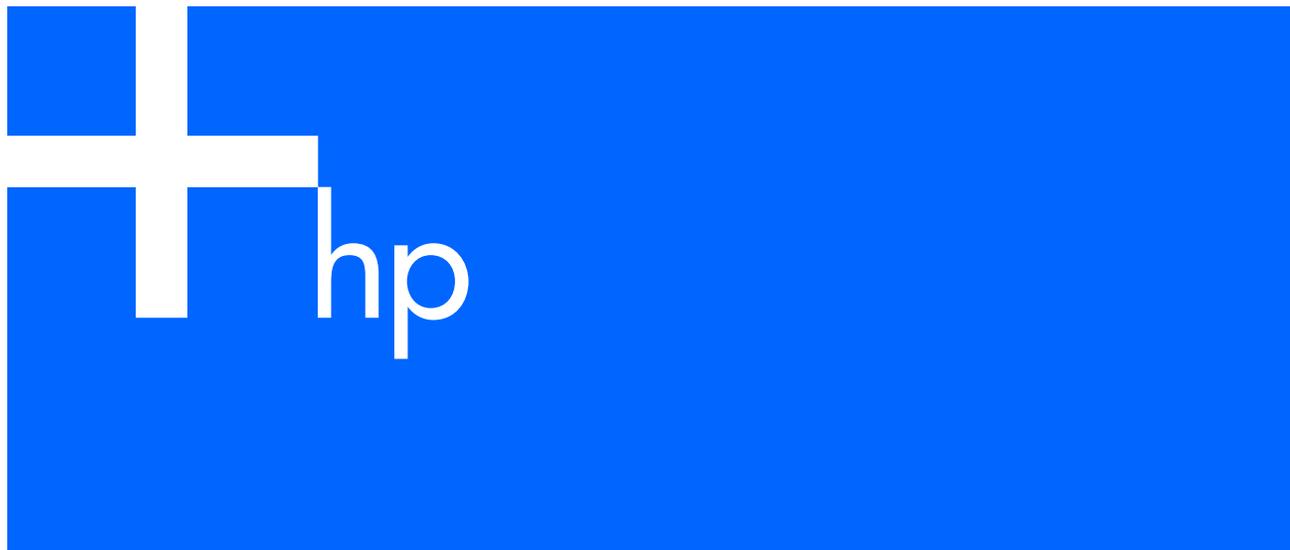


HP ProLiant DL585 Server

Maintenance and Service Guide



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Contents

1 About this guide	
Audience assumptions	5
Technician notes	5
Where to go for additional help	5
Integrated Management Log	6
Telephone numbers	6
2 Illustrated parts catalog	
Customer self-repair program	7
Mechanical components exploded view	8
Mechanical components spare parts list	8
System components exploded view	10
System components spare parts list	10
3 Removal and replacement procedures	
Safety considerations	14
Electrostatic discharge	14
Server warnings and cautions	14
Preparation procedures	14
Powering down the server	15
Locating and removing the Torx T-15 tool	16
Extending the server from the rack	16
Removing the access panel	18
Installing the access panel	18
Removing the server from the rack	19
Processor memory boards	20
Processor memory board population guidelines	20
PPM	21
Processor	22
Memory options	24
Minimum memory requirements	24
Memory population guidelines for processor memory boards with eight DIMM slots	24
Memory population guidelines for processor memory boards with four DIMM slots	24
Removing a DIMM	25
Hard drive blanks	26
Hot-plug SCSI hard drives	26
Drive replacement precautions	26
Hot-plug SAS or SATA hard drives	27
SAS or SATA hard drive cage	28
Power transfer board	29
Power supply blank	31
Hot-plug power supplies	32
Hot-plug fans	33
Universal media drives	33
Front bezel	35
Power button/LED assembly	36
Expansion boards	37
Performance balancing	38
PCI-X expansion boards	38
SCSI cables	39
Front fan cage	40
Pass-through board	41
QuickFind diagnostic display board and lightpipe	42
Rear fan cage	43

BBWC assembly	44
SCSI backplane	45
System battery	46
System board	48
AC filter cable assembly	50
Re-entering the server serial number	53
4 Diagnostic tools	
5 Server component identification	
Connectors.....	56
Rear panel	56
SCSI backplane	57
DIMM slots.....	58
Processor and PPM.....	58
LEDs	59
Front panel.....	59
QuickFind diagnostic display.....	60
Hot-plug SCSI hard drives	61
Hot-plug SAS or SATA hard drives	63
Hot-plug fans	65
Hot-plug power supplies.....	65
NIC.....	66
BBWCE	67
Internal diagnostic display.....	68
System board switches.....	69
System maintenance switch (SW3)	69
System ID switch (SW4)	70
iLO/Redundant ROM override switch (SW5)	71
Non-maskable interrupt switch	72
Rear unit identification LED switch	72
6 Troubleshooting	
If the server does not start	74
Diagnostic steps.....	75
Problems after initial boot.....	80
Troubleshooting a failed processor.....	82
Two-processor memory board configuration	82
Four-processor memory board configuration	82
Other information resources	83
Specifications	
Server specifications.....	84
Index	

1 About this guide

This maintenance and service guide can be used for reference when servicing the HP ProLiant DL585 Server.

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

Audience assumptions

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

Technician notes

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

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

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

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

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

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

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

Where to go for additional help

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

- User documentation
- *Service Quick Reference Guide*
- Service training guides
- Service advisories and bulletins
- QuickFind information services
- HP Systems Insight Manager (HP SIM) software

Integrated Management Log

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

Telephone numbers

For the name of the nearest HP authorized reseller:

- In the United States, see http://www.hp.com/service_locator.
- In Canada, see <http://www.hp.com>.

For HP technical support:

- In the United States and Canada, call 1-800-HP-INVENT (1-800-474-6836).
- Outside the United States and Canada, see <http://www.hp.com>.

2 Illustrated parts catalog

Customer self-repair program

The HP customer self-repair program offers you the fastest service under either warranty or contract. It enables HP to ship replacement parts directly to you so that you can replace them. Using this program, you can replace parts at your own convenience.

Through this convenient, easy-to-use program:

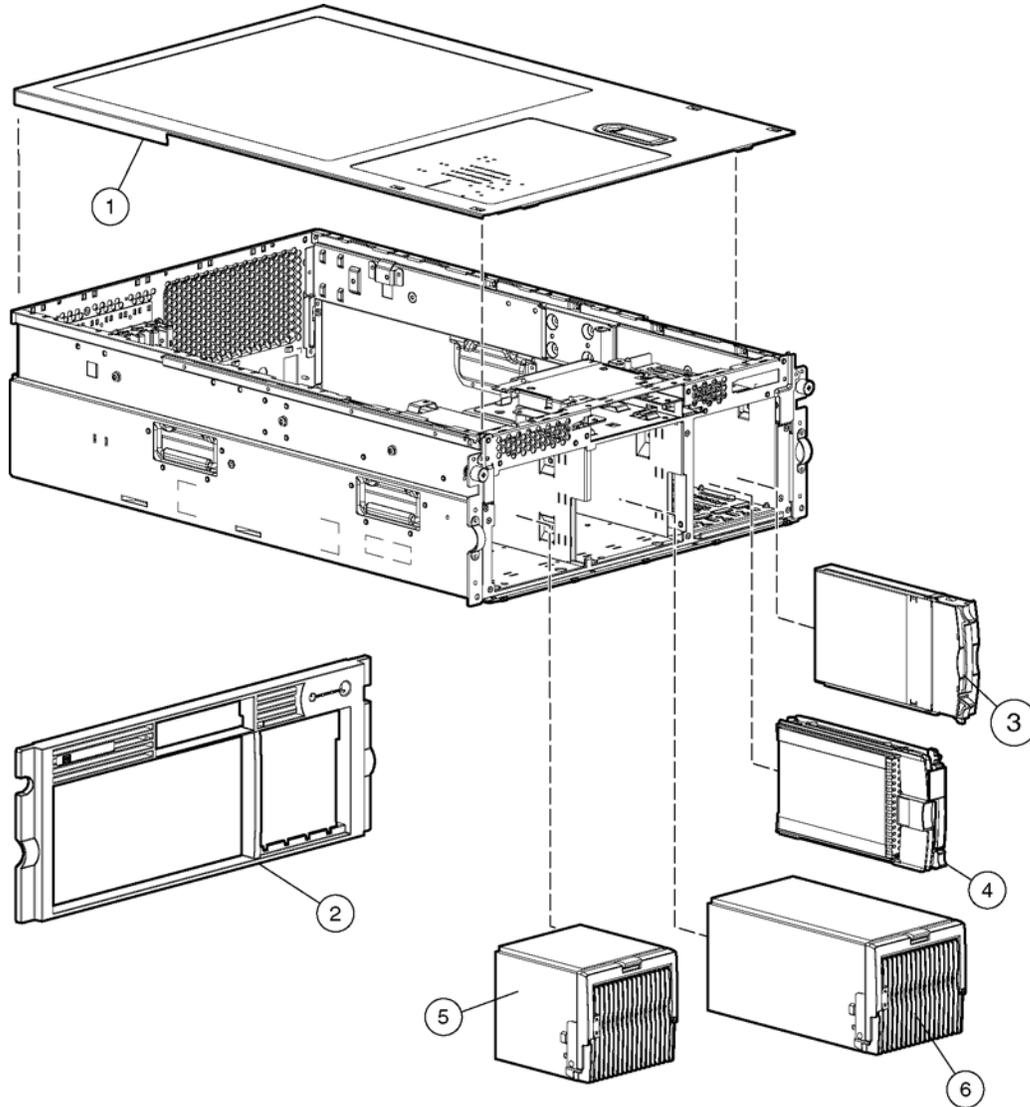
- An HP support specialist will diagnose and assess whether a replacement part is required to address a system problem. The specialist will also determine whether you can replace the part.
- Replacement parts are express-shipped. Most in-stock parts are shipped the same day you contact HP. You might be required to send the defective part back to HP, unless otherwise instructed.
- This program is available for most HP products currently under warranty or contract. For information on the warranty service, see the HP website at <http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html>.

For more information about the HP customer self-repair program, contact your local service provider. For the North American program, see the HP website at <http://www.hp.com/go/selfrepair>.

Customer replaceable parts are identified in the following tables.

Mechanical components exploded view

Figure 1 Mechanical components exploded view



Mechanical components spare parts list

Table 1 Mechanical components spare parts list

Item	Description	Assembly number	Modified assembly number	Spare part number	Modified spare part number	Customer self-repair (Yes/No)
1	Access panel	321466-001	—	359772-001	—	Yes
2	Front bezel	233588-002	—	243669-001	—	Yes
3	SCSI hard drive blank	302531-002	—	122759-001	—	Yes
4	Hard drives	—	—	—	—	—
—	36-GB SCSI hard drive, U320 15K*	271837-016‡ See requirement	404670-008	289241-001‡ See requirement	404714-001	Yes
—	72-GB SCSI hard drive, U320 10K*	271837-008‡ See requirement	404670-003	289042-001‡ See requirement	404709-001	Yes
—	72-GB SCSI hard drive, U320 15K*	271837-018‡ See requirement	404670-007	289243-001‡ See requirement	404713-001	Yes

Table 1 Mechanical components spare parts list

Item	Description	Assembly number	Modified assembly number	Spare part number	Modified spare part number	Customer self-repair (Yes/No)
—	146-GB SCSI hard drive, U320 10K*	271837-010‡ See requirement	404670-002	289044-001‡ See requirement	404708-001	Yes
—	146-GB SCSI hard drive U320 15K*	281837-028‡ See requirement	404670-006	347779-001‡ See requirement	404712-001	Yes
—	300-GB SCSI hard drive, U320 10K*	271837-021‡ See requirement	404670-001	351126-001‡ See requirement	404701-001	Yes
—	36-GB SAS hard drive, 10K*	375696-001 375712-001	—	376596-001	—	Yes
—	72-GB SAS hard drive, 10K*	375696-002 375712-002	—	376597-001	—	Yes
—	60-GB SATA hard drive, 5.4K*	390158-001	—	382264-001	—	Yes
5	Power supply blank	233685-001	—	267133-001	—	Yes
6	Power supply, 870 W, hot-plug (2.6-GHz and dual-core models)	192147-002‡ See requirement	192147-502	192201-002‡ See requirement	409781-002	Yes
7	Power cord retainer kit*	—	—	313825-001	—	Yes
8	SAS/SATA hard drive blank	376383-001	—	392613-001	—	Yes

* Not shown

‡REQUIREMENT:

For Customers in the EU only.

The use of the Original Spare part is regulated by RoHS legislation§.

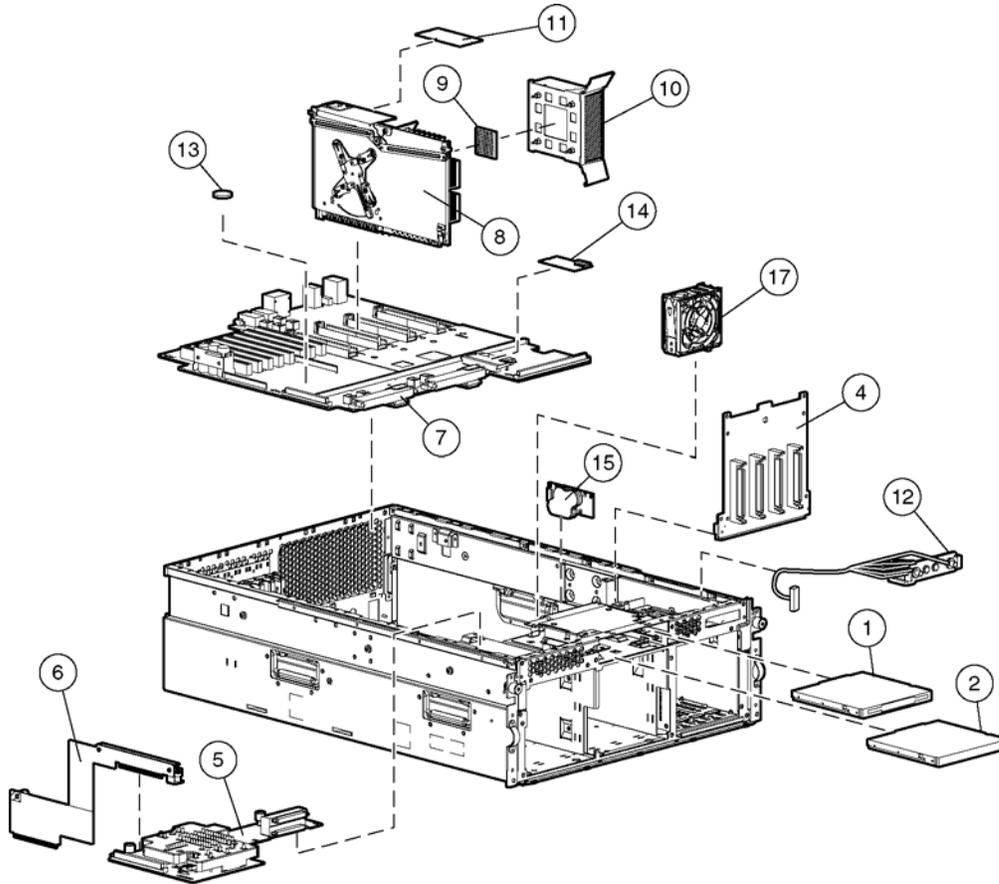
If your unit contains a part that is labelled with the Modified Spare number, the Modified Spare must be ordered as the replacement part in the EU.

If your unit contains a part that is labelled with the Original Spare number, please order the Original Spare as the replacement part in the EU. In this case either the Original Spare or the Modified Spare may be shipped which will not affect performance or functionality of the unit.

§Directive 2002/95/EC restricts the use of lead, mercury, cadmium, hexavalent chromium, PBBs and PBDEs in electronic products.

System components exploded view

Figure 2 System components exploded view



System components spare parts list

Table 2 System components spare parts list

Item	Description	Assembly number	Modified assembly number	Spare part number	Modified spare part number	Customer self-repair (Yes/No)
—	Media storage devices	—	—	—	—	—
1	CD-RW drive, universal media	294766-9D1/9D2‡ See requirement	383696-002	337273-001‡ See requirement	399959-001	Yes
2a	DVD-ROM drive, 8X, universal media (optional)*	168003-935/9D1‡ See requirement	395910-001	268795-001‡ See requirement	397928-001	Yes
2b	DVD-RW drive, universal media (optional)*	336084-9D1‡ See requirement	263394-002	384070-001‡ See requirement	399396-001	
—	Boards	—	—	—	—	—
4	SCSI backplane	010879-001‡ See requirement	010879-501	231128-001‡ See requirement	412320-001	Yes
5	Diagnostic display board and lightpipe	012134-001‡ See requirement	012134-501	356784-001‡ See requirement	416251-001	Yes
6	Pass-through board	279758-001‡ See requirement	012662-501	249106-001‡ See requirement	417235-001	Yes
7	System board	011977-002‡ See requirement	011977-502	356782-001‡ See requirement	412318-001	No

Table 2 System components spare parts list

Item	Description	Assembly number	Modified assembly number	Spare part number	Modified spare part number	Customer self-repair (Yes/No)
8	Processor memory boards	—	—	—	—	—
—	Processor memory board (PC2100/PC2700)**	011974-002‡ See requirement	011974-502	356783-001	—	Yes
—	Processor memory board (PC2100/PC2700)**	011974-003‡ See requirement	011974-503	382596-001‡ See requirement	412319-001	Yes
—	Processor memory board (PC3200)**	012567-001‡ See requirement	012567-501	378476-001‡ See requirement	412321-001	Yes
9	Processors	—	—	—	—	—
—	Processor, Opteron 850, 2.6 GHz	391162-001	—	382043-001	—	Yes
—	Processor, 2.8 GHz	397805-001	—	399203-01	—	Yes
—	Processor, dual core, 1.8 GHz	389711-001	—	390247-001	—	Yes
—	Processor, dual core, 2.2 GHz	389711-003	—	390249-001	—	Yes
—	Processor, dual core, 2.4 GHz	389711-004	—	403836-001	—	Yes
—	Processor, dual core, 2.6 GHz	389711-005	—	410873-001	—	Yes
10	Heatsink	321961-007	—	383420-001	—	Yes
11	Processor power module (PPM)	383265-001	—	383337-001	—	Yes
12	Cable kit	—	—	243670-001	—	Yes
—	U320 SCSI cable assembly	166298-003	—	—	—	Yes
—	U320 SCSI cable assembly	166298-039	—	—	—	Yes
—	Power cable assembly	233303-001	—	—	—	Yes
—	Hot-plug cable assembly	241793-012	—	—	—	Yes
13	Battery, system, 3 V	166899-001	—	153099-001	—	Yes
14	5i Plus cache memory module	011665-001	—	260741-001	—	Yes
15	Battery-Backed Write Cache Module (BBWC), 4.8 V	011668-001	—	260740-001	—	Yes
16	BBWC cache module cable*	262695-004/005	—	283033-001	—	Yes
17	Fan assembly, hot-plug, 92 x 38 mm	321520-001	—	359773-001	—	Yes
18	Fan cage cable assembly*	321518-001	—	361442-001	—	No
19	SAS backplane kit*	—	—	376475-001‡ See requirement	411794-001	Yes
—	SAS backplane board *	012564-001‡ See requirement	012564-501	—	—	Yes

Table 2 System components spare parts list

Item	Description	Assembly number	Modified assembly number	Spare part number	Modified spare part number	Customer self-repair (Yes/No)
—	Power transfer board *	012662-001‡ See requirement	012662-501	—	—	Yes
20	SAS cable kit*	—	—	393535-001	—	Yes
—	SAS data cable assembly *	361316-002	—	—	—	Yes
—	SAS power cable *	379196-001	—	—	—	Yes
21	SAS array controller*	012335-001‡ See requirement	012335-501	370855-001‡ See requirement	417343-001	Yes
22	SAS array cache (with battery)*	011773-002‡ See requirement	011773-502	309522-001‡ See requirement	416828-001	Yes
23	Plastics kit*	—	—	359768-001	—	Yes
—	Processor memory board air baffle *	337992-001	—	—	—	Yes
—	Chassis air baffle, lower *	338886-001	—	—	—	Yes
—	Chassis air baffle, upper *	333359-001	—	—	—	Yes
24	AC power cord, 15 A, 125 V*	178968-001	—	237457-001	—	Yes
25	AC power cord, 15 A, 125 V*	178968-001	—	237458-001	—	Yes
26	AC power cord, 10 A, C14-C19 IEC*	287485-003	—	311582-001	—	Yes
27	Rack-mounting hardware kit for square-hole racks*	284499-002	—	313215-001	—	Yes
28	Rack-mounting hardware kit for round-hole racks* (optional)	287528-B21	—	291895-001	—	Yes
29	Cable kit, AC filter cable assembly*	—	—	243671-001	—	No
—	Internal AC power cable assembly	233106-001	—	—	—	No
—	Internal AC power cable assembly	233106-002	—	—	—	No
30	Torx screwdriver, T-15*	107473-001	—	199630-001	—	Yes
31	Return kit*	—	—	279645-001	—	Yes
—	Memory	—	—	—	—	—
32	512-MB, PC2700 (DDR SDRAM)*	331561-841‡ See requirement	413150-841	399956-001‡ See requirement	416255-001	Yes
33	1-GB, PC2700 (DDR SDRAM)*	331562-851‡ See requirement	413151-851	399957-001‡ See requirement	416256-001	Yes
34	2-GB, PC2700 (DDR SDRAM)*	331563-851‡ See requirement	413152-851	399958-001‡ See requirement	416257-001	Yes
35	4-GB, PC2700 (DDR SDRAM)*	331564-061‡ See requirement	413153-861	395547-001‡ See requirement	416258-001	Yes
36	512-MB, PC3200 (DDR SDRAM)*	373028-051‡ See requirement	373028-851	378913-001‡ See requirement	416105-001	Yes

Table 2 System components spare parts list

Item	Description	Assembly number	Modified assembly number	Spare part number	Modified spare part number	Customer self-repair (Yes/No)
37	1-GB, PC3200 (DDR SDRAM)*	373029-051‡ See requirement	373029-851	378914-001‡ See requirement	416106-001	Yes
38	2-GB, PC3200 (DDR SDRAM)*	373030-051‡ See requirement	373030-851	378915-001‡ See requirement	416107-001	Yes

* Not shown

**Mixing processor speeds or cache sizes is not supported

‡REQUIREMENT:

For Customers in the EU only.

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If your unit contains a part that is labelled with the Modified Spare number, the Modified Spare must be ordered as the replacement part in the EU.

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§Directive 2002/95/EC restricts the use of lead, mercury, cadmium, hexavalent chromium, PBBs and PBDEs in electronic products.

3 Removal and replacement procedures

You need the following items for some procedures:

- Torx T-15 tool
- Flathead screwdriver
- Diagnostics Utility on the HP SmartStart CD

Safety considerations

Before performing service procedures, review the following safety information.

Electrostatic discharge

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:

- 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 (earthed) tools and equipment.
- Keep work area free of nonconductive materials such as ordinary plastic assembly aids and foam packing.
- Be sure that you are properly grounded (earthed) when touching a static-sensitive component or assembly.
- Avoid touching pins, leads, or circuitry.
- Use nonconductive field service tools.

Server warnings and cautions

 **WARNING!** Do not exceed the level of repair specified in the procedures in the product documentation. All troubleshooting and repair procedures are detailed to allow only subassembly or module-level repair. Because of the complexity of the individual boards and subassemblies, do not attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard.

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

- Do not disable the AC power cord grounding plug. The grounding plug is an important safety feature.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
- Unplug the power cord from each power supply to disconnect power to the equipment.

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

 **CAUTION:** Do not operate the server for extended periods without the access panel. Operating the server without the access panel results in improper airflow and improper cooling that can lead to thermal damage.

Preparation procedures

To access some components and perform certain service procedures, you must do one or more of the following:

- Extend the server from the rack.

IMPORTANT: If you are performing service procedures in an HP, Compaq branded, or third-party rack cabinet, you can use the locking feature of the rack rails to support the server and gain access to internal components.

For more information about telco rack solutions, see the RackSolutions.com website at <http://www.racksolutions.com/hp>.

- Access internal components.
If you must access internal components for removal or replacement, you can remove the access panel without removing the server from the rack.
- Power down the server.

NOTE: Do not power down the server if you are performing a hot-plug procedure.

- Remove the server from the rack.
If the rack environment, cabling configuration, or the server location in the rack creates awkward conditions, remove the server from the rack.

WARNING! Before lifting the server, remove all hot-plug power supplies and hard drives to reduce the weight.

