

HP ProLiant BL40p Server Blade Setup and Installation Guide



January 2004 (Second Edition)
Part Number 307153-002

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About This Guide

This guide provides step-by-step instructions for installation, and reference information for operation, troubleshooting, and future upgrades for the HP ProLiant BL40p server blade.

Audience Assumptions

This guide is intended for network administrators and IT personnel who install, configure, and troubleshoot system hardware and software.

Important Safety Information

Before installing this product, read the *Important Safety Information* document included with the server.

The installation and maintenance of this equipment may involve access to high-power circuitry and must be performed by trained service personnel familiar with these conditions. This equipment is intended to be installed in restricted areas, such as equipment closets and data centers, where only trained service personnel are permitted to operate and service the equipment.

Symbols on Equipment

The following symbols may be placed on equipment to indicate the presence of potentially hazardous conditions:



WARNING: This symbol, in conjunction with any of the following symbols, indicates the presence of a potential hazard. The potential for injury exists if warnings are not observed. Consult the documentation for specific details.



This symbol indicates the presence of hazardous energy circuits or electric shock hazards. Refer all servicing to qualified personnel.

WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure. Refer all maintenance, upgrades, and servicing to qualified personnel.



This symbol indicates the presence of electric shock hazards. The area contains no user or field serviceable parts. Do not open for any reason.

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



This symbol on an RJ-45 receptacle indicates a network interface connection.

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



This symbol indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists.

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



These symbols, on power supplies or systems, indicate that the equipment is supplied by multiple sources of power.

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



This symbol indicates that the component exceeds the recommended weight for one individual to handle safely.

Weight in kg
Weight in lb

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

Rack Stability



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

- The leveling jacks are extended to the floor.
 - The full weight of the rack rests on the leveling jacks.
 - The stabilizing feet are attached to the rack if it is a single-rack installation.
 - The racks are coupled together in multiple-rack installations.
 - Only one component is extended at a time. A rack may become unstable if more than one component is extended for any reason.
-

Symbols in Text

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



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



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

IMPORTANT: Text set off in this manner presents essential information to explain a concept or complete a task.

NOTE: Text set off in this manner presents additional information to emphasize or supplement important points of the main text.

Related Documents

For additional information on the topics covered in this guide, refer to the following documentation:

- *HP ProLiant BL p-Class System Setup and Installation Guide*
- *HP ProLiant BL p-Class System Maintenance and Service Guide*
- *HP ProLiant BL p-Class System Hardware Installation and Configuration Poster*
- *ProLiant BL System Best Practices Guide*
- *ProLiant BL System Common Procedures Guide*
- *HP ProLiant Servers Troubleshooting Guide*
- *HP Integrated Lights-Out User Guide*
- *HP ROM-Based Setup Utility User Guide*
- *HP ProLiant Support Pack and Deployment Utility User Guide*
- *SmartStart Scripting Toolkit User Guide*
- *White Paper: HP ProLiant BL p-Class System Over and Planning*
- *HP ProLiant BL p-Class QuickSpecs*
- *HP ProLiant BL40p server blade QuickSpecs*
- *HP ProLiant BL p-Class Multimedia*

Getting Help

If you have a problem and have exhausted the information in this guide, you can get further information and other help in the following locations.

Technical Support

In North America, call the HP Technical Support Phone Center at 1-800-652-6672. This service is available 24 hours a day, 7 days a week. For continuous quality improvement, calls may be recorded or monitored. Outside North America, call the nearest HP Technical Support Phone Center. Telephone numbers for worldwide Technical Support Centers are listed on the HP website, www.hp.com.

Be sure to have the following information available before you call HP:

- Technical support registration number (if applicable)
- Product serial number
- Product model name and number
- Applicable error messages
- Add-on boards or hardware
- Third-party hardware or software
- Operating system type and revision level

HP Website

The HP website has information on this product as well as the latest drivers and flash ROM images. You can access the HP website at www.hp.com.

Authorized Reseller

For the name of the nearest authorized reseller:

- In the United States, call 1-800-345-1518.
- In Canada, call 1-800-263-5868.
- Elsewhere, see the HP website for locations and telephone numbers.

Optional Installation Service

You may choose to have HP install the system. The installation service, as well as other services, can be purchased as a CarePack packaged service or as a customized service agreement to meet your specific requirements.

The optional installation services are available in all countries where HP has a direct or indirect service presence. In these countries, service may be ordered from and directly provided by an HP authorized service reseller, or they may be ordered directly from the HP service organization.

In the U.S. only, customized or CarePack services may be ordered by calling 1-800-652-6672.

For ordering information, refer to
www.hp.com

Reader's Comments

HP welcomes your comments on this guide. Please send your comments and suggestions by e-mail to ServerDocumentation@hp.com.

Installing the Server Blade and Options

This chapter provides installation procedures for HP ProLiant BL40p server blades and options. For additional installation information, refer to the following documents:

- Labels attached to the server blade access panel
- Documentation that ships with each option kit

To streamline the installation process, read the installation instructions for all the hardware options and identify similar steps before installing the hardware.

If you encounter any problems during installation, contact an HP authorized reseller.



WARNING: To reduce the risk of personal injury or damage to equipment, heed all warnings and cautions throughout the installation instructions.

IMPORTANT: Before installing server blades for the first time, define your hardware configuration and server blade deployment process. Refer to Chapter 2, “Configuring and Deploying Server Blades.”

Preparation Procedures

To install server blade options, you may need to complete the following procedures:

- Access internal server blade components
 - Power down the server blade
 - Remove the server blade from the server blade enclosure
 - Remove the access panel
- Remove the system board tray from the chassis
- Identify the system board components
- Install server blade options
- Reinstall the system board tray into the chassis
- Reinstall the access panel

Accessing Internal Server Blade Components

To access internal server blade components, you must remove the access panel. Observe the following warnings and cautions.



WARNING: To reduce the risk of electric shock, do not operate the server blade without the access panel.



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



CAUTION: Electrostatic discharge can damage electronic components. Properly ground yourself before beginning any installation procedure. Refer to Appendix B, “Electrostatic Discharge,” for more information.

To access internal server blade components:

IMPORTANT: If the server blade is not installed in the server blade enclosure, begin with step 4.

1. Identify the proper server blade in the server blade enclosure.
2. Remove power from the server blade in one of the following ways:
 - Use the virtual power button feature of iLO to power down the server blade from a remote location. Be sure that the server blade is in standby mode by observing that the power LED is amber. For iLO information and procedures, refer to Chapter 2, “Configuring and Deploying Server Blades,” or to the *HP Integrated Lights-Out User Guide* on the Documentation CD.
 - Press the Power On/Standby button on the front of the server blade. Be sure that the server blade is in standby mode by observing that the power LED is amber.

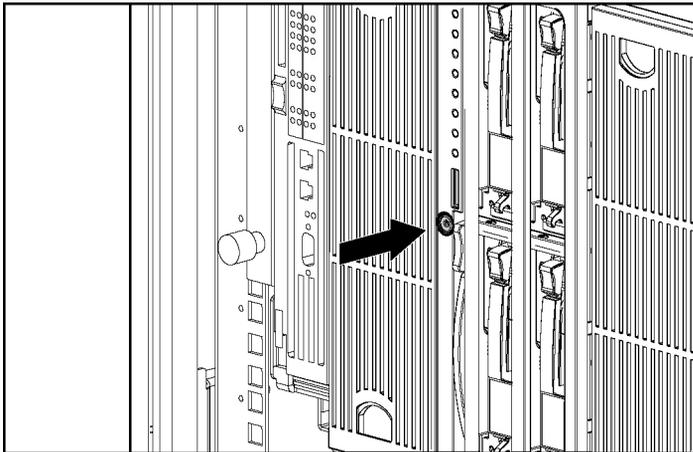


Figure 1-1: Pressing the Power On/Standby button

3. Remove the server blade from the server blade enclosure:
 - a. If the server blade is installed in either of the end bays and has a fibre channel expansion board installed in a PCI-X slot, raise the locking handle at the back of the server blade to unlock it from the enclosure.



CAUTION: To avoid damaging the equipment, be sure to unplug any fibre channel expansion board cables from the rear of the server blade before removing the server blade from the enclosure.

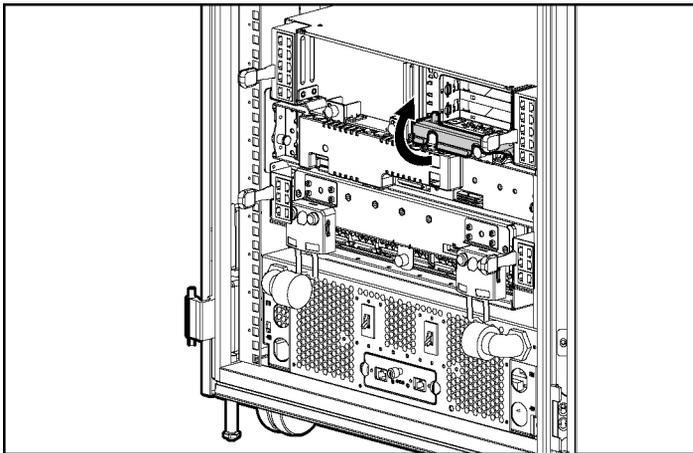


Figure 1-2: Unlocking the server blade from the enclosure

- b. Press the release button to release the locking lever (1).



CAUTION: After you press the release button, the server blade is unlocked from the enclosure. Use both hands to support the server blade when you remove it from the rack.

- c. Pull open the locking lever (2).
- d. Grasp the lever and slide the server blade from the enclosure (3). Place a hand under the server blade to support it as you remove it from the rack.

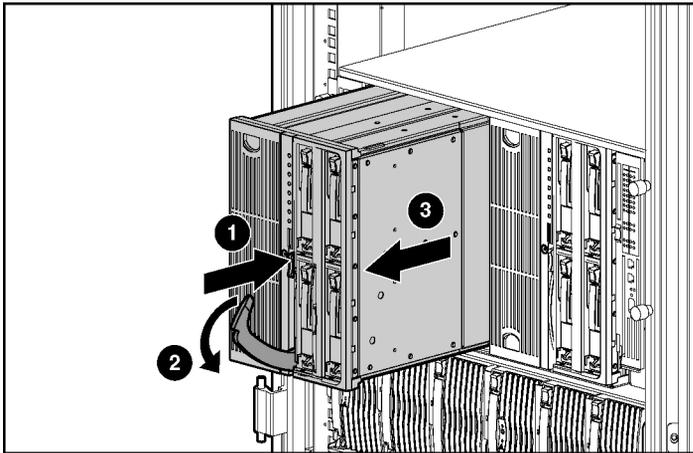


Figure 1-3: Removing the server blade from the server blade enclosure



WARNING: The ProLiant BL40p server blade exceeds the recommended weight for one individual to handle safely.

25.86 kg
(57 lb)

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

4. Place the server blade on a flat, level surface.
5. Remove the access panel:
 - a. Lift up on the hood latch handle until the access panel disengages from the chassis (1).
 - b. Slide the access panel about 1.3 cm (1/2 inch) toward the rear of the unit and lift the panel to remove it (2).

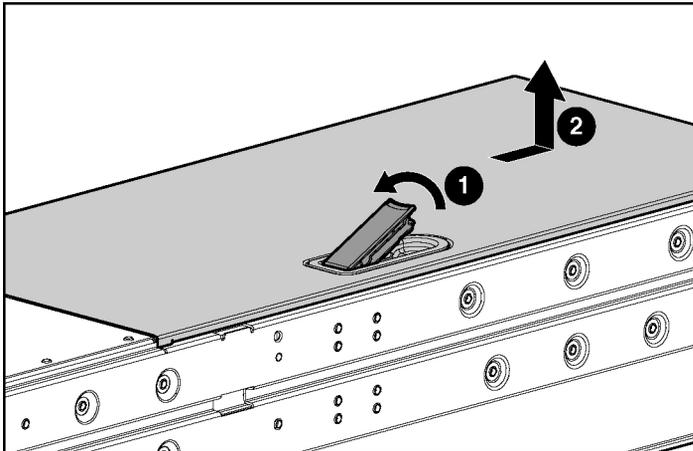


Figure 1-4: Removing the access panel

To replace the access panel, reverse step 5.

Removing the System Board Tray Assembly

The system board tray assembly must be removed from the chassis for the replacement of some components, but is not required for all preparation procedures. Refer to the instructions for replacing a specific option to determine whether the system board tray assembly must be removed. Refer to Figure 1-5 and Table 1-1 for the locations of components that must be disconnected before removing the system board tray assembly.

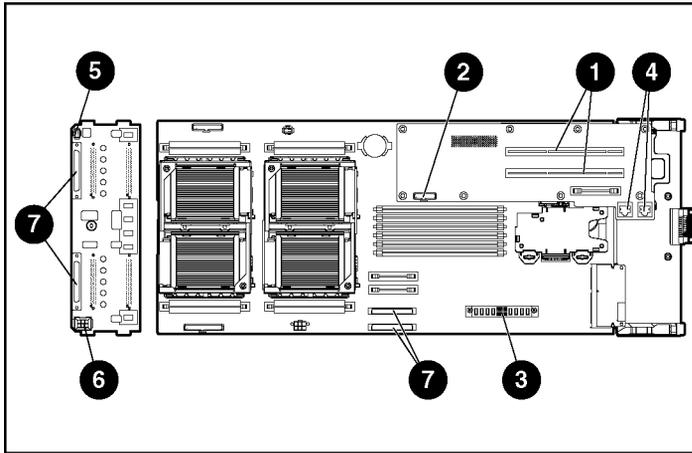


Figure 1-5: Component disconnection locations

Table 1-1: Component Disconnection Tasks

Item	Component	Task
1	PCI-X expansion boards	Remove any installed PCI-X expansion boards
2	Fan cable	Disconnect from PCI-X mezzanine board

continued

Table 1-1: Component Disconnection Tasks *continued*

Item	Component	Task
3	DC power converter	Disconnect from system board
4	RJ-45 cables	Disconnect from PCI-X mezzanine board
5	SCSI I2C cable	Disconnect from SCSI backplane board and snap into the processor baffle
6	SCSI backplane power cable	Disconnect from SCSI backplane board and snap into the processor baffle
7	SCSI cables	Disconnect from system board and SCSI backplane board

To remove the system board tray assembly:

IMPORTANT: All power must be removed from the server blade before performing these procedures.

1. Remove the access panel. Refer to Figure 1-4.
2. Remove any installed PCI-X expansion boards.

3. Remove the three-fan assembly:
 - a. Disconnect the fan cable from the PCI-X mezzanine board (1).
 - b. Pull out the fan clips located underneath the assembly (2).
 - c. Lift the assembly out of the chassis (3).

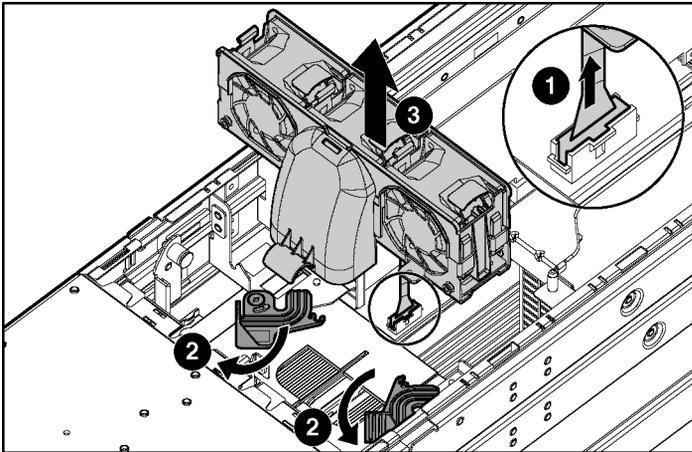


Figure 1-6: Removing the three-fan assembly

4. Remove the DC power converter from the system board. Refer to the label on the DC power converter for details.

5. Disconnect the RJ-45 cables from the PCI-X mezzanine board.

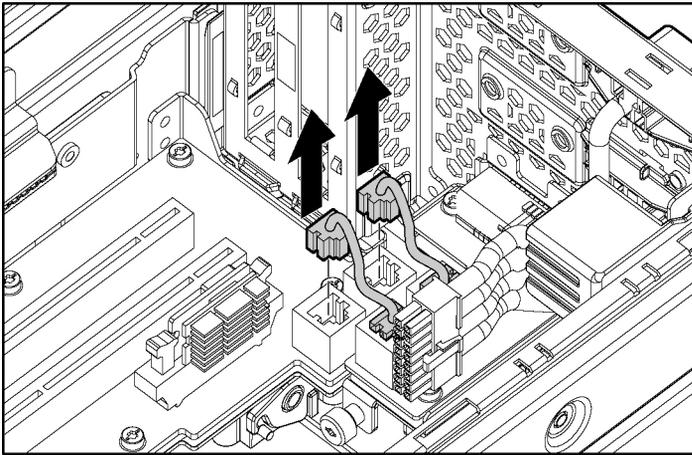


Figure 1-7: Disconnecting RJ-45 cables

6. Disconnect the SCSI I2C cable from the SCSI backplane board, and snap the cable into the processor baffle. Refer to Figure 1-8 and Figure 1-9.



