

ProLiant DL360 Server

Maintenance and Service Guide

Part Number 169616-006

Spare Part Number 173840-001

January 2002 (Sixth Edition)

COMPAQ

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Compaq ProLiant DL360 Server Maintenance and Service Guide

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Contents

About This Guide

Symbols in Text.....	vii
Important Safety Information	vii
Compaq Technician Notes.....	vii
Where to Go for Additional Help	viii
Integrated Management Log	viii
Telephone Numbers	ix
Text Conventions.....	ix

Chapter 1

Illustrated Parts Catalog

Mechanical Parts Exploded View.....	1-2
Mechanical Spare Parts List	1-2
System Components Exploded View	1-3
System Components Spare Parts List	1-3

Chapter 2

Removal and Replacement Procedures

Electrostatic Discharge Information	2-1
Symbols on Equipment.....	2-2
Rack Warnings and Precautions	2-3
Server Warnings and Precautions	2-3
Preparation Procedures	2-4
Hot-Plug Devices	2-4
Non-Hot-Plug Devices	2-4
Powering Down the Server.....	2-5
Storage Devices	2-7
External Storage Devices.....	2-7
ProLiant DL360 Server Drives	2-8
Drive Locations	2-8
Shipping/Ejector Key.....	2-9
CD-ROM/Diskette Drive Assembly	2-10
DVD-ROM/Diskette Drive Assembly.....	2-12
Bezel Blank.....	2-14
Hot-Plug SCSI Hard Drive Blank.....	2-15
Hot-Plug SCSI Hard Drives.....	2-16
Server Access Panel.....	2-17
SCSI Backplane	2-18
PCI Riser Board Assembly	2-20

Expansion Board (32-Bit Slot).....	2-22
Expansion Board (64-Bit Slot).....	2-23
Internal Smart Array/SCSI Controller Interface Assembly.....	2-25
Air Baffle.....	2-26
Fan Assembly.....	2-27
AC Power Cord and Filter.....	2-28
Power Supply.....	2-30
Cable Protector.....	2-31
CD-ROM (DVD-ROM)/Diskette Drive Assembly Backplane.....	2-32
User Interface Board.....	2-34
Memory.....	2-35
SDRAM DIMMs.....	2-36
Processors.....	2-38
Integrated Smart Array Controller.....	2-41
Battery.....	2-43
System Board.....	2-45

Chapter 3

Cable Routing Diagrams

CD-ROM (DVD-ROM)/Diskette Drive Assembly Backplane Cabling.....	3-1
Optional Smart Array/SCSI Controller Cabling.....	3-2
Optional Remote Insight Lights-Out Edition Cabling.....	3-3

Chapter 4

Diagnostics and Troubleshooting

Diagnostic Tools Utility Overview.....	4-2
Default Configuration.....	4-5
Default Configuration Messages.....	4-5
Inspect Utility.....	4-5
Utilities Access.....	4-6
Running Compaq Utilities.....	4-6
Power-On Self-Test (POST).....	4-8
POST Error Messages.....	4-8
Diagnostics Software.....	4-28
Steps for Diagnostics.....	4-28
100 – 199, Primary Processor Test Error Codes.....	4-29
200 – 299, Memory Test Error Codes.....	4-31
300 – 399, Keyboard Test Error Codes.....	4-33
400 – 499, Parallel Printer Test Error Codes.....	4-33
500 – 599, Graphics Display Unit Test Error Codes.....	4-34
600 – 699, Diskette Drive Test Error Codes.....	4-35
1100 – 1199, Serial Test Error Codes.....	4-36
1200 – 1299, Modem Communications Test Error Codes.....	4-36
6000 – 6099, Compaq NIC Boards Test Error Codes.....	4-37
6500 – 6599, SCSI Hard Drive Test Error Codes.....	4-37
6600 – 6699, SCSI/IDE CD-ROM Drive Test Error Codes.....	4-38
6700 – 6799, SCSI Tape Drive Test Error Codes.....	4-38
8600 – 8699, Pointing Device Interface Test Error Codes.....	4-39
Array Diagnostic Utility (ADU).....	4-39
Starting ADU.....	4-39

Integrated Management Log.....	4-50
Multiple Ways of Viewing the Log.....	4-50
Event List	4-52
Event Messages	4-53
Rapid Error Recovery	4-55
Automatic Server Recovery-2.....	4-55
ASR-2 Integrated Management Log Messages.....	4-67
Storage Fault Recovery Tracking.....	4-70
Storage Automatic Reconstruction.....	4-70
Network Interface Fault Recovery Tracking.....	4-70
Memory Fault Recovery Tracking	4-70
Remote Service Features	4-71
ROMPaq Error Recovery Options	4-71
ROMPaq Disaster Recovery	4-72
Compaq Insight Manager.....	4-73
Features of Compaq Insight Management.....	4-73
Compaq Insight Management Software Architecture	4-74

Chapter 5

Connectors, Switches, and Status Indicators

Connectors	5-1
Rear Panel Connectors	5-2
Riser Board Expansion Slots.....	5-3
System Board Components	5-4
System Board Switches	5-5
System Identification Switch (SW1).....	5-6
System Configuration Switch (SW2).....	5-6
Non-Maskable Interrupt (NMI) Switch	5-7
Status LED Indicators.....	5-8
Front Panel Status LED Indicators.....	5-9
Rear Panel Status LED Indicators.....	5-10
Hot-Plug SCSI Hard Drive Status LED Indicators	5-11
Low-Profile IDE CD-ROM (DVD-ROM) Drive Status LED	5-13
System Board Status LED Indicators.....	5-14

Chapter 6

Specifications

System Unit	6-2
Power Supply.....	6-3
Memory.....	6-4
CD-ROM/Diskette Drive Assembly	6-4
Low-Profile 1.44-MB Diskette Drive	6-4
Low-Profile IDE CD-ROM Drive.....	6-5
DVD-ROM/Diskette Drive Assembly.....	6-6
Low-Profile 1.44-MB Diskette Drive	6-6
Low-Profile IDE DVD-ROM Drive.....	6-7
Wide Ultra2 SCSI Hot-Plug Hard Drive	6-8
Integrated Smart Array Controller.....	6-9
NC3163 Embedded 10/100 Fast Ethernet NIC Controller (Wake On LAN)	6-10
Smart Array 4200 Controller	6-11

NC3131 Fast Ethernet NIC 64 PCI Dual Base 10/100..... 6-12

Index

About This Guide

This maintenance and service guide is a troubleshooting guide that can be used for reference when servicing the Compaq ProLiant DL360 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.

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 and a spare parts list for the Compaq *ProLiant*[™] DL360 server. See Table 1-1 and Table 1-2 for the names of referenced spare parts.

Mechanical Parts Exploded View

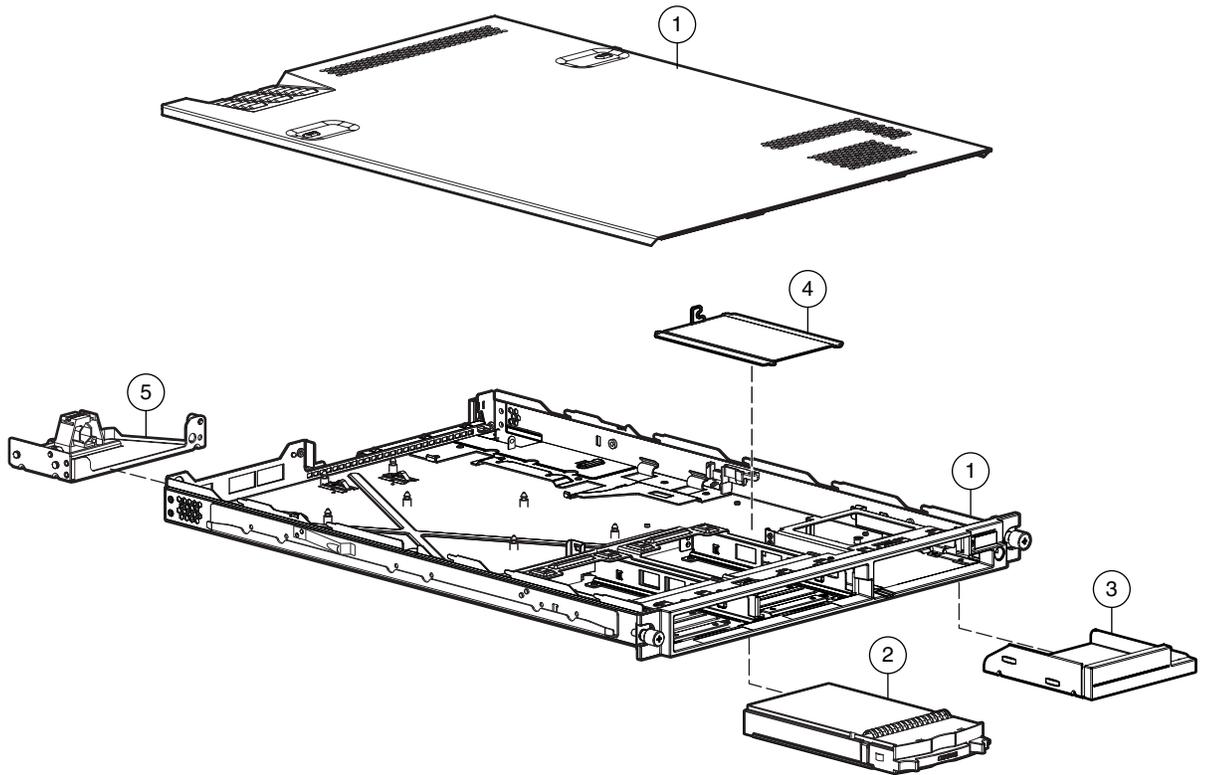


Figure 1-1: Mechanical parts exploded view

Mechanical Spare Parts List

Table 1-1: Mechanical Spares Parts List

Item	Description	Spare Part Number
1	Chassis with access panel	173838-001
2	Hard drive blank	122759-001
3	Bezel blank	173846-001
4	Cable protector	173844-001
5	Fixed cable tray	173839-001

System Components Exploded View

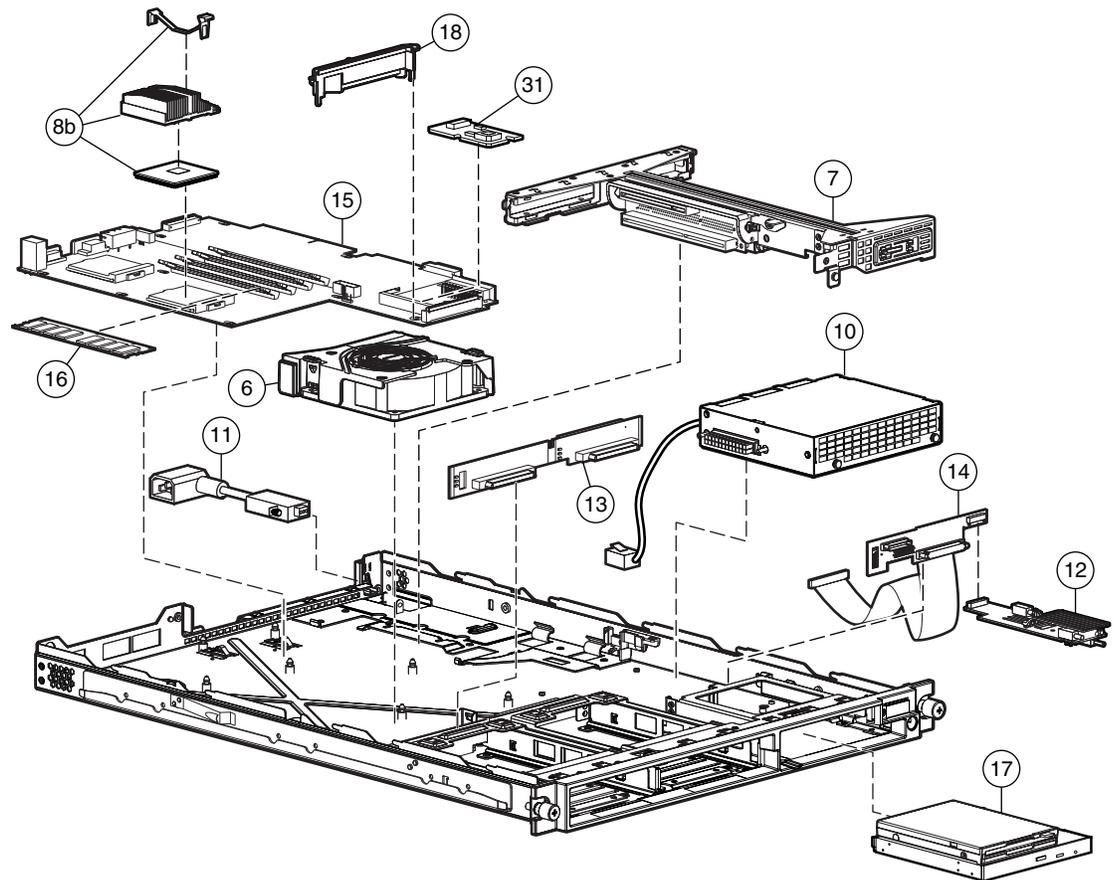


Figure 1-2: System components exploded view

System Components Spare Parts List

Table 1-2: System Components Spare Parts List

Item	Description	Spare Part Number
System Components		
6	Fan assembly	173826-001
7	PCI riser board assembly	173827-001

continued

Table 1-2: System Components Spare Parts List

Item	Description	Spare Part Number
8	a) Pentium III 550-MHz processor, clip, and heatsink, with thermal pad *	173835-001
	b) Pentium III 800-MHz processor, clip, and heatsink, with thermal pad	173836-001
	c) Pentium III 866-MHz processor, clip, and heatsink, with thermal pad *	203524-001
	d) Pentium III 933-MHz processor, clip, and heatsink, with thermal pad *	218262-001
	e) Pentium III 1.0-GHz processor, clip, and heatsink, with thermal pad *	224927-001
	f) Pentium III 1.13- GHz processor, clip, and heatsink with thermal pad *	238905-001
	g) Pentium III 1.26 GHz processor, clip, and heatsink with thermal pad *	249095-001
9	Heatsink with thermal pad (550-MHz thru 933-MHz processor speeds)*	218271-001
	Heatsinks with thermal pads (1.0-GHz processor)*	230270-001
	Heatsinks with thermal pads (1.13-GHz or 1.26-GHz processor)*	249096-001
10	Power supply, 190 W	173828-001
11	AC power cord and filter, with bracket and screw	173832-001
Boards		
12	User interface board	173831-001
13	SCSI backplane	173829-001
14	CD-ROM (DVD-ROM)/diskette drive assembly backplane	173830-001
15	a) System board (933-MHz and below) with (2) heatsinks with thermal pads	173837-001
	b) System board (1.0-GHz) with (2) heatsinks with thermal pads *	224928-001
	c) System board (1.13-GHz) with (2) heatsinks with thermal pads *	239120-001
	d) System board (1.26-GHz) with (2) heatsinks with thermal pads *	239120-001
16	128-MB registered 133-MHz SDRAM DIMM	159226-001
17a	CD-ROM/diskette drive assembly *	173834-001
	Low-profile 1.44-MB diskette drive	—
	Low-profile IDE CD-ROM drive	—
17b	DVD-ROM/diskette drive assembly *	269046-001
	Low-profile 1.44-MB diskette drive	—
	Low-profile IDE DVD-ROM drive	—
18	Plastics kit	173846-001
	Air baffle	—
	Shipping/ejector key *	—
	Front bezel *	—
	Remote Insight Lights-Out Edition interface cable *	—

continued

Table 1-2: System Components Spare Parts List

Item	Description	Spare Part Number
19	Upgrade kit *	218263-001
	SCSI grounding clip	—
	EMI gaskets	—
20	Hardware kit *	173844-001
	System board thumbscrew	—
	Cable protector	—
	Vertical PDU brackets (2)	—
21	Rack-mounting kit (fixed rack rails) *	173845-001
22	Replacement battery, 3-V lithium *	234556-001
23	PCI slot cover *	271918-001
24	Return kit *	173842-001
25	Country kit *	177851-001
26	Maintenance and service guide *	173840-001
27	64-MB registered 133-MHz SDRAM DIMM *	159225-001
28	256-MB registered 133-MHz SDRAM DIMM *	159304-001
29	512-MB registered 133-MHz SDRAM DIMM *	159227-001
30	1-GB registered 133-MHz SDRAM DIMM *	163902-001
Controllers		
31	Integrated Smart Array Controller	158855-001
Options		
32	Internal Smart Array/SCSI controller interface (cable) assembly *	173833-001
33	Remote Insight Lights-Out Edition *	158731-001
34	Sliding rails and cable management system kit *	177852-001
35	Telco rack-mounting kit *	177853-001
36	Third-party cabinet rack-mounting kit *	177854-001
37	Desktop/stackable chassis kit *	176938-001
38	AC “Y” power cord *	178129-001
Note: * Not shown		

Removal and Replacement Procedures

This chapter provides subassembly/module-level removal and replacement procedures for Compaq ProLiant DL360 servers. After completing all necessary removal and replacement procedures, run the Diagnostics program to verify that all components operate properly.

The following is recommended:

- The shipping/ejector key
- From the Compaq *SmartStart*[™] and Support Software CD:
 - System Configuration Utility software
 - 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 necessary precautions 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 and properly grounded tools and equipment.
- Keep the work area free of nonconductive materials such as ordinary plastic assembly aids and foam packing.
- Always be properly grounded when touching a static-sensitive component or assembly.
- Avoid touching pins, leads, or circuitry.
- Always place drives PCB assembly-side down.
- Use conductive field service tools.

Symbols on Equipment



25 kg
55 lb

Any product or assembly marked with these symbols indicates that the component exceeds the recommended weight for one individual to handle safely.

WARNING: To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manual material handling



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.



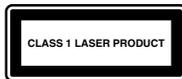
To reduce the risk of injury from electric shock hazards, do not open this enclosure.

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 and Precautions



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, but 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.



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 DL360 server must always be operated with the system access panel closed. Proper cooling will not be achieved if the system access panel is removed.

Preparation Procedures

Before beginning to remove any serviceable parts, determine whether the part is a hot-plug device or non-hot-plug device.

Hot-Plug Devices

ProLiant DL360 servers support only hot-plug SCSI hard drives.

IMPORTANT: It is not necessary to turn off the server to replace hot-plug hard drives when they not in active use.

Non-Hot-Plug Devices

If the part is a non-hot-plug device, you must power down the server before servicing the component. Non-hot-plug parts include the processors, all boards, DIMMs, the fan assembly, and the CD-ROM/diskette drive assembly.

Powering Down the Server

System power in ProLiant DL360 servers does not completely shut off with the front panel Power On/Standby switch. The switch toggles between on and standby modes, rather than on and off. The standby position removes power from most electronics and the drives, but portions of the power supply and some internal circuitry remain active. To completely remove all power from the system, you must 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: If the server is removed from the rack for device accessibility, remove the server from the rack and place it on a sturdy table or workbench. Refer to the *Compaq ProLiant DL360 Setup and Installation Guide* for further information on working with racks.



CAUTION: The system power in the server does not completely shut off from the front Power On/Standby switch. Moving the switch from on to standby leaves some portions of the power supply and some internal circuitry 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” earlier in this chapter.

To power down the server:

1. Shut down the operating system as directed in your operating system instructions.
2. Press the Front Unit Identification switch ❶ on the server front panel to illuminate the Front Unit Identification switch LED ❷. The Rear Unit Identification LED switch illuminates on the server rear panel.
3. Press the server Power On/Standby switch ❸ to place the server in standby mode. The Power LED ❹ turns to amber when standby power mode is activated.

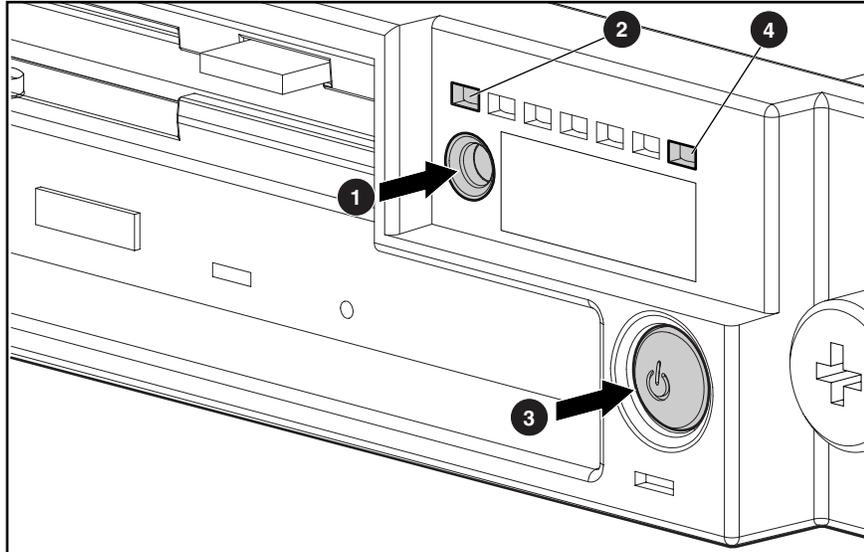


Figure 2-1: Locating the Front Unit Identification switch and LED, Power On/Standby switch, and Power LED

4. At the rear of the server, locate the illuminated Rear Unit Identification LED switch that identifies the server you are servicing ❶.

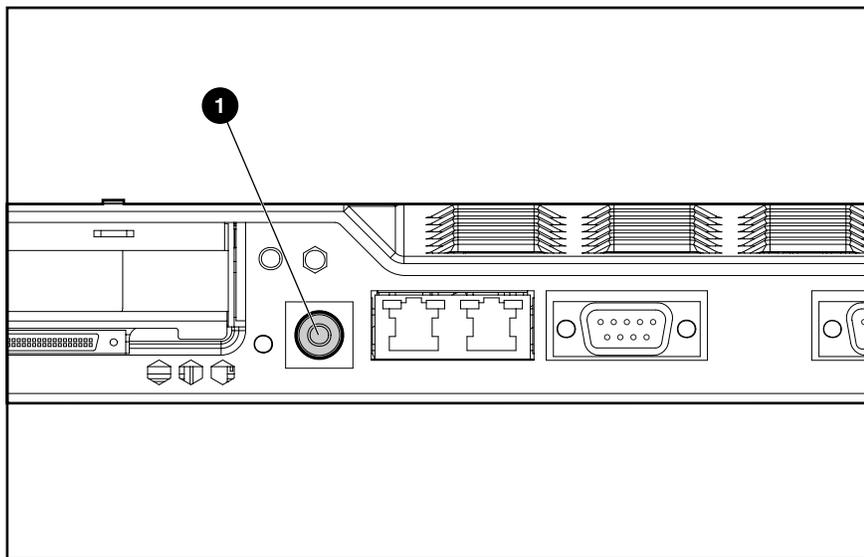


Figure 2-2: Rear Unit Identification LED switch

5. Disconnect the power cord.
6. Disconnect all remaining cables on the server rear panel.

Storage Devices

The ProLiant DL360 server supports up to four mass storage devices:

- Up to two 1-inch, hot-plug SCSI hard drives
- CD-ROM/diskette drive assembly containing:
 - Low-profile IDE CD-ROM drive
 - Low-profile 3.5-inch, 1.44-MB diskette drive
- DVD-ROM/diskette drive assembly containing:
 - Low-profile IDE DVD-ROM drive
 - Low-profile 3.5-inch, 1.44-MB diskette drive

External Storage Devices

You can connect optional tape devices to the ProLiant DL360 server by using the external SCSI port on the back of the unit.

ProLiant DL360 Server Drives

This section describes the drive cage positions, and removal and replacement procedures for parts of the ProLiant DL360 server.



CAUTION: The ProLiant DL360 server does not support IDE or EIDE hard drives.

Drive Locations

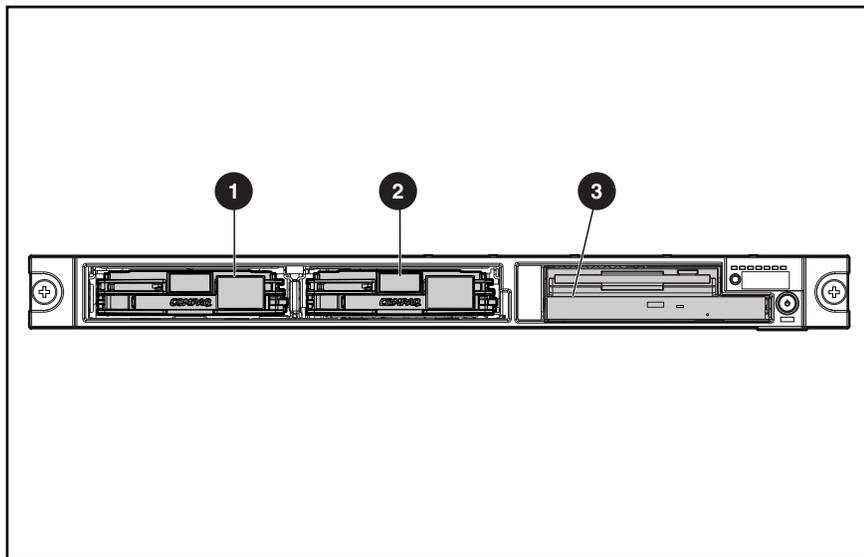


Figure 2-3: ProLiant DL360 server drive positions

Table 2-1: Drive Location

Location	Drive	SCSI ID
①	Hot-plug drive cage for 1-inch height hot-plug SCSI hard drive	0
②	Hot-plug drive cage for 1-inch height hot-plug SCSI hard drive	1
③	CD-ROM (DVD-ROM)/diskette drive assembly <ul style="list-style-type: none"> • Low-profile 3.5-inch, 1.44-MB diskette drive • Low-profile IDE CD-ROM (DVD-ROM) drive 	—

Shipping/Ejector Key

The ProLiant DL360 server includes 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 can be removed and used to eject the CD-ROM/diskette drive assembly, the DVD-ROM/diskette drive assembly, or the blank.



CAUTION: Always install the shipping/ejector key during shipping to prevent damage to the server.

IMPORTANT: Compaq recommends that you leave the shipping/ejector key stored inside the chassis unless your work environment requires frequent use of the ejection feature.

To remove the shipping/ejector key:

1. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
2. Remove the access panel. See “Server Access Panel” later in this chapter.
3. Remove the shipping/ejector key from its storage location.

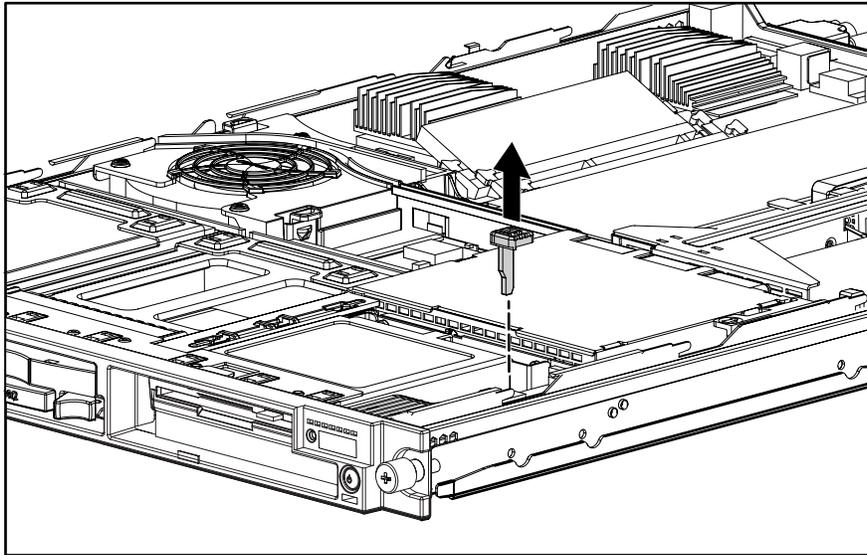


Figure 2-4: Remove the shipping/ejector key

4. Install the access panel and power on the server.

To replace the shipping/ejector key, reverse steps 1 through 4.

CD-ROM/Diskette Drive Assembly

To eject the CD-ROM/diskette drive assembly:

1. Power down the server. See “Powering Down the Server” earlier in this chapter.
2. Locate your shipping/ejector key. See “Shipping/Ejector Key” earlier in this chapter.
3. Insert the shipping/ejector key approximately 0.5 in (1.25 cm) into the CD-ROM/diskette ejector port on the lower right corner of the server front panel to eject the drives.

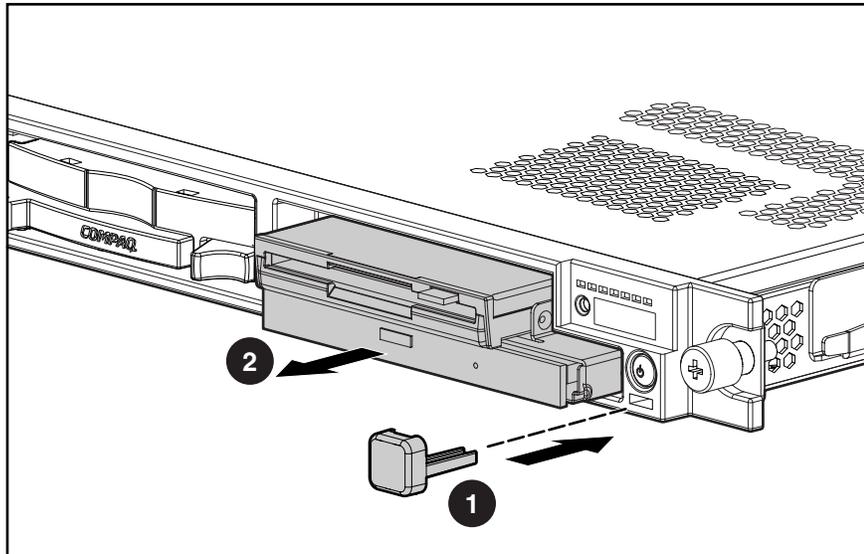


Figure 2-5: Ejecting the CD-ROM/diskette drive assembly



CAUTION: Do not operate the server without either the CD-ROM/diskette drive assembly or the bezel blank, because thermal damage can occur.

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

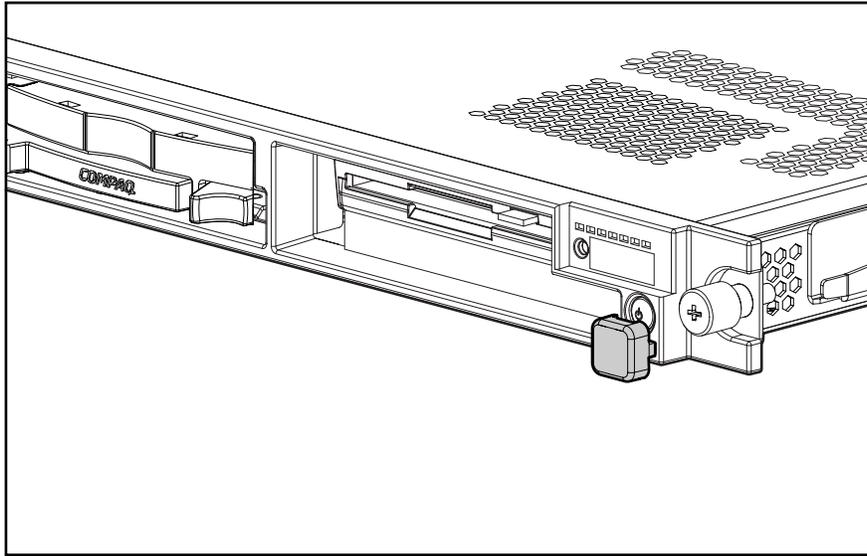


Figure 2-6: CD-ROM/diskette drive assembly fully seated

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.

NOTE: The key prevents accidental engagement of the Power On/Standby switch.

DVD-ROM/Diskette Drive Assembly

To eject the DVD-ROM/diskette drive assembly:

1. Power down the server. See “Powering Down the Server” earlier in this chapter.
2. Locate your shipping/ejector key. See “Shipping/Ejector Key” earlier in this chapter.
3. Insert the shipping/ejector key approximately 0.5 in (1.25 cm) into the DVD-ROM/diskette ejector port on the lower right corner of the server front panel to eject the drives.

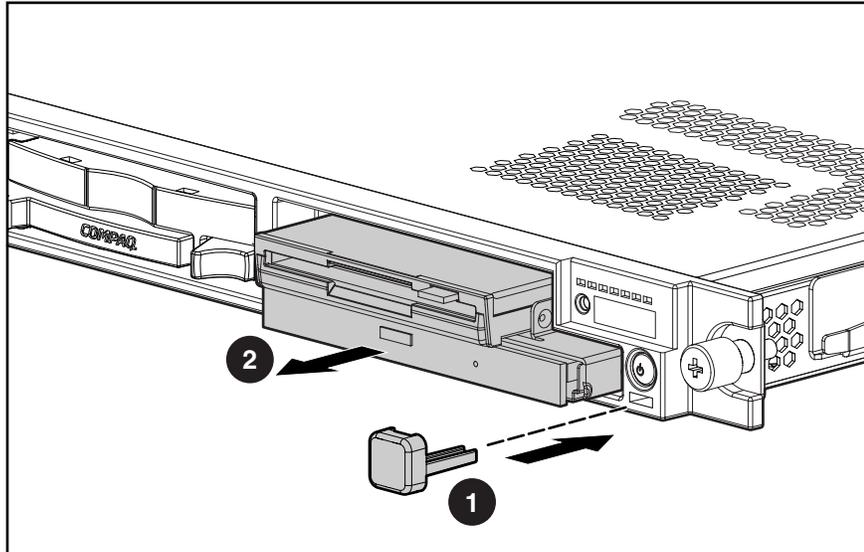


Figure 2-7: Ejecting the DVD-ROM/diskette drive assembly



CAUTION: Do not operate the server without either the DVD-ROM/diskette drive assembly or the bezel blank, because thermal damage can occur.

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

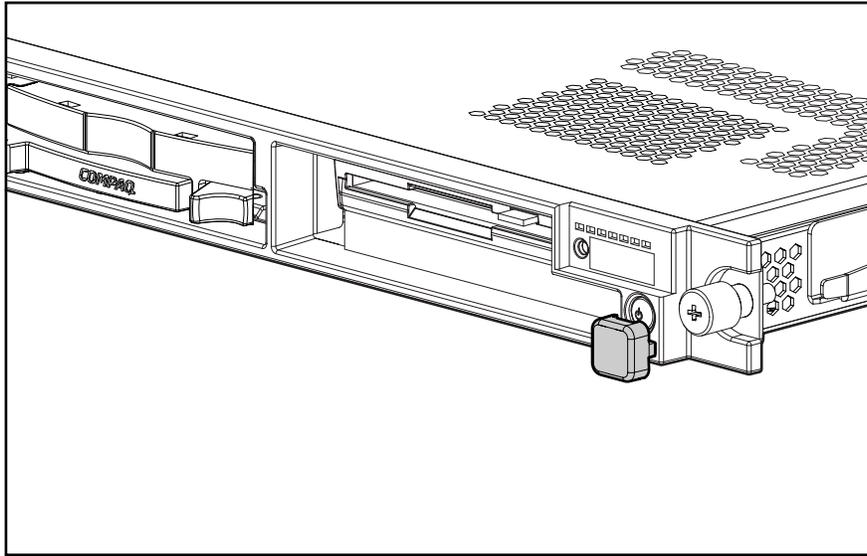


Figure 2-8: DVD-ROM/diskette drive assembly fully seated

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.

NOTE: The key prevents accidental engagement of the Power On/Standby switch.

Bezel Blank

To remove the bezel blank:

1. Power down the server. See “Powering Down the Server” earlier in this chapter.
2. Locate your shipping/ejector key. See “Shipping/Ejector Key” earlier in this chapter.
3. Insert the end of the shipping/ejector key approximately 0.5 in (1.25 cm) into the CD-ROM (DVD-ROM)/diskette ejector port on the lower right corner of the server front panel to eject the blank.

