

ProLiant DL320 Server

Maintenance and Service Guide

Part Number 203834-003

Spare Part Number 207739-001

January 2002 (Third Edition)

COMPAQ

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About This Guide

This maintenance and service guide is a troubleshooting guide that can be used for reference when servicing Compaq ProLiant DL320 servers.



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.

Symbols in Text

These symbols may be found in the text of this guide. They have the following meanings.



WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.



CAUTION: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.

IMPORTANT: Text set off in this manner presents clarifying information or specific instructions.

NOTE: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Important Safety Information

Before installing this product, read the *Important Safety Information* document provided.

Compaq Technician Notes



WARNING: Only authorized technicians trained by Compaq 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.

Where to Go for Additional Help

In addition to this guide, the following information sources are available:

- User documentation
- *Compaq Service Quick Reference Guide*
- Service training guides
- Compaq service advisories and bulletins
- Compaq *QuickFind*™ information services
- Compaq Insight Manager software

For additional copies, visit the Compaq website:

www.compaq.com

Integrated Management Log

The server includes an integrated, nonvolatile management log that contains fault and management information. The contents of the Integrated Management Log (IML) can be viewed with Compaq Insight Manager.

Telephone Numbers

For the name of your nearest Compaq authorized reseller:

- In the United States, call 1-800-345-1518.
- In Canada, call 1-800-263-5868.

For Compaq technical support:

- In the United States and Canada, call 1-800-OK COMPAQ.
- For Compaq technical support phone numbers outside the United States and Canada, visit the Compaq website:

www.compaq.com

Text Conventions

This document uses the following conventions:

- *Italic type* is used for complete titles of published guides or variables. Variables include information that varies in system output, in command lines, and in command parameters in text.
- **Bold type** is used for emphasis, for onscreen interface components (window titles, menu names and selections, button and icon names, and so on), and for keyboard keys.

- Monospace typeface is used for command lines, code examples, screen displays, error messages, and user input.
- Sans serif typeface is used for uniform resource locators (URLs).

Illustrated Parts Catalog

This chapter provides the illustrated parts breakdown for the Compaq *ProLiant*™ DL320 server. The corresponding table in this chapter provides names and ordering numbers for all referenced spare parts.

Mechanical Parts Exploded View

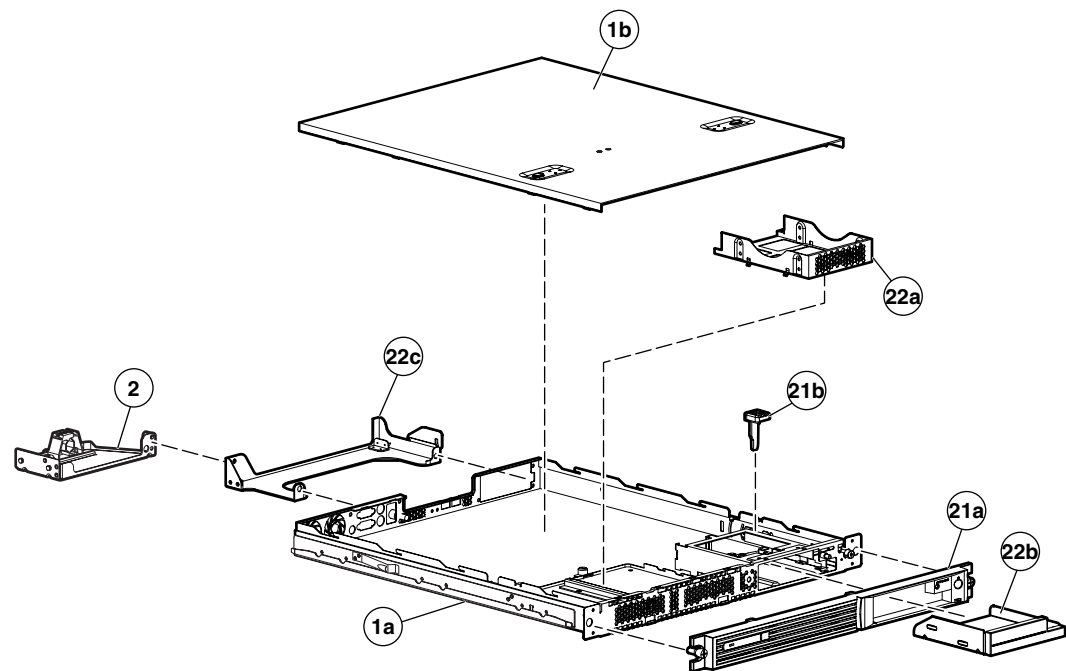


Figure 1-1: Mechanical parts exploded view

System Components Exploded View

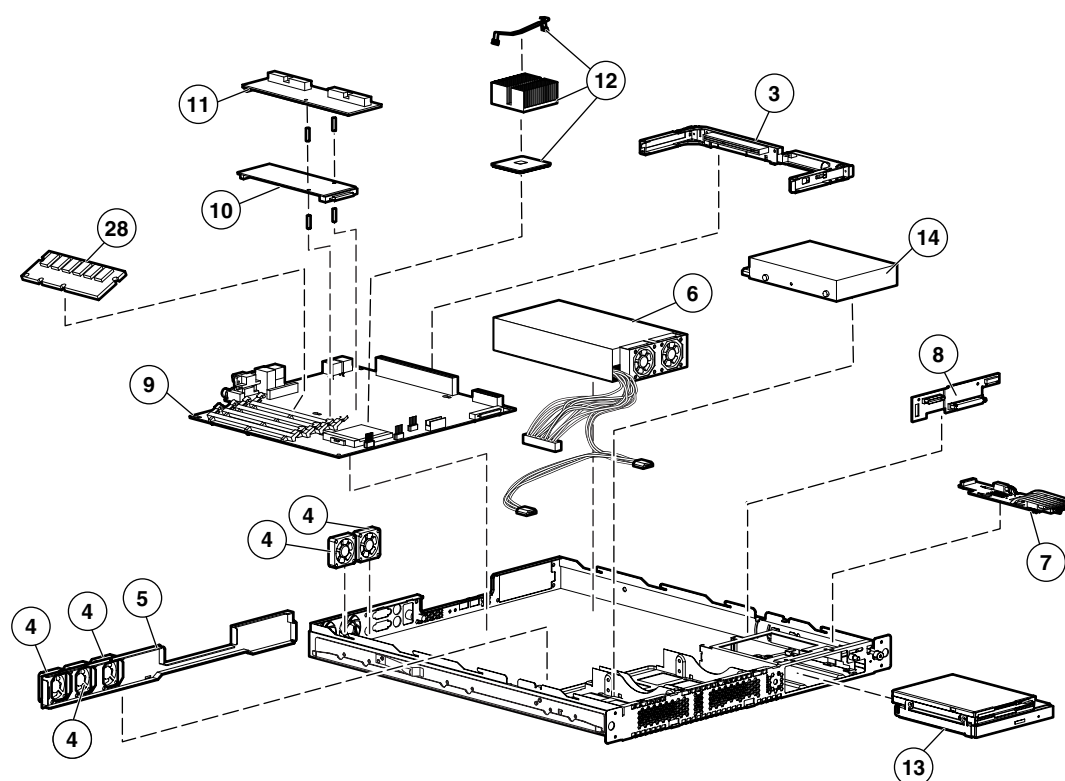


Figure 1-2: System components exploded view

System and Mechanical Spare Parts List

Table 1-1: System and Mechanical Spare Parts List

Item	Description	Spare Parts List
Mechanical Components		
1a	Chassis	207735-001
1b	Access panel	
2	Fixed cable tray	173839-001
3	PCI riser board assembly	207727-001
4	Fan	207729-001
5	Center wall and bracket with fans	213288-001
6	Power supply, 180 W	207728-001

continued

Table 1-1: System and Mechanical Spare Parts List *continued*

Item	Description	Spare Parts List
Boards		
7	User interface board	207725-001
8	CD-ROM(DVD-ROM)/diskette drive assembly backplane	207726-001
9a	System board	207723-001
9b	System board for 1.13-GHz processors or greater	260142-001
10	Single Channel Wide Ultra2 SCSI controller module and support posts (SCSI models only)	207724-001
11	Ultra ATA/100 controller module with support posts (ATA models only))	207738-001
Processors		
12a	800-MHz Intel Pentium III processor with heat sink	207720-001
12b	866-MHz Intel Pentium III processor with heat sink *	207721-001
12c	933-MHz Intel Pentium III processor with heat sink *	207722-001
12d	1-GHz Intel Pentium III processor with heat sink *	235446-001
12e	1.13-GHz Intel Pentium III processor with heat sink *	260141-001
Mass Storage Devices		
13a	CD-ROM/diskette drive assembly *	173834-001
	Low-profile 1.44-MB diskette drive	
	Low-profile IDE CD-ROM drive	
13b	DVD-ROM/diskette drive assembly *	269046-001
	Low-profile 1.44-MB diskette drive	
	Low-profile IDE DVD-ROM drive	
14	ATA hard drive, 10 GB	207737-001
15	ATA hard drive, 20 GB *	207736-001
16	SCSI hard drive, 9 GB *	152189-001
17	SCSI hard drive, 18 GB *	152191-001
Miscellaneous		
18	IEC power cord *	142258-004
19	Hard drive cable kit *	207731-001
	CD-ROM(DVD-ROM)/diskette drive assembly cable *	
	ATA hard drive cables (2) *	
20	Two-device terminated SCSI cable (Ultra3) *	207730-001
Note: * Not shown		

continued

Table 1-1: System and Mechanical Spare Parts List *continued*

Item	Description	Spare Parts List
21	Plastics kit	207733-001
21a	Bezel	
21b	Shipping/ejector key	
21c	PCI card guide *	
21d	Bezel screws *	
22	Hardware kit	207734-001
22a	Hard drive tray	
22b	Bezel blank	
22c	Cable support bracket	
22d	PCI slot cover *	
22e	Vertical-mount PDU bracket *	
23	Rack mounting kit (fixed rack rails) *	173845-001
24	Replacement battery, 3-V lithium *	234556-001
25	Return kit *	207732-001
26	Country kit *	207740-001
27	Heat sink for 1.13 GHz processors or greater*	260144-001
	Maintenance and service guide *	207739-001
Memory		
28a	64-MB registered 133-MHz SDRAM DIMM	159225-001
28b	128-MB registered 133-MHz SDRAM DIMM	159226-001
28c	256-MB registered 133-MHz SDRAM DIMM	159304-001
28d	512-MB registered 133-MHz SDRAM DIMM	159227-001
Option Kit Spares		
29	Compaq Remote Insight Lights-Out Edition *	158731-001
30	High-voltage cables for vertical-mount PDU rack solution *	178129-001
31	Sliding rails and cable management system kit *	177852-001
32	Telco rack-mounting kit *	177853-001
33	Third-party cabinet rack-mounting kit *	177854-001
34	Desktop/stackable chassis kit *	207741-001
35	DVD-ROM/diskette drive assembly (See 13b for details)	269046-001
Note: * Not shown		

Removal and Replacement Procedures

This chapter provides subassembly and module-level removal and replacement procedures for Compaq ProLiant DL320 servers. After completing all necessary removal and replacement procedures, run the diagnostics program to verify that all components operate properly.

To service the Compaq ProLiant DL320 server, you may need the following tools:

- Phillips screwdriver
- Shipping/ejector key
- Compaq *SmartStart*™ and Software Support CD
 - ROM-Based Setup Utility (RBSU)
 - Array Diagnostics Utility (ADU)
 - Diagnostics software

Electrostatic Discharge Information

A discharge of static electricity can damage static-sensitive devices or microcircuitry. Proper packaging and grounding techniques are required to prevent damage. To prevent electrostatic damage, observe the following precautions:

- Transport products in static-safe containers such as conductive tubes, bags, or boxes.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free stations.
- Cover workstations with approved static-dissipating material. Use a wrist strap connected to the work surface as well as properly grounded tools and equipment.
- Keep the work area free of nonconductive materials such as ordinary plastic assembly aids and foam packing.
- Ensure proper grounding before touching a static-sensitive component or assembly.
- Avoid touching pins, leads, or circuitry.
- Place drives PCB assembly side down on any surface.
- Use conductive field service tools.

Symbols on Equipment



Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component.

WARNING: To reduce the risk of injury from a hot component, allow the surface to cool before touching it.



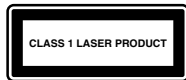
To reduce the risk of injury from electric shock hazards, do not open this enclosure.

WARNING: Any surface or area of the equipment marked with these symbols indicates the presence of electric shock hazards. The enclosed area contains no operator-serviceable parts.



Any RJ-45 receptacle marked with these symbols indicates a network interface connection.

WARNING: To reduce the risk of electric shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.



This label or equivalent is located on the surface of your CD-ROM or DVD-ROM drive. This label indicates that the product is classified as a Class 1 Laser Product

Rack Warnings



WARNING: To reduce the risk of personal injury or damage to equipment, always ensure that the rack is adequately stabilized before extending a component outside the rack. A rack may become unstable if more than one component is extended for any reason. Extend only one component at a time.



WARNING: To reduce the risk of personal injury or damage to the equipment, be sure that:

- The leveling jacks are extended to the floor.
- The full weight of the rack rests on the leveling jacks.
- The stabilizers are attached to the rack if it is a single rack installation.
- The racks are coupled together in multiple rack installations.



WARNING: When installing the server in a Telco rack, make certain that the rack frame is adequately secured to the building structure at the top and bottom.



WARNING: To reduce the risk of personal injury or damage to the equipment, at least two people are needed to safely unload the rack from the pallet. An empty 42U rack weighs 253 lb (115 kg), is over 7 ft (2.1 m) tall, and may become unstable when being moved on its casters. Do not stand in front of the rack as it rolls down the ramp from the pallet. Handle the rack from both sides.

Server Warnings and Precautions



WARNING: To reduce the risk of personal injury from hot surfaces, allow the hot-plug drives and the internal system components to cool before touching them.



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

- 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.
- Unplug the power cord from each power supply to disconnect power to the equipment.



CAUTION: Protect the server from power fluctuations and temporary interruptions with a regulating uninterruptible power supply (UPS). This device protects the hardware from damage caused by power surges and voltage spikes and keeps the system in operation during a power failure.



CAUTION: The Compaq ProLiant DL320 server must always be operated with the system access panel closed. Proper cooling is not achieved if the system access panel is removed.

Removal and Replacement Procedures

This chapter discusses preparing the server for servicing and provides step-by-step instructions for the removal or replacement of:

- Access panel
- Memory modules
- Shipping/ejector key
- CD-ROM/diskette drive assembly
- DVD-ROM/diskette drive assembly
- Bezel blank
- Bezel
- Hard drives
 - ATA hard drives
 - SCSI hard drives
- Single Channel Wide Ultra2 SCSI controller module
- Ultra ATA/100 controller module
- CD-ROM (DVD-ROM)/diskette drive assembly backplane

- User interface board
- PCI riser board assembly
- Expansion board
- PCI card guide
- Center wall
- System fans
 - Fans 1, 2, and 3
 - Fans 4 and 5
- Cables
 - Two-device terminated SCSI cable
 - ATA cables
 - CD-ROM (DVD-ROM)/diskette drive assembly cable
- Power supply
- Battery
- Processor
- System board

Powering Down the Server

System power in ProLiant DL320 servers does not completely shut off from the front panel Power On/Off switch. Although switching the server off removes power from most electronics and the drives, portions of the power supply and some internal circuitry remain active. To completely remove all power from the system, disconnect all power cords from the server.



WARNING: To reduce the risk of injury from electric shock, remove the power cord to completely disconnect power from the system.



WARNING: To reduce the risk of personal injury or damage to the equipment, ensure that only one component is extended at a time. A rack may become unstable if more than one component is extended for any reason.



WARNING: Because the rack allows you to stack computer components in a vertical rather than a horizontal plane, you must take precautions to provide for rack stability and safety to protect both personnel and property. Heed all cautions and warnings throughout the installation instructions that came with the server.



WARNING: To reduce the risk of personal injury or damage to the equipment, place the server on a sturdy table or workbench whenever it is removed from the rack for device accessibility. Refer to the *Compaq ProLiant DL320 Server Setup and Installation Guide* for further information on working with racks.



CAUTION: Moving the Power On/Off switch to the off position does not completely remove system power. Some portions of the power supply and some internal circuitry remain active. Disconnect all power cords from the server to remove all power from the system.



CAUTION: Electrostatic discharge can damage electronic components. Be sure you are properly grounded before beginning any installation procedure. For more information, see "Electrostatic Discharge Information" in this chapter.

NOTE: Microsoft Windows NT users may use the Compaq Power Down Manager to power down the server. For information on this system utility, refer to the NTREADME.HLP file on Diskette 1 of the NTSSD.

To power down the server:

1. Press the server Power On/Off switch to power down the server. When the server is off, the power LED deactivates.
2. Verify that the fan is off by listening for the fan noise to stop.
3. Disconnect the power cord first from the AC outlet and then from the server.
4. Disconnect all remaining cables on the server rear panel, including cables extending from external connectors on expansion boards.
5. For stability and safety, position the server securely on a workbench or other solid surface.

The system is now without power and can be serviced safely.

Access Panel

To access the system board, processor, memory modules, expansion slot, and other internal components, you must remove the access panel. Observe the following warnings and cautions.



WARNING: The front panel Power On/Off switch does not completely shut off all system power. Portions of the power supply and some internal circuitry remain active until AC power is removed.



WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.



CAUTION: Do not operate the server without the access panel installed because it is required for proper airflow. Operating the server without its access panel prevents proper airflow that results in improper cooling and possible thermal damage.



CAUTION: Before removing the server access panel, be sure that the server is powered down and that the power cord is disconnected from the server or the electrical outlet.



CAUTION: To avoid the risk of damage to your system or expansion boards, remove all power cords before installing or removing expansion boards. When the Power On/Off switch is in the off position, auxiliary power is still connected to the PCI expansion slot and may damage the card.



CAUTION: Electrostatic discharge can damage electronic components. Ensure proper grounding before beginning any installation procedure.

To remove the access panel:

1. Power down the server. See “Powering Down the Server” in this chapter.
2. Press and hold down the locking latches ❶.
3. Slide the access panel approximately 1.25 cm (0.5 inch) toward the rear of the unit and lift the panel to remove it ❷.

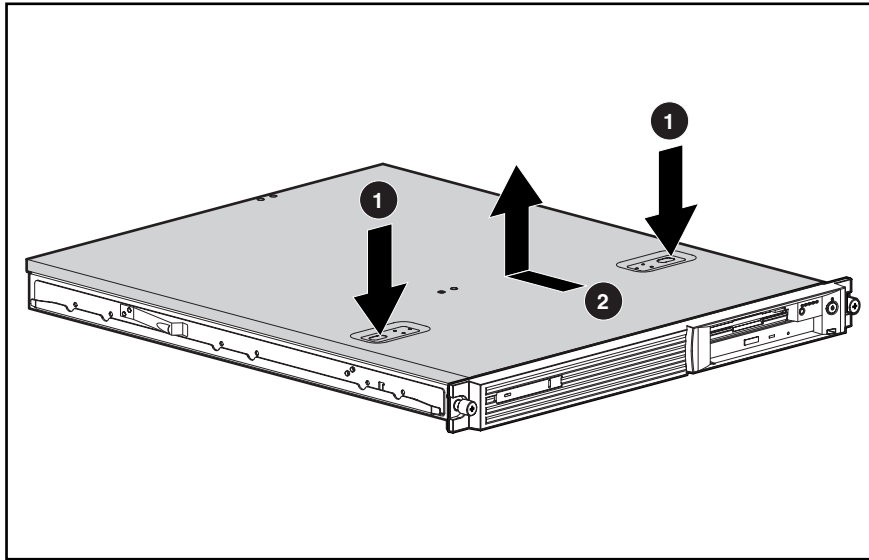


Figure 2-1: Removing the access panel

Reverse steps 1 through 3 to replace the access panel. When the locking latches snap into place, the access panel is secure.

Memory Modules

Compaq ProLiant DL320 servers support up to four PC133-MHz ECC registered, SDRAM Dual Inline Memory Modules (DIMMs) installed in four sockets on the system board.

NOTE: Populate the DIMM sockets in sequential order, starting with DIMM socket 1.

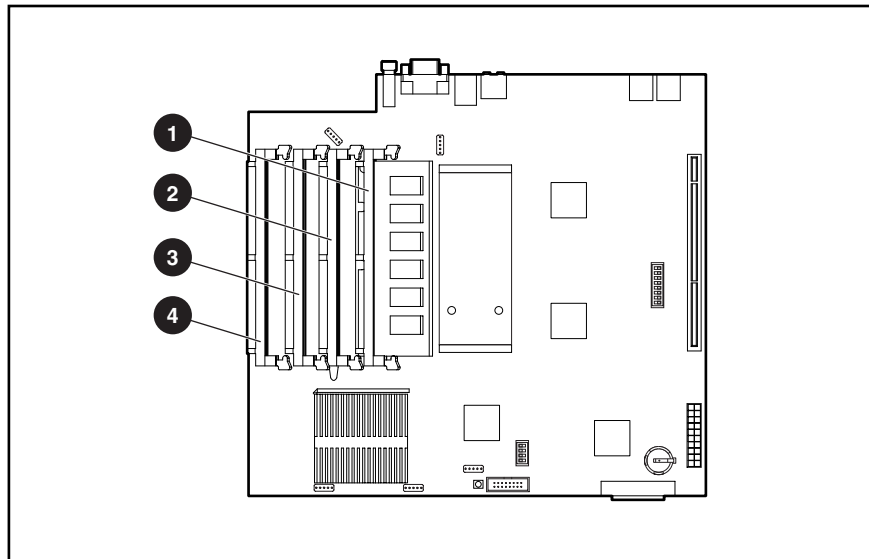


Figure 2-2: Identifying DIMM sockets on the system board

Table 2-1: DIMM Socket Identification

Item	Description
❶	DIMM socket 1 (populated)
❷	DIMM socket 2
❸	DIMM socket 3
❹	DIMM socket 4

To remove a DIMM from the system board:

1. Power down the server. See “Powering Down the Server” in this chapter.



CAUTION: Electrostatic discharge can damage electronic components. Ensure that you are properly grounded before beginning any installation procedure. Refer to “Electrostatic Discharge Information” in this chapter.

2. Remove the access panel. See “Access Panel” in this chapter.
3. Open the DIMM socket latches on the socket to be serviced ❶. The module pops out of the socket when the latches are released.



CAUTION: Remove DIMMs carefully in order to avoid bumping the controller module on the system board. The module connector pins can be damaged if the module is moved suddenly.

4. Pull the module out at the same angle as the DIMM socket on the system board ❷.

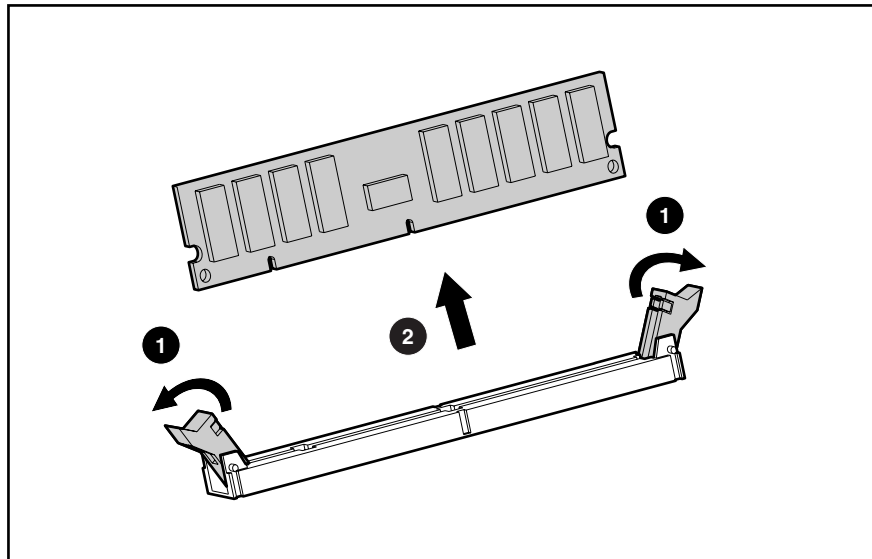


Figure 2-3: Removing a DIMM from a DIMM socket

Observe the following guidelines when installing additional memory:

- Memory installed in the ProLiant DL320 server must be PC133-MHz registered SDRAM, 3.3 V, 72 bits wide, ECC modules.
- To facilitate successive DIMM installations, install the DIMMs in sequential order, starting with DIMM socket 1. Refer to the illustration provided in this section.



CAUTION: Use only Compaq DIMMs. DIMMs from other sources can adversely affect data integrity.

To replace a DIMM on the system board:

IMPORTANT: A DIMM can be installed only one way. Be sure to match the key slots on the module with the tabs on the memory slot. Push the module down into the slot until it is fully inserted and properly seated.

1. Identify the correct DIMM socket to populate. Refer to the illustration provided in this section.
2. Open the DIMM socket latches if they are not already opened.
3. Align the key slot in the bottom edge of the DIMM with the tab in the expansion socket.



CAUTION: The system does not recognize improperly aligned or seated DIMMs.

4. Insert the DIMM at the same angle as the DIMM socket on the system board ❶. As the DIMM enters the socket, the latches close ❷.

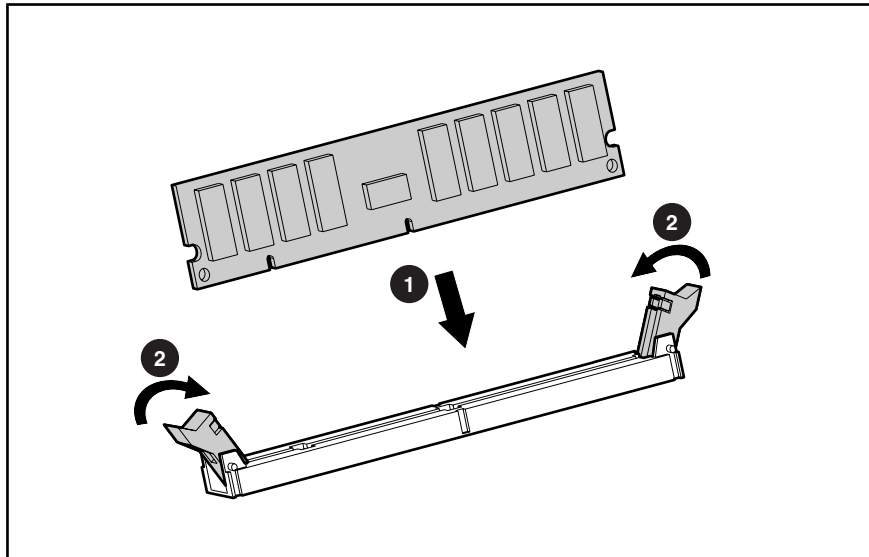


Figure 2-4: Installing a DIMM in a DIMM socket



CAUTION: Use only Compaq DIMMs. DIMMs from other sources can adversely affect data integrity.

5. Press down firmly on the DIMM while pushing the latches inward until the latches snap into place.

Shipping/Ejector Key

Compaq ProLiant DL320 servers include a shipping/ejector key that secures the CD-ROM/diskette drive assembly, the DVD-ROM/diskette drive assembly or the bezel blank during shipping. This key should be removed before server deployment. The key is also used to eject an assembly or the blank.



CAUTION: Always install the shipping/ejector key in its storage location inside the chassis before shipping the server. Failure to do so can result in damage to the CD-ROM (DVD-ROM)/diskette drive assembly.

To remove the shipping/ejector key:

1. Power down the server. See “Powering Down the Server” in this chapter.
2. Remove the access panel. See “Access Panel” in this chapter.
3. Identify and lift the shipping/ejector key from its storage location.

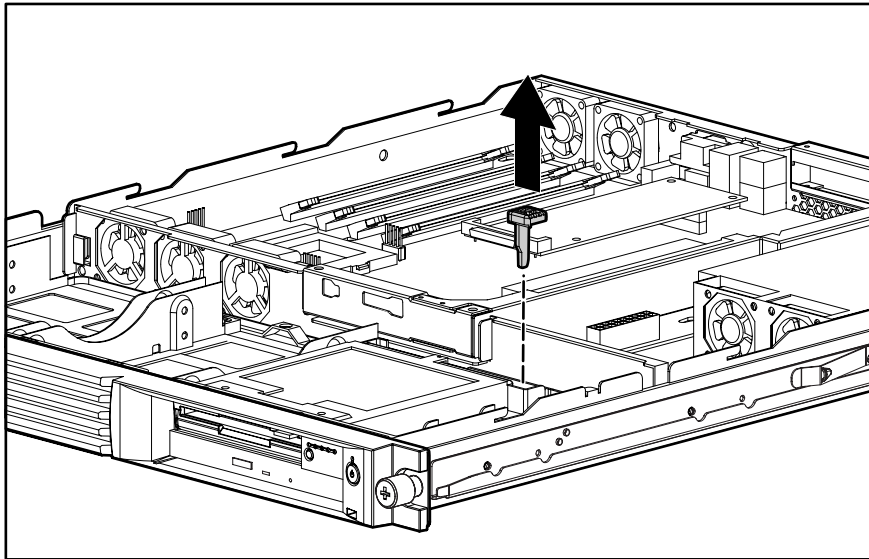


Figure 2-5: Removing the shipping/ejector key

Reverse steps 1 through 3 to replace the shipping/ejector key.

If you intend to use the CD-ROM (DVD-ROM)/diskette drive assembly ejection feature frequently, leave the key in the ejector port for easy access, as shown in the following illustration. Otherwise, store the shipping/ejector key for future use.

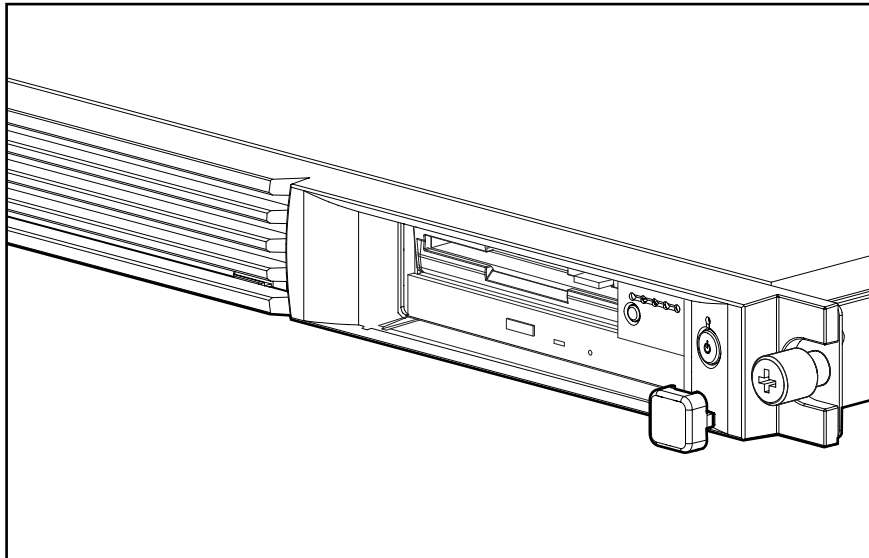


Figure 2-6: Storing the shipping/ejector key in the ejector port

CD-ROM/Diskette Drive Assembly

To remove the CD-ROM/diskette drive assembly:

1. Power down the server. See “Powering Down the Server” in this chapter.
2. Remove the shipping/ejector key from the chassis if you have not already done so. See “Shipping/Ejector Key” in this chapter.
3. Insert the shipping/ejector key approximately 1.25 cm (0.5 inch) into the CD-ROM/diskette drive assembly ejector port on the lower right corner of the server front panel ❶ to eject the CD-ROM/diskette drive assembly ❷.

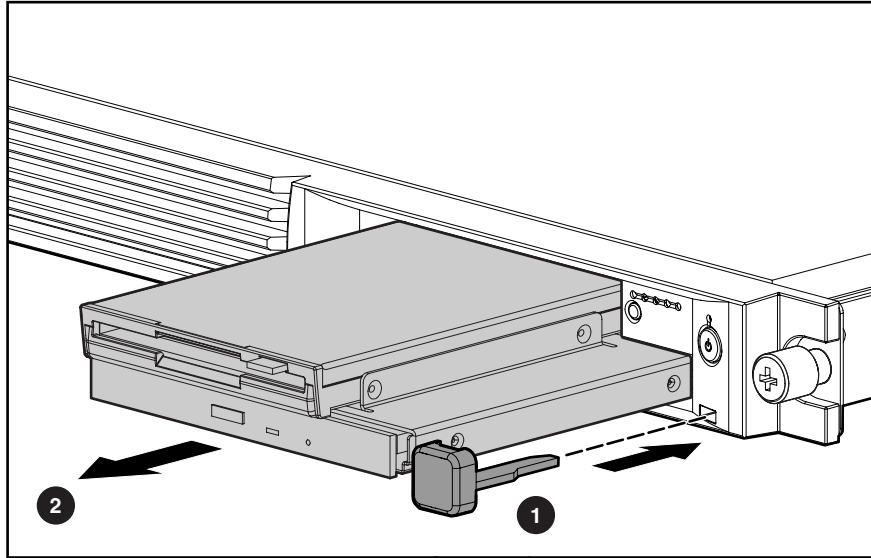


Figure 2-7: Ejecting the CD-ROM/diskette drive assembly



CAUTION: To reduce the risk of thermal damage, do not operate the server without either the CD-ROM/diskette drive assembly or the bezel blank installed.

To replace the assembly, slide the assembly into the bay until it is fully seated.

If you intend to use the CD-ROM drive/diskette ejection feature frequently, leave the shipping/ejector key in the ejector port for easy access.

