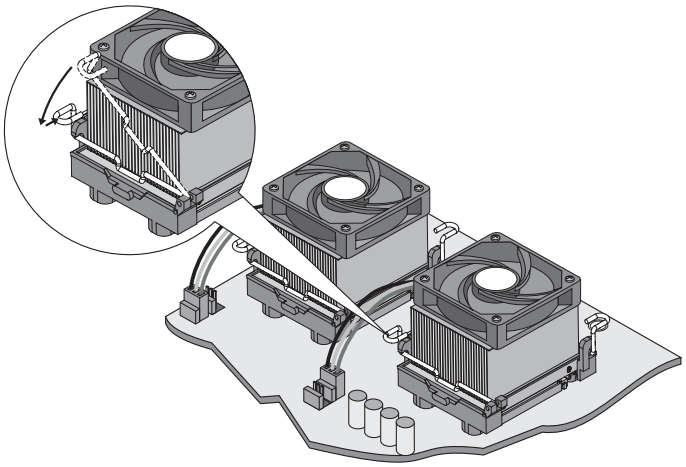


Figure 2-19: Securing heatsink

CAUTION: Failure to connect the cooling fan to its power connector will cause the server to shut down with no messages displayed, possibly causing damage to the processor.

NOTE: No speed switch settings are required for the supported processors in the HP server. These processors rely on the internal settings within the processors and do not rely on the external switch settings.

8. Close the side panel.
9. Replace the external cables and power cord.
10. Power up the server and return to normal operation.

NOTE: You may need to reconfigure or reinstall your NOS in order to use the additional processor you have installed.

Removing a Processor and Heatsink

Use this procedure to remove a processor and its heatsink. The heatsink with cooling fan must be removed first, before removing the processor.

CAUTION: Always wear a wrist-strap and use a static-dissipating work surface connected to the chassis when handling components. Be sure the metal of the wrist strap contacts your skin.

Before you touch the processor to remove it, touch a grounded, unpainted metal surface on the HP server to discharge static electricity.

1. Disconnect the cooling fan connector from its respective cooling fan connector on the system board.
2. Open the locking levers on both brackets. Refer to Figure 2-18.
3. Lift the heatsink away from the processor and out of the server.
4. Open the ZIF lever to allow removal of the processor. Refer to Figure 2-15.
5. Grasp the processor by its edges, lift it out of the socket, and place it on a static-dissipating work surface or into an anti-static bag.

Accessory Boards

The system board in the HP ProLiant ML150 server provides five PCI slots (slot 1 through slot 5), with one 32-bit slot and four 64-bit slots. All PCI slots accept full-length accessory boards.

Tested PCI Boards.

For a list of tested PCI boards, check for compatibility in the Hardware Tested Products list for the HP ProLiant ML150 server under the Service and Support topic for the specific NOS used in the server on the HP website at:

http://www.hp.com

CAUTION: Some accessory board outputs may exceed U.S. National Electrical code (NFPA 70) Class 2 or limited power source limits and must use appropriate interconnecting cabling in accordance with the National Electrical Code.

Guidelines

The following sections provide guidelines for installing PCI accessory boards into the HP ProLiant ML150 server.

Boot Priority

The server's boot order should be considered when selecting a boot device. This is especially important if you are installing a board that requires a higher priority in the boot order. The board's boot priority is set by its slot location in the boot order.

By default the server searches for boot devices in this order:

1. Flexible disk drive
2. IDE CD-ROM drive
3. Embedded SCSI B channel (SCSI drives)
4. Embedded LAN

Using the PCI Bus

The HP ProLiant ML150 server has four 64-bit PCI-X buses, dispatched on a primary and a secondary channel. The four 64 bit PCI-X busses are peer-to-peer, which provides approximately equal performance. The fifth PCI slot is a 32-bit PCI bus, which is compliant with standard PCI 2.2. Refer to Table 2-2.

Table 2-2: PCI Bus Selection.

PCI Slots	PCI Bus
Slots 1 and 2*	Secondary PCI Bus (66 MHz PCI-X)
Slots 3 and 4	Primary PCI Bus (66/100/133 MHz PCI-X)
Slots 5	32-bit PCI
***ZCR (Zero Channel RAID) cards must be inserted in the PCI slot 2 (green color).** .	

Installing an Accessory Board

Use this procedure to install an accessory board.

1. If the server is operating, log off all users, back up files if necessary, and power down the server.
2. Disconnect the power cord and any external cables connected to the server. If necessary, label each one to expedite re-assembly.

WARNING: The power supply will continue to provide standby current to the HP server until the power cord is disconnected.

3. Read the documentation included with the accessory board and follow any special instructions. PCI boards must be set to INT A on the board if jumpers are provided.

NOTE: Adding an accessory board to the HP server may alter the server's boot order. This boot order can be changed using the Setup Utility (pressing the **Delete** key during the boot process). Refer to "Boot Priority" earlier in this chapter.

4. Open the side panel.

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

5. Remove any cables attached to the accessory board. If necessary, label each one to expedite re-assembly.
6. Remove the IO locking bracket. Refer to Figure 2-20.
   a. Lift the bracket up.
   b. Rotate it outwards to detach it from the chassis.

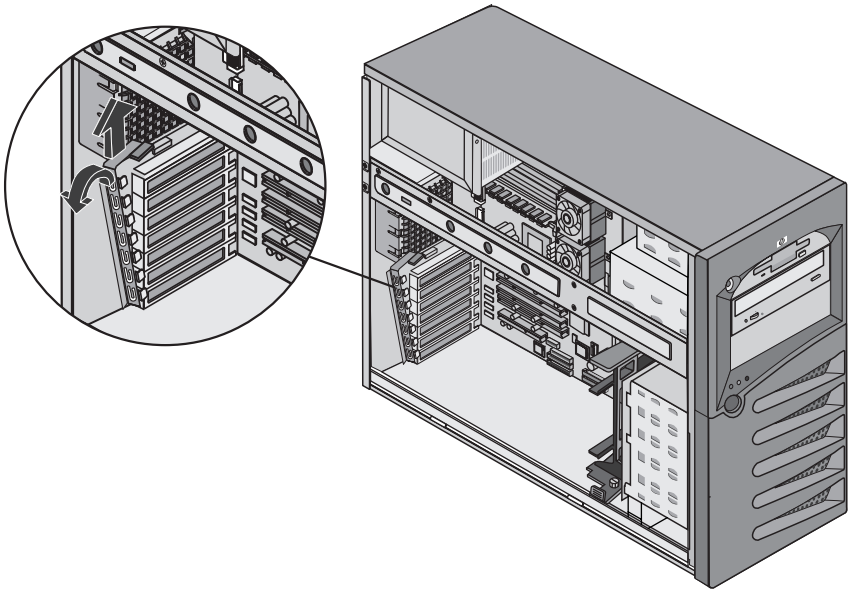


Figure 2-20: Removing IO locking bracket

7. Identify the accessory slot number to be used. Refer to Figure 2-21. (An ZCR RAID card must be inserted in PCI slot 2 (green color).)

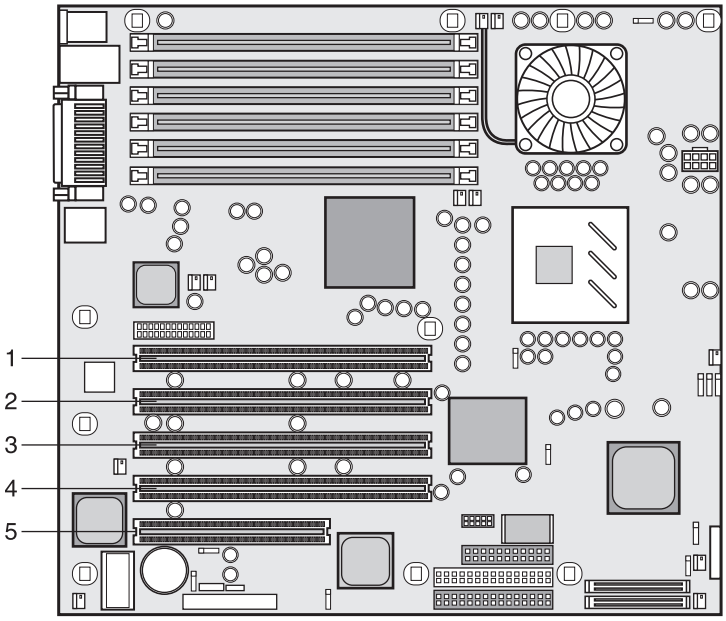


Figure 2-21: Accessory slots

Item	Description
1	PCI slot 1
2	PCI slot 2
3	PCI slot 3
4	PCI slot 4
5	PCI slot 5

8. Push the PCI slot cover from the rear of the chassis and slide it towards you to remove it. Refer to Figure 2-22.

NOTE: Be sure you save the slot covers for use later to prevent EMI interference.

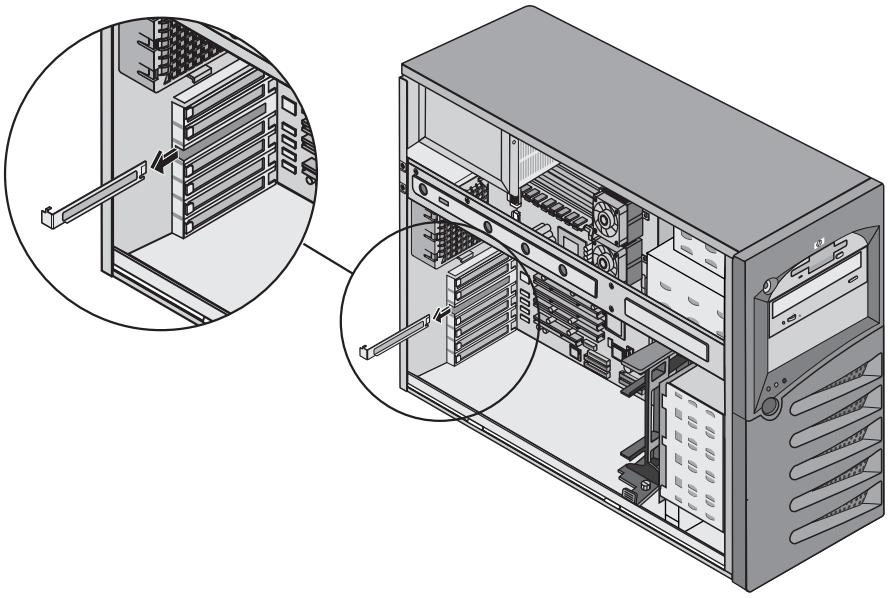


Figure 2-22: Removing slot cover

9. Align the new board carefully, slide it into position, and press it firmly into the connector.
10. Replace the IO retaining bracket and rotate it to close.
11. Close the side panel.
12. Replace the external cables and power cord.
13. Power up the server and return to normal operation.

Once the HP server is returned to normal operation, you may need to install software drivers. The drivers for the new PCI board are either part of your existing server software or included on a flexible disk or CD-ROM provided with the accessory board.

Removing an Accessory Board

Follow the steps in the preceding section, but instead of installing a card, remove the PCI card and replace the slot cover.

Racking the Server

The HP ProLiant ML150 server can be installed in HP racks (Compaq 10000/9000 series racks, HP e-series and u-series racks) using the specific HP ProLiant ML150 server rack mount kit (P/N: 344709-B21).

The HP ProLiant ML150 server occupies a 5U space.

Please refer to the *Rack Mount Kit Installation Guide* for installation instructions. This document can be downloaded from www.hp.com for preview.

Configuring the HP ProLiant ML150 server

The following sections describe how to configure the HP ProLiant ML150 server with the help of the *HP Startup CD-ROM*, which is shipped with your HP server. This CD-ROM provides the latest information concerning your HP server.

As you configure the server, it's important to have the very latest configuration information. Please refer to the HP website at:

http://www.hp.com

for a list of compatible accessories.

HP Startup CD-ROM

The *HP Startup CD-ROM* provides you with the configuration information utilities and resource information.

The Main Menu of the *HP Startup CD-ROM* directs you to modules where you can perform the required configuration tasks, or access the utilities used in the configuration process. These tasks include:

- Obtaining software and drivers for the server
- Obtaining the management and diagnostics software
- Obtaining HP ProLiant ML150 server documentation

Please refer to the *HP ProLiant ML150 Server NOS Installation and Software Guide* for more information on using the *HP Startup CD-ROM*.

BIOS Setup Utility

The HP server (BIOS) Setup Utility is used to configure the following server options:

- Main
- Advanced
- PCIPnP
- Boot
- Chipset
- ACPI
- Security
- Exit

Accessing the Setup Utility

The (BIOS) Setup Utility menu offers the choices listed above, and the corresponding items are described in the topics below.

1. Turn on the monitor and the HP server.
2. Start the Setup Utility by pressing the **Delete** key when the following message displays on the boot screen.

   ```
   Press <Del> to enter SETUP
   ```

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 will be highlighted.
- Certain fields ask you to select from a list of entries. In such cases, press the right-arrow or left arrow key repeatedly to change the entries.
- Small arrow points (▶) precede some field names. This means the field is actually a submenu. To visit the submenu, select it with the arrow keys and press the **Enter** key. The submenu then displays 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 displays. If you press the **Esc** key on a submenu, the previous screen displays. When you are making selections from a pop-up menu, use the **Esc** key to close the pop-up without making a selection.

Menu Bar

The Setup Utility provides a menu bar with several menu selections. The menu bar choices are:

Main

Use this menu option to set the server time and date, and get BIOS version and processor information.

Advanced

WARNING: Settings wrong values for the items in this menu may cause the system to malfunciton.

Use this menu option to set the I/O configuration options. Seven choices are available under Advanced.

- **CPU Configuration** – Use this option to configure the CPU speed and Hyper-Threading.
- **IDE Configuration** – Use this option to set the IDE controller options.
- **Floppy Configuration** – Use this option to define the type of the floppy drive, or disable the floppy drive.
- **Boot Settings Configuration** – Use this option to set the boot settings.
- **Super IO configuration** – Use this option to configure the Super I/O Chipset Win627.
- **DMA Event Logging** – Allow you to mark as read, clear or view event log statistics.
- **Remote Access Configuration** – Set the settings for remote access.
- **USB Configuration** – Use this option to set USB options.
- **Onboard Devices Configuration** – Use this option to configure the onboard devices.
- **Hardware Monitor** – Use this option to access the information on CPU temperature, fan speed, and voltage.

PCIPnP

WARNING: Settings wrong values for the items in this menu may cause the system to malfunciton.

Use this menu option to configure the Plug & Play PCI settings. Eight choices are available under PCIPnP.