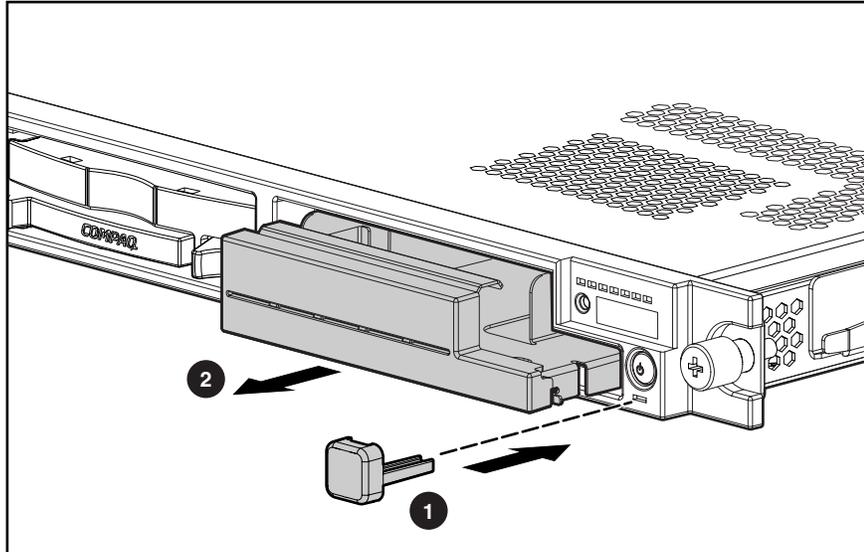


Figure 2-9: Removing the bezel blank

To replace the bezel blank, slide the blank into the empty bay until it locks into place.

Hot-Plug SCSI Hard Drive Blank

To remove a hot-plug SCSI hard drive blank:

1. Press the release button ❶.
2. Pull the blank out of the drive bay ❷.

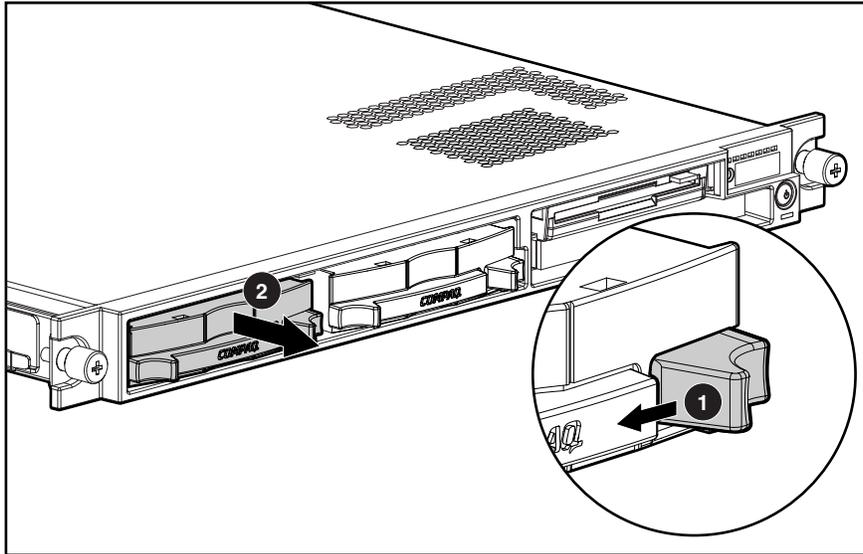


Figure 2-10: Removing a hard drive blank

To replace the blank, slide the blank into the bay until it clicks, locking into place.

Hot-Plug SCSI Hard Drives

To assess a hard drive's status, you must observe and understand the hot-plug SCSI hard drive status LEDs. For a detailed explanation of hard drive status LEDs, see Chapter 5, "Connectors, Switches, and Status Indicators."



WARNING: Read "Hot-plug Hard Drive Replacement Guidelines" in the *Compaq Servers Troubleshooting Guide* prior to removing a hard drive.

To remove a hot-plug SCSI hard drive:

1. Press the release button to unlock the lever on the hard drive ❶.
2. Pull the ejector lever to release the SCSI hard drive from the cage ❷.
3. Pull the drive to remove it from the cage ❸.

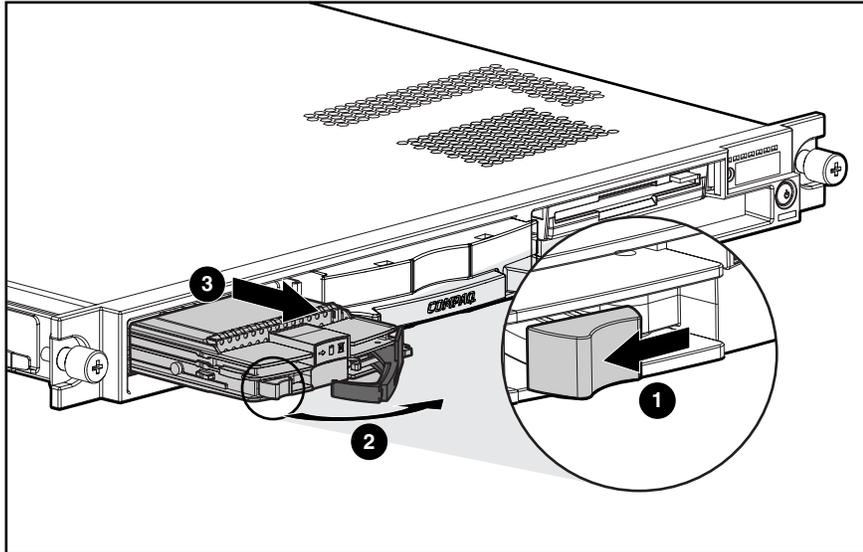


Figure 2-11: Removing a hot-plug SCSI hard drive

To replace the hard drive, slide the drive into the cage until it clicks, locking into place. Then, close the lever.

Server Access Panel

To remove the server access panel:

1. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
2. Press down on the hood latches **1**, and hold.
3. Holding the latches, slide the access panel toward the rear of the unit about 0.5 inch (1.25 cm) and lift to remove the panel **2**.

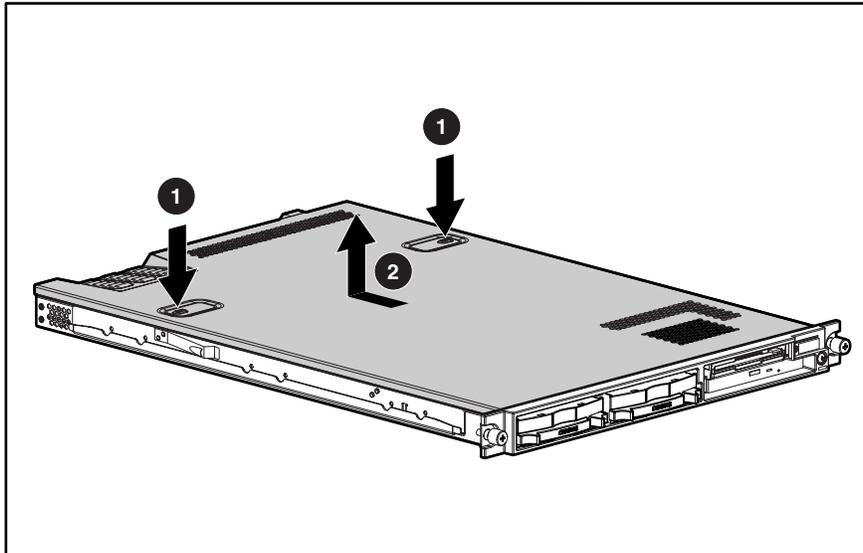


Figure 2-12: Removing the server access panel

Reverse steps 1 through 3 to replace the access panel.

SCSI Backplane

To remove the SCSI backplane:

1. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
2. Remove the access panel. See “Server Access Panel” earlier in this chapter.
3. Remove the hot-plug SCSI hard drives. See “Hot-Plug SCSI Hard Drives” earlier in this chapter.
4. Loosen the system board thumbscrew ❶ and remove the thumbscrew assembly ❷ that secures the SCSI backplane to the system board.

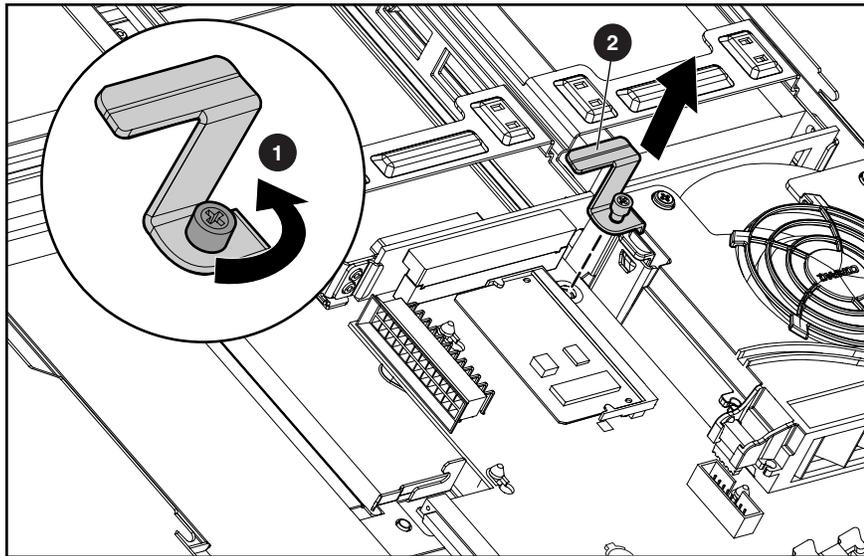


Figure 2-13: Removing the system board thumbscrew assembly

5. Carefully pull back and hold the plastic retaining clip ❶.
6. With the other hand, grasp the top center of the backplane, and pull up until the backplane unseats from SCSI port 2 ❷.

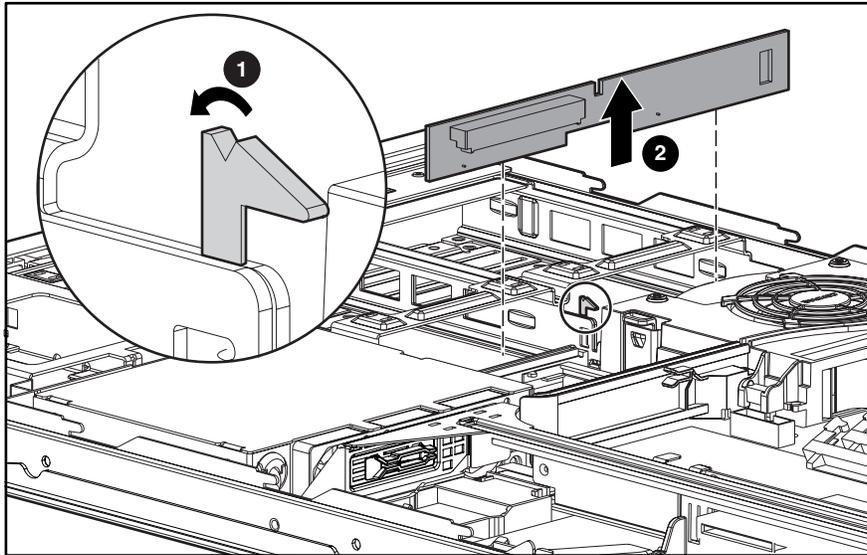


Figure 2-14: Removing the SCSI backplane

To replace the SCSI backplane, pull back on the retaining clip and insert the backplane until it seats firmly in SCSI port 2.

PCI Riser Board Assembly

To remove the PCI riser board assembly:

1. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
2. Remove the access panel. See “Server Access Panel” earlier in this chapter.
3. Disconnect any cables leading from any current expansion boards to the system board.
4. Lift the expansion board retaining lever.

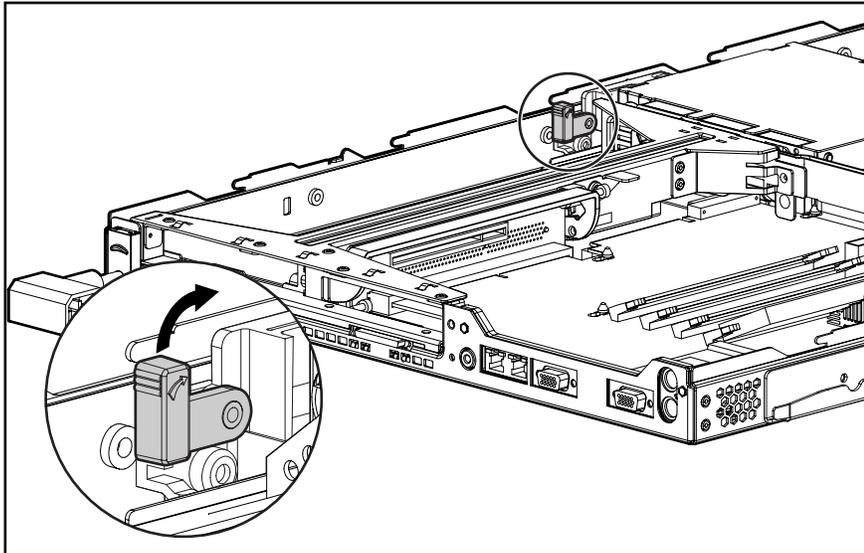


Figure 2-157: Lifting the expansion board retaining lever (expansion boards removed for clarity)

5. Unlock the PCI riser board assembly by disengaging the locking latch ❶.
6. Lift the PCI riser board assembly ejector ❷.
7. Slide the assembly toward the outside edge of the server to release the assembly from the server chassis ❸.
8. Lift the assembly from the server chassis ❹.

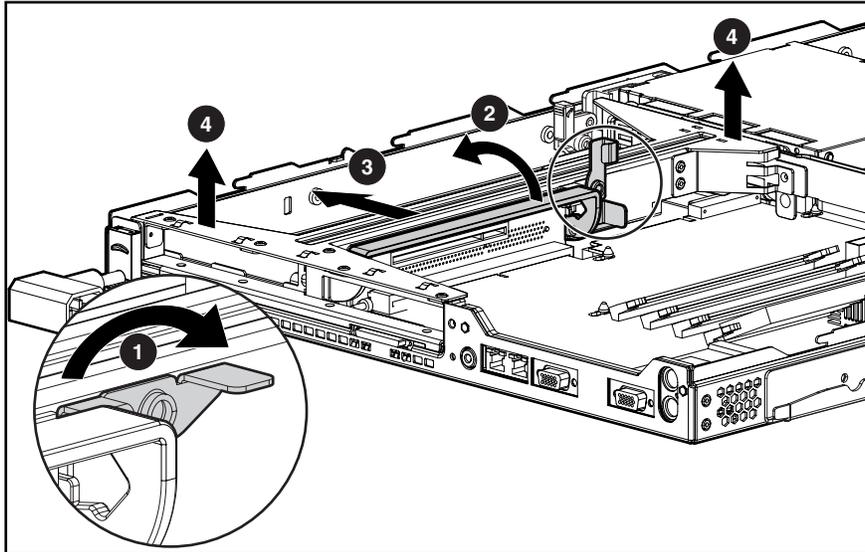


Figure 2-16: Removing the PCI riser board assembly (expansion boards removed for clarity)

Reverse steps 1 through 8 to replace the PCI riser board assembly.

Expansion Board (32-Bit Slot)

To remove an expansion board from the 32-bit slot:

1. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
2. Remove the access panel. See “Server Access Panel” earlier in this chapter.
3. Remove the PCI riser board assembly. See “PCI Riser Board Assembly” earlier in this chapter.
4. Slide the expansion board out of the 32-bit slot.

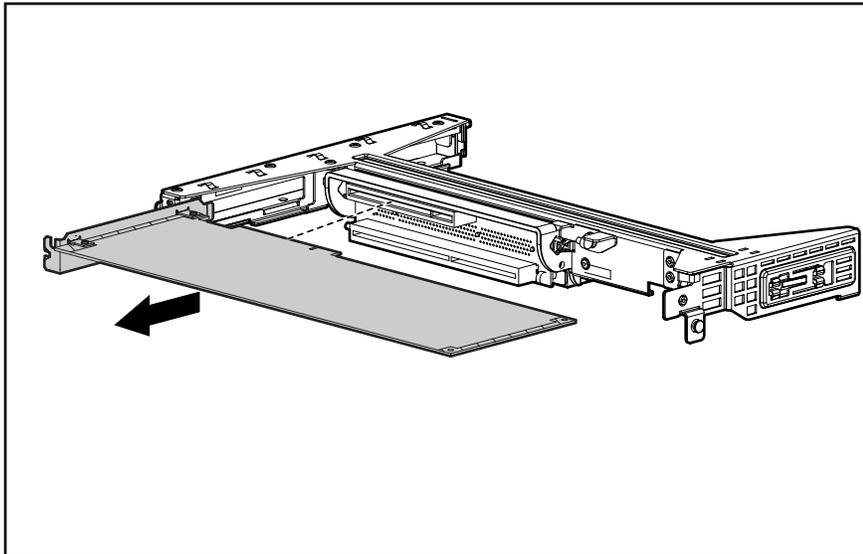


Figure 2-17: Removing an expansion board from the 32-bit expansion slot



CAUTION: Always ensure that an expansion board or expansion slot cover is installed before powering up and operating the server. Failure to install either an expansion board or expansion slot cover can lead to improper cooling and resulting thermal damage.

Reverse steps 1 through 4 to replace an expansion board in the 32-bit expansion slot, ensuring that the expansion board slides into the guiding groove, aligning with the slot.

Expansion Board (64-Bit Slot)

To remove an expansion board from a 64-bit slot:

1. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
2. Remove the access panel. See “Server Access Panel” earlier in this chapter.
3. Remove the PCI riser board assembly. See “PCI riser board assembly” earlier in this chapter.
4. Slide the expansion board retaining clip out from the assembly ❶.
5. Slide the expansion board out of the 64-bit expansion slot ❷.
6. Slide the expansion board retaining clip back into the assembly ❸.

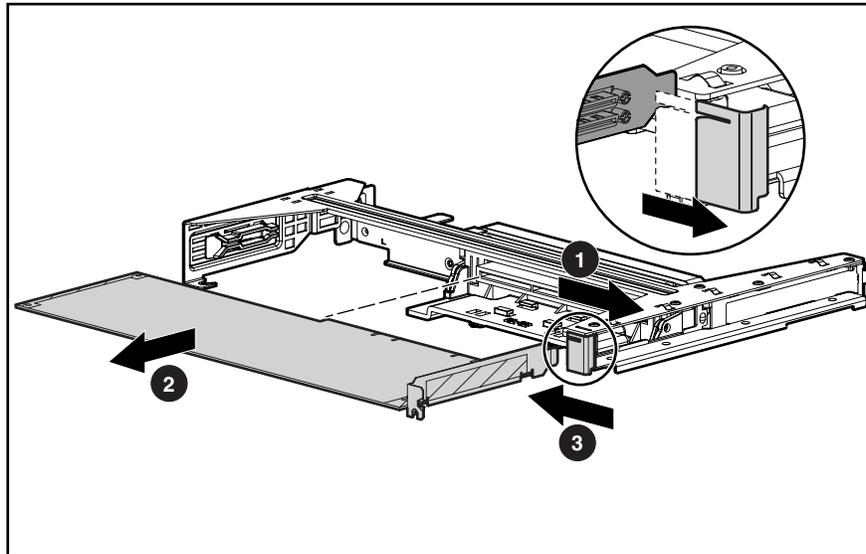


Figure 2-18: Removing an expansion board from the 64-bit expansion slot



CAUTION: Always ensure that an expansion board or expansion slot cover is installed before powering up and operating the server. Failure to install either an expansion board or expansion slot cover can lead to improper cooling and resulting thermal damage.

Reverse steps 1 through 6 to replace the expansion board in the 64-bit expansion slot, ensuring that the expansion board slides into the guiding groove **1**, aligning with the slot.

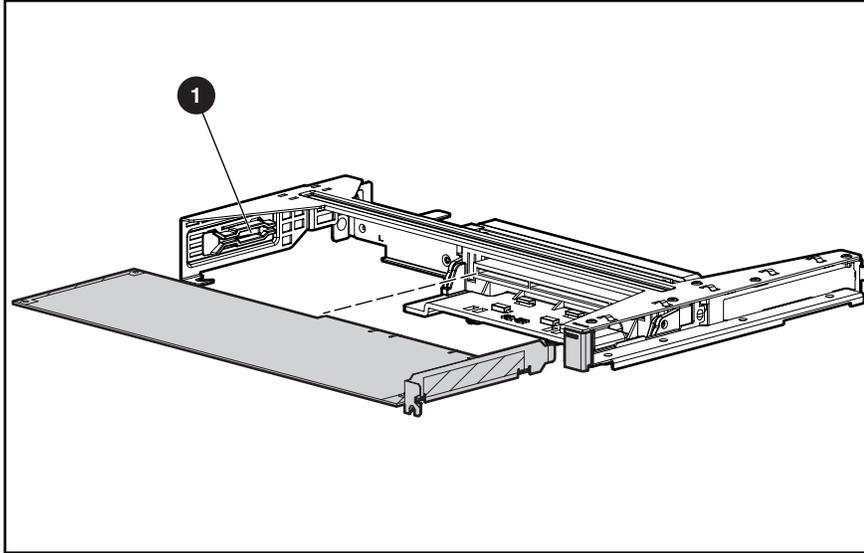


Figure 2-19: Replacing a 64-bit expansion board

Internal Smart Array/SCSI Controller Interface Assembly

To remove an optional Smart Array/SCSI controller interface assembly:

1. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
2. Remove the access panel. See “Server Access Panel” earlier in this chapter.
3. Disconnect the optional Smart Array/SCSI controller interface assembly cable from the expansion board ❶.



CAUTION: Always disconnect the Smart Array/SCSI controller interface assembly cable from the expansion board before removing the PCI riser board assembly. Failure to disconnect the cable may result in damage to the expansion board and the cable.

4. Remove the PCI riser board assembly. See “PCI Riser Board Assembly” earlier in this chapter.
5. Disconnect the optional Smart Array/SCSI controller interface assembly from the system board ❷.
6. Lift the locking tab on the interface assembly ❸.
7. Slide the assembly toward the rear of the server, unlocking it from the chassis, and lift to remove ❹.

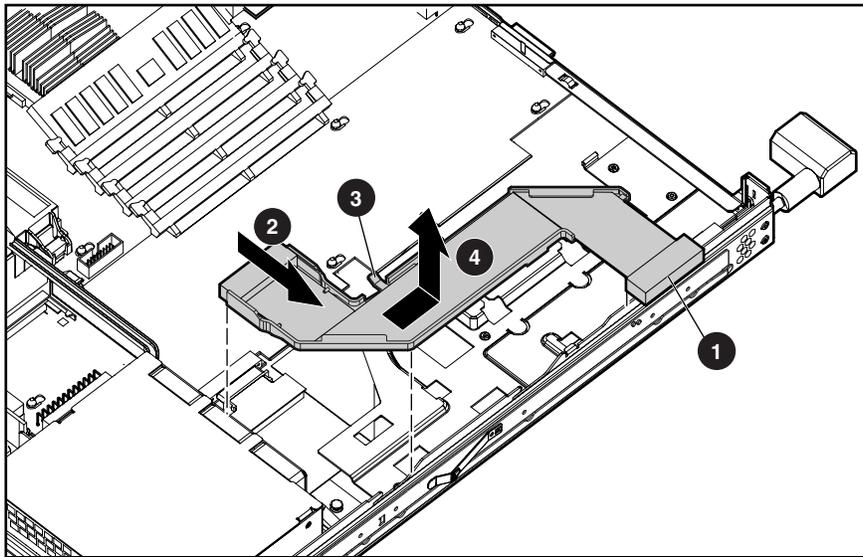


Figure 2-20: Removing the optional internal array controller interface assembly

Reverse steps 1 through 7 to replace the optional Smart Array/SCSI controller interface assembly.

Air Baffle

To remove the air baffle:

1. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
2. Remove the access panel. See “Server Access Panel” earlier in this chapter.



CAUTION: Always remove the PCI riser board assembly before removing the air baffle. Failure to remove the assembly may result in damage to expansion boards.

3. Remove the PCI riser board assembly. See “PCI Riser Board Assembly” earlier in this chapter.
4. Rotate the air baffle toward the power supply and lift.

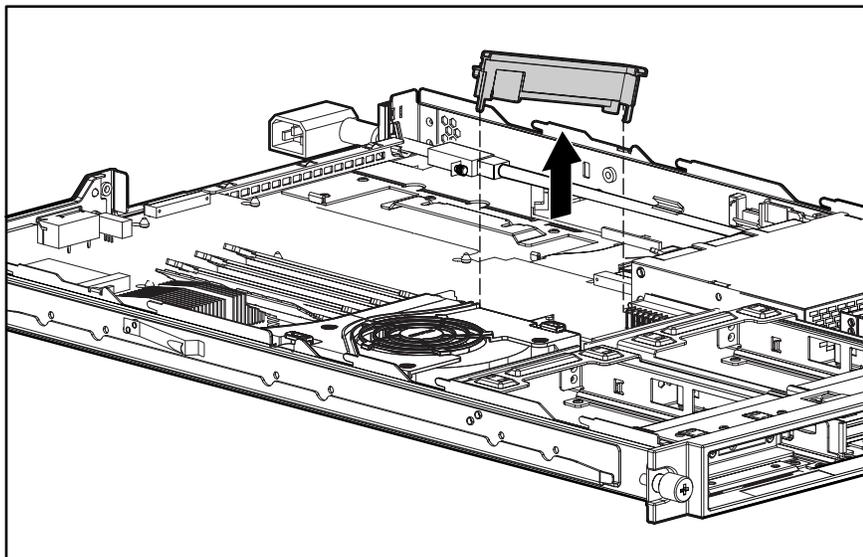


Figure 2-21: Removing the air baffle

Reverse steps 1 and 4 to replace the air baffle.

Fan Assembly

To remove the fan assembly:

1. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
2. Remove the access panel. See “Server Access Panel” earlier in this chapter.
3. Remove the PCI riser board assembly. See “PCI Riser Board Assembly” earlier in this chapter.
4. Remove the air baffle. See “Air Baffle” earlier in this chapter.
5. Press the retaining clips on both sides of the fan assembly ❶.
6. Lift the fan assembly vertically and remove it from the chassis ❷.

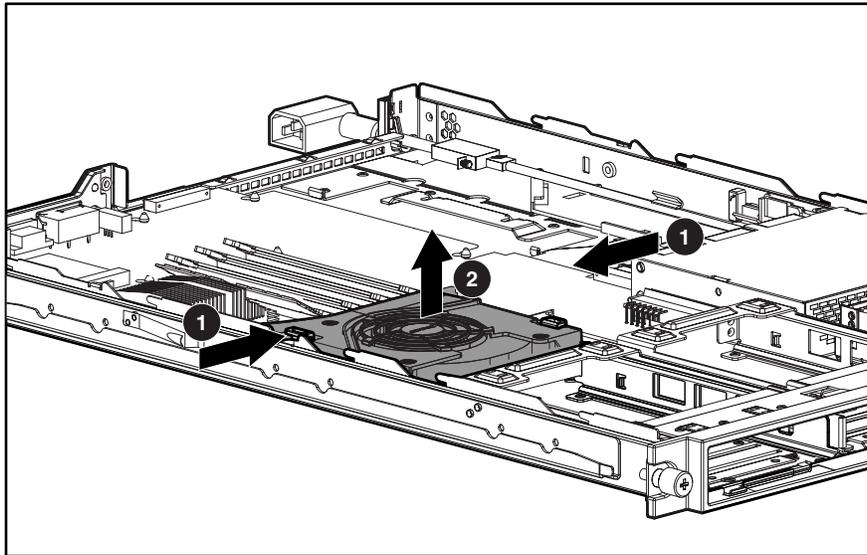


Figure 2-22: Removing the fan assembly

Reverse steps 1 through 6 to replace the fan assembly, ensuring that the fan locks into place.

AC Power Cord and Filter

To remove the AC power cord and filter:

1. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
2. Remove the access panel. See “Server Access Panel” earlier in this chapter.
3. Remove the PCI riser board assembly. See “PCI Riser Board Assembly” earlier in this chapter.
4. Loosen the thumbscrew that secures the AC power cord and filter ❶.
5. Slide the power cord retaining clip upward to free the AC power cord ❷.
6. Slide the AC power cord and filter free of the server and lay it over the edge of the chassis ❸.

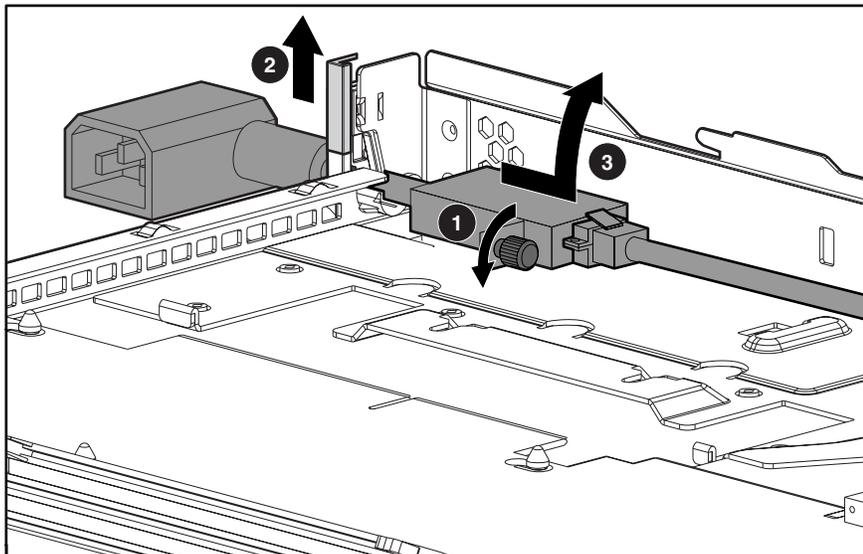


Figure 2-23: Loosening the AC power cord and filter

7. Use a T-10 screwdriver to remove the screw and bracket enclosing the power cord connector to the AC filter.

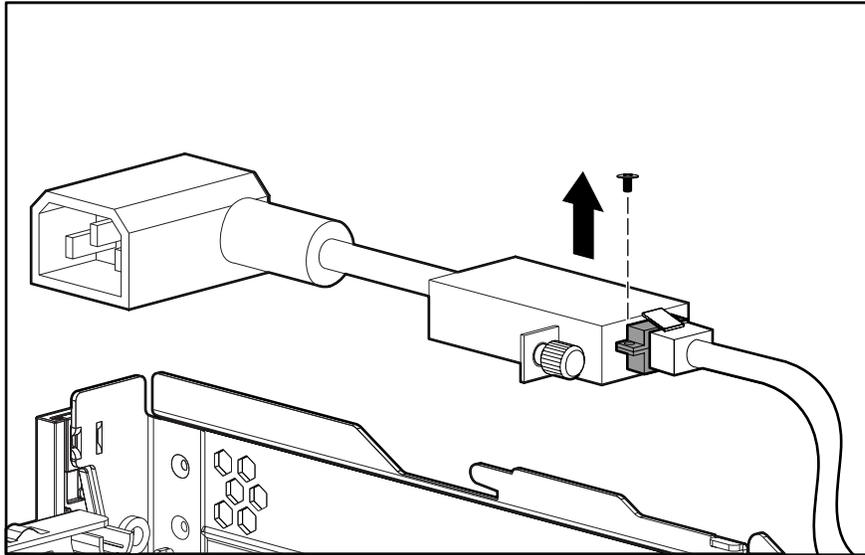


Figure 2-24: Removing the power cord connector bracket

8. Disconnect the AC power cord from the AC filter.
 - a. Push down on the internal power cord connector locking latch ❶.
 - b. Slide the internal power cord connector away from the filter ❷.

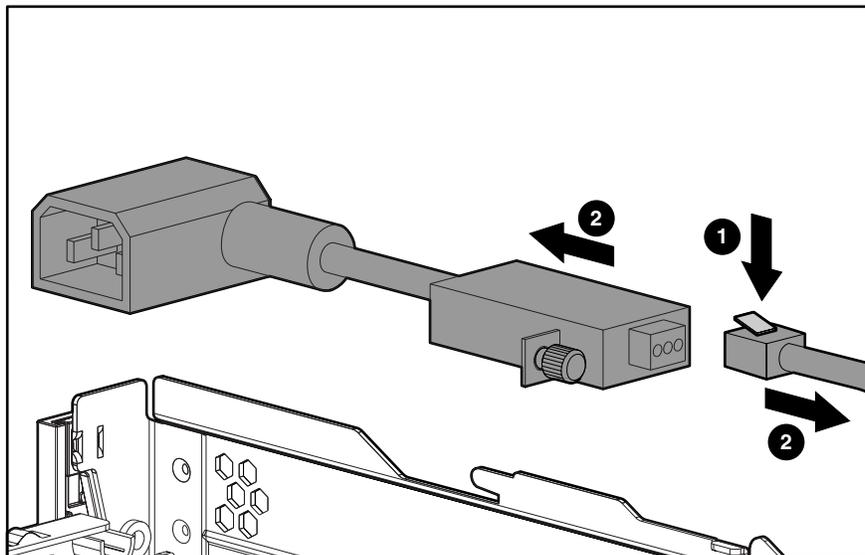


Figure 2-25: Disconnecting the power cord from the filter

Reverse steps 1 through 8 to replace the AC power cord and filter.

Power Supply

To remove the power supply:

1. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
2. Remove the access panel. See “Server Access Panel” earlier in this chapter.
3. Remove the PCI riser board assembly. See “PCI Riser Board Assembly” earlier in this chapter.
4. Remove the air baffle. See “Air Baffle” earlier in this chapter.
5. Remove the AC power cord and filter. See “AC Power Cord and Filter” earlier in this chapter.
6. Unfasten the AC power cord from its routing clips.
7. Lift the power supply retaining lever ❶.
8. Slide the power supply toward the outside edge of the server until it disengages from the system board connector ❷.
9. Tilt the outside edge of the power supply upward and lift to remove it from the chassis ❸.

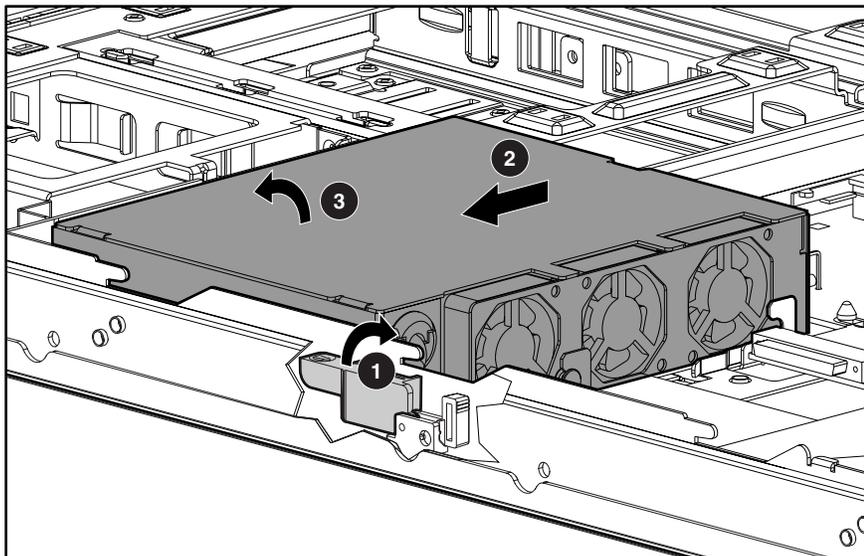


Figure 2-26: Removing the power supply

Reverse steps 1 through 9 to replace the power supply, ensuring to align the connector with the pins when inserting the power supply.

Cable Protector

To remove the cable protector:

1. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
2. Remove the access panel. See “Server Access Panel” earlier in this chapter.
3. Remove the PCI riser board assembly. See “PCI Riser Board Assembly” earlier in this chapter.
4. Remove the air baffle. See “Air Baffle” earlier in this chapter.
5. Remove the AC power cord and filter. See “AC Power Cord and Filter” earlier in this chapter.
6. Remove the power supply. See “Power Supply” earlier in this chapter.
7. If installed, remove the optional internal array controller interface assembly. See “Optional Internal Array Controller Interface Assembly” earlier in this chapter.
8. Slide the cable protector toward the rear of the server until the rear tabs are clear of the retaining sleeve ❶.
9. Lift the front edge of the cable protector and remove it from the chassis ❷.