CAUTION: The SCSI I2C cable must remain attached to the system board. To avoid damaging the system board, remove only the end connected to the SCSI backplane board.

7. Disconnect the SCSI backplane power cable from the SCSI backplane board, and snap the cable into the processor baffle. Refer to Figure 1-8 and Figure 1-9.

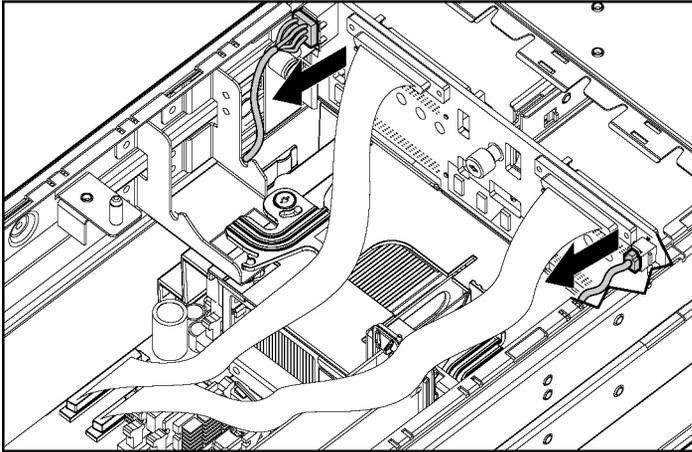


Figure 1-8: Disconnecting the SCSI I2C cable and the SCSI backplane power cable

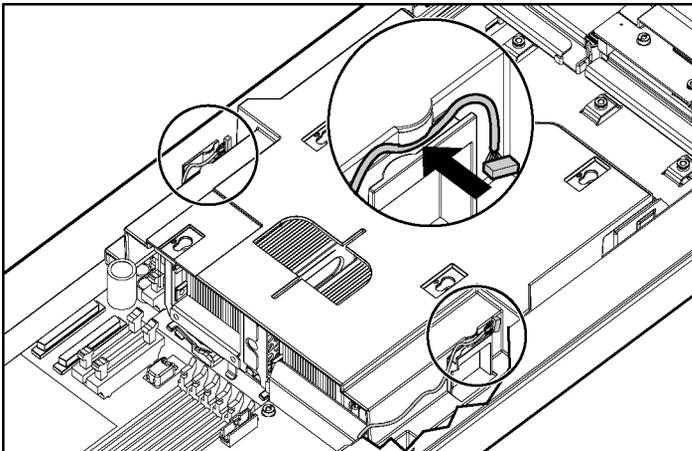


Figure 1-9: Attaching cables to the processor baffle

NOTE: The chassis has been removed from this illustration for clarity. At this point, the system board tray assembly will still be inside the chassis.

8. Disconnect both SCSI cables from the SCSI backplane board (1, 4) and from the system board (2, 3).

NOTE: Numbers 3 and 4 in Figure 1-10 reference ports A (short cable). Numbers 1 and 2 reference ports B (long cable). Crossing the cables can result in incorrect data presentation.

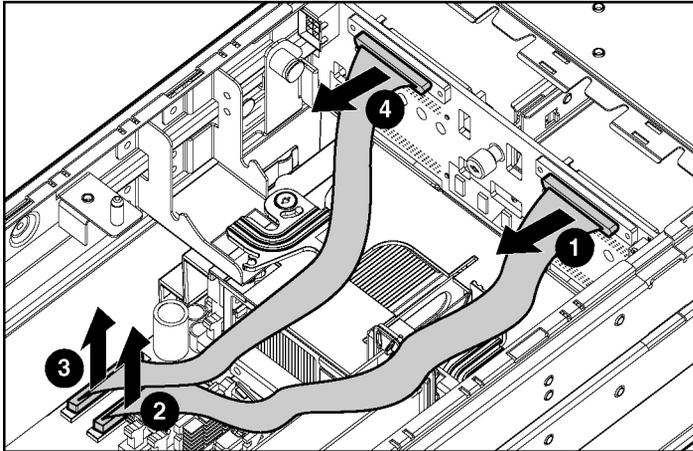


Figure 1-10: Disconnecting the SCSI cables

9. Lift the system board tray release latch (1) and turn it to unlock the system board tray from the chassis (2).
10. Push the button to release the system board tray lever (3) and slowly slide it towards the front of the server blade (4).

IMPORTANT: To avoid damaging the equipment, be sure to lift all cables away from the system board before sliding the tray out.

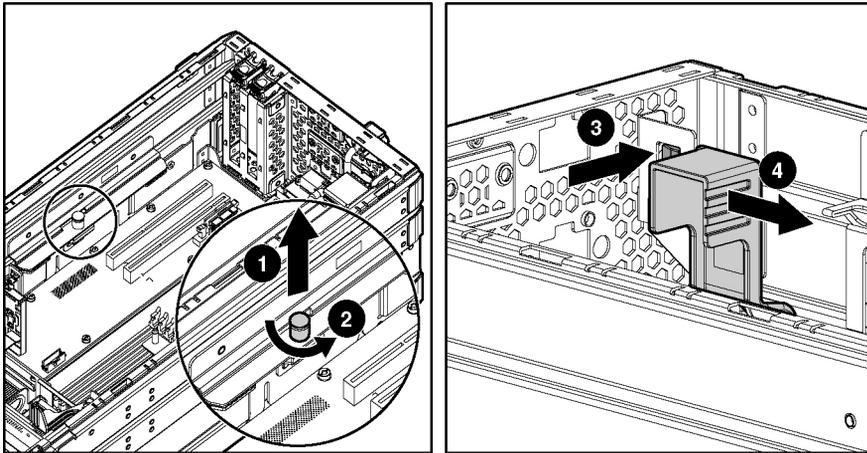


Figure 1-11: Unlocking the system board tray

11. When the system board tray lever is completely forward, slide the system board tray out of the chassis.

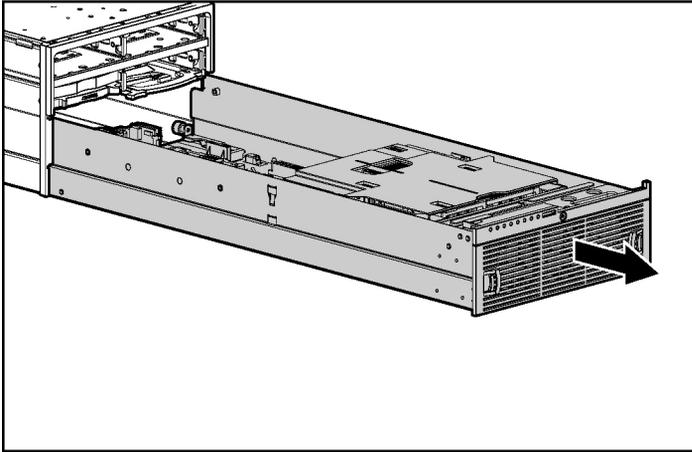


Figure 1-12: Removing the system board tray

To replace the system board, reverse steps 1 through 11.

Identifying System Board Components

Use Figure 1-13 and Table 1-2 to identify the system board components and connectors.

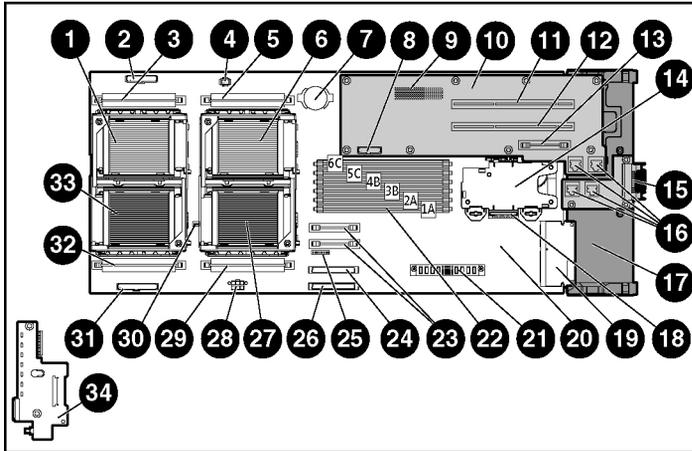


Figure 1-13: System board components and connectors

Table 1-2: System Board Components and Connectors

Item	Description	Item	Description
1	Processor socket 3	18	I/O passthrough board connector
2	LED/power switch board connector	19	Smart Array 5i Plus memory module
3	PPM slot 3	20	System board
4	SCSI I2C cable connector	21	DC power converter connector
5	PPM slot 4	22	DIMM slots 1-6
6	Processor socket 4	23	System board power module
7	System battery	24	Channel B SCSI connector
8	SCSI backplane fan connector	25	System maintenance switch (SW3)
9	PCI-X mezzanine board connector	26	Channel A SCSI connector
10	PCI-X mezzanine board	27	Processor socket 1
11	64-bit/100 MHz PCI-X slot 2	28	SCSI power connector
12	64-bit/100 MHz PCI-X slot 1	29	PPM slot 1
13	PCI-X mezzanine power module	30	System ID switch (SW1)
14	Battery-Backed Write Cache Enabler	31	Processor fan connector
15	Ethernet passthrough board (attaches to chassis)	32	PPM slot 2
16	RJ-45 connectors	33	Processor socket 2
17	NIC I/O board	34	LED/power switch board with I/O pass-through

Memory

The server blade supports up to six 2-GB, PC2100, Registered, ECC DDR DIMMs.

The following sections explain DIMM slot locations, installation guidelines, and installation procedures.

Online Spare Memory Configuration

With Online Spare Memory, you can configure primary server memory for up to 8 GB of ECC DDR memory and configure an additional 4 GB of online spare memory. In this configuration, all six DIMM slots are populated with 2-GB Registered ECC DDR DIMMs.

NOTE: Bank A refers to DIMM slots 1 and 2; bank B refers to DIMM slots 3 and 4; bank C refers to DIMM slots 5 and 6.

In the online spare configuration, the ROM automatically configures the last populated bank as the spare memory. If only banks A and B are populated, bank B is the spare bank. If banks A, B, and C are populated, bank C is the spare bank. If DIMMs in a non-spare bank exceed the limit for the single-bit correctable errors threshold as defined by the Pre-Failure Warranty, the system copies the memory contents of the failing bank to the spare bank. The system then deactivates the failing bank and automatically switches over to the spare bank.

For Online Spare Memory support, you must observe the following guidelines:

- The ROM must be up to date.
- DIMMs installed in a spare bank must be of equal or greater capacity than the DIMMs installed in other banks.

For example, if bank A is populated with two 256-MB DIMMs and bank B is populated with two 512-MB DIMMs, bank C must be populated with two 512-MB or greater DIMMs in order for online spare memory support to function properly.

After installing DIMMs, use ROM-Based Setup Utility (RBSU) to configure the system for Online Spare Memory support:

1. Access RBSU by pressing the **F9** key during power-up, when the prompt is displayed in the lower right corner of the screen.
2. Select **System Options**.
3. Select **Advanced Memory Protection**.
4. Select **Online Spare with Advanced ECC Support**.
5. Press the **Enter** key.
6. Press the **Esc** key to exit the current menu or press the **F10** key to exit RBSU.

DIMM Installation Guidelines



CAUTION: Use only HP supported DIMMs. DIMMs from other sources are known to adversely affect data integrity.

You must observe the following guidelines when installing additional memory:

- Install only PC2100, Registered, ECC DDR, 3.3-V, 72-bit wide DIMMs in the server blade.
- Always install memory in pairs of two identical DIMMs. DIMMs must be the same speed.

IMPORTANT: Install identical DIMMs in slots 1A and 2A. You can install a second set of identical DIMMs in slots 3B and 4B and a third set of identical DIMMs in slots 5C and 6C.

- Install the DIMMs in the paired banks in sequential order, populating both slots in a bank at the same time.

For Online Spare Memory support, you must also observe additional guidelines. Refer to “Online Spare Memory Configuration” in this chapter.

Installing DIMMs

Before installing DIMMs, review “Online Spare Memory Configuration” in this chapter.



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



CAUTION: Electrostatic discharge can damage electronic components. Properly ground yourself before beginning any installation procedure. Refer to Appendix B, “Electrostatic Discharge,” for more information.

To install a DIMM:

NOTE: The server blade ships with at least two DIMMs installed in DIMM slots 1A and 2A.

1. Remove the access panel. Refer to “Preparation Procedures” in this chapter.
2. Open the DIMM slot latches.
3. Align the key slot in the bottom edge of the DIMM with the tab in the DIMM slot.

IMPORTANT: DIMMs do not seat if turned the wrong way.

4. Insert the DIMM into the DIMM slot (1).
5. Press down firmly. When the DIMM seats fully in the slot, the latches close (2).

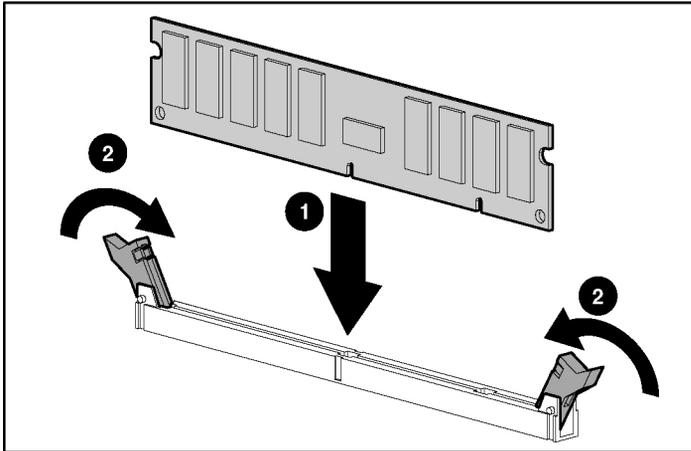


Figure 1-14: Installing a DIMM

6. Reinstall the access panel. Refer to “Preparation Procedures” in this chapter.

Processors

The ProLiant BL40p server blade has the capability of up to four Intel® Xeon™ processors. To remove a processor:

1. Power down the server blade and remove it from the server blade enclosure. Refer to “Preparation Procedures” in this chapter.
2. Remove the access panel and the system board tray. Refer to “Preparation Procedures” in this chapter.
3. Unsnap the SCSI I2C cable and SCSI backplane power cable from the processor baffle.
4. Slide the processor baffle back, and lift it off of the processor assemblies. Push the cables through the access holes in the processor baffle, but leave them attached to the system board as the processor baffle is removed.



CAUTION: To avoid damaging the system board, use caution when removing the processor baffle. The SCSI I2C cable must remain attached to the system board at this point.

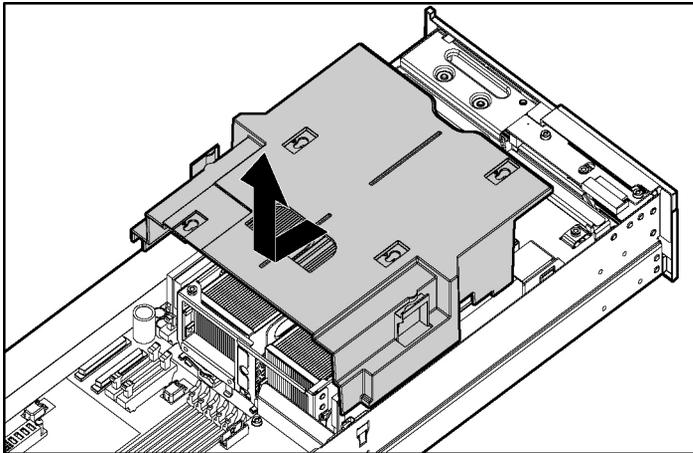


Figure 1-15: Removing the processor baffle

5. Lift the blue processor cage lever to release the processor cage (1).
6. Raise the processor cage away from the processor assembly (2).

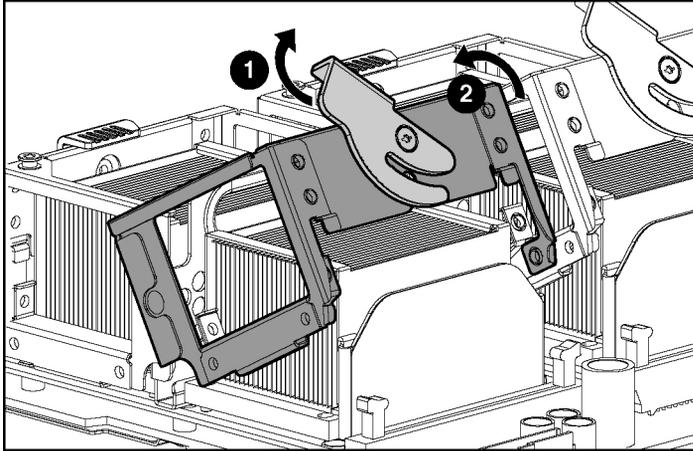


Figure 1-16: Removing the processor cage

7. Lift the processor-locking lever to release processor assembly (1).
8. Lift the processor assembly away from the processor socket (2).