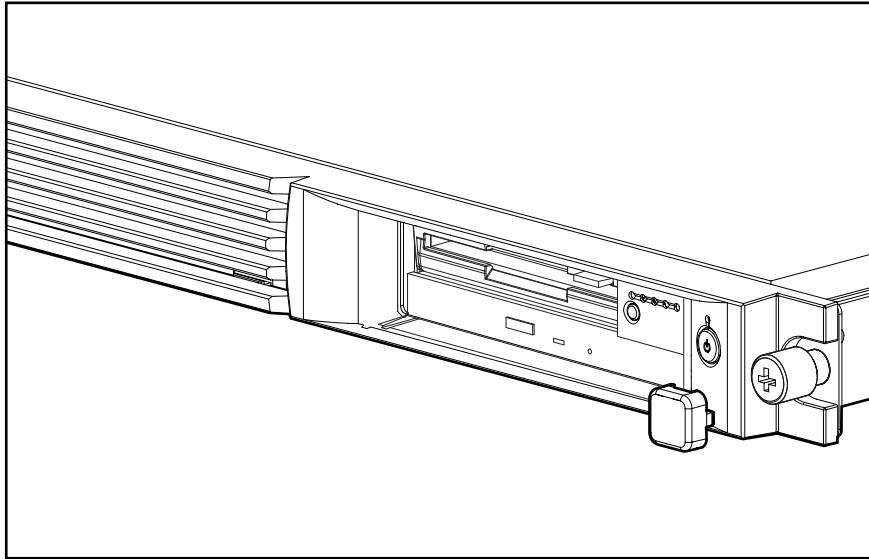


Figure 2-8: Fully seated CD-ROM/diskette drive assembly

DVD-ROM/Diskette Drive Assembly

To remove the DVD-ROM/diskette drive assembly:

1. Power down the server. See “Powering Down the Server” in this chapter.
2. Remove the shipping/ejector key from the chassis if you have not already done so. See “Shipping/Ejector Key” in this chapter.
3. Insert the shipping/ejector key approximately 1.25 cm (0.5 inch) into the DVD-ROM/diskette drive assembly ejector port on the lower right corner of the server front panel ❶ to eject the DVD-ROM/diskette drive assembly ❷.

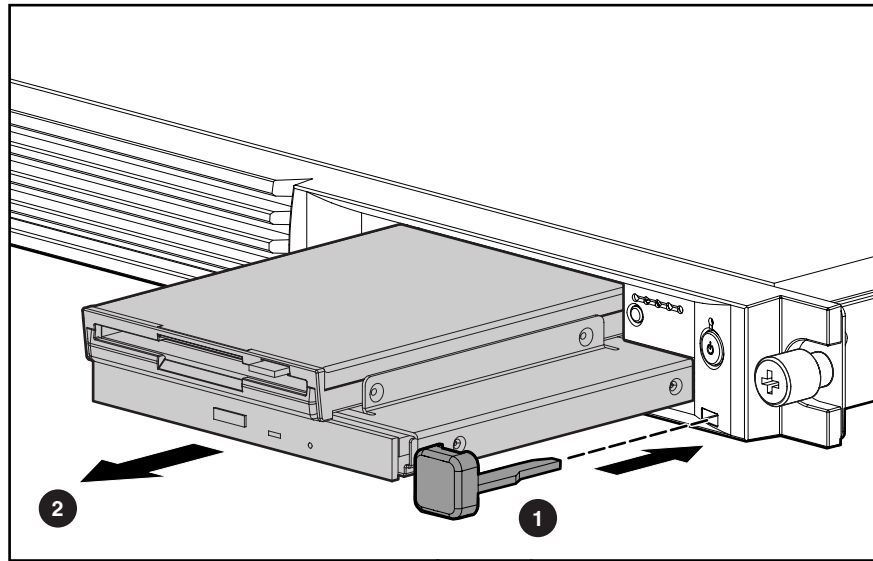


Figure 2-9: Ejecting the DVD-ROM/diskette drive assembly



CAUTION: To reduce the risk of thermal damage, do not operate the server without either the DVD-ROM/diskette drive assembly or the bezel blank installed.

To replace the assembly, slide the assembly into the bay until it is fully seated.

If you intend to use the DVD-ROM drive/diskette ejection feature frequently, leave the shipping/ejector key in the ejector port for easy access.

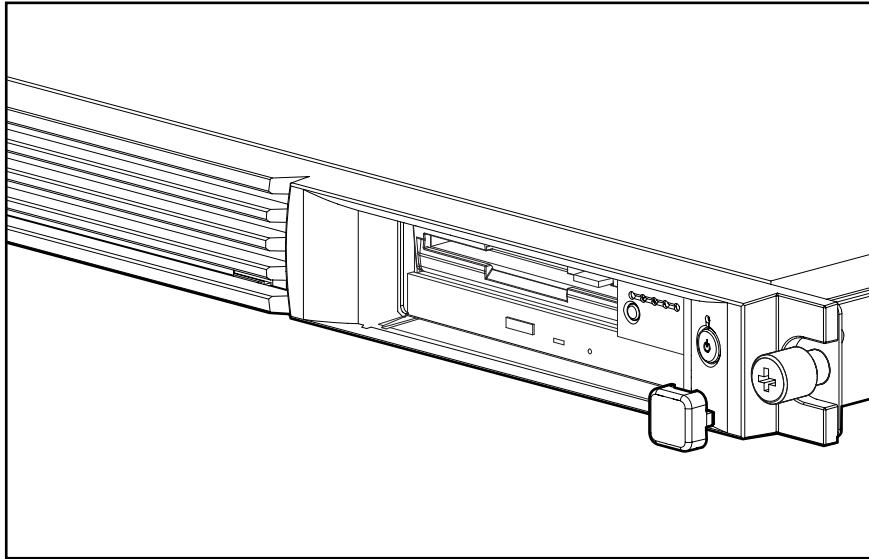


Figure 2-10: Fully seated DVD-ROM/diskette drive assembly

Bezel Blank

To remove the bezel blank:

1. Power down the server. See “Powering Down the Server” in this chapter.
2. Remove the shipping/ejector key from the chassis if you have not already done so. See “Shipping/Ejector Key” in this chapter.
3. Insert the end of the shipping/ejector key approximately 1.25 cm (0.5 inch) into the CD-ROM (DVD-ROM)/diskette drive assembly ejector port on the lower right corner of the server front panel ❶ to eject the blank ❷.

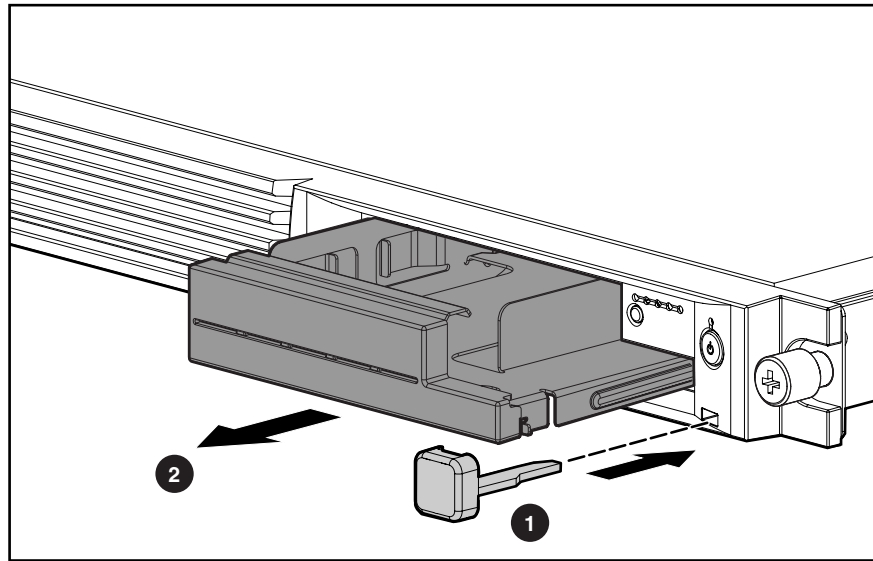


Figure 2-11: Removing the bezel blank

To replace the bezel blank, slide the blank into the empty bay until it locks into place. Store the shipping/ejector key in the chassis or other safe location for future use.

Bezel

To remove the bezel:

1. Power down the server. See “Powering Down the Server” in this chapter.
2. Remove the access panel. See “Access Panel” in this chapter.
3. If necessary, remove the CD-ROM (DVD-ROM)/diskette drive assembly or blank. See “CD-ROM/Diskette Drive Assembly,” or “DVD-ROM/Diskette Drive Assembly,” or “Bezel Blank.”
4. Remove the four bezel screws that secure the bezel to each side of the chassis.

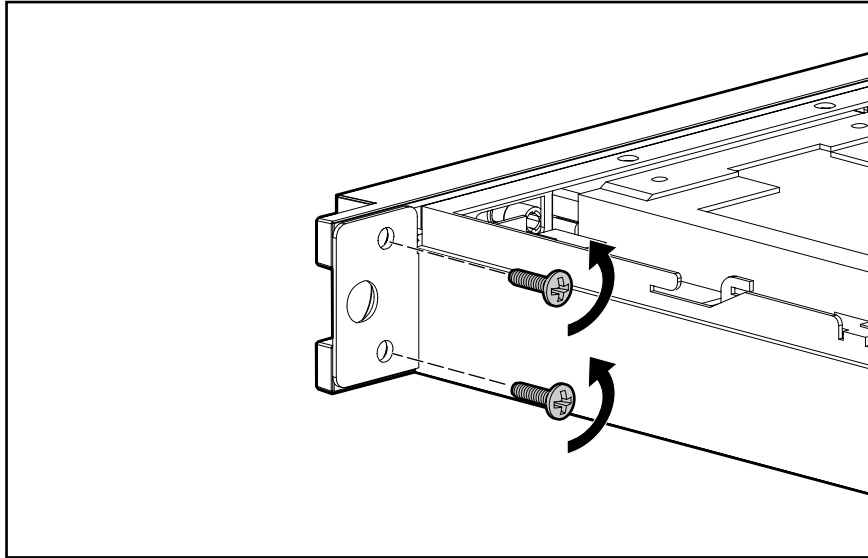


Figure 2-12: Removing the bezel screws

5. Release the latches from chassis tabs ❶ to lift the bezel out and away from the chassis ❷.

IMPORTANT: Avoid damaging the light pipes on the user interface board when removing the bezel.

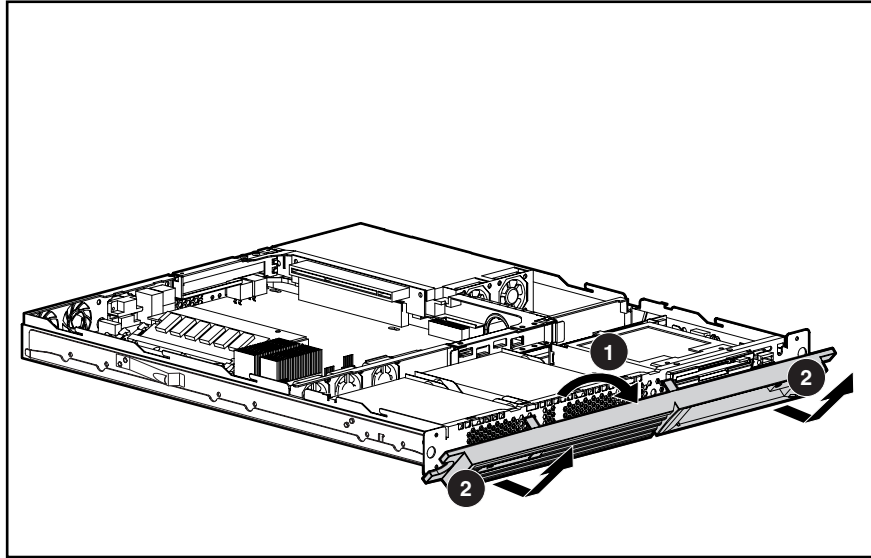


Figure 2-13: Removing the bezel from the chassis

Reverse steps 1 through 5 to replace the bezel. When the bottom of the bezel is hooked securely in place, the bezel top snaps into the chassis tabs.

Hard Drive Overview

The ProLiant DL320 server contains two drive bays for either ATA or SCSI hard drives. The server ships standard with two 1-inch drive trays. The following sections provide general guidelines and installation procedures for installing or upgrading hard drives.

Guidelines for ATA Hard Drives

When installing ATA hard drives in your ProLiant DL320 server, observe the following general guidelines:

- Populate hard drive bays starting with the lowest ATA Device number. Device 0 serves as the primary boot drive.
- Set the jumpers on both ATA drives to Cable-Select mode.

IMPORTANT: ATA hard drives must be configured to the Cable-Select mode.

NOTE: In Compaq ProLiant DL320 servers, ATA drives are set to Cable-Select mode by default.

NOTE: Refer to the documentation shipped with your hard drive to determine how to set the jumpers on your ATA hard drives to Cable-Select mode, if they are not already set in Cable-Select mode.

Guidelines for SCSI Hard Drives

Each SCSI hard drive installed in a Compaq ProLiant DL320 server must be configured with a unique SCSI ID number. Unique identification allows the system to search for the lowest numbered drive to use as a bootable partition. By default, the jumpers on Compaq SCSI hard drives are set to ID 0 and may need to be reset when the drive is installed as an optional or replacement drive in the server.



CAUTION: Installing unsupported hard drives may damage your system by consuming power and generating heat in excess of the server's operating tolerance.

This condition may result in a loss of system and/or data integrity.

NOTE: Refer to the documentation shipped with your hard drive to determine how to set the jumpers on your SCSI hard drives.

Hard Drive Identification Numbers

Compaq ProLiant DL320 servers include two 1-inch hard drive trays. Hard drives installed in the ProLiant DL320 server are labeled as Device 0 and Device 1 in the following illustration for clarification.

IMPORTANT: Always populate hard drive bays starting with the lowest ATA device number or SCSI ID number.

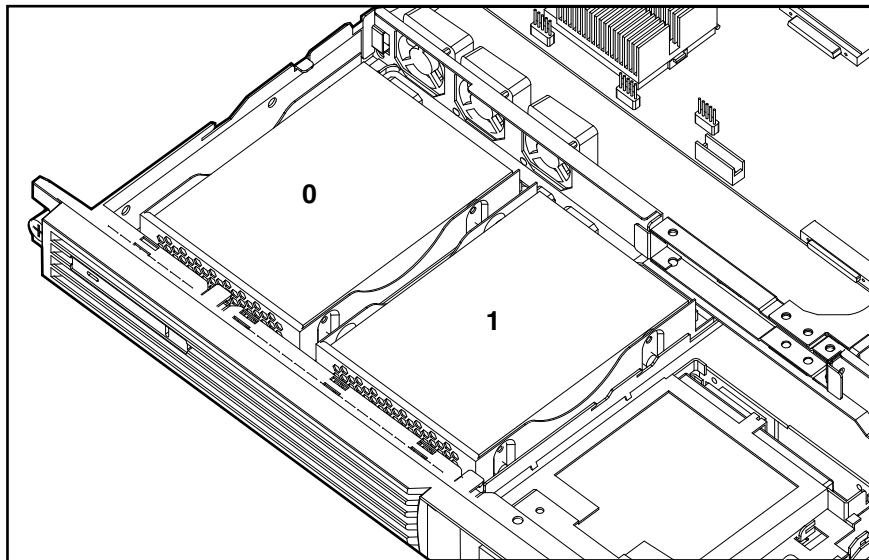


Figure 2-14: ATA device numbers or recommended SCSI ID numbers (drive cables removed for clarity)

Hard Drives

To remove a hard drive from the hard drive bay:

1. Power down the server. See “Powering Down the Server” in this chapter.
2. Remove the access panel. See “Access Panel” in this chapter.
3. Disconnect the SCSI or ATA cables from your hard drive ❶.
4. Disconnect the hard drive power cable from your hard drive ❷.
5. Remove the hard drive and hard drive tray:
 - a. Loosen the thumbscrew that secures the hard drive tray to the chassis ❸.
 - b. Slide the tray toward the rear of the server and lift the tray out of the chassis ❹.

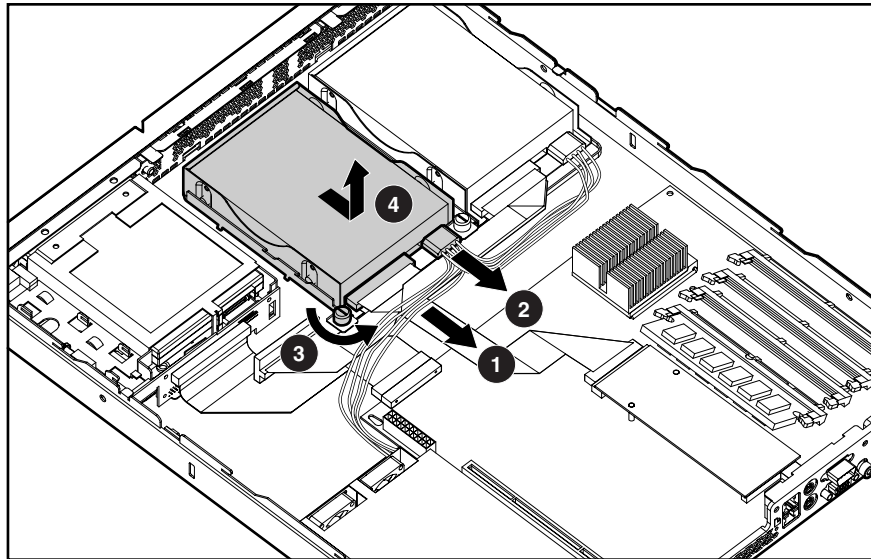


Figure 2-15: Removing a hard drive tray from the chassis (center wall removed for clarity)

6. Remove the four 6-32 Phillips-head screws that secure the hard drive to the hard drive tray ❶.
7. Remove the hard drive from the hard drive tray ❷.