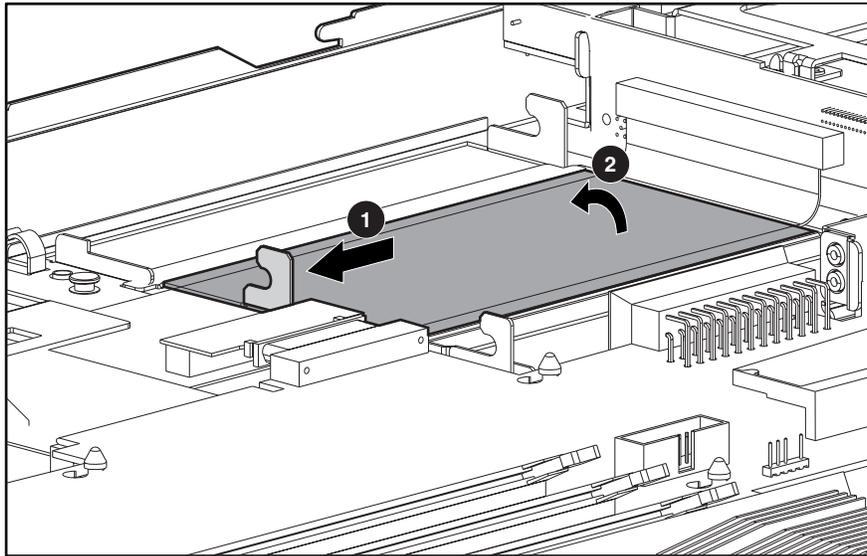


Figure 2-27: Removing the cable protector

Reverse steps 1 through 9 to replace the cable protector.

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

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

1. Remove the CD-ROM (DVD-ROM)/diskette drive assembly. See “CD-ROM/diskette Drive Assembly” or “DVD-ROM/diskette drive assembly” earlier in this chapter.
2. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
3. Remove the access panel. See “Server Access Panel” earlier in this chapter.
4. Remove the PCI riser board assembly. See “PCI Riser Board Assembly” earlier in this chapter.
5. Remove the air baffle. See “Air Baffle” earlier in this chapter.
6. Remove the AC power cord and filter. See “AC Power Cord and Filter” earlier in this chapter.
7. Remove the power supply. See “Power Supply” earlier in this chapter.
8. Remove the optional internal array controller interface assembly. See “Internal Smart Array/SCSI Controller Interface Assembly” earlier in this chapter.
9. Remove the cable protector. See “Cable Protector” earlier in this chapter.
10. Disconnect the 100-pin connector from the system board ❶.

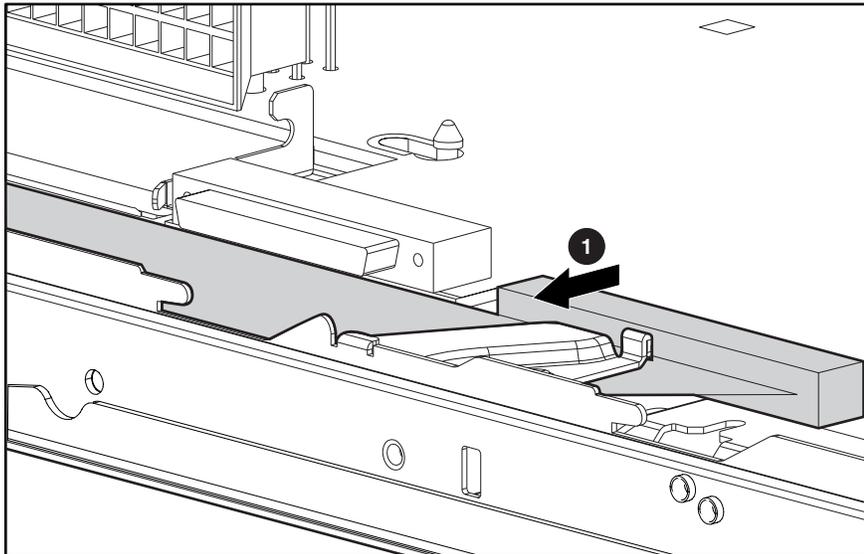


Figure 2-28: Disconnecting the 100-pin CD-ROM (DVD-ROM)/diskette drive assembly cable from the system board

11. Slide the cable from underneath the routing sleeve ❶.

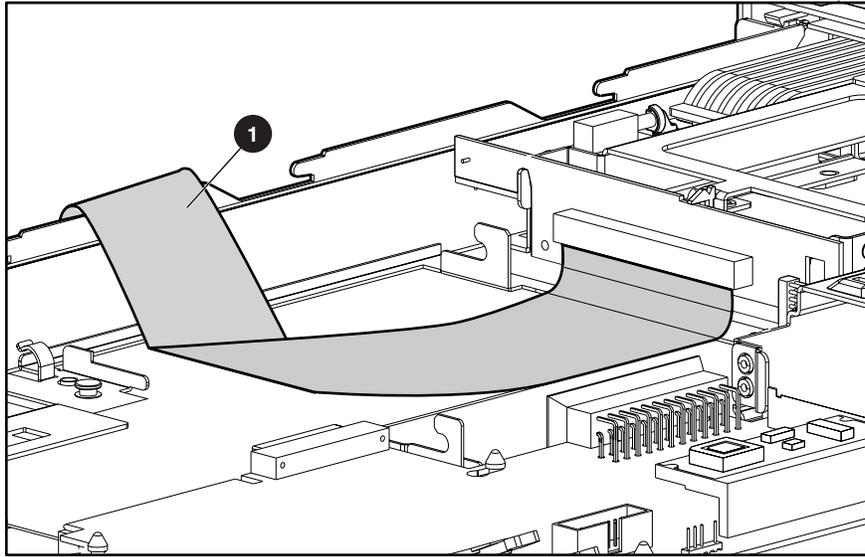


Figure 2-29: CD-ROM (DVD)/diskette drive assembly cable removed from routing sleeve

12. Carefully pull back and hold the plastic retaining clip ❶.
13. Lift the backplane vertically until it unseats from the user interface board and clears the guiding grooves ❷.

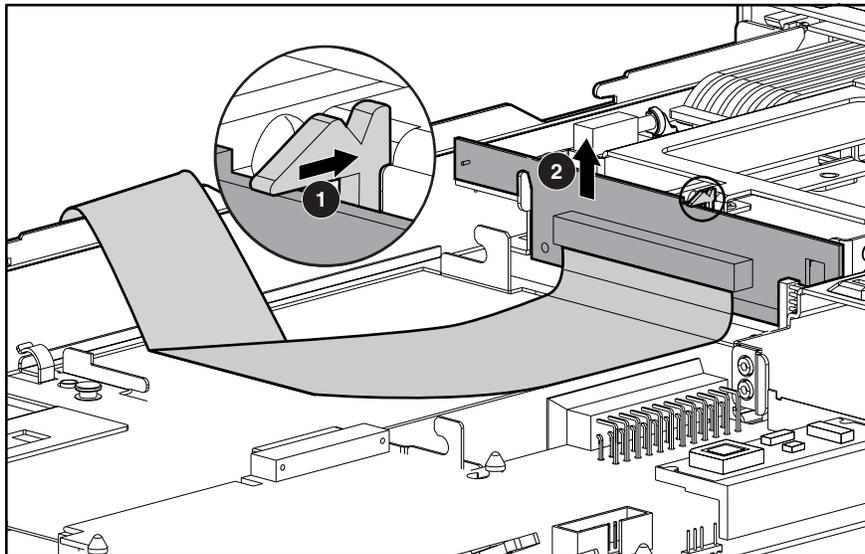


Figure 2-30: Removing CD-ROM (DVD-ROM)/diskette drive assembly backplane from chassis

Reverse steps 1 through 13 to replace the CD-ROM (DVD-ROM)/diskette drive assembly backplane.

User Interface Board

To remove the user interface board:

1. Remove the CD-ROM (DVD-ROM)/diskette drive assembly. See “CD-ROM/diskette Drive Assembly” or “DVD-ROM/diskette Drive Assembly” earlier in this chapter.
2. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
3. Remove the access panel. See “Server Access Panel” earlier in this chapter.
4. Remove the PCI riser board assembly. See “PCI Riser Board Assembly” earlier in this chapter.
5. Remove the air baffle. See “Air Baffle” earlier in this chapter.
6. Remove the AC power cord and filter. See “AC Power Cord and Filter” earlier in this chapter.
7. Remove the power supply. See “Power Supply” earlier in this chapter.
8. If installed, remove the optional internal array controller interface assembly. See “Internal Smart Array/SCSI Controller Interface Assembly” earlier in this chapter.
9. Remove the cable protector. See “Cable Protector” earlier in this chapter.
10. Remove the CD-ROM (DVD-ROM)/diskette drive assembly backplane. See “CD-ROM (DVD-ROM)/diskette Drive Assembly Backplane” earlier in this chapter.
11. Slide the user interface board toward the rear of the server and lift to remove the board ❶.

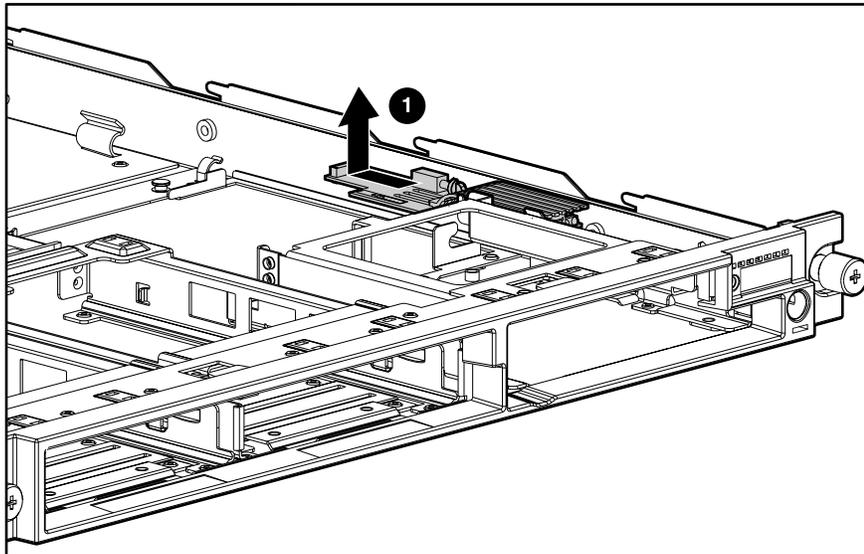


Figure 2-31: Removing the user interface board

Reverse steps 1 through 11 to replace the user interface board.

Memory

Observe the following guidelines when installing additional memory:

- The server ships standard with a single 128-MB Synchronous DRAM (SDRAM) Dual Inline Memory Module (DIMM) installed in DIMM socket 1.
- SDRAM DIMMs must be 133-MHz, registered, 3.3-volt, 72-bit wide, with Error Correction Code (ECC). No other DIMMS are compatible with the server.
- Install DIMMs of the same speed. Do not install DIMM modules supporting different speeds.
- Use only 64-, 128-, 256-, 512-MB, or 1-GB SDRAM DIMMs. Any combination of these SDRAM DIMMs can be used.
- Install DIMMs only in one direction. Be sure to match the notch on the module with the tab on the DIMM slot. Before seating the DIMM in the slot, ensure that the module key is fully inserted.
- Memory can be expanded to a maximum of 4-GB of memory.
- Use only Compaq SDRAM DIMMs. DIMMs from other sources may affect data integrity.
- Install SDRAM DIMM modules one at a time in the sequential order starting with DIMM socket 1.

SDRAM DIMMs

ProLiant DL360 servers ship standard with one SDRAM DIMM installed in DIMM socket 1. The following figure and table show the location of the DIMM slots on the system board.

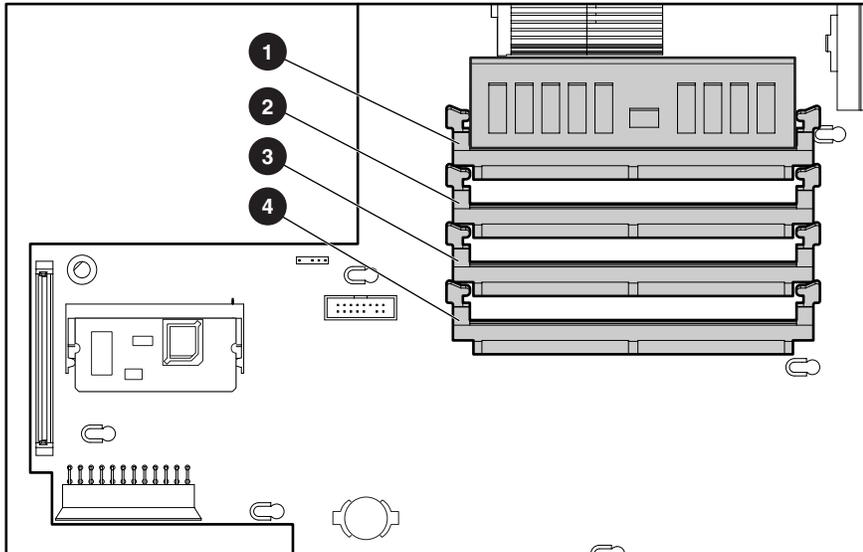


Figure 2-32: DIMM sockets identified on the system board

Table 2-2: DIMM Socket Identification

Item	Description
①	DIMM socket 1 populated with standard 128-MB DIMM
②	DIMM socket 2
③	DIMM socket 3
④	DIMM socket 4



CAUTION: Electrostatic discharge can damage electronic components. Be sure you are properly grounded before beginning any installation procedure. See “Electrostatic Discharge Information” earlier in this chapter.

To remove an SDRAM DIMM:

1. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
2. Remove the access panel. See “Server Access Panel” earlier in this chapter.
3. Press both SDRAM DIMM slot latches outward ❶.
4. Lift out the SDRAM DIMM ❷.

IMPORTANT: A memory module 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, ensuring that the module is fully inserted and properly seated.

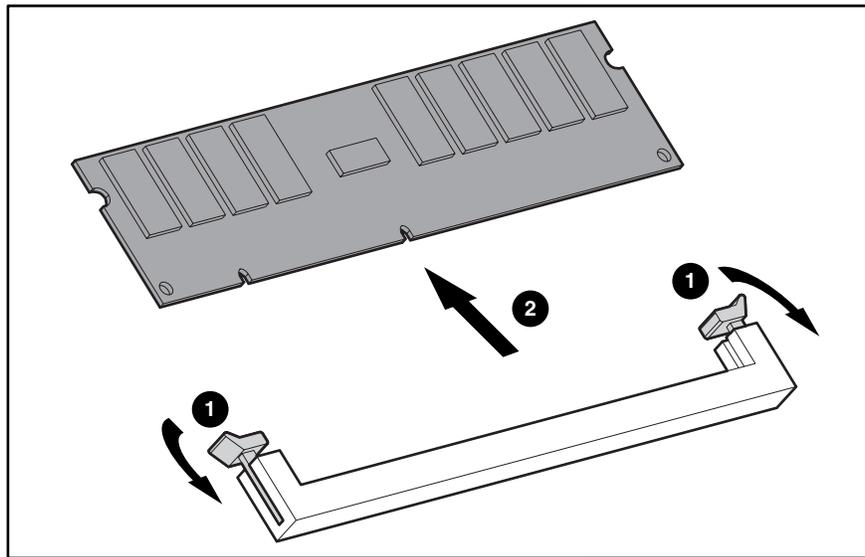


Figure 2-33: Removing an SDRAM DIMM

Reverse steps 1 through 4 to replace an SDRAM DIMM.

Processors

ProLiant DL360 servers can support up to two processors. When two processors are used, they operate in an associated mode. Heatsink installation is critical to proper processor operation, as indicated in the procedures below.

The following figure shows the location of the processor(s) on the system board.

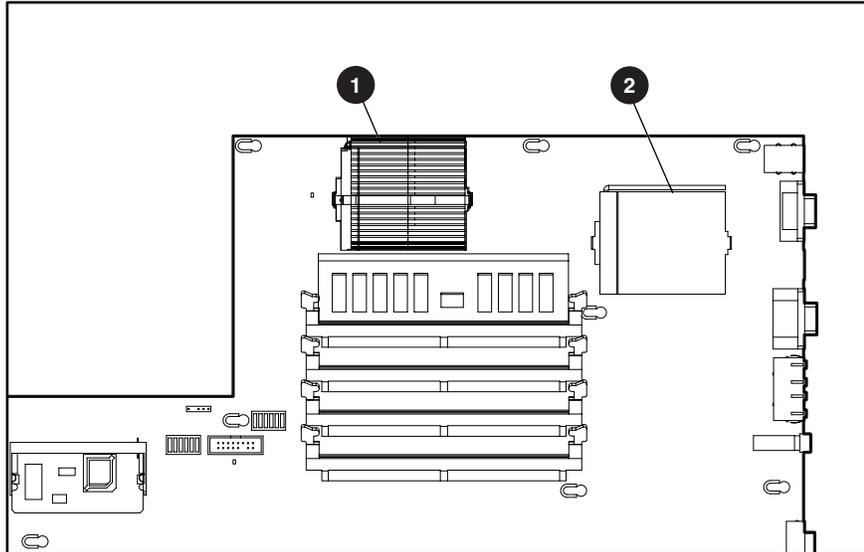


Figure 2-34: Processor and socket locations

Table 2-3: Processor and Socket Locations

Item	Description
①	Processor socket 1 (must always be populated)
②	Processor socket 2 (only populated with second processor)

Table 2-4: System Board vs Processor Reference Chart

For Processor Speeds	Requires System Board labeled "Replace with Compaq Spares P/N"
550, 800, 866 or 933-MHz	173837-001
550, 800, 866, 933 or 1.0-GHz	224928-001
1.13 or 1.26-GHz	239120-001



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



CAUTION: Processor socket 1 must be populated at all times. Failure to follow this process results in the system failing to boot and halting during the POST. This error will result in the system not functioning properly.

To remove a processor:

1. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
2. Remove the access panel. See “Server Access Panel” earlier in this chapter.
3. Disengage the heatsink-retaining clip ❶, ❷.
4. Remove the heatsink and thermal pad from the top of the processor ❸.

NOTE: Some processor shipping configurations may use a thermal compound instead of a thermal pad.

5. Lift the ejecting lever ❹.
6. Remove the processor from the system board ❺.

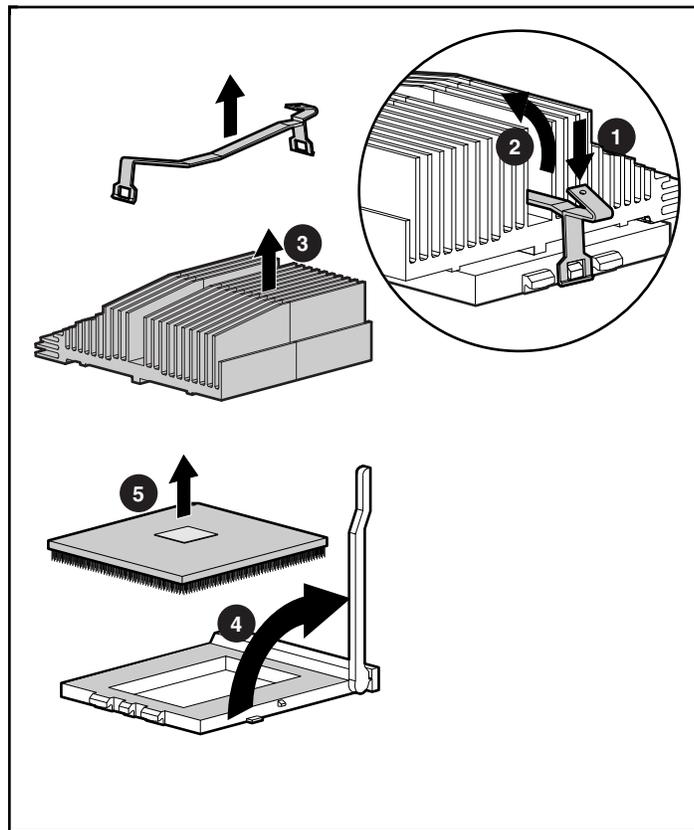


Figure 2-35: Removing the processor



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



CAUTION: Some heatsinks have an integrated, plastic-covered thermal pad. In this case, remove the plastic cover from the new heatsink to expose the adhesive side of the thermal pad before placing the heatsink on the processor.



CAUTION: If you are installing 1.0-, 1.13- or 1.26-GHz processors, you must use the appropriate heatsink for each processor socket. The heatsinks are labeled “Processor 1” and “Processor 2.” Failure to install the proper heatsink may result in damage to the processor and the system.

Reverse steps 1 through 6 to replace the processor.

Integrated Smart Array Controller

The Integrated Smart Array Controller supports the following features:

- 16-MB total memory; 8-MB read-ahead cache
- 32-bit PCI bus master interface
- RAID 0 and 1 disk fault tolerance (on internal drives only)
- Support for up to two internal Wide Ultra2 SCSI hot-plug hard drives
- Support for external backup tape drives only through the external SCSI connector on the rear panel
- Easy-to-use Array Configuration Utility
- Option ROM Configuration for Arrays
- Pre-Failure Notification and Pre-Failure Warranty through *Compaq Insight Manager*[™]
- Performance monitoring through Compaq Insight Manager

NOTE: See the Integrated Smart Array Controller documentation for a more detailed description of the Integrated Smart Array Controller.



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

To remove the Integrated Smart Array Controller:

1. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
2. Remove the server access panel. See “Server Access Panel” earlier in this chapter.
3. Pull the latches outward ❶.
4. When the Integrated Smart Array Controller rises to a 45-degree angle, pull the controller out of the slot ❷.

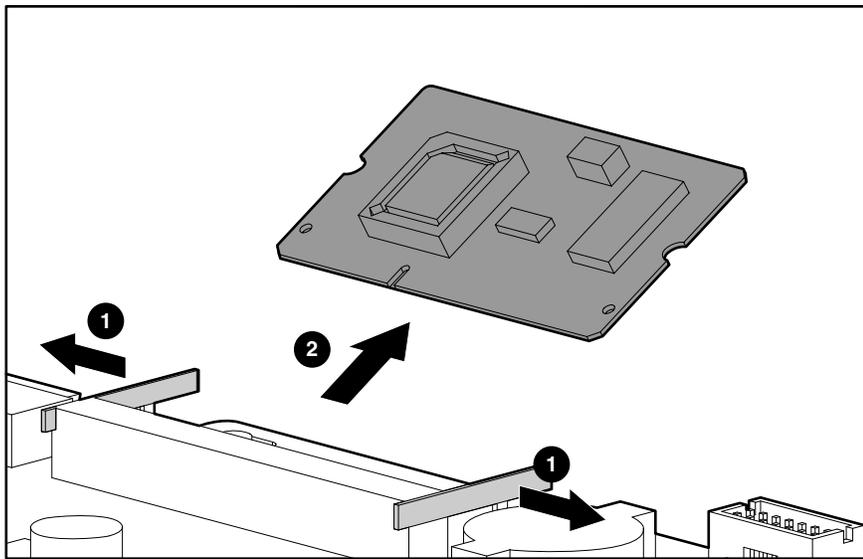


Figure 2-36: Removing the Integrated Smart Array Controller from the system board

Reverse steps 1 through 4 to replace the Integrated Smart Array Controller.

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.

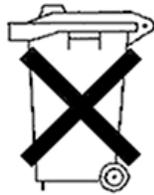


WARNING: This server contains either an internal lithium manganese dioxide, or a vanadium pentoxide battery. There is risk of fire and burns if the battery pack is not handled properly. To reduce the risk of personal injury:

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



CAUTION: Loss of BIOS settings will occur if the lithium battery is removed. BIOS settings must be reconfigured whenever the battery is replaced.



CAUTION: Batteries, battery packs, and accumulators should not be disposed of along with general household waste. In order to forward them for recycling or proper disposal, please use the public collection system, or return them to your authorized Partners or their agents.

IMPORTANT: Run the System Utility to configure the system after replacing the battery. See Chapter 4, "Diagnostics and Troubleshooting," for more information.

To remove the system board battery:

1. Complete the preparation procedures. See “Powering Down the Server” in this chapter.
2. Remove the access panel. See “Server Access Panel” in this chapter.
3. Locate the battery holder on the system board ❶.

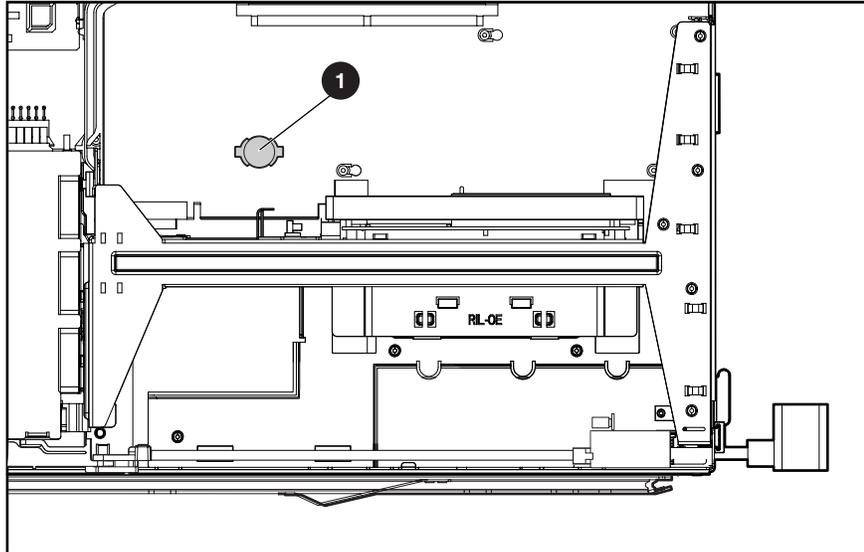


Figure 2-37: Battery location

4. If necessary, remove the PCI riser board assembly to access the battery location. See “PCI Riser Board Assembly” in this chapter.
5. Remove the battery.

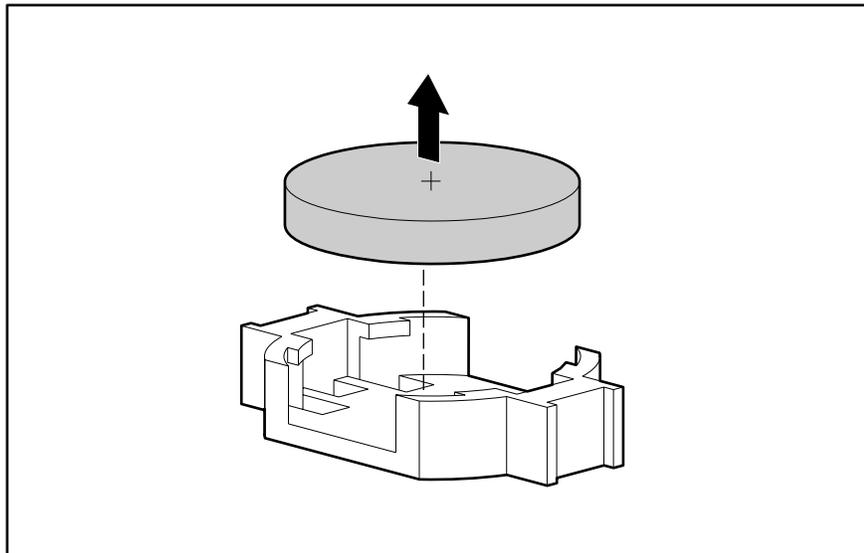


Figure 2-38: Removing the battery

Reverse steps 1 through 5 to replace the battery.

System Board

To remove the system board:

1. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
2. Remove the access panel. See “Server Access Panel” earlier in this chapter.
3. Remove the hot-plug SCSI hard drive(s). See “Hot-Plug SCSI Hard Drives” earlier in this chapter.
4. Remove the SCSI backplane. See “SCSI Backplane” earlier in this chapter.
5. Remove the PCI riser board assembly. See “PCI Riser Board Assembly” earlier in this chapter.
6. Remove the air baffle. See “Air Baffle” earlier in this chapter.
7. Remove the fan assembly. See “Fan Assembly” earlier in this chapter.
8. Remove the AC power cord and filter. See “AC Power Cord and Filter” earlier in this chapter.
9. Remove the power supply. See “Power Supply” earlier in this chapter.
10. If installed, remove the optional internal array controller interface assembly.
11. Disconnect the 100-pin connector from the system board.
12. Remove any SDRAM DIMMs. See “SDRAM DIMMs” earlier in this chapter.
13. Remove the processor(s). See “Processors” earlier in this chapter.
14. Remove the Integrated Smart Array Controller. See “Integrated Smart Array Controller” earlier in this chapter.
15. Identify the alignment keys and keyhole locations ❶ through ❾ on the system board.

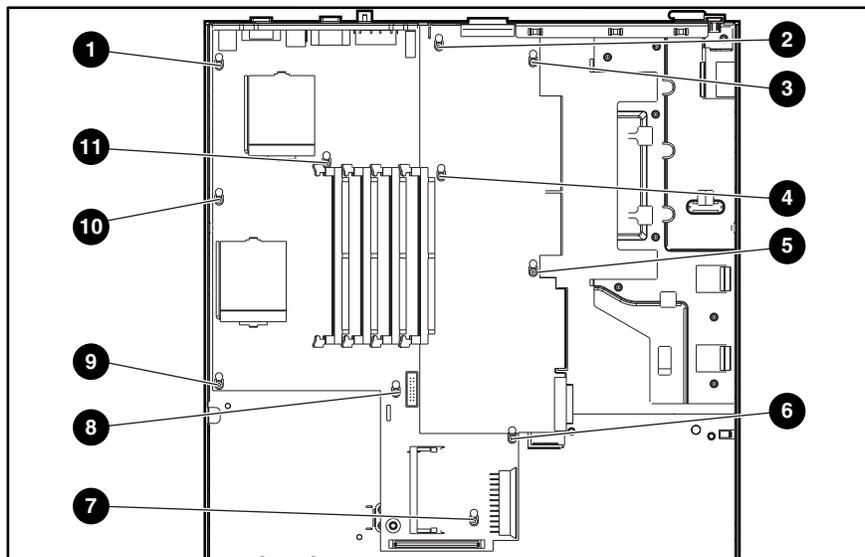


Figure 2-39: Identifying alignment keys and keyhole locations

16. Slide the system board toward the front of the chassis 0.5 inch (1.5 cm), ensuring that the board unseats from all 46he alignment keys ❶.
17. Tilt the front edge of the system board upward and lift it off the alignment keys ❷.

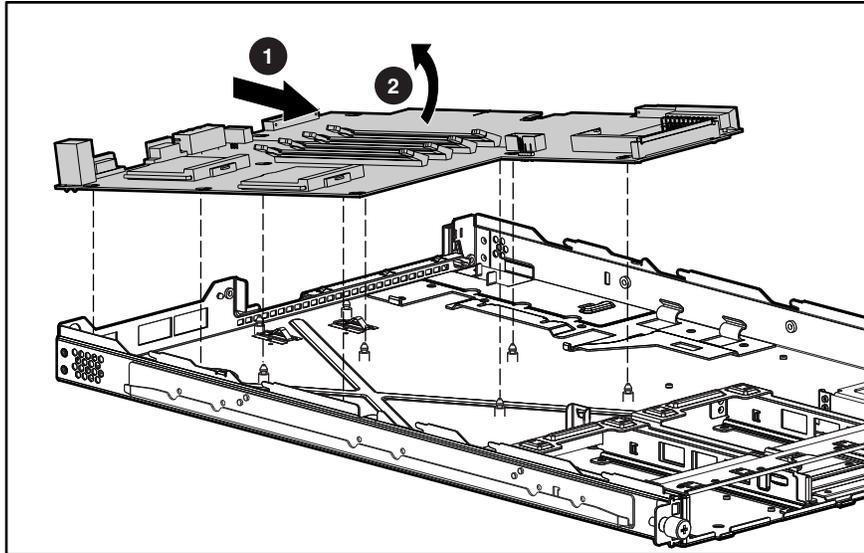


Figure 2-40: Removing the system board



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



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.

NOTE: Some heatsinks may have an integrated thermal pad. In this case, you will need to remove the plastic cover to expose the adhesive side of the thermal pad on the new heatsink.

Reverse steps 1 through 17 to replace the system board. When reinstalling the processors on the new system board, discard the used heatsinks with thermal pads. Reinstall the processors with the new heatsinks with thermal pads that come in the system board spare parts kit. For more information, see “Processors” earlier in this chapter.

Cable Routing Diagrams

Use the following sections to identify the proper routing for internal cables.



CAUTION: When routing cables, always ensure that the cables are not in a position where they will be pinched or crimped.

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

The following figure identifies the proper routing of the cable leading from the CD-ROM (DVD-ROM)/diskette drive assembly backplane to the system board.

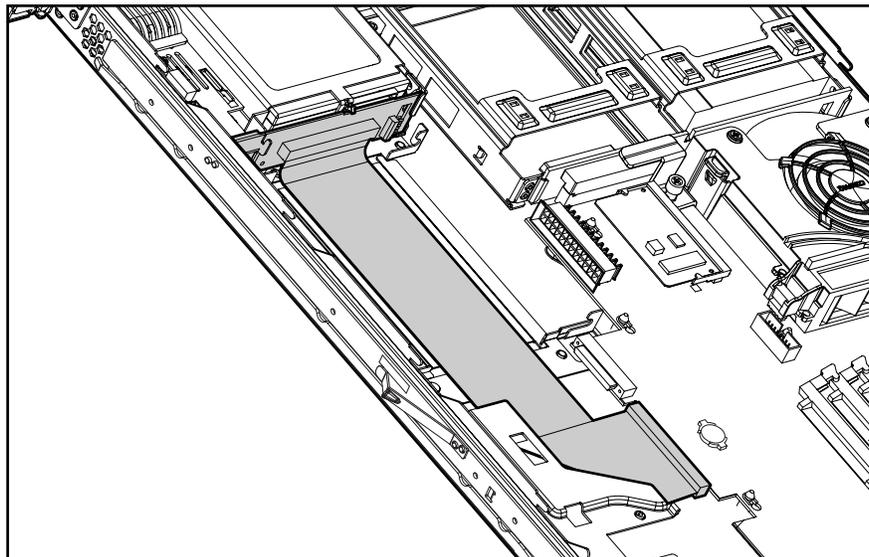


Figure 3-1: CD-ROM (DVD-ROM)/diskette assembly backplane (PCI riser board assembly, baffle, power supply, and cable protector removed for clarity)

Optional Smart Array/SCSI Controller Cabling

The following figures identify the proper routing of the optional Smart Array/SCSI controller interface assembly cable leading from the system board to the optional Smart Array/SCSI controller installed in the 64-bit expansion slot.

