COMPAQ

ProLiant DL380

Maintenance and Service Guide

Fourth Edition (June 2000)
Part Number 136363-004
Spare Part Number 159127-001
Compaq Computer Corporation

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About This Guide

This maintenance and service guide is a troubleshooting guide that can be used for reference when servicing Compaq ProLiant DL380 Servers.

IMPORTANT: The installation of options and the servicing of this product shall be performed by individuals who are knowledgeable of the procedures, precautions, and hazards associated with equipment containing hazardous energy circuits.

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.

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 electric shock or damage to the equipment:

- If the system has multiple power supplies, 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 your system, you must provide at least 12 inches (30.5 cm) of clearance at the front and back of the computer.

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

IMPORTANT: 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
- On line information at the Compaq website

  http://www.compaq.com/support/servers/index.html
- *Compaq Service Quick Reference Guide*
- Service training guides
- Compaq service advisories and bulletins
- Compaq QuickFind
- Compaq Insight Manager
- Compaq download facility: Call using computer modem 1-281-518-1418

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, 1-800-386-2172.
- For Compaq technical support phone numbers outside the United States and Canada, visit the Compaq website:

  http://www.compaq.com

Chapter **1**

Illustrated Parts Catalog

This chapter provides the illustrated parts breakdown and a spare parts list for the Compaq *ProLiant*™ DL380 Servers. See Table 1-1 and Table 1-2 for the names of referenced spare parts.

Mechanical Parts Exploded View

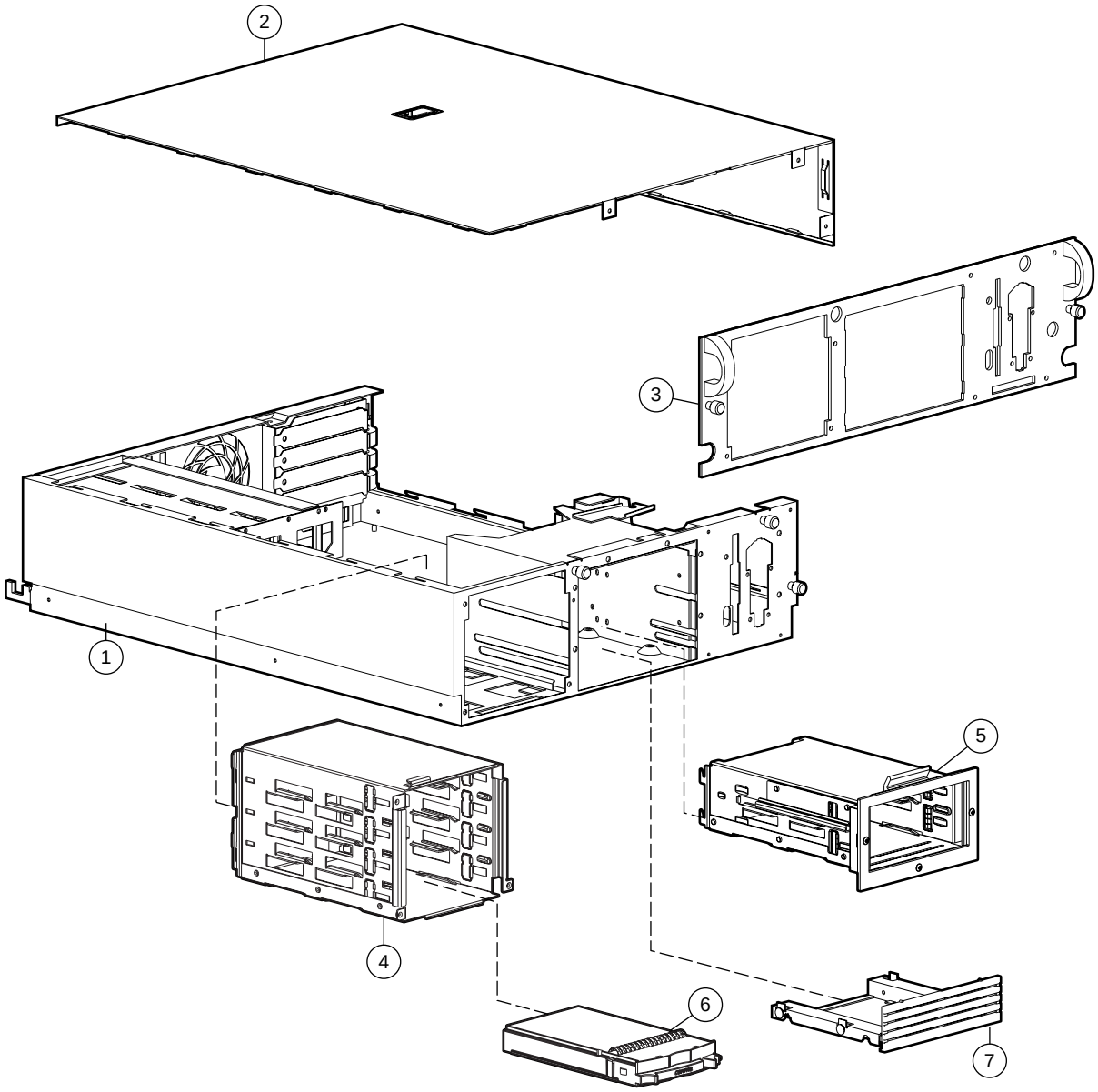


Figure 1-1. Mechanical parts exploded view

Mechanical Spare Parts List

Table 1-1
Mechanical Spare Parts List

Item	Description	Spare Part Number
	Chassis	
1	Chassis	212943-001
2	Server cover	327313-001
3	Rack-mount bezel	218257-001
4	SCSI drive cage	159137-001
5	Optional 2x1-inch media device drive cage	144087-001
6	Hard drive blank	122759-001
7	Removable media blank	Part of kit 159542-001

System Components Exploded View

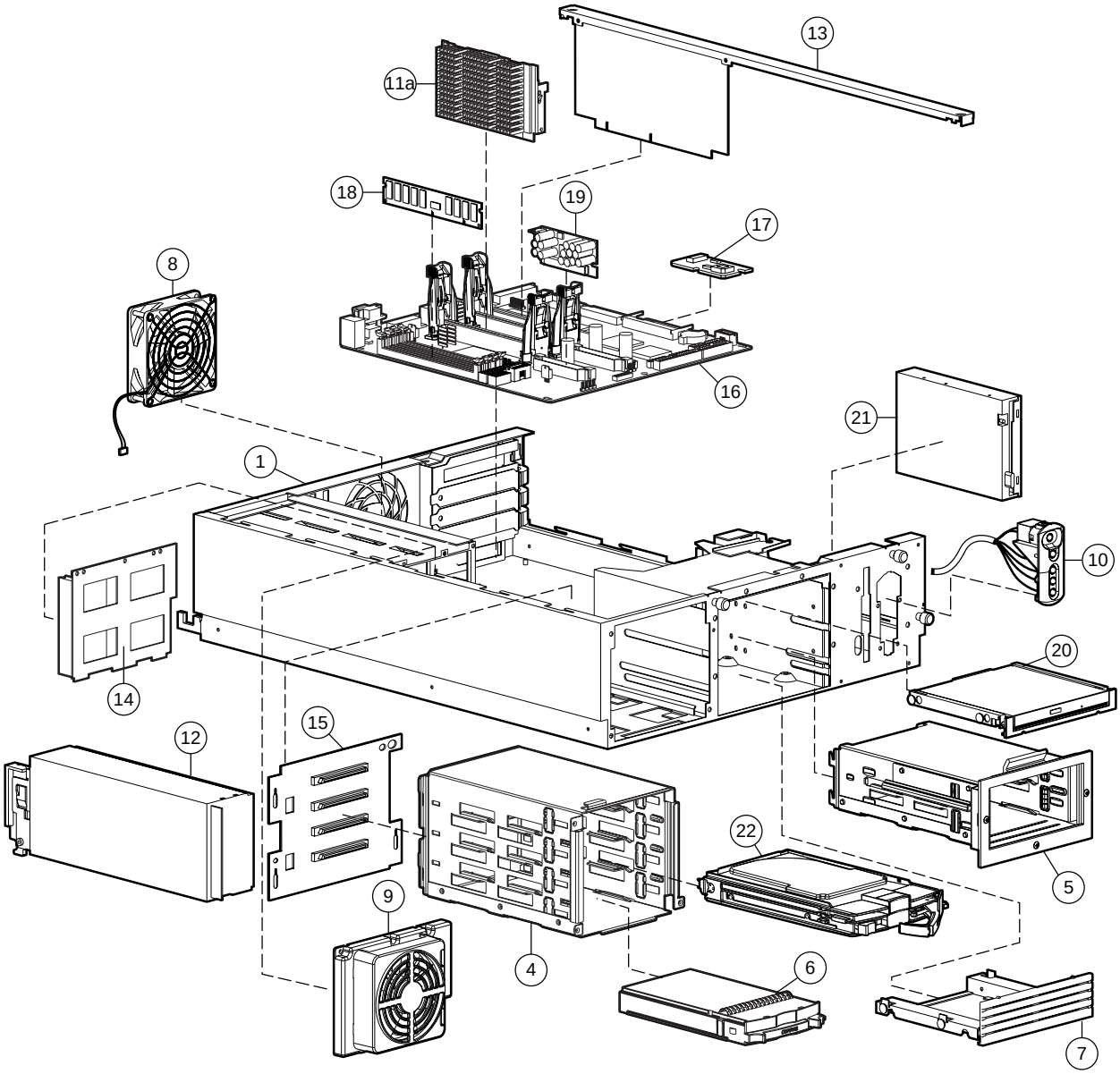


Figure 1-2. System components exploded view

System Components Spare Parts List

Table 1-2
System Components Spare Parts List

Item	Description	Spare Part Number
	System Components	
8	CPU fan	
	a) 92 mm, 74 CFM	159203-001
	b) 92 mm, 110 CFM	216472-001
9	Power supply fan	173907-001
10	Power On/Standby switch with cable and LED indicators	144086-001
11	Processors	
	a) Pentium III 667-MHz with heatsink	166109-001
	b) Pentium III 733-MHz with heatsink *	166108-001
	c) Pentium III 800-MHz with heatsink *	187781-001
	d) Pentium III 866-MHz with heatsink *	187782-001
	e) Pentium III 933-MHz with heatsink *	196628-001
	f) Pentium III 1-GHz with heatsink *	221536-001
12	Hot-plug power supply, 275 W	159125-001
	Boards	
13	Riser board and brace	159128-001
14	Hot-plug power supply backplane board	333112-001
15	SCSI drive cage backplane board	387090-001
16	System board	157824-001
17	Integrated Smart Array Controller	158855-001
18	128-MB Registered 133-MHz SDRAM DIMM	159226-001
19	Processor power module	157825-001
	Mass Storage Devices	
20	24X low-profile IDE CD-ROM drive	323332-001
21	1.44-MB diskette drive	179161-001
22	18-GB Wide Ultra2 hard drive	143920-001

* Not shown

continued

Table 1-2
System Components Spare Parts List *continued*

Item	Description	Spare Part Number
	Options	
23	Signal cable kit *	159129-001
	CD data shredded cable assembly	
	SCSI 2-device shredded cable assembly	
	SCSI 1-device shredded cable assembly	
24	Power cable kit *	327919-001
	14-pin power cable assembly	
	Main 20-pin power cable assembly	
	Hard drive/CD power cable assembly	
25	Plastics kit *	327319-001
	Option board retainer	
	Blank option board bracket	
	Power supply fan guard	
	Power supply fan cover	
26	Thermal upgrade kit*	216472-001
27	CD tray assembly *	Part of kit 159542-001
28	Return kit *	327322-001
29	Country kit *	159124-001
30	Mounting kit for rack model *	327310-001
31	Carton and buns, international *	327322-002
32	Maintenance and service guide *	159127-001
33	Battery, 3-V lithium *	179322-001
34	Baffle *	163327-001
35	Expansion slot 1 optional installation tool *	216394-001

* Not shown

continued

Table 1-2
System Components Spare Parts List *continued*

Item	Description	Spare Part Number
	Memory	
36	64-MB registered 133-MHz SDRAM DIMM *	159225-001
37	256-MB registered 133-MHz SDRAM DIMM *	159304-001
38	512-MB registered 133-MHz SDRAM DIMM *	159227-001
39	1-GB registered 133-MHz SDRAM DIMM *	163902-001
	Controllers	
40	NC3163 Embedded 10/100 Fast Ethernet NIC (Wake On LAN) *	N/A
41	Smart Array 221 controller *	400546-001
42	Smart Array 3200 controller *	340855-001
43	Smart Array 4200 controller *	401859-001
44	NC3131 Fast Ethernet NIC 64 PCI Dual Base 10/100 *	338482-001

* Not shown

Chapter **2**

Removal and Replacement Procedures

This chapter provides subassembly/module-level removal and replacement procedures for Compaq ProLiant DL380 Servers. After completing all necessary removal and replacement procedures, run the Diagnostics program to verify that all components operate properly.

The following tools are recommended:

- Torx T-15 screwdriver
- Torx T-7 screwdriver
- From the 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.

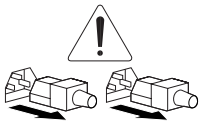
WARNING: To reduce the risk of injury from a hot component, allow the surface to cool before touching it.

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.



Power supplies or systems marked with these symbols indicate the equipment is supplied by multiple sources of power.

WARNING: To reduce the risk of electric shock or damage to the equipment, disconnect power from the server by unplugging all power cords from the electrical outlet or the server.

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

Preparation Procedures

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

Hot-Pluggable Device

Hot-pluggable devices in the ProLiant DL380 Server include SCSI hard drives and power supplies.

IMPORTANT: It is not necessary to turn off the server to replace hot-plug devices such as power supplies, fans, or hard drives when they are not in active use.

Non-Hot-Pluggable Device

If the part is non-hot-pluggable, the server must be powered down. Non-hot-pluggable parts include the processors, all boards, DIMMs, fans, and drive cages.

Powering Down the Server

System power in ProLiant DL380 Servers does not completely shut off with the front panel Power On/Standby switch. The switch toggles between On and Standby, rather than On and Off. The standby position removes power from most electronics and the drives, but portions of the hot-plug 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 all power cords 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 *ProLiant DL380 Server 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 hot-plug 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.

1. Press the Power On/Standby switch to Standby. This places the server in standby mode, thereby disabling the main hot-plug power supply output and providing auxiliary power to the server. Standby does not completely disable or remove power from the system.
2. Verify that the system LED indicator on the front panel, near the Power On/Standby switch, is amber and that the fan noise has stopped.
3. Disconnect the AC power cord from the AC outlet, then from the server.
4. Disconnect all external peripheral devices from the server.
5. For stability and safety, properly positioning the server is critical.

Rack Warnings

25 kg
55 lb

WARNING: To reduce the risk of personal injury or damage to the equipment:

- Observe local Occupational Safety requirements and guidelines for heavy equipment handling.
- Obtain adequate assistance to lift and stabilize the product during installation or removal.
- Remove all pluggable power supplies and modules to reduce the weight of the product.
- At least two people are needed to safely unload the rack from the pallet. An empty 42U rack weighs 115 kg (253 lb), is over 2.1 meters (7 ft) tall, and may become unstable when being moved on its casters. Do not stand in front of the rack as it rolls down the ramp from the pallet; handle it from the sides. Stabilize the server by keeping the unit on the rails.

25 kg
55 lb

WARNING: To reduce the risk of personal injury or damage to the equipment:

- Always load the heaviest item first and load the rack from the bottom up. This makes the rack "bottom-heavy" and helps prevent the rack from becoming unstable.
- The bottom stabilizers on the equipment must be fully extended. Be sure that the equipment is properly supported/braced when installing options and cards.
- Be sure that the rack is adequately stabilized before extending a component outside the rack. Extend only one component at a time. A rack may become unstable if more than one component is extended.

WARNING: To reduce the risk of personal injury, fire, or damage to the equipment, do not overload the AC supply branch circuit that provides power to the rack.

Server Warnings and Precautions

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

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 ProLiant DL380 Server must always be operated with system unit covers on. Proper cooling will not be achieved if the system unit covers are removed.

Server Cover

To remove the server cover:

1. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
2. Loosen the three captive thumbscrews on the rack-mount bezel ❶.
3. Use the grip slot to slide the cover toward the rear of the unit approximately 2.5 cm (1-inch); then lift off the server cover ❷.