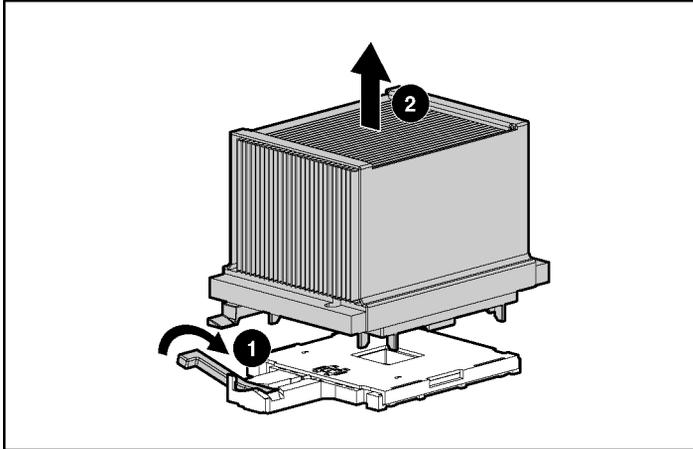


Figure 1-17: Removing a processor



CAUTION: To avoid damage to the processors and processor sockets, be sure to:

- Completely open the processor-locking lever when installing a processor assembly.
- Completely close the processor-locking lever before lowering the processor cage.

To install a processor, reverse steps 1 through 7. When lowering the processor assembly, be sure to correctly align the pins (1) before closing the processor-locking lever (2).



CAUTION: When installing three processors, they must occupy sockets 1, 2, and 4.

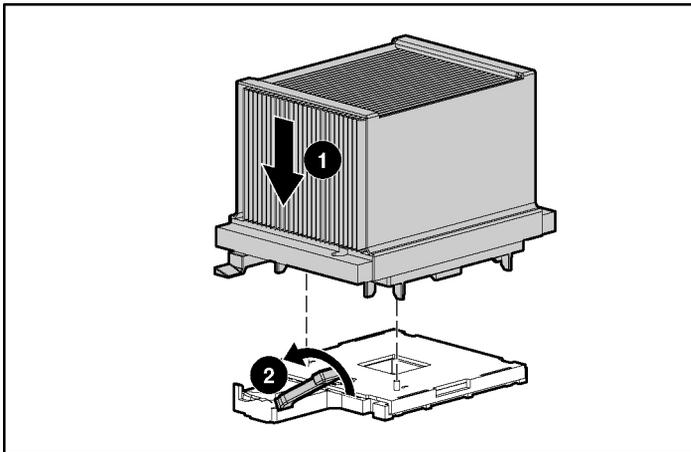


Figure 1-18: Aligning the processor pins and installing the processor



CAUTION: Do not separate the processor from the heatsink. They ship as one assembly and separating them will damage the assembly.

Battery-Backed Write Cache Enabler

The Smart Array 5i Battery-Backed Write Cache Enabler, also known as the battery module, provides transportable data protection, increases overall controller performance, and maintains any cached data for up to 72 hours without external power. It provides the system with a means for storing and saving data in the event of an unexpected system shutdown. The NiMH batteries in the battery module are continuously recharged through a trickle-charging process whenever the system power is on. Under normal operating conditions, the battery module lasts for 3 years before replacement is necessary.

To install the battery module:

1. Power down the server blade and remove it from the server blade enclosure. Refer to the “Preparation Procedures” section in this chapter.
2. Remove the access panel. Refer to “Preparation Procedures” in this chapter.
3. Install the battery module onto the standoffs on the system board. Be sure the battery module seats firmly, and turn the standoffs to secure.

NOTE: If you purchased the Battery-Backed Write Cache Enabler as an option, you need to attach the plastic casing separately.

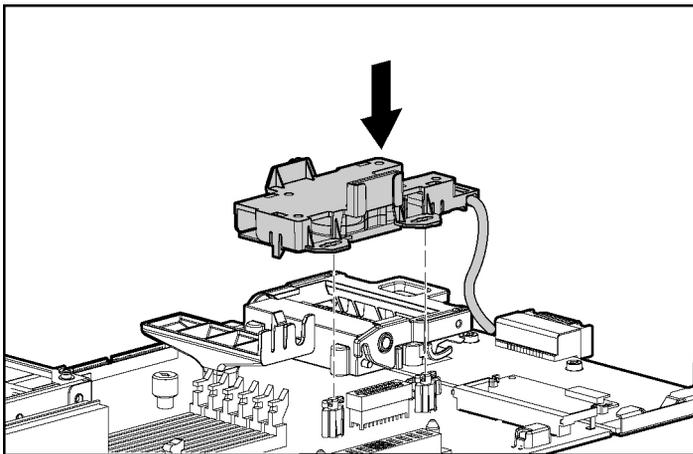


Figure 1-19: Installing the Battery-Backed Write Cache

4. Connect the cable from the battery module to the Smart Array 5i Plus memory module.

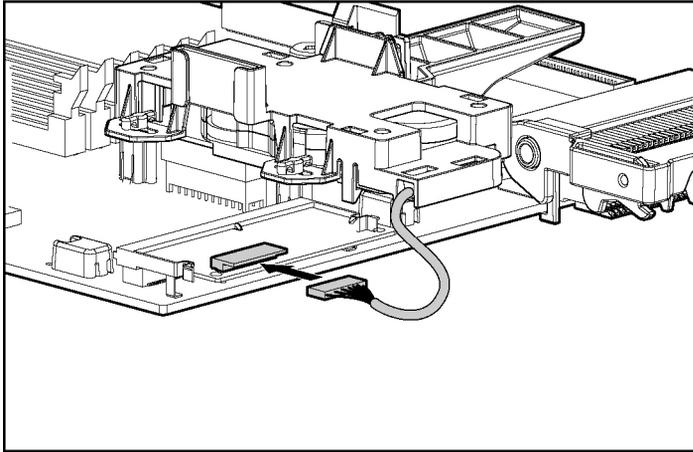


Figure 1-20: Cabling the Battery-Backed Write Cache Enabler

5. Reinstall the system board and the access panel. Refer to “Preparation Procedures” in this chapter.

NOTE: Insight Manager 7 will indicate a low charge until the battery module is fully charged for 24 to 48 hours.

Hot-Plug SCSI Hard Drives and Blanks

The following section explains removal and installation of hard drive blanks and hot-plug SCSI hard drives.

Removing Hard Drive Blanks

The server blade ships standard with four hard drive blanks. Before installing a hot-plug SCSI hard drive, you must remove a blank.



CAUTION: Always populate drive bays with either a hard drive or blank. Proper airflow can only be maintained when the bays are populated. Unpopulated drive bays can lead to improper cooling and thermal damage.

To remove a hard drive blank:

1. Press and hold the release button (1).
2. Pull the blank out of the drive bay (2).

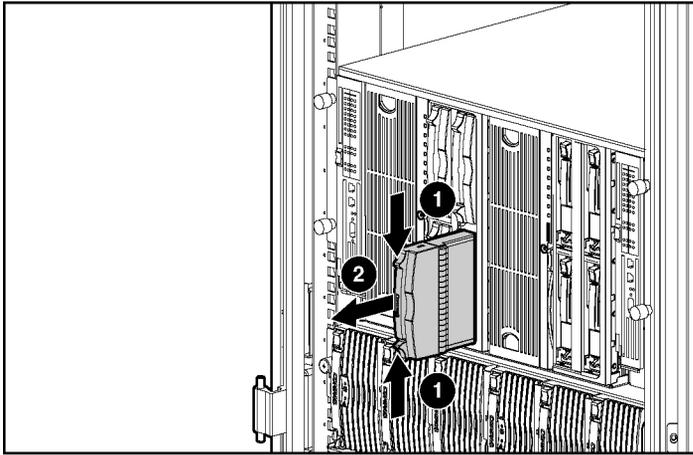


Figure 1-21: Removing a hard drive blank

NOTE: Store the hard drive blank for future use.

To install a hard drive blank, simply align the blank with the empty bay and slide the blank into the bay until the locking button engages.

SCSI ID Numbers

The server blade hot-plug SCSI hard drives have unique SCSI IDs that the system automatically sets. Figure 1-22 shows SCSI IDs for the server blade.

IMPORTANT: Always populate hard drive bays starting with SCSI ID 0 (items 3 and 4 in Figure 1-22).

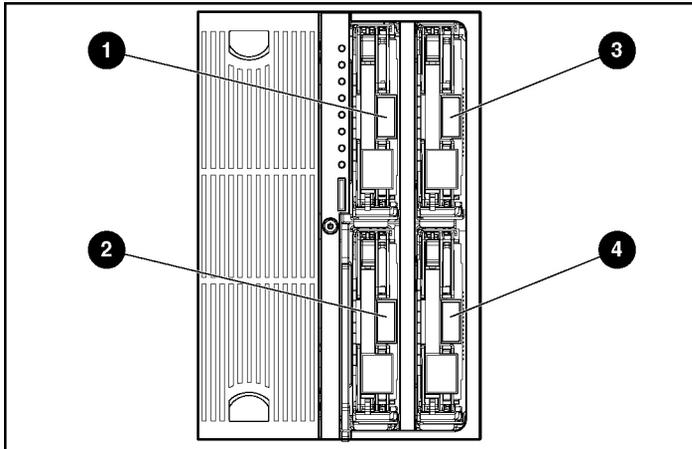


Figure 1-22: SCSI ID numbers

Table 1-3: Server Blade SCSI IDs

Item	Description	Bus
1	SCSI ID 1	B
2	SCSI ID 1	A
3	SCSI ID 0	B
4	SCSI ID 0	A

Installing Hot-Plug SCSI Hard Drives

To install hot-plug SCSI hard drives:

1. Remove the existing hard drive blank or SCSI hard drive from the bay:
 - If a hard drive blank is installed in the bay, refer to “Removing Hard Drive Blanks” in this chapter.
 - If a SCSI hard drive is already installed in the bay, refer to “Removing Hot-Plug SCSI Hard Drives” in this chapter.
2. Insert the hot-plug SCSI hard drive (1). Be sure the drive seats firmly into the connector on the SCSI backplane.
3. Close the ejector lever (2).

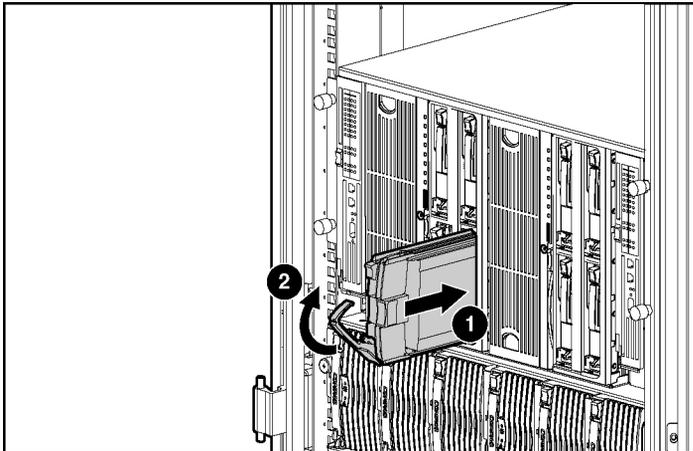


Figure 1-23: Installing a hot-plug SCSI hard drive

4. If you replaced a hard drive, restore the server blade data from the backup.
5. Use the hot-plug SCSI hard drive LEDs to identify the status of the installed drive. For more information about these LEDs, refer to the “Hot-Plug SCSI Hard Drive LEDs” section in Appendix E, “LEDs and Switches.”
6. Resume normal server blade operations.

Removing Hot-Plug SCSI Hard Drives

To remove hot-plug SCSI hard drives:

1. Back up all server blade data on the hard drive.



CAUTION: Before removing a hot-plug SCSI hard drive, use the LEDs to determine the status of the drive. Refer to the “Hot-Plug SCSI Hard Drive LEDs” section in Appendix E, “LEDs and Switches.”



CAUTION: If you are replacing a drive that is part of an array, refer to the “Hot-Plug SCSI Hard Drive Replacement Guidelines” section in the *HP ProLiant Servers Troubleshooting Guide*.

2. Press the port-colored ejector lever release button (1).

NOTE: Port-colored items indicate hot-plug components.

3. Pull the ejector lever open (2).
4. Remove the hard drive (3).

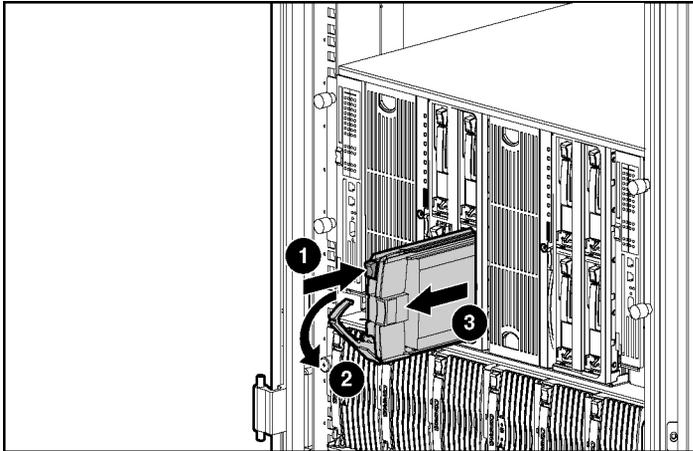


Figure 1-24: Removing a hot-plug SCSI hard drive

Installing Expansion Boards

The ProLiant BL40p server blade delivers fibre channel support for SAN implementations and clustering capabilities. The server blade has two PCI-X slots for redundant SAN connectivity and is optimized for HP StorageWorks. In addition, the server blade is also compatible with certain third-party SAN products. Refer to the contents included with the expansion board for cabling and SAN configuration instructions. To install an expansion board into a PCI-X slot:

1. Remove the access panel. Refer to “Preparation Procedures” in this chapter.
2. Remove the expansion board blank corresponding to the PCI-X slot you are populating by pressing down on the release lever (1), then pulling up (2).
3. Slide the expansion board blank out of the slot (3).

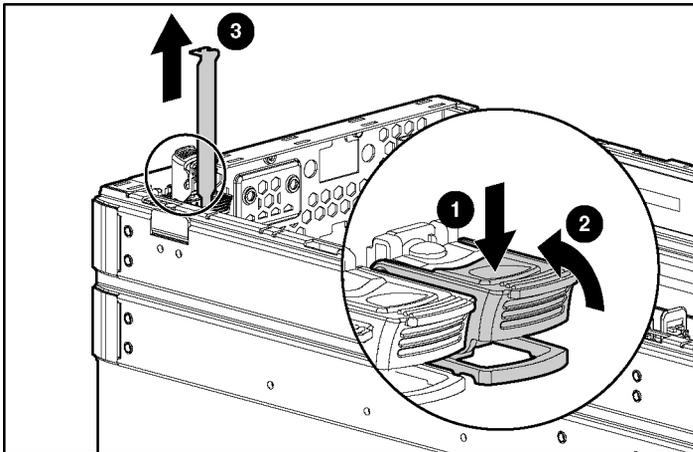


Figure 1-25: Removing expansion board blanks

4. Open the alignment guide (1).
5. Install the expansion board into the PCI-X slot (2).
6. Close the alignment guide (3).
7. Close the release lever (4).

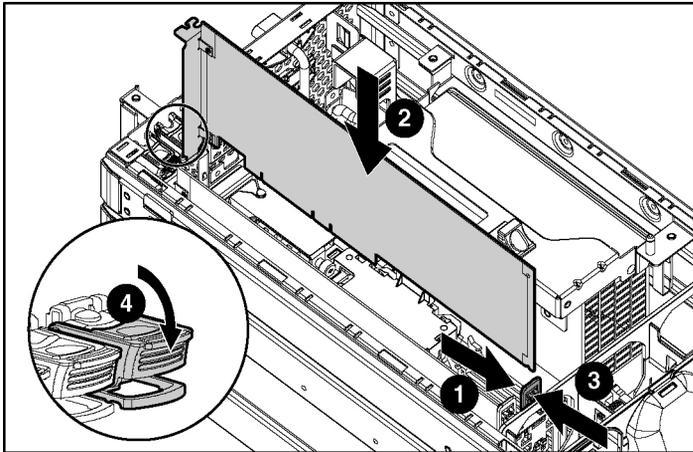


Figure 1-26: Installing an expansion board

8. Repeat steps 2 through 7 for PCI-X slot 2 if installing an additional expansion board.
9. Reinstall the access panel.
10. Install the server blade into the enclosure. Refer to “Installing a Server Blade” in this chapter.
11. Cable the expansion board as necessary. Refer to the documentation included with the expansion board for instructions.

Server Blades

Before installing server blades for the first time, define your hardware configuration and server blade deployment process. Refer to Chapter 2, “Configuring and Deploying Server Blades.”



WARNING: The ProLiant BL40p server blade exceeds the recommended weight for one individual to handle safely.

25.86 kg
(57 lb)

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

Installing a Server Blade



CAUTION: Always populate the server blade enclosure bays with either a server blade or server blade blank. Proper airflow can only be maintained when the bays are populated. Unpopulated bays can lead to improper cooling and thermal damage.