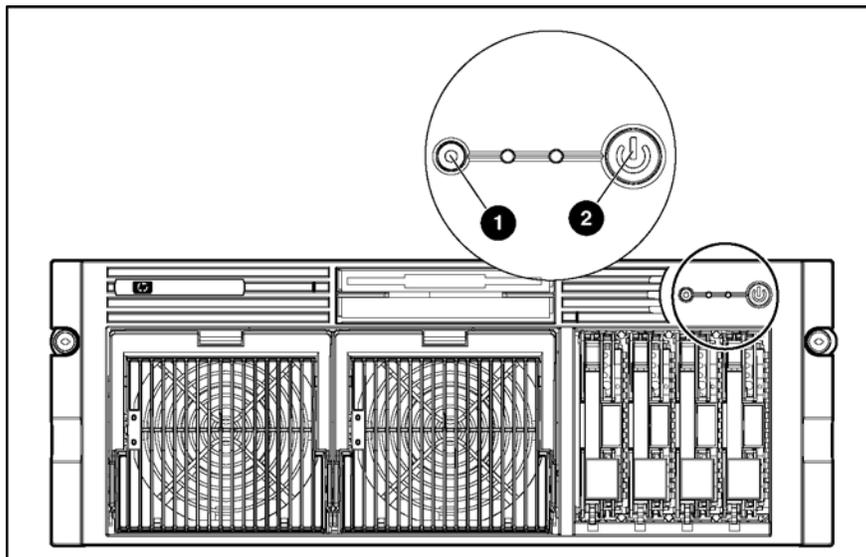
Powering down the server

WARNING! To reduce the risk of personal injury, electric shock, or damage to the equipment, remove the power cord to remove power from the server. The front panel Power on/Standby button does not completely shut off system power. Portions of the power supply and some internal circuitry remain active until AC power is removed.

IMPORTANT: If installing a hot-plug device, it is not necessary to power down the server.

1. Back up the server data.
2. Shut down the operating system as directed by the operating system documentation.
3. If the server is installed in a rack, press the UID LED button on the front panel. Blue LEDs illuminate on the front and rear of the server.
4. Press the Power on/Standby button to place the server in standby mode. When the server activates standby power mode, the system power LED changes to amber.

Figure 3 Identifying the UID LED (1) and Power on/Standby buttons (2)



5. If the server is installed in a rack, locate the server by identifying the illuminated rear UID LED button.
6. Disconnect the power cords.

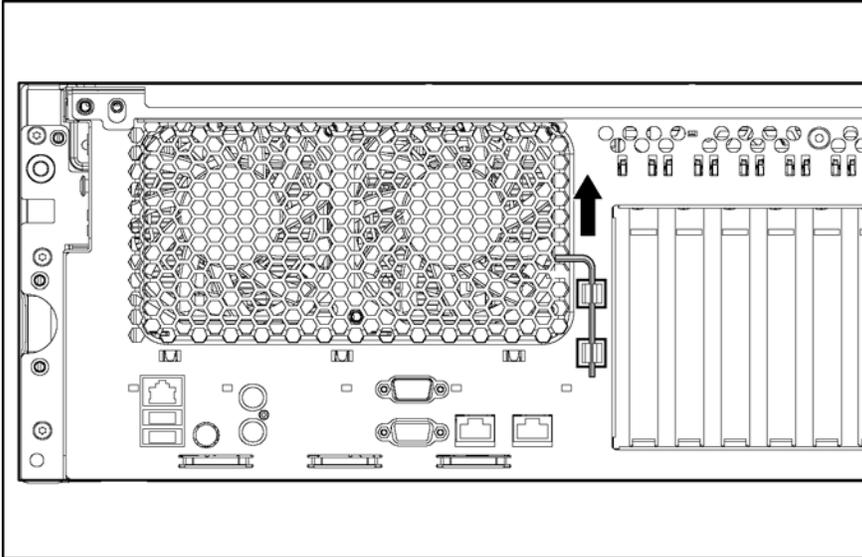
The system is now without power.

Locating and removing the Torx T-15 tool

Many hardware procedures in the server are toolless, but a few require the removal of Torx T-15 screws that have been installed for shipping or security reasons. A Torx T-15 tool ships with the server for the removal of these screws.

1. Locate the Torx T-15 tool on the back of the server.
2. Slide the tool upward out of the retaining clips.

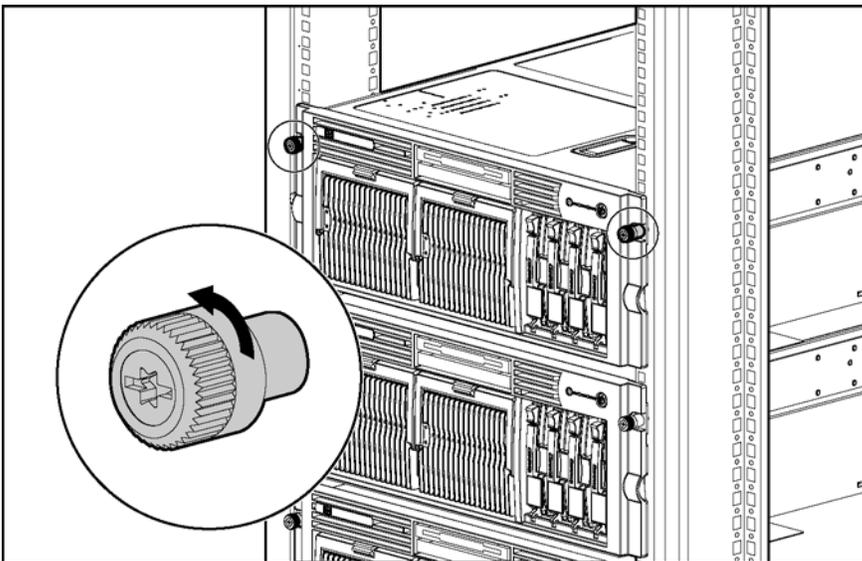
Figure 4 Removing the Torx T-15 tool



Extending the server from the rack

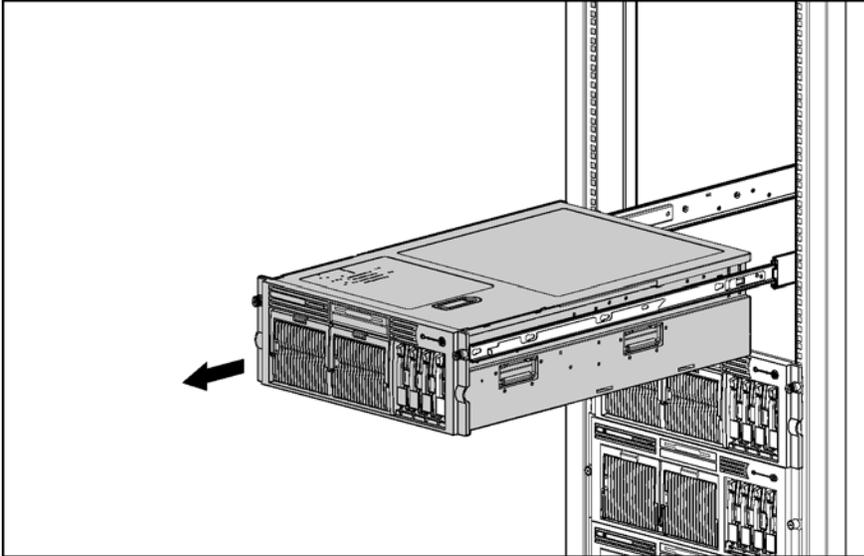
1. Loosen the thumbscrews that secure the server to the front of the rack.

Figure 5 Loosening the front panel thumbscrews



2. Extend the server on the rack rails until the server rail-release latches engage.

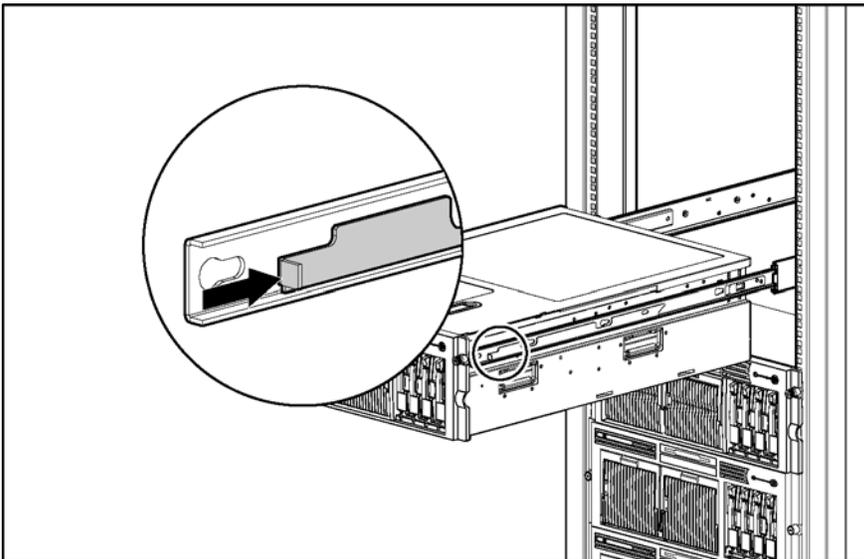
Figure 6 Extending the server from the rack



⚠ WARNING! Be careful when pressing the rail-release levers and sliding the component into or out of the rack. The sliding rails could pinch your fingertips.

3. After performing the installation or maintenance procedure, press the rail-release levers at the front of both server rails and slide the server into the rack.

Figure 7 Sliding the server into the rack



4. Secure the server by tightening the thumbscrews.

Removing the access panel

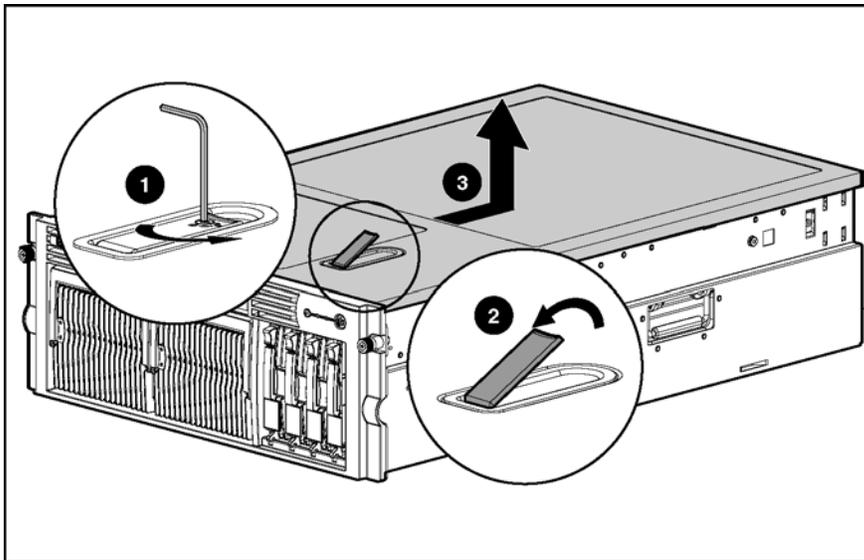
⚠ WARNING! Pressing the Power On/Standby button sets the server to the standby position, which removes power from most areas of the server. However, portions of the power supply and some internal circuitry remain active until the AC power cord is removed.

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

⚠ CAUTION: Electrostatic discharge can damage electronic components. Properly ground yourself before beginning any installation procedure.

1. Power down the server. See “Powering down the server” earlier in this chapter.
2. Extend the server from the rack. See “Extending the server from the rack” earlier in this chapter.
3. Unlock the access panel latch .
4. Lift up on the latch (2), and remove the access panel .

Figure 8 Removing the access panel



Installing the access panel

1. Place the access panel on top of the server with the latch open. Allow the panel to extend past the rear of the server approximately 1.25 cm (0.5 inches).
2. Push down on the latch. The access panel slides to a closed position.

Removing the server from the rack

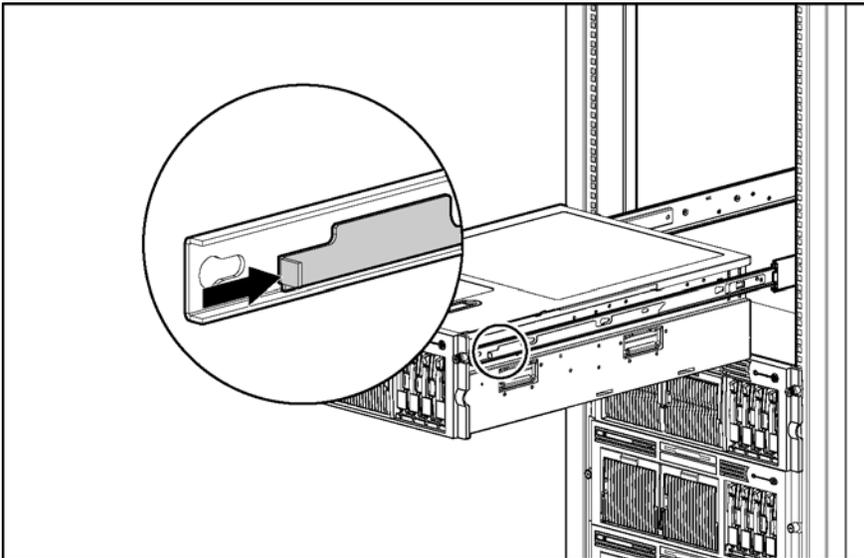
⚠ WARNING! The server is very heavy, up to 44.5 kg (98 lb). To reduce the risk of personal injury or damage to the equipment:

- Remove all hot-plug power supplies to reduce the weight of the server before lifting it.
- Observe local occupational health and safety requirements and guidelines for material handling.
- Get help to lift and maneuver the server.

To remove the server from the rack:

1. Power down the server. See “Powering down the server” earlier in this chapter.
2. Extend the server from the rack. See “Extending the server from the rack” earlier in this chapter.
3. Unplug the cables from the rear of the server.
4. Press the rail-release levers on the rails, and slide the server off the rack rails.

Figure 9 Removing the server from the rack



5. Place the server on a sturdy, level surface.
Reverse steps to install the server in the rack.

Processor memory boards

The server supports up to four processor memory boards with AMD® Opteron™ processors.

CAUTION: Processor memory boards 1 and 2 must always be installed. The system will not boot if either board is missing.

CAUTION: Update the ROM to be sure that the system ROM recognizes the new processor you are installing. For the most recent ROMPaq, see the HP website, and follow the support link on the product website.

Failure to flash the ROM before installing processor memory boards can cause system failure.

IMPORTANT: Mixing processor speeds and cache sizes is not supported.

Processor memory board population guidelines

- All processors must be of the same speed and cache size.
- Processor memory boards 1 and 2 must always be installed.
- Processor memory boards 3 and 4 must be installed as a pair.

Figure 10 Locating the processor memory boards

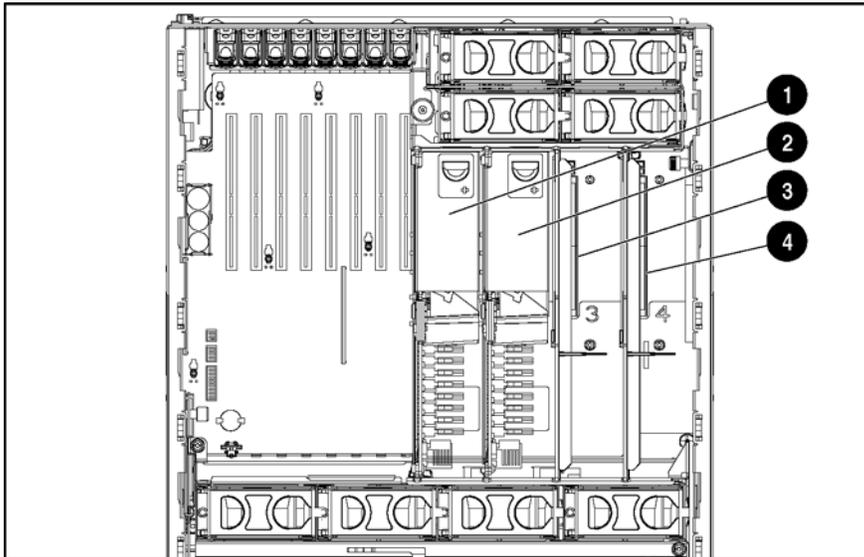


Table 3 Processor memory boards

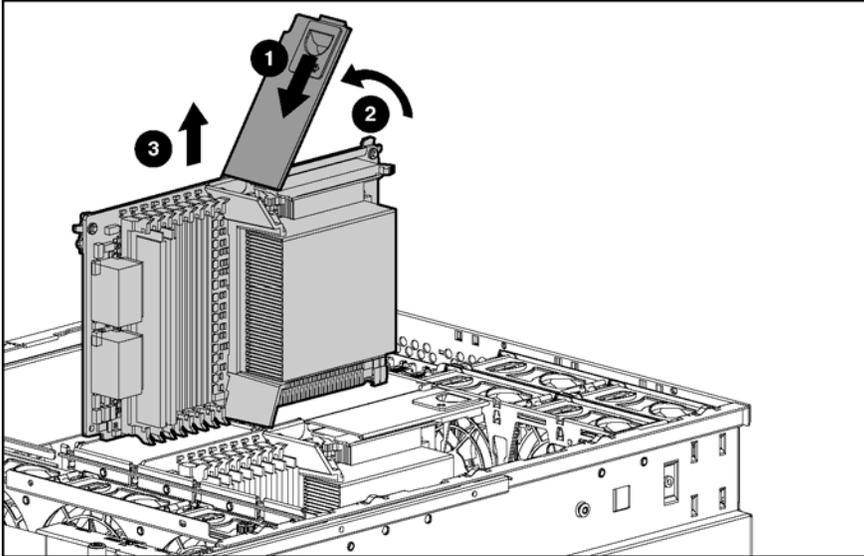
Item	Description
1	Processor memory board slot 1 (processor)
2	Processor memory board slot 2 (boot processor)
3	Processor memory board slot 3 (air baffle)
4	Processor memory board slot 4 (air baffle)

To remove a processor memory board:

1. Power down the server. See “Powering down the server” earlier in this chapter.
2. Extend the server from the rack. See “Extending the server from the rack” earlier in this chapter.
3. Remove the access panel. See “Removing the access panel” earlier in this chapter.

4. Remove the processor memory board.

Figure 11 Removing a processor memory board



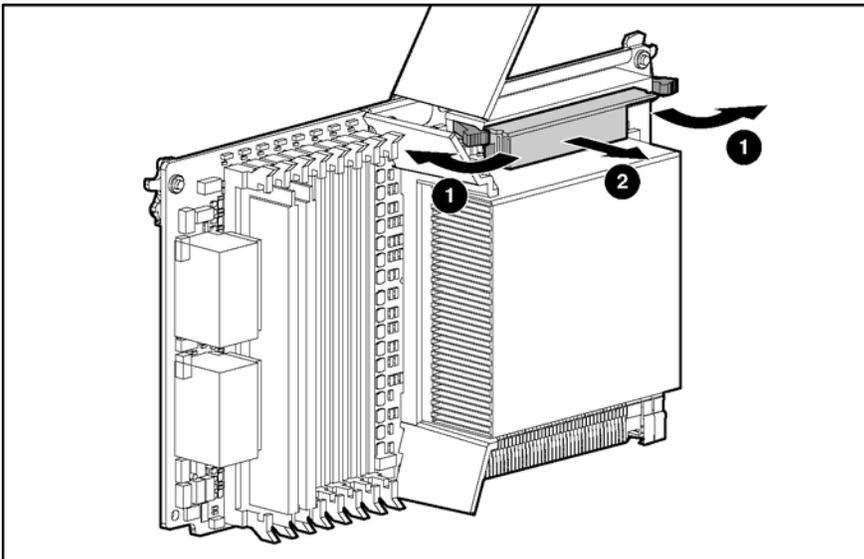
Reverse the steps to install a processor memory board.

PPM

To remove a Power Processor Module (PPM):

1. Power down the server. See “Powering down the server” earlier in this chapter.
2. Extend the server from the rack. See “Extending the server from the rack” earlier in this chapter.
3. Remove the access panel. See “Removing the access panel” earlier in this chapter.
4. Remove the processor memory board. See “Processor memory boards” earlier in this chapter.
5. Remove the PPM from the processor memory board.

Figure 12 Removing a PPM



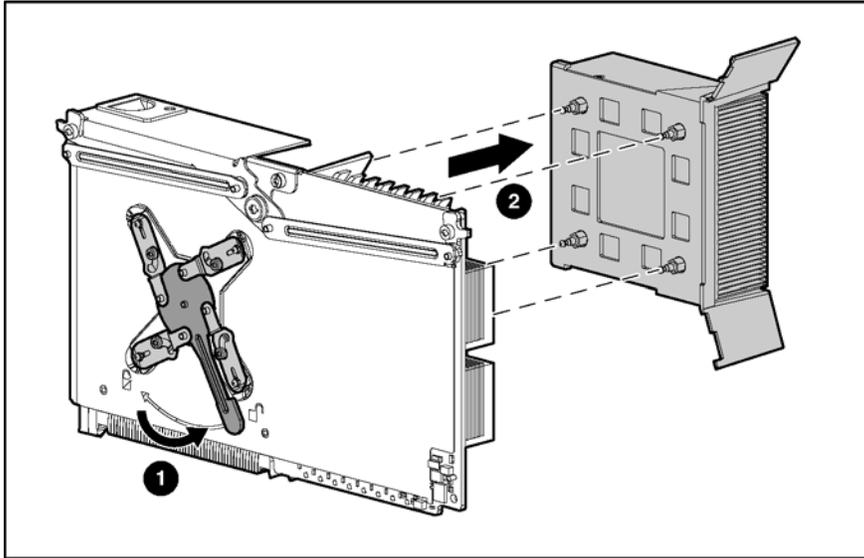
Reverse the steps to install a PPM.

Processor

Removing a processor

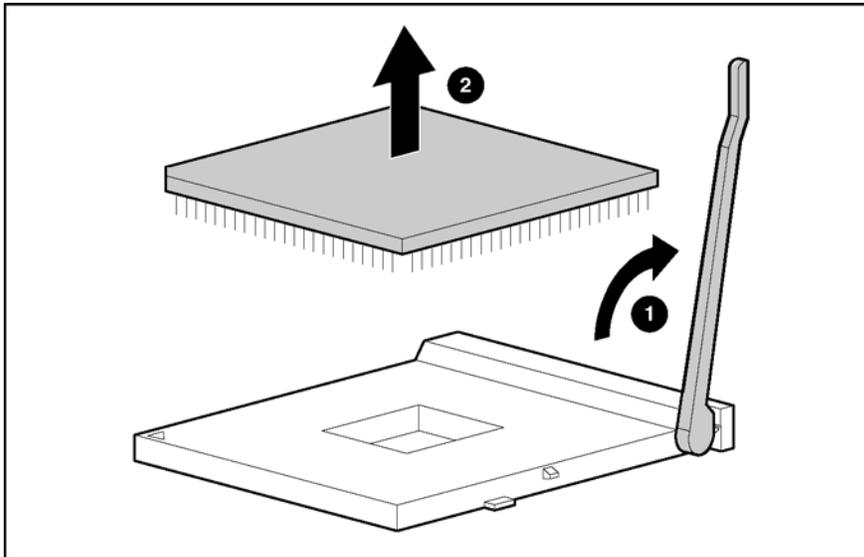
1. Power down the server. See “Powering down the server” earlier in this chapter.
2. Extend the server from the rack. See “Extending the server from the rack” earlier in this chapter.
3. Remove the access panel. See “Removing the access panel” earlier in this chapter.
4. Remove the processor memory board. See “Processor memory boards” earlier in this chapter.
5. Remove the processor heatsink.

Figure 13 Removing the processor heatsink



6. Remove the processor.

Figure 14 Removing a processor



Installing a processor

CAUTION: If reusing the heatsink, clean and apply thermal grease to prevent thermal failure. The syringe in this kit contains 1.0 gm (0.5 ml) or 0.5 gm (0.25 ml) of grease designed for use as a thermal interface between the processor and the heatsink.

1. Open the ZIF socket lever. Be sure the lever is in the fully open position.
2. Align the processor with the socket.

3. Set the processor into the ZIF socket, and hold it in place while closing and latching the socket lever. Verify that the processor is fully seated in the socket.

△ CAUTION: Failure to fully seat and latch the processor in the ZIF socket can result in damage to the processor, processor memory board, or both.

4. If reusing the processor and heatsink (spare part number 383420-001), clean the top of the processor and the bottom of the heatsink using an alcohol pad (included with the thermal grease kit) or a clean dry wipe to remove all traces of the old thermal grease. Allow the alcohol to evaporate before continuing.

△ CAUTION: The processor should be installed on the processor memory board before cleaning to prevent damaging the pins.

5. Squeeze one-half of the contents if the syringe contains 1.0 gm (0.5 ml) or the entire contents if the syringe contains 0.5 gm (0.25 ml) evenly onto the top of the processor.
6. Install the heatsink, ensuring that it is properly seated before latching it in place.
7. Install the processor memory board.
8. Replace the access panel.
9. Replace server in the rack.
10. Power up the server.

Memory options

Minimum memory requirements

- Two DIMMs must be installed in bank 1 on the processor memory board in slot two.
- All DIMMs on a processor memory board must have the same part number.