- **Plug & Play OS** – Set if you want to let the OS manage the IRQ settings or the BIOS.
- **PCI Latency Timer** – Set the value of the PCI clocks for the latency timer register of the PCI devices.
- **Allocate IRQ to PCI VGA** – Set if you want to assign an IRQ setting to the PCI video card.
- **Palette Snooping** – Enable or disable the fixing of the color problems associated with non-standard video cards such as MPEG decoders.
- **PCI IDE BusMaster** – Enable or disable the BIOS to use PCI busmastering for reading/writing to IDE devices.
- **Offboard PCI/ISA IDE Card** – Enable or disable the system to recognize and boot from an add-in IDE controller card.
- **IRQ 3, 4, 5, 7, 9, 10, 11, 14, 15** – These settings enable you to set which IRQs will be reserved for other devices other than the ones that use them by default.
- **DMA Channel 0, 1, 3, 5, 6, 7** – These settings enable or disable DMA channel 0, 1, 3, 5, 6, 7.
- **Reserved Memory Size** – Disable or set the size of the memory block to reserve for legacy ISA devices.
- **PCI Scan Order** – Set the order for the BIOS to scan PCI bus.
- **Extended BIOS Data Area** – Enable or disable the extended BIOS data area.

Boot

Use this menu option to set the boot settings and order of the system.

- **Boot Settings Configuration** – Use this option to configure the boot settings.
- **Boot Device Priority** – Set the boot priority.
- **Removable Devices** – Specify the boot sequence for removable drive booting.
- **ATAPI CDROM Drives** – Specify the boot sequence for CD-ROM drive booting.

Chipset

WARNING: Settings wrong values for the items in this menu may cause the system to malfunciton.

Use this menu option to configure the Intel E7500/E7501 chipset setting. Four choices are available under Chipset.

- **Intel E7500/E7501 NorthBridge Configuration** – Use this option to configure the Intel E7500/E7501 NorthBridge chipset.
- **Intel ICH3 SouthBridge Configuration** – Use this option to configure ICH3 IDE controller settings.
- **Intel PCI-64 Hub 2 Configuration** – Use this option to configure the Intel PCI-64 Hub 2 PCI hub chipset.
- **Spread Spectrum Setting** – Enable or disable the spread spectrum.

ACPI

Use this menu option to configure the power management settings.

- **ACPI Aware O/S** – Define whether the OS can manage IRQs, DMAs, and other system settings on its own.
- **ACPI Advanced** – Use this option to configure the advanced power management settings.
- **After Power Fail** – Set the mode of operation if an AC power failure occurs.
- **Power switch instant off** – Enable or disable the instant on/off of a 4-second delay of the power switch.

CAUTION: Do not enable the Watchdog Timer item unless you are familiar with the feature. If you enable this item, you must install the HP ML150 System Monitor (MSM) so that the server can boot successfully with watchdog timer enabled. Please refer to the *HP ProLiant ML150 Server NOS Installation and Software Guide* for installation information on MSM.

- **Watchdog Timer** – Enable or disable the watch dog timer.

Security

Use this menu option to set Power-on password protections and hardware security options. Four choices are available under Security:

- **Change Supervisor Password** - Use this option to set the Supervisor password, which will require a password to enter the Setup Utility or complete the boot process.

  The Supervisor password must be set before setting the User password or Network Server mode. Once the Supervisor password is set, the Supervisor can access and change all fields in the Setup Utility screens.

  Network Server Mode – When set, the system prompts for a password when booting from a flexible disk or CD-ROM, but not when booting from a hard drive. The power switch and keyboard are locked until the password is typed.

- **Change User Password** – Use this option to set the user password, which will require a password to enter the Setup Utility or complete the boot process.

  If the User password is set, the user may change the system time, date, user password, and a limited number of items in the various screens of the Setup Utility. The user may view all screens in the Setup Utility, but can't alter all of the settings.

- **Clear User Password** – Use this option to clear the user password.

- **Boot Sector Virus Protection** – Use this option to prevent computer viruses by protecting the hard disk boot sector (partition table) from any change if enabled.

Exit

Use this menu option to save changes or discard changes, which reverts to previous settings. When you exit, the HP server reboots.

- **Save Changes and Exit** – Use this option (or press the **F10** key) to save the changes you have made and exit the Setup Utility.

- **Discard Changes and Exit** – Use this option (or press the **Esc** key) to exit the Setup Utility without saving the changes you have made.

- **Discard Changes** – Use this option (or press the **F7** key) to discard any changes you have made.

- **Load Optimal Defaults** – Use this option (or press the **F9** key) to load optimal values for all items.

- **Load Failsafe Defaults** – Use the option (or press the **F8** key) to load failsafe values for all items.

Changing the System Date and Time

Use this topic to change the HP server's date and time and refer to the following procedure.

1. To reach the Setup Utility, boot or reboot the system and press the **Delete** key when prompted.
2. If necessary, use the left-arrow key to select **Main** from the menu bar at the top of the screen.

   Once in the Setup Utility, the menu bar displays at the top of the screen. The **Main** menu is the default menu and should be the highlighted selection at the left of the menu bar when the Setup Utility first opens.
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 **Main** 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 the **Enter** key to move to the minute field.
5. Then type in the minutes and press the **Enter** key again to move to the second field.
6. Type in the seconds and press the **Enter** key, then use the arrow keys to leave this field.
7. Scroll to the **System Date** field to 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 the **Enter** key to move to the Ddy field.
9. Then type in the day and press the **Enter** key again to move to the year field.
10. Type in the year and press the **Enter** key, and then use the arrow keys to leave this field.

    Be sure you enter all four digits for the year.
11. Use the right-arrow or left-arrow key to select the **Exit** menu.
12. Select **Exit Saving Changes** from the list of exit options, then press the **Enter** key.

    A dialog box displays and asks you to confirm your decision.
13. Select **Yes** and then press the **Enter** key.

    The HP server reboots and the date and time changes have been accepted.

Setting the HP Server's Boot Passwords

Use this topic to set a password to boot the HP server. Further, you can have a separate Supervisor password and User password, but the User password is limited in access once booted.

To configure the HP server for a password, which will require a password on boot-up, refer to the following procedure.

1. If not already in the Setup Utility, boot or reboot the system and press the **Delete** key 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 selections for the **Security** menu display.
3. If necessary, use the arrow key to move to the **Change Supervisor Password** menu selection and press the **Enter** key.

   The **Change Supervisor Password** is highlighted by default when the **Security** menu is selected.

   The first line in the menu indicates if the Supervisor Password is set.

   — If no password has been set, then **Not Set** will display in the field. If this is the case, then you are not allowed to set the User password until you set a Supervisor password. With no password set you can still boot the server without a password.

   The Supervisor password controls access to the Setup Utility and its settings, but will not be in effect until you set the password and reboot the server.

   — If **Set** is in the field, then you can change the Supervisor Password. If you do not know the existing Supervisor password, then refer to "Password Problems" in Chapter 4, "Troubleshooting."

NOTE: You must set the Supervisor password before setting the User password. The Supervisor password is the only password required to configure the HP server to boot with a password.

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

   A pop-up menu displays 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.

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

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

   The password is accepted and the next field just below it, **Re-enter new password: [ ]** or **Enter new password: [ ]** field is highlighted. For security reasons, the password does not display on the screen.

6. If necessary, enter the new password in the **Enter new password: [ ]** field and press the **Enter** key.

NOTE: Entering nothing or "blank" in the **Enter new password** field followed by entering nothing or "blank" in the **Re-enter new password** field will turn off the password setting, changing it to **Not Set**. If the Supervisor Password is changed to **Not Set**, the User password is forced to **Not Set**.

7. Enter the new password again in the **Re-enter new password: [ ]** field and press the **Enter** key.

   After re-entering the new password and pressing the **Enter** key, the pop-up menu disappears and the **Supervisor Password is** field changes to **Set** and on the next boot the HP server will request a password to access the Setup Utility and complete the boot process.

8. If you only want a single password (Supervisor), you may go to step 10 to exit the utility and save changes.

9. If you want to enter a User password, use the arrow key to move to the **Change User Password** menu selection and press the **Enter** key. Repeat Steps 4-7 for the User password.

10. If you have finished setting or changing passwords, press the **Esc** key to exit this menu.

11. Use the right-arrow key to go to the **Exit** menu.

12. Select **Exit Saving Changes** from the list of exit options, and then press the **Enter** key.

    A dialog box displays and asks you to confirm your decision.

13. Select **Yes** and then press the **Enter** key.

    The HP server reboots and the password changes have been accepted. After the server reboots, you will be required to use your new password to enter the Setup Utility or complete the boot process. If you forget your password, refer to "Password Problems" in Chapter 4, "Troubleshooting."

14. To change one of the passwords at a later date, return to the **Security** menu and repeat Steps 2 through 7 above for one or both passwords.

SCSI Configuration Utility

The HP server uses the SCSISelect Utility to verify or modify the embedded SCSI controller settings for the devices connected to the two SCSI channel connectors on the system board. If you need to verify or modify SCSI controller settings, or if you need to low-level format SCSI disks or verify SCSI disk media, run the SCSISelect Utility.

NOTE: You typically would not need to use this utility unless you are an experienced administrator or requested to do so by a support provider.

Starting SCSISelect

Follow these steps to start SCSISelect:

1. Turn on the monitor and the HP server.

   During the startup process, pay careful attention to the messages that display on your screen.

2. When the following message displays on your screen, press the **Ctrl**-**A** keys simultaneously (this message displays for only a few seconds):

   ```
   Press <Ctrl><A> for SCSISelect(TM) Utility!
   ```

3. From the menu that displays, use the arrow keys to move the cursor to the option you want to select, then press the **Enter** key.

NOTE: If you have difficulty viewing the display, press the **F5** key to toggle between color and monochrome modes. (This feature may not work on some monitors.)

Exiting SCSISelect

Follow these steps to exit SCSISelect:

1. Press the **Esc** key until a message prompts you to exit (if you changed any settings, you are prompted to save the changes before you exit).
2. At the prompt, select **Yes** to exit, then press any key to reboot the server. Any changes made in SCSISelect will take effect the next time the server is booted.

Using SCSISelect Settings

To select an option, use the arrow keys to move the cursor to the option, then press the **Enter** key.

In some cases, selecting an option displays another menu. You can return to the previous menu at any time by pressing the **Esc** key.

To restore the original SCSISelect default values, press the **F6** key from the main SCSISelect screen.

Configuring SCSISelect Settings

SCSI Bus Interface Definitions

- **SCSI Controller ID**—(Default: 7) Sets the SCSI ID for the SCSI host bus adapter. The Ultra320 SCSI Host Bus Adapter is set at 7, which gives it the highest priority on the SCSI bus. We recommend that you do not change this setting.
- **SCSI Controller Parity**—(Default: Enabled) When set to **Enabled**, verifies the accuracy of data transfer on the SCSI bus. Leave this setting enabled unless any SCSI device connected to the Ultra320 SCSI Host Bus Adapter does not support SCSI parity.
- **SCSI Controller Termination**—(Default: Enabled) Determines the termination setting for the SCSI host bus adapter. The default setting for both the LVD/SE and SE connectors is **Automatic**, which allows the SCSI host bus adapter to adjust the termination as needed depending on the configuration of the connected SCSI devices. We recommend that you do not change this setting.

Boot Device Configuration

The menu displays the Master SCSI Controller information.

SCSI Device Configuration

SCSI Device Configuration options can be set individually for each connected SCSI device.

NOTE: To configure settings for a SCSI device, you must know its SCSI ID (refer to "Using SCSI Disk Utilities" on page 2-45).

- **Sync Transfer Rate**—(Default: 320) Determines the maximum synchronous data transfer rate that the SCSI host adapter supports. Use the maximum value of 320 MBytes/sec. If a device is not Ultra320, select the transfer rate of the device (80, 53, 40, ...).
- **Packetized**—(Default: Yes) Packetization creates information units (IUs) comprised of commands, data, status information and other things. These IUs are passed as synchronous transfers, reducing overhead and improving overall efficiency.

- **QAS**—(Default: Yes) QAS speeds up the arbitration process by eliminating the bus free phase. Combined with packetization, this significantly improves bus efficiency.
- **Initiate Wide Negotiation**—(Default: Yes) When set to **Yes**, the SCSI host bus adapter attempts 16-bit data transfer (wide negotiation). When set to **No**, the SCSI host bus adapter uses 8-bit data transfer unless the SCSI device requests wide negotiation.

NOTE: Set Initiate Wide Negotiation to No if you are using an 8-bit SCSI device that hangs or exhibits other performance problems with 16-bit data transfer rate enabled.

- **Enable Disconnection**—(Default: Yes) When set to **Yes**, allows the SCSI device to disconnect from the SCSI bus. Leave the setting at **Yes** if two or more SCSI devices are connected to the SCSI host bus adapter. If only one SCSI device is connected, changing the setting to **No** results in slightly better performance.
- **Send Start Unit Command**—(Default: Yes) When set to **Yes**, the Start Unit Command is sent to the SCSI device at bootup. The following three options have no effect when the SCSI host bus adapter BIOS is disabled. (The SCSI host bus adapter BIOS is normally enabled by default.)
- **Include In BIOS Scan**—(Default: Yes) Determines if the BIOS will scan for SCSI devices.

The following option has no effect when the SCSI host bus adapter BIOS is disabled. (The SCSI host bus adapter BIOS is normally enabled by default.)

- **BIOS Multiple LUN Support**—(Default: No) Leave this setting at **No** if the device does not have multiple Logical Unit Numbers (LUNs). When set to **Yes**, the SCSI host bus adapter BIOS provides boot support for a SCSI device with multiple LUNs (for example, a CD "juke box" device in which multiple CDs can be accessed simultaneously).

Advanced Device Configuration

NOTE: Do not change the Advanced Device Configuration options unless absolutely necessary.

- **Reset SCSI Bus at IC Initialization**—(Default: Enabled) When set to **Enabled**, the SCSI host bus adapter generates a SCSI bus reset during its power-on initialization and after a hard reset.
- **Display <Ctrl> <A> Messages During BIOS Initialization**—(Default: Enabled) When set to **Enabled**, the SCSI host bus adapter BIOS displays the

  ```
  Press <Ctrl> <A> for SCSISelect (TM) Utility!
  ```

  message on your screen during system bootup. If this setting is disabled, you can still invoke the SCSISelect Utility by pressing the **Ctrl** -**A** keys after the SCSI host bus adapter BIOS banner displays.

- **Extended Int 13 Translation for DOS Drives > 1 GByte**—(Default: Enabled) When set to **Enabled**, provides an extended translation scheme for SCSI hard disks with capacities greater than 1 GByte. This setting is necessary only for MS-DOS 5.0 or above; it is not required for other operating systems, such as NetWare or UNIX.

CAUTION: Changing the translation scheme destroys all data on the drive. Be sure to back up the data before changing the translation scheme.

Use the MS-DOS Fdisk command to partition a disk larger than 1 GByte controlled by the SCSI host bus adapter BIOS, when using DOS, Windows 3.1.x, or Windows 95/98.