To install a server blade:

1. Four server blade blanks must be removed before installing a BL40p server blade into the enclosure. To remove a server blade blank:
 - a. Press the release buttons (1).
 - b. Slide the server blade blank out of the bay (2).

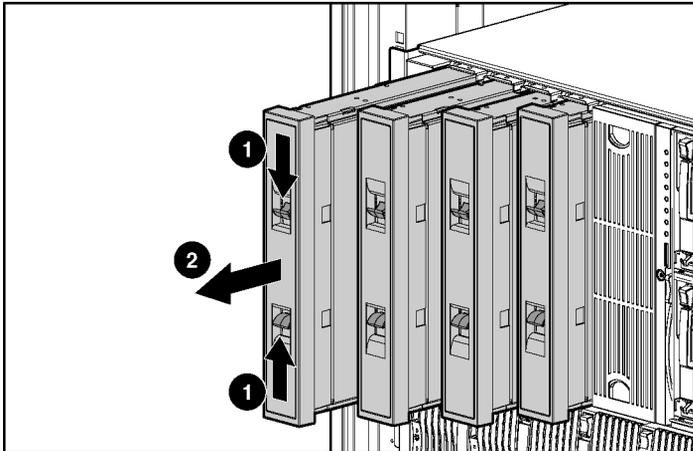


Figure 1-27: Removing a server blade blank

NOTE: Store the server blade blank for future use.

2. Repeat step 1 to remove the three other server blade blanks from adjacent bays.
3. Align the keyed end of the server blade with the guide at the end of a bay on the server blade enclosure.

IMPORTANT: The server blade is keyed to fit only one way in the bay. If the server blade does not slide easily into the bay, be sure that the server blade is oriented properly.

4. If the server blade is not populating bays 1 through 4 (farthest left) or bays 5 through 8 (farthest right):
 - a. Use a Torx T-15 screwdriver to remove the 3 screws from the locking handle (1).
 - b. Remove the locking handle from the back of the server blade (2).

NOTE: The locking handle keeps the server blade locked to the enclosure when it is installed in either of the end bays. If you are installing the server blade in the middle of the enclosure, the locking handle will not fit properly into the enclosure.

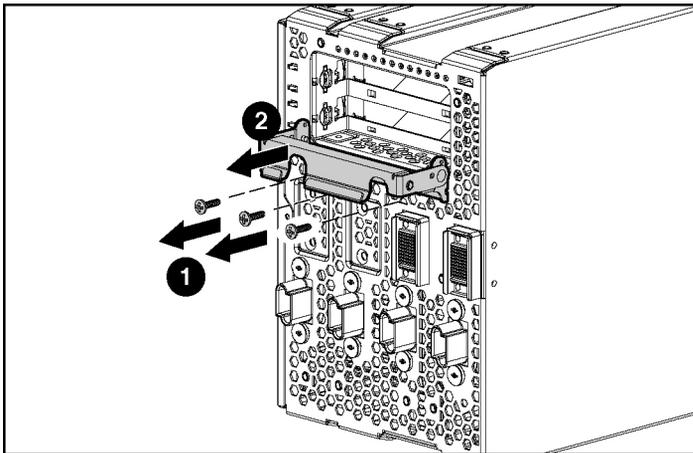


Figure 1-28: Removing the locking handle from the server blade

5. Install the server blade into the bay. Slide the server blade fully into the bay (1).
6. Close the ejector lever (2).

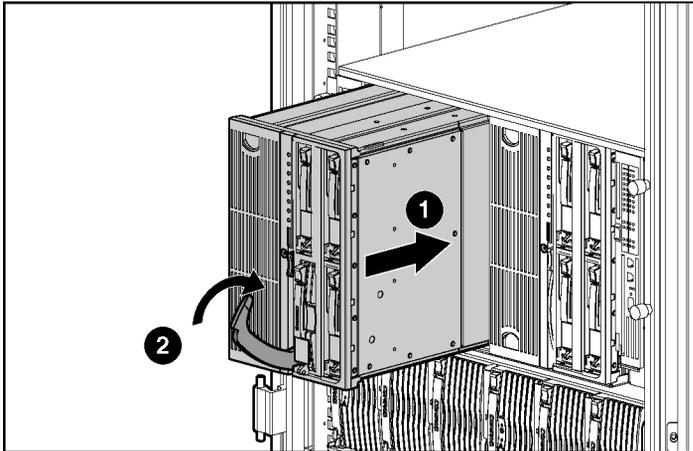


Figure 1-29: Installing a server blade

7. If installing the server blade into either of the end bays, and if the server blade has PCI-X boards installed, close the locking handle on the back of the server blade to secure it to the server blade enclosure.

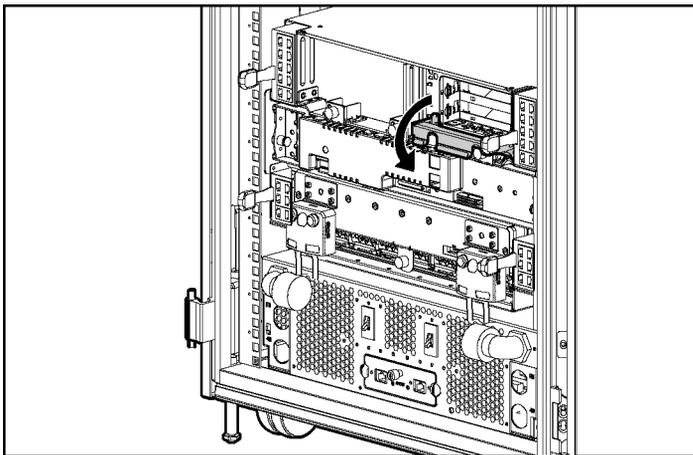


Figure 1-30: Closing the locking handle

Powering Up the Server Blade

To install a server blade in the server blade enclosure, refer to “Installing a Server Blade” in this chapter.

Server blades are set to power up automatically. If you changed this setting, use one of the following methods to power up the server blade:

- Power On/Standby button
 - A momentary press initiates a power-up request. The system detects if power is available to power on the server blade.
 - A long press, 5 or more seconds, initiates a power-up override. The system is forced to power up the server blade without detecting available power.



CAUTION: Always observe iLO alerts before initiating a power-up override to prevent a hot-plug power supply fault and possible loss of system power.

NOTE: You may choose to perform a power-up override to power up a server blade and to override the power-up request function when the management modules are not in use and when you know that sufficient power is available.

- Virtual power button features through the iLO remote console
 - A **Press and Hold** selection initiates a power-off request. The system is forced to power off if the operating system does not respond to a momentary press.
 - A **Power Cycle System On, After Off** selection simulates turning the server blade off and back on with one button press.

For more information about iLO, refer to Chapter 2, “Configuring and Deploying Server Blades.”

Configuring and Deploying Server Blades

This chapter contains information about server blade deployment methods, hardware configuration, and the software to accomplish these tasks.

Configuration and Deployment Overview

Three primary deployment methods are supported:

- Remote deployment using ProLiant Essentials Rapid Deployment Pack (RDP)
- Remote deployment using virtual devices through iLO
- Deployment using local devices with the I/O cable (depending on the server model)

Remote Deployment using RDP

The RDP software is the preferred method for rapid, high-volume server blade deployments. The RDP software integrates two powerful products: Altiris eXpress Deployment Solution and the ProLiant Integration Module.

The Altiris eXpress Deployment Server Console has an intuitive graphical user interface that provides simplified drag-and-drop server deployment using either imaging or scripting. The console also has advanced features for blade servers. The user can view blade servers in a physical tree view according to their Rack\Enclosure\Bay settings. The Deployment Server can detect when a blade is ripped out and replaced with a new blade. The user can configure the Deployment Server to automatically replay all deployment jobs on the new blade.

If you purchased RDP with the blade enclosure, follow the instructions on the Quick Start Guide, included in the kit, to register and install the software.

For product information and the latest RDP documentation, go to
www.hp.com/servers/rdp

Remote Deployment using Virtual Devices through iLO

The server blade should be connected to a network before beginning the deployment process. Connect to the server blade with one of the following methods:

- Through an existing network (in the rack)
This method requires you to install the server blade in its enclosure and assign it an IP address (manually or using DHCP).
- Through an existing network (out of the rack, with the diagnostic station)
This method enables you to configure a server blade out of the rack by powering the blade with the diagnostic station and connecting to an existing network through a hub. The IP address is assigned by a DHCP server on a network.

Integrated Lights-Out (iLO) can be a helpful debugging tool in the configuration and deployment process. HP recommends using iLO to follow the deployment process. Refer to “Integrated Lights-Out Management” in this chapter for information about these additional methods.

iLO Virtual CD-ROM Deployment

To perform a boot CD deployment:

1. Do one of the following:
 - Insert the boot CD into the client PC from which you are running the iLO Remote Console.
 - Use iLO Advanced to create an image file of the boot CD.
 - Copy the image of the boot CD to a location on the network or the client PC hard drive.

2. Remotely access the server blade through iLO Advanced. Refer to the *HP Integrated Lights-Out User Guide*.
3. Click the **Virtual Devices** tab.
4. Select **Virtual Media**.
5. Use the Virtual Media applet to select the local CD or image file and connect the Virtual CD to the server blade.
6. Use the iLO Virtual Power Button feature to reboot the server blade.

After the server blade boots, follow the normal network installation procedure for an operating system.

iLO Virtual Floppy Deployment

To perform a boot diskette deployment:

IMPORTANT: To deploy a server blade without the RDP, you must create a bootable diskette or an image of a bootable diskette. Refer to "Creating the Boot Diskette."

1. Do one of the following:
 - Insert the boot diskette into the client PC from which you are running the iLO Remote Console.
 - Use iLO to create an image file of the boot diskette.
 - Copy the image of the boot diskette to a location on the network or the client PC hard drive.
2. Remotely access the server blade through the iLO. Refer to "Integrated Lights-Out Management" in this chapter.
3. Select the **Virtual Devices** tab.
4. Select **Virtual Media**.
5. Use the Virtual Media applet to select the local diskette or image file and connect the Virtual Disk to the server blade.
6. Use the iLO Virtual Power Button feature to reboot the server blade.

After the server blade boots, follow the normal network installation procedure for your operating system.

Deployment using Local Devices with the I/O Cable

Use either the diagnostic cable or the I/O cable to perform some server blade configuration and diagnostic procedures. Depending on the model, the server blade will have either a diagnostic port or an I/O port. The I/O port only accepts the I/O cable and the diagnostic port only accepts the diagnostic cable. If the server blade has an I/O icon next to the port on the front of the server blade, use the I/O cable. If the port has no icon, use the diagnostic cable. Refer to Figure 2-1 to identify the I/O icon.

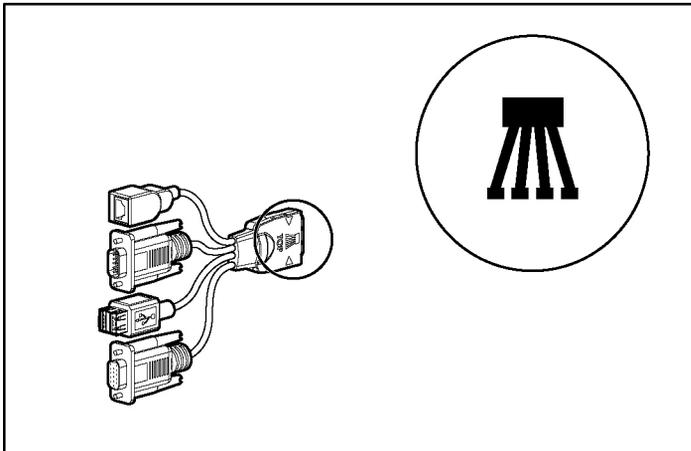


Figure 2-1: I/O cable with large view of the I/O icon

Identifying Diagnostic and I/O Cable Connectors

Figure 2-2 and Table 2-1 identify diagnostic cable and I/O cable connectors.

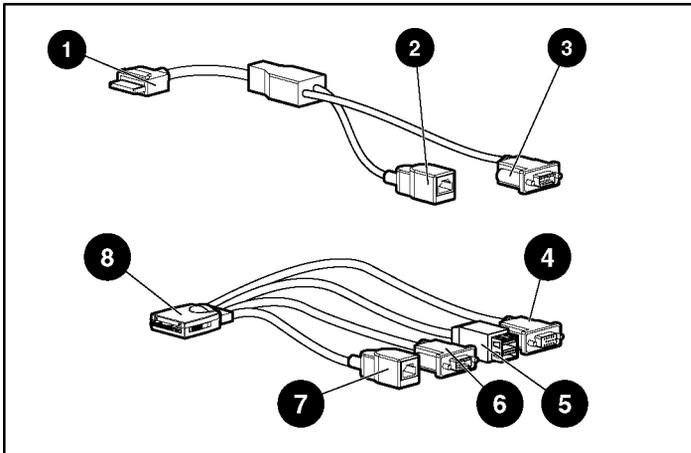


Figure 2-2: Connectors

Table 2-1: Diagnostic and I/O cable connectors

Item	Description
Diagnostic cable	
1	Server blade connector
2	iLO RJ-45 (10/100 Ethernet) connector
3	Kernel debug connector**
I/O cable*	
4	Video connector
5	USB connector (2)
6	Kernel debug connector**
7	iLO RJ-45 (10/100 Ethernet) connector
8	Server blade connector

*The I/O cable is labeled with the I/O icon. The diagnostic cable has no label.

**The kernel debug connector does not function as a serial port.

Connecting the Diagnostic Cable or the I/O Cable

To connect to iLO using either the diagnostic cable or the I/O cable, you must have the following:

- A client PC with a 10/100 Ethernet RJ-45 connector
- A network cable with RJ-45 connectors

To connect to iLO:

IMPORTANT: Do not connect the diagnostic cable or the I/O cable to a hub when using an IP address to connect to iLO. All server blades have the same IP address through the diagnostic or I/O port. Multiple server blades on a hub make the server blades indistinguishable on the network.

NOTE: Connecting the diagnostic cable to the diagnostic port or the I/O cable to the I/O port automatically disables the iLO connection on the rear of the server blade when the connection to the front port is active.

1. Connect one end of the RJ-45 network cable to the diagnostic cable (1) or the I/O cable, depending on the server blade.
2. Connect the other end of the network cable to the 10/100 Ethernet RJ-45 connector on the client PC (2).

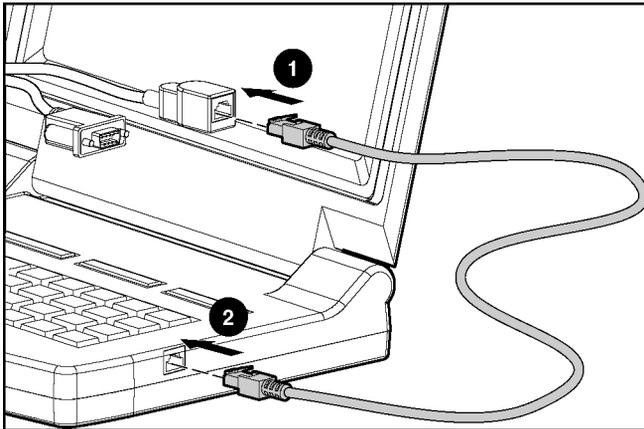


Figure 2-3: Connecting an RJ-45 network cable

3. Connect the server blade connector to the server blade.

 **CAUTION:** Disconnect the diagnostic cable or the I/O cable from the port when not in use. The port and connector do not provide permanent connections.

 **CAUTION:** Rear iLO connector performance degrades when the I/O cable or the diagnostic cable is in use, even when the iLO connector on the cable is not in use.

 **CAUTION:** Always match the I/O cable labeled with the I/O icon to the I/O port also labeled with the I/O icon. The diagnostic cable and port have no labels. Mismatched cables prevent proper connection and can cause damage.

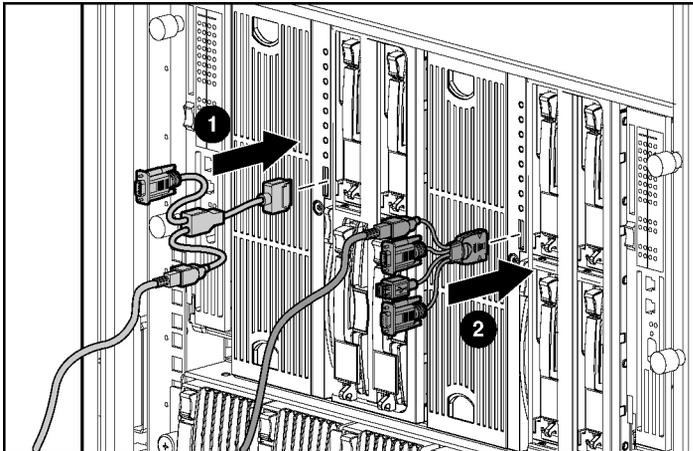


Figure 2-4: Connecting either the diagnostic cable (1) or the I/O cable (2) to the server blade

 **CAUTION:** For the diagnostic cable, the locking button is located on the top of the server blade connector.

For the I/O cable, the locking buttons are located on the sides of the server blade connector.