NOTE: Processor memory boards in slots 1, 3, and 4 can be installed without memory. Certain application programs run more efficiently if the DIMMs are balanced across all processor memory boards.

Memory population guidelines for processor memory boards with eight DIMM slots

- DIMMs on different processor memory boards can be of different sizes.
- DIMMs on the same processor memory board must be of the same size and have the same part number.
- DIMMs must be installed on a processor memory board in pairs and in bank order.
- DIMMs must populate three or fewer banks on a memory board with PC2700 DIMMs to maintain a memory clock speed of 333 MHz.



NOTE: If all four banks (eight DIMM slots) are populated with PC2700 DIMMs, the maximum memory clock speed will be 266 MHz.

Figure 15 DIMM slots

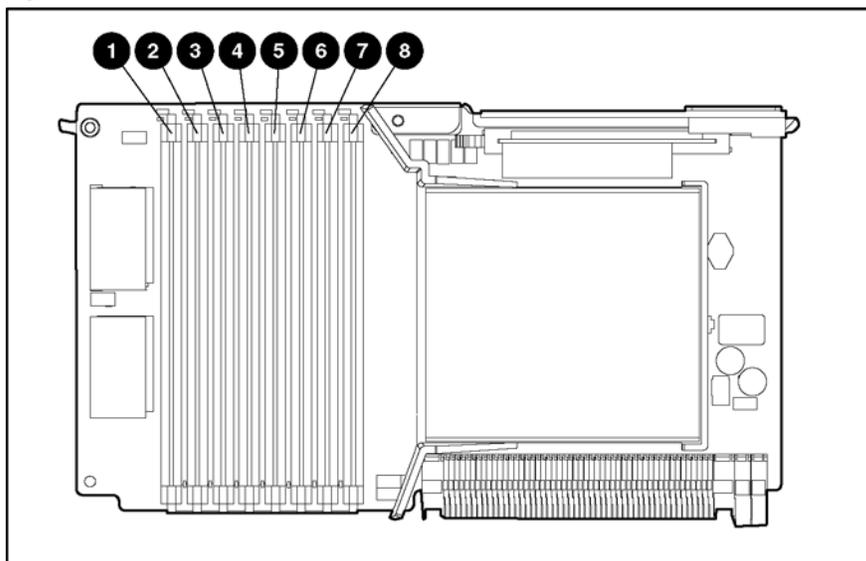


Table 4 Processor memory board memory banks

Slot	Bank
1-2	Bank 1
3-4	Bank 2
5-6	Bank 3
7-8	Bank 4

Memory population guidelines for processor memory boards with four DIMM slots

- DIMMs on different processor memory boards can be of different sizes.
- DIMMs on the same processor memory board must be of the same size and have the same part number.
- DIMMs must be installed on a processor memory board in pairs and in bank order.



NOTE: PC3200 DIMMs are only supported by processor memory boards with four DIMM slots.

Figure 16 Four DIMM slots

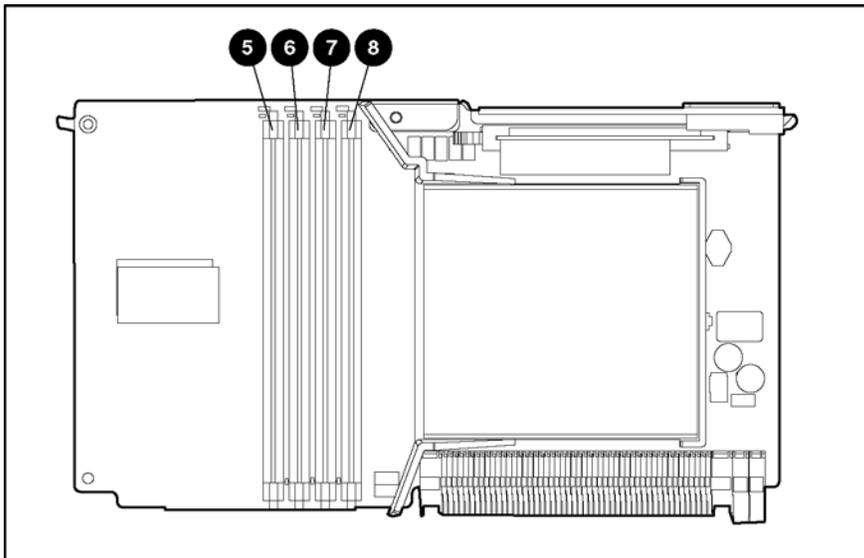


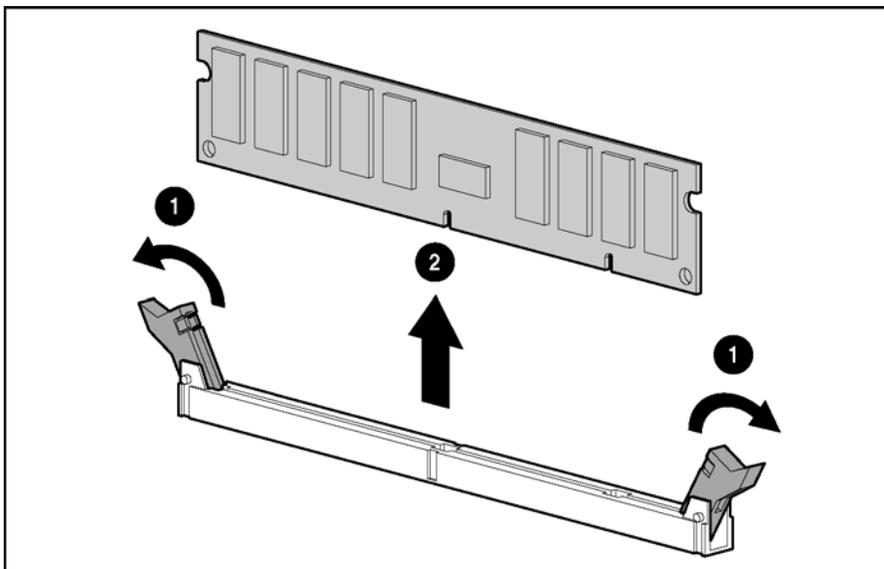
Table 5 Processor memory board memory banks with four DIMM slots

Slot	Bank
5-6	Bank 1
7-8	Bank 2

Removing a DIMM

1. Power down the server. See “Powering down the server” earlier in this chapter.
2. Extend the server from the rack. See “Extending the server from the rack” earlier in this chapter.
3. Remove the access panel. See “Removing the access panel” earlier in this chapter.
4. Remove the processor memory board. See “Processor memory boards” earlier in this chapter.
5. Remove the DIMM.

Figure 17 Removing a DIMM



IMPORTANT: Be sure all DIMM retention clips are in the closed/locked position before reinstalling processor memory board into the system.

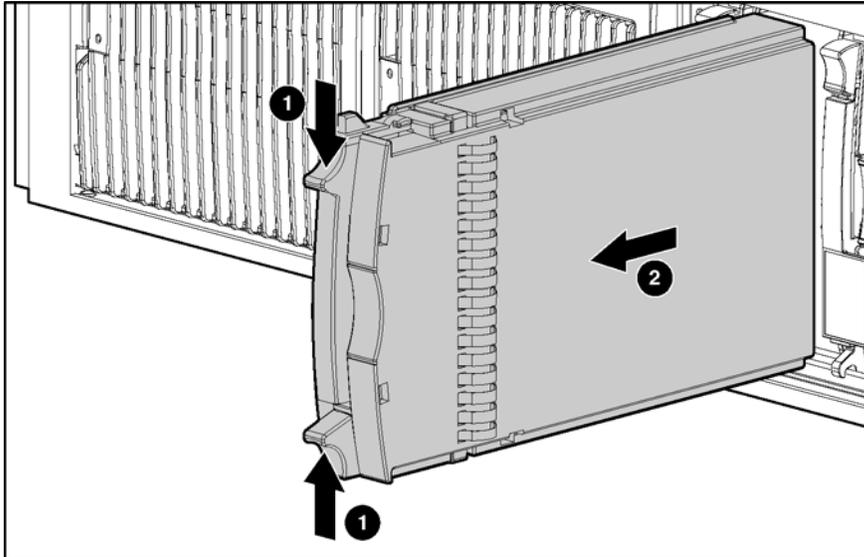
Reverse the removal steps to install a DIMM.

Hard drive blanks

To remove a hard drive blank:

1. Push the sliding release button to unlock the blank .
2. Pull the drive blank out of the drive cage .

Figure 18 Removing a drive blank



NOTE: Keep the blank for future use.

Reverse the steps to replace a drive blank.

Hot-plug SCSI hard drives

Drive replacement precautions

Be aware of the following guidelines cautioning unsafe hot-plug replacement.

- Do not remove a degraded drive if any other member of the array is offline (the online LED is off). No other drive in the array is hot-pluggable without data loss. The exception to this is the use of RAID 1+0 as a fault-tolerant configuration. In this case, drives are mirrored in pairs. More than one drive can fail and be replaced as long as the drive or drives they are mirroring are online.
- Do not remove a degraded drive if any member of an array is missing (removed previously and not yet replaced).
- Do not remove a degraded drive if any member of an array is being rebuilt, unless the drive being rebuilt has been configured as an online spare. The online LED for the drive flashes green or amber, indicating that a replaced drive is being rebuilt from the data stored on the other drives.



NOTE: An online spare drive does not activate and start rebuilding after a predictive failure alert because the degraded drive is still online. The online spare activates only after a drive in the array has failed.

- Do not replace multiple degraded drives at the same time because the fault tolerance can be compromised. When a drive is replaced, the controller uses data from the other drives in the array to reconstruct data on the replacement drive. If more than one drive is removed, a complete data set is not available to reconstruct data on the replacement drive or drives, and permanent data loss can occur.



CAUTION: Do not turn off any external unit when the server containing. A Smart Array controller is powered up. Also, do not power up the server before powering up the drive enclosure. If these ordering rules are not followed, the Smart Array controller might mark the drives in this enclosure as **failed**, resulting in permanent data loss.

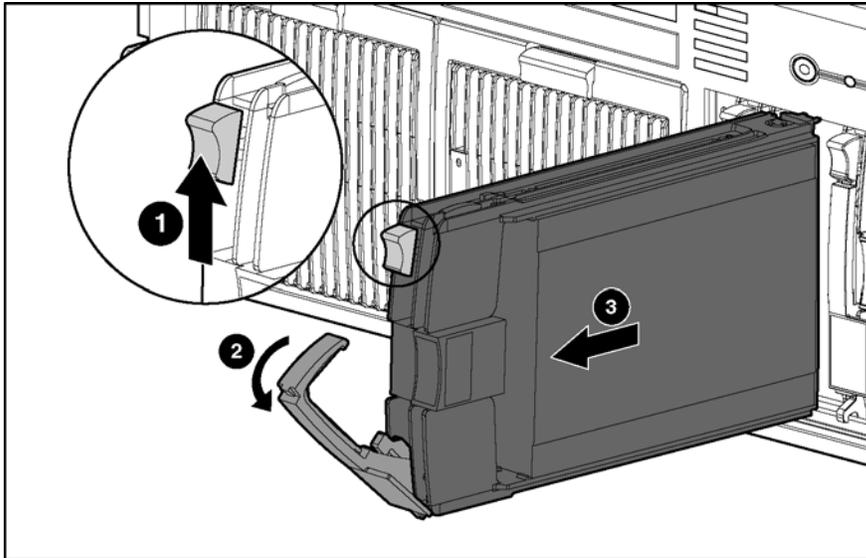
CAUTION: Remove or replace a hard drive only when the drive failure LED is amber. Data loss can occur if a drive is removed when the drive online LED is green. See “Hot-plug SCSI hard drive LEDs” in Chapter 4, “Server component identification,” for more information.

CAUTION: Remove or replace only one hard drive at a time. The controller relies on other drives to reconstruct data on the replaced drive. Drive reconstruction is active when the drive online LED is flashing green.

To remove a hot-plug SCSI hard drive:

1. Press the release button to unlock the ejector lever on the hard drive.
2. Open the ejector lever to release the drive.
3. Slide the drive out of the cage.

Figure 19 Removing a hot-plug SCSI hard drive

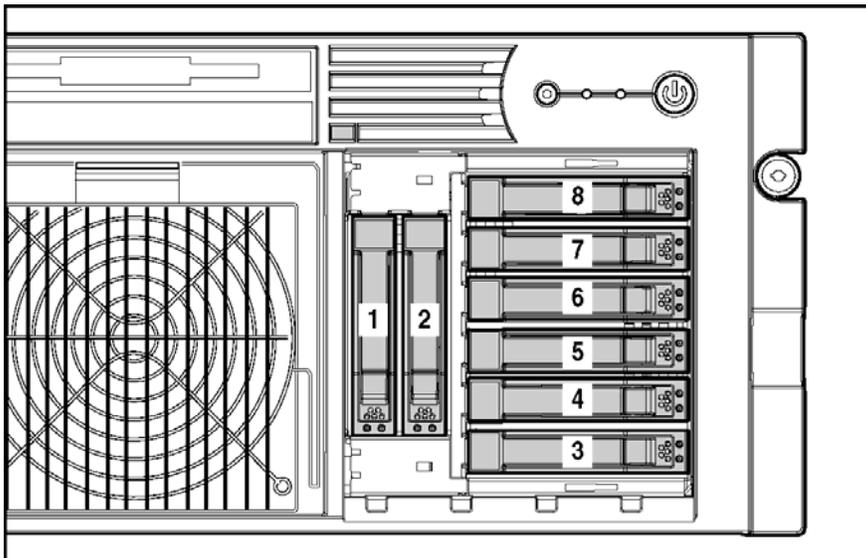


IMPORTANT: Always populate hard drive bays starting with the lowest SCSI ID.

Reverse the steps to replace a hot-plug SCSI hard drive.

Hot-plug SAS or SATA hard drives

Figure 20 Hot-plug SAS or SATA hard drive ID numbers



When adding SAS hard drives to the server, observe the following general guidelines:

- The server supports eight SAS or SATA hot-plug hard drives.

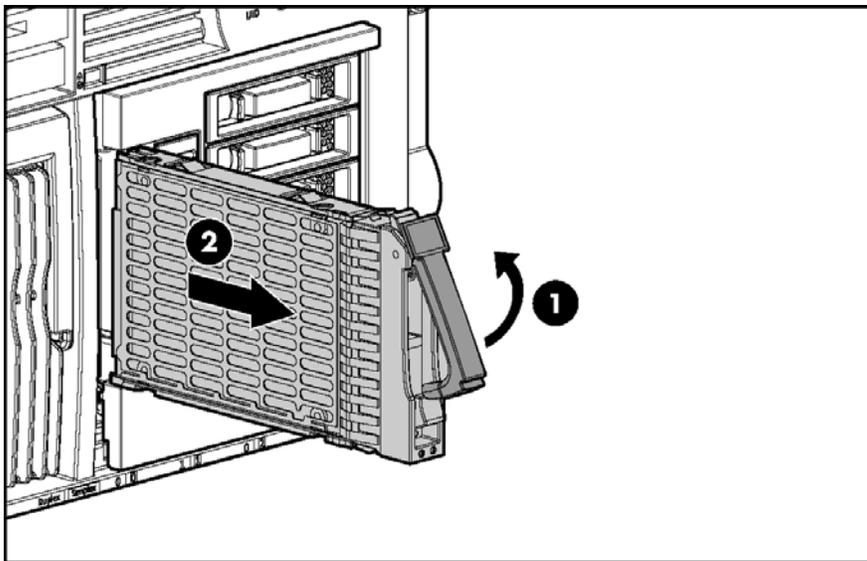
- The system automatically sets all drive numbers.
- If only one hard drive is used, install it in the bay with the lowest number.
- Hard drives must be SFF types.
- Drives must be the same capacity to provide the greatest storage space efficiency when drives are grouped together into the same drive array.

CAUTION: Remove or replace a hard drive only when the drive failure LED is amber. Data loss can occur if a drive is removed when the drive Online/Activity status LED is green. See “Hot-plug SAS or SATA hard drive LEDs” in Chapter 4, “Server component identification,” for more information.

CAUTION: Remove or replace only one hard drive at a time. The controller relies on other drives to reconstruct data on the replaced drive. Drive reconstruction is active when the drive Online/Activity status LED is flashing green.

1. Press the release button to unlock the ejector lever on the hard drive.
2. Open the ejector lever to release the drive.
3. Slide the drive out of the cage.

Figure 21 Removing a hot-plug SAS or SATA hard drive



IMPORTANT: Always populate hard drive bays starting with the lowest SCSI ID.

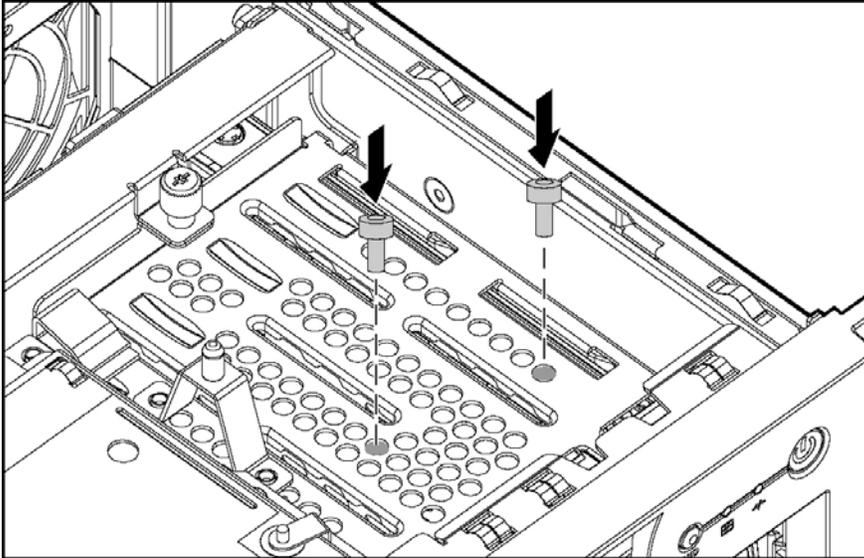
Reverse the steps to replace a hot-plug SAS or SATA hard drive.

SAS or SATA hard drive cage

1. Power down the server. See “Powering down the server” earlier in this chapter.
2. Extend the server from the rack. See “Extending the server from the rack” earlier in this chapter.
3. Remove the access panel. See “Removing the access panel” earlier in this chapter.
4. Remove all hard drives and hard drive blanks. See “Hard drive blanks” and “Hot-plug SAS or SATA hard drives” in this chapter.

5. Remove the screws securing the hard drive cage.

Figure 22 Removing the hard drive cage screws

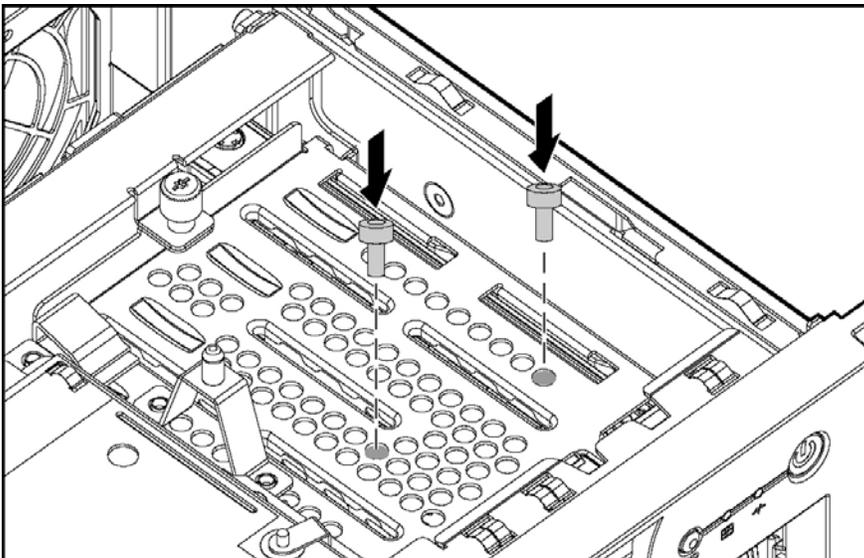


6. Slowly pull the SAS hard drive cage out of the server until there is enough room to reach behind the SAS hard drive cage.
7. Disconnect all cables from the back of the SAS hard drive cage, and slide the hard drive cage out of the server. Reverse the steps to replace the SAS-SATA hard drive cage.

Power transfer board

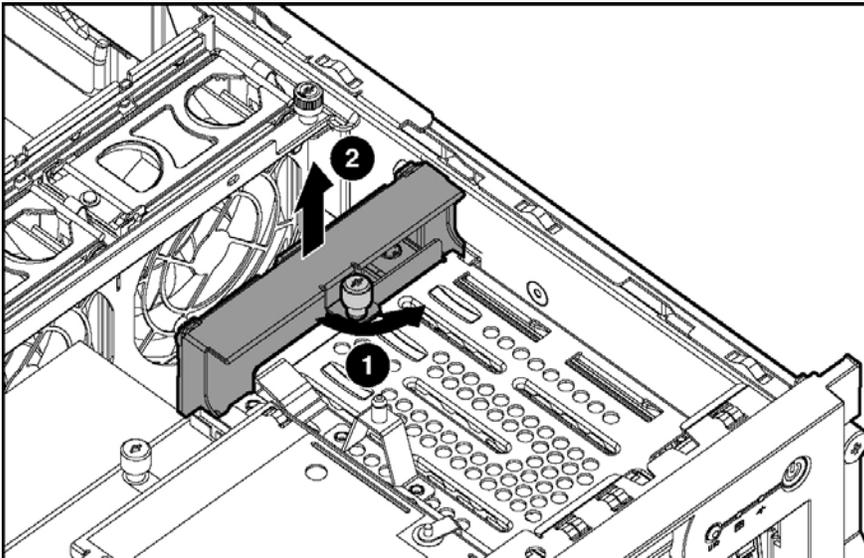
1. Power down the server. See “Powering down the server” earlier in this chapter.
2. Extend the server from the rack. See “Extending the server from the rack” earlier in this chapter.
3. Remove the access panel. See “Removing the access panel” earlier in this chapter.
4. Remove all hard drives and hard drive blanks. See “Hard drive blanks” and “Hot-plug SAS or SATA hard drives” in this chapter.
5. Remove the screws securing the hard drive cage.

Figure 23 Removing the hard drive cage screws



6. Slowly pull the SAS hard drive cage out of the server until there is enough room to reach behind the SAS hard drive cage.
7. Disconnect all cables from the back of the SAS hard drive cage, and slide the hard drive cage out of the server.
8. Disconnect the power cable from the power transfer board, and remove the cable.
9. Loosen the thumbscrew, and remove the power transfer board.

Figure 24 Removing the power transfer board



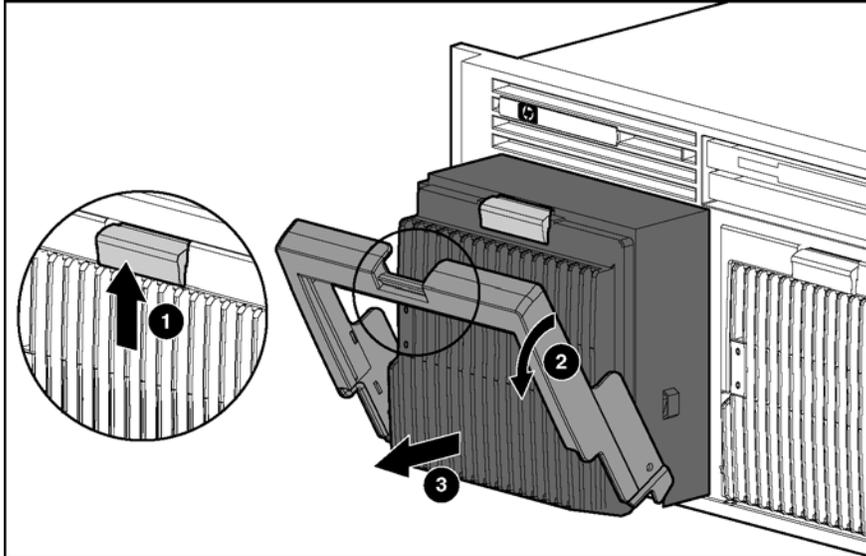
Reverse the steps to replace the power transfer board.

Power supply blank

To remove a power supply blank:

1. Press the lever-release button on the handle of the power supply blanks .
2. Pull on the lever to release the blank .
3. Remove the power supply blank from the server .

Figure 25 Removing a power supply blank



NOTE: Keep the power supply blank for future use.

Reverse the steps to replace the power supply blank.

Hot-plug power supplies

For information on power supply diagnosis, see “Hot-plug power supply LEDs” in Chapter 4, “Server component identification.”