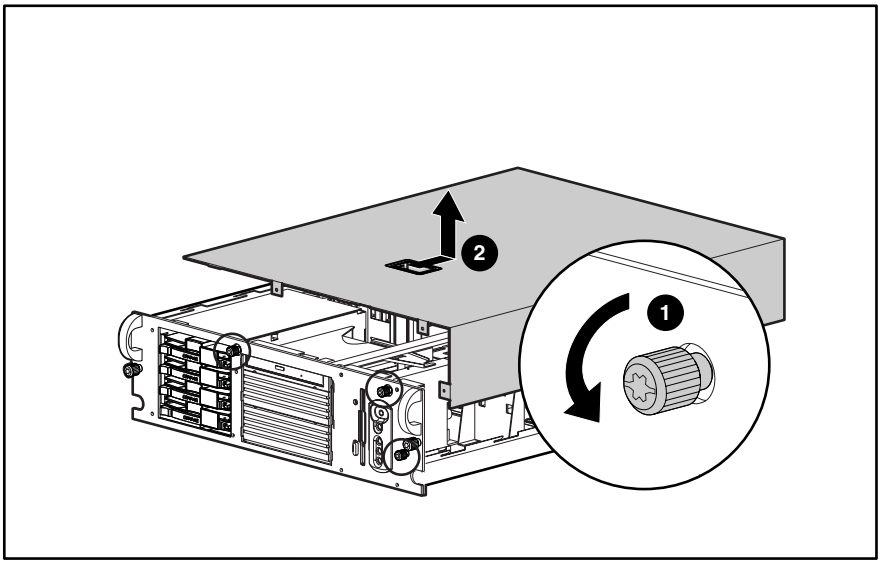


Figure 2-1. Removing the server cover

Reverse steps 1 through 3 to replace the server cover.

Power On/Standby Switch with Status Indicators

To remove the Power On/Standby switch with status indicators:

1. Perform the preparation procedures. See "Powering Down the Server" earlier in this chapter.
2. Remove the server cover. See "Server Cover" earlier in this chapter.
3. Disconnect the power switch cable from the system board ❶.
4. Press in on the two tabs on the top and bottom of the switch ❷.
5. Push the switch through the bezel as shown ❸.

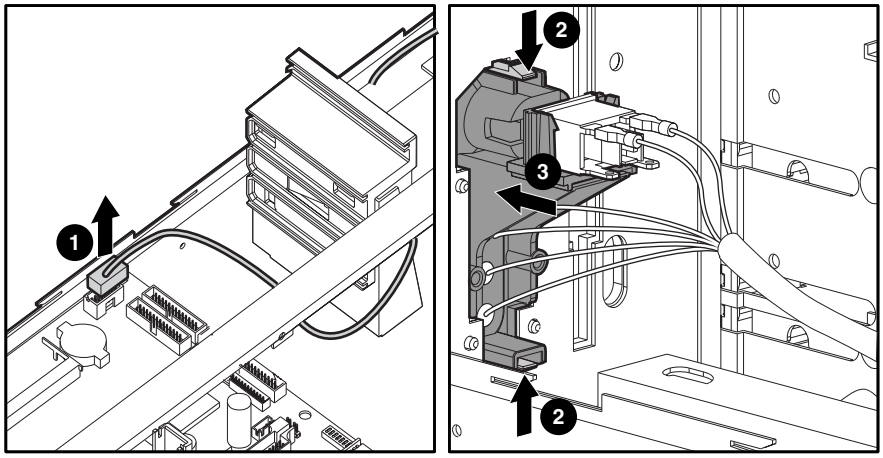


Figure 2-2. Removing the Power On/Standby switch with status indicators

Reverse steps 1 through 5 to replace the Power On/Standby switch with status indicators.

Rack-Mount Bezel

WARNING: Before removing the rack-mount bezel, be sure the computer is powered down and the power cord is disconnected from the electrical outlet.

To remove the rack-mount bezel:

1. Complete the preparation procedures. See "Powering Down the Server" earlier in this chapter.
2. Remove the Power On/Standby switch assembly from the bezel. See "Power On/Standby Switch with Status Indicators" earlier in this chapter.
3. Remove the nine screws from the front of the bezel ❶.
4. Remove the rack-mount bezel ❷.

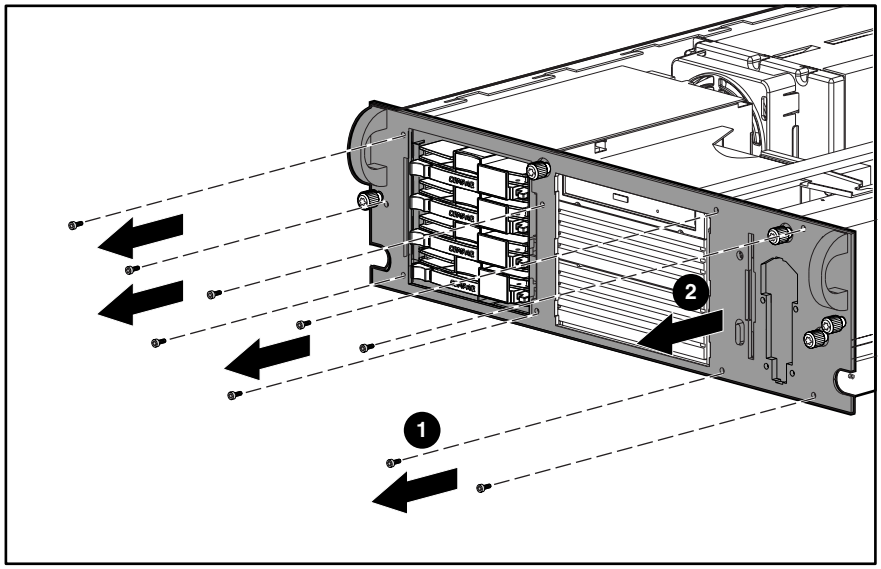


Figure 2-3. Removing the rack-mount bezel

Reverse steps 1 through 4 to replace the rack-mount bezel.

Diskette Drive

CAUTION: When removing or installing the diskette drive, be careful not to damage its front eject button.

To remove the diskette drive:

1. Complete the preparation procedures. See "Powering Down the Server" earlier in this chapter.
2. Remove the server cover. See "Server Cover" earlier in this chapter.
3. Disconnect the power and data cables from the diskette drive (if installed).
4. Remove the Power On/Standby switch. See "Power On/Standby Switch with Status Indicators" earlier in this chapter.
5. Remove one T-15 screw ❶ from the diskette drive.
6. Slide the diskette drive back, then away from the front bezel until it stops ❷.

NOTE: Ensure that the diskette eject lever clears the bezel when removing the diskette drive. Slide the diskette drive straight back from the front of the unit.

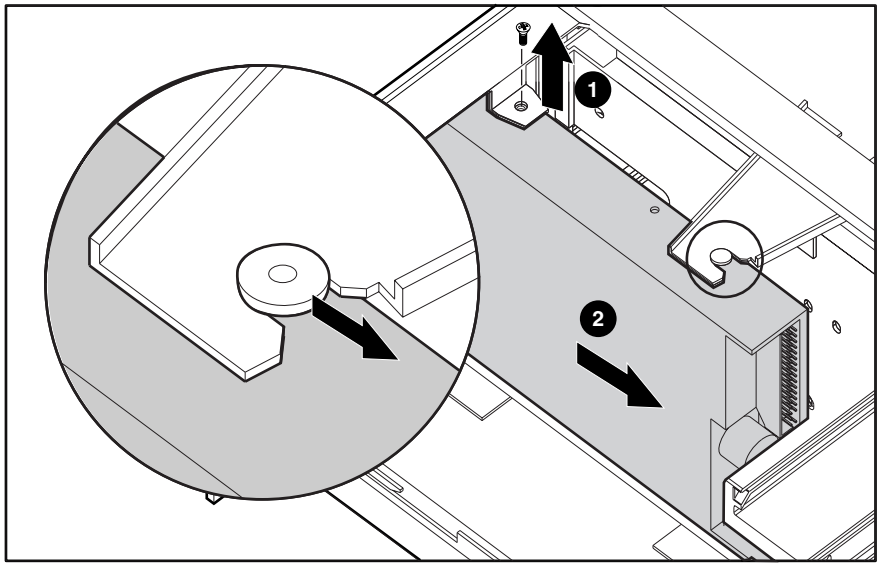


Figure 2-4. Removing the screw and sliding the diskette drive

NOTE: The cables from the Power On/Standby switch have been removed from the drawing for clarity.

7. Rotate the rear of the diskette drive toward the outer edge of the chassis ❸.
8. Lift the diskette drive straight up to remove it ❹.

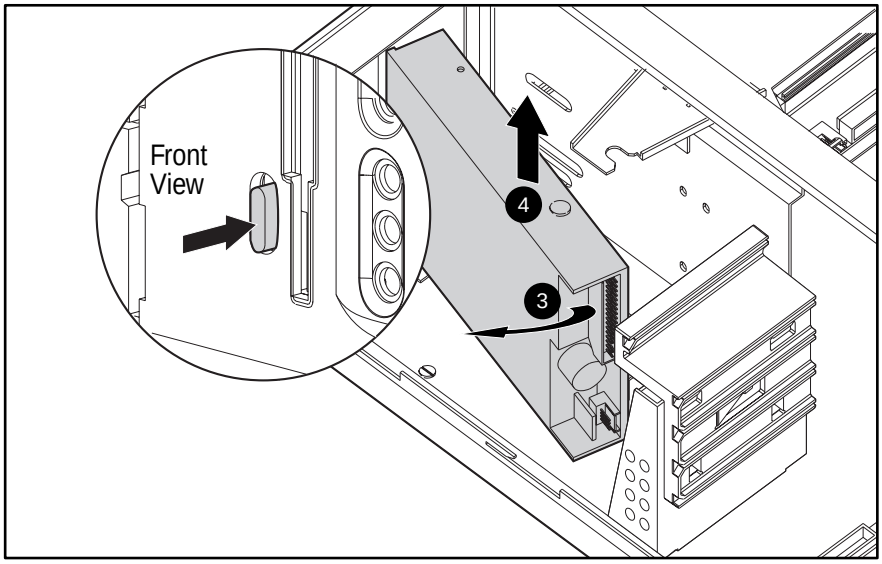


Figure 2-5. Removing the diskette drive

NOTE: The cables from the Power On/Standby switch have been removed from the drawing for clarity.

Reverse steps 1 through 8 to replace the diskette drive.

Power Supply Fan and Bracket

To remove the power supply fan and bracket:

1. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
2. Remove the server cover. See “Server Cover” earlier in this chapter.
3. Unplug the fan from the system board.
4. Remove the three screws from the power supply fan bracket ❶.
5. Move the fan assembly forward. Pull up to remove the fan assembly from the power supply ❷.

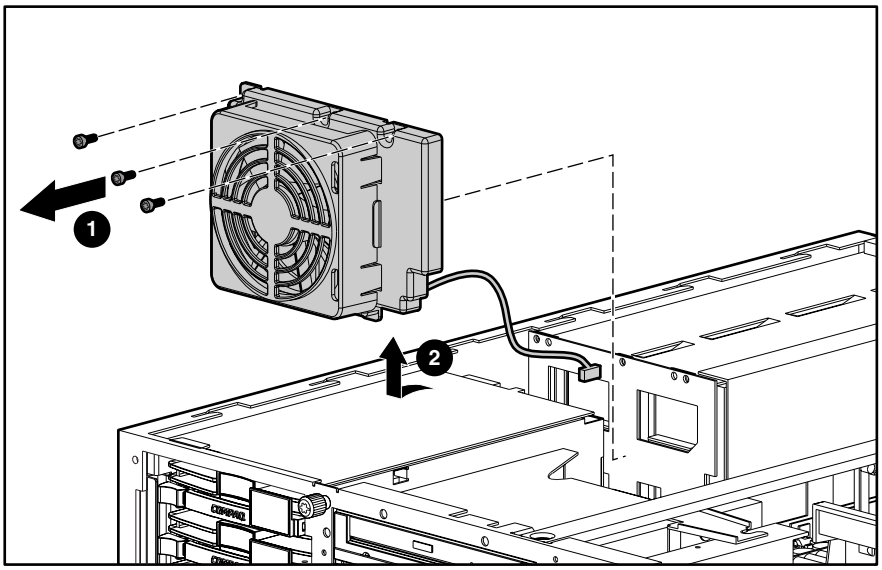


Figure 2-6. Removing the power supply fan and bracket

Reverse steps 1 through 5 to replace the power supply fan and bracket.

Power Supply Blank

To remove a power supply blank:

1. Push in the tabs on the power supply blank ❶.
2. Pull the tab out until it is horizontal ❷.
3. Pull the power supply blank out the back of the chassis ❸.

IMPORTANT: A ProLiant DL380 Server ships standard with a single power supply module. The primary module must populate the outer bay. A power supply blank may populate the inner bay. The blank can be removed and a second power supply can be installed for redundant power supply capability.

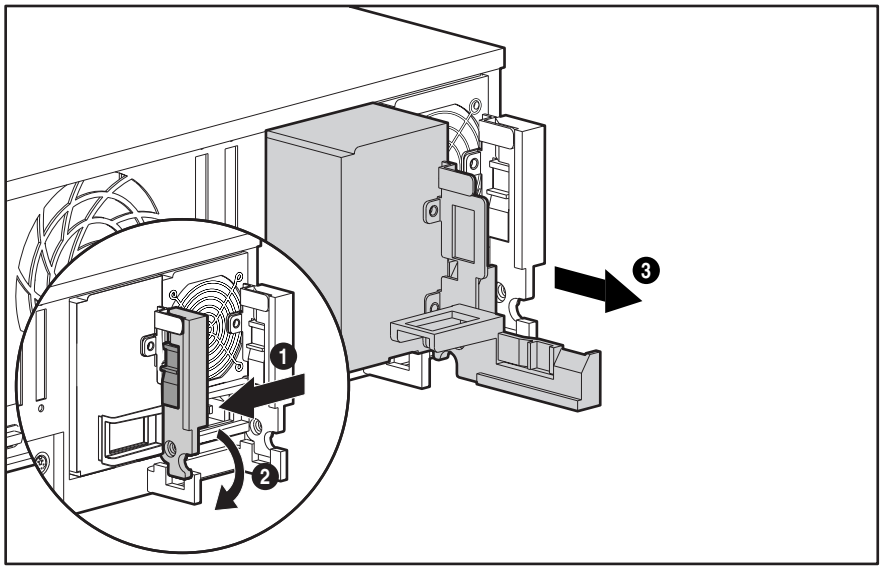


Figure 2-7. Removing the power supply blank

Reverse steps 1 through 3 to replace a power supply blank.

Hot-Plug Power Supply

WARNING: To reduce the risk of electric shock, do not disassemble the power supply or attempt to repair it. It should be replaced only with the specified spare part.

To remove a hot-plug power supply:

1. Unplug the AC power cord.
2. Push in the port-colored lever on the power supply blank ❶.
3. Pull the lever out until it is horizontal ❷.
4. Pull the power supply out the back of the chassis ❸.

IMPORTANT: A ProLiant DL380 Server ships standard with a single power supply module. The primary module must populate the outer bay. A power supply blank may populate the inner bay. The blank can be removed and a second hot-plug power supply installed for redundant power supply capability.

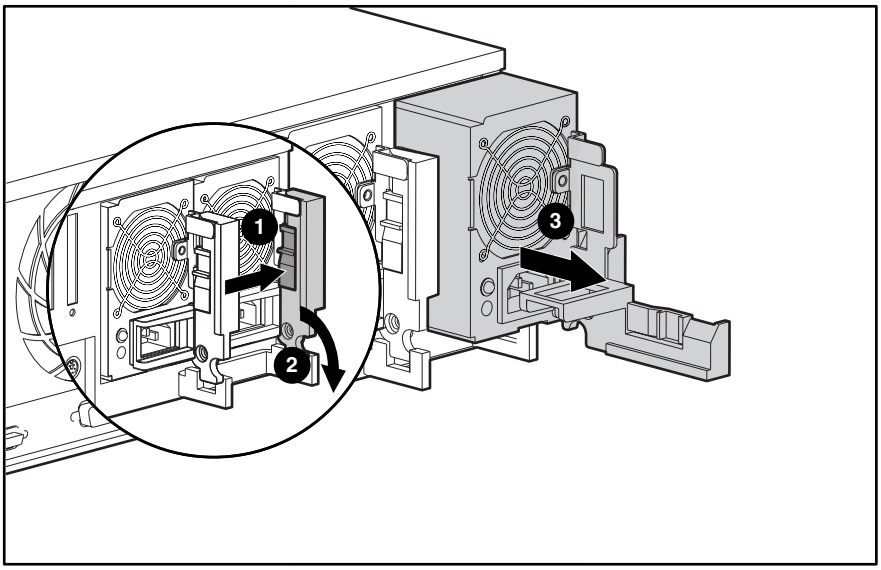


Figure 2-8. Removing a power supply

Reverse steps 1 through 4 to replace a power supply.