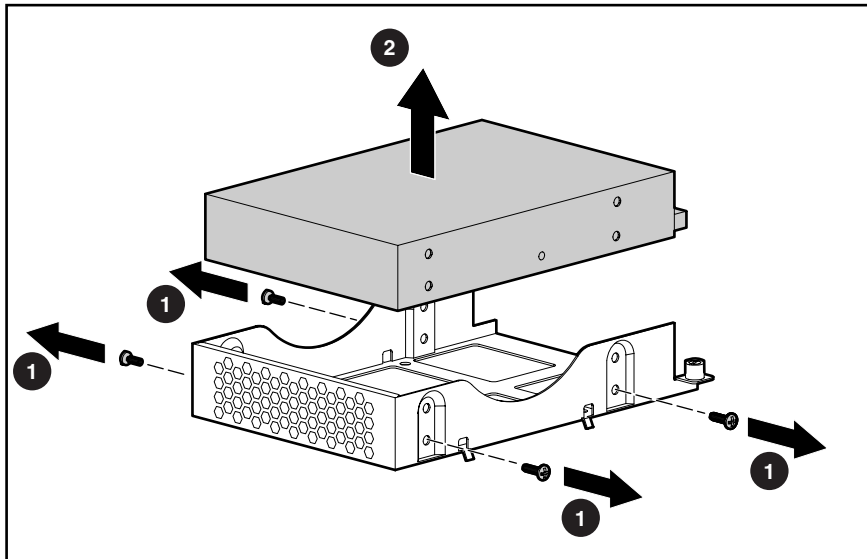


Figure 2-16: Removing a hard drive from a hard drive tray



CAUTION: Review “Guidelines for Hard Drives” in this chapter to ensure proper jumper settings and hard drive configuration.



CAUTION: When connecting the power cable to your hard drives, ensure that the connectors are installed so that the red wire faces right when viewed from the front of the server.

IMPORTANT: Ensure that you install your hard drives with the data and power connectors along the bottom of the tray, facing away from the front vent holes.

Reverse steps 1 through 6 to replace the hard drive.

Single Channel Wide Ultra2 SCSI Controller Module

To remove the SCSI module:

1. Power down the server. See “Powering Down the Server” in this chapter.
2. Remove the access panel. See “Access Panel” in this chapter.



CAUTION: Prevent damage to the connector pins by lifting the SCSI module evenly and with equal pressure on the board. Tilting the board causes the connector pins to bend.

3. Remove the SCSI module by pinching the tops of the support posts ❶ and carefully lifting the SCSI module from the system board ❷.
4. Disconnect the SCSI cable from the SCSI controller connector on the module ❸.

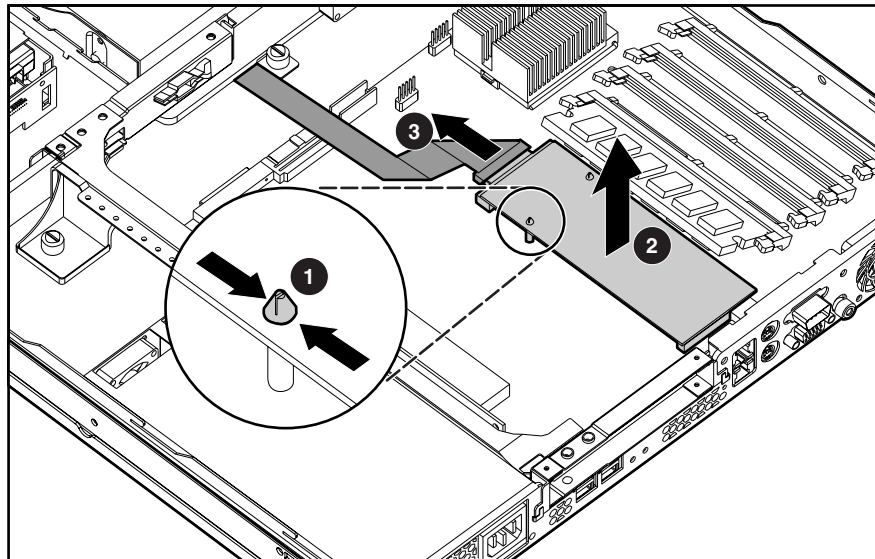


Figure 2-17: Removing the SCSI module from the system board

To replace the SCSI module, reverse steps 1 through 4, ensuring that the SCSI module seats securely on the support posts.

Ultra ATA/100 Controller Module

To remove the ATA module:

1. Power down the server. See “Powering Down the Server” in this chapter.
2. Remove the access panel. See “Access Panel” in this chapter.



CAUTION: Prevent damage to the connector pins by lifting the ATA module evenly and with equal pressure on the board. Tilting the board causes the connector pins to bend.

3. Remove the ATA module by pinching the tops of the support posts ❶ and carefully lifting the ATA module from the system board ❷.
4. Disconnect the ATA cables from the ATA controller connectors on the module ❸.

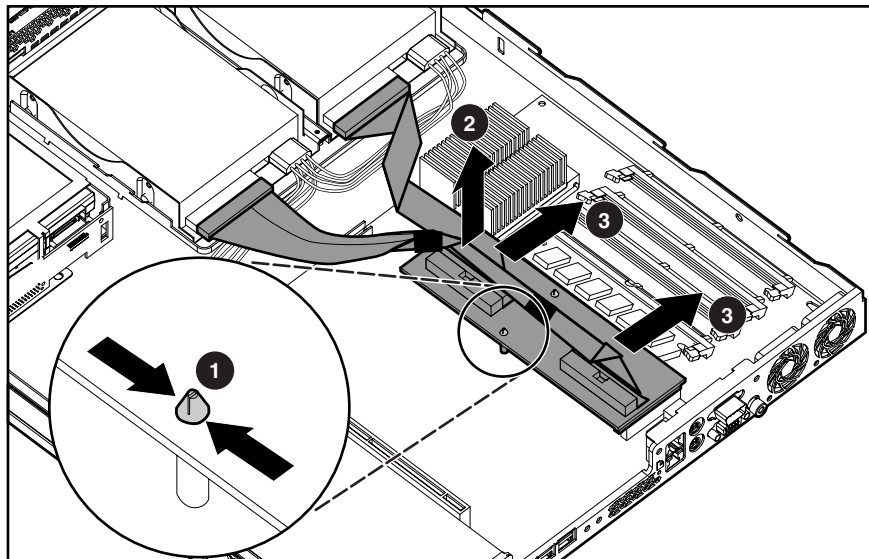


Figure 2-18: Removing the ATA module from the system board (center wall removed for clarity)

To replace the ATA module, reverse steps 1 through 4, ensuring that the ATA module seats securely on the support posts.

CD-ROM (DVD-ROM)/Diskette Drive Assembly Backplane

To remove the CD-ROM (DVD-ROM)/diskette drive assembly backplane:

1. Power down the server. See “Powering Down the Server” in this chapter.
2. Remove the access panel. See “Server Access Panel” in this chapter.
3. Remove the shipping/ejector key. See “Shipping/Ejector Key” in this chapter.
4. Remove the CD-ROM (DVD-ROM)/diskette drive assembly or bezel blank. See “CD-ROM/Diskette Drive Assembly,” or “DVD-ROM/Diskette Drive Assembly” or “Bezel Blank” in this chapter.
5. Disconnect the CD-ROM (DVD-ROM)/diskette drive assembly cable from the CD-ROM (DVD-ROM)/diskette drive assembly backplane ❶.
6. Carefully pull back and hold the plastic retaining clip ❷.
7. Lift the backplane vertically until it unseats from the drive bracket and user interface board ❸.

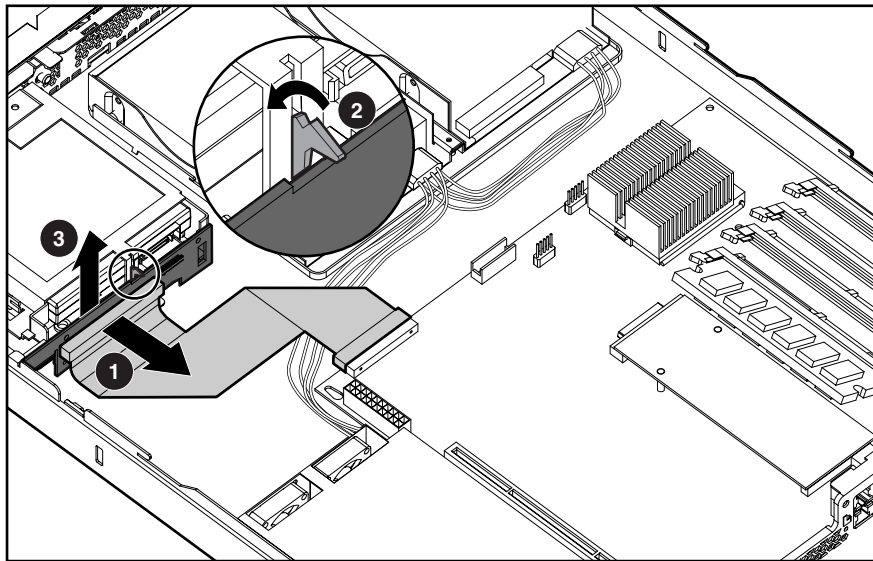


Figure 2-19: Removing a CD-ROM (DVD-ROM)/diskette drive assembly backplane from the chassis (center wall removed for clarity)

Reverse steps 1 through 7 to replace the CD-ROM (DVD-ROM)/diskette drive assembly backplane.

User Interface Board

To remove the user interface board:

1. Power down the server. See “Powering Down the Server” in this chapter.
2. Remove the access panel. See “Access Panel” in this chapter.
3. Remove the shipping/ejector key. See “Shipping/Ejector Key” in this chapter.
4. Remove the CD-ROM (DVD-ROM)/diskette drive assembly or bezel blank. See “CD-ROM/Diskette Drive Assembly,” or “DVD-ROM/Diskette Drive Assembly” or “Bezel Blank” in this chapter.
5. Remove the CD-ROM (DVD-ROM)/diskette drive assembly backplane. See “CD-ROM (DVD-ROM)/Diskette Drive Assembly Backplane” in this chapter.
6. Slide the user interface board toward the rear of the server and lift to remove the board.

IMPORTANT: Remove the user interface board carefully to avoid damaging the light pipes.

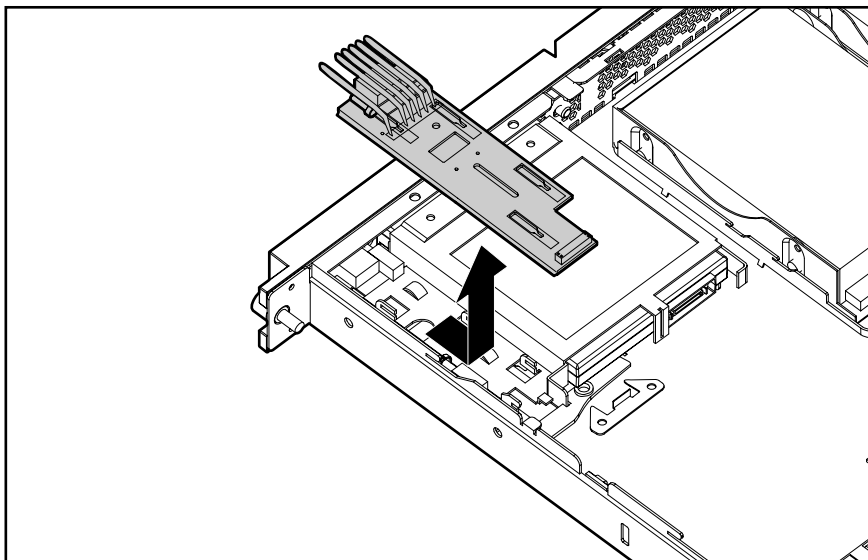


Figure 2-20: Removing the user interface board

Reverse steps 1 through 6 to replace the user interface board.

PCI Riser Board Assembly

To remove the PCI riser board assembly:



CAUTION: To avoid the risk of damage to your system or expansion boards, remove all power cords before installing or removing an expansion board. When the front panel power switch is off, auxiliary power is still connected to the PCI expansion slot and may damage the card.

1. Power down the server. See “Powering Down the Server” in this chapter.
2. Remove the access panel. See “Access Panel” in this chapter.
3. Disconnect any cables connecting an existing expansion board to the system board.
4. Loosen the PCI riser board thumbscrew ❶.
5. Lift and remove the assembly from the server chassis ❷.

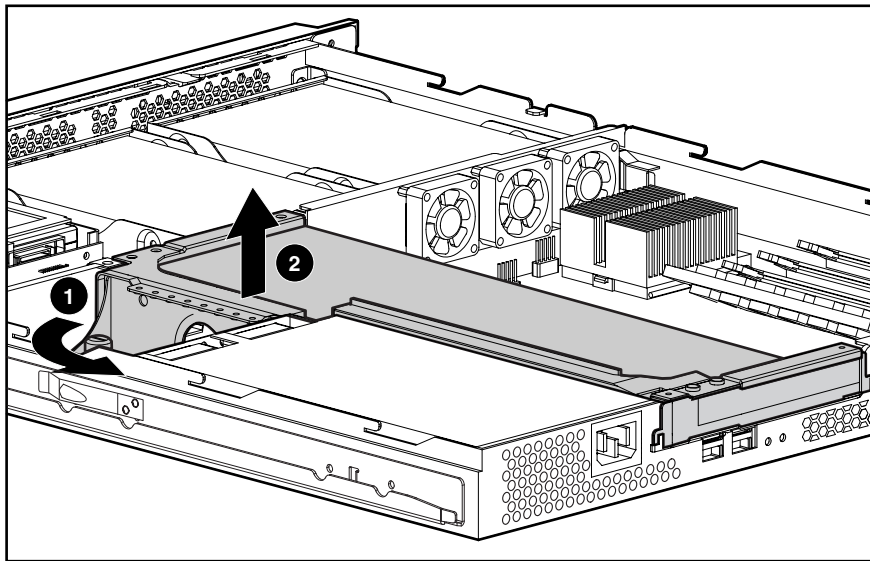


Figure 2-21: Removing the user interface board



CAUTION: When removing the PCI riser board assembly, avoid damage to the system board power cable.

If you are replacing an expansion board, see the following procedure, “Expansion Board.”

IMPORTANT: Do not replace the PCI riser board assembly in the chassis unless all installation and cabling procedures are complete.

Reverse steps 1 through 5 to replace the PCI riser board assembly, ensuring that the assembly seats properly in the retainers on the rear of the chassis.

Expansion Board

To remove an expansion board:

1. Power down the server. See “Powering Down the Server” in this chapter.



CAUTION: To avoid the risk of damage to your system or expansion boards, remove all power cords before installing or removing expansion boards.

2. Remove the access panel. See “Access Panel” in this chapter.
3. Disconnect all cables from the expansion board.
4. Remove the PCI riser board assembly. See “PCI Riser Board Assembly” in this chapter.
5. Apply even pressure to pull the expansion board out of its socket in the PCI riser board assembly.

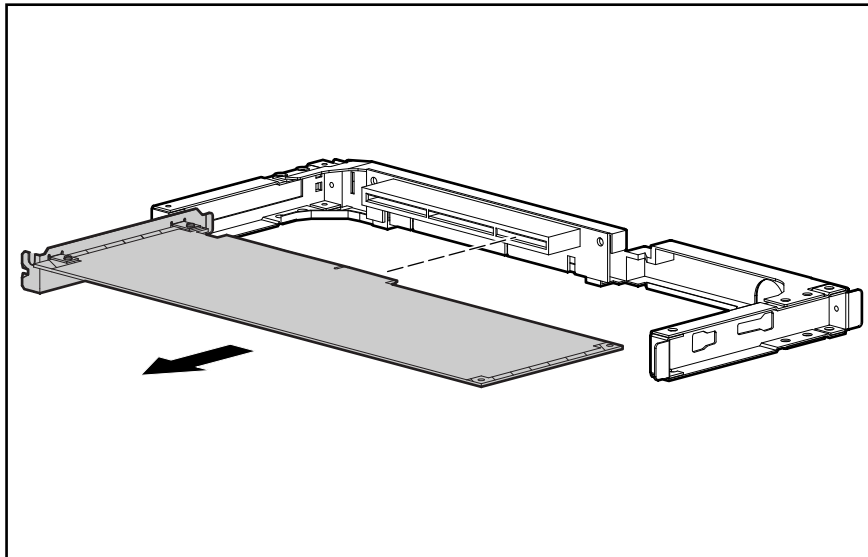


Figure 2-22: Removing an expansion board from the PCI riser board assembly

Reverse steps 1 through 5 to replace an expansion board. Use the PCI card guide on the assembly to position the board in the socket.

IMPORTANT: Ensure that the expansion board is seated securely in the expansion slot before replacing the PCI riser board assembly and access panel.

PCI Card Guide

To remove a PCI card guide:

1. Power down the server. See “Powering Down the Server” in this chapter.
2. Remove the access panel. See “Access Panel” in this chapter.
3. Remove the PCI riser board assembly. See “PCI Riser Board Assembly” in this chapter.
4. Remove the expansion board. See “Expansion Board” in this chapter.
5. Press the guide latch to release the PCI card guide ❶.
6. Slide the PCI card guide toward the open end of the riser board assembly for removal ❷.