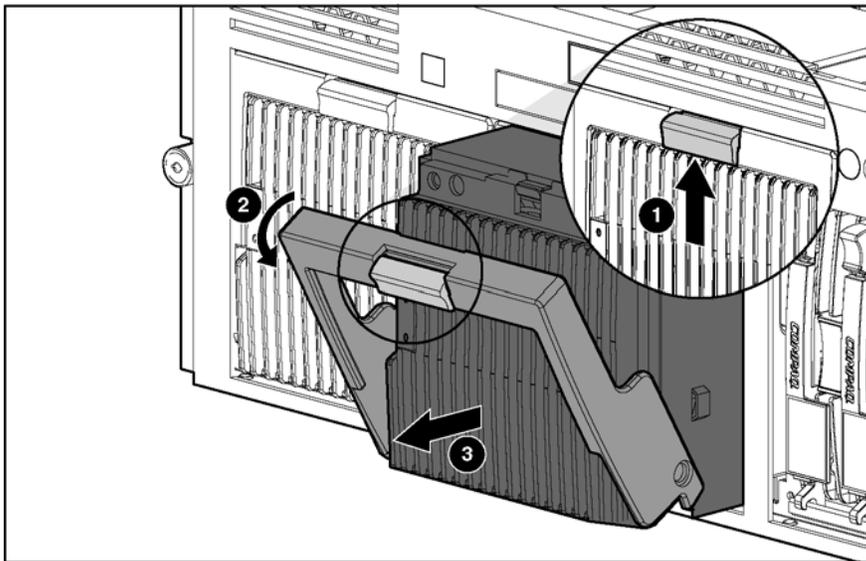
CAUTION: Do not remove a hot-plug power supply unless two power supplies are installed. If a second power supply is not installed, the system must be powered down to remove the power supply.

CAUTION: Hot-plug power supplies for the server are keyed to be sure that only 800-W hot-plug power supplies can be installed in the server. The handles on 800-W power supplies are black to distinguish them from other power supplies.

To remove a hot-plug power supply:

1. Remove the power supply shipping screw from the bottom of the server, if installed.
2. Press the lever-release button on the handle of the power supply.
3. Pull on the lever to release the power supply.
4. Remove the power supply from the server.

Figure 26 Removing a hot-plug power supply



Reverse the steps to replace the hot-plug power supply.

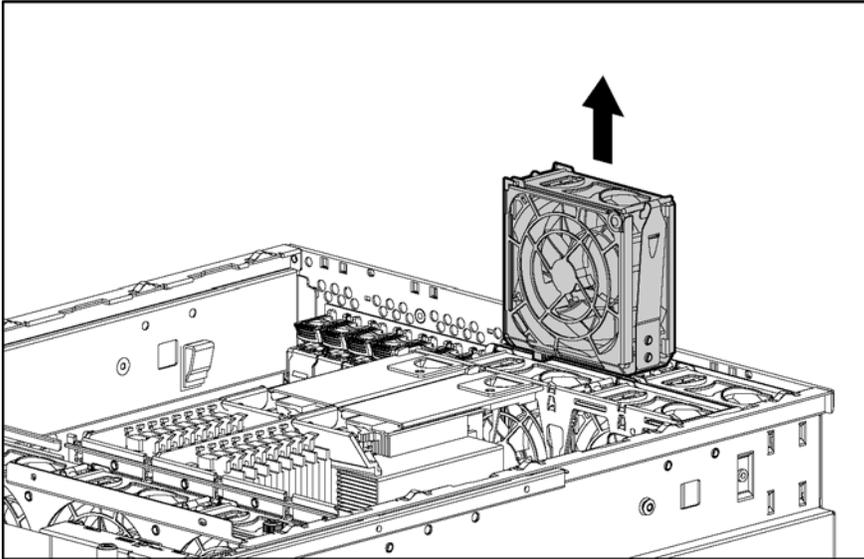
Hot-plug fans

The server supports redundant hot-plug fans in a 7+1 configuration.

To replace a hot-plug fan:

1. Extend the server from the rack. See “Extending the server from the rack” earlier in this chapter.
2. Remove the access panel. See “Removing the access panel” earlier in this chapter.
3. Identify the nonfunctioning fan by looking for an amber LED on the QuickFind diagnostic display or on the failed fan.
4. Remove the nonfunctioning fan.

Figure 27 Removing a hot-plug fan



5. Install the fan.
6. Be sure that the LED on the fan is green.
7. Reinstall the access panel.
8. Restore the server to its operating position in the rack.

CAUTION: Do not operate the server for extended periods without the access panel installed. Operating the server without the access panel results in improper airflow that can lead to thermal damage.

For information on hot-plug fan diagnosis, see “Hot-plug fans” in Chapter 4, “Server component identification.”

Universal media drives

To remove a universal media drive:

1. Power down the server. See “Powering down the server” earlier in this chapter.
2. Use the Torx T-15 tool to press the appropriate ejection button, and pull the universal media drive out of the universal media bay. See “Locating and removing the Torx T-15 tool” earlier in this chapter.

Figure 28 Removing a drive from bay 1

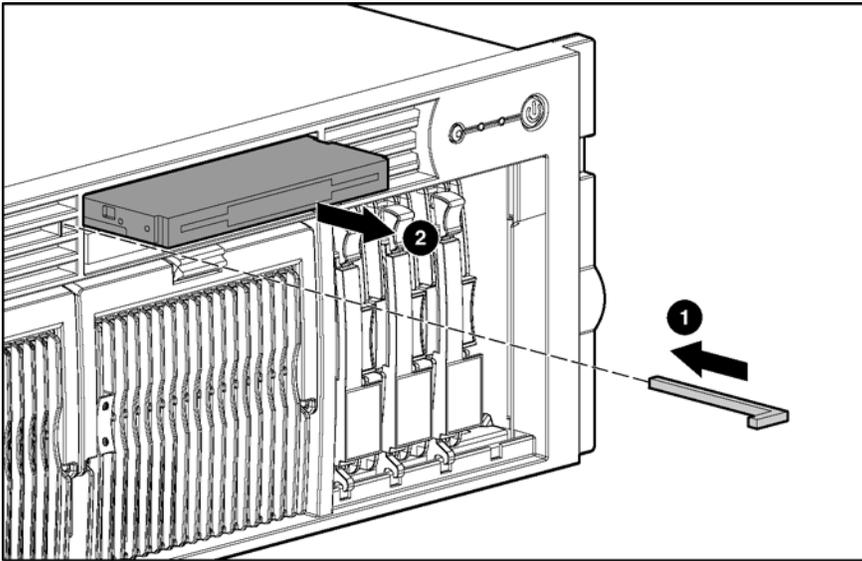
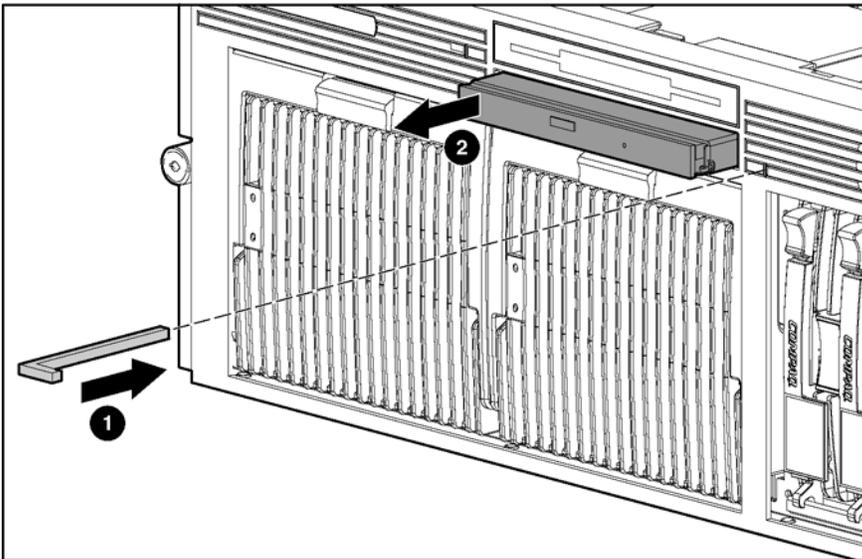


Figure 29 Removing a drive from bay 2



To replace a universal media drive, slide the drive into the slot until it engages the connector.



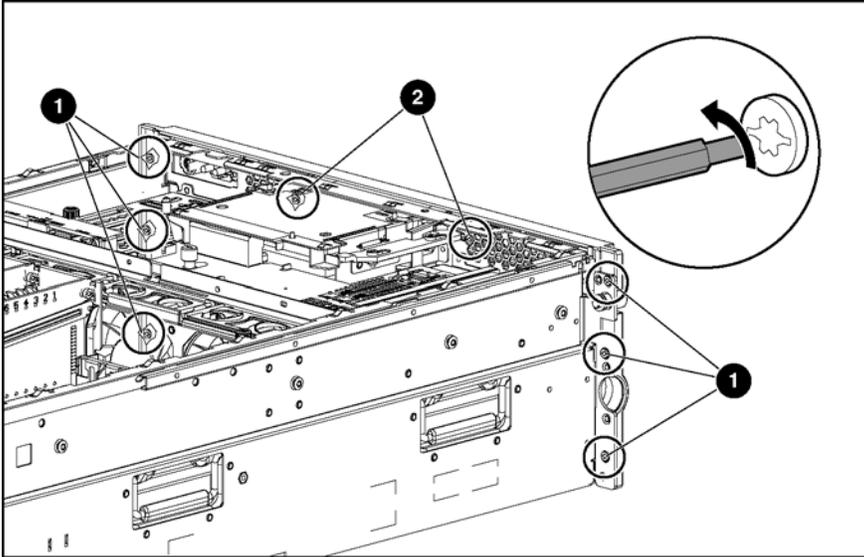
IMPORTANT: For the diskette drive to be bootable, it must be installed in the top universal media drive bay. For the CD-ROM or DVD-ROM drive to be bootable, it must be installed in the bottom universal media drive bay.

Front bezel

To remove the front bezel:

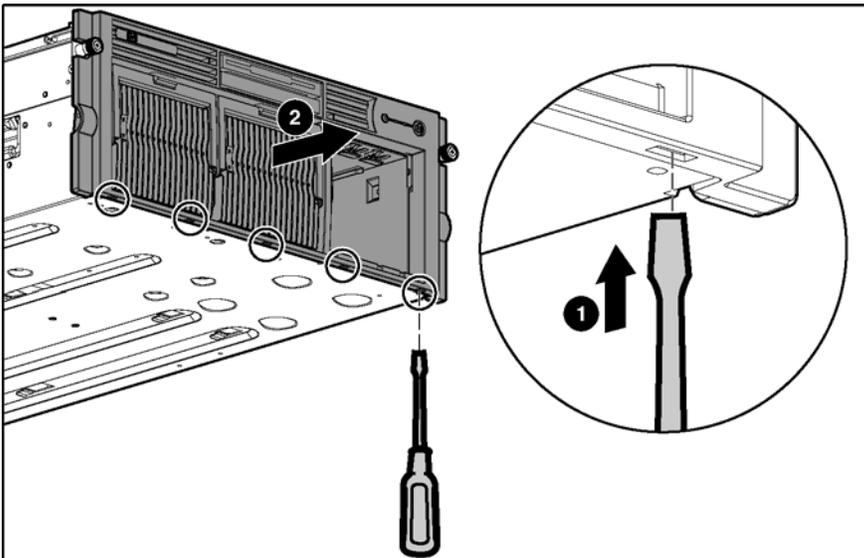
1. Power down the server. See “Powering down the server” earlier in this chapter.
2. Extend the server from the rack. See “Extending the server from the rack” earlier in this chapter.
3. Remove the access panel. See “Removing the access panel” earlier in this chapter.
4. Using the T-15 Torx tool, remove the six screws on the exterior of the chassis and the two screws on the interior of the chassis next to the universal media drive bays.

Figure 30 Removing the exterior and interior chassis screws



5. Using a flathead screwdriver, disengage the locking tabs on the bezel from under the chassis.
6. Remove the front bezel.

Figure 31 Disengaging the locking tabs and removing the front bezel



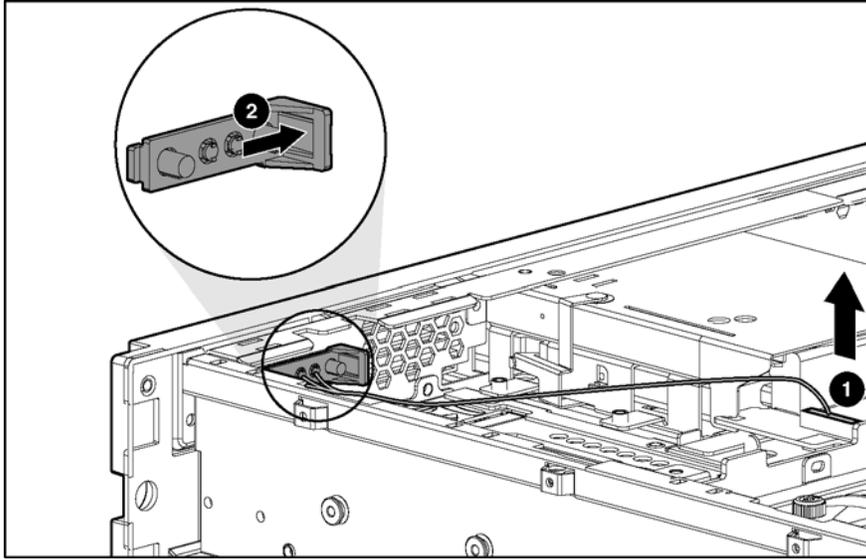
Reverse the steps to replace the front bezel.

Power button/LED assembly

To remove the power button/LED assembly:

1. Power down the server. See “Powering down the server” earlier in this chapter.
2. Extend the server from the rack. See “Extending the server from the rack” earlier in this chapter.
3. Remove the access panel. See “Removing the access panel” earlier in this chapter.
4. Unplug the cable from the diagnostic display board.
5. Push the locking tab until the opposite side comes out.

Figure 32 Removing the power button/LED assembly



Reverse the steps to replace the power button/LED assembly.

Expansion boards

The server supports the installation of PCI and PCI-X expansion boards.

- PCI 33 MHz and 66 MHz
- PCI-X 66 MHz, 100 MHz, and 133 MHz

Figure 33 PCI-X expansion slots and buses

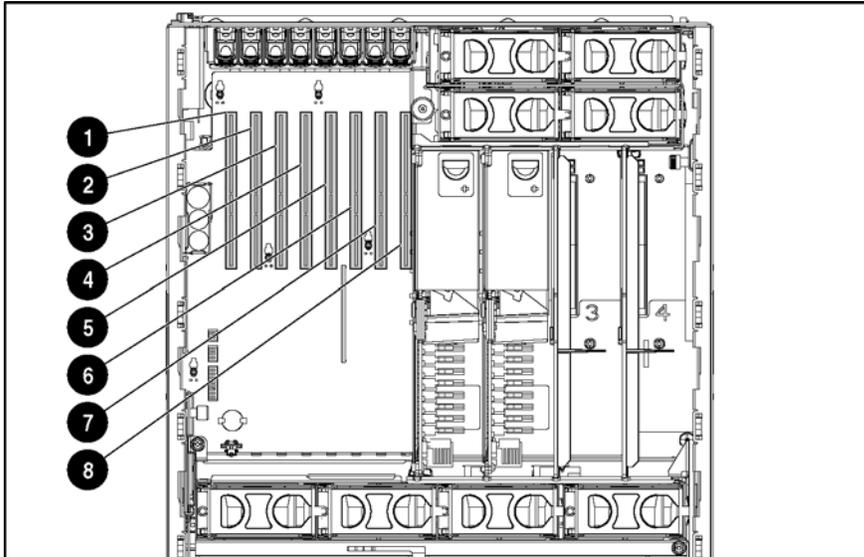


Table 6 PCI-X expansion slots and buses

Item	Slot	Bus	Description
1	Slot 1	Fifth bus	133 MHz
2	Slot 2	Sixth bus	133 MHz
3	Slot 3	Seventh bus	100 MHz
4	Slot 4	Seventh bus	100 MHz
5	Slot 5	Eighth bus	100 MHz
6	Slot 6	Eighth bus	100 MHz
7	Slot 7	Third bus	100 MHz
8	Slot 8	Third bus	100 MHz

NOTE: All PCI-X slots are 64-bit, 3.3-V keyed.

Performance balancing

Balancing is the paired arrangement of expansion boards for optimal performance based on the bus architecture of the expansion slots. Properly balancing the boards across buses can improve performance. To balance expansion boards:

- Populate slots 1 and 2 with 133-MHz PCI-X boards.
- Populate slots 3 through 8 with 100-MHz PCI-X boards.
- Populate slots across different buses before populating two slots on the same bus.

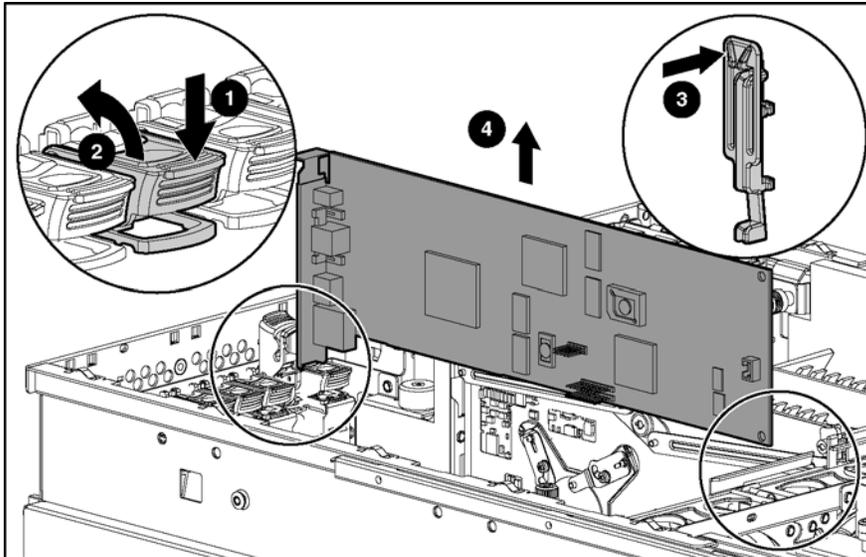
For more information about PCI-X bus architecture and numbering, see the white paper, *PCI Bus Numbering in a Windows NT Environment*, on the HP website at <http://www.hp.com>.

PCI-X expansion boards

To remove a PCI-X expansion board:

1. Power down the server. See “Powering down the server” earlier in this chapter.
2. Extend the server from the rack. See “Extending the server from the rack” earlier in this chapter.
3. Remove the access panel. See “Removing the access panel” earlier in this chapter.
4. Disconnect any cables connected to the expansion boards.
5. Press the PCI-X retaining clip toward the front of the server to lock it in the open position.
6. Press down on the expansion slot latch to release it.
7. Open the latch.
8. Remove the board from the slot.

Figure 34 Removing an expansion board



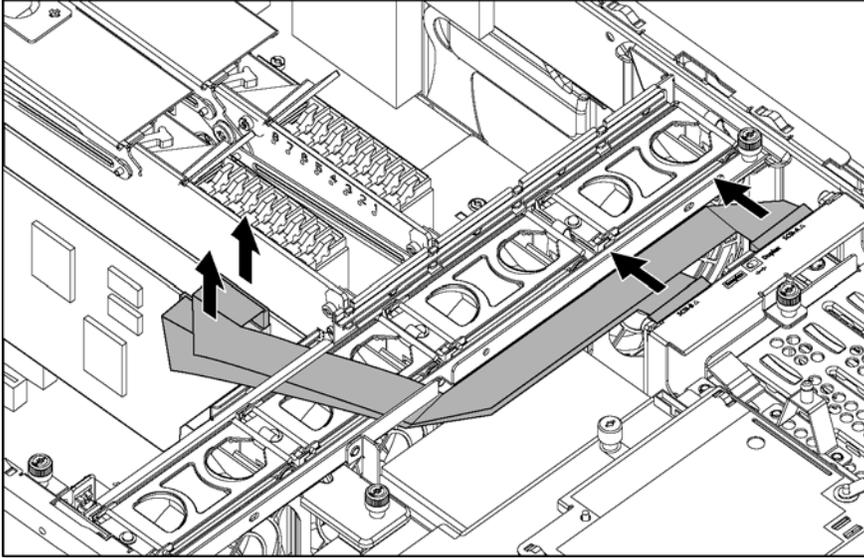
Reverse the steps to replace an expansion board.

SCSI cables

To remove the SCSI cables:

1. Power down the server. See “Powering down the server” earlier in this chapter.
2. Extend the server from the rack. See “Extending the server from the rack” earlier in this chapter.
3. Remove the access panel. See “Removing the access panel” earlier in this chapter.
4. Disconnect the SCSI cables from the SCSI backplane.
5. Disconnect the SCSI cables from the PCI-X expansion boards.

Figure 35 Disconnecting the SCSI cables



Reverse the steps to replace or install the SCSI cables.

Front fan cage

To remove the front fan cage:

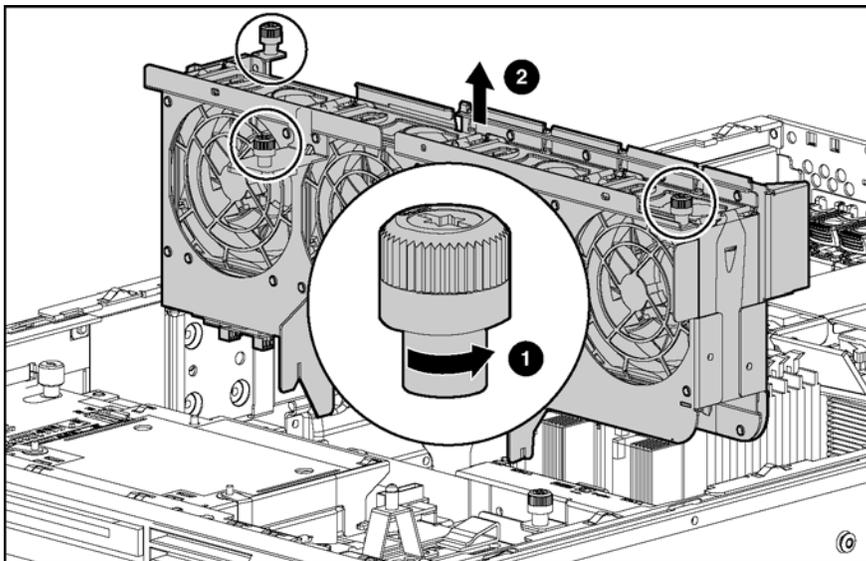
1. Power down the server. See “Powering down the server” earlier in this chapter.
2. Extend the server from the rack. See “Extending the server from the rack” earlier in this chapter.
3. Remove the access panel. See “Removing the access panel” earlier in this chapter.
4. Remove the processor memory boards. See “Processor memory boards” earlier in this chapter.
5. Remove the PCI-X expansion boards. See “PCI-X expansion boards” earlier in this chapter.
6. Remove the SCSI cables. See “SCSI cables” earlier in this chapter.
7. Loosen the three thumbscrews that secure the front fan cage to the chassis .



NOTE: It is not necessary to remove the fans before removing the fan cage. The fan cage can be removed with the fans installed.

8. Remove the hot-plug fans in the front fan cage. See “Hot-plug fans” earlier in this chapter.
9. Lift the front fan cage from the chassis .

Figure 36 Removing the front fan cage



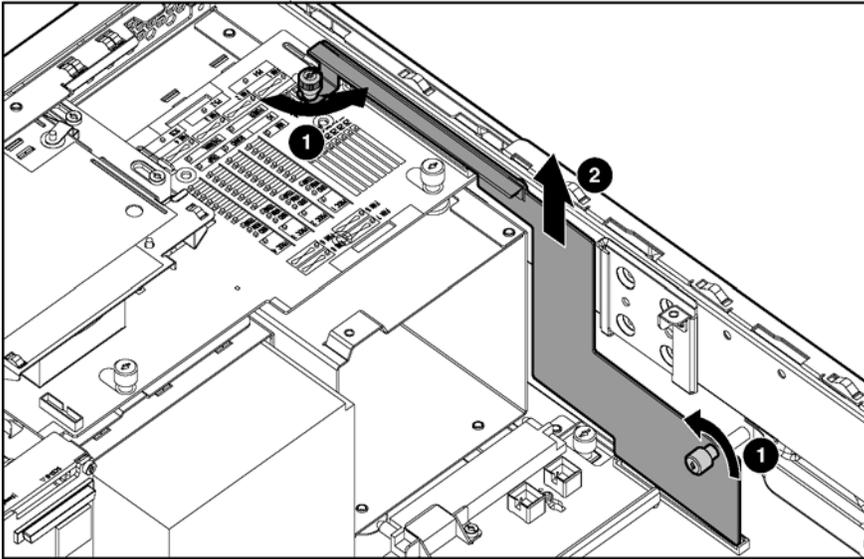
Reverse the steps to replace the front fan cage.