- **POST Display Mode**—(Default: Verbose) When set to **Verbose**, the SCSI host bus adapter BIOS displays the host adapter model on the screen during system bootup. When set to **Silent**, the message will not be displayed during bootup.
- **SCSI Controller Int 13 Support**—(Default: Enabled) When set to **Enabled**, the SCSI host bus adapter BIOS supports Int 13h extensions as required by Plug-and-Play. The setting can be either enabled or disabled if your system is not Plug-and-Play.

The following options have no effect if Int 13 support is disabled.

- **Domain Validation**—(Default: Enabled) Determines the kinds of SCSI devices connected and reduces data transfer speed when legacy SCSI devices are detected. Displays the resulting data transfer rate.
- **Support Removable Disks Under BIOS as Fixed Disks**—(Default: Disabled) Determines which removable-media drives are supported by the SCSI host bus adapter BIOS. Choices are as follows:
  - — **Disabled**— No removable-media drives are treated as hard drives. Software drivers are required because the drives are not controlled by the BIOS.

CAUTION: *You may lose data* if you remove a removable-media cartridge from a SCSI drive controlled by the SCSI host bus adapter BIOS while the drive is on. If you want to be able to remove the media while the drive is on, install the removable-media software driver and set Support Removable Disks Under BIOS as Fixed Disks to Disabled.

  - — **Boot Only**—Only the removable-media drive designated as the boot device is treated as a hard drive.
  - — **All Disks**—All removable-media drives supported by the BIOS are treated as hard drives.
- **BIOS Support for Bootable CD-ROMs**—(Default: Enabled) When set to **Enabled**, the SCSI host bus adapter BIOS allows the HP server to boot from a CD-ROM drive.

Using SCSI Disk Utilities

To access the SCSI disk utilities, follow these steps:

1. Select **the SCSI Disk Utilities** option from the menu that displays after starting SCSISelect. SCSISelect scans the SCSI bus (to determine the devices installed) and displays a list of all SCSI IDs and the devices assigned to each ID.
2. Use the arrow keys to move the cursor to a specific ID and device, then press the **Enter** key.
3. A small menu displays, displaying the options **Format Disk** and **Verify Disk Media**.

   — **Format Disk**—Allows you to perform a low-level format on a hard drive. *Most SCSI disk devices are preformatted at the factory and do not need to be formatted again.*

CAUTION: A low-level format destroys all data on the drive. Be sure to back up your data before performing this operation. You cannot abort a low-level format once it has started.

   — **Verify Disk Media**—Allows you to scan the media of a hard drive for defects. If the utility finds bad blocks on the media, it prompts you to reassign them; if you select yes, those blocks are no longer used. Pressing the **Esc** key at any time aborts the utility.

3

Diagnostics

Power-On Self Test (POST)

When the server boots, a series of tests are displayed on the screen. The number of tests displayed depends on the configuration of the server.

The POST, which reside in the BIOS ROM, isolate server-related logic failures and indicate the board or component that needs to be replaced, as indicated by the Error Messages. Most server hardware failures will be accurately isolated by the POST.

To see the POST:

- The HP server must be functionally able to run POST.
- The video subsystem must be functional.
- The keyboard must be functional.

NOTE: BIOS ROM version number is displayed on the monitor screen during power-up.

Blank Screen

WARNING: You should always turn off the power and disconnect the power cord to the server before opening the HP server and touching the internal components. Failing to do so can expose you to electric shock and the server's components to damage. The power switch does NOT turn off standby power, so disconnect the power cord to turn off standby power.

General Checks:

1. All external cables and power cables are firmly plugged in.
2. The power outlet is working.
3. The server and monitor are turned on. (The power-on indicator should be illuminated.)
4. The display's contrast and brightness settings are correct.

5. All internal cables are properly connected and all boards firmly seated.
6. Verify the processor and its heatsink-fan are firmly seated in its socket on the system board.
7. Verify the memory is installed correctly and firmly seated.
8. Verify the slots and tabs are aligned in the DIMM connector.

After Installing an Accessory:

1. Turn off the monitor, the server, and any external devices.
2. Unplug all cables from the power outlet.
3. Open the side panel.
4. Check the following:
   a. If you have installed an accessory board, verify the board is firmly seated in its slot and any switches or jumpers on the accessory board are properly set.

      Refer to the documentation provided with the accessory board.

   b. Check all internal cabling and connections.
   c. If you have changed any switches on the system board, verify each one is properly set.
5. Close the side panel and connect all cables.
6. Turn on the monitor and server.
7. If the server still does not work:
   a. Repeat steps 1, 2, and 3 of this section.
   b. Remove all accessories, except the primary boot hard disk drive.
   c. Close the side panel and connect all cables.
   d. Turn on the monitor and the server.
   e. If the server now works, replace the boards and accessories one at a time to determine which one is causing the problem.

POST Error Messages

Error messages that display during the POST process describe what prevents the server from completing the boot process. Refer to Tables 3-1 to 3-7.

NOTE: HP recommends you correct the error before proceeding, even if the server displays to start successfully. If POST still reports an error message after the corrective action, clear the CMOS configuration, as described later in this chapter.

Table 3-1: POST Error Messages – Memory

Message Displayed	Description
Gate20 Error	The BIOS is unable to properly control the system board's Gate A20 function, which controls access to memory over 1MB. This may indicate a problem with the system board.
Multi-Bit ECC Error	This message will only occur on systems using ECC enabled memory modules. ECC memory has the ability to correct single-bit errors that may occur from faulty memory modules. A multiple bit corruption of memory has occurred, and the ECC memory algorithm cannot correct it. This may indicate a defective memory module.
Parity Error	Fatal Memory Parity Error. System halts after displaying this message.

Table 3-2: POST Error Messages – Boot

Message Displayed	Description
Boot Failure…	This is a generic message indicating the BIOS could not boot from a particular device. This message is usually followed by other information concerning the device.
Invalid Boot Diskette	A diskette was found in the drive, but it is not configured as a bootable diskette.
Drive Not Ready	The BIOS was unable to access the drive because it was not ready for data transfer. This is often reported by drives when no media is present.
A: Drive Error	The BIOS attempted to configure the A: drive during POST, but was unable to properly configure the device. This may be caused by a bad cable or faulty diskette drive.
Insert BOOT diskette in A:	The BIOS attempted to boot form the A: drive, but could not find a proper boot diskette.
Reboot and Select proper Boot device or Insert Boot Media in selected Boot device	The BIOS could not find a bootable device in the system and/or removable media drive does not contain media.
NO ROM BASIC	This message occurs when no bootable device can be detected.

Table 3-3: POST Error Messages – Storage Device

Message Displayed	Description
Primary Master Hard Disk Error	The IDE/ATAPI device configured as Primary Master could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
Primary Master Drive – ATAPI Incompatible	The IDE/ATAPI device configured as Primary Master failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.

Table 3-4: POST Error Messages – Virus Related

Message Displayed	Description
BootSector Write !!	The BIOS has detected software attempting to write to a drive's boot sector. This is flagged as possible virus activity. This message will only be displayed if Virus Detection is enabled in the Setup Utility.
VIRUS: Continue (Y/N)?	If the BIOS detects possible virus activity, it will prompt the user. This message will only be displayed if Virus Detection is enabled in the Setup Utility.
DMA-2 Error	Error initializing secondary DMA controller. This is a fatal error, often indicating a problem with system hardware.
DMA Controller Error	POST error while trying to initialize the DMA controller. This is a fatal error, often indicating a problem with system hardware.
Checking NVRAM..Update Failed	BIOS could not write to the NVRAM block. This message displays when the FLASH part is write-protected or if there is no FLASH part (System uses a PROM or EPROM).
Microcode Error	BIOS could not find or load the CPU Microcode Update to the CPU. This message only applies to Intel CPUs. The message is most likely to display when a brand new CPU is installed in a system board with an outdated BIOS. In this case, the BIOS must be updated to include the Microcode Update for the new CPU.
NVRAM Checksum bad, NVRAM Cleared	There was an error while validating the NVRAM data. This causes POST to clear the NVRAM data.
Resource Conflict	More than one system device is trying to use the same non-shareable resources (Memory or I/O).
NVRAM Ignored	The NVRAM data used to store Plug'n'Play (PnP) data was not used for system configuration in POST.
NVRAM Bad	The NVRAM data used to store Plug'n'Play (PnP) data was not used for system configuration in POST due to a data error.

continued

Table 3-4: POST Error Messages (Virus Related *continued*

Message Displayed	Description
Static Resource Conflict	Two or more Static Devices are trying to use the same resource space (usually Memory or I/O).
PCI I/O conflict	A PCI adapter generated an I/O resource conflict when configured by BIOS POST.
PCI ROM conflict	A PCI adapter generated an I/O resource conflict when configured by BIOS POST.
PCI IRQ conflict	A PCI adapter generated an I/O resource conflict when configured by BIOS POST.
PCI IRQ routing table error	BIOS POST (DIM code) found a PCI device in the system but was unable successfully route an IRQ to the device. Usually this error is caused by an incomplete description of the PCI Interrupt Routing of the system.
Timer Error	This message indicates an error while programming the count register of channel 2 of the 8254 timer. This may indicate a problem with system hardware.
Interrupt Controller-1 error	BIOS POST could not initialize the Master Interrupt Controller. This may indicate a problem with system hardware.
Interrupt Controller-2 error	BIOS POST could not initialize the Slave Interrupt Controller. This may indicate a problem with system hardware.

Table 3-5: POST Error Messages – CMOS

Message Displayed	Description
CMOS Date/Time Not Set	The CMOS Date and/or Time are invalid. This error can be resolved by readjusting the system time in the Setup Utility.
CMOS Battery Low	CMOS Battery is low. This message usually indicates that the CMOS battery needs to be replaced. It could also display when the user intentionally discharges the CMOS battery.
CMOS Settings Wrong	CMOS settings are invalid. This error can be resolved by using the Setup Utility.
CMOS Checksum Bad	CMOS contents failed the Checksum check. It indicates that the CMOS data has been changed by a program other then the BIOS or that the CMOS is not retaining its data due to malfunction. This error can typically be resolved by using the Setup Utility.

Table 3-6: POST Error Messages – Miscellaneous

Message Displayed	Description
Keyboard Error	Keyboard is not present or the hardware is not responding when the keyboard controller is initialized.
Keyboard/Interface Error	Keyboard Controller failure. This may indicate a problem with system hardware.
System Halted	The system has been halted. A reset or power cycle is required to reboot the system. This message displays after a fatal error has been detected.

Clearing the CMOS Configuration

You may need to clear the CMOS configuration if the configuration has been corrupted, or if incorrect settings made in the Setup Utility have caused error messages to be unreadable.

To clear the configuration:

1. Turn off power to the server and disconnect the power cable from the power connector on the system board.
2. Open the side panel.
3. Set jumper J21 to Clear CMOS (labeled "CLR CMOS").
4. Wait for five seconds, and then set jumper J21 to Normal (labeled "OPEN NORMAL").
5. Close the side panel.
6. Turn on power to the server.
7. Press the **Delete** key to run the Setup Utility when `Press <Del> to enter SETUP` displays.
8. Make any configuration changes required.
9. Select the **Exit** option and save the changes to save the configuration and exit the Setup Utility.

HP Management Solutions

The following management options, briefly described here, are available for the HP ProLiant ML150 server.

- HP ML150 System Monitor (MSM) – This is the HP browser-based management software that provides remote administration and monitoring of critical server components.
- LAN port A Power On/Off and Wake-on-LAN (WOL) – These options allow simple remote server power management through the Embedded LAN A port. This feature allows the administrator to remotely power off, on, reset or power cycle the server. To use the WOL option, it must be enabled in the server's (BIOS) Setup Utility under WOL S5 Support (**ACPI > WOL S5 Support > Enabled**).

HP Server Diagnostics for Windows

The purpose of hardware diagnostic software is to provide tools for checking hardware problems. By design, diagnostic software executes simple tests of each hardware component. Usually, such tests assure the hardware is not the source of server problems. This allows the user to eliminate hardware as the cause of the problem and to focus on operating system configuration parameters, network connections, and application software configuration parameters as the source of the problem.

If hardware problems are confirmed, the diagnostic software program can sometimes detect and diagnose the system or specific server component causing the problem. In addition, diagnostic tools can capture information that allows support personnel to quickly assess the condition of the server.

In order to be effective, diagnostic software tools must be used in the context of a wider troubleshooting procedure.

HP Server Diagnostics for Windows Capabilities

The HP Server Diagnostics for Windows is a set of off-line diagnostic tests, including tests for system and processor components, memory, storage elements, graphics, communications, and input devices. The software is supplied on the *HP Startup CD-ROM*.

Use the *HP Startup CD-ROM* to install the HP Server Diagnostics for Windows. After the installation, you can start the diagnostics by clicking **Start > Settings > Control Panel > Diagnostics for Windows**. A basic suite of tools checks key server components, and a menu of advanced tests is available for in-depth testing.

The HP Server Diagnostics for Windows has the ability to test the following components:

System	• Processors • Refresh Timer • Speaker • Real Time Clock • Battery Unit
Input Devices	• Mouse • Keyboard • Joystick • Tablet PC Special Keys
Communication	• Parallel Port • Serial Port • USB Devices • Network Controller
Storage	• Storage Drive • Diskette Drive • Hard Drive • CD/DVD/CDRW Drive
Graphics	• Graphics Controller
Memory	• Total Memory

You can use the software to perform the tasks listed below:

- Display a high-level inventory of the server under test
- Save and print a detailed inventory of hardware components
- Conduct a basic test of components listed in the server inventory
- Display “PASSED” or “FAILED” overall results of basic tests
- Record detailed test results of basic server 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, which contains the detailed inventories and test results
- Add comments to the support ticket

About Error Messages

A hexadecimal number designates each error message reported by the software; a short note on the type of error; and a list of one or more steps the user can take in response. When you run a test, it exercises many aspects of the hardware, so the number of possible error messages exceeds 300. Most of these are encountered rarely, if ever.

Advantages and Limitations of Hardware Diagnostics

Off-line diagnostic software is useful in making sure the hardware has been eliminated as the cause for possible server problems. Such diagnostic tools can easily be shipped with a server, and they are relatively easy to use.

Some limitations of the HP Server Diagnostics for Windows are:

- For Windows 2000 and 2003 only
- Inability to indicate problems with wrongly configured servers or the network

4

Troubleshooting

If you are having problems installing your HP ProLiant ML150 server, there are a number of tools available for troubleshooting, including the information provided in this chapter.