Hot-Plug Power Supply Backplane Board

To remove a hot-plug power supply backplane board:

1. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
2. Remove the server cover. See “Server Cover” earlier in this chapter.
3. Remove the power supply fan and bracket. See “Power Supply Fan and Bracket” earlier in this chapter.
4. Disconnect all cables from the backplane board.
5. Tilt the backplane forward.
6. Pull up to remove the backplane board ❶.

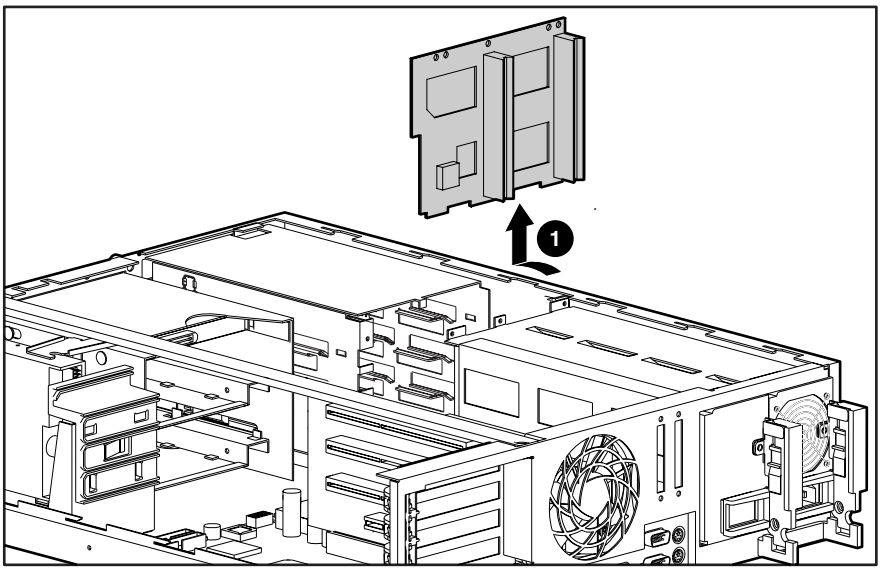


Figure 2-9. Removing a power supply backplane board

To replace a power supply backplane board, slide it into the three slots on the back of the power supply, then reverse steps 1 through 4.

Mass Storage Devices

ProLiant DL380 Servers can house up to eight mass storage devices, including:

- Up to four 1-inch, hot-plug hard drives
- Preinstalled, low-profile, IDE CD-ROM drive
- Preinstalled 3.5-inch, 1.44-MB diskette drive in the vertical position
- Two half-height 5.25-inch removable media drives
- Optional hard drive cage that supports two 1-inch SCSI hot-plug hard drives

External Storage Devices

You can connect optional mass storage devices to the ProLiant DL380 by using the external SCSI port on the back of the unit.

NOTE: All servers ship standard with SCSI ports connected to appropriate cables. In order to use the external SCSI connector, the internal cable located in port 1 must be removed.

ProLiant DL380 Drives

This section describes the drive cage positions, and removal and replacement procedures for parts of the ProLiant DL380 Server.

CAUTION: The ProLiant DL380 Server does not support the IDE or EIDE hard drives.

Drive Locations

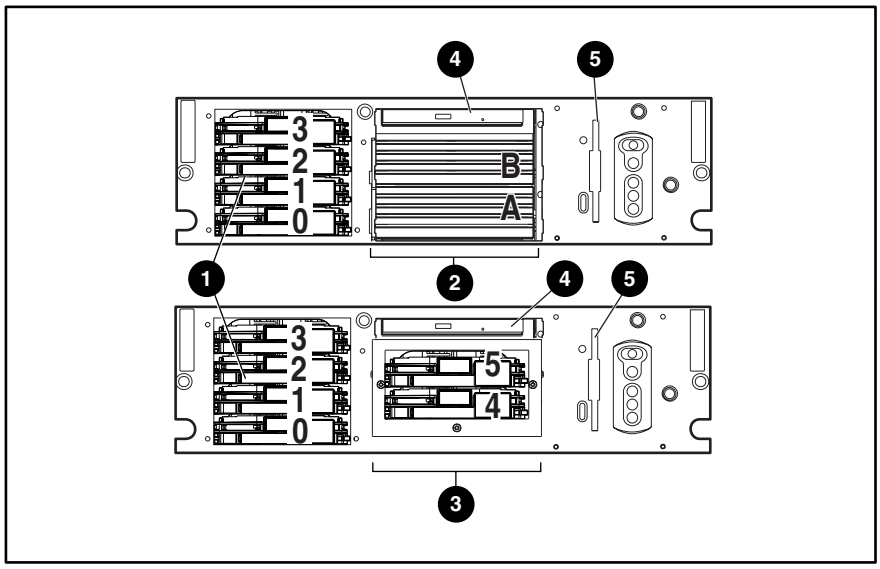


Figure 2-10. Drive options

Table 2-1
Drive Options

Item	Media Positions	Configuration
❶	0, 1, 2, 3	Hot-plug drive cage accommodating four 1-inch height SCSI hot-plug hard drives
❷	A, B	Two 5.25-inch wide x half-height drives
❸	4, 5	Optional drive cage that supports two 1-inch media devices
❹		Low-profile IDE CD-ROM drive
❺		Diskette drive

Hard Drive Blank

To remove a hard drive blank:

1. Push the tab to unlock the hard drive blank ❶.
2. Continue to press on the tab and slide the hard drive blank out of the drive cage ❷.

IMPORTANT: A hard drive blank must be installed in an unused drive slot. Failure to install a hard drive blank could result in thermal failures.

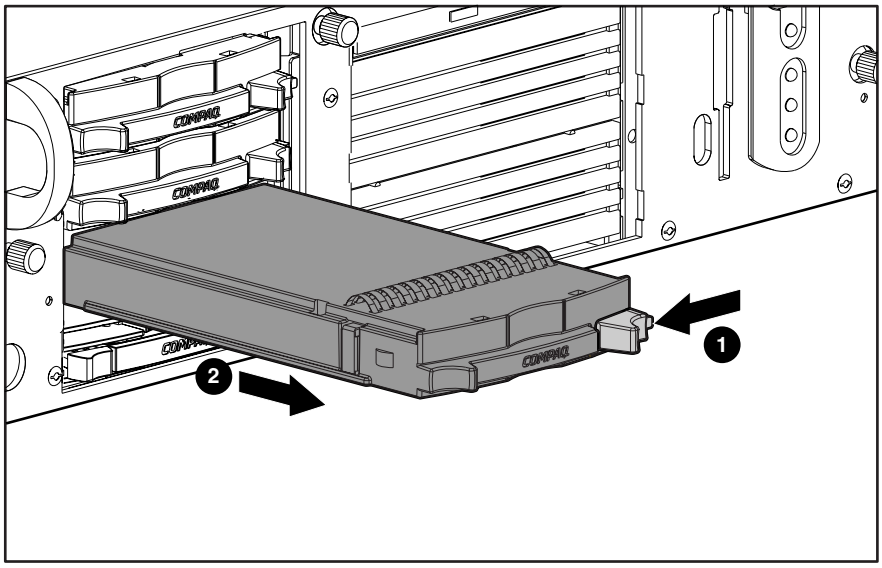


Figure 2-11. Removing a hard drive blank

To replace a hard drive blank, slide the blank into the cage until it clicks into place.

SCSI Hot-Plug Hard Drive

To remove a SCSI hot-plug hard drive:

1. Push in the tab to unlock the lever on the hard drive ❶.
2. Rotate the lever outward, as shown ❷.
3. Pull the hard drive out of the bay ❸.

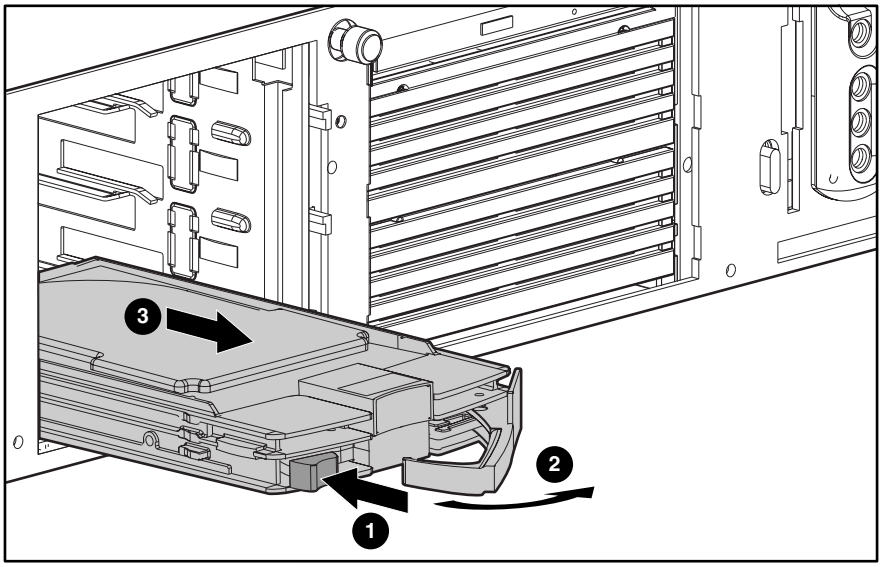


Figure 2-12. Removing a hard drive

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

Hot-Plug Drive Cage

To remove the hot-plug drive cage:

1. Complete the preparation procedures. See "Powering Down the Server" earlier in this chapter.
2. Remove the drives from the drive cage. See "SCSI Hot-Plug Hard Drive" earlier in this chapter.
3. Disconnect the SCSI and power cables from the SCSI backplane board.
4. Remove the three Torx T-15 screws securing the drive cage to the chassis ❶.
5. Pull the drive cage back, then up to remove it from the server ❷.

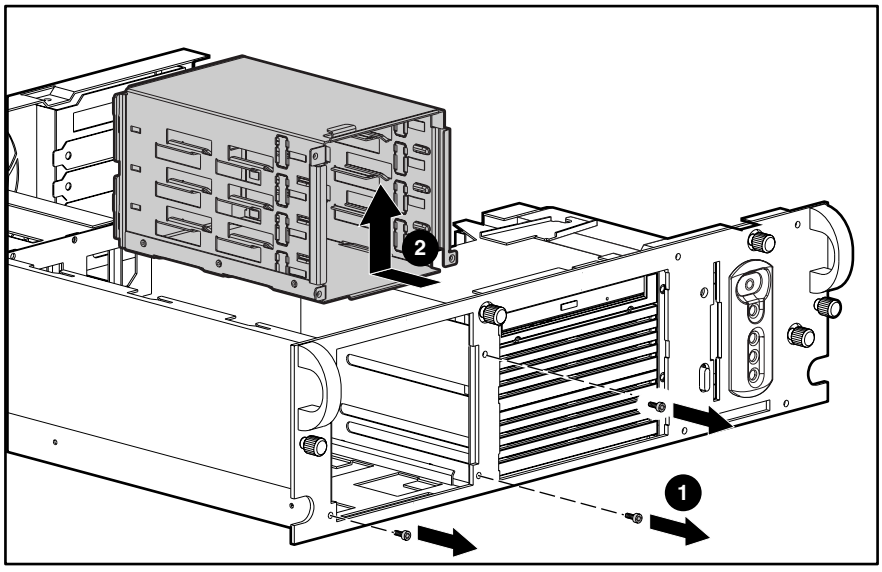


Figure 2-13. Removing a hot-plug drive cage

Reverse steps 1 through 5 to replace the hot-plug drive cage.

SCSI Backplane Board

To remove the SCSI backplane board:

1. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
2. Disconnect the SCSI and power cables from the SCSI backplane board.
3. Remove the drives from the drive cage. See “SCSI Hot-Plug Hard Drive” earlier in this chapter.
4. Remove the hot-plug drive cage. See “Hot-Plug Drive Cage” earlier in this chapter.
5. Loosen the thumbscrew securing the backplane board to the drive cage ❶.
6. Remove the backplane board from the drive cage ❷.

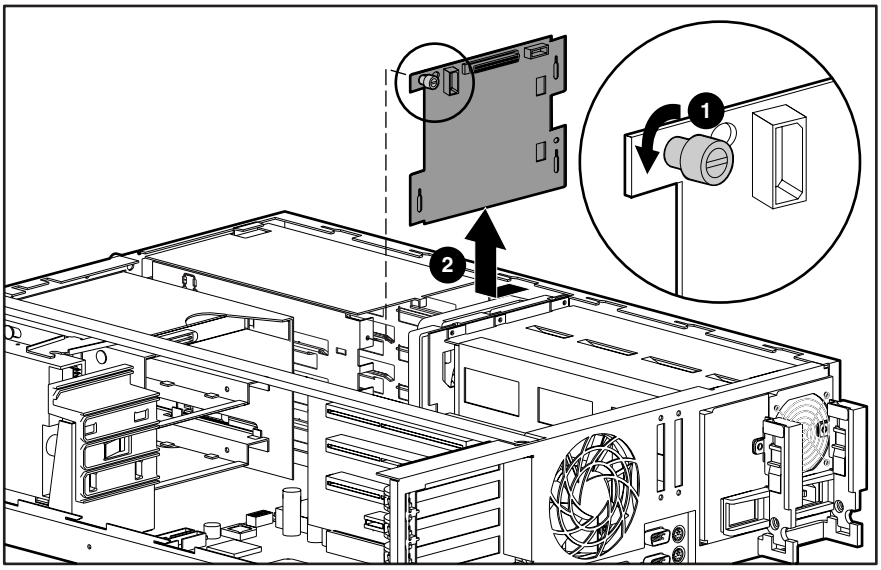


Figure 2-14. Removing a backplane board

NOTE: When replacing the SCSI backplane board, slide the backplane board down into the hooks on the back of the power supply.

Reverse steps 1 through 6 to replace the SCSI backplane board.

Low-Profile IDE CD-ROM Drive

To remove the low-profile IDE CD-ROM drive:

1. Complete the preparation procedures. See "Powering Down the Server" earlier in this chapter.
2. Remove the server cover. See "Server Cover" earlier in this chapter.
3. Remove the diskette drive. See "Diskette Drive" earlier in this chapter.
4. Disconnect the CD-ROM cable from the CD-ROM drive ❶.
5. Remove the retaining screw securing the CD-ROM drive to the chassis ❷.
6. Pull the CD-ROM drive from the drive cage ❸.

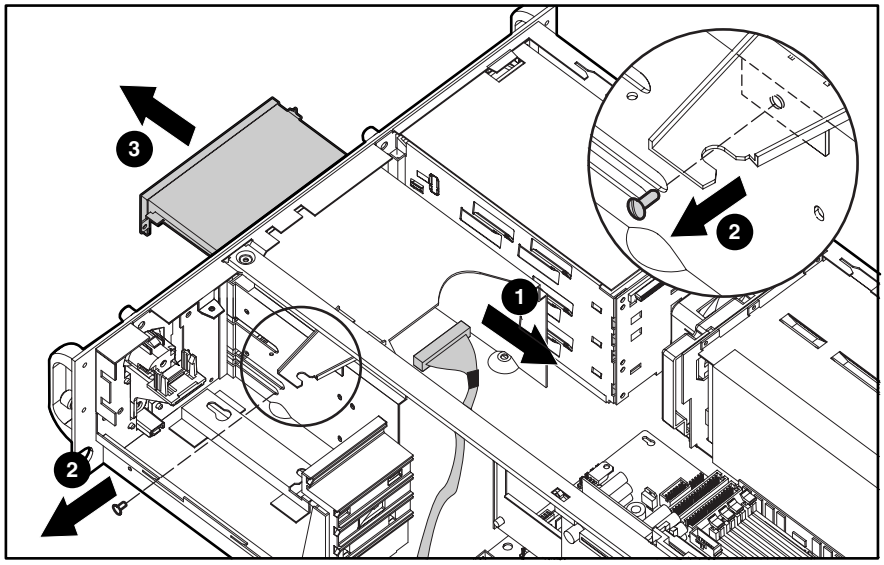


Figure 2-15. Removing the low-profile IDE CD-ROM drive

Reverse steps 1 through 6 to replace the low-profile IDE CD-ROM drive.