Pass-through board

To remove the pass-through board:

1. Power down the server. See “Powering down the server” earlier in this chapter.
2. Extend the server from the rack. See “Extending the server from the rack” earlier in this chapter.
3. Remove the access panel. See “Removing the access panel” earlier in this chapter.
4. Remove the processor memory boards. See “Processor memory boards” earlier in this chapter.
5. Remove the PCI-X expansion boards. See “PCI-X expansion boards” earlier in this chapter.
6. Remove the SCSI cables. See “SCSI cables” earlier in this chapter.
7. Remove the front fan cage. See “Front fan cage” earlier in this chapter.
8. Loosen the two thumbscrews that secure the pass-through board to the diagnostic display board and the side chassis wall . You might need to use a Torx T-15 screwdriver.
9. Lift the pass-through board straight up and out of the chassis .

Figure 37 Removing the pass-through board



Reverse the steps to replace the pass-through board.



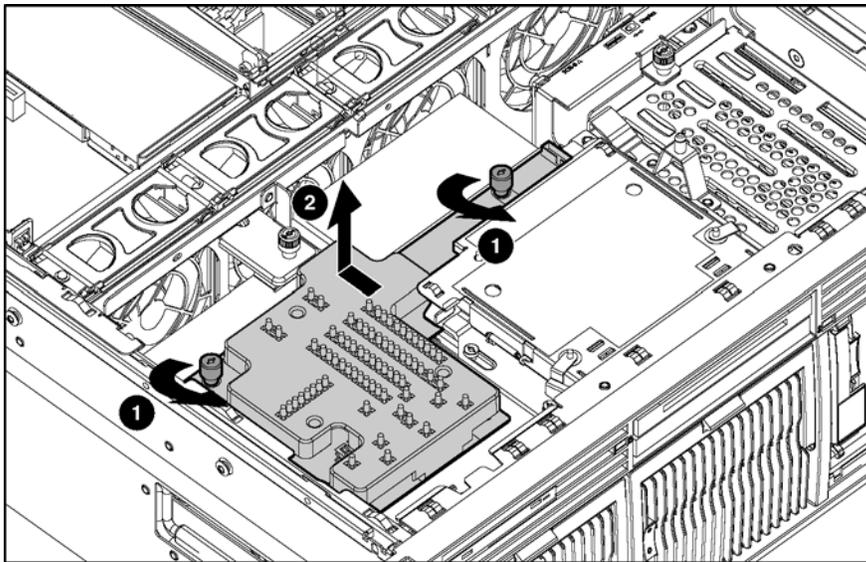
NOTE: Align the board with connectors on both ends and press simultaneously when installing.

QuickFind diagnostic display board and lightpipe

To remove the QuickFind diagnostic display board and lightpipe:

1. Power down the server. See “Powering down the server” earlier in this chapter.
2. Extend the server from the rack. See “Extending the server from the rack” earlier in this chapter.
3. Remove the access panel. See “Removing the access panel” earlier in this chapter.
4. Remove the processor memory boards. See “Processor memory boards” earlier in this chapter.
5. Remove the PCI-X expansion boards. See “PCI-X expansion boards” earlier in this chapter.
6. Remove the SCSI cables. See “SCSI cables” earlier in this chapter.
7. Remove the front fan cage. See “Front fan cage” earlier in this chapter.
8. Remove the pass-through board. See “Pass-through board” earlier in this chapter.
9. Eject all devices from the universal media drive bays. See “Universal media drives” earlier in this chapter.
10. Unplug the Power button/LED cable. See “Power button/LED assembly” earlier in this chapter.
11. Loosen the two thumbscrews holding the diagnostic display board.
12. Slide the board to the rear of the unit until it stops, and then lift it up.

Figure 38 Removing the QuickFind diagnostic display board and lightpipe



13. Lift the board out gently, being careful of the universal media drive bay connector. Reverse the steps to replace the diagnostic display board and lightpipe.

Rear fan cage

To remove the rear fan cage:

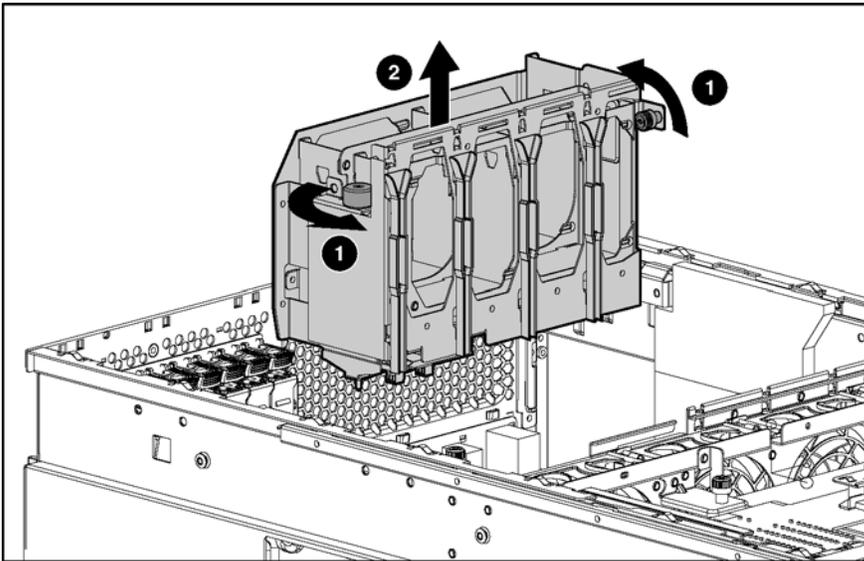
1. Power down the server. See “Powering down the server” earlier in this chapter.
2. Extend the server from the rack. See “Extending the server from the rack” earlier in this chapter.
3. Remove the access panel. See “Removing the access panel” earlier in this chapter.
4. Remove the processor memory boards. See “Processor memory boards” earlier in this chapter.



NOTE: It is not necessary to remove the fans before removing the fan cage. The fan cage can be removed with the fans installed.

5. Loosen the two thumbscrews that secure the rear fan cage to the chassis .
6. Remove the rear fan cage from the chassis .

Figure 39 Removing the rear fan cage



Reverse the steps to replace the rear fan cage.

BBWC assembly



IMPORTANT: The Battery-Backed Write Cache Enabler (BBWCE) and the 5i Plus BBWC Module **must** be removed together with the cable connected to save the data in the cache. Unplugging the cable deletes all the data in the cache.

To remove the BBWC assembly:

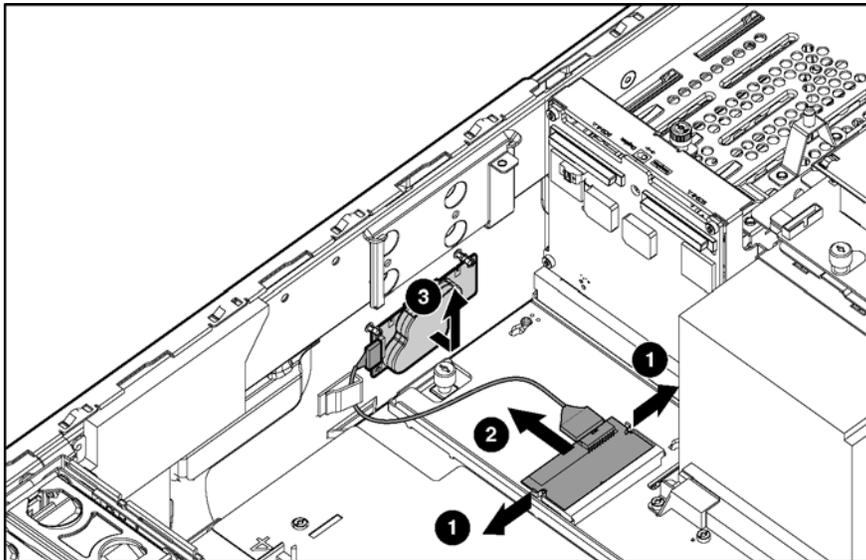
1. Power down the server. See “Powering down the server” earlier in this chapter.
2. Extend the server from the rack. See “Extending the server from the rack” earlier in this chapter.
3. Remove the access panel. See “Removing the access panel” earlier in this chapter.
4. Remove the processor memory boards. See “Processor memory boards” earlier in this chapter.
5. Remove the SCSI cables. See “SCSI cables” earlier in this chapter.
6. Remove the PCI-X expansion boards. See “PCI-X expansion boards” earlier in this chapter.
7. Remove the front fan cage. See “Front fan cage” earlier in this chapter.
8. Remove the 5i Plus BBWC Module.



CAUTION: Do not disconnect the cable connecting the BBWCE and the 5i Plus BBWC Module. Unplugging the cable deletes all the data in the cache.

9. Remove the BBWCE.

Figure 40 Removing the BBWCE and 5i Plus BBWC Module



Reverse the steps to replace the BBWCE and 5i Plus BBWC Module.

SCSI backplane

To remove the SCSI backplane:

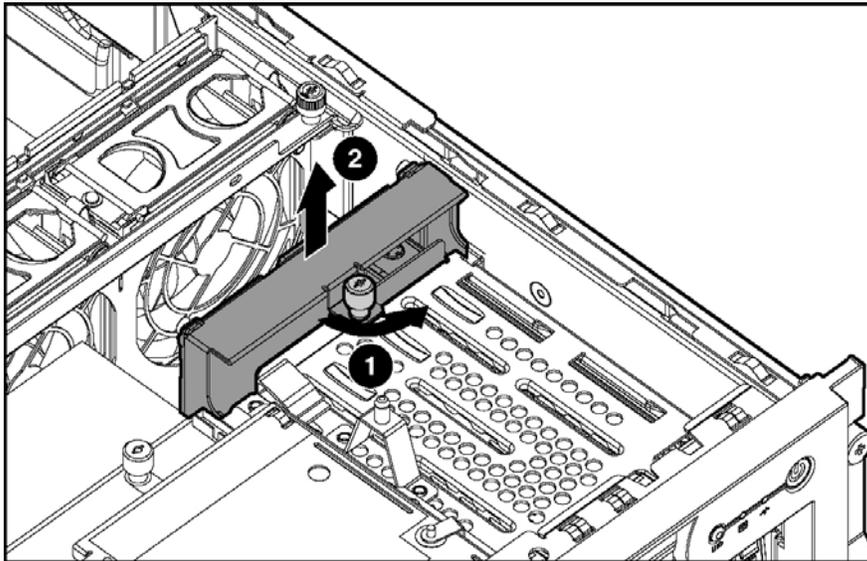
1. Extend the server from the rack. See “Extending the server from the rack” earlier in this chapter.
2. Power down the server. See “Powering down the server” earlier in this chapter.
3. Unseat all the hot-plug SCSI hard drives, and pull them away from the SCSI backplane. See “Hot-plug SCSI hard drives” earlier in this chapter.



NOTE: If you plan to take the hard drives out of the drive cage, label them so that they will be installed in the same slot.

4. Remove the access panel. See “Removing the access panel” earlier in this chapter.
5. Disconnect any SCSI cables from the SCSI backplane. See “SCSI cables” earlier in this chapter.
6. Loosen the thumbscrew.
7. Remove the SCSI backplane from the chassis.

Figure 41 Removing the SCSI backplane



Reverse the steps to replace the SCSI backplane.

System battery

- ⚠ WARNING!** This server contains an internal lithium manganese dioxide or vanadium pentoxide battery. A risk of fire and burns exists if the battery 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 (140°F)

- ⚠ CAUTION:** Do not dispose of batteries, battery packs, and accumulators with the general household waste. To forward them to recycling or proper disposal, use the public collection system or return them to either HP or an authorized service provider.

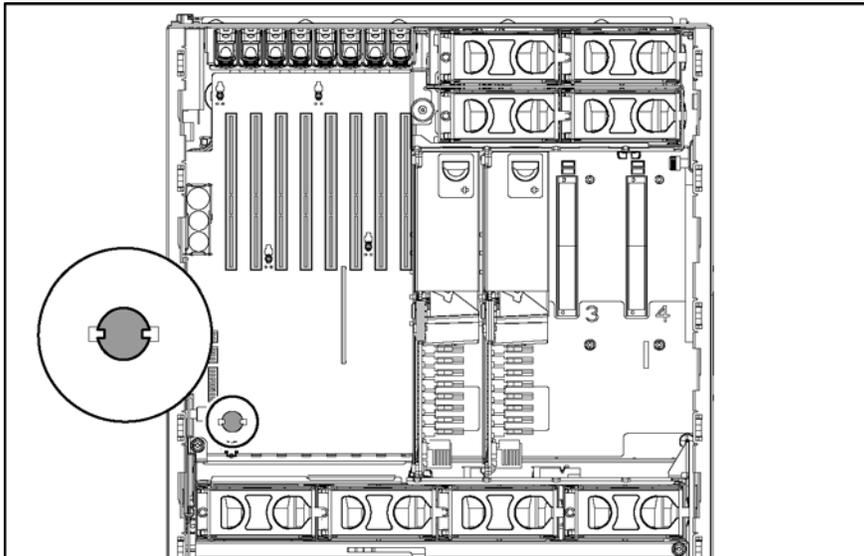
To remove the battery:

1. Power down the server. See “Powering down the server” earlier in this chapter.
2. Extend the server from the rack. See “Extending the server from the rack” earlier in this chapter.
3. Remove the access panel. See “Removing the access panel” earlier in this chapter.
4. Locate the battery on the system board.



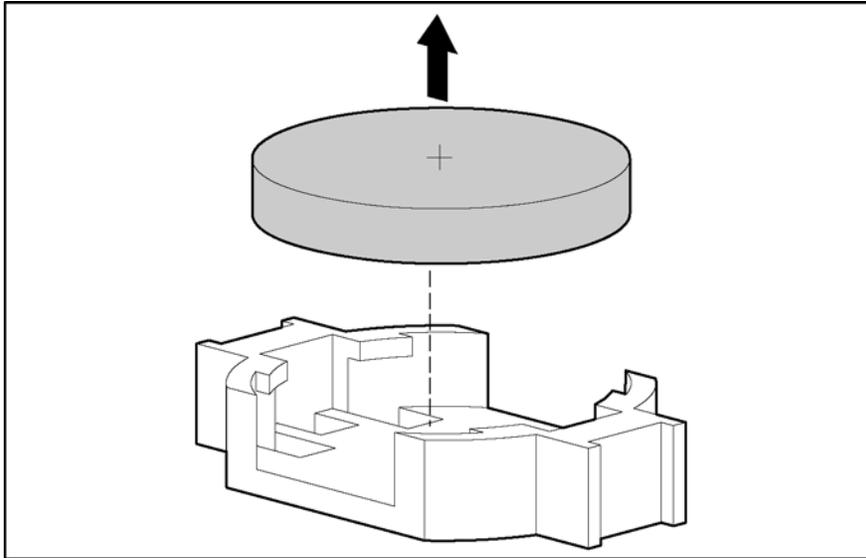
NOTE: It might be necessary to remove some PCI-X expansion boards to gain access to the battery.

Figure 42 Locating the battery on the system board



5. Remove the existing battery.

Figure 43 Removing the battery from the system board



6. Install the new battery.
7. Install the access panel.
8. Restore the server to its operating position in the rack.
9. Run RBSU to reconfigure the system if the settings were lost.

System board

To remove the system board:

1. Power down the server. See “Powering down the server” earlier in this chapter.
2. Remove all power supplies. See “Hot-plug power supply” earlier in this chapter.

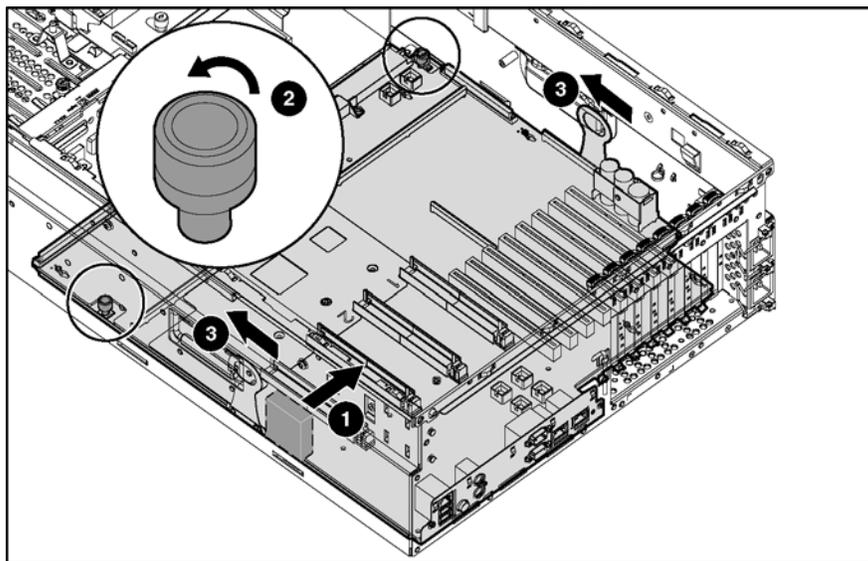


NOTE: Label the individual hard drives before pulling them out.

3. Remove all the hot-plug SCSI hard drives. See “Hot-plug SCSI hard drives” earlier in this chapter.
4. Extend the server from the rack. See “Extending the server from the rack” earlier in this chapter. Although not required, HP recommends removing the server from the rack for best performance. See “Removing the server from the rack” earlier in this chapter.
5. Remove the access panel. See “Removing the access panel” earlier in this chapter.
6. Remove the processor memory boards. See “Processor memory boards” earlier in this chapter.
7. Remove the SCSI cables. See “SCSI cables” earlier in this chapter.
8. Remove the PCI-X expansion boards. See “PCI-X expansion boards” earlier in this chapter.
9. Remove the front fan cage. See “Front fan cage” earlier in this chapter.
10. Remove the rear fan cage. See “Rear fan cage” earlier in this chapter.
11. Remove the pass-through board. See “Pass-through board” earlier in this chapter.
12. Remove the SCSI backplane. See “SCSI backplane” earlier in this chapter.
13. Remove the BBWC assembly. See “Battery-Backed Write Cache assembly” earlier in this chapter.

14. Remove the lower foam air baffle.
15. Unscrew the system board thumbscrews. It might be necessary to use the Torx tool located on the back of the server.
16. Slide the system board toward the front of the unit.

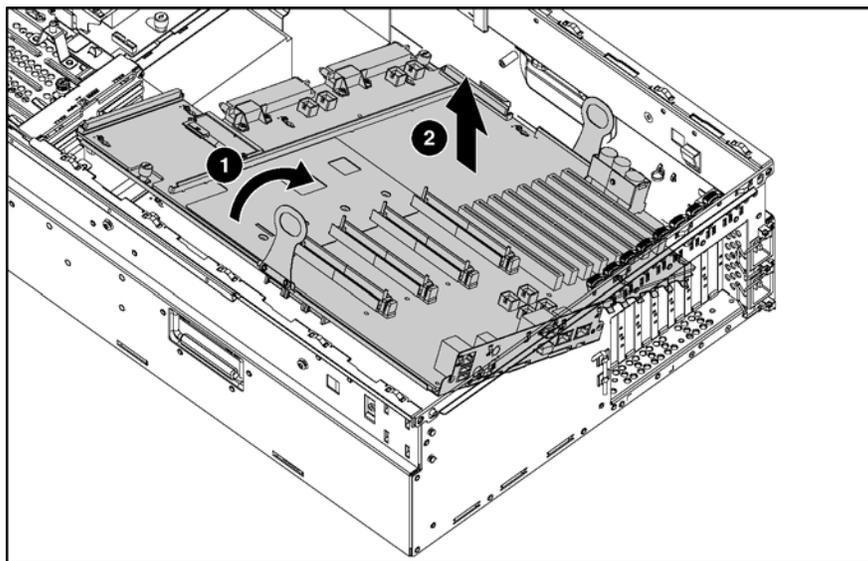
Figure 44 Unscrewing the thumbscrews and sliding the system board



IMPORTANT: When handling the system board, place your hands on the two handles only.

17. Grasping the two handles, lift the side with the processor memory board slots first, tilting the board to a 45° angle .
18. Lift the entire system board out of the chassis .
19. Compare the switch settings on the old board against the settings in Chapter 4 to be sure that they are in the correct positions.

Figure 45 Removing the system board from the chassis



Reverse the steps to replace the system board.



IMPORTANT: The server serial number must be re-entered through RBSU after replacing the system board. See the “Re-entering the server serial number” section in this chapter.

AC filter cable assembly

The AC filter cable assembly consists of two cables leading from separate power supply input connectors near the front of the chassis and ending in an AC filter and inlets at the rear of the chassis.

To remove the AC filter cable:

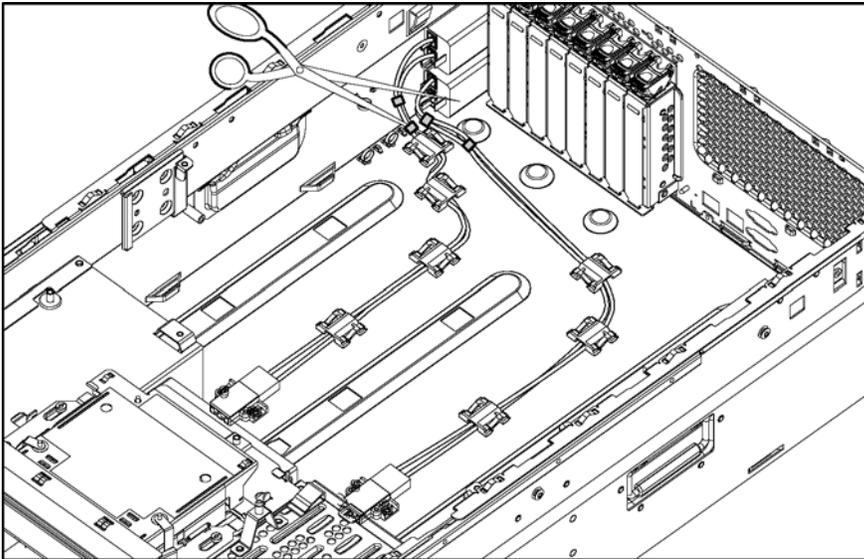
1. Power down the server. See "Powering down the server" earlier in this chapter.
2. Remove all power supplies. See "Hot-plug power supply" earlier in this chapter.



NOTE: Label the individual hard drives before pulling them out.

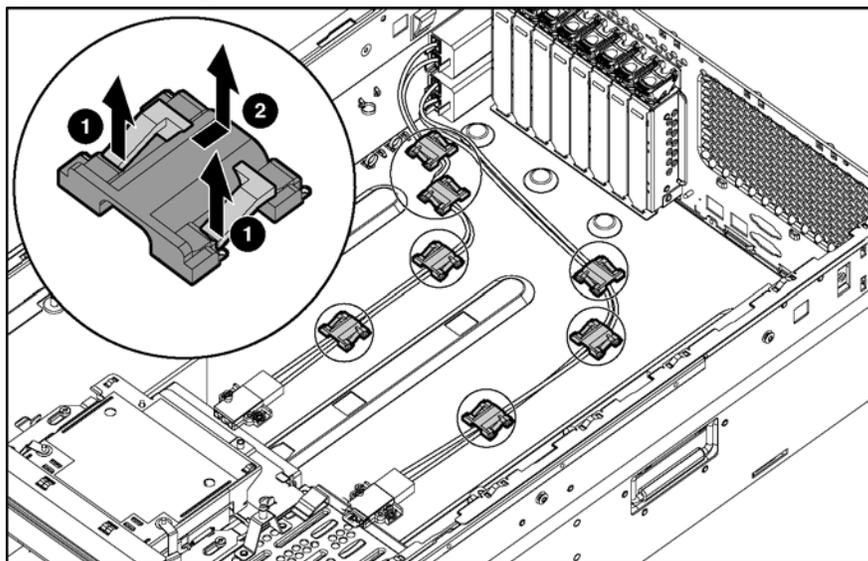
3. Remove all the hot-plug SCSI hard drives. See "Hot-plug SCSI hard drives" earlier in this chapter.
4. Extend the server from the rack. See "Extending the server from the rack" earlier in this chapter. Although not required, HP recommends removing the server from the rack for best performance. See "Removing the server from the rack" earlier in this chapter.
5. Remove the access panel. See "Removing the access panel" earlier in this chapter.
6. Remove the processor memory boards. See "Processor memory boards" earlier in this chapter.
7. Remove the SCSI cables. See "SCSI cables" earlier in this chapter.
8. Remove the PCI-X expansion boards. See "PCI-X expansion boards" earlier in this chapter.
9. Remove the front fan cage. See "Front fan cage" earlier in this chapter.
10. Remove the rear fan cage. See "Rear fan cage" earlier in this chapter.
11. Remove the pass-through board. See "Pass-through board" earlier in this chapter.
12. Remove the SCSI backplane. See "SCSI backplane" earlier in this chapter.
13. Remove the BBWC assembly. See "Battery-Backed Write Cache assembly" earlier in this chapter.
14. Remove the system board. See "System board" located earlier in this chapter.
15. Cut the four tie-wraps securing the AC filter cable to the chassis.