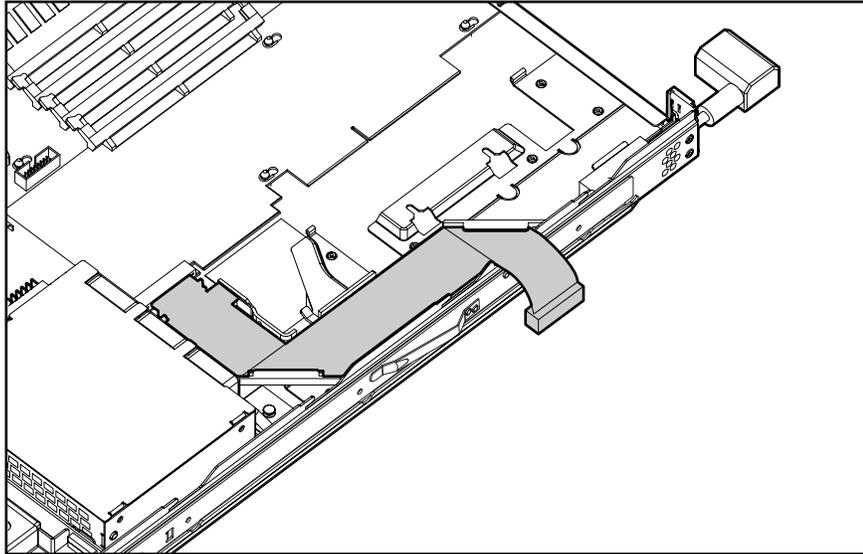


Figure 3-2: Smart Array/SCSI controller interface assembly installed (PCI riser board assembly removed for clarity)

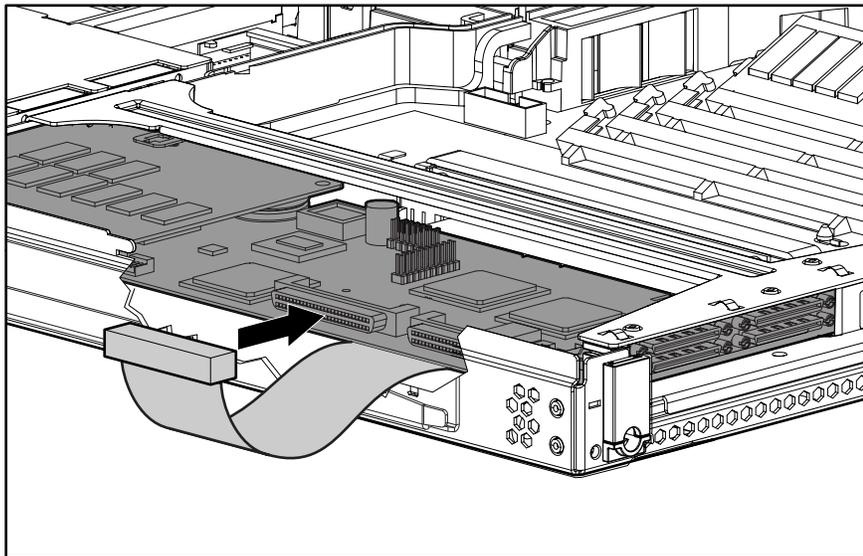


Figure 3-3: Smart Array/SCSI controller interface assembly cable connection to expansion board

Optional Remote Insight Lights-Out Edition Cabling

The following figure identifies the proper cable routing for the Remote Insight Lights-Out Edition. When installed in the ProLiant DL360 server's 32-bit expansion slot, the connector is on the underside of the expansion board.

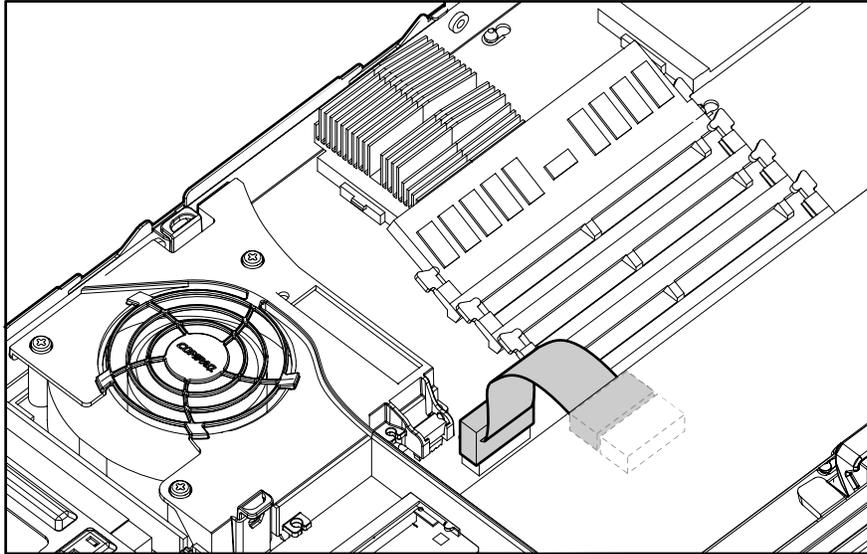


Figure 3-4: Proper cable routing for Remote Insight Lights-Out Edition

Diagnostics and Troubleshooting

This chapter describes software and firmware diagnostic tools available for all Compaq server products. The sections in this chapter are:

- Diagnostic Tools Utility Overview
- Default Configuration
- Utilities Access
- Power-On Self-Test (POST)
- Diagnostics Software
- Array Diagnostic Utility (ADU)
- Integrated Management Log
- Rapid Error Recovery
- Remote Service Features
- *ROMPaq*[™] Error Recovery Options
- Compaq Insight Manager

Diagnostic Tools Utility Overview

These utilities were developed to assist in diagnosing problems, testing the hardware, and monitoring and managing Compaq server hardware.

Table 4-1: Diagnostic Tools

Tool	What it is	How to run it
Compaq Diagnostics Program	Utility to assist testing and/or verifying operation of Compaq hardware. If problems are found, Compaq Diagnostics isolates failure(s) down to replaceable parts, whenever possible.	Diagnostics and utilities are located on Compaq system partition on hard drive and must be accessed when a system configuration error is detected during Power-On Self-Test (POST). Compaq Diagnostics software is also available on the Compaq SmartStart and Support Software CD. A diagnostics diskette can be created from SmartStart and Support Software CD, and Diagnostics run from diskette.
Compaq Inspect Utility	The Inspect utility provides a report detailing system information.	The Inspect utility can be run from either the main menu of the System Configuration Utility or the Compaq Diagnostics Program.
Compaq Insight Manager	A client/server application used to remotely manage Compaq hardware in a network environment. Reports hardware fault conditions (both failure and prefailure) and collects data for reporting and graphing.	For more information, refer to the Compaq Management CD and the <i>Compaq Insight Manager User Guide</i> . More information on viewing and printing the event list can be found in the Compaq Insight Manager section of this chapter.
Compaq Survey Utility	An online information gathering agent that runs on servers, gathering critical hardware and software information from various sources. A utility for servers running Windows NT or NetWare. If a significant change occurs between data-gathering intervals, previous information is marked, and the <i>survey text file</i> is overwritten to reflect the latest configuration and changes since last configuration. This allows a historical record of change events for server hardware and software.	Install Survey from SmartStart, Compaq Integration Maintenance Utility, or from Compaq Management CD.

continued

Table 4-1: Diagnostic Tools *continued*

Tool	What it is	How to run it
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 generate a list of detected problems.</p> <p>This tool is available for all Compaq servers covered by this guide.</p>	Use the information provided in Array Diagnostics Utility (ADU) later in this chapter.
Drive Array Advanced Diagnostics (DAAD)	<p>The predecessor to ADU, DAAD is a DOS-based tool for Compaq servers with Smart Array Controllers. DAAD collects information about the array controllers in the system and offers a list of detected problems.</p>	<p>For a list of Compaq servers still supported by this tool, visit the Compaq website:</p> <p>www.compaq.com</p>
Integrated Management Log	<p>A log of system events, such as system failures or nonfatal error conditions. View events in the Integrated Management Log:</p> <ul style="list-style-type: none"> • On the Integrated Management Display • From within Compaq Insight Manager • From within Compaq Survey Utility 	The Integrated Management Log requires Compaq operating system-dependent drivers. Refer to Compaq Support Software CD for instructions on installing the appropriate drivers.

continued

Table 4-1: Diagnostic Tools *continued*

Tool	What it is	How to run it
System Configuration Utility	<p>Utility to easily 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• Assist in running diagnostic tools such as TEST and INSPECT	<p>If the server has bootable CD-ROM drive, run Compaq System Configuration Utility directly from Support Software CD supplied with SMART Controller Option Kit, or SmartStart and Support Software CD supplied with server. Use the CD supplied for latest version supporting SMART Controller.</p> <p>If the server does not have a bootable CD-ROM drive, create diskettes with latest version of the System Configuration Utility from Support Software CD, or SmartStart and Support Software CD.</p>

Default Configuration

When the system is powered on for the first time, the system ROM detects the unconfigured state of the hardware and provides default configuration settings for most devices. By providing this initialization, the system can run Diagnostics and other software applications before running the normal SmartStart and System Configuration programs.

Default Configuration Messages

IMPORTANT: If you chose to format and partition the boot drive before running SmartStart and the System Configuration programs, this may prohibit creating a Compaq system partition and the off-line remote management features that it provides.

If you insert a System Configuration, Diagnostics, or SmartStart and Support Software CD into the CD-ROM drive prior to powering on the Server, the system ROM boots to that utility. If the system ROM does not detect one of those CDs, you will be prompted for the intended operating system. The system reboots if any operating system-dependent configurations have changed with the new operating system selection. If the selected operating system-dependent configurations are the same as the current configurations, the system starts normally. If you enter a wrong choice, on subsequent restarts you may change the operating system.

Inspect Utility

The Inspect Utility provides configuration information such as the contents of the operating system startup files, the current memory configuration, the ROM version, and Integrated Management Log information. It operates with MS-DOS emulation mode of OS/2.

Running the Inspect Utility

1. Turn the server off, then back on, then press the **F10** key when the cursor appears in the upper right corner of the screen.
2. At the main menu, select **Diagnostics and Utilities**.
3. Press the **Enter** key.
4. Select **Inspect Computer** and press the **Enter** key.

NOTE: If Diagnostics is not installed on the hard drive, System Configuration prompts you to insert the Diagnostics diskette in drive A.

5. Follow the instructions.

Printing the Inspect Listing

Click **Print** on the **Inspect** screen to print a copy of the Inspect listing. Keep a copy of the listing with each server for later reference.

Utilities Access

The Compaq SmartStart and Support Software CD contains the SmartStart program and many of the Compaq utilities needed to maintain the system, including:

- System Configuration Utility
- Array Configuration Utility
- Array Diagnostic Utility
- ROMPaq Firmware Upgrade Utilities
- Compaq Diagnostics



CAUTION: Do not select the Erase Utility when running the SmartStart and Support Software CD. This will result in data loss to the entire system.

Running Compaq Utilities

There are three ways to access Compaq utilities:

Running the Utilities on the Compaq System Partition

If the system was installed using SmartStart, the Compaq utilities will automatically be available on the Compaq system partition. The Compaq system partition could also have been created during a manual system installation.

To run the utilities on the Compaq system partition, start the system and press the **F10** key when you see:

Press F10 for Compaq system partition utilities.

Then select the desired utility from the menu:

- The System Configuration Utility is available under the **System Configuration** menu.
- The Array Configuration Utility is available under the **System Configuration** menu.
- Compaq Diagnostics (Test and Inspect) are available under the **Diagnostics and Utilities** menu.
- The ROMPaq Firmware Upgrade Utility is available under the **Diagnostics and Utilities** menu.

Running the Utilities from Diskette

- Run the utilities from their individual diskettes. If you have a utility diskette newer than the version on the SmartStart and Support Software CD, use that diskette.
- Create a diskette version of the utility from the SmartStart and Support Software CD.

To create diskette versions of the utilities from the CD:

1. Start the Compaq SmartStart and Support Software CD.
2. From the **Compaq System Utilities** screen, click **Create Support Software Disks**, then **Next**.
3. Select the diskette you would like to create from the list, then follow the instructions on the screen.

Running the Utilities from the Compaq SmartStart and Support Software CD

IMPORTANT: Only the System Configuration Utility and the Array Configuration Utility and the Array Diagnostic Utility can be executed from the Compaq SmartStart and Support Software CD. All other utilities must be executed from the Compaq system partition or from the diskette.

To run these utilities directly from the Compaq SmartStart and Support Software CD:

1. Start the Compaq SmartStart and Support Software CD.
2. From the **Compaq System Utilities** screen, select the utility you wish to run, then click **Next**. To:
 - Execute the **System Configuration Utility**, click **Run System Configuration Utility**
 - Execute the **Array Configuration Utility**, click **Run Array Configuration Utility**
 - Execute the **Array Diagnostic Utility**, click **Run Array Diagnostic Utility**

Power-On Self-Test (POST)

POST is a series of diagnostic tests that run automatically on Compaq computers when the system is turned on. POST checks the following assemblies to ensure that the computer system is functioning properly:

- System ROM
- Keyboard
- Power supply
- System board
- Memory
- Controllers
- Diskette drives
- Hard drives
- Processor power modules
- Fans

POST Error Messages

If POST finds an error in the system, an error condition is indicated by an audible and/or visual message. If an error code displays on the screen during POST or after resetting the system, use the instructions in the POST Error Messages table.

NOTE: Many of the actions listed require you to run Diagnostics or the Compaq System Configuration Utility. Steps for running these utilities are provided following the POST Error Messages tables.

The Recommended Action column lists the steps necessary to correct the problem. After completing each step, run the Diagnostics program to verify whether the error condition has been corrected. If the error code reappears, perform the next step, then run the Diagnostics program again. Follow this procedure until Diagnostics no longer detects an error condition.

Table 4-2: POST Error Messages

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
A Critical Error occurred prior to this power-up	None	A catastrophic system error, which caused the server to crash, has been logged.	Run Diagnostics. Replace failed assembly as indicated.
Unsupported Processor Detected System Halted	1 long, 1 short	Processor not supported by current system ROM.	Check Chapter 2, "Removal and Replacement Procedures," Table 2-4 for supported processors, and if supported, remove the processor and update the system to latest ROM.
FATAL ROM ERROR: The System ROM is not properly programmed	1 long, 1 short	ROM programmed in factory incorrectly.	Replace the physical ROM part.
101-ROM Error	1 long, 1 short	System ROM checksum	Run Diagnostics. Replace failed assembly as indicated.
101-I/O ROM Error	None	Options ROM checksum	Run Diagnostics. Replace failed assembly as indicated.
102-System Board Failure	None	DMA, timers, and so on	Replace the system board. Run the Compaq System Configuration Utility.
104-ASR-2 Timer Failure	None	System board failure	Run Diagnostics. Replace failed assembly as indicated.
162-System Options Not Set	2 short	Configuration incorrect	Run the System Configuration Utility and correct.
163-Time & Date Not Set	2 short	Invalid time or date in configuration memory	Run the System Configuration Utility and correct.

continued

Table 4-2: POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
172-Configuration Nonvolatile Memory Invalid	None	Nonvolatile configuration corrupt or jumper installed	Run the System Configuration Utility and correct.
177-Configuration Not Complete	None	Incomplete system configuration	Run the System Configuration Utility and correct.
178-Processor Configuration Invalid	None	Processor type or step does not match configuration memory.	Run the System Configuration Utility and correct.
180-Log Reinitialized	None	N/A	N/A
201-Memory Error	None	RAM failure	Run Diagnostics. Replace failed assembly as indicated.
203-Memory Address Error	None	RAM failure	Run Diagnostics. Replace failed assembly as indicated.
207-Invalid Memory Configuration - Check DIMM [SIMM] Installation	None	Memory module installed incorrectly.	Verify placement of memory modules.
208-Invalid Memory Speed - Check DIMM [SIMM] Installation	1 long, 1 short	The speed of the memory is too slow: <ul style="list-style-type: none"> • Xx00 = expansion board SIMMs are too slow • 00yy = system board SIMMs are too slow. • xx and yy have a corresponding bit set. 	The speed of the memory modules must be 60 ns. Verify the speed of the memory modules installed and replace if slower than 60 ns.
209-Memory Detection Failure. Check Memory Installation	1 long, 1 short	Unable to size memory	Check DIMM installation and if error persists, call Compaq service provider.

continued

Table 4-2: POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
211-Cache Switch Set Incorrectly	None	Switch not set properly during installation or upgrade.	Verify switch settings.
212-System Processor Failed/ Mapped out	1 short	Processor in slot x failed.	Run Diagnostics and replace failed processor.
214-DC-DC Converter Failed	None	PowerSafe Module (DC-DC Converter) failed.	Run Diagnostics. Replace failed assembly as indicated.
214-Processor PPM Failed Module X	None	Indicated PPM (DC-DC Converter) failed.	Replace failed assembly as indicated.
215-Processor Power Module has lost Redundancy in Socket x	None	PPM (DC-DC Converter) has lost redundancy.	Run Diagnostics. Replace failed assembly as indicated.
215-Nonfunctioning Voltage Regulator Module for Processors	None	PPM (DC-DC Converter) has failed or lost redundancy.	Run Diagnostics. Replace failed assembly as indicated.
216-Voltage Regulator Module for Processor X no longer redundant	None	Redundancy failed in PPM.	To restore redundancy, replace the PPM.
216-Processor PPM has lost Redundancy, Module X	None	Indicated PPM (DC-DC Converter) has lost redundancy.	Replace failed assembly as indicated.
218-Cache Accelerators Not Installed. System Halted.	None	Cache Accelerators not installed or improperly installed.	Check Cache Accelerator installation.

continued

Table 4-2: POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
219-Tag Update Rules SRAM Failure. System Halted	None	Catastrophic chipset failure.	Call Compaq service provider.
219-Snoop Rules SRAM Failure. System Halted.	None	Catastrophic chipset failure.	Call Compaq service provider.
220-Cache Accelerator Slot x Initialization Failed. System Halted.	None	Cache Accelerator in slot x improperly installed or bad.	Check Cache Accelerator installation and if properly installed, replace.
221-Power Fault On Processor Bus X	None	A PPM on indicated bus is in a failed state.	Run Diagnostics. Replace failed assembly as indicated.
301-Keyboard Error	None	Keyboard failure	Turn off the computer, then reconnect the keyboard.
301-Keyboard Error or Test Fixture Installed	None	Keyboard failure	Replace the keyboard.
ZZ-301-Keyboard Error	None	Keyboard failure. (ZZ represents the Keyboard Scan Code.)	<ol style="list-style-type: none"> 1. A key is stuck. Try to free it. 2. Replace the keyboard.
303-Keyboard Controller Error	None	System board, keyboard, or mouse controller failure	<ol style="list-style-type: none"> 1. Run Diagnostics. 2. Replace failed assembly as indicated.
304-Keyboard or System Unit Error	None	Keyboard, keyboard cable, or system board failure	<ol style="list-style-type: none"> 1. Make sure the keyboard is attached. 2. Run Diagnostics to determine which is in error. 3. Replace the part indicated.

continued

Table 4-2: POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
40X-Parallel Port X Address Assignment Conflict	2 short	Both external and internal ports are assigned to parallel port X.	Run the System Configuration Utility and correct.
601-Diskette Controller Error	None	Diskette controller circuitry failure	<ol style="list-style-type: none"> 1. Make sure the diskette drive cables are attached. 2. Replace the diskette drive and/or cable. 3. Replace the system board.
605-Diskette Drive Type Error	2 short	Mismatch in drive type	Run the System Configuration Utility to set diskette type correctly.
1151-Com Port 1 Address Assignment Conflict	2 short	Both external and internal serial ports are assigned to COM1.	Run the System Configuration Utility and correct.
1152-Com Port 2, 3, or 4 Address Assignment Conflict	2 short	Both external and internal serial ports are assigned to COM2, COM3 or COM4.	Run the System Configuration Utility and correct.
1610-Temperature violation detected. Waiting for system to cool	2 short	Ambient system temperature too hot	Check fan in system environment.
1611-Fan failure detected	2 short	Required fan not installed or spinning.	Check fans.
1611-I/O Fan (Fan X) failure detected	2 short	I/O fan has failed.	Replace the failed fan.
1611-CPU Fan (Fan X) failure detected	2 short	CPU fan has failed.	Replace the failed fan.

continued

Table 4-2: POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
1612-Primary power supply failure	2 short	Primary power supply has failed.	Replace power supply as soon as possible.
1613-Low System Battery	None	Real time clock system battery is running low on power.	Run Diagnostics. Replace failed assembly as indicated.
1615-Power Supply Failure, Power Supply Unplugged, or Power Supply Fan Failure in Bay X	None	A power supply or power supply fan has failed.	Replace or check specified power supply or power supply fan.
1617-Fan controller not responding	2 short	Fan controller failure	Check and replace failed controller assembly.
1617-I/O Fan controller not responding	2 short	I/O fan controller failure	Check and replace failed controller assembly.
1617-CPU Fan controller not responding	2 short	CPU fan controller failure	Check and replace failed controller assembly.
1618-PCI slots powered down. Check PCI hot plug enabler connectors.	None	PCI hot plug enabler is missing or failed.	Check and replace missing or failed assembly.
1620-Locked SCSI Bus Detected. Verify SCSI bus cabling. System halted.	None	SCSI bus failure	Run Diagnostics. Replace failed assembly as indicated.
1621-Current SCSI bus cable configuration is not recommended	None	Improper SCSI bus cabling	Check documentation for proper SCSI bus cabling.
1622-Internal SCSI Jumper Board Not Installed	None	The system has detected that the array enabler board is not installed.	Install the array enabler board.

continued

Table 4-2: POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
1703-SCSI cable error detected. Internal SCSI cable not attached to system board connector. System halted.	None	Incorrect cabling	Ensure that the integrated SCSI controller has SCSI termination attached.
1720-Slot x Drive Array – SMART Drive Detects Imminent Failure SCSI: Port y: SCSI ID x	None	Indicated drive has reported a SMART predictive-failure condition and may fail at some time in the future.	If drive is part of a nonfault-tolerant configuration, back up all data before replacing drive and restore all data afterward. If drive is part of a fault-tolerant configuration do not replace drive unless all other drives in array are online. Press the F1 key to resume.
1721-Slot x Drive Array-Drive parameter tracking predicts imminent failure. The following devices should be replaced when conditions permit. Do not replace the drive unless all other drives in the array are online. Back up data before replacing drive(s) if using RAID 0.	None	Monitor and performance threshold exceeded condition.	Replace the drive when it is reasonable. The drive has not failed, but Compaq recommends you replace the drive.
* 1724-Slot x Drive Array – Physical Drive Position Change(s) Detected – Logical drive configuration has automatically been updated	None	Logical drive configuration has been updated automatically following physical drive position changes.	Press the F1 key to resume.

continued

Table 4-2: POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
* 1726-Slot x Drive Array – Array Accelerator Memory Size Change Detected	None	Indicates array accelerator configuration has been updated automatically due to replacement of array accelerator (or controller) with one having different memory size.	Press the F1 key to resume.
* 1727-Slot x Drive Array – New Logical Drive(s) Attachment Detected. If more than 32 logical drives, this message will be followed by: Auto-configuration failed: Too many logical drives.	None	Controller has detected an additional array of drives that was attached when the power was off. The logical drive configuration information has been updated to add the new logical drives. The maximum number of logical drives supported is 32. Additional logical drives will not be added to the configuration.	Press the F1 key to resume.
1729-Disk consistency initialization in progress RAID 4/5 performance may be lower until Auto Reliability Monitoring has completed automatic parity consistency initialization.	None		This message is normal following the initial configuration of RAID 4 or RAID 5 logical drives. This POST message will go away and performance of the controller will improve after the parity data has been initialized by ARM (an automatic process that runs in the back ground on the controller.)
1730-Fixed Disk 0 does not support DMA Mode.	None	Hard drive error	Run the System Configuration Utility and correct.
1731-Fixed Disk 1 does not support DMA Mode.	None	Hard drive error	Run the System Configuration Utility and correct.

continued

Table 4-2: POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
1740-Fixed Disk 0 failed Set Block Mode command	None	Hard drive error	Run the System Configuration Utility and correct.
1741-Fixed Disk 1 failed Set Block Mode command	None	Hard drive error	Run the System Configuration Utility and correct.
1750-Fixed Disk 0 failed Identify command	None	Hard drive error	Run the System Configuration Utility and correct.
1751-Fixed Disk 1 failed Identify command	None	Hard drive error	Run the System Configuration Utility and correct.
1760-Fixed Disk 0 does not support Block Mode	None	Hard drive error	Run the System Configuration Utility and correct.
1761-Fixed Disk 1 does not support Block Mode	None	Hard drive error	Run the System Configuration Utility and correct.
1764-Slot x Drive Array - Capacity Expansion Process is temporarily disabled (followed by one of the following): <ul style="list-style-type: none"> Expansion will resume when Array Accelerator has been reattached. Expansion will resume when Array Accelerator has been replaced. Expansion will resume when Array Accelerator RAM allocation is successful. Expansion will resume when Array Accelerator battery reaches full charge. Expansion will resume when automatic data recovery has been completed. 			Reattach or replace array accelerator, wait until the array accelerator batteries have charged, or for Automatic Data Recovery to complete, as indicated.
1767-Slot x Drive Array Option ROM is Not Programmed Correctly or may Conflict with the Memory Address Range of an ISA Card. Check the Memory Address Configuration of installed ISA Card(s) or run Options ROMPaq Utility to attempt SMART-2/E Option ROM Reprogramming.			Remove or reconfigure conflicting ISA cards, especially any cards that are not recognized by the System Configuration Utility. Try reprogramming the ROM on the SMART-2/E Controller using the latest Options ROMPaq (version 2.29 or higher).

continued

Table 4-2: POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
1768-Slot x Drive Array-Resuming logical drive expansion process.	None	SMART-2 Controller error	No action required. Appears whenever a controller reset or power cycle occurs while array expansion is in progress.
1769-Slot x Drive Array - Drive(s) disabled due to failure during expand. Select F1 to continue with logical drives disabled. Select F2 to accept data loss and to re-enable logical drives.	None	SMART-2 Controller error. Data has been lost while expanding the array; therefore, the drives have been temporarily disabled.	Press the F2 key to accept the data loss and re-enable the logical drives. Restore data from backup.
1770-Slot x drive array critical drive firmware problem detected. Please upgrade firmware on the following drive(s) using Options ROMPaq (available from www.compaq.com); SCSI port (y) SCSI ID (x) (RESUME=F1 or F2 KEY)	None	Needs firmware update	The indicated drives are running firmware that is known to cause intermittent problems. Please use the Compaq Options ROMPaq utility to upgrade firmware on all drives to the latest revision. Press the F1 key or the F2 key to resume.
1771-Primary Disk Port Address Assignment Conflict	None	Internal and external hard drive controllers are both assigned to the primary address.	Run the System Configuration Utility and correct.
1771-Primary Disk Port Address Assignment Conflict	None	Internal and external hard drive controllers are both assigned to the primary address.	Run the System Configuration Utility and correct.

continued

Table 4-2: POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
1772-Secondary Disk Port Address Assignment Conflict	None	Address Assignment Conflict. Internal and external hard drive controllers are both assigned to the secondary address.	Run the System Configuration Utility and correct.
1773-Primary Fixed Disk Port Assignment Conflict	None	Fixed disk drive error	Run the System Configuration Utility and correct.
1774-Slot x Drive Array - Obsolete data found in Array Accelerator. Select F1 to discard contents of Array Accelerator. Select F2 to write contents of Array Accelerator to drives.	None	SMART-2 Controller error	Data found in array accelerator is older than data found on drives. Press the F1 key to discard the older data in the array accelerator and retain the newer data on the drives.
1775-Slot x Drive Array – ProLiant DL360 Storage System Not Responding SCSI Port (y): Check storage system power switch and cables. Turn the system power off while checking the ProLiant DL360 server power and cable connections, then turn the system power back on to retry.	None	Storage system problem	Turn off power to system. Check external ProLiant DL360 server power switch – external drives must all be powered up before or at the same time as the main system. Check cables. If retry does not help, try replacing the cable, ProLiant DL360 server firmware, ProLiant DL360 server backplane, or the Smart Array Controller. Press the F1 key to resume.

continued

Table 4-2: POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
1776-Slot x Drive Array- SCSI Bus Termination Error-internal and external drive cannot both be attached to the same SCSI port. SCSI port (y). Check cables.	None	External and internal SCSI drives are both configured Port 1.	The internal and external connectors of the specified SCSI port(s) are both attached to drives. The SCSI bus is not properly terminated when internal and external drives are attached concurrently to the SCSI bus. The indicated SCSI bus is disabled until this problem is resolved. Turn off the server power and check the cabling to the specified SCSI port. Press the F1 key to resume.
1777-Slot x Drive Array ProLiant DL360 server drive storage enclosure problem detected (followed by one or more of the following) SCSI Port (y) Cooling fan malfunction detected SCSI port (y) Overheated condition detected SCSI port (y) Side panel must be closed to prevent overheating SCSI port (y) Redundant power supply malfunction detected. SCSI port (y) Wide SCSI transfer failed SCSI port (y) Interrupt signal inoperative	None	Cooling fan failure, internal temperature alert or open side panel	Check cooling fan operation by placing hand over fan. Check internal plenum cooling fan in tower servers or storage systems. If fan is not operating, check for obstructions and check all internal connectors. Replace unit side panel if removed. If the ProLiant DL360 Storage System power LED is amber instead of green this indicates a redundant power supply failure. Check SCSI cables. If the message indicates that the SCSI cables should be checked, please verify the cabling with the diagrams in the <i>Integrated Smart Array Controller User Guide</i> . If the routing is correct, replace the cables on the specified port until the POST message is eliminated. Press the F1 key to resume.

continued

Table 4-2: POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
1778-Drive Array resuming Automatic Data Recovery process	None	This message appears whenever a controller reset or power cycle occurs while Automatic Data Recovery is in progress.	No action necessary.
1779-Drive Array Controller detects replacement drives Port (y) SCSI ID (x); Restore data from backup if replacement drive x has been installed.	None	Intermittent drive failure and/or possible loss of data.	If this message appears and drive x has not been replaced, this indicates an intermittent drive failure. This message also appears once immediately following drive replacement whenever data must be restored from backup.
1780-Disk 0 Failure	None	Hard drive/format error	Run Diagnostics. Replace failed assembly as indicated.
1781-Disk 1 Failure	None	Hard drive/format error	Run Diagnostics. Replace failed assembly as indicated.
1782-Disk Controller Failure	None	Hard disk drive circuitry error	Run Diagnostics. Replace failed assembly as indicated.
1783-Slot x Drive Array Controller Failure	None	ROM installation problem or array accelerator board problem. If this message appears immediately following a ROM installation, the ROM is defective or not installed properly.	Check to see if: <ul style="list-style-type: none"> The array accelerator board is attached properly. The array controller is firmly inserted in its slot. If error recurs, upgrade the System ROMs. Otherwise, replace the Smart Array Controller.
1784-Drive Array Drive Failure The following SCSI drive(s) should be replaced; SCSI port (y) SCSI ID (x)	None	Defective drive and/or cables	Check for loose cables. Replace defective drive X and/or cable(s).

continued

Table 4-2: POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
1785-Drive Array not Configured (followed by one of the following)	None	Configuration error	See actions below.
Run Compaq Array Configuration Utility			Run the Compaq Array Configuration Utility.
No drives detected.			Turn off the system and check the SCSI cable connections to make sure the drives are attached properly.
Drive positions appear to have changed.			Run Array Diagnostic Utility if previous positions are unknown. Then turn system power Off and move drives to their original positions.
Drive positions appear to have changed.			To avoid data loss turn system power Off and reattach drives to the original controller
Configuration information indicates drive positions beyond the capability of this controller. This may be due to drive movement from a controller that supports more drives than the current controller.			firmware to the version on the original controller using Option ROMPaq. Press the F1 key to resume.

continued

Table 4-2: POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
<p>1786-Drive Array Recovery Needed</p> <p>The following drive(s) need Automatic Data Recovery: SCSI port 1, SCSI ID 0</p> <p>Select F1 to continue automatic data recovery to drive. Select F2 to continue without starting automatic data recovery data to drive.</p> <p>Or</p> <p>Slot 1 Drive Array Recovery needed. Automatic data recovery previously aborted. The following SCSI drive(s) need automatic data recovery; SCSI port 1; SCSI ID 0.</p> <p>Select F1 to retry Automatic Data Recovery to drive. Select F2 to continue without starting Automatic Data Recovery to drive.</p>	None	Interim Data Recovery mode. Data has not been recovered yet.	<p>Press the F1 key to start the Automatic Data Recovery to begin. Data will automatically be restored to drive X now that the drive has been replaced or now seems to be working.</p> <p>Or</p> <p>Press the F2 key and the system will continue to operate in the Interim Data Recovery mode.</p> <p>The previously aborted version of the 1786 POST message will appear if the previous rebuild attempt was aborted for any reason. Run Drive Array Advanced Diagnostics (DAAD) for more information. If the replacement drive was failed, try using another replacement drive. If rebuild was aborted due to a read error from another physical drive in the array, back up all readable data on the array. Run Diagnostics Surface Analysis to restore your data.</p>
<p>1787-Slot x Drive Array Operating in Interim Recovery Mode. The following SCSI drive(s) should be replaced: SCSI port (y): SCSI ID (x)</p>	None	Hard drive X failed or cable is loose or defective. Following a system restart, this message reminds you that drive X is defective and fault tolerance is being used.	<ol style="list-style-type: none"> 1. Replace drive X as soon as possible. 2. Check loose cables. 3. Replace defective cables.

continued

Table 4-2: POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
* 1788-Slot x drive array reports incorrect drive replacement. The following SCSI drive(s) should have been replaced: SCSI port (y), SCSI ID (x). The following SCSI drive(s) were incorrectly replaced; SCSI port (y), SCSI ID (z).	None	Drives are not installed in their original positions, so the drives have been disabled. <i>See note below.</i>	Reinstall the drives correctly as indicated. Press the F1 key to restart the computer with the drive array disabled. -Or- Press the F2 key to use the drives as configured and lose all the data on them.
Select F1 to continue-drive array will remain disabled. Select F2 to reset configuration-all data will be lost.			
1788-Slot x drive array reports incorrect drive replacement. The following SCSI drive(s) should have been replaced: SCSI port (y), SCSI ID (x). The following SCSI drive(s) were incorrectly replaced; SCSI port (y), SCSI ID (z).	None	Drives are not installed in their original positions, so the drives have been disabled. <i>See note below.</i>	Reinstall the drives correctly as indicated. Press the F1 key to restart the computer with the drive array disabled. -Or- Press the F2 key to use the drives as configured and lose all the data on them.
Select F1 to continue-drive array will remain disabled. Select F2 to reset configuration-all data will be lost.			

continued

Table 4-2: POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
<p>* The 1788 error message might display inadvertently due to a bad power cable connection to the drive or by noise on the data cable. If this message was due to a bad power cable connection, but not because of an incorrect drive replacement, repair the connection and press the F2 key.</p> <p>-Or-</p> <p>If this message was not due to a bad power cable connection, and no drive replacement took place, this could indicate noise on the data cable. Check cable for proper routing.</p> <p>-Or-</p> <p>If this message is due to a defective SCSI cable, replace the cable.</p>			
1789-Slot x Drive array SCSI physical drive(s) Not Responding. Check the cables or replace the following drives: SCSI port (x), SCSI ID (x).	None	Cable or hard drive failure	<ol style="list-style-type: none"> 1. Check the cable connections. 2. Replace the cables. 3. Replace the drive. If you do not want to replace the drive now, press the F2 key.
Select F1 to continue - drive array will remain disabled. Select F2 to fail drive(s) that are not responding -Interim Recovery Mode will be enabled if configured for fault tolerance.			
1790-Disk 0 Configuration Error	None	Hard drive error or wrong drive type	Run the System Configuration Utility and Diagnostics and correct.
1791-Disk 1 Error	None	Hard drive error or wrong drive type	Run the System Configuration Utility and Diagnostics and correct.
1792-Drive Array Reports Valid Data Found in Array Accelerator. Data will automatically be written to drive array.	None	This indicates that while the system was in use, power was interrupted while data was in the array accelerator memory. Power was then restored within 8 to 10 days, and the data in the array accelerator was flushed to the drive array.	No action necessary; no data has been lost. Perform orderly system shutdowns to avoid data remaining in the array accelerator.

continued

Table 4-2: POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
1793-Drive Array - Array Accelerator Battery Depleted - Data Lost (Error message 1794 also displays.)	None	This indicates that while the system was in use, power was interrupted while data was in the array accelerator memory. Array accelerator batteries failed. Power was not restored within 8 to 10 days. Data in array accelerator has been lost.	Perform orderly system shutdowns to avoid data remaining in the array accelerator.
1794-Drive Array - Array Accelerator Battery Charge Low. Array Accelerator is temporarily disabled. Array Accelerator will be re-enabled when battery reaches full charge.	None	This is a warning that the battery charge is below 75%. Posted-writes are disabled.	Replace the array accelerator board if batteries do not recharge within 36 power-on hours.
1795-Drive Array - Array Accelerator Configuration Error. Data does not correspond to this drive array. Array Accelerator is temporarily disabled.	None	This indicates that while the system was in use, power was interrupted while data was in the array accelerator memory. The data stored in the array accelerator does not correspond to this drive array.	Match the array accelerator to the correct drive array, or run the System Configuration Utility to clear the data in the array accelerator.
1796-Drive Array - Array Accelerator Not Responding. Array Accelerator is temporarily disabled.	None	Array accelerator is defective or has been removed.	<ol style="list-style-type: none"> 1. Check that the array accelerator is properly seated. 2. Run the System Configuration Utility to reconfigure the Compaq IDA-2 without the array accelerator.

continued

Table 4-2: POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
1797-Drive Array - Array Accelerator Read Error Occurred. Data in Array Accelerator has been lost. Array Accelerator is disabled.	None	Hard parity error while reading data from posted-writes memory.	Enable array accelerator.
1798-Drive Array - Array Accelerator Write Error Occurred. Array Accelerator is disabled.	None	Hard parity error while writing data to posted-writes memory.	Enable array accelerator.
1799-Drive Array - Drive(s) Disabled due to Array Accelerator Data Loss. Select F1 to continue with logical drives disabled. Select F2 to accept data loss and to re-enable logical drives.	None	Volume failed due to loss of data in posted-writes memory.	Press the F1 key to continue with logical drives disabled or the F2 key to accept data loss and re-enable logical drive.
Beeps only: 2 Long	2 long	No valid memory is present in the system.	Replace failed memory with valid memory.
Beeps only: 2 Long + 2 Short	2 long, 2 short	Power is cycled. Temperature too hot. Processor fan not installed or spinning.	Check fan assembly.
(Run System Configuration Utility - F10 key)	None	A configuration error occurred during POST.	Press the F10 key to run System Configuration Utility.
(RESUME - F1 key)	None	As indicated to continue	Press the F1 key.