Removable Media Blank

Devices that can be installed in the removable media drive include an additional CD-ROM drive, a SCSI hard drive cage, and SLR, DAT, or DLT tape drives.

To remove a removable media blank:

1. Complete the preparation procedures. See "Powering Down the Server" earlier in this chapter.
2. Remove the server cover. See "Server Cover" earlier in this chapter.
3. Remove the diskette drive. See "Diskette Drive" earlier in this chapter.
4. Remove the T-15 Torx screw securing the removable media blank to the chassis ❶.
5. Slide the removable media blank out of the server ❷.

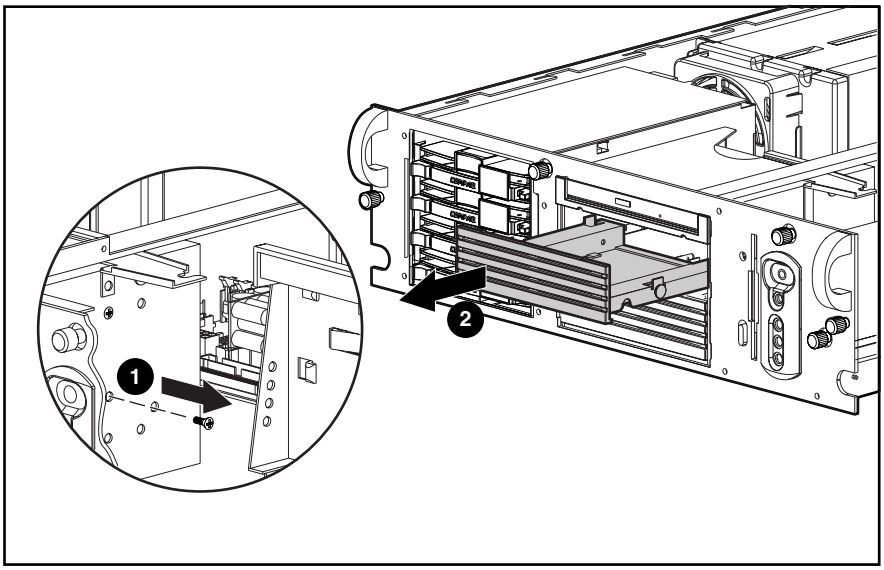


Figure 2-16. Removing the removable media blank

Reverse steps 1 through 5 to replace the removable media blank.

Optional 2x1-Inch Media Device Drive Cage

To remove the 2x1-inch media device drive cage:

1. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
2. Remove the server cover. See “Server Cover” earlier in this chapter.
3. Remove the diskette drive. See “Diskette Drive” earlier in this chapter.
4. Disconnect the power, SCSI, and signal cables.
5. Remove the T-15 screw from the side of the 2x1-inch drive cage ❶.
6. Slide the 2x1-inch drive cage out of the chassis ❷.

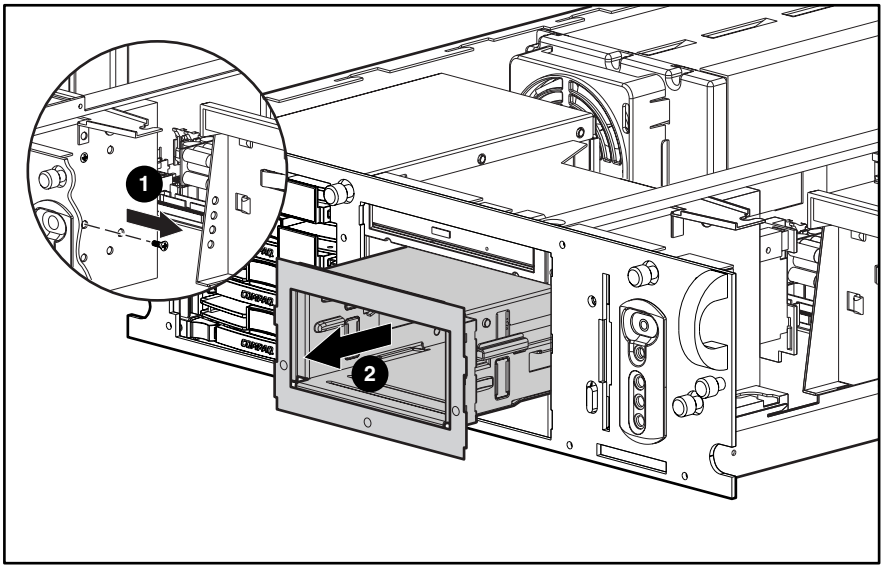


Figure 2-17. Removing an optional 2x1-inch media device drive cage

Reverse steps 1 through 6 to replace the optional 2x1-inch media device drive cage.

Cable Routing Diagrams

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

Diskette Drive Signal Cable

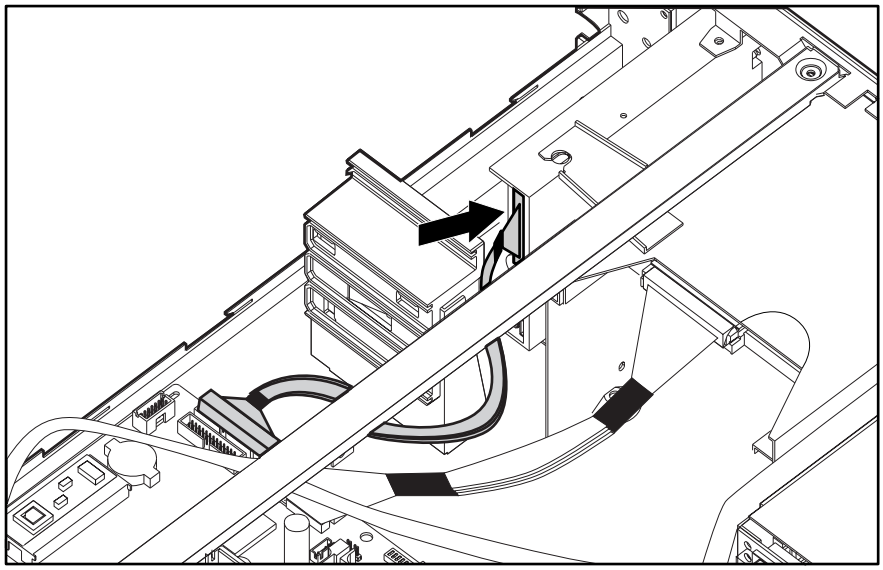


Figure 2-18. Diskette drive signal cable routing

Low-Profile CD-ROM Drive Signal Cable

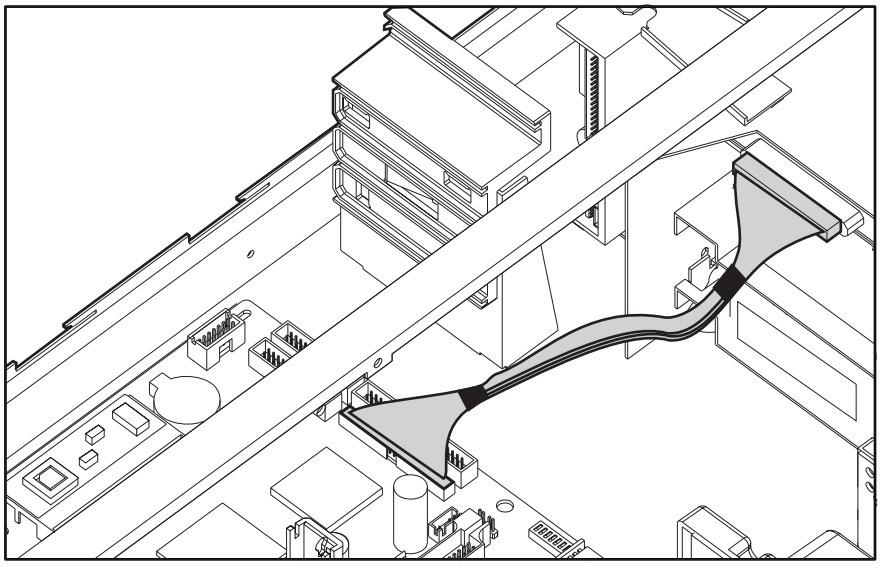


Figure 2-19. Low-profile CD-ROM drive signal cable routing

Hot-Plug Hard Drive Cage Cables

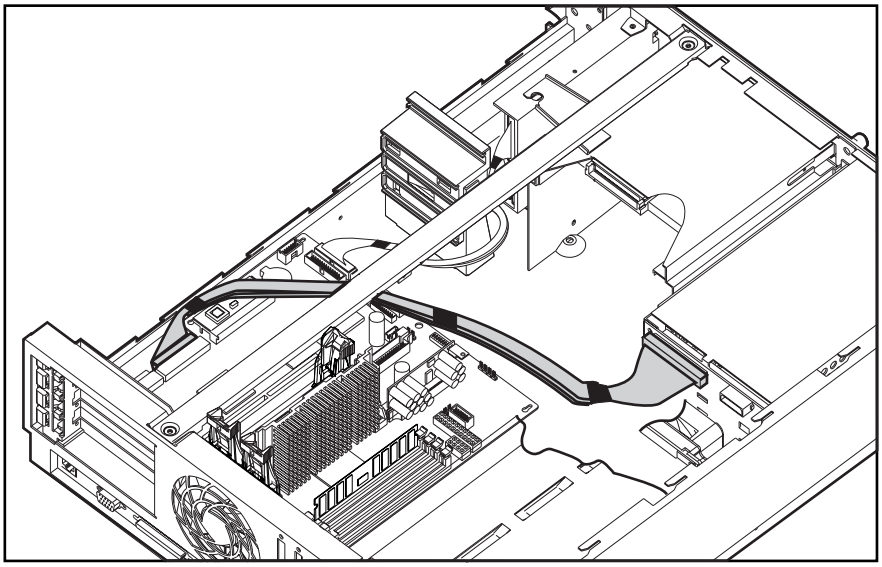


Figure 2-20. Hot-plug hard drive cage cable routing

Optional 2x1 Media Device Drive Cage Cables

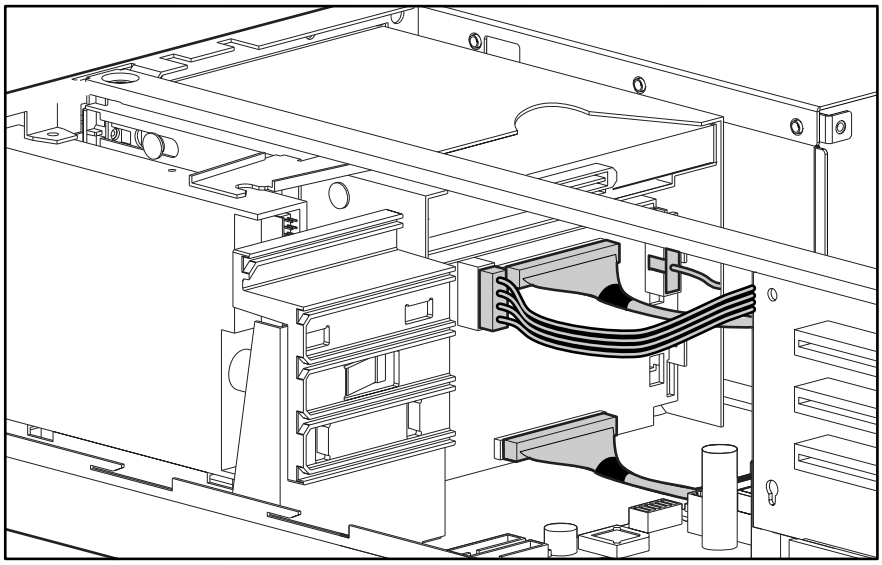


Figure 2-21. Media device drive cage cable routing

PCI Expansion Board

To remove a PCI expansion board:

1. Perform the preparation procedures. See "Powering Down the Server" earlier in this chapter.
2. Remove the server cover. See "Server Cover" earlier in this chapter.
3. Swing out the expansion board latch securing the expansion board to the riser board ❶.
4. Pull the expansion board from the chassis ❷.

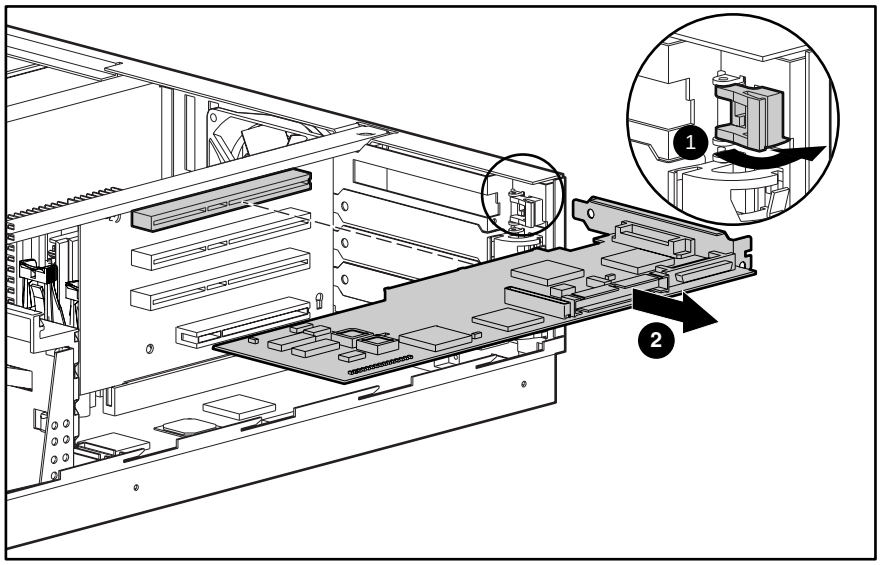


Figure 2-22. Removing a PCI expansion board

NOTE: If the PCI expansion board is not going to be replaced, then replace the expansion slot cover to prevent damage to the expansion board slot.

NOTE: Expansion boards may differ from the board shown above.

Reverse steps 1 through 4 to replace a PCI expansion board.

Riser Board and Brace

To remove the riser board and brace:

1. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
2. Remove the server cover. See “Server Cover” earlier in this chapter.
3. Remove all expansion boards, if any. See “PCI Expansion Board ” earlier in this chapter.
4. Loosen the two captive screws securing the riser board and brace ❶.
5. Lift the riser board and brace out of the unit ❷.

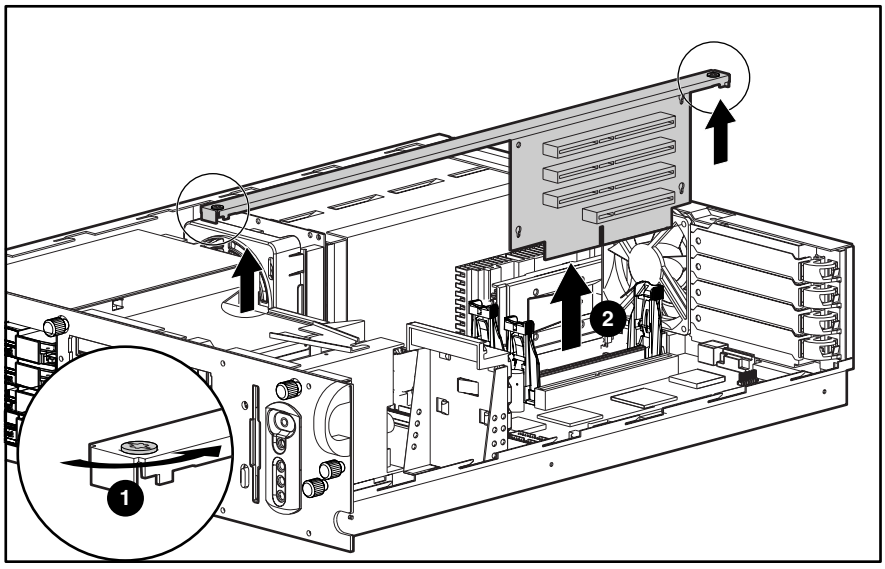


Figure 2-23. Removing the riser board and brace

NOTE: When replacing the riser board, ensure that the riser board is properly seated in the riser board slot before tightening the screws.

Reverse steps 1 through 5 to replace the riser board and brace.