Figure 46 Cutting the cable tie-wraps



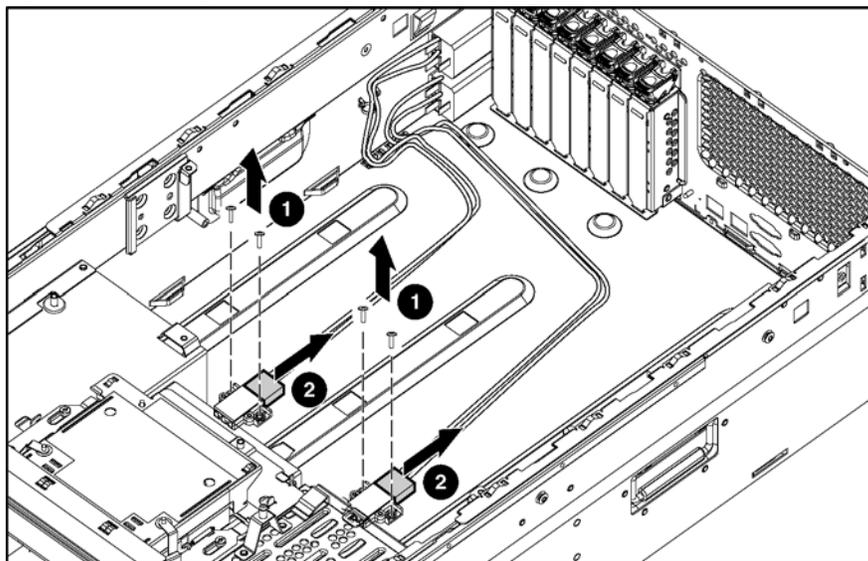
16. Remove the seven cable clips:
 - a. Lift to disengage the cable clip.
 - b. Slide the clip forward, and lift it off the chassis.

Figure 47 Removing the cable clips



17. Use the Torx T-15 tool or screwdriver to remove the eight screws that secure the power supply connectors to the chassis bottom .
18. Remove the cords from the connectors .
19. Remove the connectors from the server .

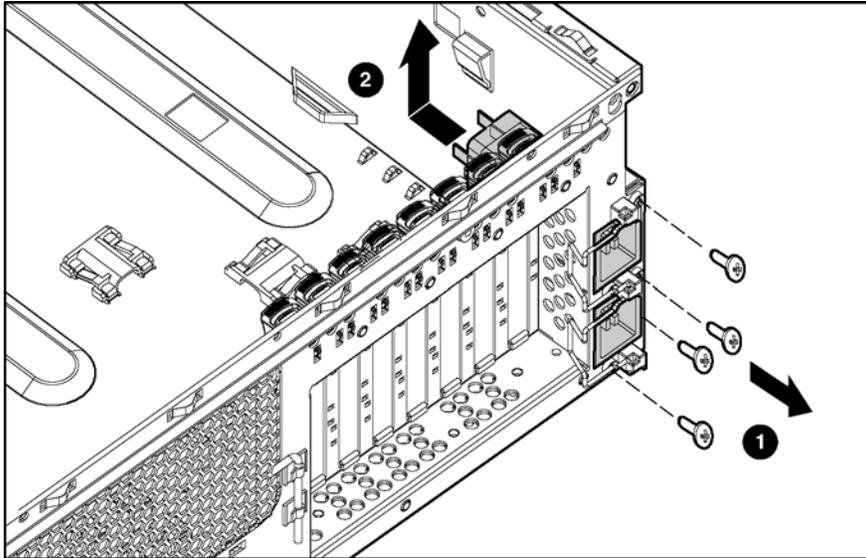
Figure 48 Removing the power supply connectors



20. Use the Torx T-15 tool or a screwdriver to remove the four screws that secure the AC filter cable assembly to the rear chassis wall.

21. Slide the assembly into the chassis, and then lift the assembly out of the chassis .

Figure 49 Removing the AC filters



Reverse the steps to replace the AC filter cable assembly.

Re-entering the server serial number

After replacing the system board or clearing the NVRAM, re-enter the server serial number.

1. To access RBSU, press the **F9** key when prompted during POST.
2. Select the **System Options** menu.
3. Select **Serial Number**. The following warning appears:

```
WARNING! WARNING! WARNING! The serial number is loaded into the system during the
manufacturing process and should NOT be modified. This option should ONLY be used
by qualified service personnel. This value should always match the serial number
sticker located on the chassis.
```

Press the **Enter** key to clear the warning.

4. Enter the serial number, and press the **Enter** key.
5. Press the **Escape** key to close the menu.
6. Press the **Escape** key to exit RBSU.
7. Press the **F10** key to confirm exiting RBSU. The server automatically reboots.

4 Diagnostic tools

Table 7 Diagnostic tools

Tool	Description	How to run the tool
Array Diagnostics Utility (ADU)	ADU is designed to run on all ProLiant systems that support HP array controllers. ADU collects information about the array controllers in the system and generates a list of detected problems.	For a list of HP servers that support ADU, follow the support link on product website at http://www.hp.com . For a complete list of ADU error messages, see the <i>HP Servers Troubleshooting Guide</i> .
Automatic Server Recovery-2 (ASR-2)	ASR-2 automatically restarts the server after a catastrophic operating system failure. With ASR-2, you have two recovery options: <ul style="list-style-type: none"> • Available Recovery provides software error recovery and environmental recovery. • Unattended Recovery logs the error information to the IML, resets the server, and tries to restart the operating system. 	Run RBSU and set ASR-2 to enable this tool.
Diagnostics	Diagnostics tests and verifies operation of HP hardware. If Diagnostics finds a hardware failure, it isolates the replaceable part, if possible.	Access Diagnostics when POST detects a system configuration error. For a complete list of POST error messages, see the <i>HP Servers Troubleshooting Guide</i> . Diagnostics can be run from the SmartStart CD or downloaded by following the support link on the product website at http://www.hp.com .
Integrated Lights-Out (iLO)	iLO is a remote management port that can be accessed through a dedicated Lights-Out port on the rear panel of the server. Accessed through a standard browser from anywhere, the iLO capabilities will not require any unique software applications to use.	For more information on iLO, see the Integrated Lights-Out user guide on the Documentation CD.
Survey utility	The survey utility gathers critical hardware and software information on servers running Microsoft® Windows®, or Linux operating systems. If a significant change occurs between data-gathering intervals, the survey utility marks the previous information and overwrites the survey text files to reflect the latest changes in the configuration.	Install the survey utility from the SmartStart CD, the Integration Maintenance Utility, or the Management CD.
Integrated Management Log (IML)	The IML is a log of system events such as system failures or nonfatal error conditions. View events in the IML from within: <ul style="list-style-type: none"> • Insight Manager 7 • Survey utility • Operating system-specific IML utilities 	The IML requires HP operating system management drivers. See the SmartStart CD for instructions on installing the appropriate drivers.

Table 7 Diagnostic tools

Tool	Description	How to run the tool
ROM-Based Setup Utility (RBSU)	RBSU configures the hardware installed in or connected to the server. Specifically, it can perform the following tasks: <ul style="list-style-type: none">• Store configuration information in nonvolatile memory• Manage memory installation, processor upgrades, network interface cards and mass storage devices• Assist in installing an operating system• Configure ports and IRQs, if required	Run RBSU by pressing the F9 key during POST.
ROMPaq Utility	The ROMPaq Utility analyzes the system and provides a choice of available ROM revisions and controller firmware.	Run this utility from the SmartStart CD included with the server.

5 Server component identification

This chapter explains the location and function of system connectors, internal and external LEDs, and system switches.

Connectors

Use this section to identify system connectors for service procedures.

Rear panel

Figure 50 Rear panel components

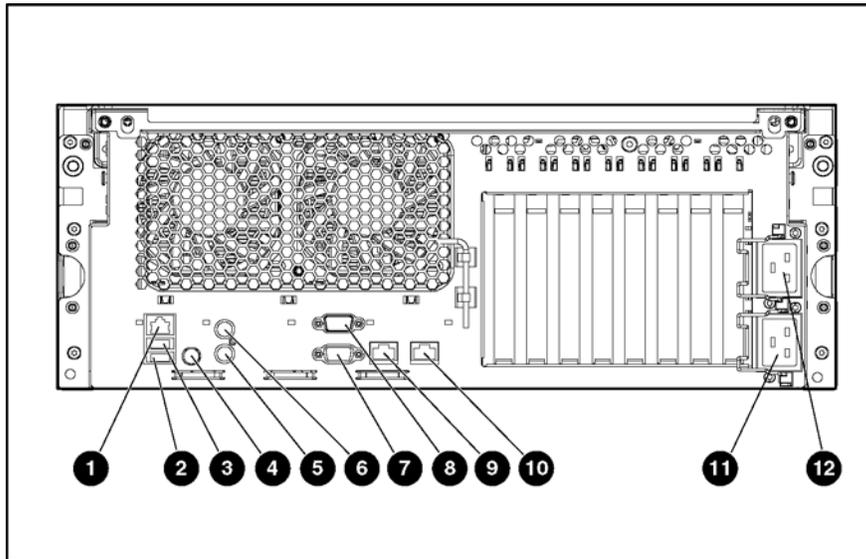


Table 8 Rear panel components

Item	Description
1	Integrated Lights-Out Manager connector
2	USB connector 1
3	USB connector 2
4	Rear init identification button and LED
5	Keyboard connector
6	Mouse connector
7	Video connector
8	Serial connector
9	NIC 2
10	NIC 1
11	AC inlet 1(primary)
12	AC inlet 2 (optional)

SCSI backplane

Figure 51 SCSI backplane board connectors

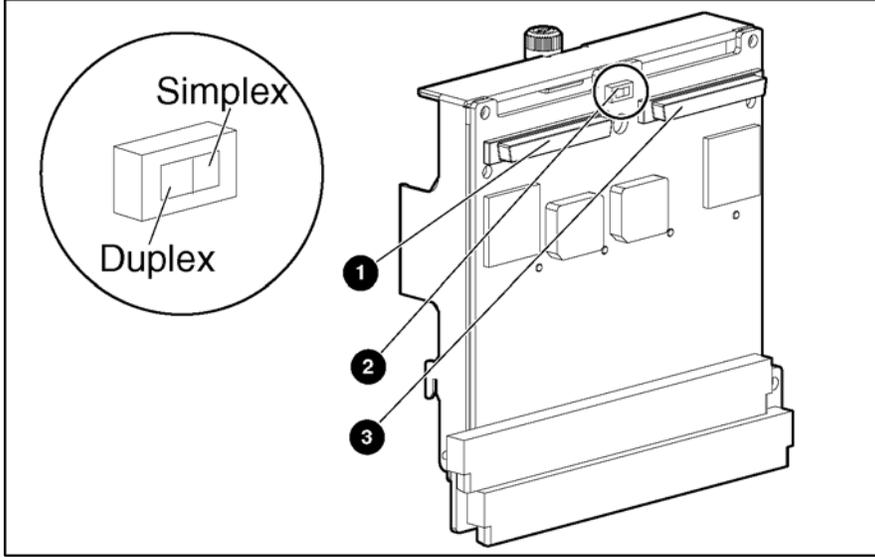


Table 9 SCSI backplane board connectors

Item	Description
1	SCSI channel A
2	SCSI simplex/duplex switch (default = duplex)
3	SCSI channel B

DIMM slots

Figure 52 DIMM slots

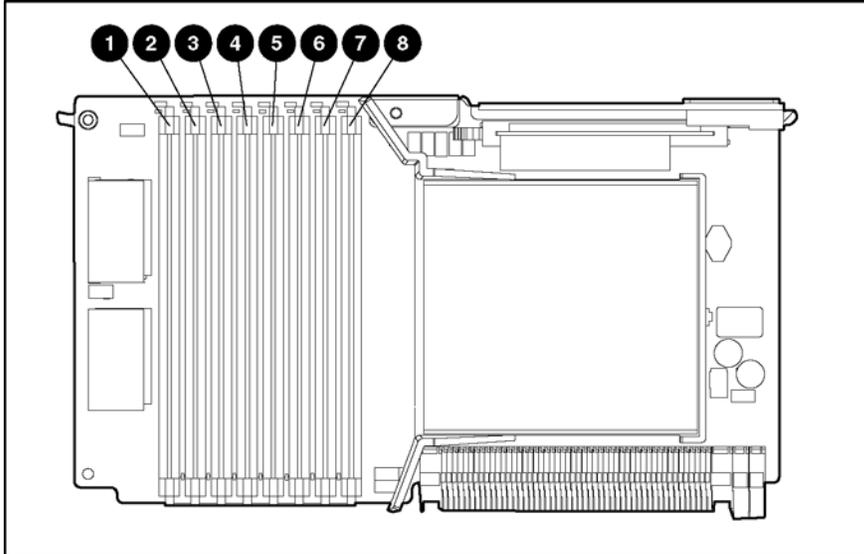


Table 10 Processor memory board memory banks

Slot	Bank
1-2	Bank 1
3-4	Bank 2
5-6	Bank 3
7-8	Bank 4

Processor and PPM

Figure 53 Processor and PPM

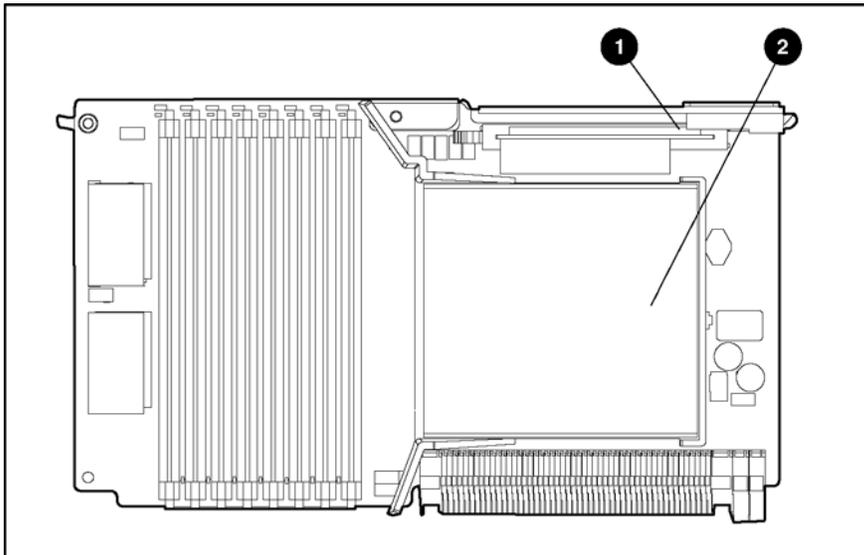


Table 11 Processor and PPM

Item	Description
1	PPM
2	Processor and heatsink

LEDs

The server contains several sets of LEDs that indicate the status and settings of hardware components.

Front panel

Figure 54 Front panel LEDs

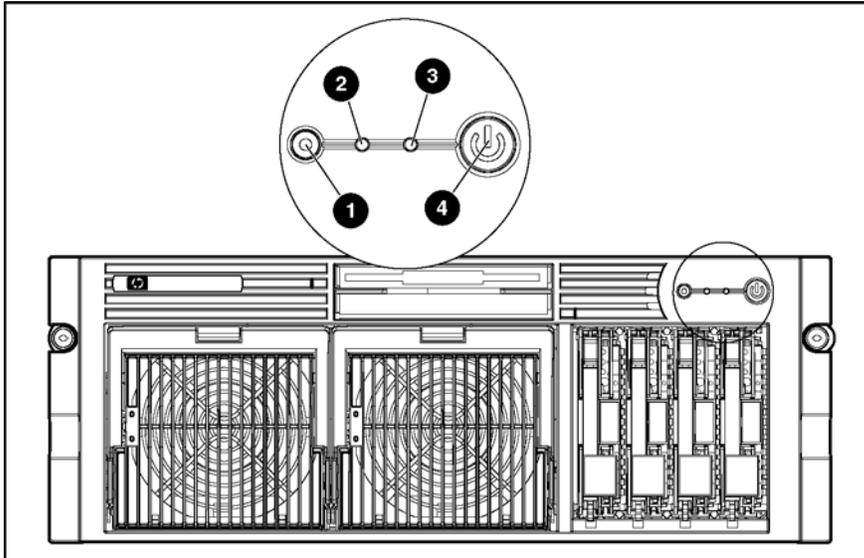


Table 12 Front panel LEDs

Item	Description	Status
1	Unit ID	Blue = Activated Blue flashing = System being managed remotely Off = Deactivated
2	Internal health	Green = Normal Red = System critical Amber = System degraded Off = System off
3	External health	Green = Normal Red = Critical power supply failure Amber = Redundant power supply failure Off = System off
4	Power	Green = On Amber = Off (auxiliary power only) Off = Power cord not attached to the server or power supply failure

QuickFind diagnostic display

Figure 55 QuickFind diagnostic display LEDs

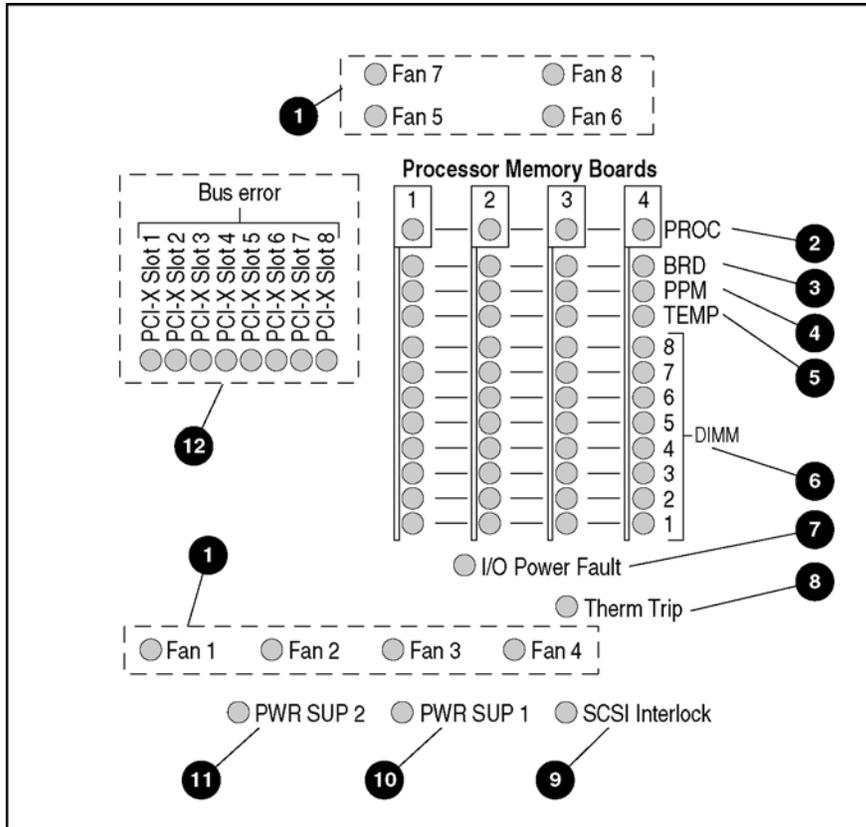


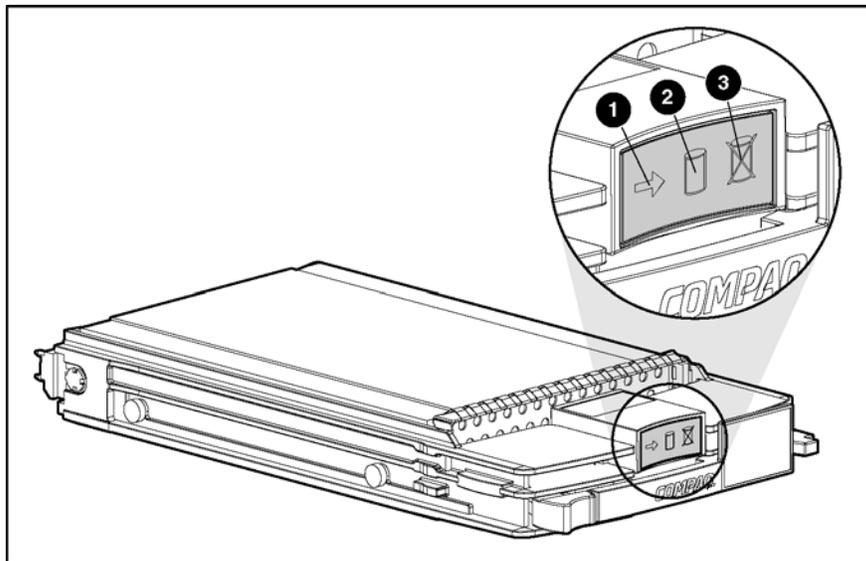
Table 13 Quickfind diagnostic display LEDs

Item	Description	Status	Action
1	Fan	Off = Normal On = Attention required	Be sure the fan is installed and seated properly. If the fan is installed and seated properly, replace the fan.
2	Processor	Off = Normal On = Attention required	Processor pre-failure notification. Inspect the IML logs, POST messages, or both. The processor might need to be replaced.
3	Processor memory board	Off = Normal On = Attention required	Processor memory board power failure. If the problem persists, replace the processor memory board.
4	PPM	Off = Normal On = Attention required	PPM power failure. If the problem persists, replace the PPM. If the PPM and the BRD LEDs are both on, there is a configuration error.
5	Temperature	Off = Normal On = Attention required	One or more components have experienced an elevated temperature or a thermal shutdown. A thermal shutdown is indicated by the Therm Trip LED. Be sure that the processor heatsink is properly attached. Be sure that no 1.7-inch DIMMs are installed that prevent airflow across the processor heatsink. Be sure that the correct DIMMs (1.2 inches tall) are installed. Be sure that all fans are installed and working properly. Be sure that the server environment meets posted requirements. For information about server environment requirements see the <i>HP ProLiant DL585 Server User Guide</i> on the documentation CD or at http://www.hp.com/support .
6	DIMM	Off = Normal On = Attention required	DIMM failure or configuration error. See the IML or POST messages.

Table 13 Quickfind diagnostic display LEDs

Item	Description	Status	Action
7	I/O power fault	Off = Normal On = Attention required	A power fault on the system I/O board occurred. If the problem persists, replace the system I/O board.
8	Therm trip	Off = Normal On = Attention required	The server experienced a thermal shutdown. If one of the CPU thermal LEDs is amber, that CPU experienced an overtemperature condition. Be sure that the processor heatsink is properly attached. For more information, see Chapter 5, "Troubleshooting." Be sure that no 1.7-inch DIMMs are installed that prevent airflow across the processor heatsink. Be sure that the correct DIMMs (1.2 inches tall) are installed. Be sure that all fans are installed and working properly.
9	SCSI interlock	Off = Normal On = Attention required	Be sure that the SCSI backplane is installed properly.
10	Power supply 1	Off = Normal On = Attention required	Look at the LEDs on the front of the power supply and take the appropriate action.
11	Power supply 2	Off = Normal On = Attention required	Look at the LEDs on the front of the power supply and take the appropriate action.
12	Bus error	Off = Normal On = Attention required	A bus error occurred. The error might have been caused by one of the adapter cards on this bus (see amber LEDs for which slots might have caused the error). If problem persists, remove or replace one or both of the cards.

Hot-plug SCSI hard drives

Figure 56 Hot-plug SCSI hard drive LEDs**Table 14** Hot-plug SCSI hard drive LEDs

Item	Description	Status
1	Drive activity	On = Drive activity Flashing = High activity on the drive or drive is being configured as part of an array Off = No drive activity
2	Online status	On = Drive is part of an array and is currently working Flashing = Online activity Off = No online activity

Table 14 Hot-plug SCSI hard drive LEDs

Item	Description	Status
3	Fault status	On = Drive failure Flashing = Fault-process activity Off = No fault-process activity

Table 15 Hot-plug SCSI hard drive LED combinations

Activity LED	Online LED	Fault LED	Status
On	Off	Off	Do not remove the drive. Removing a drive during this process will cause data loss. The drive is being accessed and is not configured as part of an array.
On	Flashing	Off	Do not remove the drive. Removing a drive during this process will cause data loss. The drive is rebuilding or undergoing capacity expansion.
Flashing	Flashing	Flashing	Do not remove the drive. Removing a drive during this process will cause data loss. The drive is part of an array being selected by the Array Configuration Utility, or the Options ROMPaq is upgrading the drive.
Off	Off	Off	OK to replace the drive online if a predictive failure alert is received and the drive is attached to an array controller. The drive is not configured as part of an array. -Or- If this drive is part of an array, then a powered-on controller is not accessing the drive. -Or- The drive is configured as an online spare.
Off	Off	On	OK to replace the drive online. The drive has failed and has been placed offline.
Off	On	Off	OK to replace the drive online if a predictive failure alert is received, provided that the array is configured for fault tolerance and all other drives in the array are online. The drive is online and configured as part of an array.
On or flashing	On	Off	Do not remove the drive. Removing a drive during this process will cause data loss. The drive is online and being accessed.