Always be sure to squeeze the locking button on the diagnostic cable before disconnecting the diagnostic cable from the diagnostic port. Failure to do so can result in damage to the equipment.

Connecting Directly to a Server Blade using Video and USB Devices

To connect directly to the server blade, use the I/O cable and any combination of the following USB devices:

- Monitor
- USB Hub
- USB Keyboard
- USB Mouse
- USB CD-ROM
- USB Diskette Drive

The devices can be connected to the I/O cable in various configurations. Two of the possible configurations are detailed in the following:

Directly Accessing a Configured Server Blade

Use the following setup to access a configured server blade:



CAUTION: Rear iLO connector performance degrades when the I/O cable or the diagnostic cable is in use, even when the iLO connector on the cable is not in use.

NOTE: For this setup, a hub is not necessary to connect directly to the blade. If you need additional connections, use the second setup.

1. Connect the I/O cable to the server blade (1).
2. Connect the video connector to a monitor (2).
3. Connect a USB mouse to the USB connector (3).
4. Connect a USB keyboard to the USB connector (4).

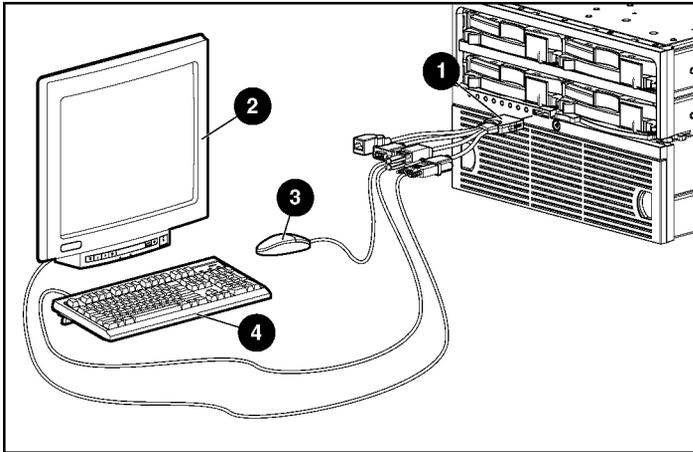


Figure 2-5: Directly accessing a configured server blade

Directly Accessing a Server Blade to Configure a Server Blade or Load Software Updates

Use the following setup to configure a server blade using a SmartStart CD or to load software updates or patches using the CD-ROM:



CAUTION: Rear iLO connector performance degrades when the I/O cable or the diagnostic cable is in use, even when the iLO connector on the cable is not in use.

1. Connect the I/O cable to the server blade (1).
2. Connect a monitor to the video connector (2).
3. Connect a USB hub to a USB connector (3).
4. Connect the following to the USB hub:
 - a. USB CD-ROM (4) and/or a USB diskette drive
 - b. USB keyboard (5)
 - c. USB mouse (6)

NOTE: HP recommends the use of a USB hub when connecting a USB diskette drive and/or USB CD-ROM drive to the server blade. This will provide more available connections.

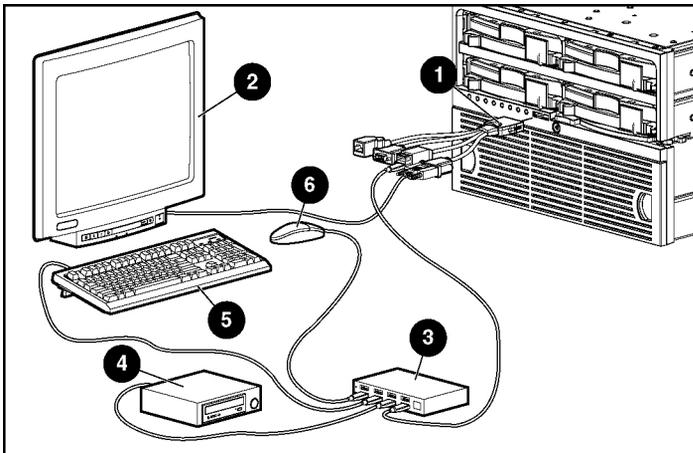


Figure 2-6: Directly connecting to the server blade using a USB hub

USB CD-ROM Deployment

CD-ROM deployment involves a bootable CD that executes a script that configures the hardware and installs the operating system.

SmartStart simplifies the deployment process and facilitates loading the operating system. However, SmartStart does not prevent you from loading the operating system and drivers manually. For more information on SmartStart, refer to the HP website:

www.hp.com/servers/smartstart

To perform a boot CD deployment:

1. Connect a USB CD-ROM, USB mouse, USB keyboard, and a monitor to the server blade using the I/O cable. Install a USB hub on the I/O cable to provide additional USB connections.
2. Insert the Smart Start CD or the operating system CD in the CD-ROM.
3. Reboot the server blade.
4. After the server blade boots, follow the normal installation procedure for an operating system.

After the operating system is configured, the server blade can access the network to locate the scripts and files necessary for deployment. The server blade should be connected to a network before beginning the deployment process. Connect to the server blade with one of the following methods:

- Through an existing network (in the rack)
This method requires you to install the server blade in its enclosure and assign it an IP address (manually or using DHCP).
- Through an existing network (out of the rack, with the diagnostic station)
This method enables you to configure a server blade out of the rack by powering the blade with the diagnostic station and connecting to an existing network through a hub. The IP address is assigned by a DHCP server on a network.

USB Diskette Drive Deployment

Diskette Image Deployment involves creating a DOS-based network-enabled boot diskette that executes a script that configures the hardware and installs the operating system. Server blades have two mechanisms for using the diskette: iLO Virtual Floppy and PXE.

IMPORTANT: To deploy a server blade without the RDP, you must create a bootable diskette or image of a bootable diskette. Refer to "Creating the Boot Diskette."

To perform a boot diskette deployment:

1. Connect a USB diskette drive, USB mouse, USB keyboard, and a monitor to the server blade using the I/O cable. Install a USB hub on the I/O cable to provide additional USB connections.
2. Insert the boot diskette into the USB diskette drive.
3. Reboot the server blade.
4. After the server blade boots, follow the normal installation procedure for an operating system.

The diskette gets the server blade on the network where it can access the scripts and files necessary for deployment. This implies a deployment infrastructure that may include an administrator workstation, PXE server, Windows® file share, or a Linux file share.

The server blade must be connected to a network before beginning the deployment process. Connect to the server blade with one of the following methods:

- Through an existing network (in the rack)
This method requires you to install the server blade in its enclosure and assign it an IP address (manually or using DHCP).
- Through an existing network (out of the rack, with the diagnostic station)
This method enables you to configure a server blade out of the rack by powering the blade with the diagnostic station and connecting to an existing network through a hub. The IP address is assigned by a DHCP server on a network.

Other methods are available for connecting to the ProLiant BL40p server blade, but they do not provide the network accessibility required to deploy the server. Refer to "Integrated Lights-Out Management" in this chapter for information about these additional methods.

NOTE: For more information about these hardware and cabling configurations, refer to the *HP ProLiant BL p-Class System Hardware Configuration and Installation Poster* and the documentation that ships with the diagnostic station.

Creating the Boot Diskette

The SmartStart Scripting Toolkit provides the tools and information for creating a diskette that will configure the hardware and install the operating system.

For details, download the latest version of the “SmartStart Scripting Toolkit” from www.hp.com/servers/sstoolkit

and refer to the *SmartStart Scripting Toolkit User Guide*.

It is also possible to configure the hardware manually using RBSU through the iLO remote console. With this method, the diskette would be more generic and would integrate into the existing network OS installation process. Refer to the “Integrated Lights-Out Management” section in this chapter.

For the most current information about operating system support on server blades, refer to the operating system support matrix available at:

www.hp.com/products/servers/platforms

then navigate to the OS support for ProLiant BL p-Class server blades.

IMPORTANT: The ProLiant BL40p server blade has the ability to connect to a SAN using PCI-X expansion boards. You can preconfigure the SAN HBA driver Smart Components in the ProLiant Support Pack. Refer to the *HP ProLiant Support Pack and Deployment Utility User Guide* or “SAN Support” in this chapter for more information.

USB Diskette Drive Deployment using PXE

PXE enables server blades to load an image over the network from a PXE server then execute it in memory. The first NIC on the server blade is the default PXE boot NIC, but any of the other NICs can be configured to boot PXE. Refer to “PXE Deployment” in this chapter for more information.

A number of third-party PXE deployment tools are available for Windows and Linux. For additional information refer to

ftp.compaq.com/pub/products/servers/management/pxe_wp.pdf

SAN Support

The ProLiant BL40p server blade delivers fibre channel support for SAN implementations and clustering capabilities. The ProLiant BL40p server blade has two PCI-X expansion slots for redundant SAN connectivity and is optimized for HP StorageWorks. In addition, the server blade is also compatible with certain third-party SAN products.

For SAN configuration information for the server blade, consult the QuickSpecs located on the ProLiant BL40p 2 product page on

www.hp.com

Or the *SAN Design Reference Guide* located at

www.compaq.com/products/storageworks/san/documentation.html

Software and Utilities

This section provides information about the following utilities and support tools:

- Integrated Lights-Out (iLO) Management
- Redundant ROM Support
- ROMPaq Utility
- ROM-Based Setup Utility (RBSU)
- Option ROM Configuration for Arrays (ORCA) Utility
- Network-based PXE Deployment
- SmartStart Scripting Toolkit
- Insight Manager 7
- Diagnostics Utility

- Automatic Server Recovery (ASR-2)
- Integrated Management Log (IML)

HP also offers the following software components:

- Health and Wellness Driver and IML Viewer
- iLO Management Interface Driver
- Rack Infrastructure Interface Service
- Management Agents

For Microsoft® Windows operating system users, these items are included in the HP ProLiant Support Pack for Microsoft Windows, available from the ProLiant BL p-Class system product page on

www.hp.com/support/files

Linux operating system users must install these items manually. For information about downloading these components, refer to

www.hp.com/support

For information on how to use these components with a Linux operating system, refer to

<http://h18000.www1.hp.com/products/servers/linux/documentation.html#howtos>

Integrated Lights-Out Management

The iLO subsystem includes an intelligent microprocessor, secure memory, and a dedicated network interface. This design makes iLO independent of the host server blade and its operating system. The iLO subsystem provides remote access to any authorized network client, sends alerts, and provides other server blade management functions.

Using a supported Web browser, you can:

- Remotely access the console of the host server blade, including all text mode and graphics mode screens with full keyboard and mouse controls.
- Remotely power up, power down, or reboot the host server blade.

- Remotely boot a host server blade to a virtual diskette image to perform a ROM upgrade or to install an operating system.
- Send alerts from iLO regardless of the state of the host server blade.
- Access advanced troubleshooting features provided by iLO.
- Launch a Web browser, use Simple Network Management Protocol (SNMP) alerting, and diagnose the server blade using Insight Manager 7.

The server blade must be properly cabled for iLO connectivity. Connect to the server blade with one of the following methods:

- Through an existing network (in the rack)

This method requires you to install the server blade in its enclosure and assign it an IP address (manually or using DHCP).

- Through the server blade diagnostic port
 - In the rack

This method requires you to connect the diagnostic cable to the diagnostic port and a client PC. Using the static IP address listed on the diagnostic cable label and the initial access information on the front of the server blade, you can access the server blade with the iLO Remote Console. For diagnostic cabling instructions, refer to “Using the Diagnostic Cable” in Chapter 1, “Installing the Server Blade and Options.”

- Out of the rack, with the diagnostic station

This method requires you to power the server blade with the optional diagnostic station and connect to an external computer using the static IP address and the diagnostic cable. For cabling instructions, refer to the documentation that ships with the diagnostic station or to the Documentation CD.

- Through the server blade rear panel connectors (out of the rack, with the diagnostic station)

This method enables you to configure a server blade out of the rack by powering the blade with the diagnostic station and connecting to an existing network through a hub. The IP address is assigned by a DHCP server on the network.

iLO ROM-Based Setup Utility

The iLO ROM-Based Setup Utility (iLO RBSU) is the recommended method to configure and set up the iLO subsystem. The iLO RBSU is designed to assist you with setting up iLO subsystem on a network; it is not intended for continued administration.

To run iLO RBSU:

1. Restart or power up the server blade.
2. Press the **F8** key when prompted during the Power-On Self-Test (POST). The iLO RBSU runs.
3. Enter a valid iLO user ID and password with the appropriate iLO privileges (Administer User Accounts, Configure iLO Settings).
4. Make and save any necessary changes to the iLO configuration.
5. Exit iLO RBSU, when finished.

HP recommends using DNS/DHCP with iLO to simplify installation. If DNS/DHCP cannot be used, use one of the following procedures to disable DNS/DHCP and to configure the IP address and the subnet mask:

1. Log into iLO using the DNS/DHCP IP address.
2. At the Administration screen, enter a valid iLO user ID and password with the appropriate iLO privileges.
3. Select **Network Settings** and enter the appropriate information.

or

1. Restart or power up the server blade.
2. Press the **F8** key when prompted during the POST. The iLO RBSU runs.
3. Enter a valid iLO user ID and password with the appropriate iLO privileges (Administer User Accounts, Configure iLO Settings).

NOTE: Use the arrow keys to highlight selections.

4. Select **Network, DNS/DHCP**, press the **Enter** key, and then select **DHCP Enable**. Press the spacebar to turn off DHCP. Be sure that DHCP Enable is set to **Off** and save the changes.
5. Select **Network, NIC, and TCP/IP**, press the **Enter** key, and type the appropriate information in the **IP Address, Subnet Mask, and Gateway IP Address** fields.
6. Save the changes. The iLO system automatically resets to use the new setup when you exit the iLO RBSU.

Access the Server Blade with iLO Remote Console

To access the server blade with iLO for the first time:

1. Locate the iLO Default Network Settings tag that contains the following information:
 - Default user ID
 - Default password
 - DNS name
 - Server blade serial number

IMPORTANT: If you have previously configured the iLO settings to change the default DNS name, user ID, or password, use the values you configured. If you made any changes to the default value, the values on the iLO Default Network Settings tag are no longer valid.

IMPORTANT: If you have forgotten your iLO access values or cannot gain access to the iLO, use the iLO switch (SW2) on your server blade system board to override iLO security.

2. From the administrator workstation or client PC, open a web browser.
3. Browse to the iLO Remote Console using one of the following methods:
 - The DNS name provided on the iLO Default Network Settings tag
 - The IP address previously configured (if you are not using DHCP)
 - The IP address assigned by the DHCP server
 - The IP address from the iLO diagnostic cable or the I/O cable (if you are using the diagnostic port or the I/O port)

4. At the certificate screen, accept the certificate.
5. At the login screen, enter the default user ID and default password provided on the iLO Default Network Settings tag.
6. At the main screen, click **Remote Console**.
7. Follow the on-screen directions. Refer to the *HP Integrated Lights-Out User Guide* for further information.

Redundant ROM Support

Server blades enable you to upgrade or configure the ROM safely with redundant ROM support. The server blade has a 4-MB ROM that acts as two, separate 2-MB ROMs. In the standard implementation, one ROM contains the current ROM program version, while the other ROM contains a backup version.

Safety and Security Benefits

When you flash the system ROM, ROMPaq writes over the older ROM and saves the current ROM as a backup, enabling you to switch easily to the backup ROM version if the new ROM becomes corrupted for any reason. This feature protects the previous ROM version, even if you experience a power failure while flashing the ROM.

Access to Redundant ROM Settings

To access the redundant ROM:

1. Access RBSU by pressing the **F9** key during power up when the prompt displays.
2. Select **Advanced Options**.
3. Select **ROM Selection**.
4. Select one of the ROM banks as the system ROM.
5. Press the **Enter** key.
6. Press the **Esc** key to exit the current menu or press the **F10** key to exit RBSU.
7. Restart the server blade.

When the server blade boots, the system identifies whether the current ROM bank is corrupt. If a corrupt ROM is detected, the system boots from the backup ROM and alerts you through POST or IML that the ROM bank is corrupt.

If both the current and backup versions of the ROM are corrupt, you must return the system board for a service replacement. Refer to the *HP ProLiant BL p-Class System Maintenance and Service Guide* and contact an HP authorized reseller.

Remote ROM Flash

The system contains individual firmware specific to various components.

The ProLiant BL40p server blade contains:

- Server blade system ROM
- Smart Array 5i Plus memory module ROM
- iLO ROM

The server blade and power enclosures contain:

- Server blade management module ROM
- Power management module ROM

Using the Smart Components for Remote ROM Flash with the Remote Deployment Utility (RDU) console application, Remote ROM Flash enables you to upgrade the firmware (BIOS) on a server blade from a remote location.

To update the ROM from a remote location, navigate to your server and download the RDU at

www.compaq.com/support/files/server/us/winroms.html

If a power loss occurs during a firmware upgrade, redundant ROM support enables data recovery.

ROMPaq Utility

ROM flash enables you to upgrade the firmware (BIOS) with system or option ROMPaq utilities.

To upgrade the BIOS:

1. Download the latest ROMPaq at www.hp.com/support
2. Follow the instructions and create a bootable diskette.

IMPORTANT: You can use the iLO Virtual Media applet to create the image file. Refer to the “Integrated Lights-Out Management” section in this chapter. If you use this method, omit step 3.