Memory

The following guidelines may be helpful when installing additional memory:

- The server ships standard with 128-MB Synchronous DRAM (SDRAM) Dual Inline Memory Module (DIMM) installed in DIMM slot 1.
- SDRAMS must be 133-MHz, registered, 3.3 volt, 72-bit wide, with Error Correction Code (ECC). No other DIMMS are compatible with server.
- Install SDRAM DIMM modules one at a time in the sequential order starting with DIMM slot 1.
- Install DIMMs of the same speed. Do not install DIMM modules supporting different speeds.
- Use only 64-, 128-, 256-, 512-MB, or, when available, 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.

ProLiant DL380 Servers ship standard with one Synchronous DRAM (SDRAM) Dual Inline Memory Module (DIMM) installed in DIMM slot 1. Figure 2-24 and Table 2-2 show the location of the DIMM slots on the system board.

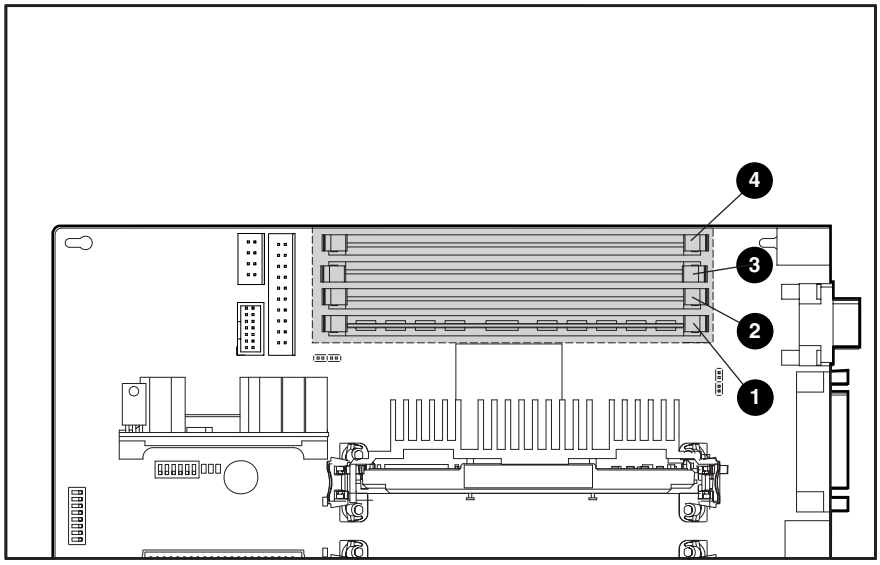


Figure 2-24. SDRAM DIMM slot locations

Table 2-2
SDRAM DIMM Slot Locations

Item	Description
❶	DIMM slot 1 (populated with standard 128-MB DIMM)
❷	DIMM slot 2
❸	DIMM slot 3
❹	DIMM slot 4

SDRAM DIMM

CAUTION: Electrostatic discharge can damage electronic components. Be sure you are properly grounded before beginning any installation procedure. Refer to "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 server cover. See "Server Cover" 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.

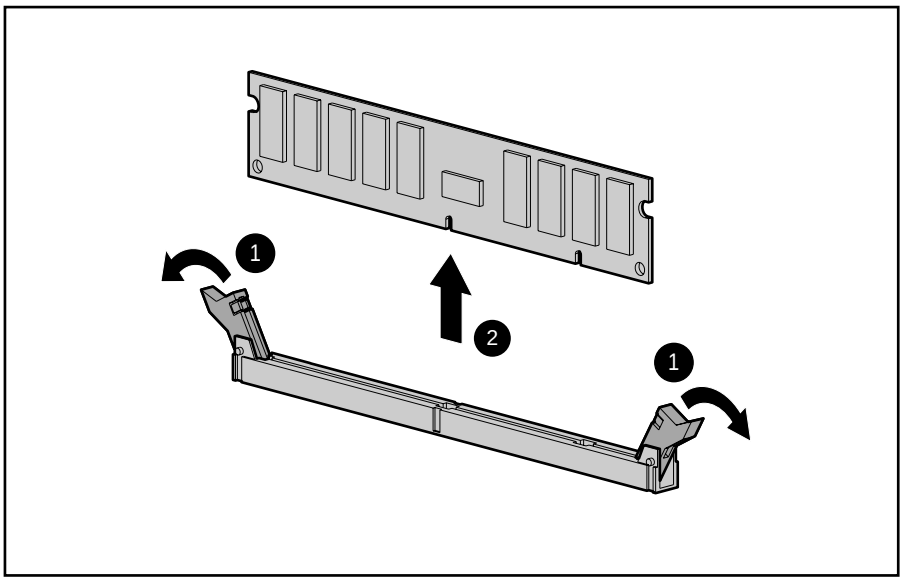


Figure 2-25. Removing an SDRAM DIMM

Reverse steps 1 through 4 to replace an SDRAM DIMM.

Processor and Processor Power Module

ProLiant DL380 Servers can support up to two processors. When two processors are used, they operate in an associated mode. Figure 2-26 and Table 2-3 show the location of the processor(s) and Processor Power Module(s) on the system board.

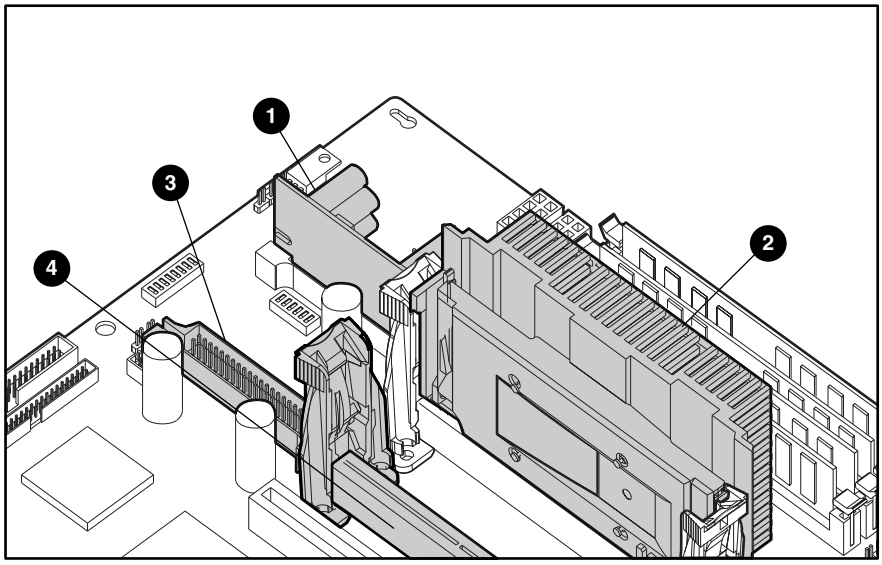


Figure 2-26. Processor and Processor Power Module locations

Table 2-3
Processor and Processor Power Module Locations

Item	Description
❶	Processor Power Module slot 1 (populated)
❷	Processor slot 1 (populated)
❸	Processor Power Module slot 2
❹	Processor slot 2

Note: Individual heat sinks may vary from the heat sink shown above.

Processor

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

To remove a processor:

1. Complete the preparation procedures. See "Powering Down the Server" earlier in this chapter.
2. Remove the server cover. See "Server Cover" earlier in this chapter.
3. Push out the tabs on the processor retaining posts ❶.
4. While pulling the latches outward, lift out the processor ❷.

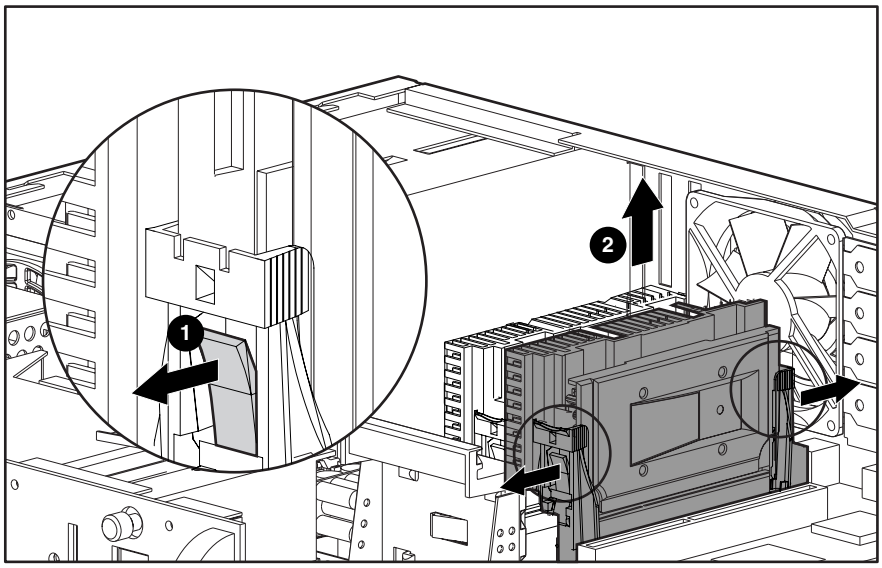


Figure 2-27. Removing the processor

To replace the processor, push in on the tabs located at each side of the processor until they click twice. Then reverse steps 1 through 4. Use the System Configuration Utility to reconfigure your system if you are replacing a faulty processor. See Chapter 3, "Diagnostics and Troubleshooting," for more information.

IMPORTANT: The processor is keyed to ensure correct alignment. Align the pattern of pins in the processor with the pattern of holes in the slot. The pins and holes will not line up if the processor is misaligned.

Processor Power Module

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

Every processor comes with a Processor Power Module (DC-to-DC converter) that provides power for the processor.

To remove a Processor Power Module (PPM):

1. Complete the preparation procedures. See "Powering Down the Server" earlier in this chapter.
2. Remove the server cover. See "Server Cover" earlier in this chapter.
3. Press the latches on the slot outward until the latches snap open ❶.
4. Pull the module out of the slot ❷.

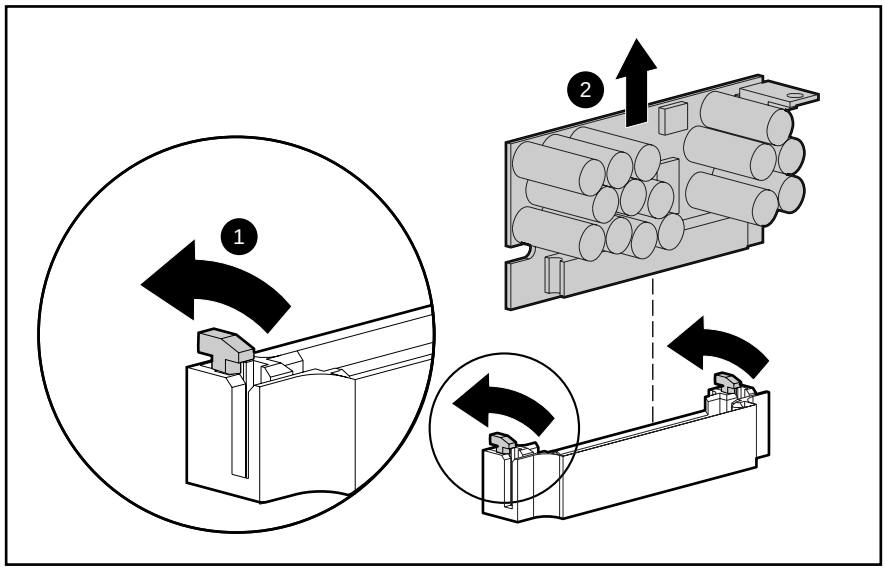


Figure 2-28. Removing a Processor Power Module

Reverse steps 1 through 4 to install a Processor Power Module. The module is keyed to ensure correct alignment. Use the System Configuration Utility to reconfigure the server. See Chapter 3, "Diagnostics and Troubleshooting," for more information.

CPU Fan

To remove the CPU fan:

1. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
2. Remove the server cover. See “Server Cover” earlier in this chapter.
3. Remove the processor(s) from the processor retaining posts. See “Processor” earlier in this chapter.
4. Remove the two processor retaining posts closest to the CPU fan.
5. Remove the four screws ❶ securing the fan assembly to the chassis.
6. Unplug the CPU fan assembly from the system board ❷.
7. Remove the CPU fan from the back of the chassis ❸.

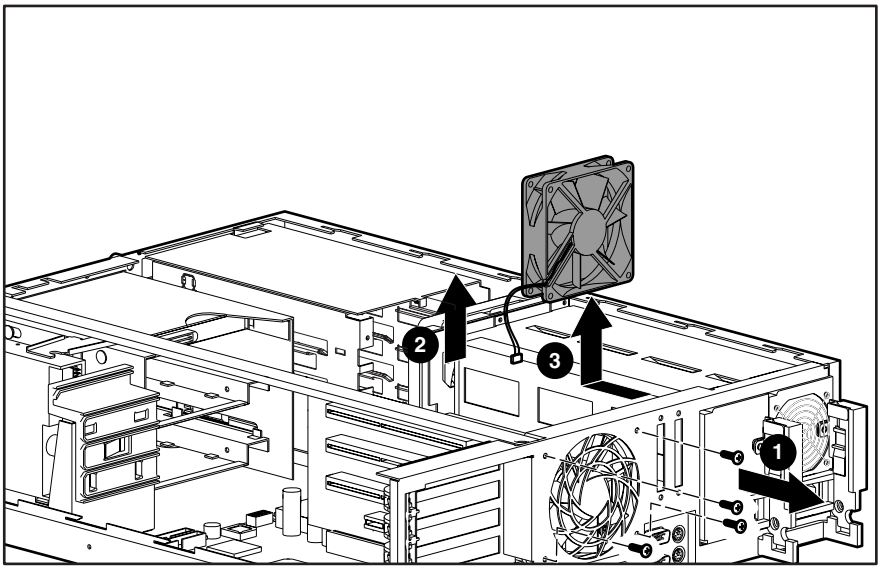


Figure 2-29. Removing the CPU fan

Reverse steps 1 through 7 to replace the CPU fan.

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, 0+1, 1, and 5 disk fault tolerance
- Support for up to four internal SCSI hot-plug hard drives
- Support for up to six internal SCSI hot-plug hard drives with optional 2x1-inch drive cage
- Migration from any RAID level to any RAID level
- Migration from any stripe size to any stripe size
- Online capacity expansion
- Online spares

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 cover. See "Server Cover" 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.

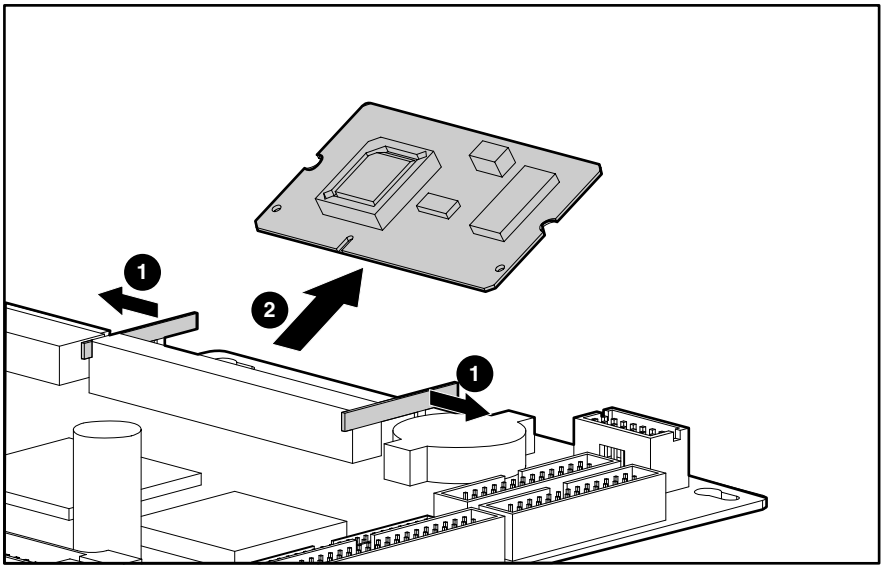


Figure 2-30. Removing the Integrated Smart Array Controller from the system board

NOTE: For instructions on installing the Integrated Smart Array Controller, refer to Chapter 4 of the *ProLiant DL380 Set-Up and Installation Guide*, or the instructions provided in the Integrated Smart Array Controller option kit.

System Board

To remove the system board:

1. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
2. Remove the server cover. See “Server Cover” earlier in this chapter.
3. Remove all expansion boards. See “PCI Expansion Board” earlier in this chapter.
4. Remove the riser board and brace. See “Riser Board and Brace” earlier in this chapter.
5. Disconnect all internal and external cables, including all power supply cables. See “Cable Routing Diagrams” earlier in this chapter.
6. Remove any SDRAM DIMMs. See “Memory” earlier in this chapter.
7. Remove the processor(s). See “Processor” earlier in this chapter.
8. Remove the Processor Power Module(s). See “Processor Power Module” earlier in this chapter.
9. Remove the CPU fan. See “CPU Fan” earlier in this chapter.
10. Remove the Integrated Smart Array Controller. See “Integrated Smart Array Controller” earlier in this chapter.
11. Remove the one thumbscrew securing the system board to the chassis ❶.
12. Slide the system board toward the front of the chassis 1.5 cm (.5 inch). Then, lift the system board up off of the five alignment keys.
13. Remove the system board from the chassis ❷.