Diagnostics Software

Test Error Codes Tables include all test error codes generated by Compaq products. Each code has a corresponding description and recommended action(s). Each system generates only those codes that apply to its configuration and options.

When you select **Diagnostics and Utilities** from the **System Configuration Utility** main menu, the utility prompts you to test, inspect, upgrade, and diagnose the server.

Diagnostics and Utilities are located on the Compaq system partition on the hard drive and must be accessed when a system configuration error is detected during the Power-On Self-Test (POST). Compaq Diagnostics software is also available on the Compaq SmartStart and Support Software CD. You can create a Diagnostics diskette from the SmartStart and Support Software CD and run Diagnostics from diskette. See procedure in the “Running Compaq Utilities” section earlier in this chapter.

The following options are available from the **Diagnostics and Utilities** menu:

- Test Computer
- Inspect Computer
- Upgrade Firmware
- Remote Utilities
- Diagnose Drive Array

Diagnostic error codes are generated when the Diagnostics software recognizes a problem. These error codes help identify possible defective subassemblies.

Steps for Diagnostics

In each case, the Recommended Action column lists the steps necessary to correct the problem. After completing each step, run the Diagnostics utility to verify that the error condition has been corrected. If the error code reappears:

1. Perform the next step listed in the table.
2. Run the Diagnostics program again.
3. Follow this procedure until the Diagnostics program no longer detects an error condition.

100 – 199, Primary Processor Test Error Codes

The 100 series of diagnostic error codes identifies failures with processor and system board functions.

Table 4-3: Primary Processor Test Error Codes

Error Code	Description	Recommended Action
101-xx	CPU test failed.	Replace the processor board and retest.
103-xx	DMA page registers test failed.	Replace the processor board and retest.
104-xx	Interrupt controller master test failed.	
105-xx	Port 61error.	
106-xx	Keyboard controller self-test failed.	
107-xx	CMOS RAM test failed.	<ol style="list-style-type: none"> 1. Replace the battery/clock module and retest. 2. Replace the system board and retest.
108-xx	CMOS interrupt test failed.	
109-xx	CMOS clock load data test failed.	
110-xx	Programmable timer load data test failed.	Replace the processor board and retest.
111-xx	Refresh detect test failed.	
112-xx	Speed test slow mode out of range	
113-xx	Protected mode test failed.	
114-xx	Speaker test failed.	<ol style="list-style-type: none"> 1. Verify the speaker connection and retest. 2. Replace the speaker and retest. 3. Replace the system board and retest.
116-xx	Cache test failed.	Replace the system board and retest.

continued

Table 4-3: Primary Processor Test Error Codes *continued*

Error Code	Description	Recommended Action
122-xx	Multiprocessor dispatch test failed.	<ol style="list-style-type: none">1. Check the system configuration and retest.2. Replace the processor board and retest.3. Replace the system board and retest.
123-xx	Interprocessor communication test failed.	
199-xx	Installed devices test failed.	<ol style="list-style-type: none">1. Check the system configuration and retest.2. Verify cable connections and retest.3. Check switch and/or jumper settings and retest.4. Run the Configuration Utility and retest.5. Replace the processor board and retest.6. Replace the system board and retest.

200 – 299, Memory Test Error Codes

The 200 series of diagnostic error codes identifies failures with the memory subsystem.

Table 4-4: Memory Test Error Codes

Error Code	Description	Recommended Action
200-xx	Invalid memory configuration.	Reinsert memory modules in correct location and retest.
201-xx	Memory machine ID test failed.	1. Replace the system ROM and retest.
202-xx	Memory system ROM checksum failed.	2. Replace the processor board and retest. 3. Replace the memory expansion board and retest.
203-xx	Memory write/read test failed.	1. Replace the memory module and retest.
204-xx	Memory address test failed.	2. Replace the processor board and retest.
205-xx	Walking I/O test failed.	3. Replace the memory expansion board and retest.
206-xx	Increment pattern test failed.	
207-xx	Invalid memory configuration-check DIMM installation. DIMMs installed have 8K refresh.	Replace DIMMs.
208-xx	Invalid memory speed detected-check DIMM installation. Slow DIMMs may cause data loss.	Replace DIMMs with timing greater than 60 ns.
209-01	RAM long test failed.	1. Replace the memory module/board and retest.
209-02	Error while saving test block.	2. Replace the system board and retest.
209-03	Error while restoring test block.	3. Replace the memory expansion board and retest.
209-89	ECC error during testing.	
210-xx	Random pattern test failed.	1. Replace the memory module and retest. 2. Replace the processor board and retest. 3. Replace the memory expansion board and retest.

continued

Table 4-4: Memory Test Error Codes *continued*

Error Code	Description	Recommended Action
211-01	RAND test failed.	1. Replace the memory module/board and retest.
211-02	Error while saving test block.	2. Replace the system board and retest.
211-03	Error while restoring test block.	
211-04	Insufficient memory to perform the test.	
211-05	Failed inverted pattern compare, but RAM was correct.	
211-89	ECC error during noise test.	
214-01	Data error during noise test	1. Replace the memory module/board and retest.
214-89	ECC error during testing	2. Replace the system board and retest.
215	Nonfunctioning DC-DC converter for processor X	Replace the DC-DC converter (Processor Power Module).

300 – 399, Keyboard Test Error Codes

The 300 series of diagnostic error codes identifies failures with keyboard and system board functions.

Table 4-5: Keyboard Test Error Codes

Error Code	Description	Recommended Action
301-xx	Keyboard short test, 8042 self-test failed.	1. Check the keyboard connection. If disconnected, turn off the computer, connect the keyboard, turn on the power, and retest.
302-xx	Keyboard long test failed.	
303-xx	Keyboard LED test, 8042 self-test failed.	
304-xx	Keyboard typematic test failed.	2. Replace the keyboard and retest. 3. Replace the system board and retest.

400 – 499, Parallel Printer Test Error Codes

The 400 series of diagnostic error codes identifies failures with parallel printer interface card or system board functions.

Table 4-6: Parallel Printer Test Error Codes

Error Code	Description	Recommended Action
401-xx	Printer failed or not connected.	1. Connect the printer and retest.
402-xx	Printer data register failed.	2. Check the power to the printer and retest.
403-xx	Printer pattern test failed.	
498-xx	Printer failed or not connected.	3. Install the loopback connector and retest. 4. Check the switch on the serial/parallel interface board (if applicable) and retest. 5. Replace the serial/parallel interface board (if applicable) and retest. 6. Replace the system board and retest.

500 – 599, Graphics Display Unit Test Error Codes

The 500 series of diagnostic error codes identifies failures with graphics or system board functions.

Table 4-7: Graphics Display Unit Test Error Codes

Error Code	Description	Recommended Action
501-xx	Graphics controller test failed.	1. Replace the monitor and retest.
502-xx	Graphics memory test failed.	2. Replace the graphics board and retest.
503-xx	Graphics attribute test failed.	
504-xx	Graphics character set test failed.	3. Replace the system board and retest.
505-xx	Graphics 80x25-mode 9x14 character cell test failed.	
506-xx	Graphics 80x25-mode 8x8 character cell test failed.	
507-xx	Graphics 40x25-mode test failed.	
508-xx	Graphics 320x200-mode color set 0 test failed.	
509-xx	Graphics 320x200-mode color set 1 test failed.	
510-xx	Graphics 640x200-mode test failed.	
511-xx	Graphics screen memory page test failed.	
512-xx	Graphics gray scale test failed.	
514-xx	Graphics white screen test failed.	
516-xx	Graphics noise pattern test failed.	

600 – 699, Diskette Drive Test Error Codes

The 600 series of diagnostic error codes identifies failures with diskette, diskette drive, or system board functions.

Table 4-8: Diskette Drive Test Error Codes

Error Code	Description	Recommended Action
600-xx	Diskette ID drive types test failed.	1. Replace the diskette and retest.
601-xx	Diskette format failed.	2. Check and/or replace the diskette power and signal cables and retest.
602-xx	Diskette read test failed.	
603-xx	Diskette write/read/compute test failed.	3. Replace the diskette drive and retest.
604-xx	Diskette random seek test failed.	4. Replace the system board and retest.
605-xx	Diskette ID media failed.	
606-xx	Diskette speed test failed.	
607-xx	Diskette wrap test failed.	
608-xx	Diskette write protect test failed.	
609-xx	Diskette reset controller test failed.	
610-xx	Diskette change line test failed.	
694-xx	Pin 34 is not cut on 360-KB diskette drive.	
697-xx	Diskette type error.	
698-xx	Diskette drive speed not within limits.	
699-xx	Diskette drive/media ID error.	1. Replace the media and retest. 2. Run the Configuration Utility and retest.

1100 – 1199, Serial Test Error Codes

The 1100 series of diagnostic error codes identifies failures with serial/parallel interface board or system board functions.

Table 4-9: Serial Test Error Codes

Error Code	Description	Recommended Action
1101-xx	Serial port test failed.	1. Check the switch settings on the serial/parallel interface board (if applicable) and retest. 2. Replace the serial/parallel interface board (if applicable) and retest. 3. Replace the system board and retest.
1109-xx	Clock register test failed.	

1200 – 1299, Modem Communications Test Error Codes

The 1200 series of diagnostic error codes identifies failures with the modem.

Table 4-10: Modem Communications Test Error Codes

Error Code	Description	Recommended Action
1201-xx	Modem internal loopback test failed.	1. Refer to the modem documentation for correct setup procedures and retest.
1202-xx	Modem time-out test failed.	
1203-xx	Modem external termination test failed.	2. Check the modem line and retest.
1204-xx	Modem auto originate test failed.	3. Replace the modem and retest.
1206-xx	Dial multi-frequency tone test failed.	
1210-xx	Modem direct connect test failed.	

6000 – 6099, Compaq NIC Boards Test Error Codes

The 6000 series of diagnostic error codes identifies failures with some Compaq Network Interface Controllers.

Table 4-11: Compaq Network Interface Boards Test Error Codes

Error Code	Description	Recommended Action
6000-xx	Network card ID failed.	Check the controller installation in the PCI slot.
6001-xx	Network card setup failed.	
6002-xx	Network card transmit failed.	
6014-xx	Network card configuration failed.	
6016-xx	Network card reset failed.	
6028-xx	Network card internal failed.	
6029-xx	Network card external failed.	
6089-xx	Network card open failed.	
6090-xx	Network card initialization failed.	
6091-xx	Network card internal loopback failed.	
6092-xx	Network card external loopback failed.	

6500 – 6599, SCSI Hard Drive Test Error Codes

The 6500 series of diagnostic error codes identifies failures with SCSI hard drives, SCSI hard drive controller boards, SCSI hard drive cabling, and system board functions. If the system uses a drive array controller, see the section for Array Diagnostic Utility (ADU).

Table 4-12: SCSI Hard Drive Test Error Codes

Error Code	Description	Recommended Action
6500-xx	SCSI disk ID drive types test failed.	1. Run the System Configuration Utility and verify the drive type.
6502-xx	SCSI disk unconditional format test failed.	
6505-xx	SCSI disk read test failed.	2. Replace the SCSI disk drive signal and power cables and retest.
6506-xx	SCSI disk SA/media test failed.	
6509-xx	SCSI disk erase tape test failed.	3. Replace the SCSI controller and retest.
6523-xx	SCSI disk random read test failed.	
6528-xx	Media load/unload test failed.	4. Replace the SCSI disk drive and retest.
		5. Replace the system board and retest.

6600 – 6699, SCSI/IDE CD-ROM Drive Test Error Codes

The 6600 series of diagnostic error codes identifies failures with the CD-ROM drive cabling, CD-ROM drives, adapter boards, or the system board assembly.

Table 4-13: SCSI/IDE CD-ROM Drive Test Error Codes

Error Code	Description	Recommended Action
6600-xx	CD-ROM ID failed.	1. Replace the CD-ROM media and retest.
6605-xx	CD-ROM read failed.	2. Check and/or replace the signal cable and retest.
6608-xx	SCSI controller test.	3. Check the switch settings on the adapter board (if applicable).
6605-xx	CD-ROM read failed.	4. Replace the SCSI controller (if applicable) and retest.
		5. Replace the CD-ROM drive and retest.
		6. Replace the system board and retest.

6700 – 6799, SCSI Tape Drive Test Error Codes

The 6700 series of diagnostic error codes identifies failures with tape cartridges, tape drives, media changers, tape drive cabling, adapter boards, or the system board assembly.

Table 4-14: SCSI Tape Drive Test Error Codes

Error Code	Description	Recommended Action
6700-xx	SCSI tape ID drive types test failed.	1. Run the System Configuration Utility and verify the drive type.
6706-xx	SCSI disk SA/media test failed.	2. Replace the SCSI tape drive signal and power cables and retest.
6709-xx	SCSI disk erase tape test failed.	3. Replace the SCSI controller and retest.
6728-xx	Media load/unload test failed.	4. Replace the SCSI tape drive and retest.
		5. Replace the system board and retest.

8600 – 8699, Pointing Device Interface Test Error Codes

The 8600 diagnostic error codes identifies failures with the pointing device (mouse, trackball, and so on) or the system board assembly.

Table 4-15: Pointing Device Interface Test Error Codes

Error Code	Description	Recommended Action
8601-xx	Pointing device interface test failed.	<ol style="list-style-type: none"> 1. Replace with a working pointing device and retest. 2. Replace the system board and retest.

Array Diagnostic Utility (ADU)

Array Diagnostic Utility (ADU) is a Windows-based software tool designed to run on all Compaq servers that support Compaq array controllers and are running SmartStart 4.10 or a later version. The two main functions of ADU are to collect all possible information about array controllers in the system and to generate a list of detected problems. The error messages and codes listed include all codes generated by Compaq products. The system generates only codes applicable to the configuration and options in the server.

ADU works by issuing multiple commands to the array controllers to determine if a problem exists. This data can then be saved to a file. In severe situations, this file can be sent to Compaq for analysis. In most cases, ADU provides enough information to initiate problem resolution immediately.

NOTE: ADU does not write to the drives, destroy data, or change or remove configuration information.

Starting ADU

1. Insert the SmartStart CD into the CD-ROM drive.
2. Restart the system from the SmartStart CD.
3. Select **Array Diagnostic Utility (ADU)** from the **System Utilities** menu.

A **Please Wait** window displays, indicating that ADU is identifying the system parameters. ADU gathers information from all of the array controllers in the system. The time it takes to gather this information depends on the size of the system. When the information-gathering process is complete, ADU displays the main screen or a window indicating any problems detected.



CAUTION: Do not cycle the power during this process. ADU must perform low-level operations that, if interrupted, could cause the controller to revert to a previous level of firmware if the firmware was soft-upgraded.

4. To generate an ADU report, select **File** then **Save Data** from the **Command** menu.

Table 4-16: ADU Diagnostic Messages

Message	Description	Recommended Action
Accelerator board not detected	Array controller did not detect a configured array accelerator board.	Install the array accelerator board on the array controller. If an array accelerator board is already installed, check for proper seating on the array controller board.
Accelerator error log	List of the last 32 parity errors on transfers to or from memory on the array accelerator board; displays starting memory address, transfer count, and operation (read and write).	If there are many parity errors, you may need to replace the array accelerator board.
Accelerator parity read errors: n	Number of times that read memory parity errors were detected during transfers from memory on array accelerator board.	If there are many parity errors, you may need to replace the array accelerator board.
Accelerator parity write errors: n	Number of times that write memory parity errors were detected during transfers to memory on the array accelerator board.	If there are many parity errors, you may need to replace the array accelerator board.
Accelerator status: Cache was automatically configured during last controller reset.	This can occur when cache board is replaced with one of a different size.	Normal operations should continue.
Accelerator status: Data in the cache was lost due to some reason other than the battery being discharged	Data in the cache was lost, but not because of the battery being discharged.	Ensure that the array accelerator is properly seated. If the error continues, you may need to replace the array accelerator.
Accelerator status: Dirty data detected has reached limit. Cache still enabled, but writes no longer being posted	The number of cache lines containing dirty data that cannot be flushed (written) to the drives has reached a preset limit. The cache is still enabled, but writes are no longer being posted. This error usually occurs when there is a problem with the drive(s).	Resolve problem with drive(s). The controller will then be able to write dirty data to drives and posted write operations will be restored.
Accelerator status: Dirty data detected. Unable to write dirty data to drives	At least one cache line contains dirty data that the controller has been unable to flush (write) to the drives. This problem usually occurs when there is a problem with the drive(s).	Resolve the problem with the drive(s). The controller will then be able to write dirty data to drives.

continued

Table 4-16: ADU Diagnostic Messages *continued*

Message	Description	Recommended Action
Accelerator status: Excessive ECC errors detected in at least one cache line. As a result, at least one cache line is no longer in use	At least one line in the cache is no longer in use due to excessive ECC errors detected during use of the memory associated with that cache line.	Replacement of cache should be considered. If cache replacement is not done remaining cache lines should continue to operate properly.
Accelerator status: Obsolete data detected	During reset initialization obsolete data was found in cache. This was due to drives being moved and written to by another controller.	Normal operations should continue. The controller will either write data to the drives or discard the data completely.
Accelerator status: Obsolete data was discarded	During reset initialization obsolete data was found in cache and was discarded (not written to drives).	Normal operations should continue.
Accelerator status: Obsolete data was flushed (written) to drives	During reset initialization obsolete data was found in cache. Obsolete data was written to the drives, but newer data may have been overwritten.	If newer data was overwritten, you may need to restore newer data; otherwise, normal operations should continue.
Accelerator status: Permanently disabled	Array accelerator board has been permanently disabled. It remains disabled until it is reinitialized using the Array Configuration Utility (ACU).	Check the Disable Code field. Run Array Configuration Utility (ACU) to reinitialize the array accelerator board.
Accelerator status: Possible data loss in cache	Possible data loss detected during power-up due to all batteries being below sufficient voltage level and no presence of identification signatures on the array accelerator board.	There is no way to determine if dirty or bad data was in the cache and is now lost.
Accelerator status: Temporarily disabled	Array accelerator board has been temporarily disabled.	Check the Disable Code field.
Accelerator status: Unrecognized status	A status returned from the array accelerator board that ADU does not recognize.	Obtain the latest version of ADU.
Accelerator status: Valid data found at reset	Valid data was found in posted write memory at reinitialization. Data will be flushed to disk.	Not an error or data loss condition. No action required.

continued

Table 4-16: ADU Diagnostic Messages *continued*

Message	Description	Recommended Action
Accelerator status: Warranty alert	Catastrophic problem with array accelerator board. Refer to other messages on Diagnostics screen for exact meaning of this message.	Replace the array accelerator board.
Adapter/NVR AM ID mismatch	Nonvolatile RAM has an ID for a different controller from the one physically present in the slot.	Run the System Configuration Utility.
Array accelerator battery pack X not fully charged	Battery is not fully charged.	If 75% of batteries present are fully charged, array accelerator is fully operational. If less than 75% of batteries are fully charged, allow 36 hours to recharge them.
Array accelerator battery pack X below reference voltage (recharging)	Battery pack on array accelerator is below required voltage levels.	Allow enough time for batteries to recharge (36 hours). If batteries have not recharged after 36 hours, replace the array accelerator board.
Board in use by expand operation	Array accelerator memory is in use by Expand operation.	Operate system without array accelerator board until Expand operation completes.
Board not attached	Array controller configured for use with array accelerator board, but one is not attached.	Attach array accelerator board to array controller.
Configuration signature is zero	ADU detected that nonvolatile RAM contains a configuration signature of zero. Old versions of the System Configuration Utility could cause this.	Run the latest version of System Configuration Utility to configure the controller and nonvolatile RAM.
Configuration signature mismatch	Array accelerator board configured for a different array controller board. Configuration signature on array accelerator board does not match the one stored on the array controller board.	To recognize the array accelerator board, run the Array Configuration Utility.
Controller communication failure occurred	Controller communication failure occurred.	ADU was unable to successfully issue commands to the controller in this slot.
Controller detected. NVRAM configuration not present	Nonvolatile RAM does not contain a configuration for this controller.	Run the System Configuration Utility to configure the nonvolatile RAM.
Controller firmware needs upgrading	Controller firmware is below the latest recommended version.	Run Options ROMPaq to upgrade the controller to the latest firmware revision.

continued

Table 4-16: ADU Diagnostic Messages *continued*

Message	Description	Recommended Action
Controller is located in special "Graphics" slot	Controller is installed in slot for special graphics control signals. If controller is used in this slot, LED indicators on front panel may not function properly.	Install the controller in a different slot and run the System Configuration Utility to configure the controller and nonvolatile RAM. Then run the Array Configuration Utility to configure controller.
Controller is not configured	Controller is not configured. If controller was previously configured and you change drive locations, there may be a problem with placement of the drives. ADU examines each physical drive and looks for drives that have been moved to a different drive bay.	Look for messages indicating which drives have been moved. If none appear and drive swapping did not occur, run the Array Configuration Utility to configure the controller and run the System Configuration Utility to configure nonvolatile RAM. Do not run either utility if you believe drive swapping has occurred.
Controller reported POST error. Error Code: x	The controller returned an error from its internal Power-On Self-Tests.	Replace the controller.
Controller restarted with a signature of zero	ADU did not find a valid configuration signature to use to get the data. Nonvolatile RAM may not be present (unconfigured) or the signature present in nonvolatile RAM may not match the signature on the controller.	Run the System Configuration Utility to configure the controller and nonvolatile RAM.
Disable command issued	Posted-writes have been disabled by the issuing of the Accelerator Disable command. This occurred because of an operating system device driver.	Restart the system. Run the Array Configuration Utility to reinitialize the array accelerator board.
Drive (bay) X firmware needs upgrading	Firmware on this physical drive is below the latest recommended version.	Run the Options ROMPaq Utility to upgrade the drive firmware to the latest revision.
Drive (bay) X has insufficient capacity for its configuration	Drive has insufficient capacity to be used in this logical drive configuration.	Replace this drive with a larger capacity drive.
Drive (bay) X has invalid M&P stamp	Physical drive has invalid monitor and performance data.	Run the System Configuration Utility to properly initialize this drive.
Drive (bay) X has loose cable	The array controller could not communicate with this drive at power-up. This drive has not previously failed.	Check all cable connections first. The cables could be bad, loose, or disconnected. Turn on the system and attempt to reconnect signal/power cable to the drive. If this does not work, replace the cable. If that does not work, the drive may need to be replaced.

continued

Table 4-16: ADU Diagnostic Messages *continued*

Message	Description	Recommended Action
Drive (bay) X is a replacement drive	This drive has been replaced. This message displays if a drive is replaced in a fault tolerant logical volume.	If the replacement was intentional, allow the drive to rebuild.
Drive (bay) X is a replacement drive marked OK	This drive has been replaced and marked OK by the firmware. This may occur if a drive has an intermittent failure (for example, if a drive has previously failed, then when ADU is run, the drive starts working again).	Replace the drive.
Drive (bay) X is failed	The indicated physical drive has failed.	Replace the drive.
Drive (bay) X is undergoing drive recovery	This drive is being rebuilt from the corresponding mirror or parity data.	Normal operations should occur.
Drive (bay) X needs replacing	The 210-megabyte hard drive has firmware version 2.30 or 2.31.	Replace the drive.
Drive (bay) X upload code not readable	An error occurred while ADU was trying to read the upload code information from this drive.	If there were multiple errors, this drive may need to be replaced.
Drive (bay) X was inadvertently replaced	The physical drive was incorrectly replaced after another drive failed.	Replace the drive that was incorrectly replaced and replace the original drive that failed. Do not run the System Configuration Utility and try to reconfigure; data will be lost.
Drive Monitoring features are unobtainable	ADU unable to get monitor and performance data due to fatal command problem such as drive time-out, or unable to get data due to these features not supported on the controller.	Check for other errors (time-outs, and so on). If no other errors occur, upgrade the firmware to a version that supports monitor and performance, if desired.
Drive Monitoring is NOT enabled for SCSI Port x Drive ID x	The monitor and performance features have not been enabled on this drive.	Run the System Configuration Utility to initialize the monitor and performance features.
Drive time-out occurred on physical drive bay X	ADU issued a command to a physical drive and the command was never acknowledged.	The drive or cable may be bad. Check the other error messages on the Diagnostics screen to determine resolution.
Drive X indicates position Y	Message indicates physical drive that appears to be scrambled or in a drive bay other than the one for which it was originally configured.	Examine the graphical drive representation on ADU to determine proper drive locations. Remove drive X and place it in drive position Y. Rearrange the drives according to the ADU instructions.

continued

Table 4-16: ADU Diagnostic Messages *continued*

Message	Description	Recommended Action
Duplicate write memory error	Data could not be written to the array accelerator board in duplicate due to the detection of parity errors. This is not a data loss situation.	Replace the array accelerator board.
Error occurred reading RIS copy from SCSI Port x Drive ID x	An error occurred while ADU was trying to read the RIS from this drive.	If there were multiple errors, this drive may need to be replaced.
FYI: Drive (bay) X is non-Compaq supplied	The installed drive was not supplied by Compaq.	If problems exist with this drive, replace it with a Compaq drive.
Identify controller data did not match with NVRAM	The identify controller data from the array controller did not match the information stored in nonvolatile RAM. This could occur if new, previously configured drives have been placed in a system that has also been previously configured. It could also occur if the firmware on the controller has been upgraded and the System Configuration Utility was not run.	Check the identify controller data under the Inspect Utility. If the firmware version field is the only difference between the controller and nonvolatile RAM data, this is not a problem. Otherwise, run the System Configuration Utility.
Identify logical drive data did not match with NVRAM	The identify unit data from the array controller did not match with the information stored in nonvolatile RAM. This could occur if new, previously configured drives have been placed in a system that has also been previously configured.	Run the System Configuration Utility to configure the controller and nonvolatile RAM.
Insufficient adapter resources	The adapter does not have sufficient resources to perform operations to the array accelerator board. Drive rebuild may be occurring.	Operate the system without the array accelerator board until the drive rebuild completes.
Less than 75% batteries at sufficient voltage	Operation of array accelerator board has been disabled due to less than 75% of battery packs being at sufficient voltage level.	Allow sufficient time for batteries to recharge (36 hours). If batteries have not recharged after 36 hours, replace the array accelerator board.
Less than 75% batteries at sufficient voltage. Battery pack X below reference voltage.	Battery pack on array accelerator is below required voltage levels.	Allow sufficient time for batteries to recharge (36 hours). If batteries have not recharged after 36 hours, replace the array accelerator board.

continued

Table 4-16: ADU Diagnostic Messages *continued*

Message	Description	Recommended Action
Logical drive X failed due to cache error	This logical drive failed due to a catastrophic cache error.	Replace the array accelerator board and reconfigure using the Array Configuration Utility.
Logical Drive X status = FAILED	This status could be issued for several reasons. If this logical drive is configured for No Fault Tolerance and one or more drives fail, this status will occur. If mirroring is enabled, and any two mirrored drives fail, this status will occur. If Data Guarding is enabled, and two or more drives fail in this unit, this status will occur. This status may also occur if another configured logical drive is in the Wrong Drive Replaced or Loose Cable Detected State.	Check for drive failures, wrong drive replaced, or loose cable messages. If there was a drive failure, replace the failed drive(s), then restore the data for this logical drive from the tape backup. Otherwise, follow the wrong drive replaced or loose cable detected procedures.
Logical Drive X status = INTERIM RECOVERY	A physical drive in this logical drive has failed. The logical drive is operating in interim recovery mode and is vulnerable.	Replace the failed drive as soon as possible.
Logical Drive X status = LOOSE CABLE DETECTED	A physical drive has a cabling problem.	Turn the system off and attempt to reattach the cable onto the drive. If this does not work, replace the cable.
Logical Drive X status = NEEDS RECOVER	A physical drive in this logical drive has failed and has now been replaced. This drive needs to be rebuilt from the mirror drive or the parity data.	When starting the system, select the F1 - rebuild drive option to rebuild the replaced drive.
Logical Drive X status = OVERHEATED	The Intelligent Array Expansion System temperature is beyond safe operating levels, and the system has shut down to avoid damage.	Check the fans and the operating environment.
Logical Drive X status = OVERHEATING	The Intelligent Array Expansion System temperature is beyond safe operating levels.	Check the fans and the operating environment.
Logical Drive X status = RECOVERING	A physical drive in this logical drive has failed and has now been replaced. The replaced drive is rebuilding from the mirror drive or the parity data.	Nothing needs to be done. Normal operations can occur.

continued

Table 4-16: ADU Diagnostic Messages *continued*

Message	Description	Recommended Action
Logical Drive X status = WRONG DRIVE REPLACED	A physical drive in this logical drive has failed. The incorrect drive was replaced.	Replace the drive that was incorrectly replaced. Then, replace the original drive that failed with a new drive. Do not run the System Configuration Utility to reconfigure; data on drive will be lost.
Loose cable detected - logical drives may be marked FAILED until corrected	ADU found loose cable. If logical drives are marked FAILED, those logical drives will be unusable until problem corrected. Controller unable to communicate with one or more physical drives, probably because of a cabling problem. Logical drives may be in a FAILED state until the condition is corrected, preventing access to data on the controller.	Turn off the system. Check cable(s) for tight connection to logical drives. Restart system. If same message recurs, cable(s) may be bad. Check all controller and drive cable connections.
Mirror data miscompared	Data was found at reinitialization in the posted write memory; however, the mirror data compare test failed resulting in data being marked as invalid. Data loss is possible.	Replace the array accelerator board.
No configuration for accelerator board	The array accelerator board has not been configured.	If the array accelerator board is present, run the Array Configuration Utility (ACU) to configure the board.
NVRAM configuration present, controller not detected	Nonvolatile RAM has a configuration for an array controller, but there is no board in this slot. Either a board has been removed from the system or a board has been placed in the wrong slot.	Place the array controller in the proper slot or run the System Configuration Utility to reconfigure nonvolatile RAM to reflect the removal or new position.
RIS copies between drives do not match	Drives on controller contain copies of RIS that do not match.	Upgrade ADU to the most recent version.
SCSI Port x Drive ID x has exceeded threshold(s)	Monitor and performance threshold for this drive has been violated.	Check for the particular threshold that has been violated.
SCSI Port x Drive ID x is not stamped for monitoring	Drive has not been stamped with monitor and performance features.	Run the Array Configuration Utility (ACU). Changing the configuration and saving should cause ACU to stamp drive with monitor and performance features. To do this without destroying the current configuration, change array accelerator size and save configuration. Change the array accelerator back to original size and save again.

continued

Table 4-16: ADU Diagnostic Messages *continued*

Message	Description	Recommended Action
SCSI Port x Drive ID x RIS copy mismatch	Copies of RIS on drive do not match.	Drive may need to be replaced. Check for other errors.
SCSI Port x Drive ID x failed – REPLACE (failure message)	ADU found drive that needs to be replaced.	Replace drive or correct condition that caused error.
SCSI Port x Drive ID x firmware needs upgrading	Drive firmware is below recommended version.	Run Options ROMPaq to upgrade drive to latest firmware revision.
SCSI Port x Drive ID x has a loose cable. SMART is unable to communicate with drive	Drive has loose cable.	Turn off the system. Check drive cable for tight connection.
SCSI Port x Drive ID x was replaced on a good volume: (failure message)	ADU found drive was replaced even though volume was fine.	No action needed.
SCSI port X, drive ID Y firmware needs upgrading	Drive's firmware may cause problems and should be upgraded.	Run Options ROMPaq to upgrade the firmware on the drive to a later version.
Set configuration command issued	The configuration of the array controller has been updated. The array accelerator board may remain disabled until it is reinitialized.	Run the System Configuration Utility to reinitialize the array accelerator board.
Soft Firmware Upgrade required	ADU has determined that the controller is running firmware that has been soft upgraded by the Compaq Upgrade Utility. However, the firmware running is not present on all drives. This could be caused by the addition of new drives in the system.	Run the Compaq Upgrade Utility to place the latest firmware on all drives.

continued

Table 4-16: ADU Diagnostic Messages *continued*

Message	Description	Recommended Action
Unable to communicate with drive on SCSI Port x, Drive ID x	Controller could not communicate with drive.	If the amber LED on the drive is on, replace the drive.
Unknown disable code	A code was returned from the array accelerator board that ADU does not recognize.	Obtain the latest version of ADU.
Unrecoverable read error	Read parity errors were detected when attempting to read same data from both sides of mirrored memory. Data loss will occur.	Replace the array accelerator board.
WARNING - Drive Write Cache is enabled on X	Drive has its internal write cache enabled. The drive may be a third-party drive, or the operating parameters of the drive may have been altered. This condition may cause data corruption if power to the drive is interrupted.	Replace the drive with a drive supplied by Compaq, or restore the operating parameters of the drive.
Warning bit detected	A monitor and performance threshold violation may have occurred. Status of a logical drive may not be OK.	Check the other error messages on the diagnosis screen for an indication of the problem.
Write memory error	Data could not be written to cache memory. This typically means that parity error was detected while writing data to cache. This could be caused by incomplete connection between cache and controller. This is not a data loss circumstance.	With power to system turned off, verify that the cache board is fully connected to controller.
Wrong Accelerator	This could mean that either the board was replaced in the wrong slot or placed in a system that was previously configured with another board type. Included with this message is a message indicating the type of adapter sensed by ADU and a message indicating the type of adapter last configured in nonvolatile RAM.	Check the diagnosis screen for other error messages. Run the System Configuration Utility to update the system configuration.

Integrated Management Log

IML records system events and stores them in an easily viewable form. Each event is marked with a time-stamp with one-minute granularity.

Events listed in the Integrated Management Log are categorized as one of four event severity levels:

- **Status**—indicates that the message is informational only.
- **Repaired**—indicates that corrective action has been taken.
- **Caution**—indicates a nonfatal error condition.
- **Critical**—indicates a component failure.

The Integrated Management Log requires operating system-dependent drivers from Compaq. Refer to the Compaq Support Software CD for instructions on installing the appropriate drivers.

Multiple Ways of Viewing the Log

You can view an event in the IML in several ways:

- From within Compaq Insight Manager
- From within the Compaq Survey Utility
- From within the IML Management Utility

Compaq Insight Manager

Compaq Insight Manager is a comprehensive management tool used to monitor and control the operation of Compaq servers and clients. Compaq Insight Manager consists of two components: a Windows-based console application, and server- or client-based management data collection agents. Starting with Compaq Insight Manager 4.0, the agents for Windows NT and NetWare are also Web-enhanced; that is, these agents enable Web browser access and monitoring of management information.