3. Access the server blade through the iLO Remote Console. Refer to “Access the Server Blade with iLO Remote Console” in this chapter for further information.
4. Insert the boot diskette.
5. Use the iLO virtual power button to power the server blade off and then on, and to set the blade to boot from the diskette image you created in step 2.

The ROMPaq Utility checks the system and provides a choice (if more than one exists) of available ROM revisions. By default, the oldest ROM version is updated. This procedure is the same for both system and option ROMPaq utilities.

If a power loss occurs during a firmware upgrade, redundant ROM support enables data recovery.

ROM-Based Setup Utility

NOTE: Most of the features in RBSU are not required in the setup of the server blade. The options in this utility are designed to assist with specific server blade configuration issues.

RBSU performs configuration activities and enables you to view server blade configuration information. The server blade ships pre-configured, and changes are not required unless you want to change the default settings.

To navigate RBSU, use the following keys:

- To access RBSU, use the iLO Remote Console and press the **F9** key when prompted during power up.
- To navigate the menu system, use the arrow keys.
- To make selections, press the **Enter** key.

RBSU automatically saves settings when you press the **Enter** key. The utility does not prompt you for confirmation of settings before you exit the utility. To change a selected setting, you must select a different setting and press the **Enter** key.

Table 2-2 contains the default settings for options in primary RBSU menus.

Table 2-2: RBSU Default Settings

Menu/Option	Default Setting
System Options	
OS Selection	Windows 2000
Serial Number	
Embedded NIC Port 1 PXE Support	Enabled
Standard Boot Order (IPL)	*
Automatic Server Recovery	
ASR Status	Enabled
ASR Timeout	10 minutes
Thermal Shutdown	Enabled
Server Passwords	
Set Power-On Password	Disabled
Set Admin Password	Disabled

* The default boot order is CD-ROM drive, diskette drive, hard drive, and network, respectively.

continued

Table 2-2: RBSU Default Settings *continued*

Menu/Option	Default Setting
Advanced Options	
MPS Table Mode	AutoSet Table
POST Speed Up	Enabled
POST F1 Prompt	Enabled
ROM Selection	Use Current ROM
Wake on LAN	Enabled
NMI Debug Button	Enabled
Processor Hyper-Threading	Enabled
Virtual Install Disk	Disabled

Option ROM Configuration for Arrays Utility

The Option ROM Configuration for Arrays (ORCA) Utility is a menu-driven utility that does not require a CD and can be started when the server blade is booting. This utility enables users to perform the following functions:

- Create, configure, and/or delete logical drives
- Specify RAID levels
- Assign online spares
- Set interrupts and the boot controller order

To run ORCA, press the **F8** key from the iLO Remote Console when the server blade is booting.

PXE Deployment

For each server blade that you are deploying, the PXE server must be connected to the NIC designated for PXE. The server blade defaults PXE functions to NIC 1, but any of the 5 NICs can be designated for PXE in RBSU. For NIC connector locations on RJ-45 patch panels and interconnect switches, refer to the *HP ProLiant BL40p Server Blade Overview Card* included with the server blade.

To deploy an operating system to multiple server blades, you can install a PXE deployment server on a network.

Preboot execution environment (PXE) is a component of the Intel Wired for Management (WfM) specification. The PXE model enables server blades to load and execute a network bootstrap program (NBP) from a PXE server and to execute a pre-configured image. The image can be an operating system image created by software utilities or a boot diskette image. This feature enables a user to configure a server blade and install an operating system over a network.

When a PXE-enabled client boots, it obtains an IP address from a dynamic host configuration protocol (DHCP) server. The client obtains the name of the NBP from the appropriate boot server. Then, the client uses trivial file transfer protocol (TFTP) to download the NBP from the boot server and executes the image.

Deployment Infrastructure

To establish a network-based PXE deployment infrastructure, you must provide the following software and minimum hardware:

- Client PC (administrative workstation)
 - Intel Pentium® III or higher processor (700 MHz or greater recommended)
 - 128 MB of RAM
 - Microsoft Windows 2000 Professional or Microsoft Windows XP operating system
 - Microsoft Internet Explorer 5.5 or above with 128-bit encryption
 - Ethernet NIC with 10/100 RJ-45 connector

- TCP/IP networking and an IP address compatible with one of the following the iLO Diagnostic Port IP address or an assigned DHCP or static IP address
- CD-ROM drive and/or diskette drive
- Any of the following Java™ Runtime Environment versions:

1.3.1_02

1.3.1_07

1.3.1_08

1.4.1

Access the Java Runtime Environment versions at
<http://java.sun.com/products/archive/index.html>

- DHCP server (IP address assignment)
 - Pentium or Pentium II 200-MHz or faster processor
 - 64 MB of RAM
 - 64 MB of free hard drive space
 - 10 Mb/s network adapter
- PXE deployment server (storing boot images)
 - Intel Pentium III or higher processor (500 MHz recommended)
 - 256 MB of RAM
 - 10 Mb/s network adapter
 - CD-ROM drive
- NFS repository server (only required for Red Hat Linux deployment)
 - Red Hat Linux 7.2 operating system installed
 - Network connection

- CD-ROM drive
- NFS installed
- 1.5 GB of available disk space
- Windows repository server (only required for Microsoft Windows deployment)
 - Microsoft Windows 2000 operating system installed
 - Network connection
 - CD-ROM drive
 - 1.5 GB of available disk space
 - TCP/IP networking and an IP address compatible with one of the following:
the iLO Diagnostic Port IP address or an assigned DHCP or static IP address
 - CD-ROM drive and/or diskette drive
 - Any of the following Java Runtime Environment versions:
 - 1.3.1_02
 - 1.3.1_07
 - 1.3.1_08
 - 1.4.1
 - Access the Java Runtime Environment versions at
<http://java.sun.com/products/archive/index.html>
- Network server with an operating system installed

SmartStart Scripting Toolkit

The HP SmartStart Scripting Toolkit radically simplifies high-volume server deployment, enabling thousands of servers to be deployed quickly and easily. The SmartStart Scripting Toolkit consists of a set of modular utilities that are used to create a set of configuration data files, which are combined using a script or batch file to provide an automated installation process.

The basic steps necessary to use the SmartStart Scripting Toolkit are:

1. Generate the server profile from a previously configured server.
2. Create a script (batch) file that reads in server configuration files to configure the server hardware and install the server operating system
3. Build the server configuration diskette that initiates the automated deployment process.

For details, download the latest version of the SmartStart Scripting Toolkit from www.hp.com/servers/sstoolkit

and refer to the *SmartStart Scripting Toolkit User Guide*.

Insight Manager 7

Insight Manager 7 is the HP application for easily managing network devices. Insight Manager 7 delivers intelligent monitoring and alerting as well as visual control of the HP devices. Documentation for Insight Manager 7 is available on the ProLiant Essentials Rapid Deployment Pack CD in the *OVERVIEW.HLP* file.

IMPORTANT: You must install and use Insight Manager 7 to benefit from the HP pre-failure warranties on processors, hard drives, and memory modules.

Insight Manager 7 features include:

- **Comprehensive Fault Management**—Insight Manager 7 provides comprehensive fault management for all major subsystems, including pre-failure alerting for disks, memory, and processors.
- **Integration Management**—Insight Manager 7 and ProLiant Essentials RDP software enable you to effectively deploy and manage configurations throughout the enterprise using Integration Server and Insight Version Control.
- **Performance Management**—Insight Manager 7 enables you to set performance and capacity thresholds for management variables related to CPU and bus usage, NIC throughput, logical disk capacity, and more.
- **Workstation Management**—Insight Manager 7 enables you to monitor and manage HP Professional Workstations.

- Client Management—Insight Manager 7 enables you to manage faults and assets on Deskpro computers and HP portables.
- Netelligent Management—Insight Manager 7 can receive alarms from Netelligent devices. Full management of Netelligent devices is supported through integration with HP Netelligent Management Software.
- Asset Management—Insight Manager 7 enables you to export asset information from the Insight Manager 7 database to leading database and spreadsheet applications, making asset management easier than ever.
- Remote Management—Insight Manager 7 enables you to manage in-band or out-of-band devices online or offline from anywhere.
- Reporting—Using Automatic Data Collection, Insight Manager 7 enables you to gather historic performance information for graphing or export purposes, which helps with upgrade performance.
- Integration with Enterprise Management Platforms—Insight Manager 7 provides integration with leading management platforms including HP OpenView, IBM NetView, SunNet Manager, and Microsoft Systems Management Server.

Diagnostics Utility

Refer to the *HP ROM-Based Setup Utility User Guide* at
www.hp.com/servers/smartstart

Run the internal diagnostics before running the Diagnostics Utility.

To run Diagnostics Utility:

1. Download the latest Diagnostics Utility at
www.hp.com/support
2. Follow the instructions and create a bootable diskette.

IMPORTANT: You can use the iLO Virtual Media applet to create the image file. Refer to the “Integrated Lights-Out Management” section in this chapter. If you use this method, omit step 3.

3. Access the server blade through the iLO Remote Console. Refer to the “Access the Server Blade with iLO Remote Console” in this chapter for more information.
4. Insert the virtual diskette.
5. Use the iLO virtual power button to power the server blade off and then on, and to set the blade to boot from the diskette image you created in step 2.

The server blade boots from the downloaded image and runs the Diagnostics Utility.

Automatic Server Recovery-2

ASR-2 is a feature that causes the system to restart when a catastrophic operating system error occurs, such as a blue-screen or kernel panic. A system fail-safe timer, the ASR-2 timer, starts when the System Management driver, also known as the Health Driver, is loaded. When the operating system is functioning properly, the system periodically resets the timer. However, when the operating system fails, the timer expires and restarts the server blade.

ASR-2 increases server blade availability by restarting the server blade within 10 minutes after a system hang or shutdown. At the same time, the Insight Manager 7 console notifies you by sending a message to a designated pager number that ASR-2 has restarted the system. You can disable ASR-2 from the Insight Manager 7 console or RBSU.

Integrated Management Log

The IML records hundreds of events and stores them in an easy-to-view form. The IML time-stamps each event with 1-minute granularity.

Events listed in the IML are categorized as one of four event severity levels:

- Status—indicates that the message is informational only
- Repaired—indicates that corrective action was taken
- Caution—indicates a non-fatal error condition occurred
- Critical—indicates a component failure has occurred

Viewing the Log

You can view recorded events in the IML in several ways, including the following:

- From within the iLO Web pages
- From within the Insight Manager 7
- From within the Survey Utility
- From within operating system specific IML viewers
 - For Windows 2000, Event Viewer, or HP IML Viewer
 - For Linux operating systems, HP IML Viewer Application

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

Viewing the Event List

To view the event list:

1. From Insight Manager 7, select the appropriate server blade, then select **View Device Data**. The selected server blade appears with buttons around its perimeter.
2. Click **Recovery**.
3. Select **Integrated Management Log**.
4. If a failed component has been replaced, select the event from the list, then select **Mark Repaired**.

Printing the Event List

To print the event list:

1. From Insight Manager 7, select the appropriate server blade. The selected server blade appears with buttons around its perimeter.
2. Click **Configuration**.
3. Click **Recovery**.
4. Click **Print**.

Survey Utility

Survey Utility is a serviceability tool that delivers online configuration capture and comparison to maximize server blade availability. It is available on the Rapid Deployment Pack CD or at

www.compaq.com/products/servers/management/agents/documentation.html

Refer to the ProLiant Essentials Rapid Deployment Pack CD for information on installing and running the Survey Utility. After you run the Survey Utility, you can view the IML by loading the output of the utility (typically called *SURVEY.TXT*) into a text viewer such as Microsoft Notepad. The event list follows the system slot information. After you open the text file, you can print it using the print feature of the viewer.

List of Events

The event list displays the affected components and the associated error messages. Though the same basic information displays, the format of the list may differ depending on whether you view it from within Insight Manager 7 or from within Survey Utility.

Table 2-3 identifies the event types (affected components) and associated event messages for server blades.

Table 2-3: Server Blade Event Messages

Event Type	Event Message
Machine Environment	
Fan failure	System Fan Failure (Fan X, Location)
Overheat condition	System Overheating (Zone X, Location)
Main Memory	
Correctable error threshold exceeded	Corrected Memory Error threshold passed (Slot X, Memory Module X)
	Corrected Memory Error threshold passed (System Memory)
	Corrected Memory Error threshold passes (Memory Module unknown)
Processor	
Correctable error threshold exceeded	Processor Correctable Error threshold passed (Slot X, Socket X)
Uncorrectable error	Processor Uncorrectable internal error (Slot X, Socket X)
PCI Bus Error	PCI Bus Error (Slot X, Bus X, Device X, Function X)
Power Subsystem	
System configuration battery low	Real-Time Battery Clock Failing
Automatic Server Recovery	
System lockup	ASR Lockup Detected: Cause
Operating System	
System crash	Blue Screen Trap: Cause [NT]
	Kernel Panic: Cause [Linux]
Automatic operating system shutdown	Automatic Operating System Shutdown Initiated Due to Fan Failure
	Automatic Operating System Shutdown Initiated Due to Overheat Condition
	Fatal Exception (Number X, Cause)

Regulatory Compliance Notices

Regulatory Compliance Identification Numbers

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

Federal Communications Commission Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at personal expense.

Modifications

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

Cables

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

Canadian Notice (Avis Canadien)

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union Notice



Products bearing the CE marking comply with the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community and if this product has telecommunication functionality, the R&TTE Directive (1999/5/EC).

Compliance with these directives implies conformity to the following European Norms (in parentheses are the equivalent international standards and regulations):

- EN 55022 (CISPR 22) – Electromagnetic Interference
- EN55024 (IEC61000-4-2, 3, 4, 5, 6, 8, 11) – Electromagnetic Immunity
- EN 60950 (IEC 60950) – Product Safety

Japanese Notice

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Korean Notice

A급 기기 (업무용 정보통신기기)

이 기기는 업무용으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며, 만약 잘못판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.

BSMI Notice

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Battery Replacement Notice

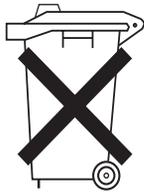
Your computer is provided with an internal lithium battery or battery pack. There is a danger of explosion and risk of personal injury if the battery is incorrectly replaced or mistreated. Unless specific replacement instructions are provided as part of this guide, replacement is to be done by an authorized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

For more information about battery replacement or proper disposal, contact an authorized reseller or authorized service provider.



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

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



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

Electrostatic Discharge

To prevent damaging the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

Preventing Electrostatic Damage

To prevent electrostatic damage, observe the following precautions:

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

Grounding Methods

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

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

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

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

Server Error Messages

Use POST error messages to assist in troubleshooting and performing basic diagnostic functions in the server blade.

POST error messages are displayed in the following locations:

- Integrated Management Log (IML)
- iLO POST log
- iLO Remote Console

For a complete listing of error messages and other troubleshooting information, refer to the *HP ProLiant Servers Troubleshooting Guide* on the Documentation CD or online at the HP reference library, accessed through:

www.hp.com/support

Troubleshooting

For a list of new server error messages that are specific to this server, refer to Appendix C, “Server Error Messages.”

For information on LEDs and switches specific to the server blade, refer to Appendix E, “LEDs and Switches.”

For information about general troubleshooting techniques, diagnostic tools, error messages, and preventative maintenance, refer to the *HP ProLiant Servers Troubleshooting Guide* on the Documentation CD.

When the Server Blade 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 blade must first complete this test each time you power up, before it can load the operating system and start running software applications.

IMPORTANT: Always be sure that you have adequate system power applied to all rack components before troubleshooting the server blade. You may need to add more hot-plug power supplies if you are installing additional server blades. If you have a power problem, refer to the *HP ProLiant BL p-Class System Overview and Planning* white paper.

If the server blade does not start:

1. Be sure that the server blade is fully seated in the server blade enclosure.
2. Be sure that power is applied to the server blade:
 - Check the status using the system power LED. For the location and explanation of the system power LED, refer to the “Server Blade Front Panel LEDs” section in Appendix E, “LEDs and Switches.”
 - Check the server blade management modules and power management modules for proper cabling and power configuration switch settings.
 - Use the Blade Power Management section of iLO to verify that at least 14 Amps are available.
 - The server blade is configured to power up upon insertion. However, if you changed that setting, be sure that the Power On/Standby button was pressed firmly.
 - Check that the circuit breakers on the bus bars are positioned up.
3. If the system does not complete POST or start loading an operating system:
 - Use the iLO remote console or the iLO system status page to identify POST messages. Refer to the *HP Integrated Lights-Out User Guide* on the Documentation CD.
 - Refer to “General Loose Connections” in the *HP ProLiant Servers Troubleshooting Guide* on the Documentation CD.
 - Refer to www.hp.com/servers/rdp for instructions on Rapid Deployment.
4. Be sure that the server blade is not rebooting repeatedly:
 - a. Be sure that the system is not rebooting due to a problem that initiates an ASR-2 reboot.