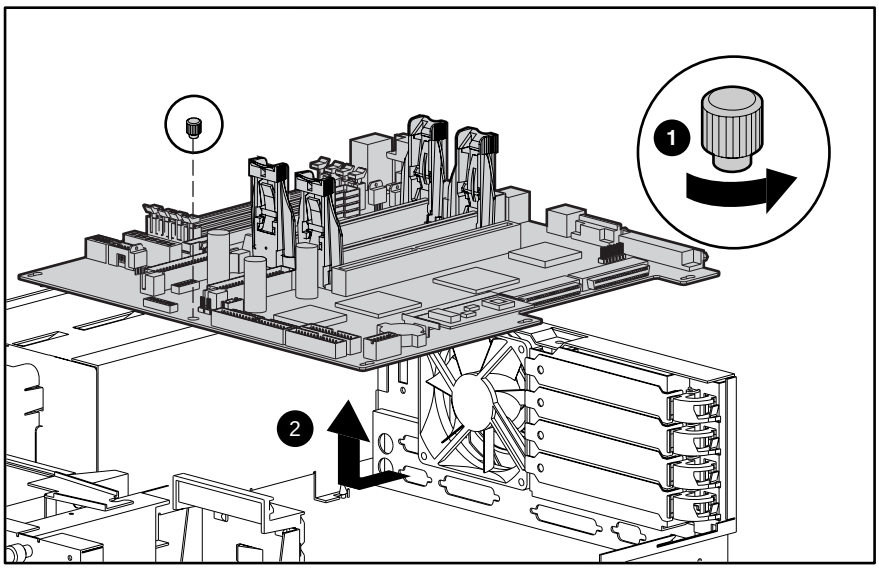


Figure 2-31. Removing the system board

Reverse steps 1 through 13 to replace the system board.

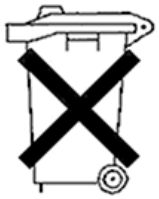
System Board Battery

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 together with general household waste. In order to forward them to 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 3, "Diagnostics and Troubleshooting," for more information.

To replace the system board battery:

1. Complete the preparation procedures. See “Powering Down the Server” earlier in this chapter.
2. Remove the server cover. See “Server Cover” earlier in this chapter.
3. Locate the battery on the system board ❶. Pull the battery sideways to remove it from the system board.
4. Install the new battery.
5. Run the System Configuration Utility to reconfigure the system. See Chapter 3, “Diagnostics and Troubleshooting,” for more information about reconfiguring the system.

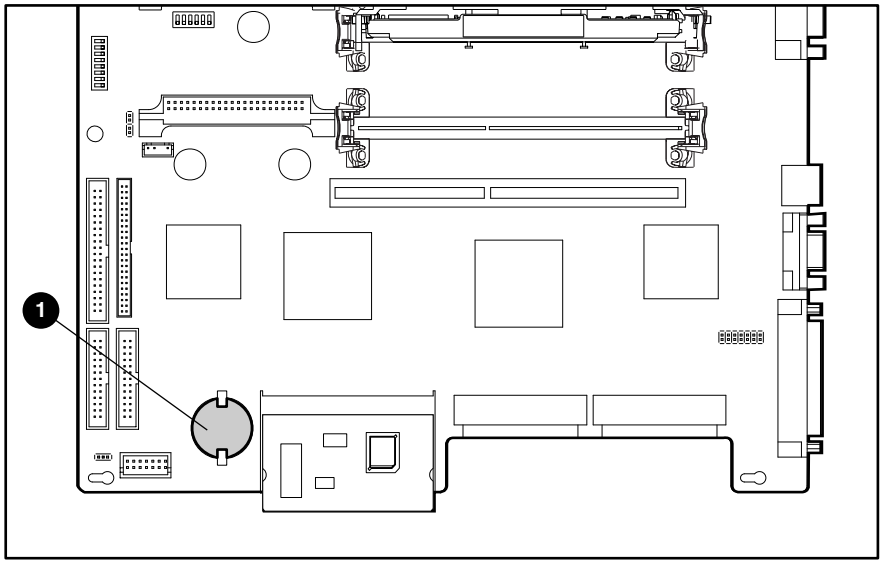


Figure 2-32. Removing a system board battery

Chapter **3**

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 3-1
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 *Compaq Insight Manager User Guide*. 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 *survey text file* 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 3-1
Diagnostic Tools *continued*

Tool	What it is	How to run it
Array Diagnostics Utility (ADU)	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. This tool is available for all Compaq servers covered by this guide.	Use the information provided in Array Diagnostics Utility (ADU) later in this chapter.
Drive Array Advanced Diagnostics (DAAD)	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.	For a list of Compaq servers still supported by this tool, visit the Compaq website: http://www.compaq.com
Integrated Management Log	A log of system events, such as system failures or nonfatal error conditions. View events in the Integrated Management Log: ■ 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.
System Configuration Utility	Utility to easily configure the hardware installed in or connected to the server. Specifically, it can: ■ 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	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. 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.

Default Configuration

When the system is first turned on, 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 **F10** when the cursor appears in the upper right corner of the screen.
2. At the main menu, select Diagnostics and Utilities.
3. Press **Enter**.
4. Select Inspect Computer and press **Enter**.

   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

Select 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 **F10** 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, select 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 select Next.
   - To execute the System Configuration Utility, select Run System Configuration Utility.
   - To execute the Array Configuration Utility, select Run Array Configuration Utility.
   - To execute the Array Diagnostic Utility, select 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
- Memory expansion boards
- 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 3-2
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 documentation 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.
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.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
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: ■ 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.
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.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
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.
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.)	1. A key is stuck. Try to free it. 2. Replace the keyboard.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
303-Keyboard Controller Error	None	System board, keyboard, or mouse controller failure	1. Run Diagnostics. 2. Replace failed assembly as indicated.
304-Keyboard or System Unit Error	None	Keyboard, keyboard cable, or system board failure	1. Make sure the keyboard is attached. 2. Run Diagnostics to determine which is in error. 3. Replace the part indicated.
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	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.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
1611-CPU Fan (Fan X) failure detected	2 short	CPU fan has failed.	Replace the failed fan.
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 has failed.	Replace or check specified power supply.
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.
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.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
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 **F1** 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 **F1** to resume.
* 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 **F1** to resume.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
* 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 **F1** 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.
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.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
1764-Slot x Drive Array - Capacity Expansion Process is temporarily disabled (followed by one of the following): ■ 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).
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 **F2** 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 **F1** or **F2** to resume.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
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.
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 **F1** to discard the older data in the array accelerator and retain the newer data on the drives.
1775-Slot x Drive Array - ProLiant Storage System Not Responding SCSI Port (y): Check storage system power switch and cables. Turn the system power off while checking the ProLiant 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 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 firmware, ProLiant backplane, or the Smart Array Controller. Press **F1** to resume.
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 **F1** to resume.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
1777-Slot x Drive Array ProLiant drive storage enclosure problem detected (followed by one or more of the following) SCSI Port (y) Colling 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 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 Integrated Smart Array Controller Installation Guide. If the routing is correct, replace the cables on the specified port until the POST message is eliminated. Press **F1** to resume.
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.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
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: ■ 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).
1785-Drive Array not Configured (followed by one of the following) Run Compaq Array Configuration Utility No drives detected. Drive positions appear to have changed. Drive positions appear to have changed. 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.	None	Configuration error	See actions below. Run the Compaq Array Configuration Utility. Turn off the system and check the SCSI cable connections to make sure the drives are attached properly. Run Array Diagnostic Utility if previous positions are unknown. Then turn system power Off and move drives to their original positions. To avoid data loss turn system power Off and reattach drives to the original controller firmware to the version on the original controller using Option ROMPaq. Select **F1** to resume.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
1786-Drive Array Recovery Needed The following drive(s) need Automatic Data Recovery: SCSI port 1, SCSI ID 0 Select F1 to continue automatic data recovery to drive. Select F2 to continue without starting automatic data recovery data to drive. Or 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. Select F1 to retry Automatic Data Recovery to drive. Select F2 to continue without starting Automatic Data Recovery to drive.	None	Interim Data Recovery mode. Data has not been recovered yet.	Press **F1** 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. Or Press **F2** and the system will continue to operate in the Interim Data Recovery mode. 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.
1787-Slot x Drive Array Operating in Interim Recovery Mode. The following SCSI drive(s) should be replaced: SCSI port (y): SCSI ID (x)	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.	1. Replace drive X as soon as possible. 2. Check loose cables. 3. Replace defective cables.

continued

Table 3-2
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). Select F1 to continue-drive array will remain disabled. Select F2 to reset configuration-all data will be lost.	None	Drives are not installed in their original positions, so the drives have been disabled. *See* note below.	Reinstall the drives correctly as indicated. Press **F1** to restart the computer with the drive array disabled. -Or- Press **F2** to use the drives as configured and lose all the data on them.
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). Select F1 to continue-drive array will remain disabled. Select F2 to reset configuration-all data will be lost.	None	Drives are not installed in their original positions, so the drives have been disabled. *See* note below.	Reinstall the drives correctly as indicated. Press **F1** to restart the computer with the drive array disabled. -Or- Press **F2** to use the drives as configured and lose all the data on them.

***** 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 **F2**.

-Or-

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.

-Or-

If this message is due to a defective SCSI cable, replace the cable.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
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). 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.	None	Cable or hard drive failure	1. Check the cable connections. 2. Replace the cables. 3. Replace the drive. If you do not want to replace the drive now, press **F2**.
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.
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.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Recommended Action
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.	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.
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 **F1** to continue with logical drives disabled or **F2** 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 fans.
(Run System Configuration Utility - F10 key)	None	A configuration error occurred during POST.	Press **F10** to run System Configuration Utility.
(RESUME - F1 key)	None	As indicated to continue	Press **F1**.

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 3-3
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 61 error.	
106-xx	Keyboard controller self-test failed.	
107-xx	CMOS RAM test failed.	1. Replace the battery/clock module and retest.
108-xx	CMOS interrupt test failed.	2. Replace the system board and retest.
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.	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.
122-xx	Multiprocessor dispatch test failed.	1. Check the system configuration and retest. 2. Replace the processor board and retest.
123-xx	Interprocessor communication test failed.	3. Replace the system board and retest.
199-xx	Installed devices test failed.	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 3-4
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.
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.	

continued

Table 3-4
Memory Test Error Codes *continued*

Error Code	Description	Recommended Action
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 3-5
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.	2. Replace the keyboard and retest.
303-xx	Keyboard LED test, 8042 self-test failed.	3. Replace the system board and retest.
304-xx	Keyboard typematic test failed.	

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 3-6
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.	3. Install the loopback connector and retest.
498-xx	Printer failed or not connected.	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 3-7
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.	3. Replace the system board and retest.
504-xx	Graphics character set test failed.	
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 3-8
Diskette Drive Test Error Codes

Error Code	Description	Recommended Action
600-xx	Diskette ID drive types test failed.	1. Replace the diskette and retest. 2. Check and/or replace the diskette power and signal cables and retest. 3. Replace the diskette drive and retest. 4. Replace the system board and retest.
601-xx	Diskette format failed.	
602-xx	Diskette read test failed.	
603-xx	Diskette write/read/compute test failed.	
604-xx	Diskette random seek test failed.	
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 3-9
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.
1109-xx	Clock register test failed.	2. Replace the serial/parallel interface board (if applicable) and retest.
		3. Replace the system board and retest.

1200 – 1299, Modem Communications Test Error Codes

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

Table 3-10
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.	2. Check the modem line and retest.
1203-xx	Modem external termination test failed.	3. Replace the modem and retest.
1204-xx	Modem auto originate test failed.	
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 3-11
Compaq Network Interface Boards Test Error Codes

Error Code	Description	Recommended Action
6000-xx	Network card ID failed.	1. Check the controller installation in the PCI slot. 2. Check the interrupt type and number setting. 3. Check the media connection at the controller and Multistation Access Unit (MAU). 4. Check the media speed (4/16) and type of Unshielded Twisted Pair/Shielded Twisted Pair (UTP/STP) settings. 5. Check the MAU, cabling, or other network components. 6. Replace the controller.
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 3-12
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. 2. Replace the SCSI disk drive signal and power cables and retest. 3. Replace the SCSI controller and retest. 4. Replace the SCSI disk drive and retest. 5. Replace the system board and retest.
6502-xx	SCSI disk unconditional format test failed.	
6505-xx	SCSI disk read test failed.	
6506-xx	SCSI disk SA/media test failed.	
6509-xx	SCSI disk erase tape test failed.	
6523-xx	SCSI disk random read test failed.	
6528-xx	Media load/unload test failed.	

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 3-13
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 3-14
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 3-15
Pointing Device Interface Test Error Codes

Error Code	Description	Recommended Action
8601-xx	Pointing device interface test failed.	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 later. 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 panel 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 panel 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 3-16
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 3-16
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.
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.

continued

Table 3-16
ADU Diagnostic Messages *continued*

Message	Description	Recommended Action
Adapter/NVRAM 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 3-16
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 3-16
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 3-16
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.
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.

continued

Table 3-16
ADU Diagnostic Messages *continued*

Message	Description	Recommended Action
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.
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.

continued

Table 3-16
ADU Diagnostic Messages *continued*

Message	Description	Recommended Action
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.
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.

continued

Table 3-16
ADU Diagnostic Messages *continued*

Message	Description	Recommended Action
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.
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.

continued

Table 3-16
ADU Diagnostic Messages *continued*

Message	Description	Recommended Action
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 select View Device Data. The selected server displays, with buttons around its perimeter.
2. Select the Recovery button, then insert Integrated Management Log.
3. If a failed component has been replaced, select the event from the list. Then select 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. Select the Configuration button then Recovery button, then 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 3-17
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.
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

continued

Table 3-17
Event Messages *continued*

Event Type	Event Message	Action
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: Cause [NT] Kernel 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 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. Select 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 3-18
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:

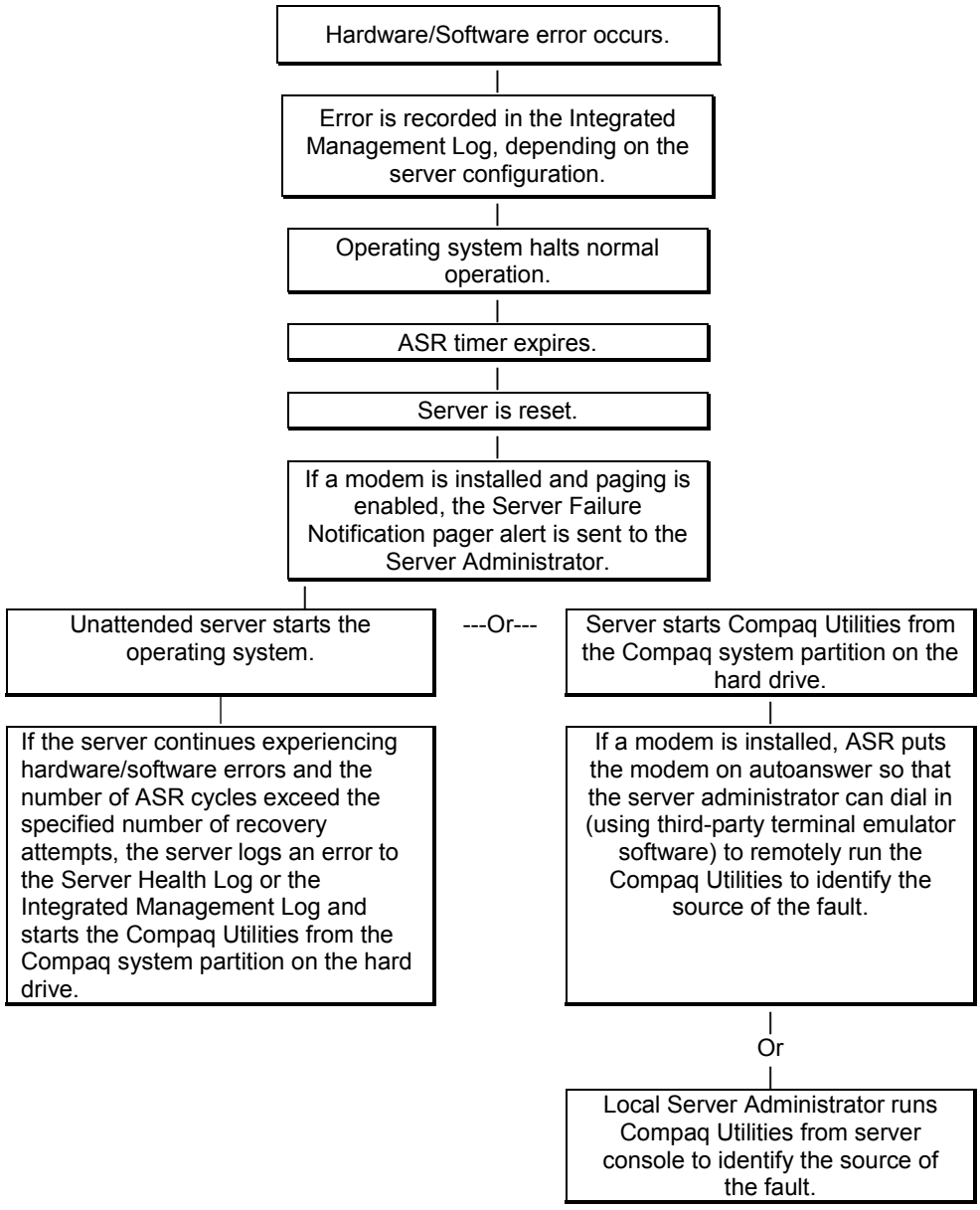


Figure 3-1. ASR-2 flow chart

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 3-19 when you enable ASR-2 to start into Compaq Utilities.