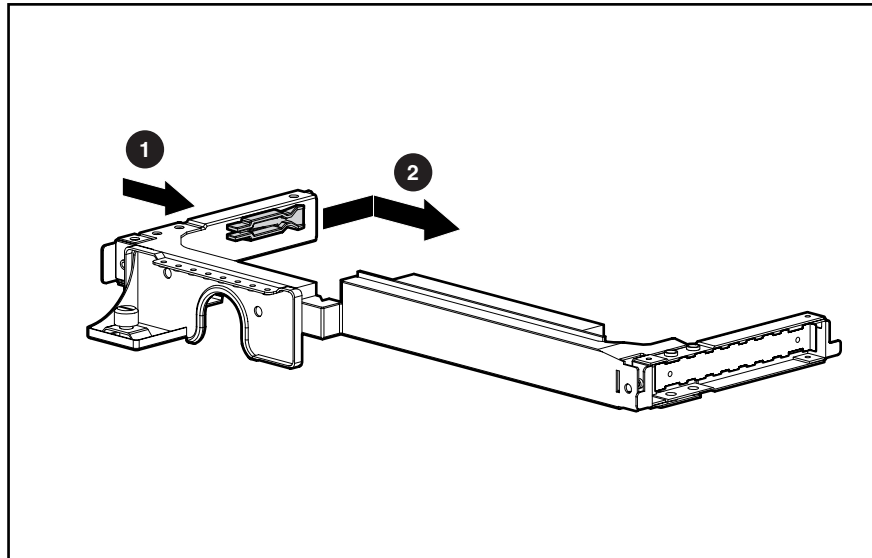


Figure 2-23: Removing the PCI card guide

Reverse steps 1 through 6 to replace a PCI card guide.

Center Wall

To remove the center wall:

1. Power down the server. See “Powering Down the Server” in this chapter.
2. Remove the access panel. See “Access Panel” in this chapter.
3. Remove the PCI riser board assembly. See “PCI Riser Board Assembly” in this chapter.



WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.

4. Disconnect the center wall fan cables from the fan connectors on the system board ❶.
5. Loosen the center wall thumbscrew ❷.

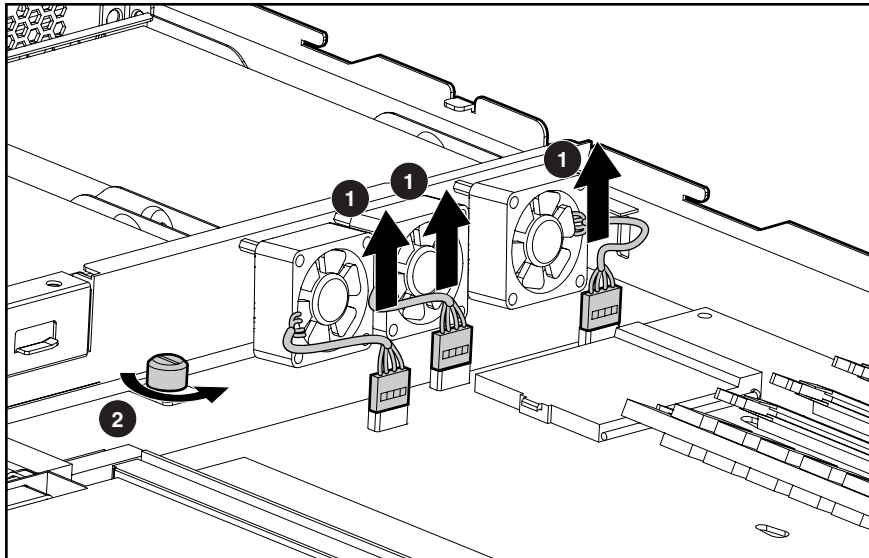


Figure 2-24: Removing the center wall (processor removed for clarity)

6. Push in the tab next to the center wall fans to unlock the center wall from the chassis **1**.
7. Raise the locking end of the center wall from the chassis **2**.

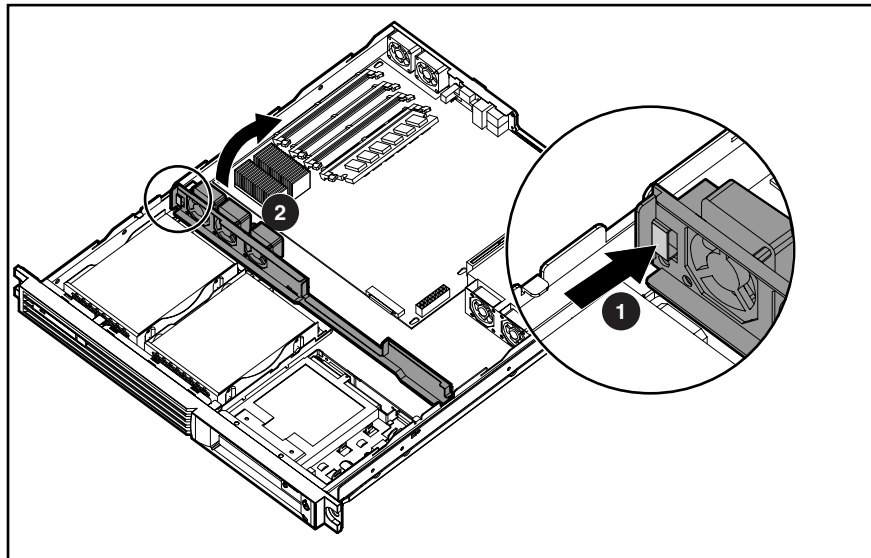


Figure 2-25: Unlocking the center wall

8. Clear the center wall alignment tab from the alignment slot.

IMPORTANT: Retain the fan spacers for use with replacement fans.

Reverse steps 1 through 8 to replace the center wall.

System Fans

Compaq ProLiant DL320 servers contains seven fans. Three fans are located on the center wall, two are located on the rear panel of the chassis, and two are located in the power supply unit.

IMPORTANT: A “Fan 6 Error” indicates an error from either one of the power supply fans. When this error occurs, you must replace the entire power supply unit.

Use the following figure and table to locate the system fans.

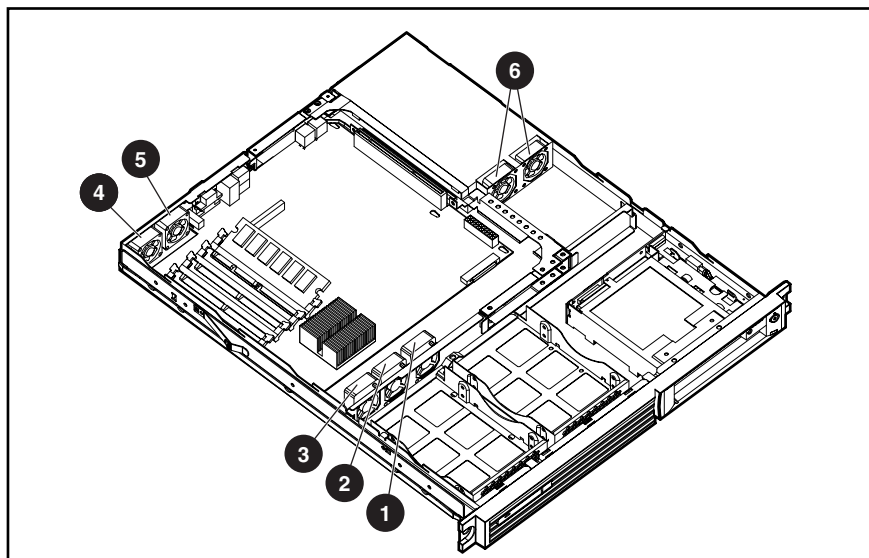


Figure 2-26: Locating the system fans

Table 2-2: System Fans

Item	Component
①	Fan 1
②	Fan 2
③	Fan 3
④	Fan 4
⑤	Fan 5
⑥	Fan 6 (power supply fans spare with power supply)

Fans 1, 2, and 3

To remove fan 1:

1. Power down the server. See “Powering Down the Server” in this chapter.
2. Remove the access panel. See “Access Panel” in this chapter.
3. Remove the PCI riser board assembly. See “PCI Riser Board Assembly” in this chapter.
4. Remove the center wall. See “Center Wall” in this chapter.
5. Disconnect the fan cable from the system board.
6. Remove the two Phillips-head screws that secure the fan to the center wall ❶.
7. Lift and remove the fan ❷.
8. Repeat steps 5 through 7 to remove fans 2 and 3, if needed.

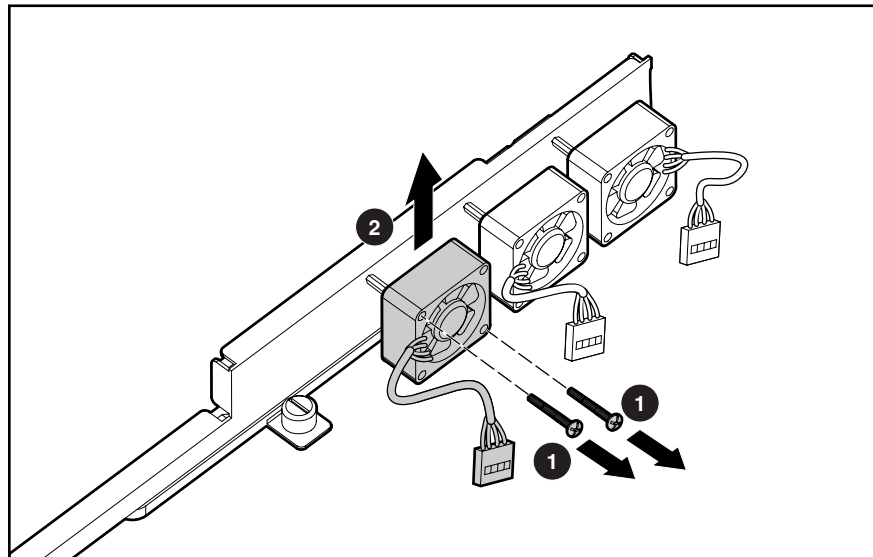


Figure 2-27: Removing fan 1 from the center wall

Reverse steps 1 through 7 to replace the fan.

Fans 4 and 5

To remove fan 5:

1. Power down the server. See “Powering Down the Server” in this chapter.
2. Remove the access panel. See “Access Panel” in this chapter.
3. Disconnect the fan cable from the fan connector on the system board ❶.
4. Remove the two Phillips-head screws that secure the fan in the chassis ❷.
5. Lift and remove the fan ❸.

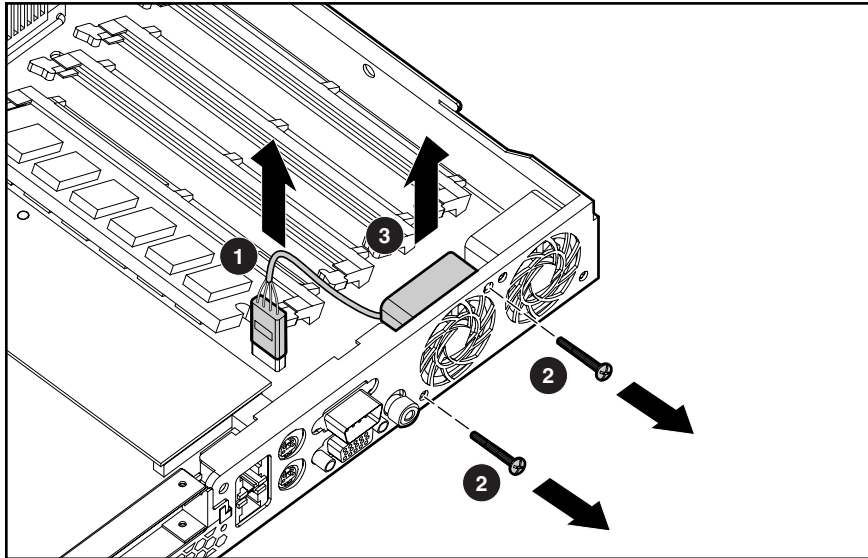


Figure 2-28: Removing fan 5 from the server

6. Repeat steps 1 through 5 to remove fan 4, if needed.

Reverse steps 1 through 6 to replace fans 4 and 5.

Cables

The following sections contain removal and replacement procedures for the standard cables that ship with the ProLiant DL320 server:

- Two-Device Terminated SCSI Cable
- ATA Cables
- CD-ROM (DVD-ROM)/Diskette Drive Assembly Cable

Two-Device Terminated SCSI Cable

To remove the SCSI cable:

1. Power down the server. See “Powering Down the Server” in this chapter.
2. Remove the access panel. See “Access Panel” in this chapter.
3. Remove the PCI riser board assembly. See “PCI Riser Board Assembly” in this chapter.
4. Remove the center wall. See “Center Wall” in this chapter.



CAUTION: To avoid hardware damage to the board, cable, or system board, use caution when installing the SCSI module onto the support posts.

5. Disconnect the SCSI cable from the hard drives ❶.
6. Disconnect the SCSI cable from the SCSI module ❷.

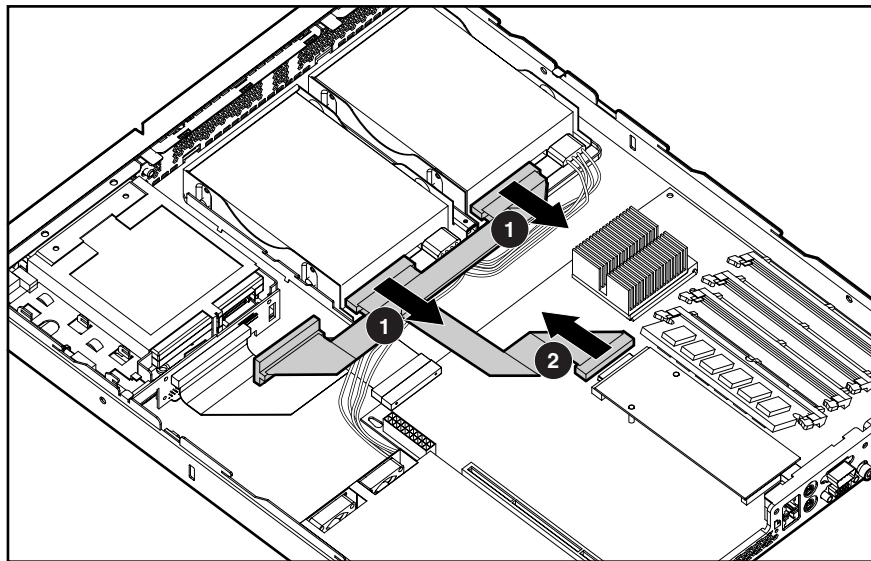


Figure 2-29: Disconnecting the SCSI cable

Reverse steps 1 through 5 to replace the SCSI cable.

ATA Cables

To remove the ATA cables:

1. Power down the server. See “Powering Down the Server” in this chapter.
2. Remove the access panel. See “Access Panel” in this chapter.
3. Remove the PCI riser board assembly. See “PCI Riser Board Assembly” in this chapter.
4. Remove the center wall. See “Center Wall” in this chapter.
5. Disconnect the ATA cables from the ATA controller connectors on the module ❶.
6. Disconnect the ATA cables from the hard drives ❷.

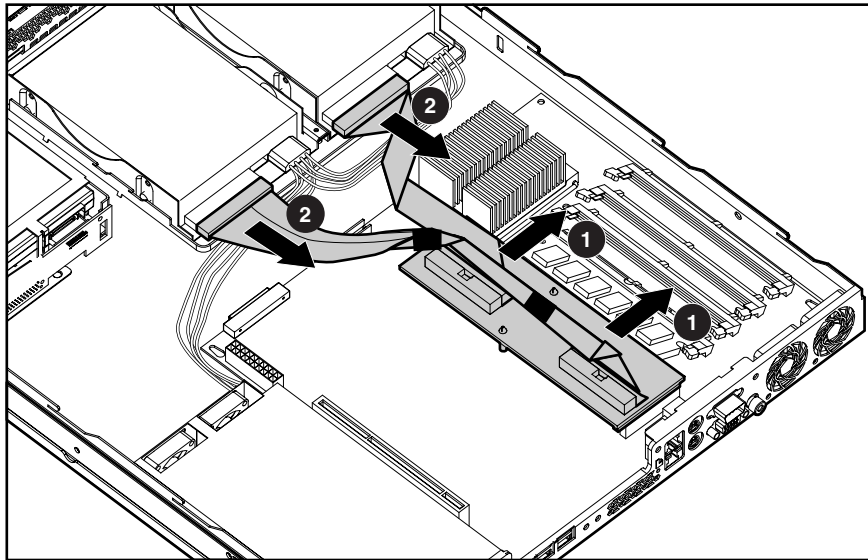


Figure 2-30: Disconnecting the ATA cables

Reverse steps 1 through 6 to replace the ATA cables.

CD-ROM (DVD-ROM)/Diskette Drive Assembly Cable

To remove the CD-ROM (DVD-ROM)/diskette drive assembly cable:

1. Power down the server. See “Powering Down the Server” in this chapter.
2. Remove the access panel. See “Access Panel” in this chapter.
3. Remove the PCI riser board assembly. See “PCI Riser Board Assembly” in this chapter.
4. Remove the center wall. See “Center Wall” in this chapter.
5. Disconnect the CD-ROM (DVD-ROM)/diskette drive assembly cable from the CD-ROM(DVD-ROM)/diskette drive assembly backplane ❶.
6. Disconnect the CD-ROM (DVD-ROM)/diskette drive assembly cable from the system board ❷.