Refer to the HP website at http:\\www.hp.com to access the most comprehensive support material:

- Latest support news – Product and support information on HP servers
- Drivers and software downloads for HP servers
- HP Instant support – Fast, web-based support that is automated and provides quick diagnosis and resolution of most computing problems
- Step-by-step guides for your system troubleshooting
- Technical information – Data sheets, application notes, configuration guides, installation tips, product papers, reference material, and more
- Compatibility issues – HP Accessories, OS/NOS, HP and third-party parts compatibility information
- Manuals – Easy installation and configuration of your HP server
- Parts and service – Information on replacement parts, exploded views, and configuration
- Tape backup support – Support for HP's SureStore Tape Backup products
- HP server registration
- Training programs – HP STAR worldwide training and certification program
- Warranty and enhanced services – Your guide to warranty service for your systems
- Proactive notification – HP will e-mail your custom information when it is available
- Contacts – How to get help or provide feedback

This chapter contain general procedures to help you locate installation problems. If you need assistance, HP recommends contacting your reseller or going to the HP website first at http://www.hp.com. Refer to the topics listed earlier regarding the HP website.

Preventive Maintenance Procedures

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

Refer to the following table for preventive maintenance procedures used for the HP ProLiant ML150 server. Be sure to turn off power to the server when cleaning it.

Components	Time Frame	Maintenance Procedure
Keyboard	Regularly	Dust with damp, lint-free cloth.
Monitor screen	Regularly	Use “HP Video Screen Cleaning Solution” found in 92193M Master Clean Kit.
Mouse	Regularly	Refer to the mouse’s manual for mouse maintenance procedures.
Tape drive heads	Monthly	Use “Magnetic Head Cleaning Solution” found in the 92193M Master Clean Kit.
Cooling fans and grilles	6 Months	Check cooling fan operation and clean the air intake openings on the chassis by removing any dust, lint, and other obstructions to airflow.

CAUTION: Do NOT use petroleum-based cleaners (such as lighter fluid or cleaners containing benzene, trichlorethylene, ammonia, dilute ammonia, or acetone. These chemicals could damage the keyboard’s plastic surfaces).

HP recommends the periodic cleaning of tape heads, capstans, and guides on HP tape drive units and those products using high-density data cartridges and mini-data cartridges. These maintenance procedures prolong tape and head life and helps reduce read/write errors due to dust and oxide.

Troubleshooting

WARNING: Before removing a cover, always disconnect the AC power cords. Disconnect them 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 the telephone cables to avoid exposure to shock hazard from the telephone ringing voltages.

WARNING: For any service activity requiring access to the system board or power distributions board, power down the server and observe all safety precaustions.

For general information on HP server products, refer to:

www.hp.com

and search for the specific product. These instructions do not generally cover third-party components or devices. Refer to the documentation that comes with the third-party device for diagnostic and troubleshooting information.

CAUTION: Always wear an antistatic wrist guard when working inside the HP server.

- Be sure the HP server is properly configured. Many HP server problems are the result of incorrect system and SCSI subsystem configuration settings.
- Check the system BIOS Setup Utility by pressing the **Delete** key during the boot process.
- Check the SCSI configuration or the disk array configuration by entering the controller's setup utility.
- Boot to the Startup CD for access to configuration tools to help setup the HP server.
- If it is a network-related error, determine if the user has enough memory and hard disk drive capacity. Run the diagnostics for the NIC. Consult with the network operating system manual.
- If it is a hardware error, follow the instructions to log users off the LAN and power down the HP server. Reboot and watch for any POST error messages as the HP server goes through POST then look up the error message in Chapter 5 of this manual. If the HP server passes POST, the HP Server Diagnostics for Windows can be used to further test the hardware.
- Use the HP Server Diagnostics for Windows whenever possible to detect hardware problems. Please refer to the *HP ProLiant ML150 Server NOS Installation and Software Guide* for installation information on the HP Server Diagnostics for Windows.
- Besides the HP Server Diagnostics for Windows, you can use the HP ML150 System Monitor (MSM), which is a set of web-based management tools that can be used to maintain and control the HP servers running Microsoft Windows. Please refer to the *HP ProLiant ML150 Server NOS Installation and Software Guide* for installation information on MSM.

Troubleshooting Checklist

1. Verify the error. Be sure it is not an erroneous error message. Is the error repeatable? Is the error message seen affecting the HP server's operation or performance?
2. Always change only one component at a time.
3. Always check the most recently added items added, both hardware and software. Remove any third-party components.
4. Be sure the HP server BIOS is updated to the latest version posted to HP's external website. Flashing/updating the system BIOS and clearing CMOS will resolve many different issues.
5. Be sure the firmware for the hard drives are kept current. Download and run the Hard Disk Drive Firmware Utility to verify if hard drive firmwares need to be updated. This utility is available from HP's external website.
6. Be sure all firmware/BIOS revisions on any controllers are kept current.
7. Use only HP-provided drivers for any HP devices used in the HP server. This includes using HP drivers for the initial installation of any NOS (Network Operating System) that is supported on the specific HP server.
8. Check all cable and power connections, including those in the rack. If the HP server is not powering on, unplug the AC power cords and wait 20 seconds then plug the AC power cords in again and restart the HP server. Check for normal operation.
9. Verify that all cables and boards are securely plugged into their appropriate connectors and slots.

If the problem still persists:

1. Simplify the HP server's configuration. The minimum required:
   - — Monitor
   - — Keyboard
   - — Mouse
   - — 1 hard drive (may need to disconnect for hardware troubleshooting)
   - — CD-ROM and Flexible disk drive (may need to disconnect for hardware troubleshooting)
2. Reconnect the power cords and power on the HP server. If operational, power back down and reinstall one component at a time and power on the HP server after the installation of each component to try and determine which component is causing the problem.

If the problem persists, call the HP Customer Support Center for further troubleshooting assistance.

Server Does Not Power On

Follow these steps if the power/activity light does not light green after you press the power-on button.

Remove the AC power cord, wait 15 seconds, reconnect the power cord, and try again.

1. Verify all cables and power cords are firmly plugged into the respective receptacles.
2. If the server is plugged into a switched multiple-outlet box, be sure the switch on the outlet box is turned on.
3. Plug a different electrical device (such as a printer) into the power outlet, and turn on the device to verify the outlet has power.
4. Verify that the problem is not caused by an internal device connection:
   a. Disconnect the power cord.
   b. Remove the side panel. Refer to Chapter 2.
   c. Verify the power supply is firmly connected to the system board connector.
   d. Verify the front panel power switch is connected to the system board.
   e. Remove the power connectors from all internal devices except the system board.
   f. Reconnect the power cord.
   g. Verify that the front panel green LED light is on. If it is off, call your HP Customer Support provider.
   h. If the front panel green LED light is on, reconnect the power connectors one by one to the internal devices in order to check which device or connection is defective.

Be sure that you remove the power cord before you reconnect each internal device. After reconnecting the device, turn the power on again. If the green LED is still on, repeat this step with another device until you find the device that prevents the green LED from turning on. Call your HP Customer Support provider with this information and for further instructions.

Server Passes POST, but Does Not Function

If there is no error message, follow the steps in this section to troubleshoot the problem. If the problem persists, contact your HP Customer Support provider or your reseller.

If there is no error message, follow these steps:

1. If you are an experienced user, verify the server is configured correctly in the (BIOS) Setup Utility. To start the (BIOS) Setup Utility, boot or reboot the system and press the **Delete** key when prompted.
2. If the server still does not work:
   a. Power off the server and remove all external peripherals, except the monitor and keyboard.
   b. Test the server for normal operation now.
   c. If the server still does not work, go to step 3.
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 cord and all telephone cables.
   b. Remove the server's left side cover.
   c. Verify all accessory boards are firmly seated in the respective slots.
   d. Be sure all disk drive power and data cables are securely and properly connected.
   e. Verify the mass storage configuration with the descriptions listed in Chapter 2 of this guide.
   f. Verify all the DIMMs are HP DIMMs.
   g. Replace the left side cover, and if necessary, use the lock to secure the cover on the server.
   h. Replace the power cord and all of the cables.
   i. Turn on the monitor.
   j. Turn on the server.
   k. Check for an error message.
4. Reboot the server.
5. Run the HP Diagnostics for Windows and verify the server's hardware integrity.

BIOS Reset/Update/Recovery

Should you experience compatibility or stability issues with the HP server, HP recommends starting the troubleshooting by first updating the system BIOS, which may fix the current problem. If the BIOS has become corrupt, it is possible to perform a BIOS reset, recovery, or update to correct the condition. A BIOS update/recovery diskette is created when the most current BIOS is downloaded from the HP website to be used in flashing the BIOS on the server. To perform a reset, an update, or a BIOS recovery, perform one of the following procedures.

BIOS Reset

If the HP server needs the BIOS settings set to the factory defaults (the HP recommended values) due to possible corruption, perform the following steps. The default values have been selected to optimize the HP server's performance.

NOTE: It is recommended that the system's setup and configuration settings be noted before resetting the system to the defaults in the BIOS Setup Utility.

1. Reboot the HP server in a normal manner and press the **Delete** key to enter the BIOS Setup Utility.
2. Press the **F9** key to load default values.
3. Press the **F10** key to save changes and exit the BIOS Setup Utility.

BIOS Update/Recovery

Use this procedure to update the HP server system BIOS with the latest BIOS version. HP regularly posts a new version of the HP server BIOS on the website to improve the HP server's performance.

1. Provide a blank, formatted 3 ½" floppy diskette.
2. Insert this diskette to any Windows PC with HTML browser and a connection to the Internet.

   http://www.hp.com
3. Locate and download the latest HP server BIOS to the PC's hard drive. Double-click on the file and follow the instructions to extract the file to the floppy diskette. This downloaded BIOS on the diskette becomes the BIOS update diskette.

4. Boot the HP server with the BIOS update diskette in the flexible disk drive. The BIOS Utility Update program will start and you will be prompted to update the system BIOS.
5. After the BIOS update is complete, remove the BIOS update diskette and then reboot the HP server.
6. Press the **Delete** key to enter the BIOS Setup Utility and make the necessary changes needed in the BIOS Setup Utility, press the **F10** key to save the changes and exit the utility.
7. Label, date, and save this flexible diskette for use as a BIOS Recovery diskette.

NOTE: If you do not have convenient access to the Internet, you can create a BIOS Update/Recovery diskette from the *HP Startup CD-ROM*. Please note that the CD-ROM may not provide the most recent BIOS. To create the BIOS Update/Recovery diskette, run *HP Startup CD-ROM* on any Windows PC with an HTML browser and follow the menu instructions.

Clearing the BIOS Configuration

NOTE: It is recommended that the system's setup and configuration settings be noted before clearing the BIOS configuration as this will reset all settings back to the default.

You may need to clear the BIOS (CMOS) configuration if the configuration has become corrupt or if incorrect settings made in the Setup Utility have caused error messages to be unreadable.

To clear the configuration, refer to "Clearing the CMOS Configuration" in Chapter 3 for the detailed information.

Password Problems

Supervisor Password

1. Power off the HP server.
2. Clear the CMOS configuration as described in the "Clearing the CMOS Configuration" section of Chapter 3.
3. Power on the HP server. The system BIOS Setup Utility will allow access to it now without having to enter any password.
4. A new Supervisor password can now be set from the system BIOS Setup Utility.

User Password

If you need to reset the User password and you know the Supervisor password, perform the following steps:

1. Restart the HP server.
2. During the boot process, press the **Delete** key to start the system BIOS Setup Utility.
3. Enter the Supervisor password and once in the Setup Utility, go to the **Security** menu.
4. Move to the **Change User Password** menu selection and press the **Enter** key.
5. Enter the new User password and press the **Enter** key.
6. Reconfirm the new User password and press the **Enter** key. This sets a new User password.
7. Exit the Setup Utility and save the changes to save the new password.

General Server Problems

"Operating System Not Found" Message Appears

1. Check for a non-bootable diskette in the flexible disk drive. If found, remove the diskette form the drive.
2. Check for a tape in the tape drive. If found, remove the tape cartridge from the drive.
3. Power on the HP server. If the message still appears, reboot the HP server and when prompted, enter the system BIOS Setup Utility and check that the device boot order is correct.
4. If a disk array controller is being used and the NOS is installed on a hardware array/container, verify that the array/container is in an optimal state by accessing and checking the disk array controller's setup utility during startup.
5. Boot to a DOS disk and check the partitions to ensure the primary partition is active.

If the problem persists, contact the HP Customer Support Center for further troubleshooting assistance.

Server Stops Working (Hangs)

Typically, if the HP server hangs before the end of POST completes, the problem is possibly a hardware problem or failure. If the HP server hangs after POST completes, the problem is possibly due to an incorrectly configured or corrupt driver, operating system, or application program, or a media (disk drive) error.

If the HP server stops working or hangs starting up:

1. Review the Troubleshooting Checklist in this chapter before you continue.
2. Try to verify exactly where the HP server is stopping during POST. For example: is the HP server stopping at the memory count or a SCSI controller? Look for any error messages and make note of them for further assistance in troubleshooting the problem.

If the failure persists, verify there is not a hardware problem by running the HP Server Diagnostics for Windows or checking the Hardware Event log on HP servers that have that option.

1. If the failure persists, try removing any recently added hardware and check if the problem still exists. If the problem has disappeared, add one removed hardware component at a time back into the HP server to try and verify which hardware component is causing the problem.

For further assistance, contact the HP Customer Support Center before replacing any parts.

Power Problems

NOTE: The HP ProLiant ML150 server supports the ACPI (Advanced Configuration and Power Management 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 server.

Refer to Chapter 1 in this manual BEFORE doing any further troubleshooting to verify that the HP ProLiant ML150 server is not in a sleep mode.

A flashing green power LED indicates the HP ProLiant ML150 server is in a sleep mode.

1. Verify the HP server's power cord is plugged in to a known good power source.
2. Is the On/Off LED on the front of the HP ProLiant ML150 server a steady green, which indicts it is getting power?
3. Remove the HP server form any UPS or PDU and connect the HP server directly to a power source.

4. Verify the AC power source is good:
   a. Verify the circuit breaker for the AC power outlet.
   b. If the breaker was off, verify all devices connected to the HP server share the same circuit breaker and are the only devices on it.
   c. Reset the circuit breaker after reconfiguring the devices if needed.
   d. Verify the AC power outlet is not faulty by plugging in a known good device.
   e. Verify the DC power supply cable connected to the system board.
5. If the fans (system, power supply, and processor heat sink) are not audible and the above steps are verified:
   a. Disconnect the power cord/s for five minutes in order to reset the power supply's circuitry.
   b. With the power cord/s disconnected, remove the HP server cover.

CAUTION: Always wear an anti-static wrist guard when working inside the HP server.

   c. Remove all the accessory boards, including any hard disk drive controller board or video board. Disconnect all mass storage power cords and cables.
   d. Plug the power cord/s back in and turn on the HP server.
   e. If power is still not getting to the HP server, the power supply may be faulty.

Contact the HP Customer Support Center for further assistance before replacing any parts.