Table 3-19
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 **Enter** 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.
Dial-out status	Enabled	Allows ASR-2 to dial out to a remote workstation. If you selected this option, Dial-In Status is automatically selected. 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.

continued

Table 3-19
Compaq System Configuration Utility Pager Settings for Booting into Compaq Utilities *continued*

Pager Data	Example Setting	Description
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		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. 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. **Note:** The Network Status must be set to Enabled for network access.
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.
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 3-20
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 3-21
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.

continued

Table 3-21
ASR-2 IML Messages *continued*

Message	Description
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.
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 3-22
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 3-23
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 **F10** 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 **F10** 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 3-24
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. (Refer to Configuration Switches Table 3-24 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 stared storage area in a ProLiant CL1850.

- **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 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.

Chapter **4**

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 Components

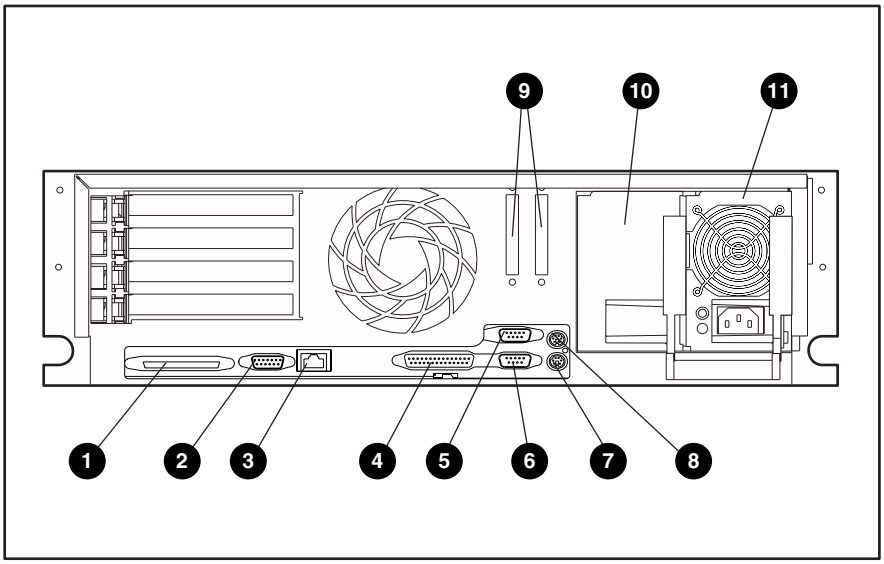


Figure 4-1. Rear panel components

Table 4-1
Rear Panel Components

Item	Description
❶	External SCSI port
❷	Video (blue) port
❸	RJ-45 Ethernet with 10/100-Mbit operation port with LED indicator
❹	Parallel printer port (burgundy)
❺	Serial port B (teal)
❻	Serial port A (teal)
❼	Hot-plug keyboard connector (purple)
❽	Mouse connector (green)
❾	External SCSI access
❿	Hot-plug redundant power supply bay (supports optional redundant power supply)
⓫	Hot-plug power supply

Riser Board Expansion Slots

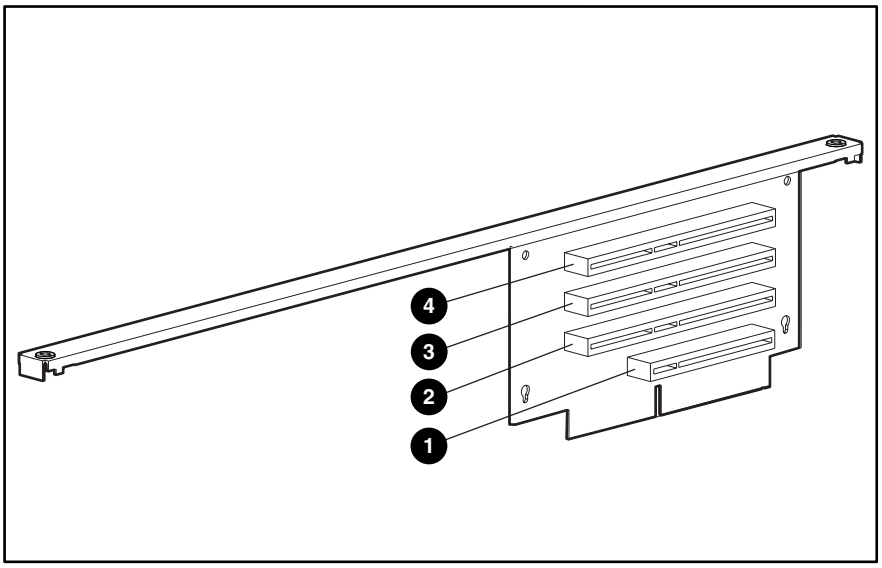


Figure 4-2. Riser board expansion slots

Table 4-2
Riser Board Expansion Slots

Item	Description
❶	32-bit PCI slot
❷	64-bit PCI slot
❸	64-bit PCI slot
❹	64-bit PCI slot

System Board Components

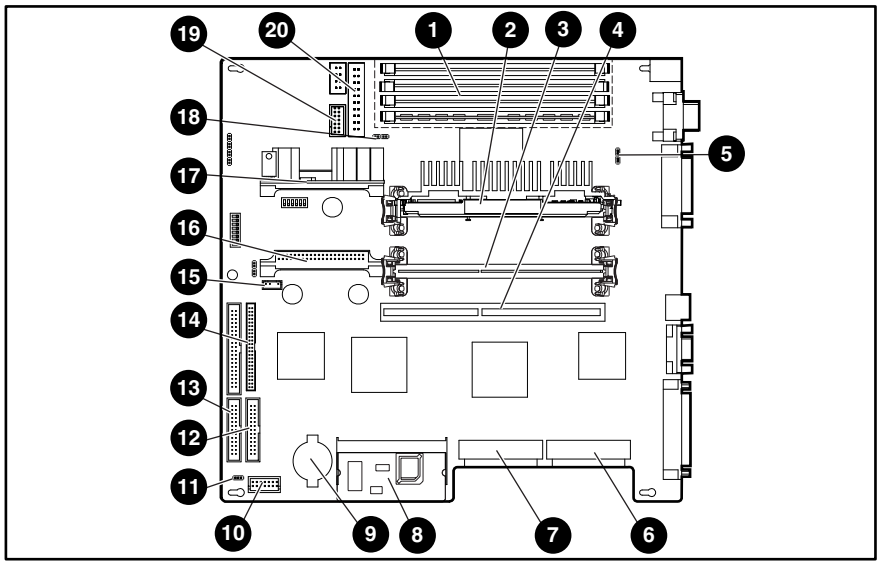


Figure 4-3. System board components

Table 4-3
System Board Components

Item	Description	Item	Description
❶	DIMM slots	⓫	Virtual power button connector
❷	Processor slot 1 (populated)	⓬	Reserved
❸	Processor slot 2	⓭	Diskette drive connector
❹	Riser board slot	⓮	CD-ROM drive connector
❺	CPU fan header	⓯	CD-ROM drive audio connector
❻	SCSI port 1	⓰	Processor Power Module (PPM) slot 2
❼	SCSI port 2	⓱	PPM slot 1
❽	Integrated Smart Array Controller	⓲	Power supply fan header
❾	Battery	⓳	Power supply signal cable header
❿	Power switch connector	⓴	Power supply power connector

Switches

The Compaq ProLiant DL380 Server has two switchbanks (SW1 and SW2) located on the system board. These switches are used to set the configuration of the server. SW1 is used as a system identification switch and the setting is pre-set in the factory. Do not change these settings. Incorrectly set switches may result in damage to the server.

System Configuration Switchbank (SW2)

The system configuration switchbank (SW2) is a six-position switch that is used for system configuration. The position of SW2 on the system board is shown in Figure 4-4, and the default switch settings are shown in Table 4-4.

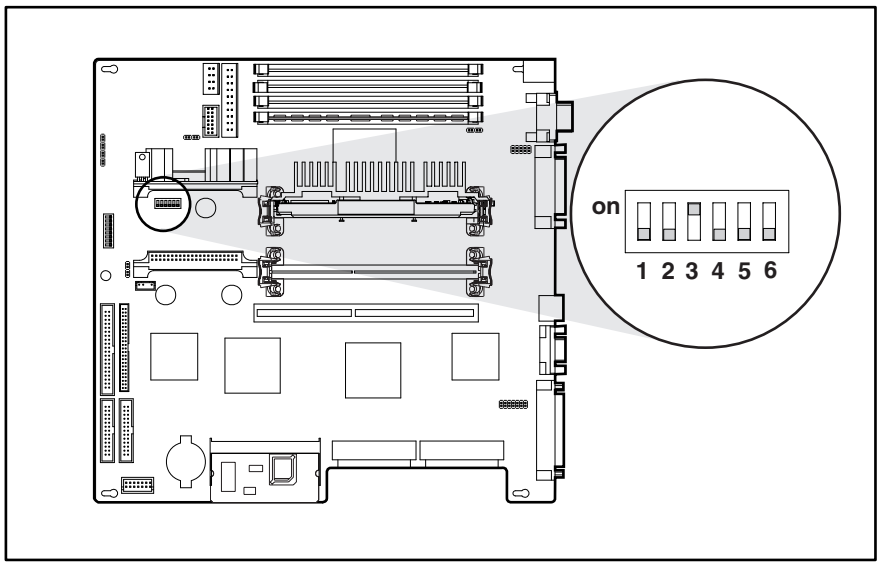


Figure 4-4. Location of switchbank SW2

Table 4-4
System Configuration Switchbank (SW2) Settings

Item	Description	Default Setting
❶	Embedded video disable	Off
❷	Configuration lock	Off
❸	Rack mount	On
❹	Diskette drive boot override	Off
❺	Password disable	Off
❻	Maintenance	Off

LED Indicators

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

- Power switch
- Hot-plug power supply
- RJ-45 connector
- System board
- SCSI hard drive
- Low-profile IDE CD-ROM drive
- 1.44-MB diskette drive
- Riser board

Power Switch LED Indicators

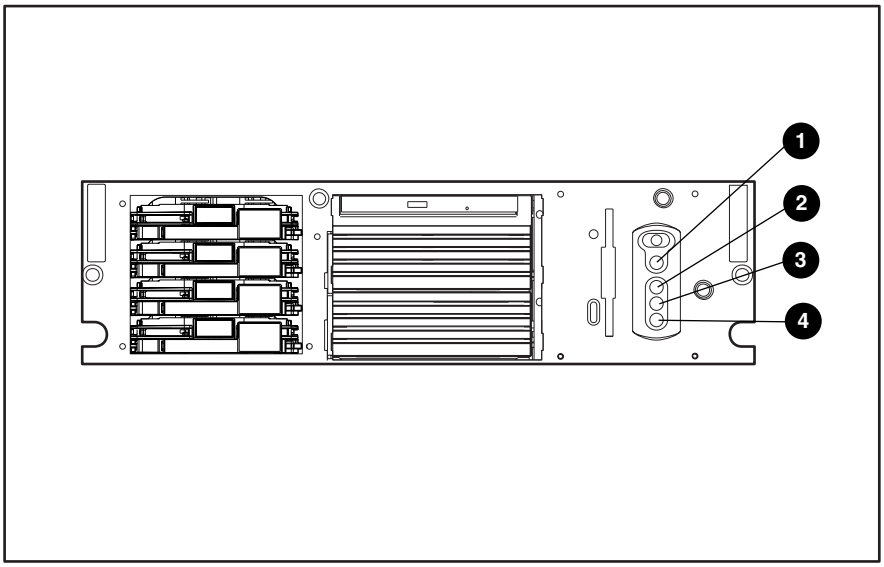


Figure 4-5. Power switch LED indicators

Table 4-5
Power Switch LED Indicators

Item	Description	Status
❶	Power On/Standby	Amber = Standby Green = On
❷	Disk activity (including the CD-ROM drive and hot-plug hard drives)	Green = Drive activity Off = No drive activity
❸	EMB, NIC link status	Green = Embedded NIC linked to network Off = Embedded NIC not linked to network
❹	EMB, NIC activity	Green = Embedded NIC activity Off = No embedded NIC activity

Note: When in Standby mode, NIC LED indicators are not operational.

Hot-Plug Power Supply LED Indicators

Each power supply has a single LED indicator. See Figure 4-6 and Table 4-6 for a detailed description of the indicator.

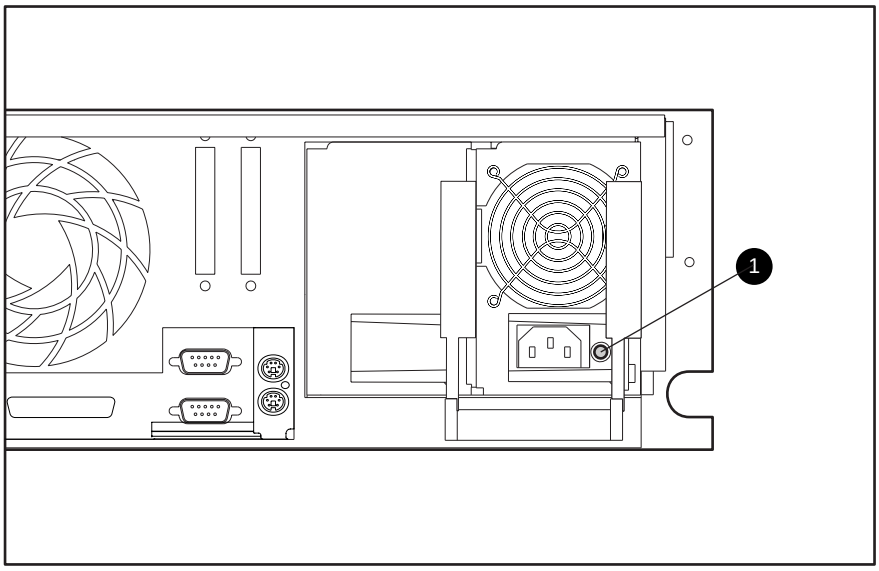


Figure 4-6. Hot-plug power supply LED indicators

Table 4-6
Hot-Plug Power Supply LED Indicators

Item	Status	Condition
❶	Green	AC power is connected to this power supply. The server is powered up.
	Off	No AC power is connected to this supply. The server is in Standby or the power supply has failed.

RJ-45 LED Indicators

There are two LED indicators on the RJ-45 connector. See Figure 4-7 and Table 4-7 for a detailed description of both indicators.