ASR-2 is defaulted to restart the server blade automatically, loading the operating system. If a critical error occurs, ASR-2 logs the error in the IML and restarts the server blade.

For more information, refer to the “Automatic Server Recovery-2” and “System Short Circuit” sections of the *HP ProLiant Servers Troubleshooting Guide* on the Documentation CD.
 - b. Use the iLO remote console to identify a possible thermal event.

5. Power cycle the server blade. If the server blade does not restart, proceed to the “Server Blade Diagnostic Steps” section in this appendix.
6. Check the server blade for the following normal power-up sequence to be sure that the system meets the minimal hardware requirements and is powered up during normal operations:
 - a. The front panel power LED turns from standby (amber) to on (solid green).
 - b. The fans start up.
 - c. The internal health LED flashes during the POST process; it turns solid green if POST is successful.
 - d. The system beeps twice after a successful boot and the internal health LED will be solid green.
7. View the iLO remote console or video device connected through the I/O cable connectors for the following default boot messages to be sure the system meets the minimal hardware requirements and is powered up during normal operations:
 - HP ProLiant logo
 - Memory test
 - ROM information
 - Copyright information
 - Processor initialization
 - iLO initialization
 - Array controller initialization
 - PXE initialization
8. The operating system loads to complete the boot process.

If the server blade completes POST and attempts to load the operating system, go to the “Problems After Initial Boot” section in this appendix.

Server Blade Diagnostic Steps

If the server blade does not power up, or powers up but does not complete POST, answer the questions in Table D-1 to determine appropriate actions based on the symptoms observed. According to the answers you give, you are directed to the appropriate table that immediately follows.

Table D-1: Diagnostic Steps

Question	Action
Question 1: Is the server blade system power LED illuminated?	If yes, continue to question 2. If no, refer to Table D-2.
Question 2: Is the server blade system power LED green?	If yes, continue to question 3. If no, refer to Table D-3.
Question 3: Is the server blade internal health LED solid green?	If yes, continue to question 4. If no, refer to Table D-4.
Question 4: Is the iLO remote console displaying error information?	If yes, use the POST messages for further diagnosis. Refer to Table D-5 for details. If no, refer to Table D-5.

NOTE: Insight Manager, iLO, or the IML Log can determine which component requires replacement if a possible reason for an amber or red LED is a failed processor, PPM, DIMM, or fan.

A port 84 LED reading can be translated into a hexadecimal code and used for troubleshooting. Refer to Appendix E, “LEDs and Switches,” for the location of the port 84 LED, or to the *HP ProLiant BL40p Server Blade Maintenance and Service Guide* for a listing of the codes. Port 84 can also be seen using iLO.

Table D-2: Is the Server Blade System Power LED Illuminated?

Answer	Possible Reasons	Possible Solutions
No	<p>A broken connection exists between one or more of the following components:</p> <ul style="list-style-type: none"> • Server blade enclosure and server blade • DC converter module and system board • DC converter module and power supply cables • LED/power switch board and system board <p>A short has occurred on the system board.</p> <p>The DC converter module electronic fuse has been tripped.</p> <p>One or more of the following may need to be replaced:</p> <ul style="list-style-type: none"> • server blade enclosure • DC converter module • power supply cables • system board • LED/power switch board 	<p>Perform the following steps:</p> <ol style="list-style-type: none"> 1. Power down the system and disconnect all possible fibre channel cables at the back of the server blade. 2. Remove the server blade from the enclosure. 3. Check the connectors on the rear of the server blade and on the interior of the enclosure for damage. 4. With the system powered down, remove the access panel. 5. Be sure that the proper connections exist among the DC converter module and the attached cable, system board, and LED/power switch board. 6. Check for bent pins on all components installed on the system board. 7. Replace the access panel, and reinstall the server blade into the enclosure. <p>If the system power LED is still not illuminated, perform one of the following actions:</p> <ul style="list-style-type: none"> • Check that the circuit breakers on the bus bars are positioned up. • Use the iLO remote console to continue the diagnosis. • Move the server blade into a different slot to determine if the server blade or the enclosure is the source of the problem. • Contact an authorized service provider for replacement parts and service.
Yes		<p>If the system power LED is illuminated, refer to Table D-3.</p>

Note: For LED locations and functions, refer to Appendix E, “LEDs and Switches.”

Table D-3: Is the Server Blade System Power LED Green?

Answer	Possible Reasons	Possible Solutions
<p>No, it is amber</p>	<p>Power On/Standby button has not been pressed firmly or long enough.</p> <p>A short may have occurred in the system.</p> <p>The PCI-X mezzanine board is not properly seated.</p> <p>The NIC I/O board is not properly seated.</p> <p>One or both of the system board power modules are missing or not functioning.</p> <p>The PCI-X mezzanine power module is missing or not functioning.</p> <p>One or more of the following may need to be replaced:</p> <ul style="list-style-type: none"> • DC converter module • power supply cables • system board • NIC I/O board • PCI-X mezzanine board • LED/power switch board 	<ul style="list-style-type: none"> • Firmly press the Power On/Standby button for 4 to 6 seconds. <p>Note: If not enough power is available in the enclosure, pressing the power button could shut down the entire rack.</p> <ul style="list-style-type: none"> • Restart the server blade through the iLO Virtual Power button feature. <p>If the LED is still amber, disconnect any installed fibre channel cables at the back of the server blade, remove the server blade from the enclosure, and remove the access panel. Perform the following steps:</p> <ol style="list-style-type: none"> 1. Remove the PCI-X mezzanine board and the NIC I/O board. 2. Check for bent pins on the NIC I/O board and PCI-X mezzanine board, and reinstall them. 3. Replace the access panel, and reinstall the server blade into the enclosure. <p>If the system power LED is still not green, and if the server blade internal health LED is amber or red, refer to Table D-4.</p>
<p>Yes</p>		<p>If the system power LED is green, refer to Table D-4.</p>
<p>Note: For LED locations and functions, refer to Appendix E, “LEDs and Switches.”</p>		

Table D-4: Is the Server Blade Internal Health LED Solid Green?

Answer	Possible Reasons	Possible Solutions
No, it is amber.	<p>A DIMM is in pre-failure condition.</p> <p>One of the three SCSI backplane fans has failed.</p>	<p>Perform the following steps:</p> <ol style="list-style-type: none"> 1. Power down the system, and disconnect all possible fibre channel cables at the back of the server blade. 2. Remove the server blade from the enclosure. 3. With the system powered down, remove the access panel. 4. Visually inspect the system for damage. 5. Reseat or replace DIMMs. 6. Be sure that the proper connections exist among the DC converter module, system board, and LED/power switch board. 7. Reinstall the access panel. 8. Reinstall and power up the server blade. <p>If the health LED is still not solid green, perform one of the following actions:</p> <ul style="list-style-type: none"> • Use the iLO remote console to continue the diagnosis. • Use the I/O cable connectors, depending on the server blade model, to continue diagnosis. • Contact an authorized service provider for replacement parts and service.

continued

Table D-4: Is the Server Blade Internal Health LED Solid Green? *continued*

Answer	Possible Reasons	Possible Solutions
<p>No, it is flashing green.</p>	<p>The server blade is still in POST. If the flashing continues after 2.5 minutes, one of the following conditions may apply:</p> <ul style="list-style-type: none"> • No bootable devices exist, and the server blade is not connected to the PXE network. • A SCSI hard drive with an operating system is not installed properly, or is not functioning. 	<p>Wait for the server blade to complete POST.</p> <p>Be sure a SCSI hard drive is available with an operating system installed properly.</p> <p>Be sure that a connection exists to either a bootable device or to the PXE deployment server. Refer to “Network-Based PXE Deployment” in Chapter 2 for details.</p> <p>Clear the system configuration. Refer to the “Clearing the System Configuration” section in this appendix.</p> <p>Switch to the redundant ROM. Refer to the “Accessing the Redundant ROM” section in this appendix.</p> <p>If the internal health LED is still not solid green, perform one of the following actions:</p> <ul style="list-style-type: none"> • Use the iLO remote console to continue the diagnosis. • Use the I/O cable connectors, depending on the server blade model, to continue diagnosis. • Use the iLO system status page to help determine the problem. • Contact an authorized service provider for replacement parts and service.

continued

Table D-4: Is the Server Blade Internal Health LED Solid Green? *continued*

Answer	Possible Reasons	Possible Solutions
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>Processors are mismatched (speed and/or type).</p> <p>A PPM has failed.</p> <p>A PPM is not installed.</p> <p>A DIMM has experienced a multibit error.</p> <p>No valid memory is in the system. Populated banks have missing, mismatched, or unsupported DIMMs.</p> <p>An overtemperature condition has occurred.</p>	<p>Perform the following steps:</p> <ol style="list-style-type: none"> 1. Power down the system, and disconnect all cables at the back of the server blade. 2. Remove the server blade from the enclosure. 3. With the system powered down, remove the access panel. 4. Visually inspect the system for damage. 5. Add or replace processors, PPMs DIMMs, power modules, and/or the fans. 6. Be sure that the proper connections exist between the system board, PCI-X mezzanine board, NIC I/O board, SCSI backplane fan cable and LED/power switch board. 7. Reinstall and power up the server blade. Be sure at least 14 A are available.

continued

Table D-4: Is the Server Blade Internal Health LED Solid Green? *continued*

Answer	Possible Reasons	Possible Solutions
<p>No, it is red <i>(continued)</i></p>	<p>Two or three of the SCSI backplane fans are not installed or have failed, or the fan cable is not properly connected to the PCI-X mezzanine board.</p> <p>One or both of the system board power modules have failed.</p> <p>The PCI-X mezzanine power module is not functioning.</p> <p>An interlock error has occurred on the PCI-X mezzanine board, at least one system board power module, the PCI-X mezzanine power module, or the NIC I/O board.</p> <p>Power is not available to the enclosure.</p>	<p> LEDs on the internal components may determine the cause of the problem. Use the optional diagnostic station to power up the server blade with the access panel removed.</p> <p>Internal components should be checked for damage or replaced if the corresponding LED is on. Check that the following LEDs are off:</p> <ul style="list-style-type: none"> • System board power modules • PCI-X mezzanine board power module • PCI-X mezzanine board interlock • NIC I/O board interlock <p>If the internal health LED is still not solid green, perform one of the following actions:</p> <ul style="list-style-type: none"> • Use the iLO remote console to continue the diagnosis. • Use the I/O cable connectors, depending on the server blade model, to continue diagnosis. • Use the iLO system status page to help determine the problem. <p>Contact an authorized service provider for replacement parts and service.</p>
<p>Yes</p>		<p>If the internal health LED is green, refer to Table D-5.</p>
<p>  WARNING: To reduce the risk of injury from electric shock hazards, only qualified service personnel should power up the server blade with the access panel removed.</p>		
<p>Note: For LED locations and functions, refer to Appendix E, “LEDs and Switches.”</p>		
<p>Note: The internal health LED should be off when the server blade is not powered on.</p>		

Table D-5: Is the iLO Remote Console Displaying Error Information?

Answer	Solution
No	An iLO problem exists. Refer to the <i>HP Integrated Lights-Out User Guide</i> that ships on the Documentation CD.
Yes	Error and event logs are available for diagnosis. Determine the next action by observing POST progress and error messages. Use the iLO system status page to help determine the problem. Refer to Appendix C, "Server Error Messages," and the <i>HP ProLiant Servers Troubleshooting Guide</i> on the Documentation CD for a complete description of POST error messages.

System Configuration Switch Procedures

When you perform troubleshooting steps, this guide may instruct you to perform the following procedures:

- Clear the system configuration.
- Access the redundant ROM.

IMPORTANT: Do not perform these procedures until directed to do so by the troubleshooting tables in this appendix.

To complete these procedures, you must either change the settings in RBSU, or change physical settings on the system configuration switch (SW3). For switch locations and positions, refer to Figure E-5 in Appendix E, "LEDs and Switches."

Clearing the System Configuration

To clear the system configuration using RBSU:

1. Access the **Erase Non-Volatile Memory** feature from the **Advanced Options** menu.
2. Select **Yes, Select to Erase**.

To clear the system configuration using the system configuration switch:

1. Power down the server blade using one of the following methods:
 - Press the Power On/Standby button on the front of the server blade.
 - Use the virtual power button feature in the iLO remote console.
2. Disconnect the server blade from all power sources using one of the following methods:
 - Remove the server blade from the enclosure and set it on a flat, level surface.
 - Disconnect the server blade from the diagnostic station.
3. Remove the access panel. Refer to the “Accessing Internal Server Blade Components” section in Chapter 1, “Installing the Server Blade and Options.”
4. Change position 6 of SW3 to on. For switch locations and positions, refer to Figure E-5 and table E-6 in Appendix E, “LEDs and Switches.”
5. Install the access panel.
6. Connect the server blade to system power using one of the following methods:
 - Install the server blade in the enclosure.
 - Connect the server blade to the diagnostic station.
7. Power up the server blade using one of the following methods:
 - Press the Power On/Standby button on the front of the server blade.
 - Use the virtual power button feature in the iLO remote console.
8. Wait for the POST message that prompts you to change the switch setting:
Maintenance switch detected in the "On" position.
Power off the server and turn switch to the "Off" position.

9. Repeat steps 1 through 3.
10. Change position 6 of SW3 to off.
11. Repeat steps 5 through 7.

IMPORTANT: When the server blade boots after NVRAM is cleared, a delay of up to 2 minutes is normal. During this delay, the system appears non-functional. Do not attempt any procedures during the delay.

Accessing the Redundant ROM

If the system ROM is corrupted, you can manually set the system to use the backup version or redundant ROM.

To access the redundant ROM using RBSU:

1. Access the **Redundant ROM Selection** feature from the **Advanced Options** menu.
2. Select **Switch to Backup ROM**.

To access the redundant ROM using the system configuration switch:

1. Power down the server blade using one of the following methods:
 - Press the Power On/Standby button on the front of the server blade.
 - Use the virtual power button feature in the iLO remote console.
2. Disconnect the server blade from all power sources using one of the following methods:
 - Remove the server blade from the enclosure and set it on a flat, level surface.
 - Disconnect the server blade from the diagnostic station.
3. Remove the access panel. Refer to the “Accessing Internal Server Blade Components” section in Chapter 1, “Installing the Server Blade and Options.”
4. Change positions 1, 5, and 6 of SW3 to on. For switch locations and positions, refer to Figure E-5 in Appendix E, “LEDs and Switches.”
5. Install the access panel. Refer to the “Installing the Access Panel” section in Chapter 2, “Installing the Server Blade and Options.”

6. Connect the server blade to system power using one of the following methods:
 - Install the server blade in the enclosure.
 - Connect the server blade to the diagnostic station.
7. Power up the server blade using one of the following methods:
 - Press the Power On/Standby button on the front of the server blade.
 - Use the virtual power button feature in the iLO remote console.
8. As soon as the server blade powers up, it emits two beeps.
9. Repeat steps 1 through 3.
10. Change positions 1, 5, and 6 of SW3 to off.
11. Repeat steps 5 through 7.

If both the current and backup versions of the ROM are corrupt, you must return the system board for a service replacement. Refer to the *HP ProLiant BL p-Class System Maintenance and Service Guide* and contact an authorized reseller.

Problems After Initial Boot

Once the server blade has passed POST, you may still encounter errors, such as an inability to load the operating system. Reinstall the operating system and use the documentation that ships on the Rapid Deployment Pack CD or refer to “Software Problems” in the *HP ProLiant Servers Troubleshooting Guide* on the Documentation CD for more information.

Refer to the *HP ProLiant Servers Troubleshooting Guide* on the Documentation CD or to the HP reference library, accessed through www.hp.com/support, for 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

LEDs and Switches

This appendix identifies the locations and explains the functions of LEDs and switches.

LEDs

The system contains several sets of LEDs that indicate the status and settings of hardware components. Use the following sections to determine the location and functions of LEDs on these components:

- ProLiant BL40p server blade front panel
- ProLiant BL40p server blade system board
- Hot-plug SCSI hard drive
- Fans

Server Blade Front Panel LEDs

Nine LEDs on the front of the server blade indicate server status. Use Figure E-1 and Table E-1 to identify LED locations and functions.