Video/Monitor Problems

These are basic guidelines for troubleshooting video issues. They are arranged in such an order as to be used progressively. The HP server should not be re-populated with components until video is produced. For each step taken, be certain to unplug the power for 30-60 seconds prior to powering the HP server back on. For each power up attempt, allow at least 60 seconds for the HP server to produce video.

NOTE: Take appropriate electrostatic discharge precautions prior to working inside the HP server.

NOTE: If using a third-party video controller card and the onboard video controller (if applicable) was disabled, remove this controller card, connect the cable to the onboard video controller then clear the CMOS. This re-enables the onboard video. For instructions on clearing CMOS, refer to the "Clearing the CMOS Configuration" section in Chapter 3.

1.

2. Test the monitor on another machine to verify the monitor is not faulty.
3. Disconnect the HP server from any console switch box during troubleshooting. Connect a known good monitor, keyboard, and mouse to the HP server to troubleshoot.
4. Verify that the AC power source is good. If suspect, try another power source.

NOTE: Verify that fans and hard drives are spinning up. If no fans or drives are spinning up, refer to previous section on Power Problems.

If there is still no video:

1. Power off the HP server and unplug from the power source and remove the covers.
2. Clear the CMOS configuration as described in the "Clearing the CMOS Configuration" section of Chapter 3.
3. Plug the HP server into a power source and power on the HP server.

If there is still no video:

1. Power off the HP server and unplug form the power source.
2. Remove all PCI controller cards.
3. Disconnect power and SCSI connections from hard drives.
4. Disconnect IDE and flexible disk drive cables.
5. Take the HP server down to base memory (1 DIMM) and reseat that DIMM.
6. Plug the HP server into a known good power source and power on the HP server.
7. If video returns, reinstall the removed components one at a time back into the HP server. One of the removed components may have been causing the no video problem.
8. After all the components are reinstalled, reset the HP server's BIOS.

If the problem persists, contact the HP Customer Support Center for further troubleshooting assistance before replacing any parts.

Configuration Problems

The Configuration Cannot Be Saved and the Battery Loses Power or the Configuration Information Is Frequently Lost

WARNING: There is a danger of explosion if the battery is incorrectly installed. For your safety, never attempt to recharge, disassemble, or burn the old battery. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

NOTE: Configuration information is saved in the CMOS on the system board. The CMOS battery is the power source that saves this information.

1. If the HP server frequently loses the time and date, clear the CMOS and flash the system BIOS to the latest revision. Refer to "Clearing the CMOS Configuration" in Chapter 3 for clearing the BIOS configuration and updating the system BIOS.
   - — After performing the BIOS flash, on reboot, enter the BIOS Setup Utility (pressing the **Delete** key during POST when prompted) and set the date and time.
   - — Exit the BIOS Setup Utility making sure to save changes.
   - — Check if this resolves the issue.
2. If this does not resolve the issue, replace the CMOS battery. The battery is attached to the system board.
   - — Turn off AC power to the HP server.
   - — Unplug the HP server's power cords from the power source.
   - — Remove the covers.
   - — Locate the CMOS battery on the system board and replace the battery.
   - — Power on the HP server, and set the date and time from the BIOS Setup Utility (pressing the **Delete** key during POST when prompted).
   - — Exit the BIOS Setup Utility, making sure to save changes.

On reboot, check if the issue is resolved with the good battery in the HP server. If this still does not resolve the issue, please contact the HP Customer Support Center for further troubleshooting assistance before replacing any parts.

Printer Problems

If the printer does not work, do the following:

1. Verify that the AC power cord is plugged into the power source and the printer.
2. Be sure the printer power switch is ON and the AC outlet is working.
3. If the printer is plugged into a multiple-outlet box, be sure the switch on the outlet box is turned on and the circuit breaker (if applicable) is not tripped.
4. Be sure the printer is online and available for printing.
5. Verify the correct cables are being used and that the cables are connected properly. Be sure the cable pins are not bent.
6. Try a known good cable.
7. If the printer's parallel date cable is plugged into the HP server after the server is on, reboot the HP server.
8. Examine the printer for a paper jam.
9. Run the printer self-test. Refer to the printer's manual for instructions.
10. Be sure the correct port setting when configuring the printer.
11. Run the system BIOS Setup Utility (pressing the **Delete** key on POST when prompted) to verify the I/O port status. Be sure it is not disabled.
12. Test another peripheral from the HP server's parallel port to ensure functionality.

If the printer still does not work, contact the HP Customer Support Center for further assistance.

The Keyboard Does Not Work

NOTE: Use only an HP-Approved Keyboard as others may not work correctly.

If the keyboard does not work or a character is not displayed when a key is pressed:

1. Be sure that the keyboard is not locked, if the HP server has this feature.
2. Be sure that the keyboard cable connections at the rear of the HP server and at the back of the keyboard are secure.

NOTE: Be sure the keyboard is plugged into the keyboard port and not into the mouse port in the back of the server.

3. If the KVM switchbox is used with this HP server, remove the keyboard and plug the keyboard directly into the keyboard port of the HP server.

4. Try replacing the keyboard with a known good keyboard, and then reboot the HP server.
5. If there is a keyboard extender cable, be sure the connection is secure or remove the extender and plug the keyboard directly into the HP server.

If the problem persists, contact the HP Customer Support Center for more troubleshooting steps before replacing any parts.

The Mouse Does Not Work

The HP server automatically detects a mouse when one is installed. If the mouse or other input device is not working, check the following:

1. Verify that the mouse cable is properly and securely connected to the HP server or KVM switch box.
2. If a KVM switch box is used with this HP server, remove the mouse and plug the mouse directly into the mouse port on the HP server.

NOTE: Be sure the mouse is plugged into the mouse port and not the keyboard port.

3. Be sure that the mouse port does not have a resource conflict with another device. Use the system BIOS Setup Utility (pressing the **Delete** key) to check.
4. Be sure that the correct mouse driver has been installed onto the boot drive. Refer to the mouse installation manual or the operating system manual.
5. Replace the mouse with a known good mouse.

If the problem persists, the system board may need to be replaced. Contact the HP Customer Support Center for further troubleshooting assistance before replacing any parts.

Flexible Disk and Flexible Disk Drive Problems

If the HP server cannot boot from, write to, or format a flexible diskette, do the following:

1. Try booting from a known good flexible disk.
2. Run the system BIOS Setup Utility (pressing the **Delete** key on POST when prompted) and verify the mass storage configuration is correct.

NOTE: If for some reason the system BIOS Setup Utility cannot be accessed, clear the CMOS. Refer to “Clearing the CMOS Configuration” in Chapter 3.

3. Be sure the flexible disk drive is set as the first boot device in the BIOS Setup Utility if you are deliberately booting from a diskette.
4. Be sure the disk is not write-protected.
5. Verify the activity light on the drive is on.
6. Try another flexible diskette.

Flexible Disk Drive Problems

1. Verify that the internal drive cables are securely attached and functional by inspecting the cables and reseating the connections at both ends.
2. If the cables are securely attached and the drive still does not work, replace the cable with a known good cable.

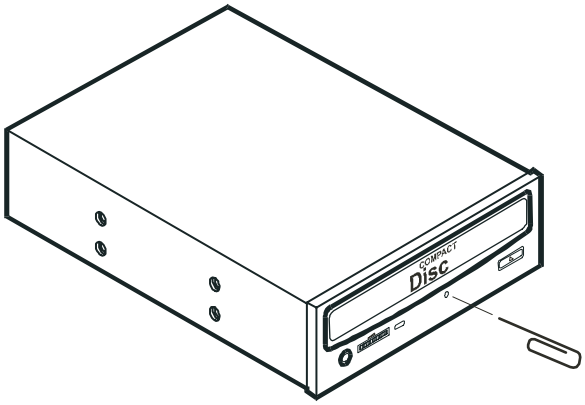
If the problem persists, call the HP Customer Support Center for further assistance before replacing any parts.

CD-ROM Problems

The CD-ROM Drawer Will Not Open

If the CD-ROM drawer fails to open when the Eject Button is pressed or with software commands, do the following:

1. Turn off the HP server.
2. To open the drawer, inset a pointed object, such as a paper clip, into the emergency eject hole and push in about 1.75 inches (40 mm).



3. Remove the disk and close the drawer.
4. After the disk is removed, start the HP server and try to open the drawer again with the eject button or software command.

If the drawer still will not open, call HP Customer Support for further assistance before replacing any parts.

The CD-ROM Drive Is Not Working Properly

The CD-ROM drive provided with all the HP server models is an IDE CD-ROM. If the CD-ROM drive does not work, do the following:

1. Review the basic IDE installation guidelines to ensure a proper configuration.
2. In addition, check the following:
   - — Verify correct drivers are installed.
   - — Verify there is a CD-ROM disk in the CD-ROM drive.
   - — Verify the IDE Controller and devices are displayed during Power On Self Test (POST).
   - — Verify all internal drive cables are securely attached and functional.
3. Verify that the Local Bus IDE Adapter item is correctly configured in the Setup program:
   - — Power on the HP server and press the **Delete** key to enter the BIOS Setup Utility when this option displays.
   - — Check the **Advanced > IDE Configuration** item is enabled.

If the problem persists, contact the HP Customer Support Center for further troubleshooting steps before replacing any parts.

NOTE: Check for Environmental Problems That Could Damage Disk Media and Disk Drive Heads.

Environmental problems result from:

- Radiated Interference: sources include communications and radar installations, radio/TV broadcast transmitters, and hand-held receivers.
- Airborne contaminants: Sources include dust, smoke, and ashes. Steam from duplication equipment may result in intermittent disk errors.

Server Will Not Boot from a CD-ROM Disk

1. Verify the CD-ROM disk is bootable.
2. Use the BIOS Setup Utility to verify that the CD-ROM Drive is first in the boot order. To do this:
   - Reboot the server and run the (BIOS) Setup Utility (pressing the **Delete** key).
   - Move to the **Boot** menu.
   - If necessary, move the CD-ROM up in the boot order list. This ensures the CD-ROM will boot before any of the hard disk drives (IDE or SCSI).
   - Save and exit the Setup Utility.

If the problem persists, contact the HP Customer Support Center for further troubleshooting assistance.

SCSI Problems

The SCSI Boot Controller BIOS Has Trouble Loading the Boot Logical Drive (NOS Drive)

1. Verify the SCSI boot controller is bannering (displaying) on POST.
2. Be sure that the SCSI boot controller's BIOS is enabled. Check this from the SCSISelect` Utility. To access this utility, press **Ctrl**-**A** when an Adaptec controller banners on POST.
3. Determine what the boot order is for the HP server. To verify that the SCSI boot controller board is in the correct position in the boot order, press the **Delete** key on POST to access the system BIOS Setup Utility. The boot order can be viewed and changed from this utility. If necessary, change the slot (if applicable) that the SCSI controller is in to change the location in the boot order.
4. If the problem persists:
   a. Clear CMOS and flash the system BIOS. Refer to "Clearing the CMOS Configuration" in Chapter 3.
   b. Repeat step 3.
5. If you installed more than one SCSI controller, try disabling the BIOS on all other SCSI controller except for the SCSI boot controller. This lets the SCSI BIOS for the boot controller load and prevents conflicts with other SCSI controllers. If necessary, remove all the other SCSI controller boards except the SCSI boot controller until the issue is resolved.

Contact the HP Customer Support Center for further troubleshooting assistance.

A SCSI Controller Does Not Work at Initial Installation

Many SCSI controller problems are caused by an incorrect configuration rather than by faulty hardware. If the SCSI controller does not work after installation, do the following:

1. Verify the SCSI controller BIOS is bannering (displaying) on POST.
2. If more than one SCSI controller was installed, verify that each adapter is set to a separate BIOS address or disable the BIOS on all of the other adapters except the boot controller.
3. Be sure there are no resource conflicts.
4. For each device on the SCSI controller, check:
   - — Each device has a unique SCSI address.
   - — Do not set any device to SCSI ID 7. This is usually the controller SCSI ID.

If the SCSI banner still does not banner on POST, check the following:

NOTE: Wear an anti-static wrist guard when working inside the HP server.

1. If the SCSI controller is an adapter board:
   a. Power off the HP server. Unplug the power cord from the power source and remove the covers.
   b. Reseat the SCSI controller board in its slot.
   c. Replace the covers, plug the power cords back into a power source, and power on the HP server.
2. If the SCSI controller still does not banner on POST:
   a. Do all the previous to power off the HP server then move the SCSI controller board into another slot.
   b. If this still does not resolve the issue:
   - — Clear CMOS. (Refer to “Clearing the CMOS Configuration” in Chapter 3.)
   - — Flash the system BIOS. (Refer to the previous instructions in this chapter on System BIOS Update.)

Contact the HP Customer Support Center for further troubleshooting assistance before replacing any parts.

A SCSI Device Stops Working

If a SCSI device stops working:

1. Verify it banners on POST or is seen in the SCSISelect Utility.
2. If an accessory board was added recently, check for a resource conflict between the new board and an existing accessory boards.
   a. Remove the board and restart the HP server.
   b. If this corrects the problem, the new board is either defective or it is trying to use a system resource used by another SCSI controller board.
   c. Try the accessory board in another slot.
3. Check for any recent changes or upgrades to the software. For example, has anyone moved, removed, or changed the configuration files or drivers? Refer to the software documentation for more information.
4. If you suspect hardware failure and there are no system error messages, check each component associated with the failure. Equipment failure is probably the most unlikely reason for a SCSI device failure.

Contact the HP Customer Support Center for further troubleshooting assistance before replacing any parts.

A SCSI Device Does Not Work after Installation

NOTE: The SCSI controller board supplied with some HP servers come with a single channel SCSI controller board and cannot support internal and external SCSI devices on the same controller.

NOTE: Refer to the documentation provided with the SCSI device for any specific information regarding installation.

If a SCSI device does not work after installation, do the following:

1. If using a single channel SCSI controller for external devices, be sure no internal devices are connected on the internal channel of the SCSI controller. HP does not support using both internal and external connections on a single-channel controller, and a second SCSI controller board must be purchased for use with the external SCSI device.
2. Verify the SCSI BIOS is being executed properly. The internal and external SCSI device controllers display a banner during startup. The BIOS then checks for valid devices on the SCSI bus, and reports which devices are found. If the SCSI devices are installed and configured correctly, a list confirming the devices will banner on POST after the controller banners.

3. Verify the switch settings on the SCSI devices are correct.
4. Verify each SCSI device is assigned a unique SCSI ID.
5. Be sure no SCSI device is set to SCSI ID 7. This SCSI address is generally used by the SCSI controller.
6. Be sure all installed SCSI controllers are configured correctly.
7. If the SCSI devices installed in an external connected to the HP server operate in Ultra SCSI or FAST SCSI mode, this may cause a problem. The SCSI controller board and the internal SCSI devices normally provided with the HP servers operate in Ultra 160 SCSI mode. The external SCSI devices may be slowing down or causing the internal SCSI controller board to be ineffective and therefore non-operational.
8. Check the SCSI cables for problems that may be caused by any recent HP server maintenance, hardware upgrades, or physical damage.
9. Check the system BIOS version to ensure it is the most recently issued version. The most recent version is listed on HP's website.
10. Verify the SCSI bus is terminated at both ends. By default, HP server SCSI controllers in external enclosures are terminated. When a device is connected to a connector on the SCSI bus, bus termination for that connector is disabled. Verify the last device on the bus is terminated.