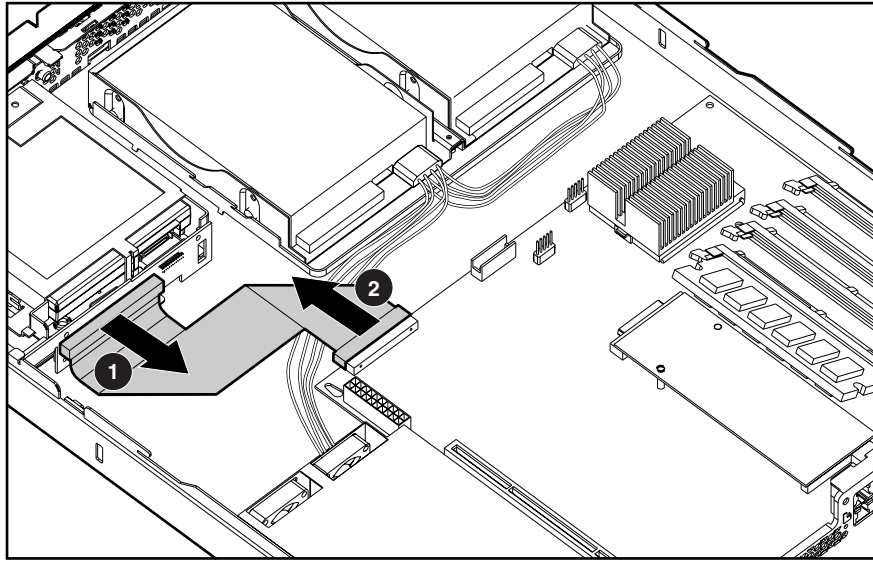


Figure 2-31: Disconnecting the CD-ROM (DVD-ROM)/diskette drive assembly cable

Reverse steps 1 through 5 to replace the CD-ROM DVD-ROM)/diskette drive assembly cable.

Power Supply

IMPORTANT: A “Fan 6 Error” indicates an error from one of the power supply fans. When this error occurs, you must replace the entire power supply unit.

To remove the power supply:

1. Power down the server. See “Powering Down the Server” in this chapter.
2. Remove the access panel. See “Server Access Panel” in this chapter.
3. Remove the PCI riser board assembly. See “PCI Riser Board Assembly” in this chapter.
4. Remove the center wall. See “Center Wall” in this chapter.
5. Disconnect the hard drive power cables from the hard drives ❶.
6. Disconnect the power supply cable from the power supply connector on the system board by pressing the locking tab on the side of the connector and pulling upwards ❷.
7. Remove the two Phillips-head screws that secure the power supply unit to the chassis ❸.
8. Slide the power supply away from the back of the chassis and lift it from the server ❹.

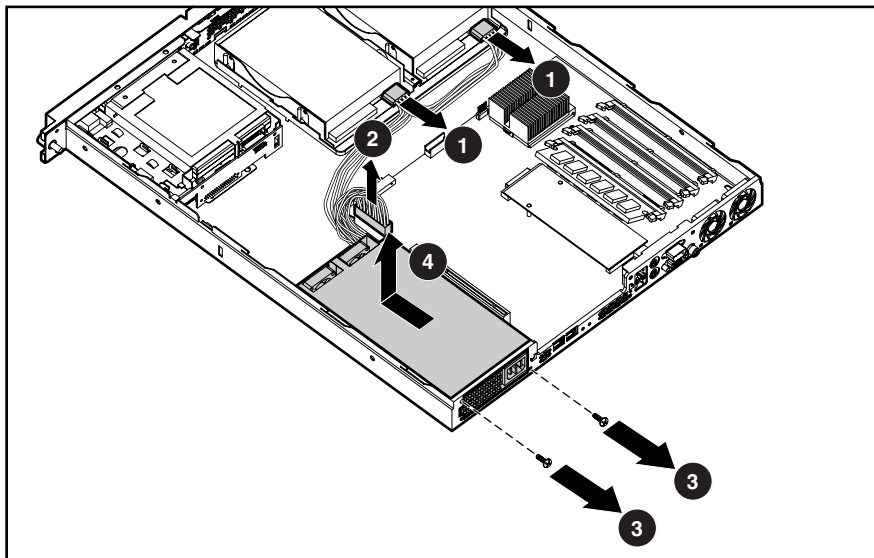


Figure 2-32: Removing the power supply

Reverse steps 1 through 8 to replace the power supply.

Battery

If the server no longer automatically displays the correct date and time, you may need to replace the battery that provides power to the real-time clock. Under normal use, battery life is 5 to 10 years. Replace used batteries with a Compaq 540-milliampere-hour lithium, 3V replacement battery.



WARNING: This server contains either an internal lithium manganese dioxide, or a vanadium pentoxide battery. There is risk of fire and burns if the battery pack is not handled properly. To reduce the risk of personal injury:

- Do not attempt to recharge.
 - 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 spare designated for this product.
-



CAUTION: Loss of BIOS settings occurs when the battery is removed. BIOS settings must be reconfigured whenever the battery is replaced.



CAUTION: Batteries, battery packs, and accumulators should not be disposed of together with general household waste. Use the public collection system or return used batteries to your authorized partners or their agents for proper recycling and disposal.

IMPORTANT: Run the ROM-Based Setup Utility (RBSU) to configure the system after replacing the battery. Refer to the server troubleshooting guide or setup and installation guide for more information.

To remove the battery:

1. Power down the server. See “Powering Down the Server” in this chapter.
2. Remove the access panel. See “Access Panel” in this chapter.
3. Locate the battery on the system board.

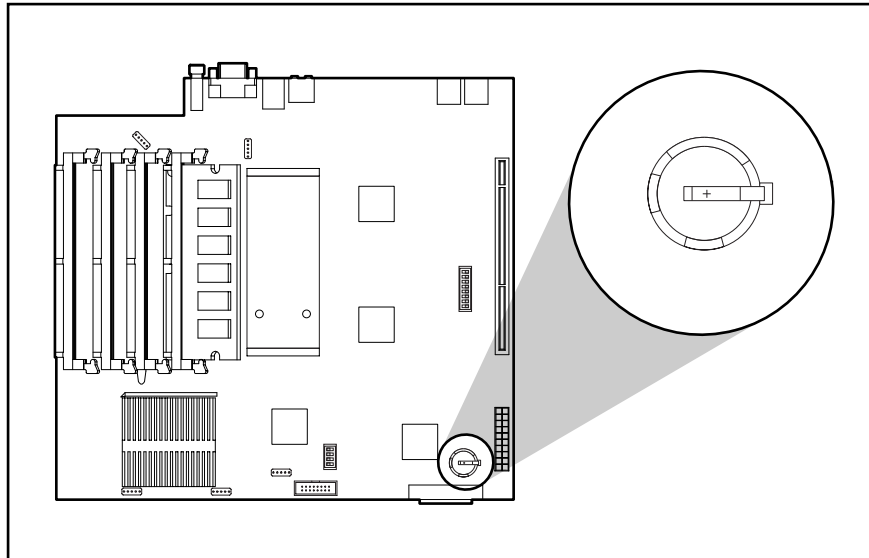


Figure 2-33: Locating the battery

4. If necessary, remove the PCI riser board assembly to access the battery location. See “PCI Riser Board Assembly” in this chapter.
5. Press the battery forward from the clip side of the assembly to slide the battery up and out of the battery holder.

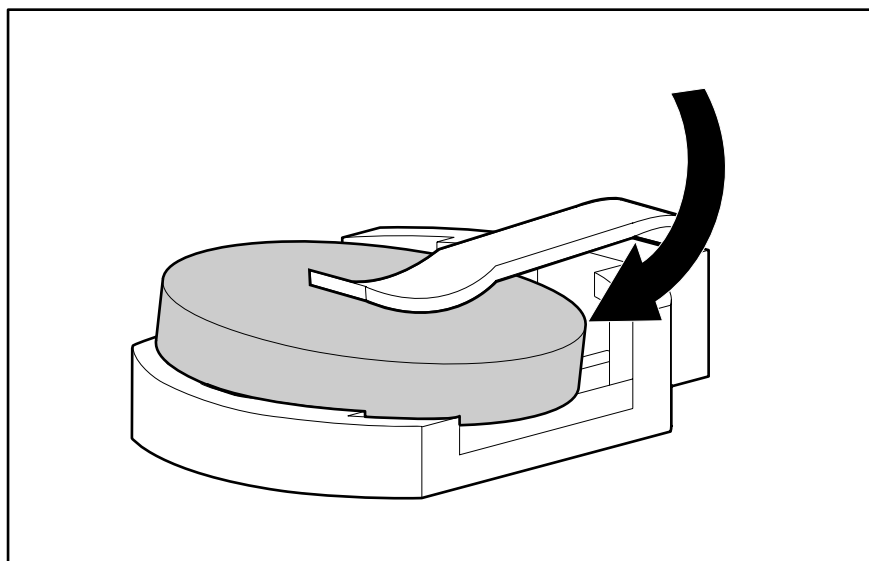


Figure 2-34: Removing the battery

IMPORTANT: Do not bend the retaining clip during battery replacement. For proper operation, the clip must maintain a position of contact with the battery.

Reverse steps 1 through 5 to replace the battery, ensuring that the new battery is installed with the positive side up.

Processor



CAUTION: Always use a new thermal pad and a new heatsink when replacing processors. Failure to use new components can cause damage to the processor.

To remove the processor:

1. Power down the server. See “Powering Down the Server” in this chapter.
2. Remove the access panel. See “Access Panel” in this chapter.
3. Locate the processor on the system board.

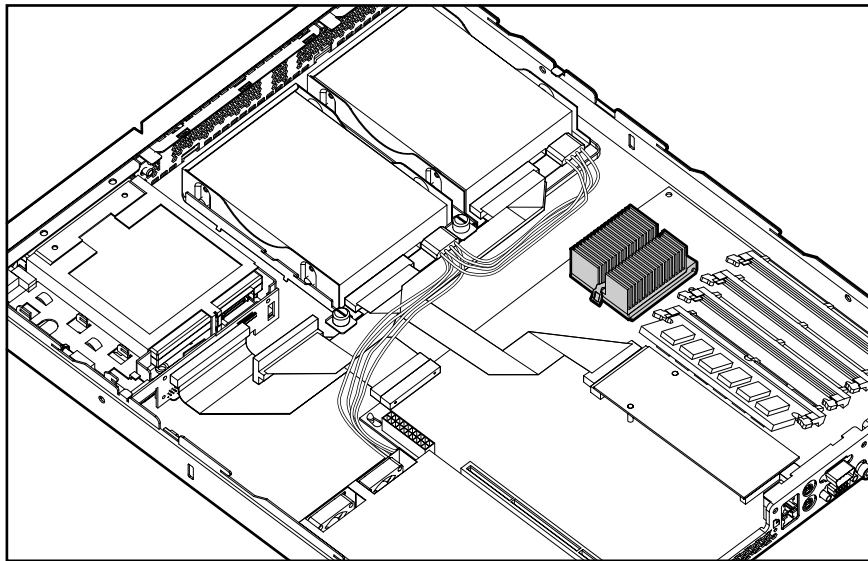


Figure 2-35: Locating the processor on the system board (center wall removed for clarity)



WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.



CAUTION: The processor socket must be populated at all times. Failure to replace the processor results in the system failing to boot and halting during the POST. This error prevents the system from functioning properly.

4. Disengage the heatsink retaining clip ❶, ❷.
5. Remove the heatsink from the top of the processor ❸.



CAUTION: Always use a new thermal pad and a new heatsink when replacing processors. Failure to use new components may result in damage to the processor.

6. Lift the ejecting lever ❹ to disengage the processor from the system board ❺.

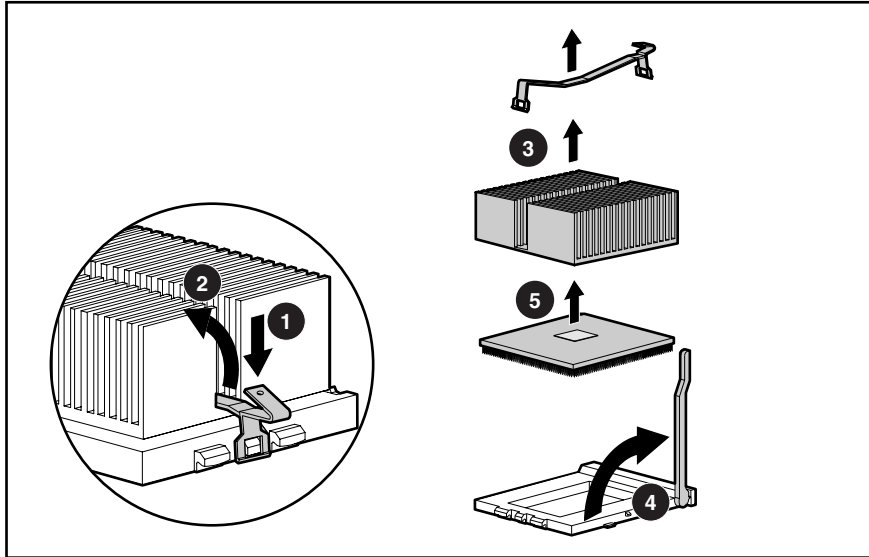


Figure 2-36: Removing the processor



CAUTION: Scrape thermal interface material off of the processor carefully to avoid damaging the processor. Store the processor in a static-free environment after removing it from the server.



CAUTION: Remove the plastic cover to expose the adhesive side of the thermal pad on the new heatsink before placing the heatsink on the processor. The system will not continue to operate if the plastic cover is left in place.

7. If you intend to reuse the processor, carefully scrape the thermal pad from the processor surface and apply a new thermal pad and heatsink before reseating the processor.

Reverse steps 1 through 6 to reinstall the processor and heatsink.

System Board



CAUTION: The system board spare kit ships with two color-coded heat sinks. After replacing your system board and reinstalling your processor, install the replacement heat sink that has the same color as the original heat sink.

To remove the system board:

1. Power down the server. See “Powering Down the Server” in this chapter.
2. Remove the access panel. See “Access Panel” in this chapter.
3. Remove the PCI riser board assembly. See “PCI Riser Board Assembly” in this chapter.
4. Remove the center wall. See “Center Wall” in this chapter.
5. Remove the SCSI or ATA module. See “Single Channel Wide Ultra2 SCSI Controller Module,” or “Ultra ATA/100 Controller Module” in this chapter.
6. Remove any DIMMs. See “Memory Modules” in this chapter.
7. Disconnect the fan 4 and fan 5 cables. See “System Fans” in this chapter.
8. Disconnect the power supply from the system board. See “Power Supply” in this chapter.
9. Disconnect the CD-ROM (DVD-ROM)/diskette drive assembly cable from the system board. See “CD-ROM (DVD-ROM)/Diskette Drive Assembly Cable” in this chapter.
10. Remove the system battery. See “Battery” in this chapter.

IMPORTANT: Observe the color of your heat sink to identify the correct replacement heat sink later in this procedure.

11. Remove the processor. See “Processor” in this chapter.



CAUTION: Always use a new thermal pad and a new heatsink when replacing processors on the system. Failure to use new components may result in damage to the processor. See “Processor” in this chapter.

12. Identify the alignment keys and keyhole locations ❶ through ❹ on the system board.

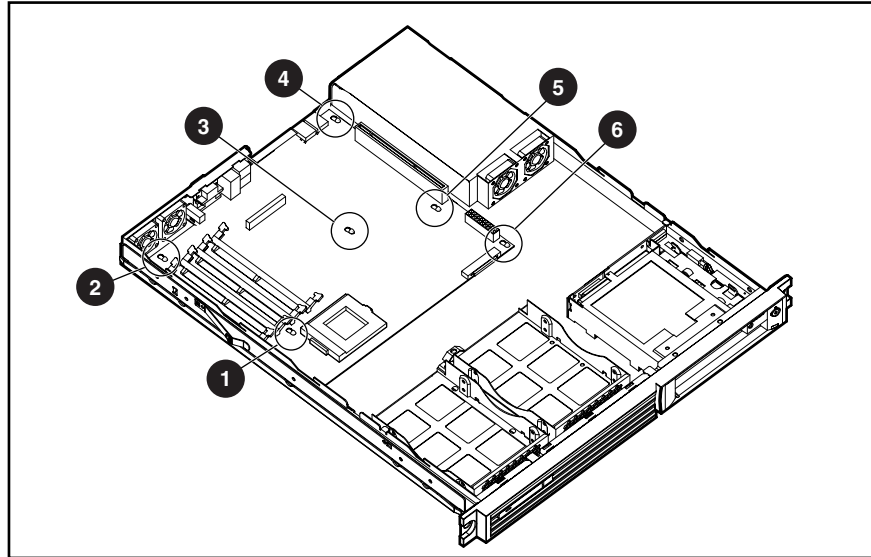


Figure 2-37: Identifying alignment keyhole locations

13. Remove all Phillips head screws that secure the system board to the chassis ❶.
14. Slide the system board 0.5 inches (1.5 cm) toward the front of the chassis, ensuring that the board unseats from all the alignment keys, and lift the board up and away from the keys ❷.