The management agents monitor over 1,000 management parameters. Key subsystems are instrumented to make health, configuration, and performance data available to agent software. Agents act upon data by initiating information, such as statistics on network interface or storage subsystem performance.

Viewing the Event List

1. From Compaq Insight Manager, select the appropriate server, then click **View Device Data**. The selected server displays, with buttons around its perimeter.
2. Click the **Recovery**, then insert Integrated Management Log.
3. If a failed component has been replaced, select the event from the list. Then click **Mark Repaired**.

Printing the Event List

NOTE: You can view the event list only from the Recovery/Integrated Management Log screen as described above.

1. From the **Compaq Insight Manager** screen, select the appropriate server.
2. Click Configuration, Recovery, Print.

Compaq Survey Utility

The Compaq Survey Utility is a serviceability tool available for Windows NT and Novell NetWare. It delivers online-configuration capture and comparison to maximize server availability. It is delivered on the Compaq Management CD in the SmartStart package or is available on the Compaq website. Refer to the Compaq Management CD for information on installing and running the Compaq Survey Utility.

After running the Compaq Survey Utility, view the IML by loading the output of the utility (typically called "survey.txt") into a text viewer such as Microsoft Notepad. The event list follows the system slot information. After opening the text file, print it using the print feature of the viewer.

Compaq IML Management Utility

The Compaq IML Management Utility is a DOS-based tool that gives you the offline ability to review, mark corrected, and print events from the IML. It is located on the Compaq SmartStart and Support Software CD. Refer to the SmartStart Installation for Servers poster, which ships with the server, for information on how to install and use the IML Management Utility.

Event List

The Event List displays the affected components and the associated error messages. Though the same basic information displays, the format of the list may differ, depending on how you view it: on the Integrated Management Display, from within Compaq Insight Manager, or the Compaq Survey Utility. An example of the format of an event displayed on the Integrated Management Display is as follows:

```
**001 of 010**  
---caution---  
03/19/1997  
12:54 PM  
FAN Failure  
Main System  
Location:  
    System Board  
Fan ID: 03  
**END OF EVENT**
```

Event Messages

Table 4-17: Event Messages

Event Type	Event Message	Action
Machine Environment		
Fan Failure	System Fan Failure (Fan X, Location).	Replace fan.
Overheat Condition	System Overheating (Zone X, Location).	Check fans.
Main Memory		
Correctable Error threshold exceeded	Corrected Memory Error threshold passed (Slot X, Memory Module X).	Replace the defective memory module.
	Corrected Memory Error threshold passed (System Memory).	Replace the memory modules one at a time (if more than one) and retest the system after each replacement.
	Corrected Memory Error threshold passed (Memory Module unknown).	Replace the memory modules one at a time (if more than one).
Uncorrectable Error	Uncorrectable Memory Error (Slot X, Memory Module X).	Replace the defective memory module.
	Uncorrectable Memory Error (System Memory).	Replace the defective memory module.
	Uncorrectable Memory Error (Memory Module unknown).	Replace the memory modules one at a time (if more than one) and retest the system after each replacement.
Processor		
Correctable Error Threshold exceeded	Processor Correctable error Threshold passed (Slot X, Socket X).	Replace the processor.
Uncorrectable Error	Unrecoverable Host Bus Data Parity Error.	Replace the processor.
Host Bus Error	Unrecoverable Host Bus Address Parity Error.	Call the service provider or Compaq for diagnosis.
PCI Bus Error	PCI Bus Error (Slot X, Bus X, Device X, Function X).	Power down PCI slot and replace board.

continued

Table 4-17: Event Messages *continued*

Event Type	Event Message	Action
Power Subsystem		
Power Supply Failure	System Power Supply Failure (Power Supply X).	Replace power supply.
Power Supply Inserted	System Power Supply Inserted (Power Supply X).	None
Power Supply Removed	System Power Supply Removed (Power Supply X).	None
Power Supply Not Redundant	System Power Supplies Not Redundant.	Add power supply.
System Configuration Battery Low	Real-Time Clock Battery Failing.	Replace battery.
Power Module Failure	A CPU Power Module (System Board, Socket X).	Replace power module.
Power Module Failure	A CPU Power Module (Slot X, Socket X).	Replace power module.
Automatic Server Recovery–2		
System Lockup	ASR Lockup Detected: Cause	Call the service provider or Compaq for diagnosis.
Operating System		
System Crash	Blue Screen Trap: [NT] Kernal Panic: Cause [UNIX] Abnormal Program Termination: Cause [NetWare]	Refer to the documentation for the operating system.
Automatic OS Shutdown	Automatic Operating System Shutdown Initiated Due to Fan Failure Condition Automatic Operating System Shutdown Initiated Due to Overheat Condition Fatal Exception (Number X, Cause)	Refer to the documentation for the operating system.

Rapid Error Recovery

Compaq servers provide rapid recovery services for diagnosing and recovering from errors. These tools are available for local and remote diagnosis and recovery.

Rapid recovery means fast identification and resolution of complex faults. The Rapid Recovery Engine and Insight Management Agents notify the system administrator when a failure occurs, ensuring that the server experiences minimal downtime. You enable these features through the System Configuration Utility. These integrated server management features are:

- Automatic Server Recovery-2 (ASR-2)
- Integrated Management Logs
- Storage Fault Recovery Tracking
- Storage Automatic Reconstruction (requires the Integrated Smart Array Controller)
- Network Interface Fault Recovery Tracking
- Memory Fault Recovery Tracking

These are discussed in more detail on the server documentation CD.

Automatic Server Recovery-2

Automatic Server Recovery-2 (ASR-2) lets the server restart automatically from the operating system or the Compaq Utilities. To use this feature, you must use the System Configuration Utility to install Compaq Utilities in the Compaq system partition.

You can enable the ASR-2 feature to restart a server after a critical hardware or software error occurs. If a critical error occurs, the server records the error information in the Integrated Management Log, restarts the system, and pages you. Using the Compaq System Configuration Utility, configure the system for automatic recovery or for attended local or remote access to diagnostic and configuration tools.

NOTE: ASR-2 is available only on specific operating systems. ASR-2 drivers are provided by Compaq.

You can also configure ASR-2 to page an administrator when the system restarts. ASR-2 depends on the application and driver that routinely notify the ASR-2 hardware of proper system operations. If the time between ASR-2 notifications exceeds the specified period, ASR-2 assumes a fault has occurred and initiates the recovery process.

To configure ASR-2:

1. Run the System Configuration Utility.
2. Click **View** and **Edit Details**.
3. Set the software error recovery status to **Enabled**.
4. Set the software error recovery timeout.

The available recovery features are:

- **Software Error Recovery**—can be set to automatically restart the server after a software-induced server failure.
- **Environmental Recovery**—can be set to allow the server to restart when temperature, fan, or AC power conditions return to normal.

Unattended Recovery

For unattended recovery, ASR-2 performs the following actions:

- Logs the error information to the IML
- Resets the server
- Pages you (if a modem is present and you selected Paging)
- Tries to restart the operating system

Often the server restarts successfully, making unattended recovery the ideal choice for remote locations where trained service personnel are not immediately available.

If ASR-2 cannot restart the server within 10 attempts, it places a critical error in the Integrated Management Log, starts the server into Compaq Utilities, and enables remote access (if you configured remote access).

To use this level of ASR-2, you must configure ASR-2 to load the operating system after restart.

Attended Recovery

For attended recovery, ASR-2 performs the following actions:

- Logs the error information to the IML
- Resets the server
- Pages you (if a modem is present and you selected Paging)
- Starts Compaq Utilities from the hard drive
- Enables remote access

During system configuration, these utilities are placed on the system utilities partition of the hard drive.

If you have configured for dial-in access and have a modem with an auto-answer feature installed, you can dial in and remotely diagnose or reconfigure the server.

If you have configured the Compaq Utilities for network access, you can access the utilities over the network. You can use Compaq Insight Manager for dial-in or network access.

Hardware Requirements

To use this level of ASR-2 over a modem, you need the following:

- Compaq External Netelligent modem or compatible
- System Configuration Utility and Diagnostics Utility installed on the Compaq system partition of the hard drive
- ASR-2 configured to load Compaq Utilities after restart

You can also run Compaq Utilities remotely over an IPX or IP network using the Network feature:

- To use Compaq Utilities on an IPX network, you must have Compaq Insight Manager 2.0 or later or an NVT (Novell Virtual Terminal) Terminal Emulator with VT100 or ANSI terminal capabilities.
- To use Compaq Utilities on an IP network, you must have Compaq Insight Manager 2.10 or later, or a Telnet Terminal Emulator with VT100 or ANSI capabilities.

If you are notified that ASR-2 restarted the server and you have restarted to Compaq Utilities, use the Inspect Utility or Compaq Insight Manager to view the critical error. Run Diagnostics to diagnose and resolve the problem.

You can configure ASR-2 to restart the server into Compaq Utilities to diagnose the critical error or to start the operating system to return the server to operational status as rapidly as possible.

When you enable ASR-2 to start the operating system, the server tries to start from the primary partition. In this mode, ASR-2 can page you if a critical error occurs, but you cannot access Compaq Utilities.

When you enable ASR-2 to start Compaq Utilities, the server restarts after a critical error and loads Compaq Utilities from the Compaq system partition on the hard drive.

You can configure the server to start Compaq Utilities in four different ways:

- Without remote console support; for example, to run Compaq Utilities from the server console only
- With remote console support using modems for dial-in access
- With remote console support using a modem to dial a predetermined telephone number
- With remote console support through a network connection (IP or IPX)

Table 4-18: ASR-2 Features

Features	Definition
Software error recovery	If enabled, ASR-2 is activated if the OS hangs or has a crash that results in a lockup.
Software error recovery timeout	Determines how long the server waits to enable ASR-2 after an OS lockup.
Standby recovery server option	If enabled, ASR-2 activation initiates a switch to a standby recovery server.
Standby recovery server port	Port used to communicate with the recovery server.
Standby recovery timeout	Determines how long the server waits to initiate switch after ASR-2 activation.
Software error recovery start option	Allows the server to restart either into the OS or into Compaq Utilities.
Thermal shutdown	If enabled, shuts down the server if a critical thermal error occurs.
UPS shutdown	If enabled, allows the server to perform a shutdown if a UPS is activated.
UPS shutdown threshold	Determines how long the server waits to shut down after the UPS is activated. If desired, this number should provide enough time for an administrator to perform any necessary operations or to gracefully shut down the server.

Compaq Integrated Remote Console

The standard Compaq Integrated Remote Console performs a wide range of configuration activities. Console features include:

- Is accessible using ANSI terminal
- Operates independently of the operating system
- Provides for remote server restart
- Provides access to system configuration
- Uses out-of-band communication with dedicated management modem installed in the server

For more information, see the *Integrated Remote Console User Guide* that shipped with the server.

IMPORTANT: Before configuring ASR-2, verify that the System Configuration Utility and Diagnostics software are installed on the Compaq system partition. ASR-2 must have this to start Compaq Utilities after a system restart. Compaq recommends this even if you configure ASR-2 to start the operating system.

Compaq Health Driver

The Compaq Health Driver continually resets the ASR-2 timer according to the frequency you specified in the System Configuration Utility (for example, 10 minutes). If the ASR-2 timer counts down to zero before being reset, due to an operating system crash or a server lockup, ASR-2 restarts the server into either Compaq Utilities or the operating system (as indicated by the System Configuration parameters). The default value is 10 minutes. The allowable settings are 5, 10, 20, and 30 minutes.

For remote and off-site (unattended) servers, setting the software error recovery timeout for 5 minutes reduces server downtime and allows the server to recover quickly. For local (attended) servers located on site, you can set the software error recovery timeout for 20 or 30 minutes, giving you time to arrive at the server if you wish to manually diagnose the problem.

The Compaq Health Driver is independent of the ASR-2 timer. You should load it and enable the ASR-2 timer. This allows the driver to detect and log information in the IML regarding numerous hardware and software errors. However, you cannot enable the ASR-2 timer without loading the Compaq Health Driver.

Before ASR-2 restarts the server, it records any information available about the condition of the operating system in the IML. This information can be used to diagnose an operating system crash or server lock-up, while still allowing the server to be restarted.

The following ASR-2 flow chart shows you the sequence of events after a hardware or software error occurs:

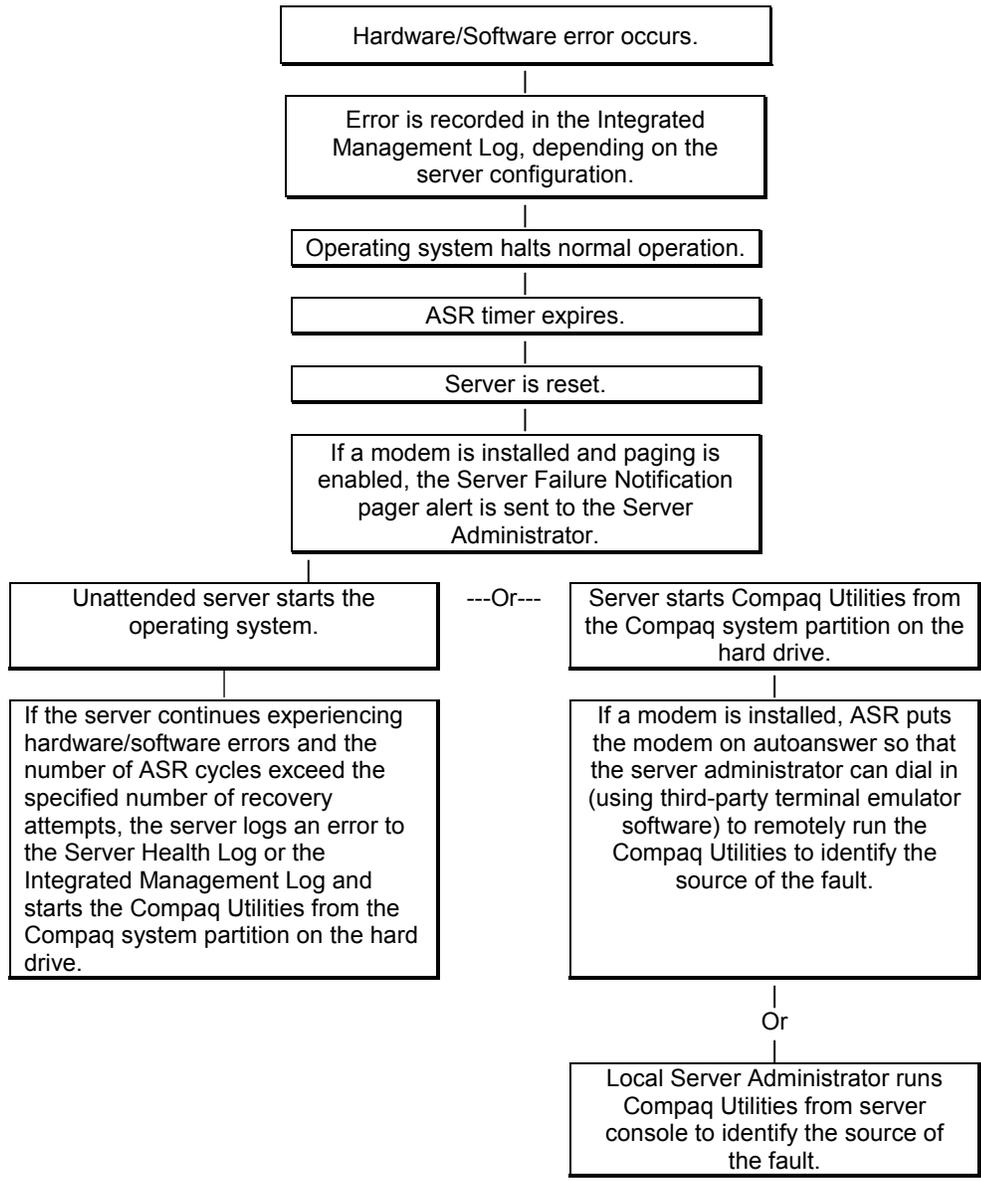


Figure 4-1. ASR-2 flow chart

Booting into Compaq Utilities

When you enable ASR-2 to start into Compaq Utilities and a critical error occurs, the operating system-specific Health Driver logs the error information in the IML and the ASR-2 feature restarts the server. When the system reinitializes, the system pages the designated administrator (if enabled), and starts Compaq Utilities from the hard drive.

If Dial-In status is enabled, the modem is placed in auto-answer mode. If you enable Dial-Out status, you are automatically enabled for Dial-In.

If Network Status is enabled, the appropriate network support software is loaded, depending on the network protocol, IP or IPX. This allows remote access via the network.

IMPORTANT: Compaq Utilities are loaded from a specially created Compaq system partition on the hard drive. This partition was configured during server configuration.

You can access the server and view the Integrated Management Logs remotely by modem, in-band over the network, or directly from the server. For modem access, you must have either Compaq Insight Manager 2.0 or above or have a VT100 or ANSI terminal type device. You may use a standard CRT with VT100 or ANSI emulation capability, or you may use a PC with a VT100 or ANSI terminal emulation package. The communication parameters must be set for 8 data bits, no parity, and 1 stop bit.

You can also enable ASR-2 to allow network access using the Network Status feature in the System Configuration Utility. You must have either Compaq Insight Manager 2.0 or greater or a Novell Virtual Terminal (NVT) emulator on an IPX network to use this feature. You must also have version 2.24 or later of the System Configuration Utility. For IP access, you must have Compaq Insight Manager 2.10 or later, or a Telnet Terminal emulator to use this feature. You also must have version 2.24 or later of the System Configuration Utility.

The System Configuration Utility settings should resemble the settings in Table 4-19 when you enable ASR-2 to start into Compaq Utilities.

Table 4-19: Compaq System Configuration Utility Pager Settings for Booting into Compaq Utilities

Pager Data	Example Setting	Description
Pager status	Enabled	Indicates whether the pager feature is enabled or disabled
Pager dial string	ATDT 555-5555	Indicates the pager dial string and delay before the pager message; pagers typically use one of the following formats: Local pagers: ATDT 555-5555 Wide area pagers: ATDT 1-800-555-5555,1234567#
Pager message	1234567#	Represents a unique number (maximum seven digits, numeric only) that you must designate to identify the server on the pager display. The ROM adds a three-digit code to the front of this number. The first two indicate the subsystem and the third indicates the severity of the error that caused the alert. The # symbol usually terminates the message. If no message is required, delete the # symbol.
Pager test	Select to test pager setup	Use this to test the current pager settings. Press the Enter key to dial the pager number, and the pager message (if present) displays. You must configure the computer before testing the pager, and the Pager Status must be set to Enabled . Do not test the pager if you are running remotely and are using only one modem.
Serial interface	COM1	Select the communications port for the modem used by the pager and the remote ASR-2 functions. The options are COM1 and COM2 .
Dial-in status	Enabled	Set Dial-In Status to Enabled . Be sure the Reset Boot option is set to Boot Compaq Utilities . When the system starts because of an ASR reset, it starts to the Compaq Utilities, sets the Management Modem to auto-answer, and waits for the administrator to dial in and run the Compaq Utilities. You automatically disable this option when you configure the software error recovery start option to Boot Operating System . When ASR pages you, you cannot dial in unless ASR-2 exceeds 10, the threshold number of server restart retries. When this happens, ASR-2 restarts the server into the Compaq Utilities and places the modem in auto-answer mode.

continued

Table 4-19: Compaq System Configuration Utility Paper Settings for Booting into Compaq Utilities *continued*

Pager Data	Example Setting	Description
Dial-out status	Enabled	<p>Allows ASR-2 to dial out to a remote workstation. If you selected this option, Dial-In Status is automatically selected.</p> <p>To use the dial-out feature, set Dial-Out Status to Enabled and set the Dial-Out String to the correct phone number. You must also set the Reset Boot option to Boot Compaq Utilities. When the system restarts because of an ASR reset, the administrator is paged via Pager Status and Pager Dial String, the system restarts to the Compaq Utilities, and dials out to the phone number provided in the Dial-Out string. The dial-out number will be tried five times. If it fails to connect after five attempts, the modem is put in autoanswer mode.</p>
Dial-out string	555-1234	Enter the dial string followed by the remote computer telephone number.
Network status	Enabled	To allow network access to Compaq Utilities, set Network Status to Enabled and ensure that the Reset Boot option is set to Boot Compaq Utilities .
Network protocol		<p>To use IPX network access, set Network Protocol to IPX. When the system restarts to the Compaq Utilities because of an ASR reset, it loads IPX network support. This enables remote access using NVT.</p> <p>To use IP network access, set Network protocol to IP. Also make sure to set Network IP address, Network IP net mask, and Network IP router address. When the system restarts to the Compaq Utilities because of an ASR reset, it loads IP network support. This enables remote access using Telnet.</p> <p>Note: The Network Status must be set to Enabled for network access.</p>
Network controller	Compaq	For all Compaq standard network controllers.
Network host name	CPQHOU	Enter the network name of the server. Use underscores instead of spaces within the name—for example, Compaq_Server. If you are using IPX network access to the Compaq Utilities, this server name is used to advertise NVT host services. This server name displays in the Compaq Insight Manager server list when the program determines it can communicate using NVT. Set this name to be the same as the server name you assign when the host OS is running.
Network card slot	Slot #	Select the slot number of the network interface card you wish to use for network access to Compaq Utilities.
Network frame type	ETHERNET_II	Select the frame type for the network. Selections include both Ethernet and Token Ring topologies.

continued

Table 4-19: Compaq System Configuration Utility Paper Settings for Booting into Compaq Utilities *continued*

Pager Data	Example Setting	Description
Network IP address	xxx.xxx.xxx.xxx	Enter the IP address for this server in standard dot notation. Note: This is not used if you select Custom for Network controller . You must enter the IP address in the NET.CFG file that you load into the Compaq system partition.
Network IP net mask	xxx.xxx.xxx.xxx	Enter the net mask for this server in standard dot notation. Note: This is not used if you select Custom for network controller . You must enter the IP address in the NET.CFG file that you load into the Compaq system partition.
Network IP router address	xxx.xxx.xxx.xxx	Enter the router to be used for this server in standard dot notation. Note: This is not used if you select Custom for network controller . You must enter the IP address in the NET.CFG file that you load into the Compaq system partition.

If you configure the server to boot into Compaq Utilities, it prepares for remote communications. You can remotely run Diagnostics software, the Inspect Utility, or the System Configuration Utility using a workstation running terminal emulation software, such as Compaq Insight Manager or PC Anywhere.

Booting into the Operating System

When you enable ASR-2 to restart into the operating system and a critical error occurs, ASR-2 logs the error in the IML and restarts the server. The system ROM pages the designated administrator, then executes the normal restart process.

IMPORTANT: When you enable ASR-2 to restart into the operating system, Modem Dial-In Status, Network Status, and Modem Dial-Out Status are automatically disabled. In this mode, ASR-2 can page you if a critical error occurs, but you cannot access the server, and the server cannot dial out to a remote workstation.

If the ASR-2 feature cannot restart the server within 10 attempts, it logs a critical error in the IML and restarts the server into the Compaq Utilities, and puts the modem into auto-answer mode.

The System Configuration Utility setting should resemble the following when you enable ASR to restart into the operating system:

Table 4-20: OS Restart SCU Setting for ASR•2

Option	Setting
Serial interface	COM1
Dial-in status	Disabled
Dial-out status	Disabled
Dial-out string	555-1234
Network status	Disabled
Network protocol	IPX
Network controller	Compaq
Network host name	CPQHOU
Network card slot	Slot #
Network frame type	ETHERNET_II
Network IP address	xxx.xxx.xxx.xxx
Network IP net mask	xxx.xxx.xxx.xxx
Network IP router address	xxx.xxx.xxx.xxx

ASR-2 Security

The standard Compaq password features function differently during ASR-2 than during a typical system startup. During ASR-2, the system does not prompt for the power-on password. This allows ASR-2 to restart the operating system or Compaq Utilities without user intervention.

To maintain system security, set the server to boot in Network Server Mode (an option in the System Configuration Utility). This option ensures that the server keyboard is locked until you enter the keyboard password.

Select an administrator password (an option in the System Configuration Utility). During attended ASR-2 (local or remote), you must enter this administrator password before any modifications can be made to the server configuration.

ASR-2 Integrated Management Log Messages

The Integrated Management Log (IML) records memory errors, as well as catastrophic hardware and software errors that cause the system to fail. This information helps you quickly identify and correct the problem, thus minimizing downtime.

You can view the IML through Compaq Insight Manager. The Diagnostics Utility either resolves the error or suggests corrective action in systems that do not support event logs.

The IML or Integrated Management Log identifies and records all the following errors. Each error type is explained below.

Table 4-21: ASR-2 IML Messages

Message	Description
Abnormal Program Termination	The operating system has encountered an abnormal situation that has caused a system failure.
ASR-2 detected by ROM	An ASR-2 activity has been detected and logged by the system ROM.
ASR-2 Test Event	The System Configuration Utility generated a test alert.
Automatic Server Recovery Base Memory Parity Error	The system detected a data error in base memory following a reset due to the Automatic Server Recovery-2 (ASR-2) timer expiration.
Automatic Server Recovery Extended Memory Parity Error	The system detected a data error in extended memory following a reset due to the ASR-2 timer expiration.
Automatic Server Recovery Memory Parity Error	The system ROM was unable to allocate enough memory to create a stack. Then, it was unable to put a message on the screen or continue starting the server.
Automatic Server Recovery Reset Limit Reached	The maximum number of system resets due to ASR-2 timer expiration has been reached, resulting in the loading of Compaq Utilities.
Battery Failing	Low system battery warning. Replace battery within 7 days to prevent loss of nonvolatile configuration memory. Failure of the battery supporting the system's nonvolatile RAM is imminent.
Caution: Temperature Exceeded	The operating system has detected that the temperature of the system has exceeded the caution level. Accompanying data in the log notes if an auto-shutdown sequence has been invoked by the operating system.
Diagnostic Error	An error was detected by the Diagnostics Utility. See the specific error code in this chapter for a detailed explanation.

continued

Table 4-21: ASR-2 IML Messages *continued*

Message	Description
Error Detected On Boot Up	The server detected an error during the Power-On Self-Test (POST).
Processor Prefailure	A CPU has passed an internal corrected error threshold; excessive internal ECC cache errors.
NMI - PCI Bus Parity Error	A parity error was detected on the PCI bus.
NMI - Expansion Board Error	A board on the expansion bus indicated an error condition, resulting in a server failure.
NMI - Expansion Bus Master Time-Out	A bus master expansion board in the indicated slot did not release the bus after its maximum time, resulting in a server failure.
NMI - Expansion Bus Slave Time-Out	A board on the expansion bus delayed a bus cycle beyond the maximum time, resulting in a server failure.
NMI - Fail-Safe Timer Expiration	Software was unable to reset the system fail-safe timer, resulting in a server failure.
Processor Exception	The indicated processor exception occurred.
NMI - Processor Parity Error	The processor detected a data error, resulting in a server failure.
Server Manager Failure	An error occurred with the Server Manager/R.
NMI - Software Generated Interrupt Detected Error	Software indicated a system error, resulting in a server failure.
Caution: Temperature Exceeded	The operating system has detected that the temperature of the system has exceeded the caution level. Accompanying data in the log notes whether an auto-shutdown sequence has been invoked by the operating system.
Abnormal Program Termination	The operating system has encountered an abnormal situation that has caused a system failure.
ASR-2 Test Event	The System Configuration Utility generated a test alert.
NMI - Automatic Server Recovery Timer Expiration	The operating system has received notice of an impending ASR-2 timer expiration.
Required System Fan Failure	The required system fan has failed. Accompanying data in the log notes if an auto-shutdown sequence has been invoked by the operating system.
UPS A/C Line Failure Shutdown or Battery Low	The UPS notified the operating system that the AC power line has failed. Accompanying data indicates whether either an auto-shutdown sequence has been invoked or the battery is nearly depleted.
ASR-2 detected by ROM	An ASR-2 activity has been detected and logged by the system ROM.

Revision History Table

Some errors can be resolved by reviewing changes to the server configuration. The server has an Automatic Revision Tracking (ART) feature that helps you review recent changes to the server configuration.

One ART feature is the Revision History Table, which contains the hardware version number of the system board and any other system boards providing ART-compatible revision information. This feature lets you determine the level of functionality of an assembly in a system without opening or powering down the unit.

Table 4-22: Revision History Table

Current Revisions	
Date	10/21/99
System board revision	03
Assembly version	1
Functional revision level	C
Processor 01 revision	01
Assembly version	1
Functional revision level	A
Previous Revisions	
Date	10/31/95
System board revision	03
Assembly version	1
Functional revision level	C
Processor 01 revision	01
Assembly version	1
Functional revision level	A

The Revision History Table is stored in nonvolatile RAM and is accessed through the Inspect Utility and Compaq Insight Manager.

Storage Fault Recovery Tracking

This feature tracks over 12 failure-indication parameters, such as timeouts, spin-up, and self-test errors of SCSI drives. You can use these parameters to pinpoint failed storage subsystem components and to recover from controller or hard drive failure.

Storage Automatic Reconstruction

This feature automatically reconstructs data to an online spare or to a replaced drive if a drive fails. To use the reconstruction feature, you must configure the server for drive mirroring or data guarding. The reconstruction decreases system downtime by allowing rapid recovery to full system operation if a drive fails.

Network Interface Fault Recovery Tracking

This feature tracks over 20 failure-indication parameters, such as alignment errors, lost frames, and frame copy errors, of Ethernet and Token Ring network interfaces. It decreases network downtime by enabling diagnosis of actual network interface failures.

Memory Fault Recovery Tracking

This feature inspects the operation of the memory subsystem looking for uncorrectable memory errors.

Remote Service Features

Compaq servers have the following management features that you can access through a modem or a network:

Table 4-23: Compaq Servers Remote Management Features

Feature	Description
Service Session	Provides remote access to all the utilities on the Compaq system partition, including Diagnostics utilities, Inspect, ROMPaq, Drive Array Advanced Diagnostics (DAAD), and the System Configuration Utility. Also provides the capability for remote file transfer services to and from the Compaq system partition.
Disk-Based Diagnostics	Provides remote diagnostic capability after you configure ASR-2 and the reset restart option to restart from Compaq Utilities. Also allows you to view Health Logs. Disk-based diagnostics can also be run locally. Press the F10 key during the restart process when the cursor moves to the upper-right corner of the monitor.
Server Restart	Provides the ability to restart the server remotely from Compaq Insight Manager while the operating system is running. Allows the server to restart back to the operating system or restart to the Compaq system partition. Provides a complete system reset to all peripherals. If you select Boot to Compaq Utilities from Compaq Insight Manager, Compaq Utilities loads the appropriate remote services so that remote access is available. If network status is enabled, network support is loaded. If Dial-In status is enabled, the modem is set to auto-answer.
Configuration Utility	Allows you to run the remote System Configuration Utility locally. Press the F10 key during the restart process when the cursor moves to the upper-right corner of the monitor.
Firmware Updates	Allows you to update the server firmware remotely. Uses firmware images on the Compaq system partition that might have been previously uploaded with the file transfer services.

ROMPaq Error Recovery Options

From time to time it may be desirable to upgrade the current system ROM. Some reasons for this may be as follows:

- Customer requires ROM upgrade
- Obtained new SmartStart CD-ROM
- Desire to upgrade server processors
- Request from Compaq

The process of upgrading the system ROM is referred to as flashing the ROM. Flashing consists of using software to replace the current ROM image with a new one through ROMPaq.

Should an error such as a power failure occur during this process, the flash operation will not be completed, causing the ROM image in the server to be corrupted. Compaq provides two options for ROMPaq recovery, depending on the server and circumstances involved.

ROMPaq Disaster Recovery

The following option should be utilized by any server that does not have a valid ROM image.

1. Build a fresh ROMPaq diskette, using the latest version for the server involved.

NOTE: If the ROM is corrupted by a ROMPaq interruption, the initial ROMPaq attempt may have affected the contents of the original diskette.

2. Turn off the server.
3. Set configuration switches 1, 4, 5, and 6 on the system maintenance switch block to On to enable disaster mode.

Table 4-24: Configuration Switches

Switch	Function
1	Disable on-board graphics
4	Disable diskette drive
5	Disable password
6	Clear NVRAM

4. Insert the ROMPaq diskette. Although you will utilize a normal ROMPaq diskette, this situation will not allow you to save the old image.
5. Turn on the server. The keyboard, mouse and monitor are all inactive.
6. The server makes two long beeps, to indicate that you are in Disaster Recovery Mode and that you should insert the ROMPaq diskette.
7. The server reads the diskette for the latest ROM image. If the diskette is not in place, the system continues to beep until a valid ROMPaq diskette is inserted.
8. After successful completion of this process,
 - a. Turn off the server.
 - b. Remove the diskette.
 - c. Reset configuration switches 1, 4, 5 and 6. (See Table 4-24 within this section.)
 - d. Turn on the server as usual.

After a failed ROMPaq, power down the server and repeat the above process.

Compaq Insight Manager

Compaq Insight Manager is the Compaq application for easily managing network devices. Compaq Insight Manager delivers intelligent monitoring and alerting as well as visual control of the servers.

In Compaq servers, every hardware subsystem, such as disk storage, system memory, and system processor, has a robust set of management capabilities. Compaq Full-Spectrum Fault Management prevents faults before they happen, keeps the system up and running in the unlikely event of a failure, and delivers rapid server recovery to normal operation after a fault.

Features of Compaq Insight Management

Compaq Insight Management features include:

- **Web browser access**—to Insight Manager Device and Configuration information from anywhere you have network access and a standard Web browser for Windows NT and NetWare servers.
- **Comprehensive fault management**—for all major subsystems, including prefailure alerts in advance of potential system failures.

NOTE: Compaq Insight Manager will not support pre-failure alerts from the stored storage area in a ProLiant DL360 server.

- **Broad configuration management**—provides effective deployment and maintenance of consistent, manageable configurations with Insight Version Control and Integration Server Maintenance. Version Control and Integration Server Maintenance allows the administrator to monitor and update versions of the server and workstation firmware, drivers and utilities.
- **Performance management**—sets performance and capacity thresholds for management variables related to CPU and bus utilization, NIC throughput, logical disk capacity, and more.
- **Workstation management**—monitors and manages Compaq Professional Workstations.
- **Client management**—manages faults and assets on Compaq Deskpro computers.
- **Netelligent management**—receives alarms from Netelligent devices. Full management of Netelligent devices is supported through integration with Compaq Netelligent Management Software.
- **Asset management**—exports asset information from the Compaq Insight Manager database to leading database and spreadsheet applications.
- **Remote management**—manages in-band or out-of-band devices, online or offline, from any location.
- **Integration can be provided for enterprise management platforms**—provides integration with leading management platforms including HP OpenView, IBM NetView, SunNet Manager, and Microsoft Systems Management Server.

- **Full integration with Compaq Remote Insight Board/PCI and ProLiant DL360 server Integrated Remote Console**—allows “in-band” and “out-of-band” connection for server management to ensure that customers are in touch with their systems, even when they are offline or without power.
- **SNMP standards**—allow integration with other management products.
- **Flexible network conductivity**—supports multiple transport protocols including IPX, TCP/IP and PPP to operator over LANs, WANs, and modems.
- **Support for these operating systems:**
 - Microsoft Windows NT
 - Novell NetWare, intraNetWare 2000 and IntranetWare for Small Business
 - SCO UNIX, OpenServer, and UnixWare
 - IBM OS/2 Warp family of products
- **Reporting**—using Automatic Data Collection, gathers historic performance information for graphing or export purposes.

Compaq Insight Management Software Architecture

The Compaq Insight Management software architecture is typical of other network management solutions. It has a client/server architecture and is composed of agent software (Compaq Insight Management Agents) and the management application software (Compaq Insight Manager).

Insight Management Agents

Insight Agents operate on Compaq systems (such as servers and workstations), performing in-depth monitoring of the system’s state by collecting and measuring system parameters. These parameters indicate the current state of subsystems by counting the occurrence of particular events (for example, the number of read operations performed on a disk drive) or monitoring the state of a critical function (such as whether the cooling fan is operating).