Contact the HP Customer Support Center for further troubleshooting assistance before replacing any parts.

Processor Problems

Contact the HP Customer Support Center for further troubleshooting assistance before replacing any parts.

Memory Problems

NOTE: The HP ProLiant ML150 server uses only 2.5V, 184-pin, PC2100 266 MHz, registered, ECC, DDR DIMMs. The EDO DIMMs and PC 100 SDRAM DIMMs from earlier HP server models will fit into the DIMM slots in the HP ProLiant ML150 server, but the EDO DIMMs and PC 100 SDRAM will not function properly and are not supported.

The memory modules used for the HP ProLiant ML150 server are DIMMs.

1. Review the troubleshooting checklist from this manual before you continue.
2. If memory problems are being experienced, power the HP server off and on gracefully. This performs a "cold" restart rather than a "warm" restart by doing a **Ctrl**-**Alt**-**Delete**.
3. Verify that all the DIMMs are the correct DIMMs for this particular HP server.
4. Verify that all the memory is counted during the Power On Self Test (POST).
5. Run the HP Server Diagnostics for Windows memory test.

CAUTION: Wear an anti-static wrist guard when working inside the HP server.

If the problem persists:

1. Power off the HP server, unplug the power cord from the power source and remove the left side cover.
2. Locate and reseat the memory modules.
3. Plug the power cord back into the power source and power on the HP server.
4. Verify that all the memory is counted during the Power On Self Test (POST).

If the problem still persists:

1. Power off the server and unplug the power cord for the power source.
2. Remove all but one DIMM.
3. Plug the power cord back into the power source and power on the HP server.
4. If the error is not present, power off and unplug the server then add another DIMM, continuing this process until all the DIMMs are installed or a failure occurs.
5. Verify the failure by reinstalling the DIMM by itself and attempt to duplicate the error.
6. Try the faulty DIMM in another memory slot to confirm that the slot is not defective.
7. Replace the defective DIMM.

Contact the HP Customer Support Center for further troubleshooting assistance if needed.

Network Interface Card (Embedded or PCI) Problems

If the HP server cannot connect to the network and all the LEDs are lit on the NIC:

1. Verify that there are no resource conflicts between the NIC and any other accessory. Do this from the system BIOS Setup Utility (pressing the **Delete** key on POST when prompted).
2. Reboot the HP server and log into the NOS.
3. Be sure the latest and correct HP drivers are being used for the NIC.
4. Be sure the port on the switch or hub (or other device) has the same speed and duplex settings as on the NIC.

CAUTION: Setting an incorrect duplex mode can degrade performance, cause data loss, or result in lost connections.

5. Test the NIC as directed in the installation tasks for each NOS. Also check the README files on the support driver's disk.
6. Use the PING command to verify TCP/IP configuration.
   a. Ping the IP address of the default gateway. If the PING command fails, verify that the default gateway IP address is correct and that the gateway (router) is operational.
   b. Ping the IP address of a remote host (a host that is on a different subnet). If the PING command fails, verify that the remote host IP address is correct, that the remote host is operational, and that all of the gateways (routers) between this computer and the remote host are operational.
7. Directly connect two devices (with no hub, switch, or other device) using a "crossover" cable. PING the other computer's IP address.

NOTE: The PING command uses Internet Control Message Protocol (ICMP) Echo Request and Echo Reply messages. Packet filtering policies on routers, firewalls, or other types of security gateways might prevent the forwarding of this traffic.

LEDs Are Not Lit on the NIC

No lit LEDs probably indicates a bad network cable, hub connection, or other network error.

1. Be sure that the cabling is installed correctly:
   a. Try another known good network cable.
   b. Try another network connection (another hub, switch, etc.).
   c. Connect the NIC to a known good network connection.

If there are still no lit LEDs, do the following:

1. Power off the HP server and unplug the power cord/s from the power source. Remove the left side cover.

NOTE: The HP ProLiant ML150 server has an integrated NIC so skip the following steps unless a PCI NIC is installed in the server.

CAUTION: Always wear an antistatic wrist guard when working inside the HP server.

2. Locate the NIC and reseat it in its slot.
3. Replace the covers; plug in the power cord to a power source, and power on the HP server.
4. If the problem persists, perform the previous steps 2 and 3 but move the NIC to another slot.
5. Replace the covers; plug in the power cord to a power source, and power on the HP server.

If the problem persists, contact the HP Customer Support Center for further troubleshooting assistance before replacing any parts.

5

Replacing Parts

Safety Information

Follow the procedures listed below to ensure safe handling of components and to prevent harm to both you and the server:

- Use an anti-static wrist strap and a grounding mat.
- Handle accessory boards and components by the edges only. Do not touch any metal-edge connectors or any electrical components on accessory boards.
- Do not wear clothing subject to static charge build-up, such as wool or synthetic materials.

WARNING: Hazardous voltages are present inside the server. Always remove AC power from the system and other associated assemblies while working inside the unit. Serious injury may result if this warning is not observed.

WARNING: Before opening the HP server, always disconnect the power cords and unplug telephone cables. 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. Disconnect telephone cables to avoid exposure to shock hazard from telephone ringing voltages.

Note that the power switch does not turn off the standby power. Disconnect the power cord to turn off standby power.

Chassis Fan

The chassis fan is mounted within the rear panel of the chassis.

Use the following steps to replace the chassis fan:

1. If the server is operating, log off all users, back up files, and power down the server.
2. Disconnect the power cord and any external cables connected to the server. If necessary, label each one to expedite re-assembly.
3. Open the side panel.
4. If necessary, remove any accessory boards from the system board allowing clear access to the fan.
5. Squeeze the two blue tabs together and pull down slightly to release the latch from the rear panel slots.
6. Unplug the connector and lift out the fan. Refer to Figure 5-1.

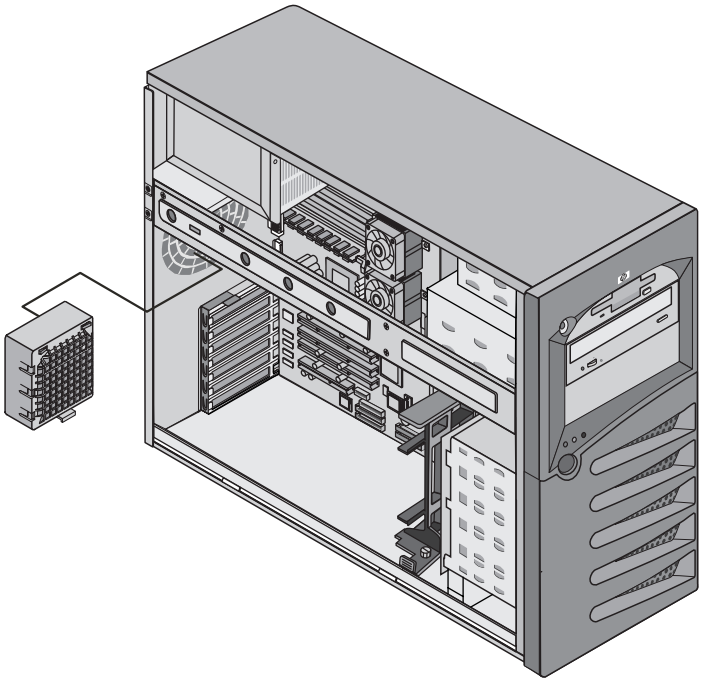


Figure 5-1: Removing chassis fan

7. Remove the replacement chassis fan from the shipping container.
8. Connect the chassis fan connector.
9. Line up the tabs of the fan with the openings on the rear panel and snap the fan into place.
10. Replace any accessory boards removed to access the fan.
11. Close the side panel.
12. Replace the external cables and power cord.
13. Power up the server and return it to normal operation.

Power Supply

The power switch on the front panel controls the power supply.

Use the following steps to replace the power supply:

1. If the server is operating, log off all users, back up files, and power down the server.
2. Disconnect the power cord and any external cables connected to the server. If necessary, label each one to expedite re-assembly.
3. Open the side panel.
4. Disconnect the power supply connections to the FDD and CD-ROM drive.
5. Unplug the power cables (J27 and J28) from the system board.
6. Remove any long PCI cards.
7. Remove the screw in front of the PCI card guide and remove the guide.
8. Unplug the power to the hot swap back plane or from the cold swap power jumper cable.
9. Remove the four screws securing the power supply to the chassis. These are located at the rear of the chassis. Refer to Figure 5-2.
10. Slide the power supply forward and remove it.

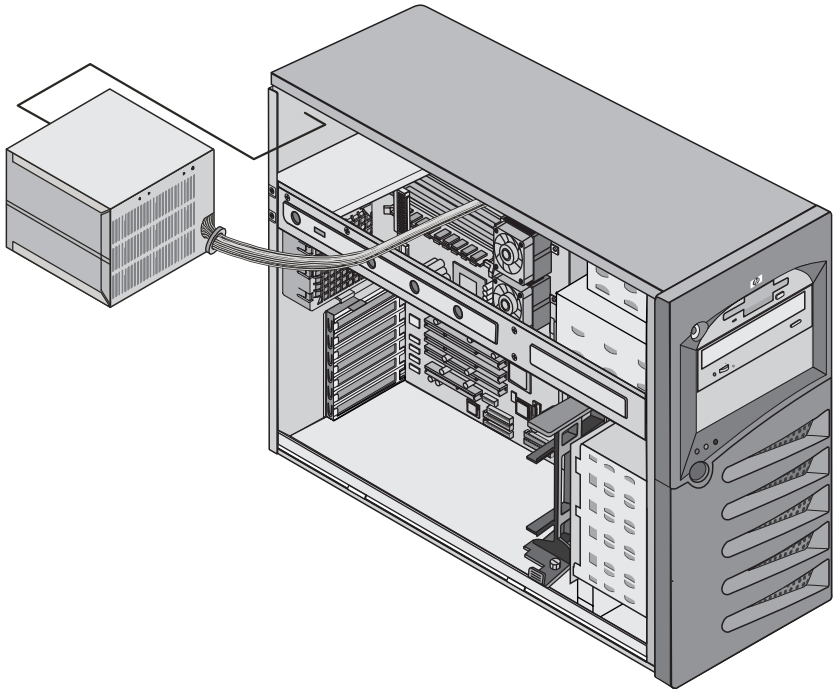


Figure 5-2: Removing power supply

11. Place the new power supply into the chassis.
12. Replace the four screws securing the power supply to the chassis.
13. Connect the internal power cables.
14. Re-install the PCI card guide and tighten the thumbscrew.
15. Re-install any full length PCI cards.
16. Re-install the PCI card lock.
17. Close the side panel.
18. Replace the external cables and power cord.
19. Power up the server and restore it to normal operation.

Battery

Use the following steps to replace the battery:

WARNING: There is a danger of explosion if the battery is incorrectly installed. For your safety, never attempt to recharge, disassemble, or burn the old battery. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

1. If the server is operating, log off all users, back up files, and power down the server.
2. Disconnect the power cord and any external cables connected to the server. If necessary, label each one to expedite re-assembly.

WARNING: The power supply will continue to provide standby current to the HP server until the power cord is disconnected.

3. Open the side panel.
4. Remove any accessory boards, if necessary, allowing access to the battery socket.
5. Remove the existing battery. Refer to Figure 5-3.

   The battery is spring loaded into the mounting socket and held in place by a latching mechanism. Press the release mechanism toward the outside of the mounting socket to release the battery.

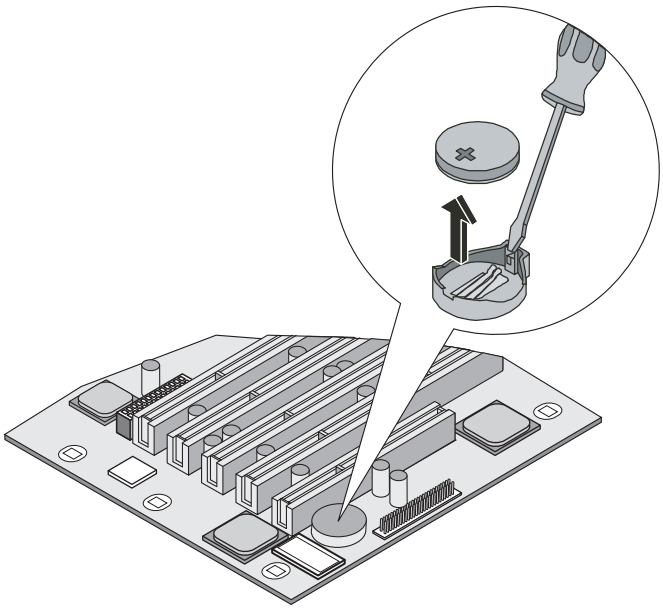


Figure 5-3: Replacing battery

6. Insert the new battery with the positive sign (+) facing out, and ensure that it is seated completely. Be sure the retaining latch is in place, and holds the battery firmly.
7. If necessary, replace any accessory boards removed to allow access to the battery socket.
8. Close the side panel.
9. Replace the external cables and power cord.
10. Power up the server and return it to normal operation.

System Board

Use the following steps to replace the system board:

1. If the server is operating, log off all users, back up files, and power down the server.
2. Disconnect the power cord and any external cables connected to the server. If necessary, label each one to expedite re-assembly.
3. Remove the side panel.
4. Remove all accessory boards mounted on the system board.
5. Remove all cables connected to the system board. If necessary, label each one to expedite re-assembly.
6. Lay the chassis down to gain access to the system board.
7. Remove the system fan.
8. Remove the PCI card guide.
9. Remove the four (eight if a second processor/heatsink is installed) screws securing the heatsink and the fan cable(s).
10. Use a Torx T-15 driver to remove the ten screws securing the system board to the chassis.

CAUTION: Use caution to prevent the T-15 driver from slipping and damaging the system board.

11. Lift the system board gently at its two front corners to unsnap the board from the chassis.
12. Slide the system board forward and then lift the board up and away from the chassis. Refer to Figure 5-4.