Hot-plug SAS or SATA hard drives

Figure 57 Hot-plug SAS or SATA hard drive LEDs

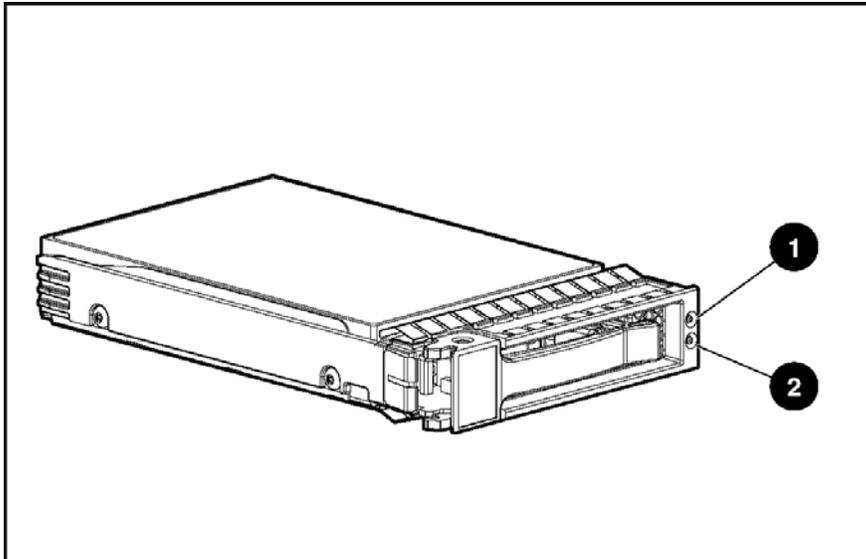


Table 16 Hot-plug SAS or SATA hard drive LEDs

Item	Description	Status
1	Fault/UID status	Amber = Drive failure Flashing Amber = Fault-process activity Blue = Unit identification is active Off = No fault-process activity
2	Online/Activity Status	Green = Drive activity Flashing green = High activity on the drive or the drive is being configured as part of an array Off = No drive activity

Table 17 Hot-plug SAS or SATA hard drive LED combinations

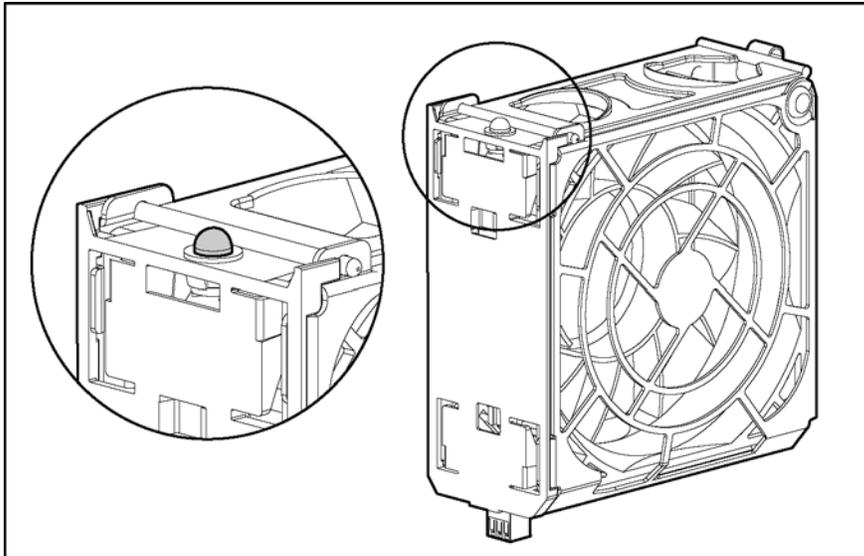
Online/Activity LED (green)	Fault/UID LED (amber/blue)	Interpretation
On, off, or flashing	Alternating amber and blue	The drive has failed, or a predictive failure alert has been received for this drive. It also has been selected by a management application.
On, off, or flashing	Steadily blue	The drive is operating normally, and it has been selected by a management application.
On	Amber, flashing regularly (1 Hz)	A predictive failure alert has been received for this drive. Replace the drive as soon as possible.
On	Off	The drive is online, but it is not active currently.
Flashing regularly (1 Hz)	Amber, flashing regularly (1 Hz)	Do not remove the drive. Removing a drive may terminate the current operation and cause data loss. The drive is part of an array that is undergoing capacity expansion or stripe migration, but a predictive failure alert has been received for this drive. To minimize the risk of data loss, do not replace the drive until the expansion or migration is complete.

Table 17 Hot-plug SAS or SATA hard drive LED combinations

Online/Activity LED (green)	Fault/UID LED (amber/blue)	Interpretation
Flashing regularly (1 Hz)	Off	Do not remove the drive. Removing a drive may terminate the current operation and cause data loss. The drive is rebuilding, or it is part of an array that is undergoing capacity expansion or stripe migration.
Flashing irregularly	Amber, flashing regularly (1 Hz)	The drive is active, but a predictive failure alert has been received for this drive. Replace the drive as soon as possible.
Flashing irregularly	Off	The drive is active, and it is operating normally.
Off	Steadily amber	A critical fault condition has been identified for this drive, and the controller has placed it offline. Replace the drive as soon as possible.
Off	Amber, flashing regularly (1 Hz)	A predictive failure alert has been received for this drive. Replace the drive as soon as possible.
Off	Off	The drive is offline, a spare, or not configured as part of an array.

Hot-plug fans

Figure 58 Hot-plug fan LED



The hot-plug fan LED indicates the following conditions:

Table 18 Hot-plug fan LED

LED status	Description
Off	Power is not applied to the fan
Green	Power is applied to the fan
Amber	Fan failure

Hot-plug power supplies

Figure 59 Hot-plug power supply LEDs

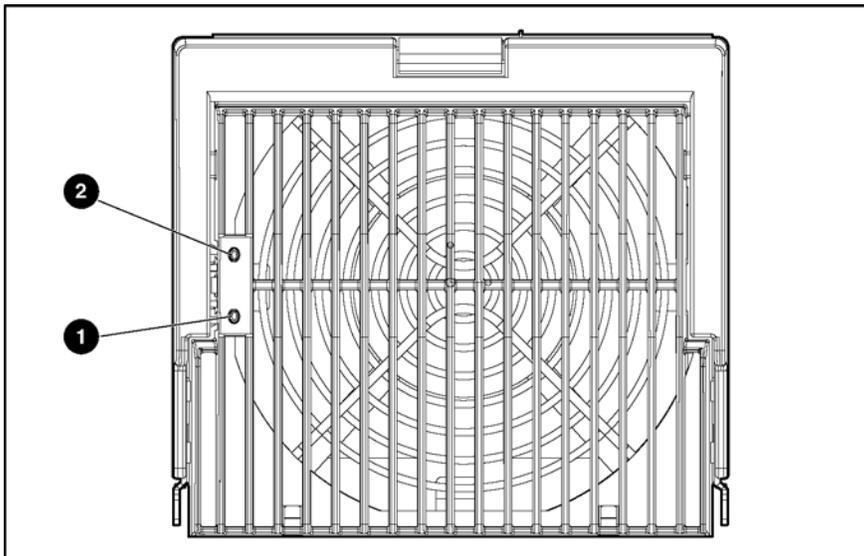


Table 19 Hot-plug power supply LEDs

(1) Power LED status (green)	(2) Fault LED status (amber)	Description
Off	Off	No AC power
Off	On	No AC power to power supply -Or- Power supply failure

Table 19 Hot-plug power supply LEDs

(1) Power LED status (green)	(2) Fault LED status (amber)	Description
Blinking	Off	AC power present System in standby mode
On	Off	Power supply on and working properly
On	Blinking	Power supply current limit exceeded

NIC

Figure 60 NIC LEDs

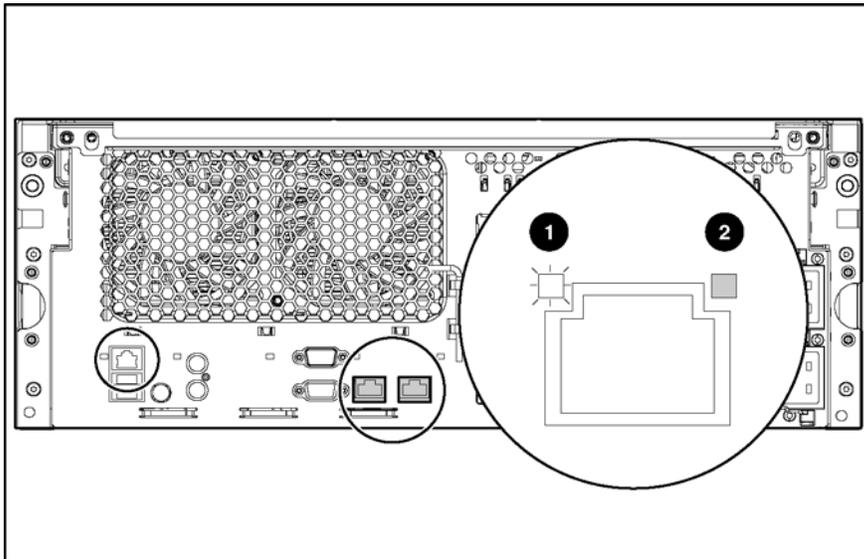
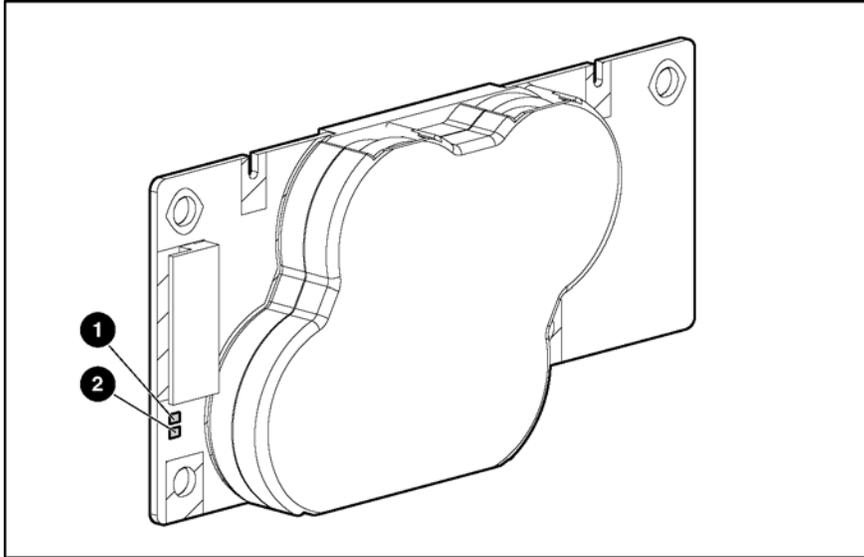


Table 20 NIC LEDs

Item	Description	LED color	Status
1	Activity LED	Green	On or flashing = Network activity Off = No network activity
2	Link LED	Green	On = Linked to the network Off = Not linked to the network

Figure 61 BBWCE LEDs



NOTE: The battery takes 24 hours to charge for the first time.

Table 21 BBWCE LEDs

Server status	LED color	LED status	Battery module status
Server is on and has normal run time.	Green (2)	On	Fast charging
—	Green (2)	Off	Trickle charging
—	Amber (1)	On	Short in the connection of one or more of the four button cells within the battery module
—	Amber (1)	Blinking	Open in the circuit between the positive and negative terminals of the battery module
—	Amber (1)	Off	Battery module status is normal
Server is on and is in the first 30 seconds after power up.	Amber (1) or green (2)	On	Temporary lock-out state. Data is lost because cable being detached
Server is off and is in data retention mode.	Amber (1)	Blinking every 15 seconds	Backing up user data held in write cache.

CAUTION: After the server is powered down, wait 15 seconds and then check the LED illumination pattern before unplugging the cable from the battery module. The LEDs are not visible with the rear access panel on.

If the amber LED blinks after 15 seconds, do not remove the cable from the battery module. This module is backing up data, and data is lost if the cable is detached.

When the server is on, review the POST message before plugging or unplugging the cable from the module.

Internal diagnostic display

Figure 62 Internal diagnostic display LEDs and switches

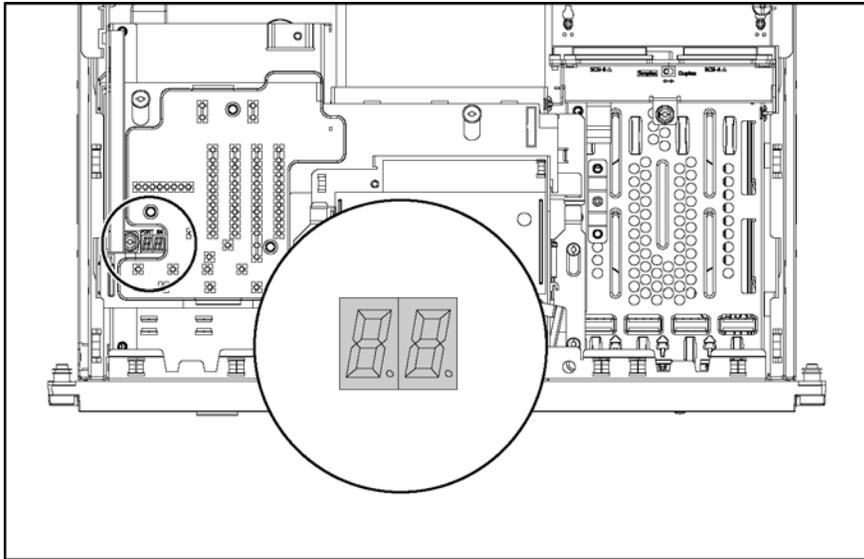


Table 22 Internal diagnostic display switches

Item	Switch 1	Switch 2	Description
Port 84	Off	Off	For more information on Port 84, see the Port 84 diagnostic codes that occur during the boot process.
Reserved	Off	On	N/A
iLO	On	Off	For more information on iLO, see the <i>Integrated Lights-Out User Guide</i> .
5i Plus	On	On	For more information on 5i Plus, see the <i>Smart Array 5i Plus Controller User Guide</i> .



NOTE: System defaults to iLO codes when powered off with SW1 and SW2 both off.

System board switches

Some server operations, including adding or removing a component or changing a security feature, require that you reconfigure a system switch. If the system configuration is incorrect, the server might not work properly and you might receive error messages on the screen. Setting and checking the system board switches is an important part of the overall troubleshooting process.

The server has three switch banks:

- System maintenance switch (SW3)
- System ID switch (SW4)
- iLO/Redundant ROM override switch (SW5)

This section provides figures and tables to identify the locations, positions, functions, and settings for each of these switches.

System maintenance switch (SW3)

Figure 63 System maintenance switch (SW3)

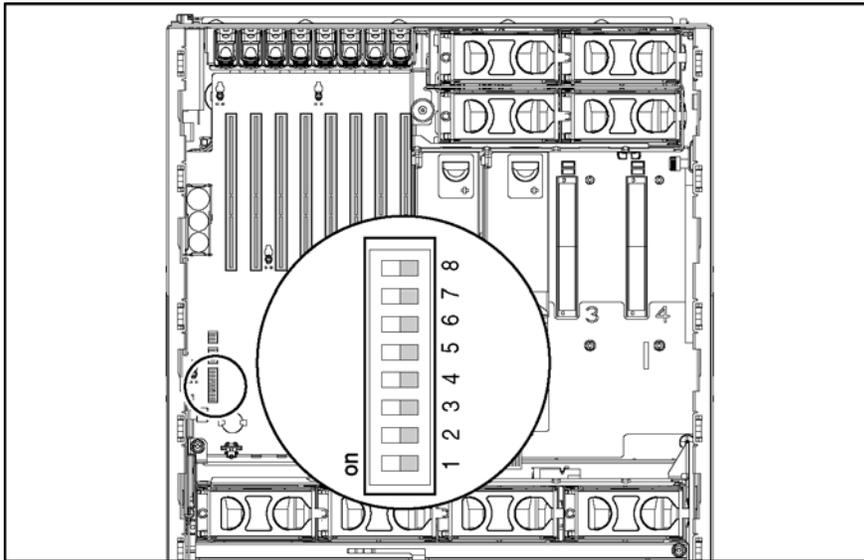


Table 23 System maintenance switch (SW3)

Position	Default	Function	Description	Settings
1	—	Reserved	—	—
2	Off	Lock configuration	Enables or disables configuration changes NVRAM.	Open (off) Configuration can be changed. Closed (on) Configuration is locked and cannot be changed.
3	—	Reserved	—	—
4	Off	Diskette boot override	Enables or disables booting from diskette drive. Both settings enable you to read from and write to the diskette after the system completes the boot sequence.	Open (off) The diskette drive boot is controlled by the configuration. Closed (on) The diskette drive boots regardless of the configuration.

Table 23 System maintenance switch (SW3)

Position	Default	Function	Description	Settings
5	Off	Password disable	Enables or disables password protection.	Open (off) Power-on password is enabled. Closed (on) Power-on password is disabled.
6	Off	Configuration validation	Invalidates NVRAM configuration information.	Open (off) NVRAM is valid. Closed (on) NVRAM is invalid, and configuration is lost.
7	Off	Reserved	—	—
8	Off	Reserved	—	—

CAUTION: When maintenance mode is turned on (the maintenance switch is set to on/closed) and the system is powered up, NVRAM configuration is invalidated.

System ID switch (SW4)

Figure 64 System ID switch (SW4)

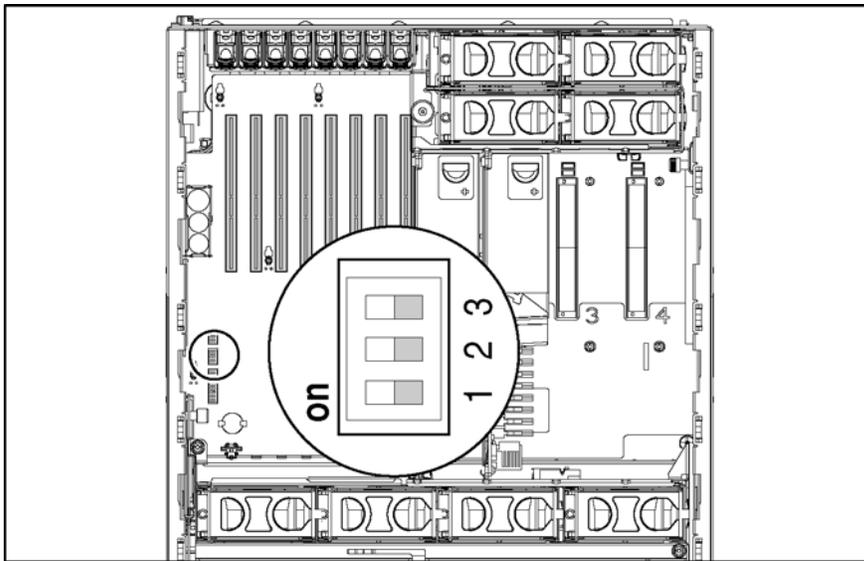


Table 24 System ID Switch (SW4)

Position	Description
1	Reserved
2	Reserved
3	Reserved

iLO/Redundant ROM override switch (SW5)

The iLO/Redundant ROM override switch (SW5) is a two-position switch that is used for miscellaneous purposes. The iLO security override switch allows you full access to the iLO processor. This access is necessary if you lost your password or if the iLO boot-block must be flashed.

Figure 65 iLO/Redundant ROM override switch (SW5)

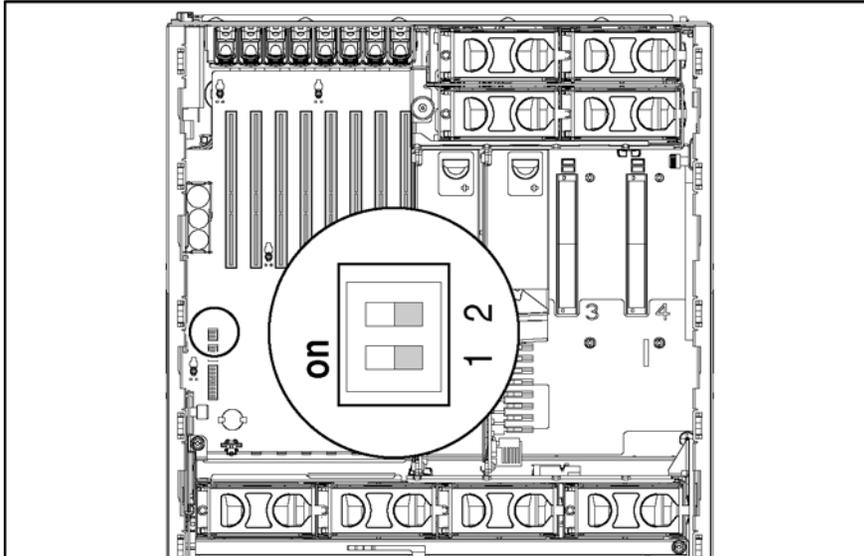


Table 25 iLO/Redundant ROM override switch (SW5)

1	Off	iLO security override	The override allows the administrator full access to the iLO processor.	Open (off) Normal Closed (on) Override
2	Off	Redundant bootblock select	This override forces booting from the redundant bootblock.	Open (off) Normal Closed (on) Redundant bootblock (ROM)

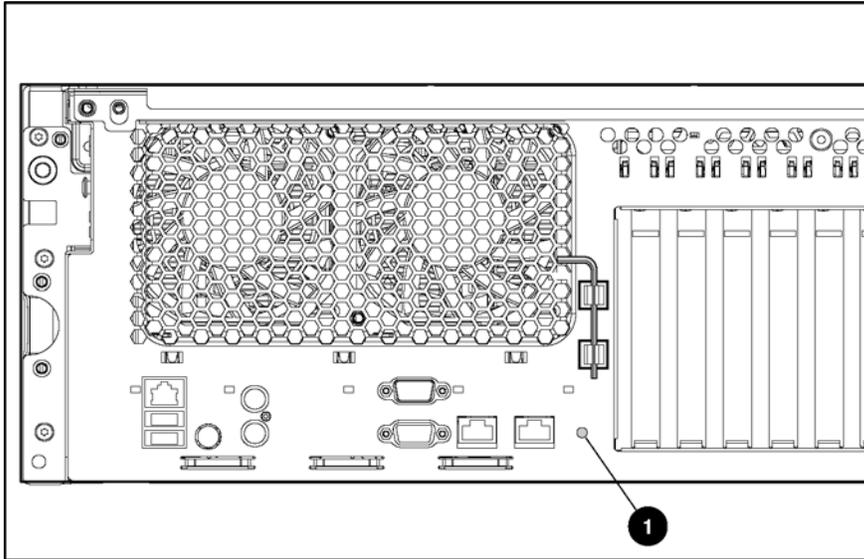
Non-maskable interrupt switch

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

Systems running supported Microsoft operating systems experience a blue screen trap when the operating system crashes. When this happens, Microsoft recommends that system administrators perform a non-maskable interrupt (NMI) event by pressing a dump switch. The NMI event allows a hung system to become responsive.

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

Figure 66 NMI switch



Rear unit identification LED switch

Figure 67 Rear unit identification LED switch

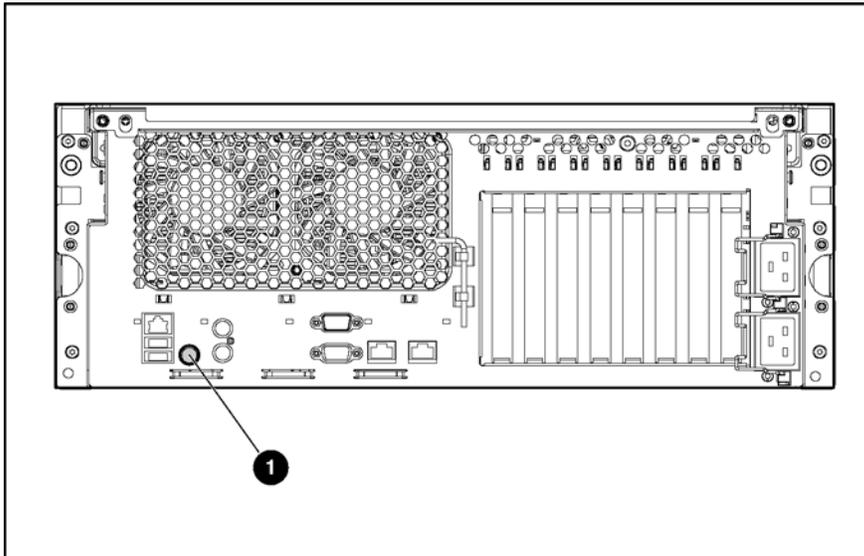


Table 26 Rear unit identification LED switch (1)

LED status	Description
On (blue)	The switch is activated.
Off	The switch is deactivated.
Flashing	The system is being remotely accessed.

6 Troubleshooting

This chapter provides specific troubleshooting information for the server. Use it to find details about server startup and operation errors.