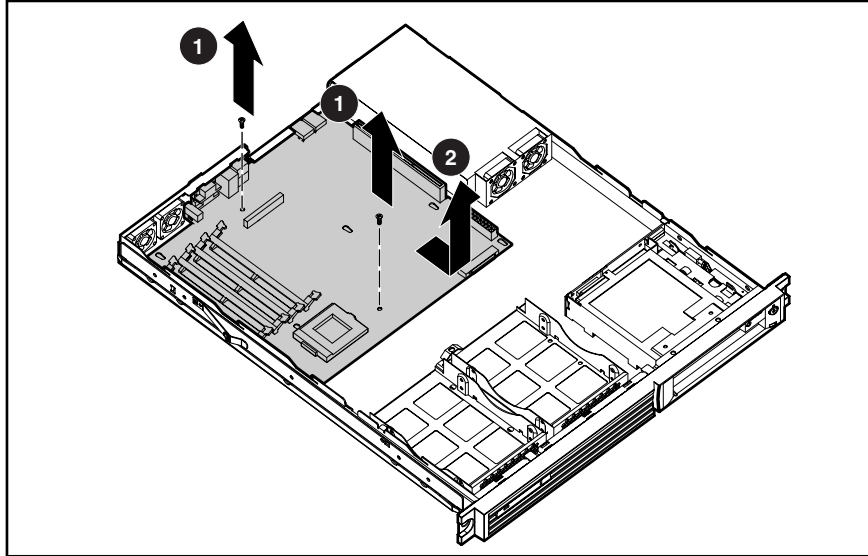


Figure 2-38: Removing the system board

Reverse steps 1 through 14 to replace the system board.



CAUTION: Install the replacement heat sink that has the same color as the original heat sink.

Diagnostic Tools

This chapter provides an overview of the software and firmware diagnostic tools available for Compaq ProLiant DL320 servers.

Diagnostic Tools Utility Overview

The following utilities assist in diagnosing problems, testing hardware, and monitoring and managing Compaq ProLiant DL320 server operations.

Table 3-1: Diagnostic Tools

Tool	What it is	How to run it
Compaq Diagnostics	A tool to assist testing and/or verifying operation of Compaq hardware. If problems are found, Compaq Diagnostics isolates failures down to replaceable part, whenever possible.	<p>Diagnostics and utilities must be accessed when a system configuration error is detected during Power-On Self-Test (POST). For a complete list of POST error messages, refer to the <i>Compaq Servers Troubleshooting Guide</i>.</p> <p>Compaq Diagnostics software is also available on the Compaq SmartStart and Software Support CD. A Diagnostics diskette can be created from the SmartStart and Software Support CD. The diskette can be used to run the diagnostics software.</p>
Compaq Inspect Utility	A utility that provides a report detailing system information.	Run the Inspect Utility from the Compaq Diagnostics program.
<i>Compaq Insight Manager™</i>	A client/server application used to manage Compaq hardware remotely within a network environment. Compaq Insight Manager reports hardware fault conditions (both failure and pre-failure) and collects data for reporting and graphing.	<p>For more information, refer to the Compaq Management CD and the <i>Compaq Insight Manager User Guide</i>.</p> <p>More information on viewing and printing the event list can be found in the <i>Compaq ProLiant DL320 Server Setup and Installation Guide</i>.</p>

continued

Table 3-1: Diagnostic Tools *continued*

Tool	What it is	How to run it
Compaq Survey Utility	<p>An online information-gathering agent that runs on servers to collect critical hardware and software information from various sources.</p> <p>If a significant change occurs between data-gathering intervals, previous information is marked and the survey text file is overwritten to reflect the latest configuration and changes since the last configuration. This utility provides a historical record of change events for server hardware and software.</p>	Install the Survey Utility from SmartStart, the Compaq Integration Maintenance Utility, or the Compaq Management CD.
Compaq SmartStart	The intelligent way to set up your Compaq server. Located on the Compaq SmartStart and Software Support CD, SmartStart includes <i>ROMPaq™</i> Utility, driver updates, and assisted operating system installations.	Use the information provided in the Server Setup and Management pack.
Array Diagnostics Utility (ADU)	<p>A Windows-based tool designed to run on all Compaq systems that support Compaq array controllers. Two main functions of ADU are to collect all possible information about the array controllers in the system and to generate a list of detected problems.</p> <p>This tool is available for all Compaq servers covered by this guide.</p>	<p>Use the information provided in the ADU.</p> <p>For a complete list of ADU error messages, refer to the <i>Compaq Servers Troubleshooting Guide</i>.</p>
Drive Array Advanced Diagnostics (DAAD)	A DOS-based tool for Compaq servers with Smart Array controllers. The predecessor to ADU, DAAD collects information about the array controllers in the system and offers a list of detected problems.	<p>For a list of Compaq servers still supported by this tool, visit the Compaq website:</p> <p>http://www.compaq.com</p>
Integrated Management Log (IML)	<p>A log of system events such as system failures or nonfatal error conditions. View events in the IML from within:</p> <ul style="list-style-type: none"> • Compaq Insight Manager • Compaq Survey Utility • OS-specific IML Utilities 	The IML requires Compaq operating system-dependent drivers. Refer to the Compaq SmartStart and Software Support CD for instructions on installing the appropriate drivers.

continued

Table 3-1: Diagnostic Tools *continued*

Tool	What it is	How to run it
ROM-Based Setup Utility (RBSU)	<p>A utility used to configure the hardware installed in or connected to the server. Specifically, it can:</p> <ul style="list-style-type: none"> • Resolve resource conflicts in areas such as memory, port addresses, and interrupts (IRQs). • Configure PCI boards automatically. • Provide switch and jumper settings. • Manage installation of memory, processor upgrades, and mass storage devices such as hard drives, tape drives, and diskette drives. • Store configuration information in nonvolatile memory. • Assist in installation of an operating system. 	Run RBSU directly by pressing the F9 key during POST.
Automatic Server Recovery (ASR)	<p>A tool that lets the server restart automatically after a catastrophic operating system failure.</p> <ul style="list-style-type: none"> • Available Recovery—software error recovery and environmental recovery • Unattended Recovery—logs the error information to the IML, resets the server, and tries to restart the operating system 	This tool is a function of the combined hardware and software system through the RBSU. Set the ASR to enable.
ROMPaq Utility	A utility that upgrades the current system ROM.	Run this utility from the <i>ROMPaq</i> ™ diskette after powering up the system unit.
SmartStart Diskette Builder	A tool that creates a diskette version of the Compaq SmartStart and Software Support CD.	Run the diskette builder tool from the Compaq SmartStart and Software Support CD.

Connectors, Switches, and LED Indicators

Connectors

This section contains figures and tables showing connector locations on the front panel, rear panel, PCI riser board assembly, and the system board of the Compaq ProLiant DL320 server.

Rear Panel Connectors

The following figure and table show the connectors on the rear panel of Compaq ProLiant DL320 servers.

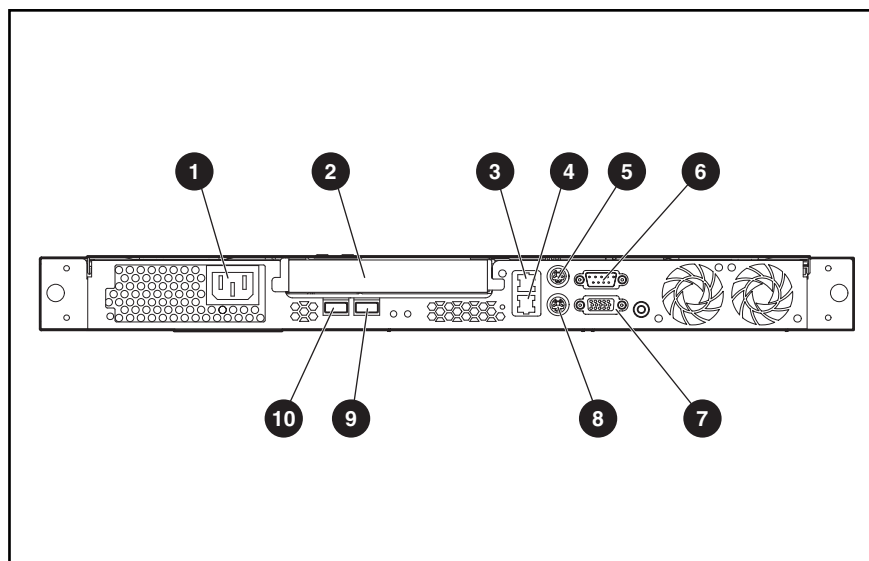


Figure 4-1: Rear panel connectors

Table 4-1: Rear Panel Connectors

Item	Description
1	Power connector
2	Expansion slot
3	RJ-45 Fast Ethernet connector for NIC 2
4	RJ-45 Fast Ethernet connector for NIC 1 (supports PXE)
5	Mouse connector
6	Serial connector
7	Video connector
8	Keyboard connector
9	USB 1 connector
10	USB 2 connector

Expansion Slot Connectors

The following figure and table show expansion slot connectors on the PCI riser board assembly.

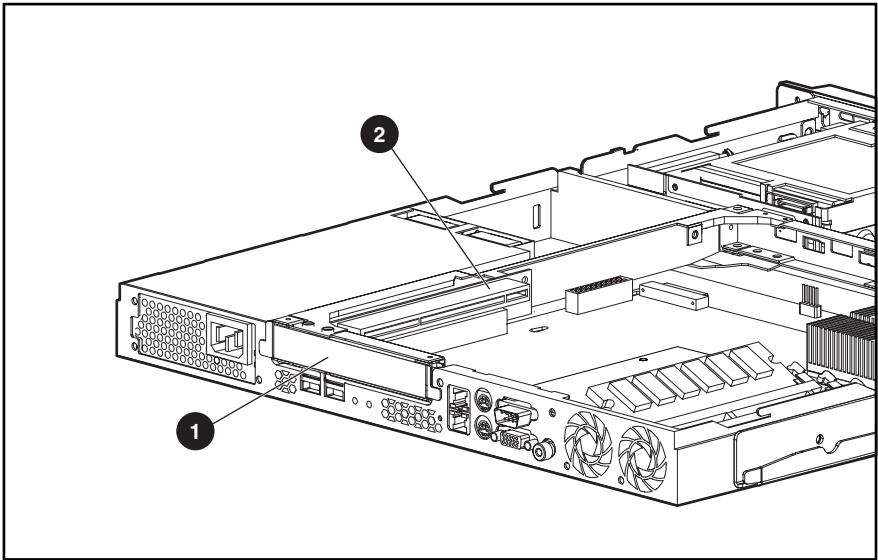


Figure 4-2: Expansion slot connectors

Table 4-2: Expansion Slot Connectors

Item	Description
❶	64-bit PCI slot cover
❷	64-bit PCI expansion slot

System Board Connectors

The following figure and table show connectors on the system board.

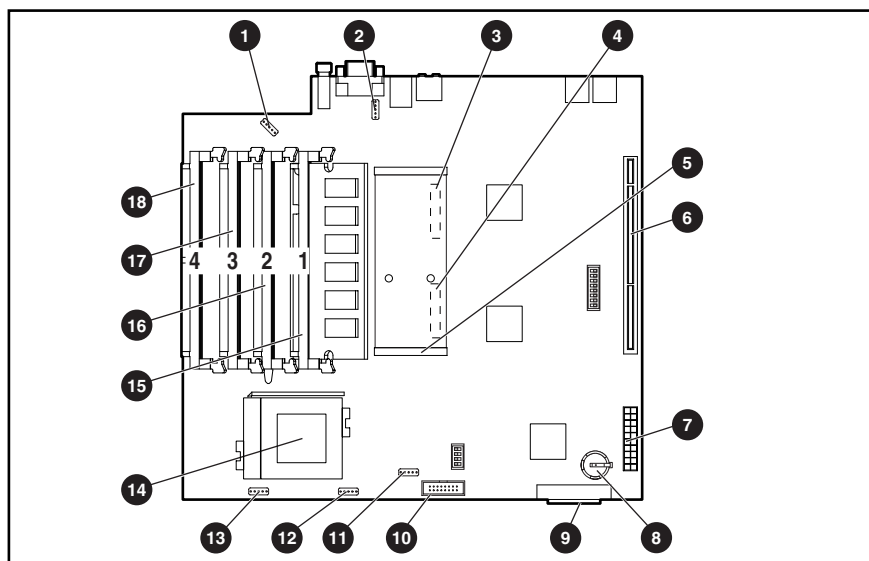


Figure 4-3: System board connectors

Table 4-3: System Board Connectors

Item	Description	Item	Description
1	Fan 4 connector	10	Remote Insight Lights-Out Edition connector
2	Fan 5 connector	11	Fan 1 connector
3	ATA Device 1 cable connector, (ATA models only)	12	Fan 2 connector
4	ATA Device 0 cable connector, (ATA models only)	13	Fan 3 connector
5	SCSI cable connector (SCSI models only)	14	Processor socket (populated)
6	PCI riser board assembly connector	15	DIMM socket 1 (populated)
7	Power supply connector	16	DIMM socket 2
8	Battery	17	DIMM socket 3
9	CD-ROM (DVD-ROM)/diskette drive assembly connector	18	DIMM socket 4

System Switches

The Compaq ProLiant DL320 server has two switch banks (SW2 and SW3) for system configuration and a non-maskable interrupt (NMI) switch that is used for NMI events.

Refer to the labels on the inside of the server access panel or to the following sections for the proper switch settings. The following figure and table show the location of the system switches.

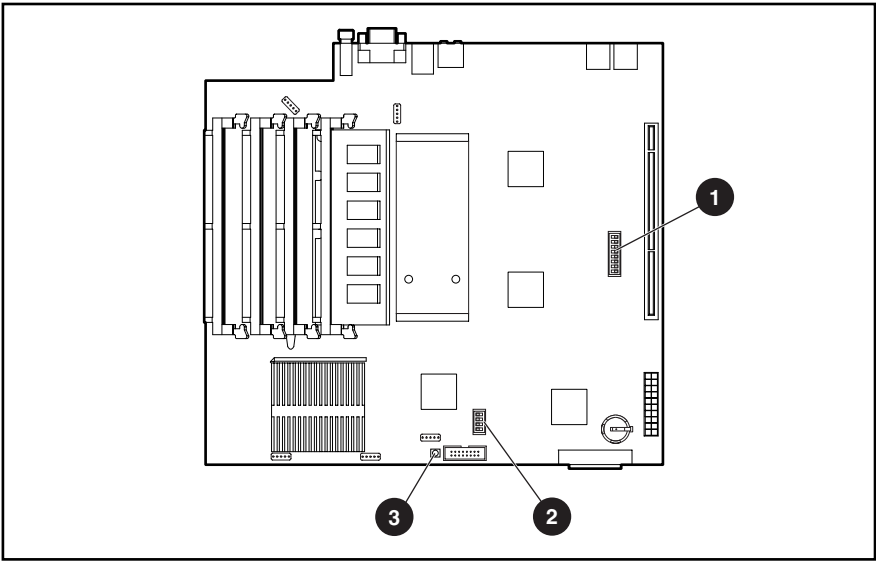


Figure 4-4: System switches

Table 4-4: System Board Switches

Item	Description
❶	System configuration switch (SW3)
❷	System switch (SW2)
❸	Non-maskable interrupt (NMI) switch

System Switch (SW2)

The system switch (SW2) is a four-position switch used for performing recovery and other diagnostic operations. Refer to the labels attached to the inside of the server access panel or the following table for the proper system switch settings



CAUTION: Clearing CMOS or nonvolatile RAM (NVRAM) deletes your configuration information. Refer to the *Compaq ProLiant DL320 Server Setup and Installation Guide* for complete instructions on configuring your server.

Table 4-5: Switch Settings (SW2) Settings

Switch Position	Function	Default Position
S1	Clear password	Off
S2	Clear CMOS	Off
S3	Recovery mode	Off
S4	Reserved	Off

Note: "On" activates the function.

System Configuration Switch (SW3)

The system configuration switch (SW3) is an eight-position switch used for system configuration. Refer to the labels attached to the inside of the server access panel or the following table for the proper system configuration switch settings.

Table 4-6: System Configuration Switch (SW3) Settings

Switch Position	Function	Default Position
S1	VGA Disable	Off
S2	Reserved	Off
S3	Reserved	Off
S4	Reserved	Off
S5	Reserved	Off
S6	Reserved	Off
S7	Reserved	Off
S8	Reserved	Off

Note: "On" activates the function.

LED Indicators

This section contains illustrations and descriptions for Compaq ProLiant DL320 server LEDs, both internal and external:

- Front panel
- Rear panel
- System board

Front Panel LED Indicators

Front panel status LEDs allow constant monitoring of basic system functions while the server is operating.