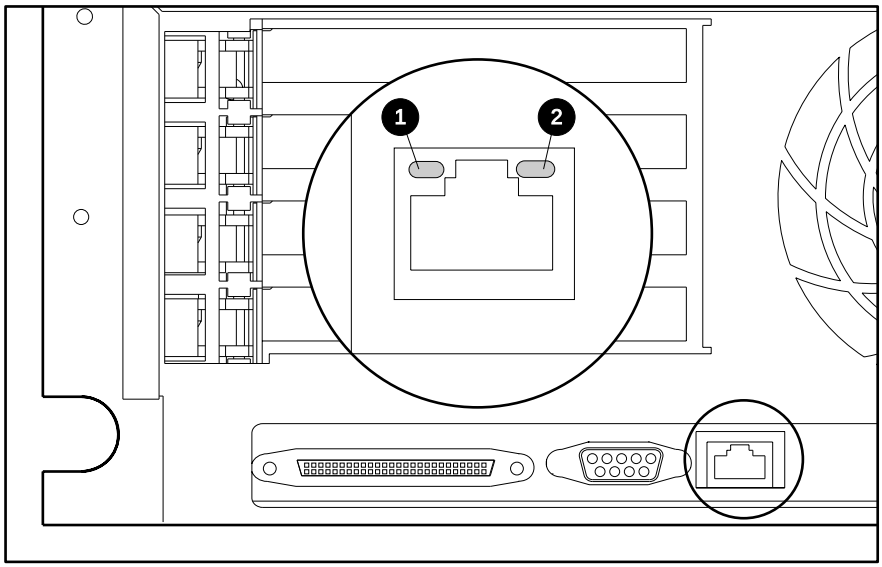


Figure 4-7. RJ-45 LED indicators

Table 4-7
RJ-45 LED Indicators

Item	Status	Condition
❶	Green	Activity
	Off	No activity
❷	Green	NIC is linked
	Off	NIC is not linked

System Board LED Indicators

There are six LED indicators on the system board. See Figure 4-8 and Table 4-8 for a detailed description of these indicators.

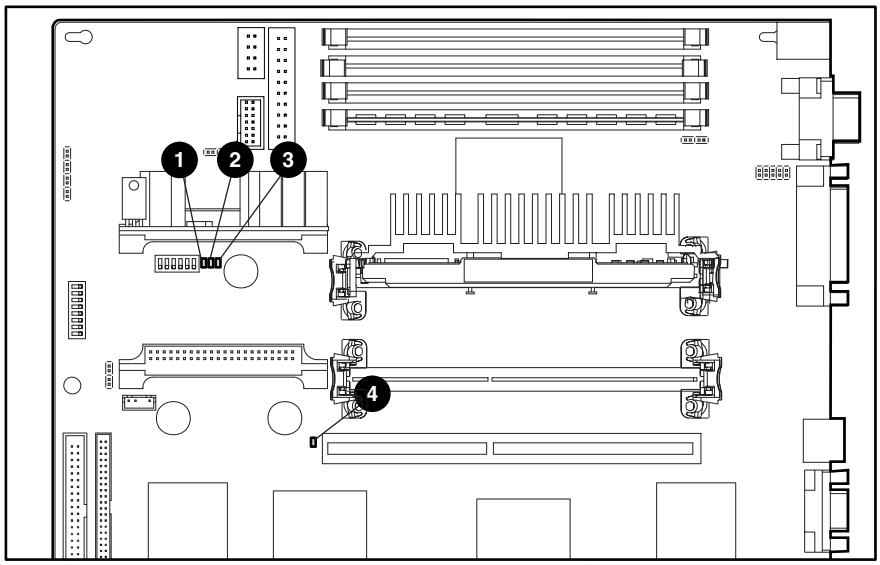


Figure 4-8. System board LED indicators

Table 4-8
System Board LED Indicators

Item	Status	Condition
❶	Green = Power to system	System power good
	Off = System in Standby or Off	
❷	Red = Processor 1 internal error	IEFF1
	Off = Normal	
❸	Red = Processor 2 internal error	IEFF2
	Off = Normal	
❹	Red = Riser card not seated	Interlock
	Off = Normal, riser card is seated	

SCSI Hard Drive LED Indicators

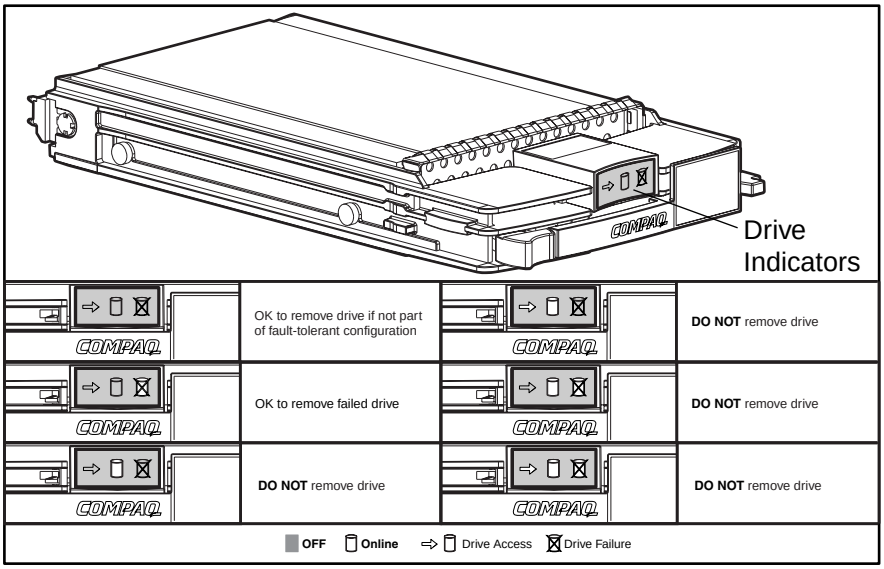


Figure 4-9. SCSI hard drive LED indicators

Low-Profile IDE CD-ROM Drive LED Indicator

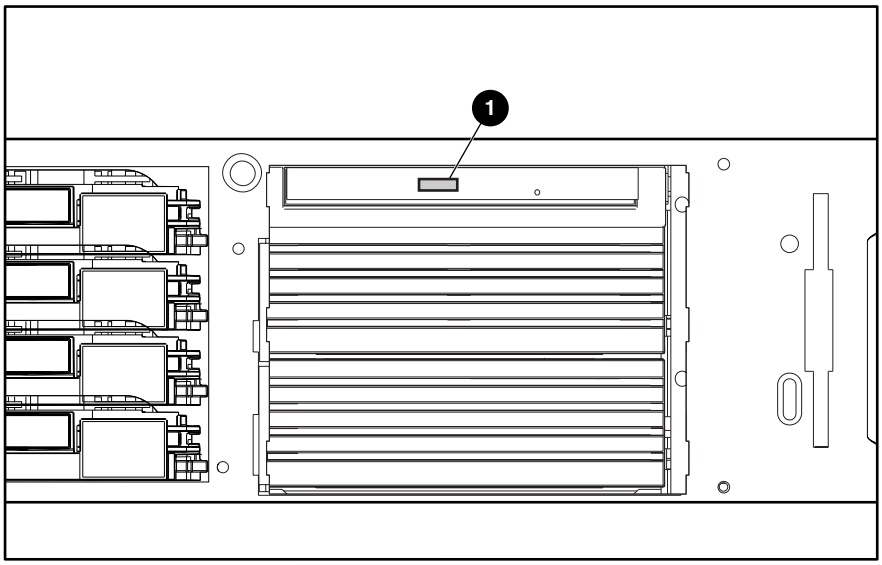


Figure 4-10. Low-profile CD-ROM drive LED indicator

Table 4-9
Low-Profile CD-ROM Drive LED Indicator

Item	Status	Condition
1	On	Activity
	Off	No activity

1.44-MB Diskette Drive LED Indicator

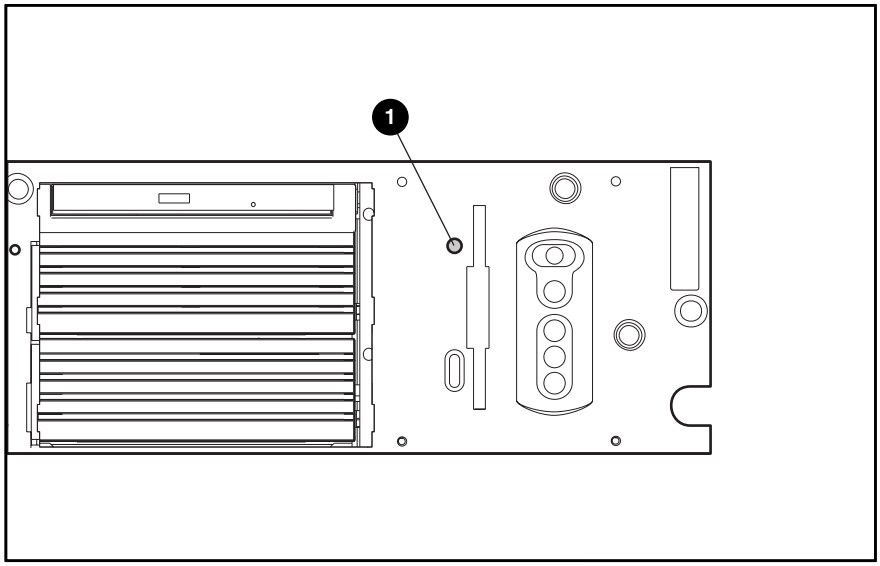


Figure 4-11. 1.44-MB diskette drive LED indicator

Table 4-10
1.44-MB Diskette Drive LED Indicator

Item	Status	Condition
❶	On	Activity
	Off	No activity

Riser Board LED Indicator

The riser board has one LED indicator. See Figure 4-12 and Table 4-11 for a description of this indicator.

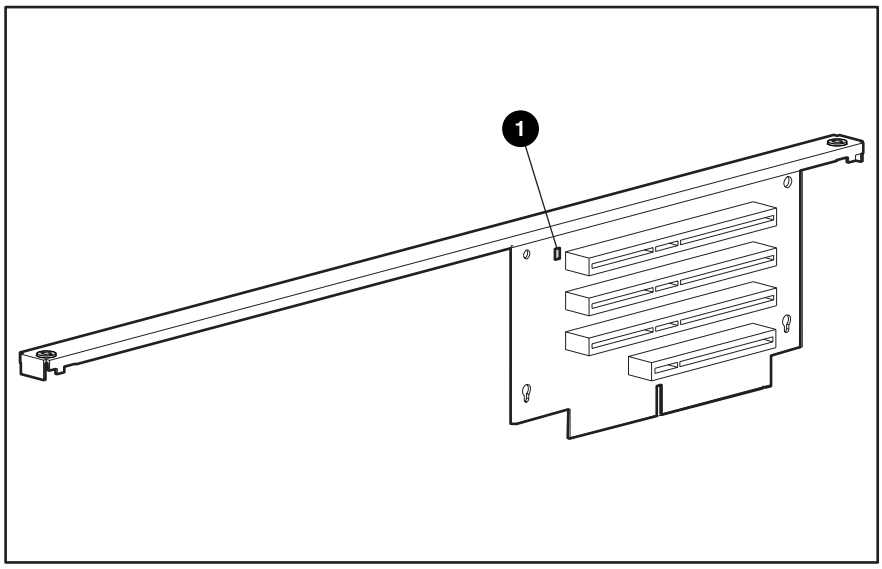


Figure 4-12. Riser board LED indicator

Table 4-11
Riser Board LED Indicator

Item	Status	Condition
❶	Amber	AC power connected to server
	Off	AC power disconnected from server

Chapter 5

Specifications

This chapter provides operating and performance specifications for Compaq ProLiant DL380 Servers and optional hardware. The sections in this chapter are:

- System Unit
- Hot-Plug Power Supply
- Memory
- 1.44-MB Diskette Drive
- Low-Profile IDE CD-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 221 Controller (optional)
- Smart Array 3200 Controller (optional)
- Smart Array 4200 Controller (optional)
- NC3131 Fast Ethernet NIC 64 PCI Dual Base 10/100 (optional)
- Optional 2x1-Inch Hot-Plug Hard Drive Cage

System Unit

Table 5-1
System Unit Specifications

Item	Description
Height	12.9 cm (5.1 inch)
Depth	56.1 cm (22.1 inch)
Width	45.00 cm (17.7 inch)
Weight (fully configured)	15.9 kg (35.0 lb)
International input voltage requirements	
Rated input voltage	100-240 VAC
Rated input frequency	50-60 Hz
Rated input current	4.8 A, 2.4 A (110V, 220V)
U.S. input voltage requirements	
Rated input voltage	100-240 VAC
Rated input frequency	50-60 Hz
Rated input current	4.8 A, 2.4 A (110V, 220V)
Power supply output power	
Rated steady-state power	275 W
Maximum peak power	306 W
BTUs	1475 BTU/h
Temperature range	
Operating	10° to 35°C (50° to 95°F)
Nonoperating	-20° to 50°C (-4° to 122°F)
Relative humidity (noncondensing)	
Operating	8% to 90%
Nonoperating	5% to 95%
Maximum wet bulb temperature	38.7°C (101.7°F)

Hot-Plug Power Supply

Table 5-2
Hot-Plug 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	50Hz to 60 Hz
Rated input power	432 W
Rated input current	4.8A 2.4A (110V, 220V)
Steady state power	275 W
Maximum peak power	305 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	Dielectric voltage withstand
Input to ground	Input to output
Input transient susceptibility	Input to ground
Maximum wet bulb temperature	38.7°C

Memory

Table 5-3
SDRAM DIMM Specifications

Item	Description
Size	64-MB, 128-MB, 256-MB, 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.

1.44-MB Diskette Drive

Table 5-4
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	Third, 1.0 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)	169 ms/94 ms
Settling time	15 ms
Latency average	100 ms
Cylinders (high/low)	80/80
Read/write heads	2

Low-Profile IDE CD-ROM Drive

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

Item	Description
Applicable disk	CD-DA, CD-ROM (mode 1 and 2); CD-XA (mode 2, Form 1 and 2), CD-1 Ready; CD-Extra; Photo CD (single and multiple session); CDi ready
Capacity	550 MB (mode 1, 12 cm) 640 MB (mode 2, 12 cm)
Block size	2638, 2352 bytes (mode 0); 2352, 2340, 2336, 1024 bytes (mode 1); 2352, 2340, 2336, 2048, 1024 bytes (mode 2)
Dimensions	
Height	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	2100-4800 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 μm
Cache/buffer	128 KB
Startup time	<7s
Stop time	<4s (single); <30s (multi-session)
Laser parameters	
Type	Semiconductor Laser
Wave length	700 ± 25nm
Divergence angle	53.5° ± 1.5°
Output power	0.13 mW
Operating conditions	
Temperature	5° to 45°C (41° to 118°F)
Humidity	5% - 90% (10% to 80%)

Wide Ultra2 SCSI Hot-Plug Hard Drive

Table 5-6
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	10º to 35º	10º to 35º	10º to 35º	10º to 35º
Fahrenheit	50º to 95º	50º to 95º	50º to 95º	50º to 95º

Integrated Smart Array Controller

Table 5-7
Integrated Smart Array Controller Specifications

Item	Description
Temperature range (noncondensing)	
Operating	10° to 35°C (50° to 95°F)
Shipping	-20° to 50°C (-4° 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 5-8
NC3163 Embedded 10/100 Fast Ethernet NIC Controller (Wake On LAN) Specifications

Dimensions	Metric (U.S.)
Operating speed	10/100 Mbits/s
Transfer rate	133 MB/s
Data transfer method	32-bit PCI bus master
Temperature range	
Operating	0° to 55°C (32° to 131°F)
Nonoperating	-65° to 85°C (-85° 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 221 Controller

Table 5-9
Smart Array 221 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° to 35° (C50° to 95°F)
Nonoperating	-30° to 60°C (-22° 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 physical 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 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

Smart Array 3200 Controller

Table 5-10
Smart Array 3200 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° to 35° (C50° to 95°F)
Nonoperating	-30° to 60°C (-22° 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 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

Smart Array 4200 Controller

Table 5-11
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° to 35° (50° to 95°F)
Nonoperating	-30° to 60°C (-22° 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 5-12
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° to 55°C (32° to 131°F)
Nonoperating	-65° to 85°C (-85° 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

Optional 2x1-Inch Hot-Plug Drive Cage

Table 5-13
Optional 2x1-Inch Hot-Plug Drive Cage Specifications

Item	Description
Dimensions	
Height	2.54 cm (1.0 inch)
Length	17.74 cm (7.0 inch)
Thickness	5.08 cm (2.0 inch)
Temperature range	
Operating	10° to 35° (C50° to 95°F)
Nonoperating	-30° to 60°C (-22° 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	2
SCSI electrical interface	Low-voltage differential (LVD) and single-ended

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