Insight Desktop Agents operate on Compaq Deskpro computers, monitoring functions that include temperature sensing and disk prefailure alerting.

Insight Agents provide information to management applications, such as Compaq Insight Manager, and can generate alarm notifications if significant changes occur in the fault or performance aspects of system operation. Information is delivered to and from the Insight Agents by the industry-standard Simple Network Management Protocol or SNMP.

Compaq Insight Manager

Compaq Insight Manager delivers intelligent monitoring and alerting as well as visual control of the Compaq hardware. In the unlikely event of hardware failures, Compaq Insight Manager also provides a full complement of remote maintenance and control facilities.

For additional information, refer to the online *Compaq Insight Manager User Guide* on the server documentation CD that accompanied the server.

Connectors, Switches, and Status Indicators

Connectors

This section contains graphics and tables showing connector locations on the rear panel, the riser board, and the system board.

Rear Panel Connectors

The following figure and table show the connectors on the rear panel of the ProLiant DL360 server.

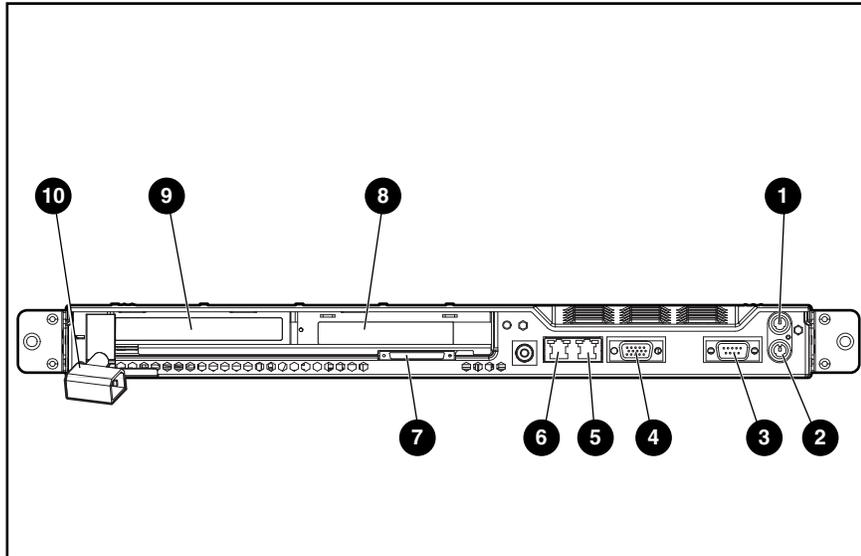


Figure 5-1: Rear panel connectors

Table 5-1: Rear Panel Connectors

Item	Description
①	Mouse connector (green)
②	Hot-plug keyboard connector (purple)
③	Serial connector (teal)
④	Video connector (blue)
⑤	RJ-45 Fast Ethernet connector at 10/100 Mbit/s for NIC 1
⑥	RJ-45 Fast Ethernet connector at 10/100 Mbit/s for NIC 2
⑦	External SCSI (tape only) connector
⑧	Expansion PCI slot 2 (32-bit)
⑨	Expansion PCI slot 1 (64-bit)
⑩	Power connector

Riser Board Expansion Slots

Use the following figure and table to identify the ProLiant DL360 server expansion slots.

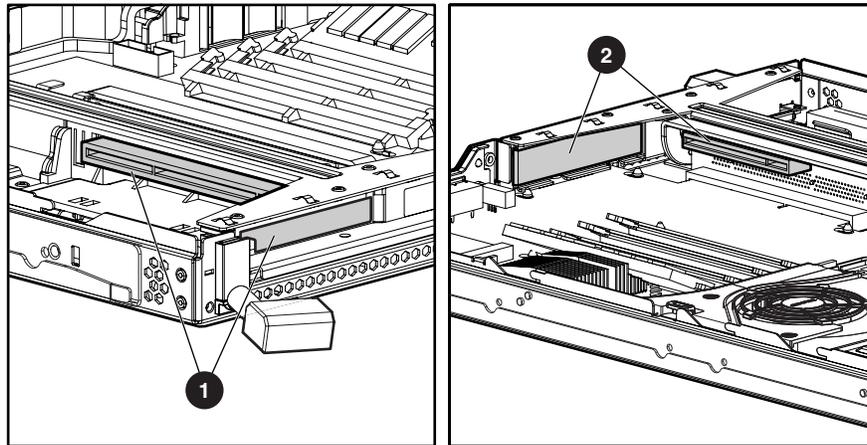


Figure 5-2: Riser board expansion slots

Table 5-2: Riser Board Expansion Slots

Item	Description
①	64-bit PCI slot and slot cover
②	32-bit PCI slot and slot cover

System Board Components

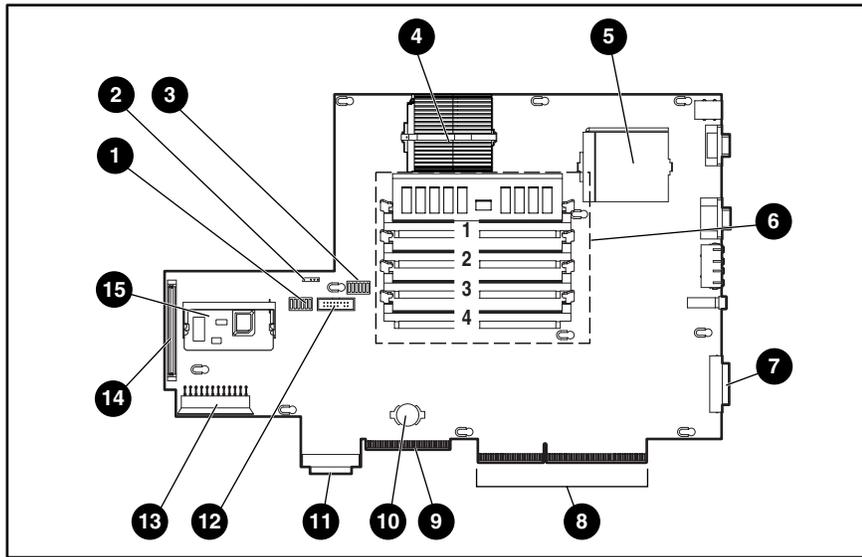


Figure 5-3: System board components

Table 5-3: System Board Components

Item	Description	Item	Description
❶	System configuration switch (SW2)	❾	CD-ROM (DVD-ROM)/diskette drive assembly connector
❷	Fan assembly connector	❿	RTC battery
❸	System identification switch (SW1)	⓫	Internal Smart Array/SCSI controller interface assembly connector
❹	Processor socket 1 (populated)	⓬	Remote Insight Lights-Out Edition interface cable connector
❺	Processor socket 2	⓭	Power supply connector
❻	DIMM sockets (1-4)	⓮	SCSI port 2 (internal)
❼	SCSI port 1 (external, tape only)	⓯	Integrated Smart Array Controller
❽	PCI riser board assembly connector		

System Board Switches

The Compaq ProLiant DL360 server has two switch banks (1 and 2) located on the system board that are used to set the overall configuration of your server.

- The system identification switch (SW1) ❶ is an eight-position switch (S1-S8) that provides the processor switch settings of your server.

The server autodetects and configures these switch settings.



CAUTION: Do not change these settings. The system automatically detects and configures settings when a processor is added or replaced.

- The system configuration switch 2 (SW2) ❷ is a six-position switch (S1-S6) that is used for maintenance configuration.

Refer to the labels on the inside of the system unit cover or to the following table for the proper system configuration switch settings. The following figure shows the location of the system switches.

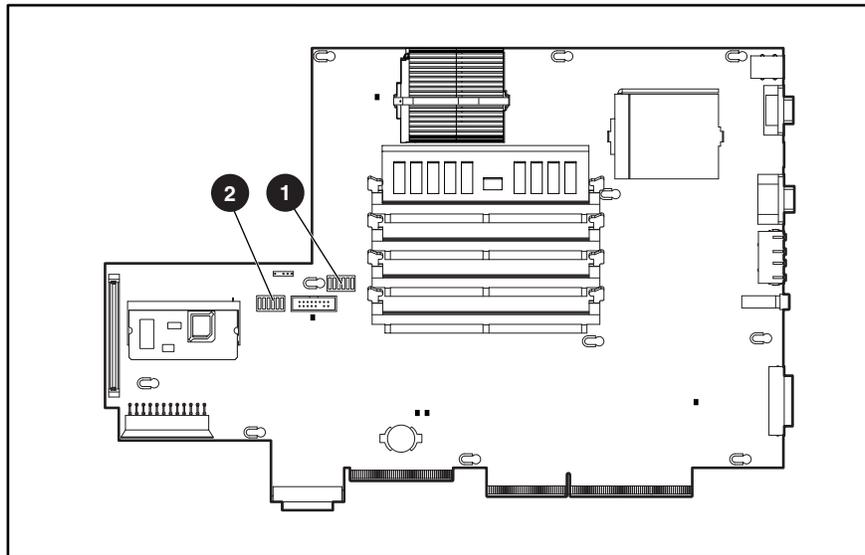


Figure 5-4: System board switches

System Identification Switch (SW1)

Switch settings are preconfigured for shipping. All settings are reserved. Do not change these settings.



CAUTION: Do not change switch settings because incorrectly set switches may result in damage to the server.

System Configuration Switch (SW2)

The following table defines the function for each switch setting on SW2, a six-position maintenance switch.

Table 5-4: System Configuration Switch (SW2) Settings

Switch	Description	Default Position
1	Video disable override	Off
2	Lock configuration	Off
3	Rack mount	On
4	Diskette drive boot override	Off
5	Password disable	Off
6	Maintenance	Off

Non-Maskable Interrupt (NMI) Switch

Crash dump analysis is an essential part of eliminating reliability problems such as hangs or crashes in operating systems, device drivers, and applications. Many crashes will freeze a system requiring you to do a hard reset. Resetting the system erases any information that would support root cause analysis.

Systems running Microsoft Windows NT experience a blue screen trap when the operating system crashes. When this happens, Microsoft recommends that system administrators perform a Non-Maskable Interrupt (NMI) event by pressing a dump switch. The NMI event allows a hung system to once again become responsive.

The ProLiant DL360 server is equipped with an NMI switch that, when pushed, performs a memory dump before performing a hard reset ❶.



CAUTION: Do not use the switch when the server is operating properly. Using the NMI Crash Dump switch on a functioning system (using any operating system) causes the unit to reboot or restart with possible data loss.

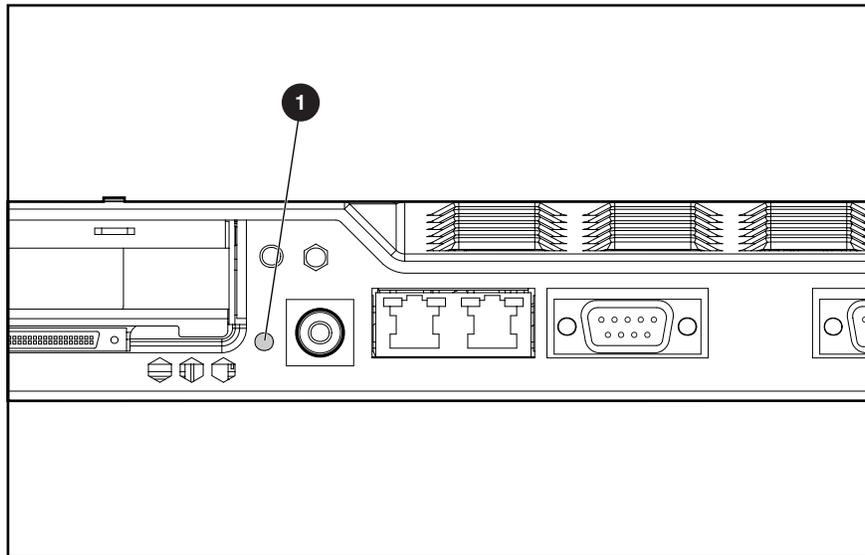


Figure 5-5: NMI switch location

Status LED Indicators

This section contains graphics and tables showing status LED locations and descriptions on the following components:

- Front panel
- Rear panel
- Hot-plug SCSI hard drives
- Low-profile IDE CD-ROM drive
- Low-profile IDE DVD-ROM drive
- System board

Front Panel Status LED Indicators

The set of LEDs on the front of the server indicates server status. The following figure and table identify and describe the location and function of the LEDs.

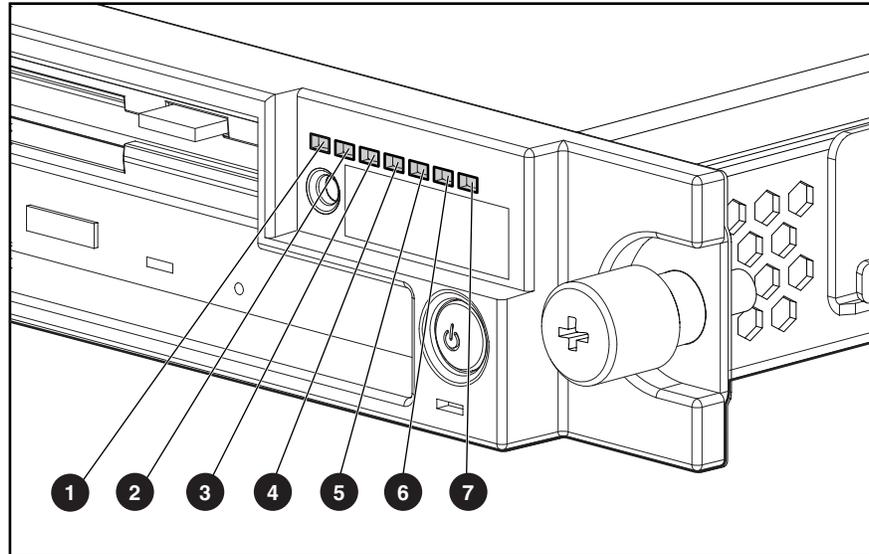


Figure 5-6: Identifying the status LEDs on the front panel

Table 5-5: Front Panel Status LEDs

Item	LED Description	Status
①	Front Unit Identification switch status	Blue = Activated OFF = Deactivated
②	NIC 1 network activity status	Green = Network activity OFF = No activity
③	NIC 1 network link status	Green = Linked to network OFF = No Link
④	NIC 2 network activity status	Green = Network activity OFF = No activity
⑤	NIC 2 network link status	Green = Linked to network OFF = No Link
⑥	Disk drive activity, including the CD-ROM, DVD-ROM, diskette, and hot-plug SCSI hard drives	Green = Drive activity OFF = No drive activity
⑦	Power On/Standby status	Amber = Standby Green = ON OFF = power cord not attached to the server or power supply failure

Rear Panel Status LED Indicators

The server rear panel contains five LEDs: one for the Rear Unit Identification LED switch and four for the RJ-45 connectors. Use the following figure and table to identify each LED.

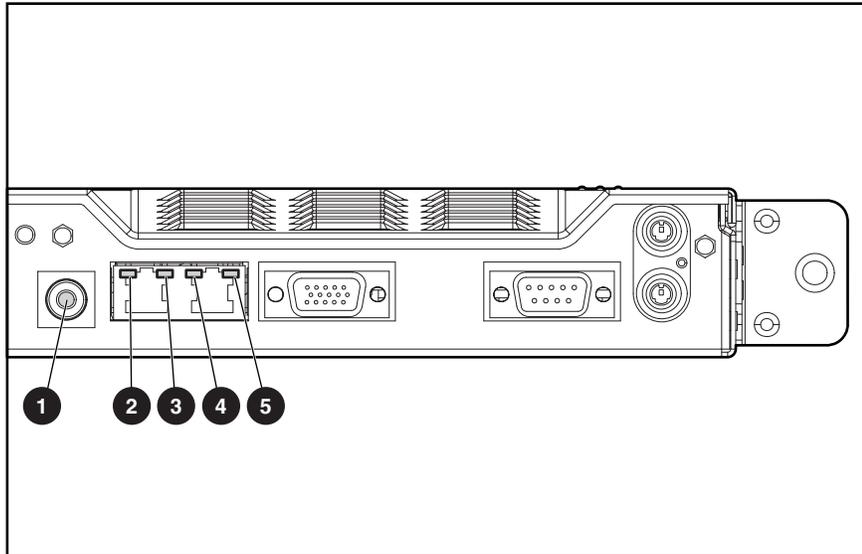


Figure 5-7: Rear panel LED indicators

Table 5-6: Rear Panel Status LEDs

Item	LED Description	Status
①	Rear unit identification LED switch	Blue = activated OFF = deactivated
②	NIC 2 activity	Green = activity OFF = no activity
③	NIC 2 link	Green = network connected OFF = network disconnected
④	NIC 1 activity	Green = activity OFF = no activity
⑤	NIC 1 link	Green = network connected OFF = network disconnected

Hot-Plug SCSI Hard Drive Status LED Indicators

Each hot-plug SCSI hard drive has three LED indicators located on the front of the drive, as shown in the following figure. Use the following figure and table to analyze the status of each hot-plug SCSI hard drive.

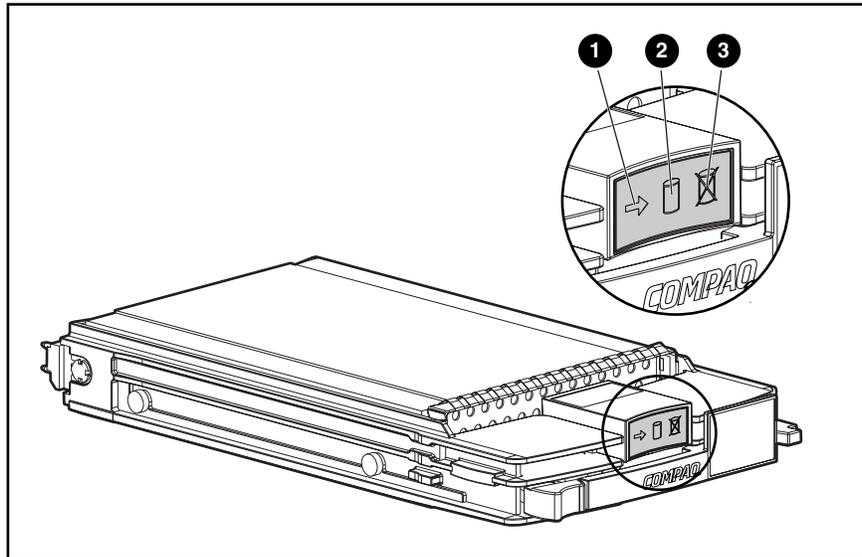


Figure 5-8: Hot-plug SCSI hard drive LED indicators

- The LED on the left indicates Drive Activity ❶, where On indicates activity and Off indicates no activity by the drive.
- The center LED indicates Online Status ❷, where Flashing indicates an active online condition and Off indicates an inactive online condition.
- The LED on the right indicates Fault Status ❸, where Flashing indicates fault-process activity and Off indicates a no fault-process activity.

Table 5-7: Hot-Plug SCSI Hard Drive LED Status Combinations

❶ Activity	❷ Online	❸ Fault	Means
On	Off	Off	Do not remove the drive. Removing a drive during this process will cause data loss. The drive is being accessed and is not configured as part of an array.
On	Flashing	Off	Do not remove the drive. Removing a drive during this process will cause data loss. The drive is rebuilding or undergoing capacity expansion.

continued

Table 5-7: Hot-Plug SCSI Hard Drive LED Status Combinations

① Activity	② Online	③ Fault	Means
Flashing	Flashing	Flashing	<p>Do not remove the drive. Removing a drive during this process will cause data loss.</p> <p>The drive is part of an array being selected by the Array Configuration Utility.</p> <p>-Or-</p> <p>The Options ROMPaq is upgrading the drive.</p>
Off	Off	Off	<p>OK to replace the drive online if a predictive failure alert is received (see the following section for details) and the drive is attached to an array controller.</p> <p>The drive is not configured as part of an array.</p> <p>-Or-</p> <p>If this drive is part of an array, then a powered-on controller is not accessing the drive.</p> <p>-Or-</p> <p>The drive is configured as an online spare.</p>
Off	Off	On	<p>OK to replace the drive online.</p> <p>The drive has failed, and has been placed off-line.</p>
Off	On	Off	<p>OK to replace the drive online if a predictive failure alert is received (see the following section for details), provided that the array is configured for fault tolerance and all other drives in the array are online.</p> <p>The drive is online and configured as part of an array.</p>
On or Flashing	On	Off	<p>OK to replace the drive online if a predictive failure alert is received (see the following section for details), provided that the array is configured for fault tolerance and all other drives in the array are online.</p> <p>The drive is online and being accessed.</p>

Low-Profile IDE CD-ROM (DVD-ROM) Drive Status LED

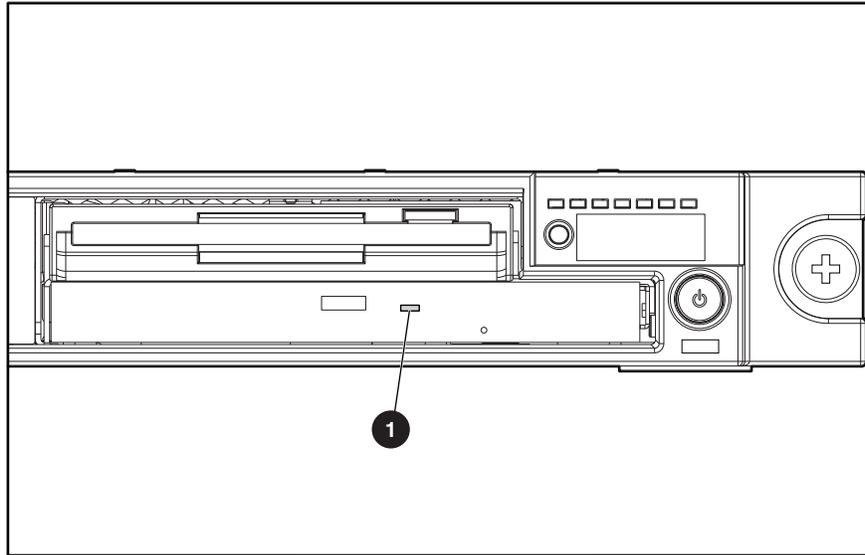


Figure 5-9: Low-profile IDE CD-ROM (DVD-ROM) drive status LED

Table 5-8: Low-Profile CD-ROM (DVD-ROM) Drive LED Indicator

Item	Status	Condition
❶	ON	Activity
❶	OFF	No activity

System Board Status LED Indicators

The internal LEDs on the system board identify conditions that are relevant to service personnel. Use the following figure and table to determine system board LED locations and status.

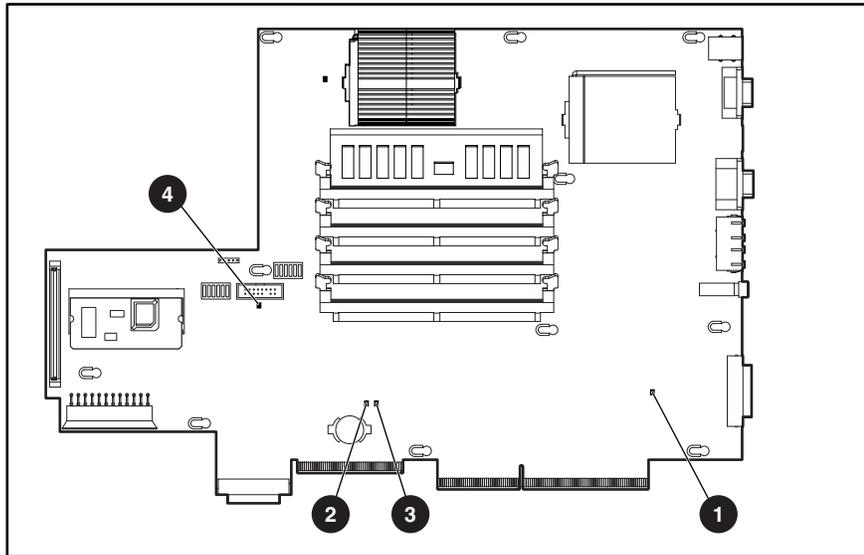


Figure 5-10: System board LEDs

Table 5-9: System Board Status LEDs

Item	LED Description	Status
①	Power status	ON = 5V power source is active (system is ON) OFF = system in standby mode or OFF
②	Processor 1 error (IERR1)	ON = CPU 1 failed (Error found) OFF = CPU 1 is operational
③	Processor 2 error (IERR2)	ON = CPU 2 failed (Error found) OFF = CPU 2 is operational
④	Interlock	ON = PCI riser board assembly is not fully seated or installed OFF = PCI riser board assembly is connected

Specifications

This chapter provides operating and performance specifications for Compaq ProLiantDL360 servers and optional hardware. The sections in this chapter are:

- 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
- Wide Ultra2 SCSI Hot-Plug Hard Drive
- Integrated Smart Array Controller
- NC3163 Embedded 10/100 Fast Ethernet NIC Controller (Wake on LAN)
- Smart Array 4200 Controller (optional)
- NC3131 Fast Ethernet NIC 64 PCI Dual Base 10/100 (optional)

System Unit

Table 6-1: System Unit Specifications

Item	Description
Height	4.19 cm (1.65 inch)
Depth	63.5 cm (25 inch)
Width	42.55 cm (16.75 inch)
Weight (fully configured)	11.81 kg (26 lb)
International input voltage requirements	
Rated input voltage	100 to 240 VAC
Rated input frequency	50 to 60 Hz
Rated input current	3.3 A, 1.7 A (110 V, 220 V)
U.S. input voltage requirements	
Rated input voltage	100 to 240 VAC
Rated input frequency	50 to 60 Hz
Rated input current	2.66 A, 1.33 A (110 V, 220 V)
Power supply output power	
Rated steady-state power	170 W
Maximum peak power	190 W
BTUs	968 BTU/h
Temperature range	
Operating	10°C to 35°C (50°F to 95°F)
Non-operating	-20°C to 50°C (-4°F to 122°F)
Relative Humidity (non-condensing)	
Operating	8% to 90%
Non-operating	5% to 95%
Maximum wet bulb temperature	38.7°C (101.7°F)

Power Supply

Table 6-2: 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	50 to 60 Hz
Rated input power	292 W
Rated input current	3.3 A, 1.7 A (110 V, 220 V)
Steady state power	170 W
Maximum peak power	190 W
Ambient temperature range	
Operating	10°C to 35°C (41°F to 113°F)
Shipping	-30°C to 50°C (-40°F to 185°F)
Relative humidity (noncondensing)	
Operating	80% to 90%
Nonoperating	5% to 95%
Dielectric voltage withstand	
Input to output	2000 VAC/minute
Input to ground	2000 VAC/minute
Maximum wet bulb temperature	38.7°C (101.7°F)

Memory

Table 6-3: SDRAM DIMM Specifications

Item	Description
Size	64-, 128-, 256-, 512-MB, 1-GB
Speed	133 MHz 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, or 1-GB 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 6-4: Low-Profile 1.44-MB Diskette Drive Specifications

Item	Description
Size	8.89 mm (3.5 inch)
LED indicator (front panel)	Green
Read/write capacity per diskette (high/low density)	1.44 MB/720 KB
Drives supported	1
Drive height	0.6 inch
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 CD-ROM Drive

Table 6-5: 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	12.7 mm (0.5 inch)
Depth	130 mm (5.12 inch)
Width	131 mm (5.16 inch)
Weight	<340 g (<11.98 oz)
Data transfer rate	
Sustained	150 KB/s (sustained 1X)
Burst	2100 to 4800 KB/s
Access times (typical)	
Full stroke	<350 ms
Random	<150 ms
Disc diameter	12 cm, 8 cm (4.7 inch, 3.15 inch)
Disc thickness	1.2 mm, 0.05 cm (.047 inch x .20 inch)
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°C to 45°C (41°F to 118°F)
Humidity	5% to 90% (10% to 80%)

DVD-ROM/Diskette Drive Assembly

Low-Profile 1.44-MB Diskette Drive

Table 6-6: 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 6-7: 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)
Track Pitch	1.60 μ m (CD-ROM) 0.74 μ m (DVD)
Block size	Mode 0 2352 bytes Mode 1 2352, 2340, 2336, 2048 bytes Mode 2 2352, 2340, 2336, 2048 bytes DVD - 2048 bytes
Performance	
Access times (typical)	
Full stroke	DVD <300 ms, CD <200 ms
Random	DVD <180 ms, CD <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 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%

Wide Ultra2 SCSI Hot-Plug Hard Drive

Table 6-8: Wide Ultra2 SCSI Hot-Plug Hard Drive Specifications

	9.1 GB	9.1 GB	18.2 GB	18.2 GB
Logical capacity	9100 MB	9100 MB	18209 MB	18209 MB
Height	Third, 1.0 inch	Third, 1.0 inch	Third, 1.0 inch	Third, 1.0 inch
Size	3.5 inches	3.5 inches	3.5 inches	3.5 inches
Interface	Wide Ultra2 SCSI	Wide Ultra2 SCSI	Wide Ultra2 SCSI	Wide Ultra2 SCSI
Transfer rate synchronous (Max)	80 MB/s	80 MB/s	80 MB/s	80 MB/s
Single track	0.8 ms	0.8 ms	0.8 ms	0.8 ms
Average	7.9 ms	5.4 ms	6.9 ms	7.5 ms
Full stroke	17.0 ms	12.2 ms	15.0 ms	16.0 ms
Rotational speed	7200 rpm	10,000 rpm	7200 rpm	10,000 rpm
Bytes/sector	512	512	512	512
Logical blocks	17,773,524	17,773,524	35,556,080	35,556,080
Operating temperature				
Celsius	10° to 35°	10° to 35°	10° to 35°	10° to 35°
Fahrenheit	50° to 95°	50° to 95°	50° to 95°	50° to 95°

Integrated Smart Array Controller

Table 6-9: Integrated Smart Array Controller Specifications

Item	Description
Temperature range (noncondensing)	
Operating	10°C to 35°C (50°F to 95°F)
Shipping	-20°C to 50°C (-4°F to 122°F)
Relative humidity (noncondensing)	
Operating	8% to 90%
Nonoperating	5% to 95%
Maximum drives supported	Up to 15 per channel
Logical drives supported	32
Simultaneous drive transfer channels	2
Data transfer method	32-bit PCI bus master
Total transfer rate	160 MB/s (80 MB/s per channel)
SCSI electrical interface	Low-voltage differential (LVD) and single ended
PCI bus transfer rate (maximum)	133 MB/s
SCSI port connectors (internal and external)	PCI 64D extended SCSI connector
Protocol	Wide Ultra2 SCSI
Software upgradable firmware	Yes
Read cache	8 MB

NC3163 Embedded 10/100 Fast Ethernet NIC Controller (Wake On LAN)

Table 6-10: NC3163 Embedded 10/100 Fast Ethernet NIC Controller (Wake On LAN) Specifications

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

Smart Array 4200 Controller

Table 6-11: Smart Array 4200 Controller Specifications

Item	Description
Dimensions	
Height	13.7 cm (5.4 inch)
Length	12.4 cm (31.5 inch)
Thickness (including Array accelerator)	2.5 cm (1.0 inch)
Temperature range	
Operating	10°C to 35°C (50°F to 95°F)
Nonoperating	-30°C to 60°C (-22°F to 140°F)
Relative humidity (noncondensing)	
Operating	20% to 80%
Nonoperating	5% to 90%
Power required	
	+3.3V/300 mA
	+5V/3.0A
	+12V/60 mA
	-12V/0 mA
Heat dissipated (maximum)	16.7 W
Maximum drives supported	18
Logical drives supported	32
Simultaneous drive transfer channels	2
Data transfer method	32-bit PCI bus master
Total transfer rate	160 MB/s (80-MBs per channel)
SCSI electrical interface	Low-voltage differential (LVD) and single-ended
PCI bus transfer rate (maximum)	133 MB/s
SCSI port connectors	PCI 64D extended SCSI connector

NC3131 Fast Ethernet NIC 64 PCI Dual Base 10/100

Table 6-12: NC3131 Fast Ethernet NIC 64 PCI Dual Base 10/100 Specifications

Item	Description
Dimensions	
Height	9.9 cm (3.9 inches)
Depth	16.5 cm (6.5 inches)
Thickness (including array accelerator)	6.4 cm (2.5 inches)
Temperature range	
Operating	0°C to 55°C (32°F to 131°F)
Nonoperating	-65°C to 85°C (-85°F to 185°F)
Relative humidity (noncondensing)	
Operating	10% to 90%
Nonoperating	5% to 95%
Bus master interface	32/64 bit PCI
Power required	1050 mA@5V max
Emissions standards	FCC class A
Safety compliance	CE Mark

A

- AC 'Y' power cord
 - part number 1-5
- AC power cord and filter
 - part number 1-4
 - removing 2-28
 - replacing 2-29
- access panel
 - removing 2-17
 - replacing 2-17
- ADU
 - accessing 4-6
 - description 4-3, 4-39
 - executing 4-7
 - starting 4-39
- air baffle
 - part number 1-4
 - removing 2-26
 - replacing 2-26
- alignment keys 2-46
- Array Configuration Utility
 - accessing 4-6, 4-7
 - accessing from System Configuration 4-6, 4-7
 - executing 4-7
- Array Diagnostic Utility *See* ADU
- ART, assembly version 4-69
- ASR-2
 - allowing network access 4-61
 - attended recovery 4-56
 - booting into Compaq Utilities 4-61
 - booting into operating system 4-65
 - configuring 4-55, 4-58
 - default value 4-59
 - description 4-55
 - dial-in status, restart setting 4-65
 - dial-out status, restart setting 4-65
 - dial-out string, restart setting 4-65
 - features 4-58
 - flow chart 4-60
 - for off-site servers 4-59
 - for remote servers 4-59
 - hardware requirements 4-57
 - Integrated Management Log messages 4-67

- network card slot, restart setting 4-65
 - network controller, restart setting 4-65
 - network frame type, restart setting 4-65
 - network host name, restart setting 4-65
 - network IP address, restart setting 4-65
 - network IP net mask, restart setting 4-65
 - network IP router address, restart setting 4-65
 - network protocol, restart setting 4-65
 - network status, restart setting 4-65
 - OS Restart SCU Setting, table 4-65
 - paging administrator 4-55
 - security 4-66
 - serial interface, restart setting 4-65
 - software error
 - recovery 4-58
 - recovery start option 4-58
 - recovery timeout 4-58
 - standby recovery
 - server option 4-58
 - server port 4-58
 - time-out 4-58
 - thermal shutdown 4-58
 - timer 4-59
 - unattended recovery 4-56
 - UPS shutdown 4-58
 - UPS shutdown threshold 4-58
- ASR-2 IML log messages *See* error log messages
- Asset Management, defined 4-73
- Automatic Data Collection, defined 4-74
- Automatic Revision Tracking *See* ART
- Automatic Server Recovery-2 *See* ASR-2
- automatic storage reconstruction, defined 4-70

B

- battery
 - disposal 2-43
 - part number 1-5
 - removing 2-44
- bezel blank
 - part number 1-2
- bezel blank, removing 2-14
- BIOS settings, reconfiguring 2-43
- button, release 2-16