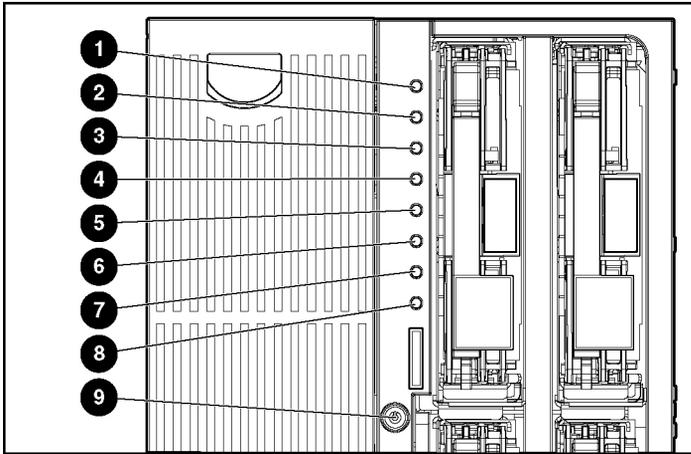


Figure E-1: Front panel LEDs

Table E-1: Front Panel LEDs

Item	LED Description	Status
1	Unit identification	Blue = Flagged Blue flashing = Management mode Off = No remote management
2	Internal Health	Green = Normal (when server blade is powered on) Off = Normal (when server blade is on standby) Amber = System degraded Red = System critical
3	External Health	Green = Normal (when server blade is powered on) Off = Normal (when server blade is on standby) Amber = Redundant fan failed Red = Critical fan failure

continued

Table E-1: Front Panel LEDs *continued*

Item	LED Description	Status
4	NIC 1	Green = Linked to network
5	NIC 2	Green flashing = Network activity
6	NIC 3	Off = No activity
7	NIC 4	
8	NIC 5	
9	Power On/Standby	Green = On Amber = Standby (power available) Off = Unit off

System Board LEDs

The LEDs on the system board will be visible only when the optional diagnostic station is used to supply power to the server blade, with the access panel removed.



WARNING: To reduce the risk of injury from electric shock hazards, only qualified service personnel should power up the server blade with the access panel removed.

Refer to Figure E-2 and Table E-2 to identify system board LED locations and functions.

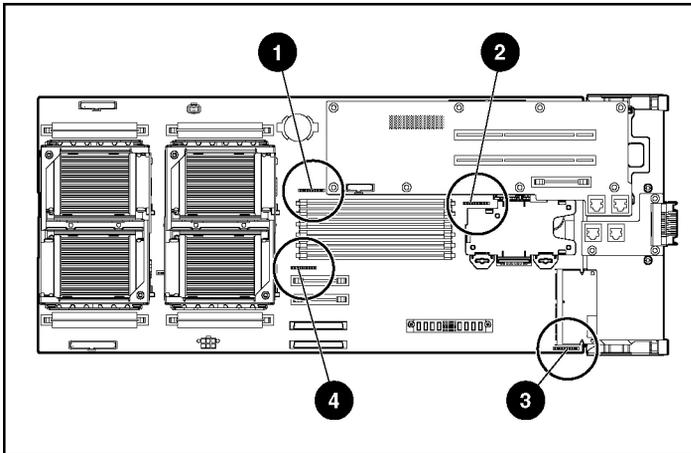


Figure E-2: System board LEDs

Table E-2: System Board LEDs

Item	LED Description	Status
1	Port 84	A combination of illuminated LEDs indicates the Port 84 code. Refer to the <i>HP ProLiant BL40p Server Blade Maintenance and Service Guide</i> for a listing of the codes.
2	iLO	Green = Normal Off = No iLO connectivity
3	Smart Array 5i memory module	Green = Normal Off = No activity
4	Power	Green = Normal Off = No power available

Hot-Plug SCSI Hard Drive LEDs

Each hot-plug SCSI hard drive has three LEDs located on the front of the drive. The LEDs provide activity, online, and fault status for each corresponding drive when configured as a part of an array and attached to a powered-on Smart Array controller. Their behavior may vary depending on the status of other drives in the array. Use Figure E-3 and Table E-3 to identify LED locations and functions.



CAUTION: Before removing a hard drive, refer to the *HP ProLiant Servers Troubleshooting Guide* on the Documentation CD for information on hard drive replacement.

- The first LED indicates drive activity status (1), where on indicates activity and off indicates no activity by the drive.
- The second LED indicates online status (2), where flashing indicates an active online condition and off indicates an inactive online condition.
- The third LED indicates fault status (3) where flashing indicates fault-process activity and off indicates a no-fault-process activity.

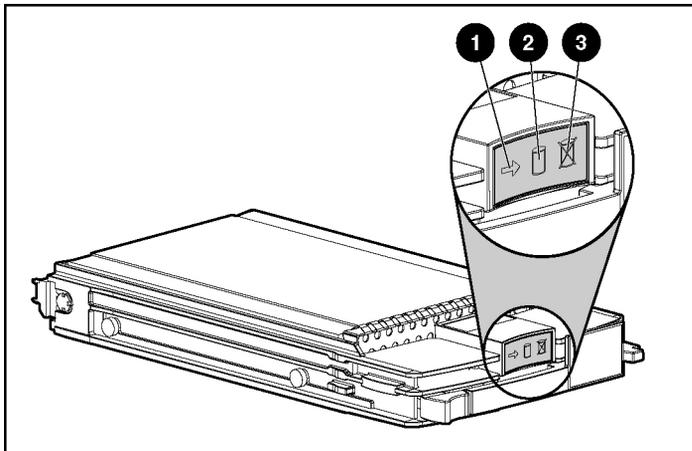


Figure E-3: Hot-plug SCSI hard drive LEDs

Table E-3: Hot-Plug SCSI Hard Drive LED Status Combinations

(1) Activity	(2) Online	(3) Fault	Means
On	Off	Off	<p>Do not remove the drive. Removing a drive during this process causes data loss.</p> <p>The drive is being accessed and is not configured as part of an array.</p>
On	Flashing	Off	<p>Do not remove the drive. Removing a drive during this process causes data loss.</p> <p>The drive is rebuilding or undergoing capacity expansion.</p>
Flashing	Flashing	Flashing	<p>Do not remove the drive. Removing a drive during this process causes data loss.</p> <p>The drive is part of an array being selected by the Array Configuration Utility.</p> <p>-or-</p> <p>The Options ROMPaq is upgrading the drive.</p>
Off	Off	Off	<p>OK to replace the drive online if a predictive failure alert is received and the drive is attached to an array controller.</p> <p>The drive is not configured as part of an array.</p> <p>-or-</p> <p>If this drive is part of an array, a powered-on controller is not accessing the drive.</p> <p>-or-</p> <p>The drive is configured as an online spare.</p>
Off	Off	On	<p>OK to replace the drive online.</p> <p>The drive has failed and has been placed offline.</p>

continued

Table E-3: Hot-Plug SCSI Hard Drive LED Status Combinations *continued*

(1) Activity	(2) Online	(3) Fault	Means
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	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 being accessed.

Fan LEDs

Nine fan LEDs are on two fan board assemblies. Use Figure E-4 and Table E-4 to identify fan LED locations and functions.

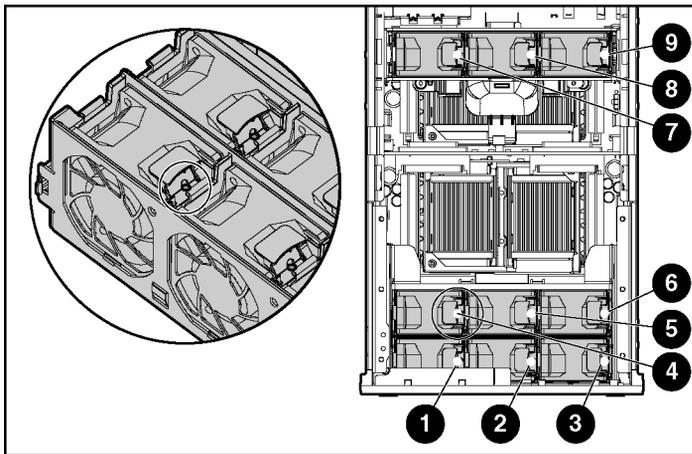


Figure E-4: Fan LEDs

Table E-4: Fan LEDs

Item	LED Description	Status
1	Fan 1 Status	Off = Fan not powered
2	Fan 2 Status	Green = Normal
3	Fan 3 Status	Amber = Fan failure
4	Fan 4 Status	
5	Fan 5 Status	
6	Fan 6 Status	
7	Fan 7 Status	
8	Fan 8 Status	
9	Fan 9 Status	

Power On/Standby Button

Setting the server blade Power On/Standby button to the standby position removes power from most areas of the server blade. This process may take 30 seconds, during which time some internal circuitry remains active.

IMPORTANT: To remove power completely, remove the server blade from the server blade enclosure.

Use Figure E-5 to identify the button location.

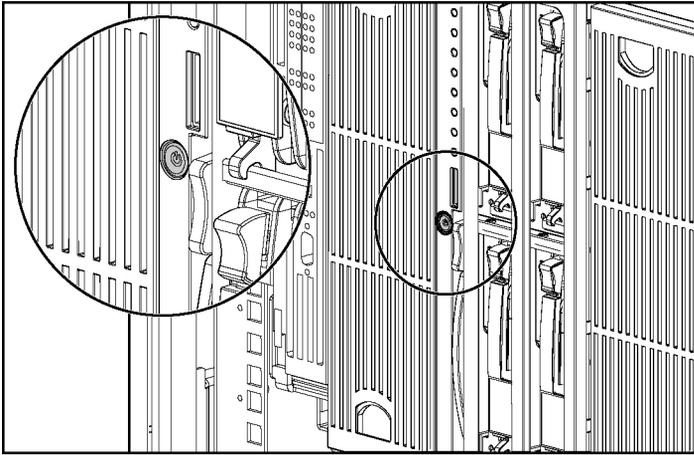


Figure E-5: Power On/Standby button

System Switches

System switches enable you to change certain settings or to perform advanced diagnostic procedures. The following sections explain the functions of each switch. Refer to Figure E-6 and Table E-5 to identify switch locations and functions.

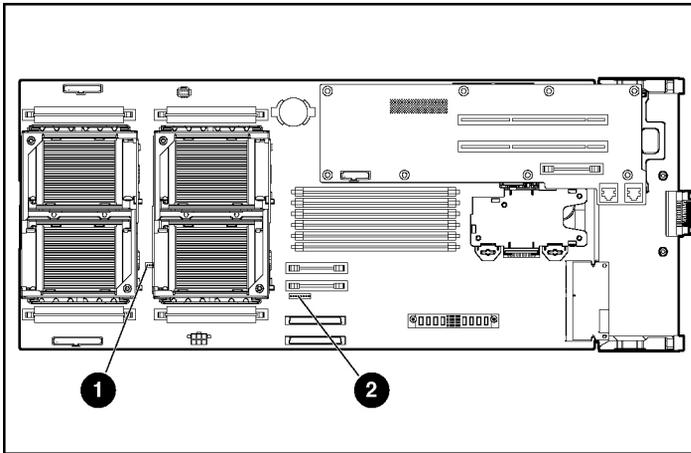


Figure E-6: Server blade system switches

Table E-5: Server Blade System Switches

Item	Description
1	System ID switch (SW1)
2	System maintenance switch (SW3)

System Maintenance Switch (SW3)

The system maintenance switch is an eight-position switch that implements protection and override functions. The default setting for all eight positions is off. For the proper system maintenance switch settings, refer to Table E-6 or refer to the labels attached to the inside of the server access panel.

Table E-6: System Maintenance Switch (SW3) Settings

Position	Description	On/Off Function
1	iLO Security Override	Off = iLO Security is enabled. On = Overrides iLO security function.
2	Configuration lock	Off = System configuration can be modified. On = System configuration is locked and cannot be modified.
3	iLO Power Button Override	Off = System power button is controlled through iLO. Rack power availability is checked before system can power on. On = System power button turns on the system, regardless of power availability.
4	Enable Diskette Boot	Off = Diskette boot is controlled by configuration. On = Override diskette boot.
5	Password Disable	Off = Power-on password is normal. On = Power-on password is disabled.
6	Invalidate Configuration	Off = Normal. On = ROM treats the system configuration as invalid.
7	Interlock Disable	Off = Normal. On = Disable interlock.
8	Hot Spare Boot Disable	Off = Hot spare boot is enabled. On = Hot spare boot functionality is disabled.

System ID Switch (SW1)

The system ID switch is a three-position switch used for chassis ID. Settings should be changed only by an authorized service provider. Refer to Table E-7 for system ID switch settings.

Table E-7: System ID Switch (SW1) Settings

Position	Description	On/Off Function
1	Chassis ID0	All pins will be set to off. HP does not recommend changing this switch setting.
2	Chassis ID1	
3	Chassis ID2	

Specifications

This appendix provides operating and performance specifications for the ProLiant BL40p server blade.

ProLiant BL40p Server Blade

Table F-1: Operating and Performance Specifications for ProLiant BL40p Server Blade

Dimensions	
Width	26.14 cm (10.29 in)
Depth	71.12 cm (28.00 in)
Height	17.50 cm (6.89 in)
Weight (maximum)	25.86 kg (57.0 lb)
Temperature range ¹	
Operating	10° to 35°C (50° to 95°F)
Nonoperating:	
Shipping	-40° to 60°C (-40° to 140°F)
Storage	-20° to 60°C (-4° to 140°F)

¹ Operating temperature has an altitude derating of 1°C per 304.8 m (1.8°F per 1,000 ft). No direct sunlight. Upper operating limit is 3,048 m (10,000 ft) or 70 Kpa/10.1 psia. Upper non-operating limit is 9,144 m (30,000 ft) or 30.3 KPa/4.4 psia.

continued

**Table F-1: Operating and Performance Specifications
for ProLiant BL40p Server Blade** *continued*

Dimensions	
Relative humidity (noncondensing) ²	
Operating	10% to 90%
Non-operating:	
Shipping	10% to 90%
Storage	10% to 95%
Maximum wet bulb temperature	28°C (82°F)

² Storage maximum humidity of 95% is based on a maximum temperature of 45°C (113°F). Altitude maximum for storage is 70 KPa.

System Board Battery Replacement

When the server blade no longer automatically displays the correct date and time, you may need to replace the battery that provides power to the real-time clock. Under normal use, battery life is usually about 5 to 10 years. Use an HP 540-mAh, lithium, 3-V replacement battery (spare P/N 179322-001).

To install a new battery:

1. Power down the server blade. Refer to “Preparation Procedures” in Chapter 1, “Installing the Server Blade and Options.”
2. Remove the server blade from the server blade enclosure. Refer to “Preparation Procedures” in Chapter 1, “Installing the Server Blade and Options.”
3. Remove the access panel and system board tray. Refer to “Preparation Procedures” in Chapter 1, “Installing the Server Blade and Options.”
4. Locate the battery holder on the system board.

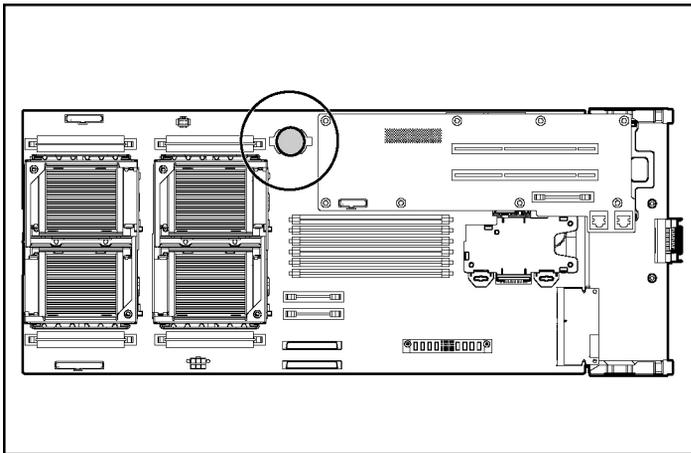


Figure G-1: Battery holder



WARNING: For proper battery disposal, refer to “Battery Replacement Notice” in Appendix A, “Regulatory Compliance Notices.”

5. Remove the existing battery:
 - a. Insert a pen or other narrow object into the slot at the front of the battery holder to pop the battery out (1).
 - b. Lift the battery away from the battery holder (2).

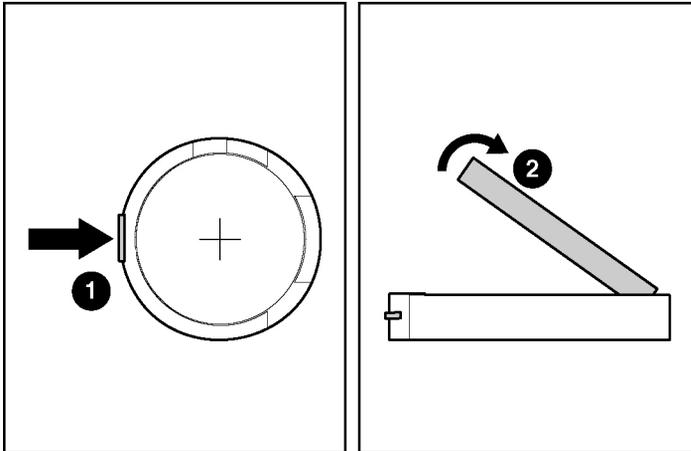


Figure G-2: Removing the existing battery

6. Install the new battery by pressing it into the holder.
7. Reinstall the system board and the access panel. Refer to “Preparation Procedures” in Chapter 1, “Installing the Server Blade and Options.”
8. Install the server blade in the server blade enclosure. Refer to “Installing a Server Blade” in Chapter 1, “Installing the Server Blade and Options.”
9. Power up the server blade. Refer to “Powering Up the Server Blade” in Chapter 1, “Installing the Server Blade and Options.”
10. Run RBSU to reconfigure the system with the new battery. Refer to “ROM-Based Setup Utility” in Chapter 2, “Configuring and Deploying Server Blades.”

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