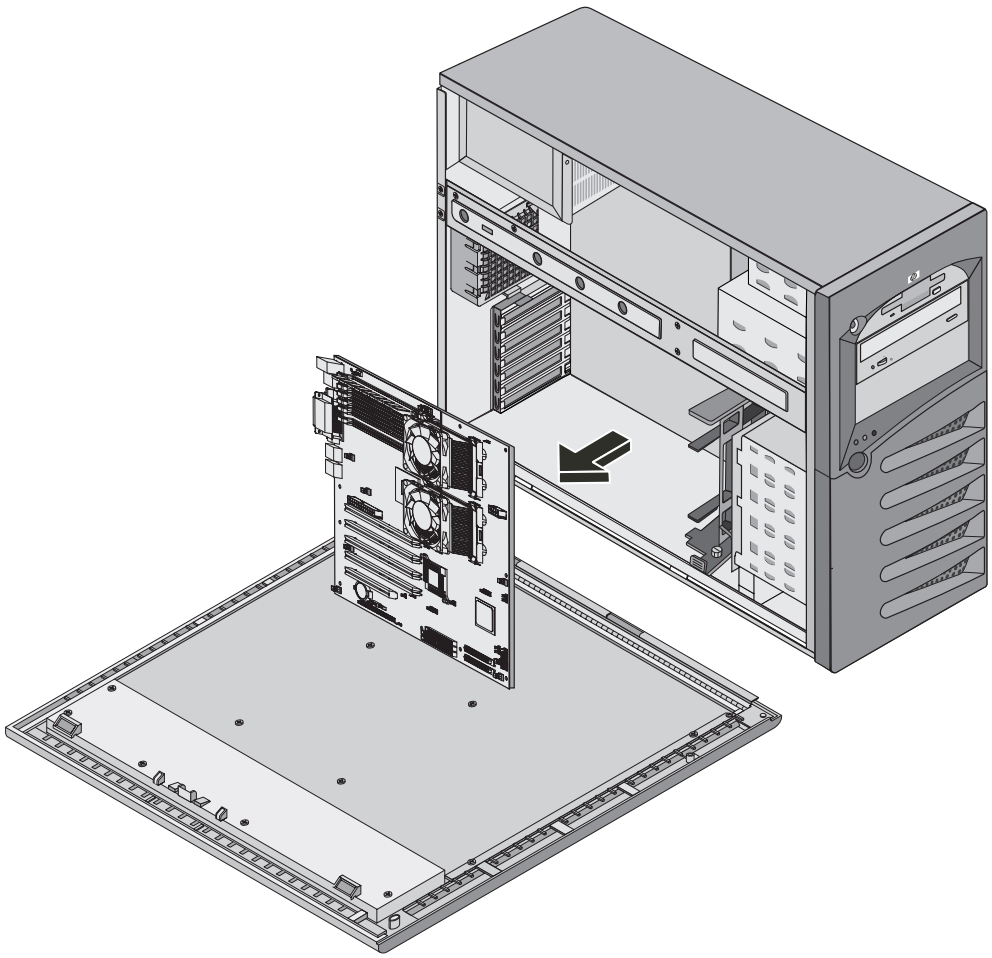


Figure 5-4: Removing system board

13. Place the system board on an anti-static pad and record all jumper connections and settings.
14. Remove memory and processors. Place components on an anti-static pad.

15. Place the system board and any cables in an anti-static container.
16. Remove the replacement system board and any cables from the anti-static shipping container.
17. Place the system board on an anti-static pad and set all jumper connections and settings as recorded during the system board removal.
18. Place the system board in the chassis aligning the rear panel connectors to the rear chassis and the mounting holes in the board with the holes in the chassis.
19. Snap the board into place.
20. Install the ten screws securing the system board to the chassis.
21. Replace memory and processors.

NOTE: A tube of grease is provided with the replacement system board. One half of the tube should be used for each processor.

a. Wipe the grease off of the heatsink and processor.

b. Place a round dollop of the grease in the center of the CPU heat spreader.

c. Push the heatsink straight down to evenly spread the grease.

d. Install the heatsink to the CPU.

22. Replace all cables that were removed.
23. Replace any removed accessory boards.
24. Return the machine to its upright position.
25. Replace the system fan.
26. Connect the power cord and any external cables to the server.
27. Close the side panel.
28. Power up the server and return it to normal operation.

6

Parts Identification and Parts List

This chapter provides exploded views and replaceable parts lists. The part numbers in the lists apply to both cold swap and hot swap models of the HP server, except where noted.

NOTE: The part numbers listed in this chapter were available at the time of publication. Part numbers may change after publication. Order parts by the number listed in this chapter; HP's parts price list database will generally contain a reference to the revised part number. If a system board needs to be replaced, remove processor modules, DIMMs, or adapter boards and transfer these to the new board. Be sure all jumper and switch settings on the old board are transferred to the new board.

Exploded View and Parts List – Bezels and Drives

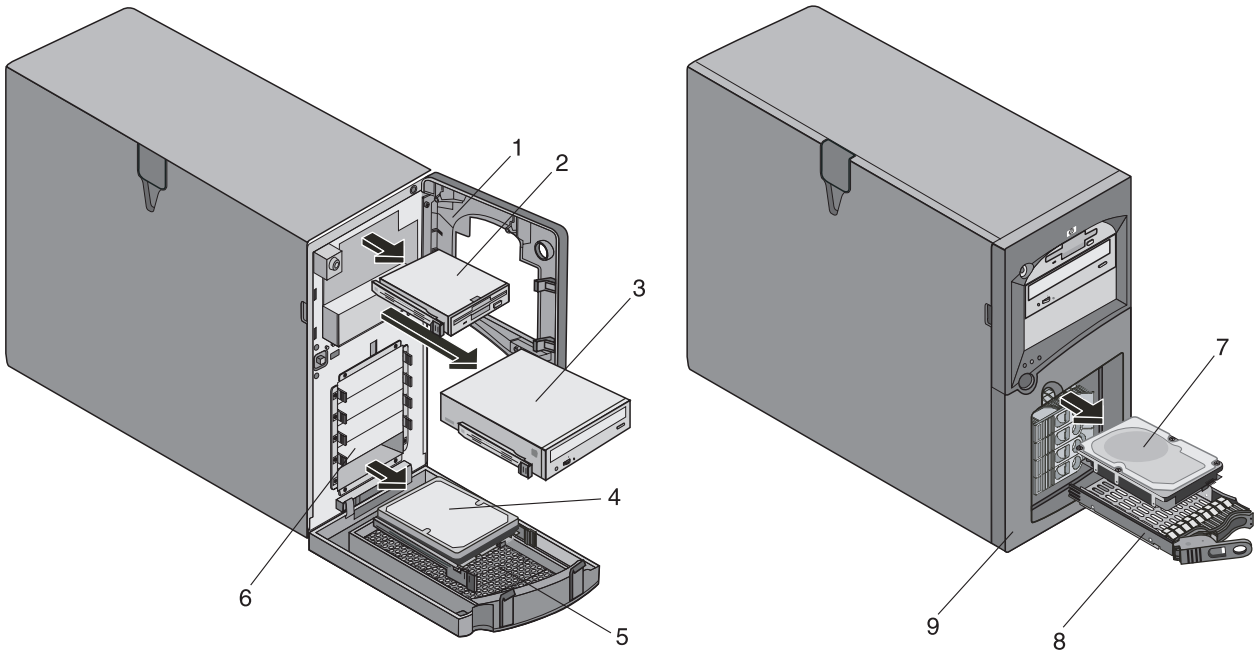


Table 6-1: Parts List – Bezels and Drives

Item No.	Description	Part Number
1	Upper Bezel	344694-003
2	Flexible Disk Drive	344703-003
3a	CD-ROM Drive	344702-003
3b	DVD-ROM Drive	344701-003
4a	36GB 10K Cold Swap Drive Ultra320	344688-003
4b	73GB 10K Cold Swap Drive Ultra320	344690-003
4c	144GB 10K Cold Swap Drive Ultra320	344692-003
5	Cold Swap Lower Bezel	344696-003
6	Filler Panel	344683-003
7a	36GB 10K Hot Swap Drive Ultra320	344687-003
7b	73GB 10K Hot Swap Drive Ultra320	344689-003
7c	144GB 10K Hot Swap Drive Ultra320	344691-003
8	Hot Swap Hard Drive Carrier	344684-003
9	Hot Swap Lower Bezel	344695-003

Exploded View and Parts List– Internal Components

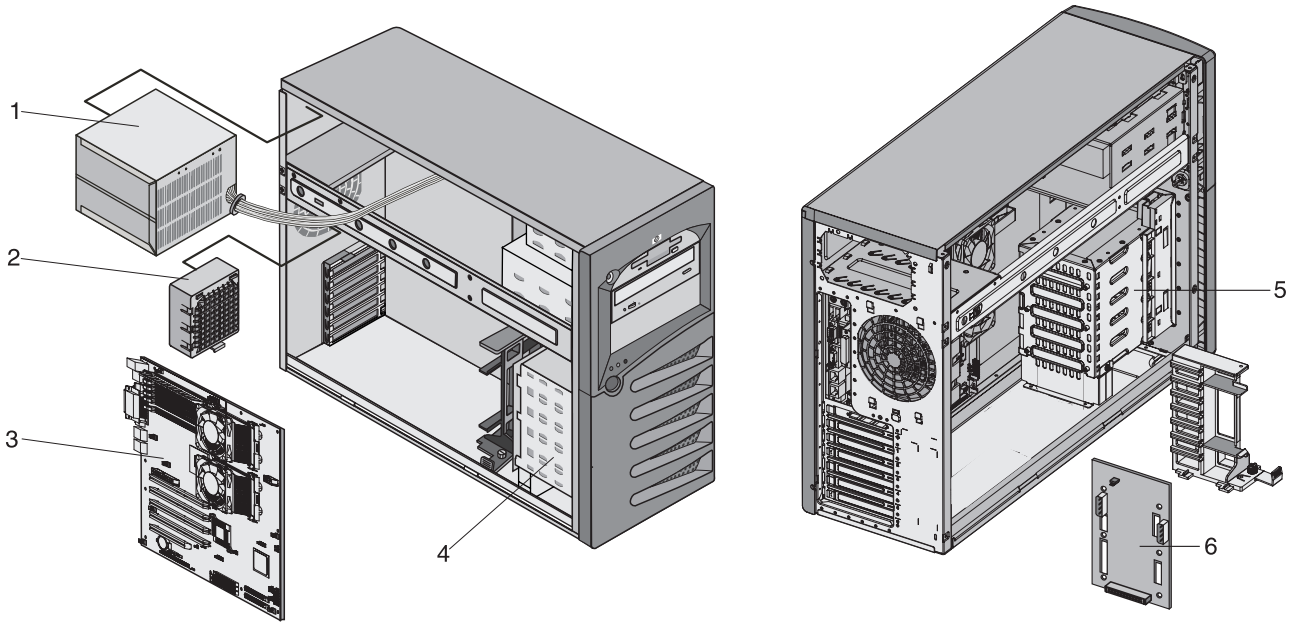


Table 6-2: Parts List – Internal Components

Item No.	Description	Part Number
1	Power Supply	344674-003
2	Fan Assembly	344693-003
3	System Board	344673-003
4	Cold Swap Hard Drive Cage	344698-003
5	Hot Swap Hard Drive Cage	344697-003
6	Hot Swap SCSI Back Plane	344682-003

Exploded View and Parts List – System Board Components

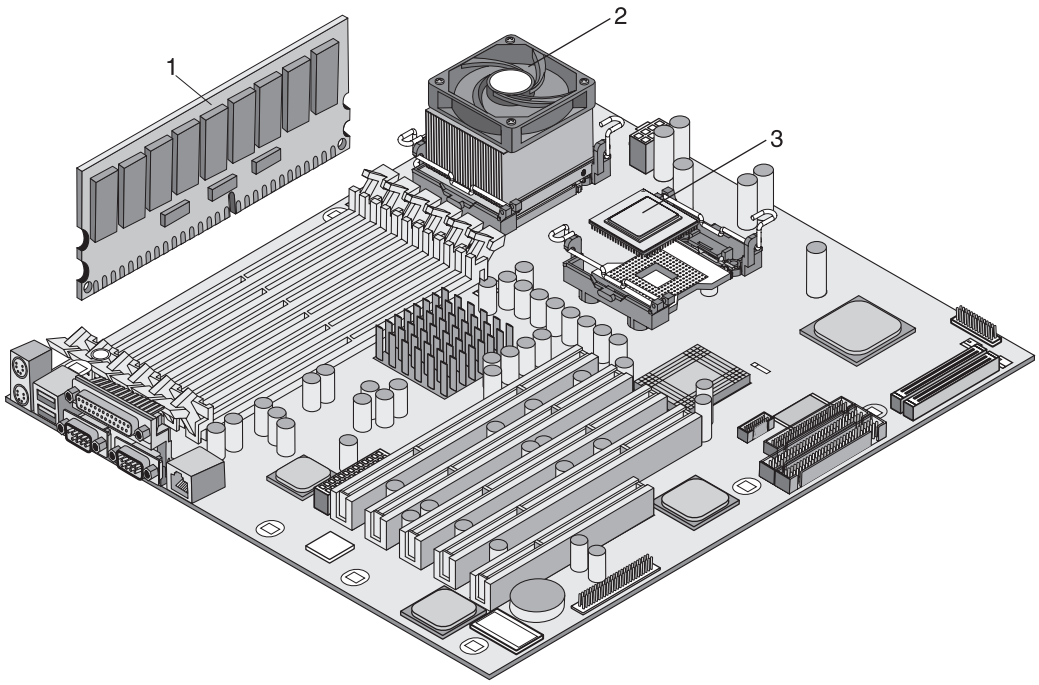


Table 6-3: Parts List – System Board Components

Item No.	Description	Part Number
1	DIMM, 256 MB, DDR226	344685-003
2a	Heatsink for 2.8 GHz Processor	344679-003
2b	Heatsink for 3.06 GHz Processor	345278-003
3a	Processor, P4, 2.8 GHz	344710-003
3b	Processor, P4, 2.4 GHz	344711-003
3c	Processor, P4, 2.66 GHz	344916-003
3d	Processor, P4, 3.06 GHz	344917-003

Parts List – Accessories

Table 6-4: Parts List – Startup CD-ROM

Description	Part Number
HP Startup CD-ROM[1]	344705-003
[1]**This Part Number is revised with each new release.**	

Table 6-5: Parts List – Keyboard and Mouse

Description	Part Number
Keyboard, U.S. International	344707-002
Keyboard, China	344707-AA1
Keyboard, Taiwan	344707-AB1
Keyboard, Korea	344707-AD1
Mouse	344704-001

Table 6-6: Parts List – Cables

Description	Part Number
Power Cord, Europe	100614-003
Power Cord, UK/Singapore/Hong Kong	100613-003
Power Cord, Japan	139867-006
Power Cord, India/South Africa	187487-004
Power Cord, China	346001-AA1
Cold Swap SCSI Cable	344678-003
Hot Swap SCSI Cable	344681-003

7

Specifications

This chapter provides the power requirements, operating conditions (environmental requirements), physical requirements, hardware specifications, and video resolutions of the HP ProLiant ML150 server.