C

- cable protector
 - part number 1-5
 - removing 2-31
 - replacing 2-31
- cable tray, fixed
 - part number 1-2
- cabling
 - CD-ROM/diskette drive assembly
 - backplane 3-1
 - optional Smart Array/SCSI controller 3-2
 - Remote Insight Lights-Out Edition 3-3
- cautions
 - ADU 4-39
 - battery disposal 2-43
 - BIOS settings 2-43
 - cable routing 3-1
 - controller firmware upgrade 4-39
 - data loss 4-6
 - Erase Utility 4-6
 - firmware upgrade 4-39
- CD-ROM drive
 - access times 6-5
 - applicable disk 6-5
 - block size 6-5
 - cache/buffer 6-5
 - capacity 6-5
 - data transfer rate 6-5
 - depth 6-5
 - diameter 6-5
 - height 6-5
 - laser parameters 6-5
 - location 2-8
 - operating conditions 6-5
 - specifications 6-5
 - startup time 6-5
 - stop time 6-5
 - test error codes 4-38
 - thickness 6-5
 - track pitch 6-5
 - weight 6-5
 - width 6-5
- CD-ROM/diskette drive assembly
 - part number 1-4
 - removing 2-10
- CD-ROM/diskette drive assembly backplane
 - part number 1-4
 - removing 2-32
 - replacing 2-33
- CD-ROM/diskette ejector port 2-14
- CDs
 - SmartStart and Support Software 2-1
- chassis, part number 1-2
- Client Management, defined 4-73
- clips, retaining 2-27
- communication parameters, setting 4-61
- Compaq Insight Management
 - features 4-73
 - software architecture 4-74
- Compaq Insight Manager
 - defined 4-50, 4-74
 - description 4-2
 - remote maintenance 4-74
 - viewing the event list 4-51
- Compaq Integrated Remote Console, features 4-58
- Compaq Network Interface Controller *See* NIC
- Compaq Survey Utility
 - description 4-2
 - installing 4-2
 - viewing 4-51
- Compaq system partition, accessing utilities
 - from 4-6
- Compaq System Reference Library 4-55
- Comprehensive Insight Management, defined 4-73
- conflict, resolving 4-4
- connectors 5-1 to 5-4
 - 100-pin 2-32
 - battery 5-4
 - CD-ROM/diskette drive assembly 5-4
 - expansion slots 5-2
 - fan assembly 5-4
 - internal Smart Array/SCSI controller interface
 - assembly 5-4
 - keyboard 5-2
 - mouse 5-2
 - PCI riser board assembly 5-4
 - power 5-2
 - power supply 5-4
 - rear panel 5-2
 - Remote Insight Lights-Out Edition interface
 - cable 5-4
 - RJ-45, network 5-2
 - SCSI, external 5-2
 - serial 5-2
 - video 5-2
- controllers
 - array *See* Integrated Smart Array Controller
 - NC3163 Embedded 10/100 Fast Ethernet NIC
 - controller
 - specifications 6-10
 - Smart Array 4200, specifications 6-11
- Correctable Memory Logs *See* IML
- country kit, part number 1-5

D

- DAAD
 - accessing remotely 4-71
 - description 4-3
- default configuration
 - determining 4-5

- messages 4-5
 - desktop chassis kit
 - part number 1-5
 - Diagnose Drive Array utility, accessing 4-28
 - Diagnostics
 - accessing 4-2, 4-6
 - booting remotely 4-64
 - defined 4-28
 - description 4-2
 - diskette, creating 4-28
 - Drive Array 4-28
 - error codes 4-28
 - locating 4-2
 - overview 4-2
 - running 4-28
 - starting from CD 4-5
 - test error codes
 - CD-ROM drive 4-38
 - diskette drive 4-35
 - graphics display unit 4-34
 - hard drive 4-37
 - keyboard 4-33
 - memory 4-31
 - modem 4-36
 - NIC 4-37
 - pointing device interface 4-39
 - processor 4-29
 - SCSI hard drive 4-37
 - SCSI tape drive 4-38
 - SCSI/IDE CD-ROM drive 4-38
 - serial port 4-36
 - tape drive 4-38
 - Test Error Codes Tables, description 4-28
 - when to run 4-8
 - dial-in status, setting 4-62
 - dial-out status, setting 4-63
 - dial-out string, setting 4-63
 - DIMM slot latches 2-37
 - DIMM, 128-MB
 - part number 1-4
 - DIMM, 1-GB
 - part number 1-5
 - DIMM, 256-MB
 - part number 1-5
 - DIMM, 512-MB
 - part number 1-5
 - DIMM, 64-MB
 - part number 1-5
 - DIMMs *See* memory
 - installation guidelines 2-35
 - removing 2-37
 - replacing 2-37
 - sockets
 - identification 2-36
 - location 5-4
 - population order 2-36
 - disk controller *See* Integrated Smart Array Controller
 - diskette drive
 - access times 6-4, 6-6
 - cylinders 6-4, 6-6
 - disabling 4-72
 - disabling boot 5-6
 - height 6-4, 6-6
 - LED indicator 6-4, 6-6
 - location 2-8
 - number supported 6-4, 6-6
 - part number 1-4
 - read/write capacity 6-4, 6-6
 - read/write heads 6-4, 6-6
 - size 6-4, 6-6
 - specifications 6-4, 6-6
 - test error codes 4-35
 - transfer rate 6-4, 6-6
 - diskette, creating Diagnostics 4-28
 - Drive Array Advanced Diagnostics *See* DAAD
 - drive array, diagnosing 4-28
 - drivers, installing 4-3
 - DVD-ROM drive
 - access times 6-7
 - applicable disk formats 6-7
 - block size 6-7
 - cache/buffer 6-7
 - capacity 6-7
 - data transfer rate 6-7
 - depth 6-7
 - diameter 6-7
 - dimensions 6-7
 - disc thickness 6-7
 - height 6-7
 - humidity range 6-7
 - specifications 6-7
 - startup time 6-7
 - stop time 6-7
 - track pitch 6-7
 - weight 6-7
 - width 6-7
 - DVD-ROM/diskette drive assembly backplane
 - removing 2-32
 - replacing 2-33
 - DVD-ROM/diskette ejector port 2-14
- ## E
- ejecting
 - CD-ROM/diskette drive assembly 2-10, 2-12
 - ejecting lever, processor 2-39
 - ejector lever, hard drive 2-16
 - ejector port 2-14
 - electrostatic discharge 2-1
 - environmental recovery 4-56
 - error codes *See also* test error codes

- 101 through 105 4-9
- 101 through 199 4-29
- 1101 through 1199 4-36
- 1151 4-13
- 1152 4-13
- 1201 through 1299 4-36
- 1610 through 618 4-13
- 162 through 164 4-9
- 1620 through 622 4-14
- 1703 4-15
- 172 through 174 4-10
- 1720 through 1724 4-15
- 1726 through 1761 4-16
- 1764 through 1772 4-17
- 1773 through 1780 4-19
- 1781 through 1784 4-21
- 1785 4-22
- 1786 through 1788 4-23
- 1789 through 1794 4-25
- 1795 through 1799 4-26
- 180 4-10
- 200 through 215 4-31
- 201 through 215 4-10
- 216 through 221 4-11
- 301 through 304 4-12, 4-33
- 401 through 498 4-33
- 40X 4-13
- 501 through 516 4-34
- 600 through 699 4-35
- 6000 through 6099 4-37
- 601 through 605 4-13
- 6500 through 6599 4-37
- 6600 through 6699 4-38
- 6700 through 6799 4-38
- 8600 through 8699 4-39
- beeps only 4-27
- description 4-28
- error condition, resolving 4-28
- error log messages
 - Abnormal Program Termination 4-67, 4-68
 - ASR-2 detected by ROM 4-67, 4-68
 - ASR-2 Test Event 4-67, 4-68
 - Automatic Server Recovery
 - Base Memory Parity Error 4-67
 - Extended Memory Parity Error 4-67
 - Memory Parity Error 4-67
 - Reset Limit Reached 4-67
 - Battery Failing 4-67
 - Caution, Temperature Exceeded 4-67, 4-68
 - Diagnostic Error 4-67
 - Error Detected On Boot Up 4-68
 - NMI
 - Automatic Server Recovery Timer
 - Expiration 4-68
 - Expansion Board Error 4-68
 - Expansion Bus Master Time-Out 4-68
 - Expansion Bus Slave Time-Out 4-68
 - Fail-Safe Timer Expiration 4-68
 - PCI Bus Parity Error 4-68
 - Processor Parity Error 4-68
 - Software Generated Interrupt Detected
 - Error 4-68
 - Processor Exception 4-68
 - Processor Prefailure 4-68
 - Required System Fan Failure 4-68
 - Server Manager Failure 4-68
 - UPS A/C Line Failure Shutdown or Battery
 - Low 4-68
 - error messages
 - A Critical Error occurred prior to this
 - power-up 4-9
 - Accelerator board not detected 4-40
 - Accelerator error log 4-40
 - Accelerator parity read 4-40
 - Accelerator parity write 4-40
 - accelerator status
 - Cache was automatically configured 4-40
 - Data in the cache was lost 4-40
 - Dirty data detected has reached limit 4-40
 - Dirty data detected. Unable to write 4-40
 - Excessive ECC errors 4-41
 - Obsolete data detected 4-41
 - Obsolete data was discarded 4-41
 - Obsolete data was flushed 4-41
 - Possible data loss in cache 4-41
 - Temporarily disabled 4-41
 - Unrecognized status 4-41
 - Valid data found at reset 4-41
 - Warranty alert 4-42
 - Adapter/NVRAM ID mismatch 4-42
 - Array accelerator battery pack X
 - not fully charged 4-42
 - Array accelerator battery pack X below
 - reference voltage 4-42
 - ASR-2 Timer Failure 4-9
 - beeps only 4-27
 - Board in use by expand operation 4-42
 - Board not attached 4-42
 - Cache Accelerator Slot X Initialization
 - Failed 4-12
 - Cache Accelerators Not Installed 4-11
 - Cache Switch Set Incorrectly 4-11
 - Com Port Address Assignment Conflict 4-13
 - Configuration Nonvolatile Memory
 - Invalid 4-10
 - Configuration Not Complete 4-10
 - Configuration signature is zero 4-42
 - configuration signature mismatch 4-42
 - controller
 - communication failure occurred
 - detected. NVRAM configuration not
 - present 4-42

- firmware needs upgrading 4-42
- is not configured 4-43
- located in special graphics slot 4-43
- reported POST error 4-43
- restarted with a signature of zero 4-43
- CPU Fan (Fan X) failure detected 4-13
- CPU Fan controller not responding 4-14
- Current SCSI bus cable configuration is not recommended 4-14
- DC-DC Converter Failed 4-11
- Disable command issued 4-43
- Disk 0 Configuration Error 4-25
- Disk 0 Failure 4-21
- Disk 1 Error 4-25
- Disk 1 Failure 4-21
- Disk Controller Failure 4-21
- Diskette Controller Error 4-13
- Diskette Drive Type Error 4-13
- drive (bay) X
 - firmware needs upgrading 4-43
 - has insufficient capacity for its configuration 4-43
 - has invalid M&P stamp 4-43
 - has loose cable 4-43
 - is a replacement drive 4-44
 - is a replacement drive marked OK 4-44
 - is failed 4-44
 - is undergoing drive recovery 4-44
 - needs replacing 4-44
 - upload code not readable 4-44
 - was inadvertently replaced 4-44
- drive array
 - Array Accelerator Battery Charge Low 4-26
 - Array Accelerator Battery Depleted 4-26
 - Array Accelerator Configuration Error 4-26
 - Array Accelerator Not Responding 4-26
 - Array Accelerator Read Error 4-27
 - Array Accelerator Write Error 4-27
 - Controller detects replacement drives 4-21
 - Drive Failure 4-21
 - Drive(s) Disabled due to Array Accelerator Data Loss 4-27
 - External Drive Subsystem Error 4-20
 - not Configured 4-22
 - Operating in Interim Recovery Mode 4-23
 - Recovery Needed 4-23
 - Reports Valid Data 4-25
 - resuming Automatic Data Recovery process 4-21
- Drive Monitoring features are unobtainable 4-44
- Drive Monitoring is NOT enabled 4-44
- Drive Not Responding 4-25
- Drive time-out occurred on physical drive bay X 4-44
- Drive X indicates position Y 4-44
- Duplicate write memory error 4-45
- Error occurred reading RIS copy from SCSI Port X 4-45
- Fan controller not responding 4-14
- Fan failure detected 4-13
- Fatal ROM Error 4-9
- Fixed Disk 0 does not support DMA Mode 4-16
- Fixed Disk does not support Block Mode 4-17
- Fixed Disk failed Identify command 4-17
- Fixed Disk failed Set Block Mode command 4-17
- FYI, Drive (bay) X is non-Compaq supplied 4-45
- I/O Fan (Fan X) failure detected 4-13
- I/O Fan controller not responding 4-14
- I/O ROM Error 4-9
- Identify controller data did not match NVRAM 4-45
- Identify logical drive data did not match NVRAM 4-45
- Incorrect Drive Replaced 4-24
- Insufficient adapter resources 4-45
- Internal SCSI Jumper Board Not Installed 4-14
- Invalid Memory Configuration 4-10
- Invalid Memory Speed 4-10
- Keyboard Controller Error 4-12
- Keyboard Error 4-12
- Keyboard or System Unit Error 4-12
- Less than 75% batteries at sufficient voltage 4-45
- Locked SCSI Bus Detected. 4-14
- Log Reinitialized 4-10
- Logical drive X failed due to cache error 4-46
- Logical drive X status
 - Failed 4-46
 - Interim Recovery 4-46
 - Loose Cable Detected 4-46
 - Needs Recover 4-46
 - Overheated 4-46
 - Overheating 4-46
 - Recovering 4-46
 - Wrong Drive Replaced 4-47
- Loose cable detected, logical drives may be marked FAILED 4-47
- Low System Battery 4-14
- Memory Address Error 4-10
- Memory Detection Failure 4-10
- Memory Error 4-10
- Mirror data miscompared 4-47
- No configuration for accelerator board 4-47
- Nonfunctioning Voltage Regulator Module 4-11
- NVRAM configuration present, controller not detected 4-47

- Parallel Port X Address Assignment
 - Conflict 4-13
- PCI slots powered down. 4-14
- Permanently disabled 4-41
- Power Fault On Processor Bus X 4-12
- Power Supply Failure, Power Supply
 - Unplugged, or Power Supply Fan Failure 4-14
- Primary Disk Port Address Assignment
 - Conflict 4-18
- Primary Fixed Disk Port Assignment
 - Conflict 4-19
- Primary power supply failure 4-14
- Processor Configuration Invalid 4-10
- Processor Power Module has lost Redundancy 4-11
- Processor PPM Failed 4-11
- Processor PPM has lost Redundancy 4-11
- RESUME - F1 key 4-27
- RIS copies between drives do not match 4-47
- ROM Error 4-9
- Run System Configuration Utility 4-27
- SCSI cable error detected 4-15
- SCSI Port X Drive ID X
 - failed - Replace 4-48
 - firmware needs upgrading 4-48
 - has exceeded threshold(s) 4-47
 - has loose cable 4-48
 - is not stamped for monitoring 4-47
 - replaced on a good volume 4-48
 - RIS copy mismatch 4-48
- SCSI Port X drive ID Y firmware needs upgrading 4-48
- Secondary Disk Port Address Assignment
 - Conflict 4-19
- Set configuration command issued 4-48
- Slot X Drive Array
 - Array Accelerator Memory Size Change Detected 4-16
 - Capacity Expansion Process is temporarily disabled 4-17
 - Drive(s) disabled due to failure during expand 4-18
 - New Logical Drive(s) Attachment Detected 4-16
 - Obsolete data found in Array Accelerator 4-19
 - Physical Drive Position Change(s) Detected 4-15
 - ProLiant Storage System Not Responding SCSI port (y) 4-19
 - Resuming logical drive expansion process 4-18
 - SMART Drive Detects Imminent Failure 4-15
- Slot x Drive Array Controller Failure 4-21
- Slot x Drive Array Option ROM is Not Programmed Correctly 4-17
- Snoop Rules SRAM Failure 4-12
- Soft Firmware Upgrade required 4-48
- System Board Failure 4-9
- System Options Not Set 4-9
- System Processor Failed/ Mapped out 4-11
- Tag Update Rules SRAM Failure 4-12
- Temperature violation detected 4-13
- Time & Date Not Set 4-9
- Unable to communicate with drive on SCSI Port x 4-49
- Unknown disable code 4-49
- Unrecoverable read error 4-49
- Unsupported Processor Detected System Halted 4-9
- Voltage Regulator Module for Processor X 4-11
- Warning bit detected 4-49
- Warning, Drive Write Cache enabled on X 4-49
- Write memory error 4-49
- Wrong Accelerator 4-49
- Event List *See also* IMD
 - defined 4-52
 - printing 4-51
 - viewing 4-51
- event messages, defined 4-53
- event type
 - ASR-2, system lockup 4-54
 - Fan Failure 4-53
 - machine environment
 - Fan Inserted 4-53
 - Fan Removed 4-53
 - Fans Not Redundant 4-53
 - Overheat Condition 4-53
 - main memory
 - Correctable Error threshold exceeded 4-53
 - Uncorrectable Error 4-53
 - operating system
 - automatic OS shutdown 4-54
 - system crash 4-54
 - PCI bus error 4-53
 - power subsystem
 - power module failure 4-54
 - power supply failure 4-54
 - power supply inserted 4-54
 - power supply not redundant 4-54
 - power supply removed 4-54
 - system configuration battery low 4-54
 - processor
 - Correctable Error Threshold exceeded 4-53
 - Host Bus Error 4-53
 - Uncorrectable Error 4-53
- events log
 - description 4-3

- viewing 4-3
- expansion board retaining clip 2-23
- expansion board, 32-bit
 - removing 2-22
 - replacing 2-22
- expansion board, 64-bit
 - removing 2-23
 - replacing 2-24
- expansion slot connectors 5-2
- expansion slots
 - illustrated 5-3
 - locations 5-3
- external SCSI connector 5-2

F

- fan assembly
 - part number 1-3
 - removing 2-27
 - replacing 2-27
- flow chart, ASR-2 4-60
- front panel LEDs 5-9
- front unit identification switch and LED 2-5

G

- graphics display unit, test error codes 4-34
- graphics, disabling on-board 4-72
- grooves, guiding 2-22, 2-24, 2-33
- grounding guidelines 2-1
- guiding grooves 2-22, 2-24, 2-33

H

- hard drive blank
 - part number 1-2
 - removing 2-15
 - replacing 2-15
- hard drives
 - capacity 6-8
 - ejector lever 2-16
 - height 6-8
 - interface 6-8
 - LEDs
 - activity 5-9
 - drive activity 5-11
 - fault status 5-11
 - online status 5-11
 - locations and SCSI IDs 2-8
 - removing 2-16
 - replacing 2-16
 - size 6-8
 - specifications 6-8
 - test error codes 4-37
 - transfer rate 6-8
 - types supported 2-8

- hardware kit
 - part number 1-5
- Health Driver, description 4-59
- heatsink 2-39
- heat-sink retaining clip 2-39
- heatsink with thermal pad, part number 1-4
- hood latches 2-17
- humidity range
 - DVD-ROM drive 6-7

I

- icons, symbols on equipment 2-2
- IDE CD-ROM drive
 - dimensions 6-5
 - part number 1-4
- IDE DVD-ROM drive *See* DVD-ROM drive
- illustrations
 - expansion slots 5-3
 - Integrated Smart Array Controller 2-42
 - mechanical parts 1-2
 - rear panel connectors 5-2
 - system board
 - components 5-4
 - system components 1-3
- IMD Event List, defined 4-52
- IML *See also* error log
 - accessing from Compaq Insight Manager 4-50
 - defined 4-50, 4-67
 - description 4-3
 - error messages 4-67
 - error types, explained 4-67
 - recorded information 4-59, 4-61, 4-65, 4-67
 - security levels defined 4-50
 - viewing 4-50, 4-51, 4-67
- Insight Agents, defined 4-74
- Insight Management Agents, enabling 4-55
- Inspect Computer utility, accessing 4-28
- Inspect listing, printing 4-5
- Inspect utility
 - accessing 4-2
 - booting remotely 4-64
 - description 4-2, 4-5
 - printing Inspect listing 4-5
 - running 4-5
- Integrated Management Log *See* error log. *See* IML
- Integrated Remote Console, features 4-58
- integrated server management, features 4-55
- Integrated Smart Array Controller
 - cache size 6-9
 - data transfer method 6-9
 - illustrated 2-42
 - maximum drives supported 6-9
 - part number 1-5
 - protocol 6-9
 - removing 2-42

- SCSI port connectors 6-9
 - socket location 5-4
 - specifications 6-9
 - transfer rate 6-9
- interlock status LED 5-14
- internal Smart Array/SCSI controller interface assembly
 - part number 1-5
 - removing 2-25
 - replacing 2-25
- IP access 4-61
- IP/IPX, using network features 4-57
- IRQ conflict, resolving 4-4

J

- jumper settings, obtaining 4-4

K

- key *See* shipping/ejector key
- keyboard
 - connector 5-2
 - test error codes 4-33
- keys, alignment 2-46
- kits
 - country 1-5
 - desktop/stackable chassis 1-5
 - hardware 1-5
 - plastics 1-4
 - rack mounting 1-5
 - return 1-5
 - sliding rails and cable management 1-5
 - Telco rack-mounting 1-5
 - third-party cabinet rack-mounting 1-5
 - upgrade 1-5

L

- LEDs 5-7 to 5-14
 - CD-ROM drive 5-13
 - disk drive activity 5-9
 - front panel 5-9
 - front unit identification 5-9
 - front unit identification switch 2-5
- hard drives
 - drive activity 5-11
 - fault status 5-11
 - online status 5-11
- hot-plug SCSI hard drives 5-11
- interlock 5-14
- internal 5-14
- network activity 5-9, 5-10
- network link 5-10
- power 5-9
- power status 5-14

- processor error 5-14
 - rear panel 5-10
 - rear unit identification 5-10
 - rear unit identification switch 2-6
- locating
 - DIMM sockets 2-36
 - processors 2-38
- locking tab 2-25
- low-profile 1.44-MB diskette drive *See* diskette drive
- low-profile IDE DVD-ROM drive *See* DVD-ROM drive

M

- maintenance and service guide, part number 1-5
- mass storage devices *See* storage devices
- mechanical parts
 - exploded view 1-2
 - illustrated 1-2
- memory *See also* DIMMs
 - clearing NVRAM 4-72
 - errors, recorded to Log 4-67
 - installation guidelines 2-35
 - installation order 2-35
 - maximum expansion capacity 2-35
 - module size 6-4
 - part number 1-4, 1-5
 - removing 2-37
 - replacing 2-37
 - specifications 6-4
 - speed 6-4
 - test error codes 4-31
 - upgrade requirements 6-4
 - width 6-4
- modem
 - test error codes 4-36
 - when used with ASR-2 4-57
- mouse connector 5-2

N

- NC3163 Embedded 10/100 Fast Ethernet NIC
 - controller
 - specifications 6-10
- Netelligent Management, defined 4-73
- network
 - access, configuring ASR-2 for 4-61
 - card slot, selecting 4-63
 - frame type, selecting 4-63
 - host name, setting 4-63
 - interface fault recovery, defined 4-70
 - protocol, setting 4-63
- Network Interface Controller *See* NIC
- network interface controllers (NICs)
 - LEDs

- activity status 5-9, 5-10
 - link status 5-10
 - network IP
 - address, setting 4-64
 - net mask, setting 4-64
 - router address, setting 4-64
 - NIC
 - test error codes 4-37
 - non-maskable interrupt (NMI) switch
 - location 5-7
 - purpose 5-7
- O**
- operating system, booting into 4-65
- P**
- pager
 - booting Compaq Utilities from 4-62
 - serial interface, selecting 4-62
 - setting dial string 4-62
 - setting message 4-62
 - settings 4-62
 - testing 4-62
 - parallel printer, test error codes 4-33
 - part numbers
 - AC 'Y' power cord 1-5
 - AC power cord and filter 1-4
 - air baffle 1-4
 - battery 1-5
 - bezel blank 1-2
 - cable protector 1-5
 - cable tray, fixed 1-2
 - CD-ROM/diskette drive assembly 1-4
 - CD-ROM/diskette drive assembly backplane 1-4
 - chassis 1-2
 - country kit 1-5
 - desktop chassis kit 1-5
 - DIMM, 128-MB 1-4
 - DIMM, 1-GB 1-5
 - DIMM, 256-MB 1-5
 - DIMM, 512-MB 1-5
 - DIMM, 64-MB 1-5
 - diskette drive 1-4
 - fan assembly 1-3
 - front bezel 1-4
 - hardware kit 1-5
 - heatsink with thermal pad 1-4
 - IDE CD-ROM drive 1-4
 - Integrated Smart Array Controller 1-5
 - internal Smart Array/SCSI controller interface assembly 1-5
 - maintenance and service guide 1-5
 - memory 1-4, 1-5
 - PCI riser board assembly 1-3
 - PCI slot cover 1-5
 - plastics kit 1-4
 - power supply 1-4
 - rack management solution 1-5
 - rack mounting kit 1-5
 - Remote Insight Lights-Out Edition 1-5
 - Remote Insight Lights-Out Edition interface cable 1-4
 - removable media blank 1-2
 - return kit 1-5
 - SCSI backplane 1-4
 - shipping/ejector key 1-4
 - system board 1-4
 - Telco rack mounting kit 1-5
 - third-party rack mounting kit 1-5
 - thumbscrew, system board 1-5
 - upgrade kit 1-5
 - user interface board 1-4
 - parts catalog, illustrated 1-1
 - password, disabling 4-72, 5-6
 - PCI boards, configuring automatically 4-4
 - PCI riser board assembly
 - part number 1-3
 - removing 2-20
 - replacing 2-21
 - PCI riser board assembly ejector 2-21
 - PCI slot cover
 - part number 1-5
 - PCI slots, identified 5-3
 - plastics kit, part number 1-4
 - pointing device interface, test error codes 4-39
 - POST
 - defined 4-8
 - error messages 4-8
 - power connector 5-2
 - power cord retaining clip 2-28
 - power LEDs 5-9, 5-14
 - Power On/Standby switch 2-5
 - power status LEDs 5-14
 - power supply
 - frequency range 6-3
 - input specifications 6-3
 - part number 1-4
 - removing 2-30
 - replacing 2-30
 - temperature range 6-3
 - voltage input 6-3
 - power supply retaining lever 2-30
 - powering down the server 2-5
 - Power-On Self-Test *See* POST
 - processor
 - test error codes 4-29
 - processors
 - location 5-4

- removing 2-39
- replacing 2-40
- sockets
 - location 2-38
- status LEDs 5-14

R

rack

- stabilization 2-3
- weight 2-3

rack management solution

- part number 1-5

rack mounting kit, part number 1-5

Rapid Recovery Engine, enabling 4-55

rapid recovery services 4-55

rear panel

- LEDs 5-10

rear panel connectors, illustrated 5-2

rear unit identification LED switch 2-6

recovery

- attended 4-56
- automatic 4-55, 4-56
- environmental 4-56
- from software error 4-56
- rapid recovery services 4-55
- unattended 4-56

release button 2-16

Remote Insight Lights-Out Edition

- cabling 3-3

- part number 1-5

remote management features, defined 4-71

Remote Management, defined 4-73

remote service features, defined 4-71

Remote Utilities, accessing 4-28

removing

- AC power cord and filter 2-28
- air baffle 2-26
- battery 2-44
- bezel blank 2-14
- cable protector 2-31
- CD-ROM/diskette drive assembly 2-10
- CD-ROM/diskette drive assembly
 - backplane 2-32
- DIMMs 2-37
- DVD-ROM/diskette drive assembly
 - backplane 2-32
- expansion board, 32-bit 2-22
- expansion board, 64-bit 2-23
- fan assembly 2-27
- hard drive 2-16
- hard drive blank 2-15
- internal Smart Array/SCSI controller interface
 - assembly 2-25
- memory 2-37
- PCI riser board assembly 2-20

- power supply 2-30
- processors 2-39
- SCSI backplane 2-18
- server access panel 2-17
- shipping/ejector key 2-9
- system board 2-45
- user interface board 2-34

replacing

- AC power cord and filter 2-29
- air baffle 2-26
- cable protector 2-31
- CD-ROM/diskette drive assembly
 - backplane 2-33
- DIMMs 2-37
- DVD-ROM/diskette drive assembly
 - backplane 2-33
- expansion board, 32-bit 2-22
- expansion board, 64-bit 2-24
- fan assembly 2-27
- hard drive 2-16
- hard drive blank 2-15
- internal Smart Array/SCSI controller interface
 - assembly 2-25
- memory 2-37
- PCI riser board assembly 2-21
- power supply 2-30
- processors 2-40
- SCSI backplane 2-19
- server access panel 2-17
- system board 2-46
- user interface board 2-34

resource conflict, resolving 4-4

retaining clips 2-27

- expansion board 2-23
- power cord 2-28

retaining lever, power supply 2-30

retaining sleeve 2-31

return kit, part number 1-5

Revision History Table

- accessing 4-69
- defined 4-69
- where stored 4-69

RJ-45 connectors 5-2

ROM is corrupted 4-72

ROMPaq

- Disaster Recovery 4-72
- Firmware Upgrade Utility, accessing 4-6
- interruption 4-72

routing sleeve 2-33

S

SCSI backplane

- part number 1-4
- removing 2-18
- replacing 2-19

- SCSI CD-ROM drives *See* CD-ROM drives
- SCSI connector, external 5-2
- SCSI hard drives *See* hard drives
- SCSI ports 2-19
 - location 5-4
- SCSI tape drives *See* tape drives
- security levels
 - Caution, defined 4-50
 - Critical, defined 4-50
 - Repaired, defined 4-50
 - Status, defined 4-50
- security, ASR-2 4-66
- serial connector 5-2
- serial port, test error codes 4-36
- server access panel *See* access panel
- setting system board switches 5-5
- shipping/ejector key
 - part number *See* plastics kit
 - removing 2-9
 - using 2-10, 2-12, 2-14
- sleeve, retaining 2-31
- sleeve, routing 2-33
- Smart Array 4200 controller
 - data transfer method 6-11
 - dimensions 6-11
 - drives supported 6-11
 - height 6-11
 - power requirements 6-11
 - SCSI port connectors 6-11
 - specifications 6-11
 - temperature range 6-11
 - thickness 6-11
 - transfer rate 6-11
- SmartStart and Support Software CD 2-1
 - contents 4-6
 - running utilities 4-6
 - running utilities from 4-7
 - starting from 4-5
- software error
 - recovery from 4-56, 4-58
 - recovery start option 4-58
 - recovery timeout 4-58
- spare parts list
 - mechanical parts 1-2
 - system components 1-3
- specifications 6-1
 - CD-ROM drive 6-5
 - diskette drive 6-4, 6-6
 - DVD-ROM drive 6-7
 - hard drives 6-8
 - Integrated Smart Array Controller 6-9
 - memory 6-4
 - NC3163 Embedded NIC 6-10
 - power supply 6-3
 - Smart Array 4200 controller 6-11
 - system unit 6-2
- Standby recover
 - server option 4-58
 - server port 4-58
 - time-out 4-58
- storage automatic reconstruction, defined 4-70
- storage devices
 - external 2-7
 - internal 2-7
 - types supported 2-7
- storage fault recovery tracking, defined 4-70
- Survey Utility, viewing 4-51
- switch settings
 - system configuration switch (SW2) 5-6
- switch settings, obtaining 4-4
- switches 5-4 to 5-7
 - maintenance configuration (SW2) 5-5
 - non-maskable interrupt (NMI) 5-7
 - system 5-5
 - system identification (SW1) 5-5
- symbols on equipment 2-2
- system board
 - components, illustrated 5-4
 - LEDs 5-14
 - part number 1-4
 - removing 2-45
 - replacing 2-46
- system components
 - exploded view 1-3
 - illustrated 1-3
 - spare parts list 1-3
- System Configuration CD, starting from 4-5
- system configuration switch (SW2) *See also* switches
 - location 5-4
- System Configuration Utility
 - accessing 4-6
 - booting remotely 4-64
 - description 4-4
 - executing 4-7
 - messages 4-5
 - running 4-4
 - selecting Diagnostics from 4-28
- system configuration, determining 4-5
- system identification switch (SW1) *See also* switches
 - location 5-4
- system switches 5-5
- system unit
 - depth 6-2
 - height 6-2
 - power supply specifications 6-2
 - specifications 6-2
 - temperature range 6-2
 - voltage input requirements 6-2
 - weight 6-2
 - width 6-2

T

tab, locking 2-25

tables

- 1.44-MB Diskette Drive Specifications 6-4
- ASR-2 Features 4-58
- ASR-2 IML Messages 4-67
- Compaq Servers Remote Management Features 4-71
- Compaq System Configuration Utility Pager Settings 4-62, 4-63, 4-64
- Configuration Switches 4-72
- Diagnostic Tools 4-2
- Diskette Drive Test Error Codes 4-35
- Graphics Display Unit Test Error Codes 4-34
- Hot-Plug Power Supply Specifications 6-3
- Integrated Smart Array Controller Specifications 6-9
- Keyboard Test Error Codes 4-33
- Low-Profile 1.44-MB Diskette Drive Specifications 6-6
- Low-Profile CD-ROM Drive LED Indicators 5-13
- Low-Profile IDE CD-ROM Drive Specifications 6-5
- Low-Profile IDE DVD-ROM Drive Specifications 6-7
- Memory Test Error Codes 4-31
- NC3163 Embedded 10/100 Fast Ethernet NIC Controller Specifications 6-10
- OS Restart SCU Setting for ASR-2 4-65
- Parallel Printer Test Error Codes 4-33
- Pointing Device Test Error Codes 4-39
- Primary Processor Test Error Codes 4-29
- Rear Panel Components 5-2
- Revision History Table 4-69
- Riser Board Expansion Slots 5-3
- SCSI Hard Drive Test Error Codes 4-37
- SCSI Tape Drive Test Error Codes 4-38
- SDRAM DIMM Specifications 6-4
- Serial Test Error Codes 4-36
- Smart Array 4200 Controller Specifications 6-11
- System Board Components 5-4
- System Unit Specifications 6-2
- Wide Ultra2 SCSI Hot-Plug Hard Drive Specifications 6-8

tape drives, test error codes 4-38

Telco rack-mounting kit

part number 1-5

Test Computer utility, accessing 4-28

test error codes

- CD-ROM drive 4-38
- diskette drive 4-35
- graphics display unit 4-34
- hard drive 4-37

- keyboard 4-33
- memory 4-31
- modem 4-36
- NIC board 4-37
- parallel printer 4-33
- pointing device interface 4-39
- processor 4-29
- SCSI hard drive 4-37
- SCSI tape drive 4-38
- SCSI/IDE CD-ROM drive 4-38
- serial port 4-36
- tape drive 4-38

thermal pad 2-39

thermal shutdown 4-58

third-party rack mounting kit

part number 1-5

thumbscrew, system board

part number 1-5

tools, recommended 2-1

U

unit identification switches

LEDs

front 5-9

rear 5-10

Upgrade Firmware utility, accessing 4-28

upgrade kit, part number 1-5

UPS shutdown threshold 4-58

user interface board

part number 1-4

removing 2-34

replace 2-34

utilities

accessing 4-6

ADU

accessing 4-6

description 4-3

executing 4-7

allowing network access to 4-63

Array Configuration

accessing 4-6, 4-7

executing 4-7

Compaq

configuring server to start 4-57

Insight Manager 4-73

Insight Manager, description 4-2

running on IPX network 4-57

running remotely 4-57

Survey Utility, description 4-2

Survey, installing 4-2

System Reference Library 4-55

creating diskette versions 4-7

DAAD

accessing remotely 4-71

description 4-3

- Diagnose Drive Array, accessing 4-28
 - Diagnostics
 - accessing 4-6
 - accessing from Compaq system partition 4-6
 - menu choices 4-28
 - selecting from System Configuration Utility 4-28
 - Firmware Upgrade, accessing 4-6
 - Health Driver 4-59
 - IML Management Utility, defined 4-51
 - Inspect
 - accessing 4-2
 - description 4-2, 4-5
 - printing Inspect listing 4-5
 - running 4-5
 - Inspect Computer, accessing 4-28
 - Integrated Management Log, description 4-3
 - Remote Utilities, accessing 4-28
 - ROMPaq Firmware Upgrade, accessing 4-6
 - running from SmartStart and Support Software CD 4-7
 - starting from ASR-2 4-61
 - Survey, defined 4-51
 - System Configuration
 - accessing 4-6
 - booting from pager 4-62
 - description 4-4
 - executing 4-7
 - running 4-4
 - Test Computer, accessing 4-28
 - Upgrade Firmware, accessing 4-28
- V**
- video
 - connector 5-2
 - disabling 5-6
- W**
- warnings
 - battery 2-43
 - electric shock 2-2
 - explosion 2-43
 - hot surfaces 2-2, 2-42
 - personal injury 2-42
 - rack weight 2-3
 - Wide Ultra2 hard drive *See* hard drives
 - Workstation Management, defined 4-73