For information on LEDs and switches specific to the server, see Chapter 4, "Server component identification."

For a more detailed discussion of troubleshooting techniques, diagnostic tools, error messages, and preventative maintenance, see the *HP Servers Troubleshooting Guide* included on the Documentation CD that ships with the server.



WARNING! A risk of personal injury exists from hazardous energy levels. The installation of options and the routine maintenance and service of this product should be performed by individuals who are knowledgeable about the procedures, precautions, and hazards associated with equipment containing hazardous energy circuits.

If the server does not start

This section provides systematic instructions on what to try and where to go for help for the most common problems encountered during initial POST. The server must first complete this test each time you power up, before it can load the operating system and start running software applications.

 **WARNING!** A risk of personal injury exists from hazardous energy levels. The installation of options, and the routine maintenance and service of this product shall be performed by individuals who are knowledgeable about the procedures, precautions, and hazards associated with equipment containing hazardous energy circuits.

If the server does not start:

1. Verify that the server and monitor are plugged into a working outlet.
2. Be sure that the power source is working properly:
 - a. Verify the status using the system power LED.
 - b. Verify that the Power on/Standby button was pressed firmly.
3. Be sure that the power supplies are working properly by looking at the power supply LEDs.

 **NOTE:** For more information about the location and status of LEDs, see Chapter 4, “Server component identification.” For more information about power, see the *HP Servers Troubleshooting Guide*.

4. Look at the interlock LEDs on the hood label. If any LEDs are amber, reseal the component.
5. If the system does not complete POST or start loading an operating system, see the *HP Servers Troubleshooting Guide*.
6. If the server is rebooting repeatedly, verify that the system is not rebooting because of a problem that initiates an ASR-2 reboot. Some operating systems reboot server when an error occurs. This behavior is the default in Microsoft Windows Server™ 2003.
7. Restart the server.

 **IMPORTANT:** If the server does not restart, proceed to the following section, “Diagnostic steps.”

8. Look at the server for the following normal power-up sequence to verify that the system meets the minimal hardware requirements and is powered up during normal operations:
 - a. The power button LED turns from standby (amber) to on (green).
 - b. The fans start up. It is normal for the fans to initially run at full speed and then slow down.
9. Look at the monitor for the following messages that verify the system meets the minimal hardware requirements and is powered up during normal operations:
 - a. ProLiant logo
 - b. BIOS information
 - c. Copyright information
 - d. Processor initialization
 - e. Multi-initiator configuration

 **IMPORTANT:** Select the multi-initiator configuration utility (by pressing CTRL-A) only to support HP storage and clustering options.

- f. PXE initialization
- g. Option ROMs
- h. SCSI devices

The operating system loads to complete the boot process.

If the server completes POST and attempts to load the operating system, go to the “Problems after initial boot” section in this chapter.

Diagnostic steps

If the server does not power up or powers up but does not complete POST, answer the questions in Table 27 to determine appropriate actions based on the symptoms observed. The flow of questions reflects the usual flow of events during a power-on sequence. A flow chart following this table illustrates the recommended diagnostic steps and decision options.

According to the answers you give, you will be directed to an appropriate secondary table in this section. The table outlines possible reasons for the problem, options available to assist in diagnosis, possible solutions, and references to other sources of information.

Table 27 Diagnostic steps

Question	Action
Question 1: Is the system power LED off?	If no, continue to question 2. If yes, see Table 28.
Question 2: Is the system power LED green?	If yes, continue to question 3. If no, see Table 29.
Question 3: Is the external health LED green?	If yes, continue to question 4. If no, see Table 30.
Question 4: Is the internal health LED green?	If yes, continue to question 5. If no, see Table 31.
Question 5: Is the monitor displaying information?	If yes, use the POST messages for further diagnosis. See Table 32 for details. If no, see Table 32.

Table 28 Is the system power LED off?

Answer	Possible reasons	Possible solutions
Yes	The system is not connected to AC power, or no AC power is available.	Be sure that the power cord is connected to the power supply.
	A power supply problem exists. The power supply might not be connected or inserted properly, it might have a damaged connector, or it might have failed.	Be sure that the power supply is undamaged and fully seated, and then verify that the power supply LED is green when you power up the server. See Chapter 4, "Server component identification," for locations and states.
	A broken connection exists between the front panel LED assembly and the removable media board.	Be sure that the power switch cable assembly is inserted properly to the removable media board.
No	The front panel LED assembly has failed.	See the <i>HP Servers Troubleshooting Guide</i> for further options. If these solutions do not solve the problem, contact an authorized service provider for assistance.
	—	If the system power button LED is amber, press the Power on/Standby button. See Table 29.

NOTE: For LED locations and functions, see Chapter 4, "Server component identification."

Table 29 Is the system power LED green?

Answer	Possible reasons	Possible solutions
No, it is off	Power on/Standby button has not been pressed firmly.	Firmly press the power button.

Table 29 Is the system power LED green?

Answer	Possible reasons	Possible solutions
—	A power supply problem exists. The power supply may not be connected or inserted properly, it may have a damaged connector, or it may have failed.	Be sure that the power supply is undamaged, the power supply is fully seated, and the power supply LED is green.
—	The system may have experienced a short.	Check for bent connector pins and improperly seated expansion boards.
—	The front panel LED assembly has failed.	Be sure that the front panel LED assembly cable is connected to the power backplane.
—	—	If these solutions do not solve the problem, contact an authorized service provider for assistance.
Yes	—	If the system power button LED is green, see Table 30.

NOTE: For LED locations and functions, see Chapter 4, “Server components identification.”

Table 30 Is the external health LED green?

Answer	Possible reasons	Possible solutions
No, it is amber	One power supply has failed; therefore, power supply redundancy is lost.	Be sure that each installed power supply is securely connected to an AC power source. Locate the amber power supply LED to identify the failed power supply. Contact an authorized service provider for replacement parts and service.
No, it is red	All installed power supplies have experienced a failure.	Remove all AC power from power supplies and reconnect to clear the error condition. Replace the power supply. Contact an authorized service provider for replacement parts and service.
Yes	—	See Table 31 if the external health LED is green.

NOTE: For LED locations and functions, see Chapter 4, “Server components identification.”

Table 31 Is the internal health LED green?

Answer	Possible reasons	Possible solutions
--------	------------------	--------------------

Table 31 Is the internal health LED green?

Answer	Possible reasons	Possible solutions
No, it is amber	<p>A processor is in pre-failure condition.</p> <p>A DIMM is in pre-failure condition.</p> <p>One memory bank is valid, but another bank is missing a DIMM.</p> <p>One memory bank is valid, but another bank has mismatched DIMMs installed.</p> <p>One memory bank is valid, but another bank has an unsupported DIMM type installed.</p> <p>A redundant fan has failed.</p>	<p>Use internal component failure LEDs to identify:</p> <ul style="list-style-type: none"> • Missing components • Degraded components • Failed components • Improperly installed components <p>Replace any missing components, reseal all components, and restart the system. If LED failure indicator reappears, replace the failing component. For more troubleshooting information, see the <i>HP Servers Troubleshooting Guide</i>. For component replacement procedures, see the <i>HP ProLiant DL585 Servers Maintenance and Service Guide</i> at http://www.hp.com/support.</p> <p>Contact an authorized service provider for replacement parts and service.</p>
No, it is red	<p>A processor has failed.</p> <p>Processor 1 is not installed.</p> <p>A processor is an unsupported type.</p> <p>Processor does not have an associated PPM installed.</p> <p>A PPM has failed.</p> <p>A DIMM has experienced a multibit error.</p> <p>DIMM pairs have mismatched DIMMs.</p> <p>DIMMs are missing.</p> <p>DIMMs are an unsupported type.</p> <p>A required fan has failed.</p> <p>A thermal event has occurred.</p>	<p>Use internal component failure LEDs to identify:</p> <ul style="list-style-type: none"> • Missing components • Failed components • Improperly installed components • Thermal event <p>Replace any missing components, reseal all components, and restart the system. If LED failure indicator reappears, replace the failing component. For more troubleshooting information, see the <i>HP Servers Troubleshooting Guide</i>. For component replacement procedures, see the <i>HP ProLiant DL585 Servers Maintenance and Service Guide</i> at http://www.hp.com/support.</p> <p>Contact an authorized service provider for replacement parts and service.</p>
—	A component is not properly seated.	Look at the interlock LEDs on top of the front access panel. Be sure that all components are seated securely.
—	Interlock problem	Reseat all boards and cables.
—	Processor memory board configuration error	<p>Inspect the diagnostic LED panel to determine if one of the processor memory boards has both its PPM and BRD LEDs illuminated.</p> <p>Ensure that processor and PPM are properly installed on the processor memory board.</p>

Table 31 Is the internal health LED green?

Answer	Possible reasons	Possible solutions
—	PPM or board power fault	Inspect the QuickFind diagnostic display panel to determine if one of the PPMs, processor memory boards, or system board has experienced a power fault. Ensure that all components are seated properly. If problem persists, replace the failed component. A PPM failure will be shown by the PPM LED being illuminated on the specific processor memory board. If the processor memory board BRD LED is amber, see “Troubleshooting a failed processor” later in this chapter. If the I/O power LED is amber, replace the system I/O board.
—	Thermal shutdown	If the Therm Trip LED is amber, the system encountered an unexpected thermal shutdown. If one of the processor memory board TEMP LEDs is amber, ensure that the processor heatsink is properly attached, all fans are functioning properly, and that the external environment is within specified parameters. Inspect the iLO logs for any temperature-related warnings.
Yes	—	If the internal health LED is green, see Table 32.

NOTE: For LED locations and functions, see Chapter 4, “Server components identification.”

Table 32 Is the monitor displaying information?

Answer	Possible reasons	Possible solutions
No	The monitor might not have power. Video might not be connected properly. Non-volatile RAM (NVRAM) might be corrupted. The system ROM and redundant ROM might be corrupted. A processor memory board or HyperTransport link might have failed.	Be sure that the monitor AC power cord is plugged in and that the monitor power button has been pressed. If a video card is installed, be sure that the video cable is properly connected. Verify the video connections. See the <i>HP Servers Troubleshooting Guide</i> . Clear NVRAM. See the Caution following the table. See Chapter 4 for the correct switch setting. Are there any audible indicators, such as a series of beeps? A series of beeps is the audible signal indicating the presence of a POST error message. See the <i>HP Servers Troubleshooting Guide</i> for a complete description of each beep sequence and the corresponding error messages. See the “Troubleshooting a failed processor” section later in this chapter. If these steps do not solve the problem, contact an authorized service provider for assistance.

Table 32 Is the monitor displaying information?

Answer	Possible reasons	Possible solutions
Yes		Video is available for diagnosis. Determine the next action by observing POST progress and error messages. See the <i>HP Servers Troubleshooting Guide</i> for a complete description of each POST error message.

Problems after initial boot

After the server has passed POST, you might still encounter errors, such as an inability to load the operating system. Use Table 33 to troubleshoot server installation problems that occur after the initial boot.

See the *HP Servers Troubleshooting Guide* for more information.

Table 33 Problems after initial boot

Problem	Possible reasons	Possible solutions
System cannot load ProLiant Essentials Foundation Pack.	ProLiant Essentials Foundation Pack requirements not met.	Check the ProLiant Essentials Release Notes provided in the ProLiant Essentials Online Reference Information on the ProLiant Essentials Foundation Pack.
—	CD-ROM drive is not properly seated.	Reseat CD-ROM drive.
—	Insufficient memory is available.	A rare Insufficient Memory message might display the first time ProLiant Essentials is booted on certain unconfigured systems. Cold boot the machine with the ProLiant Essentials Foundation Pack inserted in the CD-ROM drive to correct the problem.
—	Existing software is causing conflict.	Run the System Erase Utility. Read the Caution at the end of the table. See the instructions in the <i>HP Servers Troubleshooting Guide</i> .
ProLiant Essentials fails during installation.	Error occurs during installation.	Follow the error information provided. If it is necessary to reinstall, run the System Erase Utility. Read the Caution at the end of the table. See the instructions in the <i>HP Servers Troubleshooting Guide</i> .
—	CMOS is not cleared.	Run the System Erase Utility. Read the Caution at the end of the table. See the instructions in the <i>HP Servers Troubleshooting Guide</i> .
Server cannot load operating system.	Required operating system step was missed.	Follow these steps: <ol style="list-style-type: none"> 1 Note at which phase the operating system failed. 2 Remove any loaded operating system. 3 See the operating system documentation. 4 Install the operating system again.
—	Installation problem occurred.	See the operating system documentation and to the ProLiant Essentials Release Notes on the ProLiant Essentials for Servers CD. Run RBSU and look at the OS Selection menu.
—	Problem was encountered with the hardware you have added to the system.	See the documentation provided with the hardware. See the User Guide to identify correct SCSI bus cabling configuration for the unit.

Table 33 Problems after initial boot

Problem	Possible reasons	Possible solutions
—	Problem was encountered with hardware added to a new configure-to-order system (where available).	You must complete the factory-installed operating system software installation before adding new hardware to the system. Be sure you are following the instructions provided in the <i>Factory-Installed Operating System Software Installation Guide</i> . Remove the new hardware and complete the software installation. Then, reinstall the new hardware.

 **CAUTION:** The System Erase utility causes loss of all configuration information, as well as loss of existing data on all connected hard drives. Please read the appropriate section and the associated warning in the *HP Servers Troubleshooting Guide* before performing this operation.

See the *HP Servers Troubleshooting Guide* to obtain the following:

- Information you need to collect when diagnosing software problems and to provide when contacting support
- Instructions on how to upgrade the operating system and its drivers
- Information about available recovery options and advice on minimizing downtime

Troubleshooting a failed processor

The AMD HyperTransport™ link architecture links multiple processors. When a processor failure occurs, the root cause of the problem can be either a failed HyperTransport link or a failed processor.

A failed processor or failed HyperTransport link causes the system to hang at POST without video.

Perform the steps outlined in the following sections to isolate a failed component in a two- or four-processor memory board configuration.

Two-processor memory board configuration

In a two-processor memory board configuration, processor memory boards are installed in slot 1 and slot 2. Because the system does not boot with only one processor board, one or two extra, known good boards (along with processors) might be required to troubleshoot.



IMPORTANT: Be sure that the processor memory board in slot 2 has DIMMs installed. For more information on memory population guidelines, see the “Memory options” section in Chapter 2.

1. Reseat both processor memory boards, and power up the server. If this does not resolve the problem, proceed to the next step.
2. Replace the processor memory board in slot 2 with a known good board, and power up the server.
3. If the problem has not been resolved, replace the processor memory board in slot 2 with the original processor board, and replace the processor board in slot 1 with the known good processor board.
4. If the problem has not been resolved, replace the original processor boards in slot 1 and slot 2 with two known good processor boards. If the system still fails to boot, replace the system board.

Four-processor memory board configuration

In a four-processor memory board configuration, all processor memory board slots are populated.

1. If the system fails to boot, remove the processor memory boards in slot 3 and slot 4 to attempt booting with two processors. If this action corrects the problem, one or both of the processor memory boards removed from slots 3 and 4 might be bad.
2. Complete the steps described in the “Two-processor memory board configuration” section earlier in this chapter to isolate the failed components.
3. If this procedure does not resolve the problem, replace the processor memory boards in slots 1 and 2 with the two boards that were removed from slots 3 and 4. If the problem has been resolved, one or both of the processor boards originally in slots 1 and 2 might be bad.
4. Complete the steps described in the “Two-processor memory board configuration” section earlier in this chapter to isolate the failed components.
5. If all processor boards work, run two at a time. If the four-processor configuration still does not work, a link on the system board might be bad. Replace the system board.

Other information resources

See the following additional information for help.

Table 34 Troubleshooting resources

Resource	Description
<i>HP Servers Troubleshooting Guide</i>	This guide is a resource for obtaining troubleshooting information that is beyond the scope of this document. It includes general hardware and software troubleshooting information for all ProLiant servers, a complete list of error messages along with explanations of probable causes, and a list of remedial measures. This guide resides on the Documentation CD that ships with the server. To be sure that you have the most up-to-date copy of the <i>HP Servers Troubleshooting Guide</i> , visit the product website at http://www.hp.com .
Other online documentation	Product Bulletin QuickSpecs OS Support Matrix

For additional information on warranties and service and support upgrades (Care Pack services), visit the product website at <http://www.hp.com>.

Specifications

Server specifications

Table 35 Server specifications

Feature	Units
Dimensions	
Height	17.5 cm (6.88 in)
Depth	69.2 cm (27.25 in)
Width	46.3 cm (19.0 in)
Weight	30.8 kg, minimum (68 lb, minimum) 44.5 kg, maximum (98 lb, maximum)
High-line voltage requirements	
Rated input voltage	180 V to 264 V
Rated input frequency	47 Hz to 63 Hz
Rated input current	6 A
Low-line voltage requirements	
Rated input voltage	90 V to 132 V
Rate input frequency	47 Hz to 63 Hz
Rated input current	12 A
Power supply output power	
Rated steady-state power	800 W
Maximum peak power	800 W
Temperature range	
Operating	10° to 35°C (50° to 95°F)
Non-operating	-30° to 60°C (-20° to 140°F)
Relative humidity (non-condensing)	
Operating	20% to 80%
Non-operating	5% to 90%
Maximum wet bulb temperature	38.7°C (101.7°F)
Heat dissipation	3900 BTU/hr

Index

A

AC filter cable, 50
AC power supply. See hot-plug power supply
access panel: installing, 18; removing, 18
additional information, 5
ADU. See Array Diagnostics Utility
Array Diagnostics Utility (ADU), 54
ASR-2. See Automatic Server Recovery-2
Automatic Server Recovery-2 (ASR-2), 54

B

battery. See system battery
BBWC assembly, 44
BBWCE: LEDs, 67; removing, 44
bus numbering white paper, 38

C

CarePaq, 83
CD-ROM drive, 33
connectors: AC inlets, 56; Integrated Lights-Out Manager, 56; keyboard, 56; mouse, 56; NIC, 56; serial, 56; USB, 56; video, 56
Customer self-repair program, 7

D

data loss caution, 80
diagnostics: accessing, 54; description, 54; locating, 54
DIMM: population guidelines, 24; removing, 25
diskette drive, 33
documentation: HP ProLiant DL585 Server User Guide, 60; *HP Servers Troubleshooting Guide*, 73; *HP Servers Troubleshooting Guide*, 54; *HP Servers Troubleshooting Guide*, 74; *HP Servers Troubleshooting Guide*, 74; *HP Servers Troubleshooting Guide*, 75; *HP Servers Troubleshooting Guide*, 77; *HP Servers Troubleshooting Guide*, 77; *HP Servers Troubleshooting Guide*, 78; *HP Servers Troubleshooting Guide*, 79; *Integrated Lights-Out User Guide*, 54, 68; *Service Quick Reference Guide*, 5; *Smart Array 5i Plug Controller User Guide*, 68
drivers, installing, 54
DVD drive, 33

E

electrostatic discharge (ESD), 14
electrostatic-sensitive parts, precautions, 14
error messages, POST, 79
ESD. See electrostatic discharge
events log, 54
expansion boards: installation guidelines, 37; non-hot-plug slot, 38; peak frequency, PCI-X, 37
expansion slots: features, 37; white paper, 38
external health LED, 59

F

fans. See hot-plug fans
features: expansion slots, 37; PCI-X technology, 37
front bezel, 35
front fan cage, 40
front panel thumbscrews, loosening, 16

G

grounding, 14
guidelines: DIMM population, 24; expansion board installation, 37; hot-plug SAS hard drive, 27; hot-plug SATA hard drive, 27; hot-plug SCSI hard drive population, 26; processor memory board population, 20
guides: *Factory-Installed Operating System Software Installation Guide*, 81; *HP Servers Troubleshooting Guide*, 83; *Integrated Lights-Out User Guide*, 54, 68; *Service Quick Reference Guide*, 5; *Smart Array 5i Plus Controller User Guide*, 68

H

hard drive blank, 26
help resources, 5
hot-plug fan: configuration, 33; removing, 33
hot-plug hard drive blank. See hard drive blank
hot-plug power supply: blanks, 31; removing, 32
hot-plug SAS hard drive: guidelines, 27; ID numbers, 27; removing, 27
hot-plug SATA hard drive: guidelines, 27; ID numbers, 27; removing, 27
hot-plug SCSI hard drive: removal guidelines, 26; removing, 27

HP authorized reseller, 6
HP SIM. See HP Systems Insight Manager
HP Systems Insight Manager, 6
HP website, 38, 54, 83

I

iLO. See Integrated Lights-Out (iLO)
installation problems: factory-installed operating systems, 81; insufficient memory message, 80; operating system problem, 80; ProLiant Essentials errors, 80; ProLiant Essentials Foundation Pack failure, 80
installation procedures, 18, 22
Integrated Lights-Out (iLO): defined, 54; switch, 68
Integrated Management Log (IML), 6, 54
internal health LED, 59

L

LEDs: BBWCE, 67; external health, 59; internal health, 59; power, 59; UID, 59

M

mechanical components, illustrated, 8
media board, 42
media drive. See universal media drive
memory: eight-DIMM configuration, 24; four-DIMM configuration, 24; insufficient during install, 80; minimum requirements, 24; population guidelines, 24; problem diagnosis, 80

N

NIC: connectors, 56
non-hot-plug PCI-X expansion board, 38
non-maskable interrupt (NMI) switch, 72
non-volatile RAM. See NVRAM
normal power-up sequence, 74
NVRAM: clearing, 53, 78; CMOS problem diagnosis, 80; problem diagnosis, 78; when to clear, 78

O

operating system, installation problems, 80

P

pass-through board, 41
PCI-X buses, numbering, 38
PCI-X non-hot-plug expansion board:
 removing, 38; replacing, 38
PCI-X technology: features, 37; load
 balancing, 37; peak frequency, 37;
 performance balancing, 38; slot
 population, 38
port 84 switch, 68
POST error messages, 79
power button/LED assembly, 36
power LED, 59
Power Processor Module. *See* PPM
power supply. *See* hot-plug power
 supply
power transfer board, 29
powering down server, 15
powering up, normal sequence for, 74
PPM: removing, 21; when to replace,
 78
preparation procedures, 14
processor: installing, 22; removing, 22
processor memory boards: cautions,
 20; configuration, four-board, 82;
 configuration, two-board, 82;
 population guidelines, 20;
 removing, 20; troubleshooting, 82
ProLiant Essentials Foundation Pack:
 diagnosing installation failure, 80;
 installation problems, 80; memory
 problems, 80

Q

QuickFind diagnostic display:
 removing, 42

R

rack: extending the server, 16;
 replacing server, 16
rail release levers, locating, 16
RBSU. *See* ROM-Based Setup Utility

rear fan cage, 43
re-entering serial number, 53
replacing: server in rack, 16
required tools, 14
ROM: BIOS problem diagnosis, 80;
 problem diagnosis, 80
ROM Based Setup Utility (RBSU), 55
ROMPaq Utility, 55

S

SAS hard drive. *See* hot-plug SAS
 hard drive
SAS or SATA hard drive cage, 28
SATA hard drive. *See* hot-plug SATA
 hard drive
SCSI backplane, removing, 45
SCSI cables, 39
SCSI hard drive. *See* hot-plug SCSI
 hard drive
serial number, re-entering, 53
server: extending from the rack, 16;
 powering down, 15; removing from
 rack, 19; replacing in rack, 16;
 serial number, re-entering, 53
SIM. *See* HP Systems Insight Manager
Smart Array 5i Plus controller, 44, 68
static electricity, preventing, 14
Survey utility, 54
switches: 5i plus, 68; Integrated Lights-
 Out (iLO), 68; port 84, 68; system
 board, 69
system battery, 46
system board: removing, 48; switches,
 69
System Erase Utility: caution, 80; uses,
 80

T

technical support, 6
telephone numbers, 6
thumbscrews, front panel, 16
Torx T-15 tool: locating, 16; removing,
 16

troubleshooting: BIOS problems, 80;
 CD-ROM problems, 80; CMOS
 problems, 80; configure-to-order
 system problems, 81;
 factory-installed software problems,
 81; how to diagnose problems, 75,
 80; installation problems, 80;
 memory problems, 80; new
 hardware added, 80; NVRAM
 problems, 78; problems after initial
 boot, 80; ProLiant Essentials
 Foundation Pack problems, 80;
 resources, 83; ROM problems, 80;
 startup problems, 74, 80; steps to
 take, 74, 75, 80; video problems,
 78; when the server does not start,
 74

U

UID LED, 59
universal media drive, 33
utilities: ADU, 54; IML, described, 54;
 RBSU, 55; ROMPaq, 55; Survey
 utility, 54

V

video, problem diagnosis, 78

W

websites: CarePaq, 83; customer self-
 repair, 7; HP, 38, 54, 83;
 maintenance and service guide, 83;
 technical support, 7; warranty, 7,
 83
white papers, PCI-X bus numbering,
 38
work area recommendations, 14
wrist strap, using, 14