The following tables provide the specifications required for normal operation of the HP ProLiant ML150 server.

NOTE: The specifications and requirements for the power supply and environment can vary if you install a mass storage device in the server that has more stringent environmental limits than required for the HP server. Ensure the operating environment for any mass storage devices you intend to install are compatible with the server environmental requirements.

Power Supply Requirements

Parameter	Characteristics
Input Type	Wide-ranging, PFC
Input Voltage	100 to 127 VAC ± 10%, 50/60 Hz 200 to 240 VAC ± 10%, 50/60 Hz
Operating Current	100 VAC: 8.5 A 200 VAC: 4.0 A
In-rush Current	50 A peak, 240 VAC
Operating Power	450 W

Environment

Parameter	Conditions
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 3,000 m (~ 10,000 ft)
Non-operating	-30 to 12,000 m (~ 40,000 ft)
Thermal Output	
Maximum Operating	1720 BTU/hr
Acoustic Emissions	Sound level (LpA): <40 dB (A)

Weight and Dimensions

Weight	Approx. 47 lbs (23 kg.) for base model – excluding keyboard, monitor, and optional accessories
Height	17.44 inches (443mm) with feet; 17.32 (440mm) without feet
Width	8.5 inches (216mm)
Depth	24.38 inches (619mm) including 5mm fan dimple

Hardware Specifications

Processors	Intel Xeon (up to 2 processors), supported speeds: 2.4 GHz and above, 512 K level 2 or 1 M level 3 cache on processor
Chipset	Intel E7501 chipset with 533 MHz bus speed support
Memory	Up to six PC2100 266 MHz ECC registered DDR DIMMs for a maximum total of 12 GB. Supported DIMM types: 256 MB, 512 MB, 1 GB, and 2 GB
Video	Embedded ATI Rage XL chip video with 8 MB SDRAM
SCSI	Embedded Adaptec AIC-7902 SCSI dual channel controller; 320 MB/s transfer rate with two 68-pin connectors
IDE	Embedded Enhanced-IDE dual channel controller
LAN	Embedded Intel 82545EM 10/100/1000 PCI Fast Ethernet Controller; with Wake-on-LAN enabled/disabled via BIOS setup
PCI Bus	Five slots: one 32-bit slot at 33 MHz; two PCI-X 64-bit slots at 66 MHz, two PCI-X 64-bit slots at 66/100/133 MHz
I/O	One Serial port and one bi-directional parallel port with ECP/EPP high-speed support; PS/2 style mouse and keyboard connectors; two USB ports
CD-ROM	5.25-inch optical device; IDE interface
Flexible Disk Drive	3.5-inch device

System Board Layout

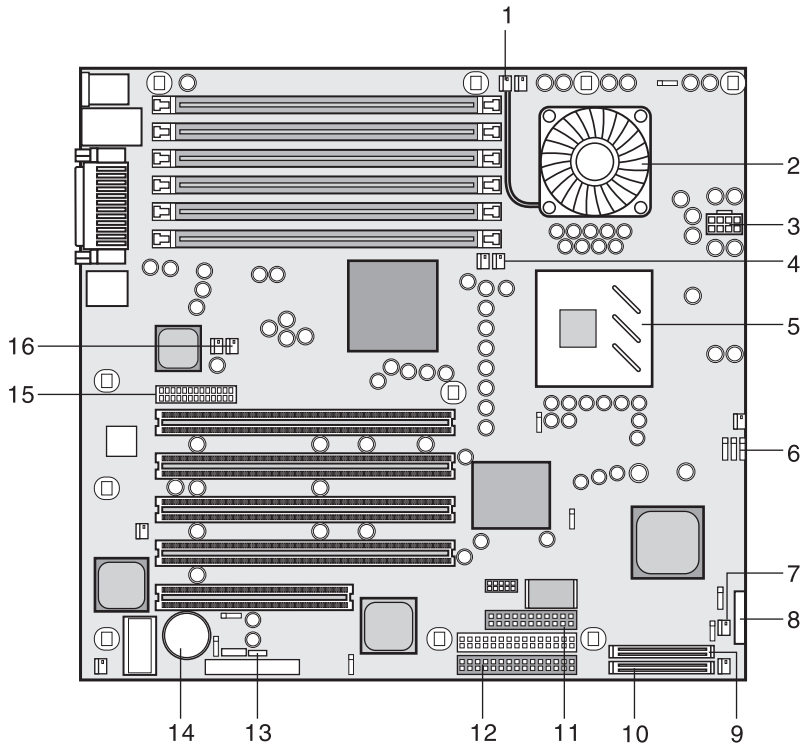


Figure 7-1: System board components

Item	Description	Item	Description
1	CPU 1 fan	9	SCSI A
2	Processor 1 (CPU 1)	10	SCSI B
3	8-pin CPU power connector	11	FDD
4	CPU 2 fan	12	Primary IDE
5	Processor 2 (CPU 2)	13	Wake-on-LAN
6	Activity /Link header	14	Battery
7	System fan (option)	15	Power connector
8	Front panel connector	16	System fan (option)

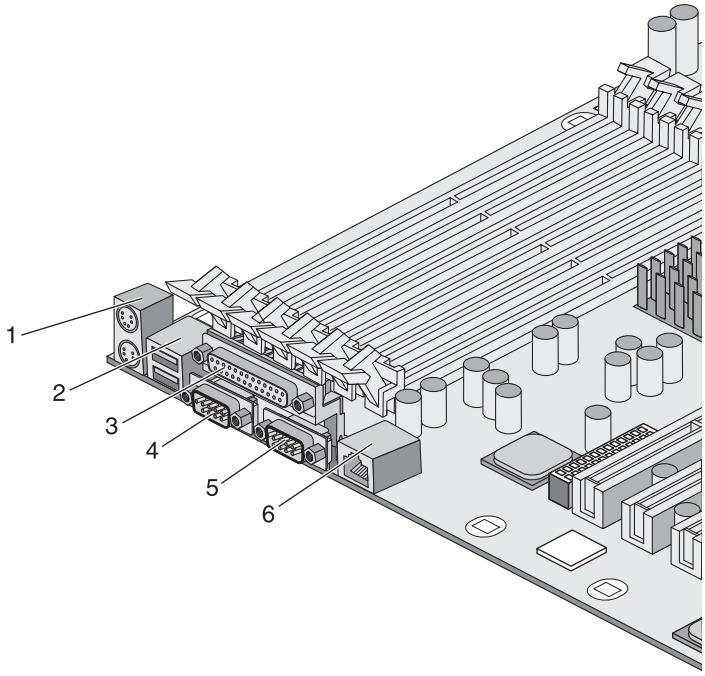


Figure 7-2: System board connectors

Item	Description
1	Mouse and keyboard
2	USBs
3	Parallel
4	Serial
5	Video SVGA
6	LAN

A

Regulatory Compliance Notices

Regulatory Compliance Series Number

For the purpose of regulatory compliance certifications and identification, your product has been assigned a unique series number. The series number can be found on the product nameplate label, along with all required approval markings and information. When requesting compliance information for this product, always refer to this series number. The series number is not the marketing name or model number of the product.

Federal Communications Commission Notice

Part 15 of the Federal Communications Commission (FCC) Rules and Regulations has established Radio Frequency (RF) emission limits to provide an interference-free radio frequency spectrum. Many electronic devices, including computers, generate RF energy incidental to their intended function and are, therefore, covered by these rules. These rules place computers and related peripheral devices into two classes, A and B, depending upon their intended installation. Class A devices are those that may reasonably be expected to be installed in a business or commercial environment. Class B devices are those that may reasonably be expected to be installed in a residential environment (for example, personal computers). The FCC requires devices in both classes to bear a label indicating the interference potential of the device as well as additional operating instructions for the user.

The FCC rating label on the device shows the classification (A or B) of the equipment. Class B devices have an FCC logo or FCC ID on the label. Class A devices do not have an FCC logo or FCC ID on the label. After the Class of the device is determined, refer to the corresponding statement in the following sections.

Class A Equipment

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC 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, 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 will be required to correct the interference at personal expense.

Class B Equipment

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 that is different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Hewlett-Packard Company may void the user's authority to operate the equipment.

Cables

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods in order to maintain compliance with FCC Rules and Regulations.

Mouse Compliance Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Laser Device Notices

All HP systems equipped with a laser device comply with safety standards, including International Electrotechnical Commission (IEC60825). With specific regard to the laser, the equipment complies with laser product performance standards set by government agencies as a Class 1 laser product. The product does not emit hazardous light; the beam is totally enclosed during all modes of customer operation and maintenance.

Laser Safety Warnings

WARNING: To reduce the risk of exposure to hazardous radiation:

- **Do not try to open the laser device enclosure. There are no user-serviceable components inside.**
- **Do not operate controls, make adjustments, or perform procedures to the laser device other than those specified herein.**
- **Allow only HP authorized service technicians to repair the laser device.**

Compliance with CDRH Regulations

The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration implemented regulations for laser products on August 2, 1976. These regulations apply to laser products manufactured from August 1, 1976. Compliance is mandatory for products marketed in the United States.

Compliance with International Regulations

All HP systems equipped with laser devices comply with appropriate safety standards including IEC60825.

Laser Product Label

The following label or equivalent is located on the surface of the HP supplied laser device.

This label indicates that the product is classified as a CLASS 1 LASER PRODUCT. This label appears on a laser device installed in your product.

Laser Information

Table A-1: Laser Information

Feature	Description
Laser type	Semiconductor GaAlAs
Wave length	780 nm +/- 35 nm
Divergence angle	53.5 degrees +/- 0.5 degrees
Output power	Less than 0.2 mW or 10,869 W m-2 sr-1
Polarization	Circular 0.25
Numerical aperture	0.45 inches +/- 0.04 inches

Battery Replacement Notice

Your computer is equipped with an internal lithium battery or battery pack. There is a danger of explosion and risk of personal injury if the battery is incorrectly replaced or mistreated. Unless specific replacement instructions are provided as part of this guide, replacement is to be done by an authorized service provider using the HP spare designated for this product. For more information about battery replacement or proper disposal, contact your authorized reseller or your authorized service provider.

WARNING: Your computer contains an internal lithium battery or battery pack. There is risk of fire and burns if the battery pack is not properly handled. To reduce the risk of personal injury:

- **Do not attempt to recharge the battery.**
- **Do not expose to temperatures higher than 60°C.**
- **Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.**
- **Replace only with the HP spare designated for this product**.

Batteries, battery packs, and accumulators should not be disposed of together with the general household waste. To forward them to recycling or proper disposal, please use the public collection system or return them to HP, your authorized HP partners, or their agents.

Regulatory Statements

Korea RRL Class B statement

B급 기기 (가정용 정보통신기기)

이 기기는 가정용으로 전자파적합등록을 한 기기로서
주거지역에서는 물론 모든지역에서 사용할 수 있습니다.

Japan VCCI Class B Statement

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。

DECLARATION OF CONFORMITY

according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name: Hewlett-Packard Singapore Pte Ltd

Manufacturer's Address: 452, Alexandra Road,Singapore 119961

declares, that the product

Product Name: HP ProLiant ML150
Regulatory Model: [3] SNPRD-0301
Product Options: All

conforms to the following Product Specifications:

Safety: IEC 60950:1999 / EN 60950:2000

EMC: CISPR 22:1997 +A1 / EN 55022:1998 +A1 Class B[1]
CISPR 24:1997 / EN 55024:1998
IEC 61000-3-2:1995 / EN 61000-3-2:1995 +A14
IEC 61000-3-3:1994 +A1 / EN 61000-3-3:1995 +A1
FCC Standards[2]
AS / NZS standards

Additional Information:

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC and carries the CE-marking accordingly

1,2) This Device complies with Part 15 of the FCC Rules. Operation is subject to the following two Conditions: 1) this device may not cause harmful interference, and 2) this device must accept any interference received, including interference that may cause undesired operation.

3) For Regulatory purposes, this product is assigned a Regulatory model number which stays with the safety aspects of the design. This number should not be confused with the marketing name or the product numbers.

Singapore, 16 July 03

AIK-JEN, LEE
OPERATIONS MANAGER

Local contact for regulatory topics only:

European Contact : Hewlett-Packard GmbH, HQ-TRE, Herrenberger Strasse 140, 71034 Boeblingen, Germany

Asia Pacific: Hewlett-Packard Singapore Pte Ltd. 452, Alexandra Road, Singapore 119961 (fax: +65 6275 9195)

B

Electrostatic Discharge

Preventing Electrostatic Damage

A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage when setting up the system or handling parts:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

Grounding Methods To Prevent Electrostatic Damage

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm ± 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have an HP authorized reseller install the part.

For more information on static electricity, or assistance with product installation, contact your authorized reseller.

C

Power Cord Set Requirements

The power cord set meets the requirements for use in the country where you purchased your equipment. The voltage selection switch allows you to select the appropriate line voltage for the HP server.

Power cord sets for use in other countries must meet the requirements of the country where you use the server. For more information on power cord set requirements, contact your Authorized HP Dealer

General Requirements

The requirements listed below are applicable to all countries:

- The length of the power cord must be at least 1.8 m (6.0 ft) and a maximum of 3.7 m (12 ft).
- The power cord set must be approved by an acceptable accredited agency responsible for evaluation in the country where the power cord will be used.
- The power cord set must have a minimum current capacity and nominal voltage rating of 10 A/125 volts AC, or 10A/250 volts AC, as required by the power system of each country.
- The appliance coupler must meet the mechanical configuration of an EN60320/IEC60320 Standard Sheet C13 Connector, for mating with the appliance outlet on the computer.

Country-Specific Requirements

Use Table C-1 to identify the appropriate accredited agency in your country.

Table C-1: Power Cord Set Requirements By Country

Country	Accredited Agency	Applicable Note Numbers
Australia	EANSW	1
Austria	OVE	1
Belgium	CEBC	1
Canada	CSA	2
China	CCC	4
Denmark	DEMKO	1
Finland	SETI	1
France	UTE	1
Germany	VDE	1
Italy	IMQ	1
Japan	JIS	3
Norway	NEMKO	1
Sweden	SEMKO	1
Switzerland	SEV	1
United Kingdom	BSI	1
United States	UL	2

1. Flexible cord must be <HAR> Type HO5VV-F, 3-conductor, 1.0 mm^2 conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.
2. Flexible cord must be Type SVT or equivalent, No. 18 AWG, 3-conductor. Wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V).
3. Appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. Flexible cord must be Type VCT or VCTF, 3-conductor, 1.0 mm^2 conductor size. Wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7A, 125V) configuration.
4. Appliance coupler, flexible cord, and wall plug must bear a "CCC" mark together with CCC factory code or CCC certificate number in accordance with China Compulsory Product Certification rule. Flexible cord must be Type RVV, 3-conductor, 1.0 mm^2 conductor size. Wall plug must be a two-pole grounding type configuration.

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