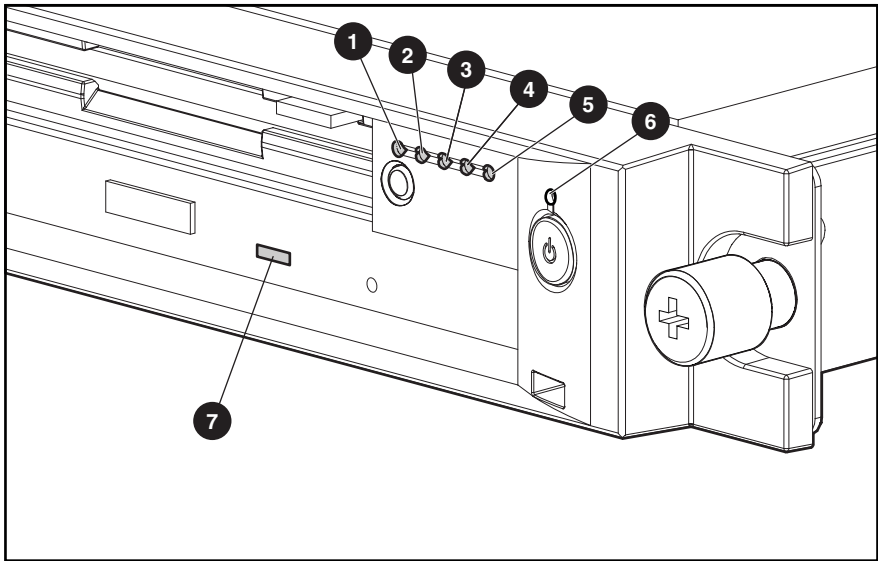


Figure 4-5: Front panel LEDs

Table 4-7: Front Panel LEDs

Item	LED Description	Status
❶	Front unit identification	Blue = Activated Off = Deactivated
❷	NIC 2 link/activity	Green = Link Off = No link Blinking = Activity
❸	NIC 1 link/activity	Green = Link Off = No link Blinking = Activity
❹	System health	Green = Good Amber = Degraded Red = Critical error

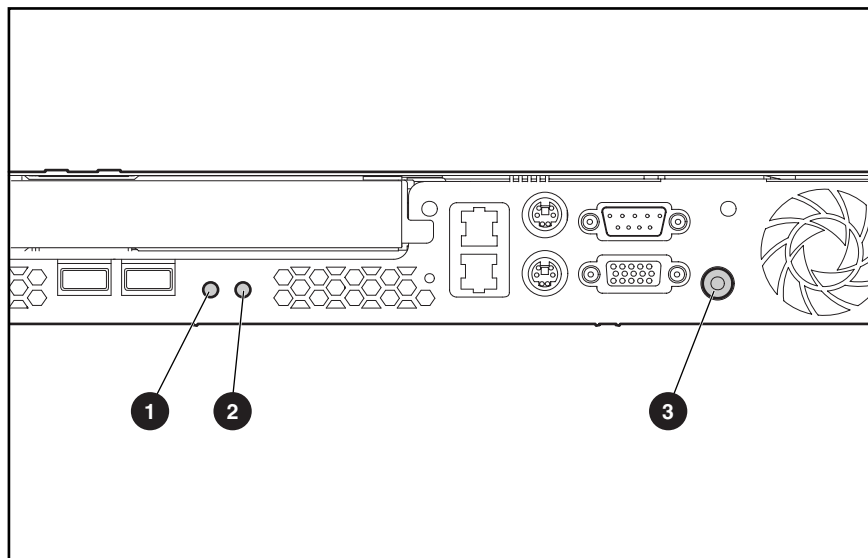
continued

Table 4-7: Front Panel LEDs *continued*

Item	LED Description	Status
⑤	Drive activity	Green = Activity Off = No activity
⑥	Power On/Off	Green = Power on Amber = Power good Off = Power off
⑦	CD-ROM/DVD-ROM drive activity	Green = Activity Off = No activity

Rear Panel LED Indicators

The server rear panel contains three LEDs that allow monitoring of network activity and server identification.

**Figure 4-6: Rear panel LEDs****Table 4-8: Rear Panel LEDs**

Item	Description	Status
①	NIC 2 link/activity	On = Link Off = No link Blinking = Activity
②	NIC 1 link/activity	On = Link Off = No link Blinking = Activity
③	Rear unit identification	Blue = Activated Off = Deactivated

Internal LED Indicator

The Compaq ProLiant DL320 system board contains an internal power status LED for use during troubleshooting operations. When the LED is illuminated, adequate power is available to the system from the power supply. If the LED is not illuminated, either the power cord is not connected or the power supply has failed.

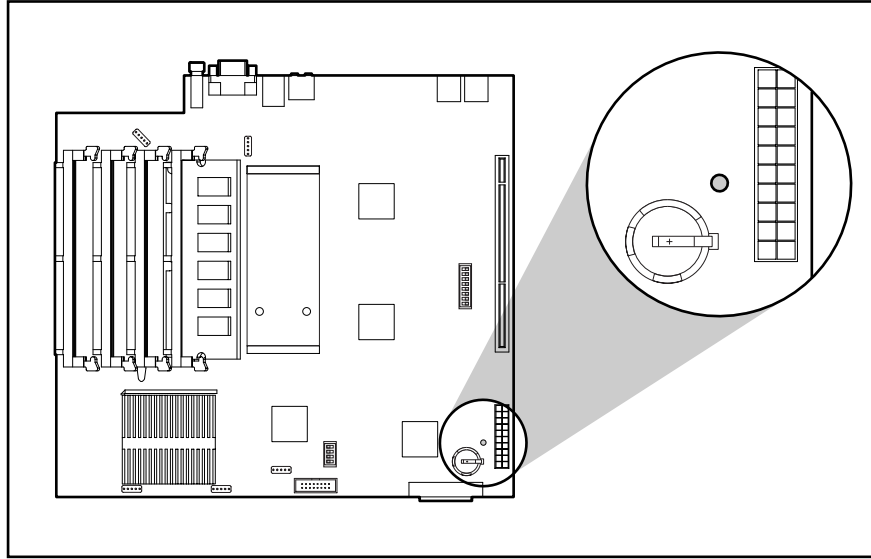


Figure 4-7: Power status LED

The power status LED is located next to the battery on the system board.

Specifications

This chapter provides operating and performance specifications for Compaq ProLiant DL320 server components and optional hardware including:

- System unit
- Power supply
- Memory
- CD-ROM/diskette drive assembly
 - Low-profile 1.44-MB diskette drive
 - Low-profile IDE CD-ROM drive
- DVD-ROM/diskette drive assembly
 - Low-profile 1.44-MB diskette drive
 - Low-profile IDE DVD-ROM drive
- Single Channel Wide Ultra2 SCSI controller module
- Ultra ATA/100 controller module
- Optional hard drives
 - Ultra3 SCSI hard drives
 - ATA hard drives
- Compaq NC3163 Fast Ethernet NICS10/100 Wake On LAN

System Unit

Table 5-1: System Unit Specifications

Item	Description
Height	1.67 inch (4.24 cm)
Depth	21.5 inch (54.6 cm)
Width	16.75 inch (42.55 cm)
Weight (configured with two SCSI hard drives, four DIMM modules, and a PCI expansion board)	24.58 lb (11.15 kg)
U.S. and international input voltage requirements	
Rated input voltage	100-200/200-240 VAC
Rated input frequency	50/60 Hz
Rated input current	2 A, 1 A (100 to 120 VAC, 200 to 240 VAC)
Rated steady-state power	151 W
Maximum peak power	200 W (for max. duration of two minutes)
BTUs	682 BTU/hr
Temperature range	
Operating	10° to 35°C (50° to 95°F)
Non-operating	Shipping: -40° to 60°C (-40° to 140°F)
	Storage: -20° to 60°C (-4° to 140°F)
Maximum wet-bulb temperature	28°C (82°F)

Power Supply

Table 5-2: Power Supply Specifications

Item	Description
Input voltage specifications	
Rated input voltage	100 VAC to 240 VAC
Rated input line	180 VAC to 264 VAC (90 VAC to 132 VAC)
Frequency range	47 to 63 Hz
Rated input power	298 W
Rated input current	3.3 A, 1.7 A (110 V, 220 V)
Steady state power	180 W
Maximum peak power	200 W for 2 minutes
Ambient temperature range	
Operating	5°C to 50°C (41°F to 122°F)
Non-operating	-40°C to 85°C (-40°F to 185°F)
Relative humidity (non-condensing)	
Operating	5% to 95%
Non-operating	5% to 95%
Dielectric voltage withstand	
Input to output	3000 VAC/minute
Input to ground	1500 VAC/minute
Maximum wet-bulb temperature	28°C (82°F)

Memory

Table 5-3: SDRAM DIMM Specifications

Item	Description
Size	64-, 128-, 256-, or 512-MB
Speed	133-MHz speed minimum
Width	72 bits
Upgrade requirement	Any combination of SDRAM DIMM (minimum 128 MB total memory required)
Note: Use only 64-, 128-, 256-, 512-MB, registered, 72-bit wide, 3.3-volt, registered ECC SDRAM. SDRAM must be 133 MHz or faster. Use Compaq SDRAM only.	

CD-ROM/Diskette Drive Assembly

Low-Profile 1.44-MB Diskette Drive

Table 5-4: Low-Profile 1.44-MB Diskette Drive Specifications

Item	Description
Size	3.5 inch (8.89 cm)
LED (front panel)	Green
Read/write capacity per diskette (high/low density)	1.44 MB/720 KB
Drives supported	1
Drive height	0.6 inch (1.52 cm)
Drive rotation	300 rpm
Transfer rate bits/sec (high/low)	500/250 Kb/s
Bytes/sector	512
Sectors/track (high/low)	18/9
Tracks/side (high/low)	80/80
Access times	
Track-to-track (high/low)	6 ms/3 ms
Access times	
Track-to-track (high/low)	6 ms/3 ms
Average (high/low)	174 ms/94 ms
Settling time	15 ms
Latency average	100 ms
Cylinders (high/low)	80/80
Read/write heads	2

Low-Profile IDE CD-ROM Drive

Table 5-5: Low-Profile IDE CD-ROM Drive Specifications

Item	Description
Applicable disk	CD-DA, CD-ROM (mode 1 and 2); CD-XA (mode 2, Form 1 and 2), CD-1 Ready; CD-Extra; Photo CD (single and multiple session); CDi ready
Capacity	550 MB (mode 1, 12 cm) 640 MB (mode 2, 12 cm)
Block size	2638, 2352 bytes (mode 0); 2352, 2340, 2336, 1024 bytes (mode 1); 2352, 2340, 2336, 2048, 1024 bytes (mode 2)
Dimensions	
Height	0.5 inch (1.27 cm)
Depth	5.12 inch (13.00 cm)
Width	5.16 inch (13.11 cm)
Weight	<11.98 oz (<340 g)
Data transfer rate	
Sustained	150 KB/s (sustained 1X)
Burst	2100-4800 KB/s
Access times (typical)	
Full stroke	<350 ms
Random	<150 ms
Disc diameter	4.7 inch, 3.15 inch (12 cm, 8 cm)
Disc thickness	.047 inch x .20 inch (0.12 cm, 0.51 cm)
Track pitch	1.6 μ m
Cache/buffer	128 KB
Startup time	<7s
Stop time	<4s (single); <30s (multi-session)
Laser parameters	
Type	Semiconductor Laser
Wave length	700 \pm 25nm
Divergence angle	53.5° \pm 1.5°
Output power	0.13 mW
Operating conditions	
Temperature	5° to 45°C (41° to 118°F)
Humidity	5% to 90% (10% to 80%)

DVD-ROM/Diskette Drive Assembly

Low-Profile 1.44-MB Diskette Drive

Table 5-6: Low-Profile 1.44-MB Diskette Drive Specifications

Item	Description
Size	3.5 inch (8.89 cm)
LED (front panel)	Green
Read/write capacity per diskette (high/low density)	1.44 MB/720 KB
Drives supported	1
Drive height	0.6 inch (1.52 cm)
Drive rotation	300 rpm
Transfer rate bits/sec (high/low)	500/250 Kb/s
Bytes/sector	512
Sectors/track (high/low)	18/9
Tracks/side (high/low)	80/80
Access times	
Track-to-track (high/low)	6 ms/3 ms
Average (high/low)	174 ms/94 ms
Settling time	15 ms
Latency average	100 ms
Cylinders (high/low)	80/80
Read/write heads	2

Low-Profile IDE DVD-ROM Drive

Table 5-7: Low-Profile IDE DVD-ROM Drive Specifications

Item	Description
Applicable disk formats	DVD (Single and Double Layer), DVD-5, DVD-9, DVD-10, DVD-R, CD-ROM (mode 1 and 2), CD-DA, CD-XA (mode 2, Form 1 and 2), CD-I (Mode 2, Form 1 & 2), CD-I Ready, CD-Bridge, CD-R, Photo CD (single and multiple session)
Disc Diameter	4.72 inch, 3.15 inch (12 cm, 8 cm)
Capacity	4.7 Gbytes (DVD-5) 8.5 Gbytes (DVD-9) 9.4 Gbytes (DVD-10) 550 MB (mode 1, 12 cm) 640 MB (mode 2, 12 cm) 180 MB (8 cm)
Disc Thickness	1.2 mm (CD-ROM) 1.2 mm (DVD-ROM)
Track Pitch	1.60 μ m (CD-ROM) 0.74 μ m (DVD-ROM)
Block size	Mode 0 2352 bytes Mode 1 2352, 2340, 2336, 2048 bytes Mode 2 2352, 2340, 2336, 2048 bytes DVD-ROM - 2048 bytes
Performance	
Access times (typical)	
Full stroke	DVD-ROM <300 ms, CD-ROM <200 ms
Random	DVD-ROM <180 ms, CD-ROM <120 ms
Data transfer rate (1KB = 1024 bytes)	150 KB/s (sustained 1X CD-ROM mode) 1552 – 3600 KB/s (24X CAV CD-ROM mode) 4463 – 10800 KB/s (8X CAV DVD-ROM mode)
Bus Rate	16.6 Mbytes/s (burst) with DMA support
Cache/buffer	128 KBytes (Minimum)
Startup time	<15s (typical)
Stop time	<4s (typical)
Dimensions	
Height	0.5 inch (1.27 cm)
Depth	5.12 inch (13.00 cm)
Width	5.16 inch (13.11 cm)
Weight	<12.35 oz (<350 g)
Operating conditions	
Temperature	5° to 55°C (41° to 131°F) / -30° to 60°C (-22° to 140°F)
Humidity	10% to 80% / 5% to 90%

Single Channel Wide Ultra2 SCSI Controller Module

Table 5-8: Single Channel Wide Ultra2 SCSI Controller Module Specifications

Item	Description
Temperature range (non-condensing)	
Operating	10° to 35°C (50° to 95°F)
Shipping	-20° to 50°C (-4° to 122°F)
Relative humidity (non-condensing)	
Operating	8% to 90%
Non-operating	5% to 95%
Maximum drives supported	Up to 15 per channel
Logical drives supported	15
Simultaneous drive transfer channels	1
Data transfer method	32-bit PCI bus master
Total transfer rate	80 MB/s
SCSI electrical interface	Low-voltage differential (LVD) and single-ended
PCI bus transfer rate (maximum)	133 MB/s
SCSI port connectors (internal)	68-pin Ultra3 SCSI connector
Protocol	Wide Ultra2 SCSI
Software upgradable firmware	Yes
Read cache	8 MB

Ultra ATA/100 Controller Module

Table 5-9: Ultra ATA/100 Controller Module Specifications

Item	Description
Temperature range (non condensing)	
Operating	0° to 70°C (32° to 158°F)
Shipping	-40° to 125°C (-40° to 257°F)
Relative humidity (non condensing))	
Operating	10% to 90%
Non operating	5% to 95%
Simultaneous drive transfer channels	2 channels
Transfer rate synchronous (Max)	100 MB/s
Data transfer method	32-bit PCI bus master
Drive support	Ultra ATA, EIDE & Fast ATA-2
PCI bus transfer rate (maximum)	133 MB/s
Data transfer modes	UDMA Modes 5/4/3/2/1/0, DMA Modes 2/1/0, PIO Modes 4/3/2/1/0
Protocol	ATA100 compatible
Feature	CRC (Cyclical Redundancy Check)
Buffer size	128 byte

Optional Hard Drives

Ultra3 SCSI Hard Drives

Table 5-10: Ultra3 SCSI Hard Drive Specifications

	9.1 GB	18.2 GB
Logical capacity	9100 MB	18209 MB
Height	Third, 1.0 inch (2.54 cm)	Third, 1.0 inch (2.54 cm)
Size	3.5 inch (8.89 cm)	3.5 inch (8.89 cm)
Interface	Ultra3 SCSI	Ultra3 SCSI
Transfer rate synchronous (maximum)	160 MB/s	160 MB/s
Single track	0.8 ms	0.8 ms
Average	5.4 ms	7.5 ms
Full stroke	12.2 ms	16.0 ms
Rotational speed	10,000 rpm	10,000 rpm
Bytes/sector	512	512
Logical blocks	17,773,524	35,556,080
Operating temperature		
Celsius	10° to 35°	10° to 35°
Fahrenheit	50° to 95°	50° to 95°

ATA Hard Drives

Table 5-11: ATA Hard Drive Specifications

	10 GB	20 GB
Logical capacity	10005 MB	20020 MB
Height	Third, 1.0 inch (2.54 cm)	Third, 1.0 inch (2.54 cm)
Size	3.5 inch (8.89 cm)	3.5 inch (8.89 cm)
Interface	ATA100	ATA100
Transfer rate synchronous (max)	100 MB/s	100 MB/s
Single track	0.8 ms	0.8 ms
Average	5.4 ms	7.5 ms
Full stroke	12.2 ms	16.0 ms
Rotational speed	7,200 \pm 0.1% rpm	7,200 \pm 0.2% rpm
Bytes/sector	512	512
Logical blocks	17,773,524	35,556,080
Operating temperature		
Celsius	10° to 35°	10° to 35°
Fahrenheit	50° to 95°	50° to 95°

Compaq NC3163 Fast Ethernet NIC 10/100 Wake On LAN

Table 5-12: Compaq NC3163 Fast Ethernet NIC 10/100 Wake On LAN Specifications

Operating speed	10/100 Mbits/s
Transfer rate (PCI bus)	133 MB/s
Data transfer method	32-bit PCI bus master
Temperature range	
Operating	0° to 55°C (32° to 131°F)
Non-operating	-65° to 85°C (-85° to 185°F)
Relative humidity (non-condensing)	
Operating	10% to 90%
Non-operating	5% to 95%
Power required	195 mA@5V max
Emissions standards	FCC class A
Safety compliance	CE Mark

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