HP ProLiant DL580 Generation 2 Server Setup and Installation Guide

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Contents

Chapter 2
Integrated Lights-Out

Chapter 3
Smart Array 5i Plus Controller

Chapter 4
Planning the Server Installation

Chapter 5
Installing Hardware Options

Chapter 6
Memory

Chapter 7
PCI-X Technology

Chapter 8
Installing the Server in a Rack

Chapter 9
Server Setup

Chapter 10
Server Configuration and Utilities

Appendix A
Regulatory Compliance Notices

Appendix B
Electrostatic Discharge

Appendix C
System Battery

Appendix D
Cabling Guidelines

Appendix E
System LEDs and Switches

Appendix F
Server Error Messages

Appendix G
Server Specifications

Appendix H
Troubleshooting

Index

List of Figures

List of Tables

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 DL580 Generation 2 servers.

Audience Assumptions

This guide is for the person who installs, administers, and troubleshoots servers. HP assumes you are qualified in the servicing of computer equipment and trained in recognizing hazards in products with hazardous energy levels.

⚠ Important Safety Information

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

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:

- The hardware installation and configuration poster that ships with the server
- The hardware installation and configuration labels located on top of the front and rear access panels of the server
- The installation documentation that ship with option kits
- The Documentation CD, which includes the following resources:
  - *HP Servers Troubleshooting Guide*
  - *Smart Array 5i Plus Controller and Battery-Backed Write Cache Enabler User Guide*
  - *Integrated Lights-Out User Guide*
  - *PCI Hot-Plug Administration Guide*
  - Advanced Memory Protection multimedia
  - *ROM-Based Setup Utility Guide*
  - *PCI-X Hot-Plug Animation*
- A link to the maintenance and service guide

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 can be purchased as an HP Care Pack packaged service or as a customized service agreement to meet your specific requirements. Some of the HP Care Pack services are as follows:

- HP Care Pack Installation Services for Hardware

- HP Care Pack Hardware and Operating System Installation for ProLiant Servers

- HP Care Pack Installation and Start-up Services for Microsoft® Windows® 2000 and Windows NT® operating systems

- HP Care Pack Installation and Start-up and Migration Services for Novell NetWare operating system

- HP Care Pack Installation and Start-up Services for Insight Manager

Visit the HP website for detailed descriptions of these HP Care Pack services. This method helps ensure top performance from the start and is especially valuable for business-critical environments.

This optional hardware installation service is available in all countries where HP has a direct or indirect service presence. Service may be ordered from and directly provided by an authorized service provider or, in the United States only, service may be ordered by calling 1-800-652-6672. In the United States, HP makes all the arrangements to have the system installed by qualified guaranteed service providers. For U.S. ordering information, refer to the product page on 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`.

1

Server Features

The HP ProLiant DL580 Generation 2 server is the ideal solution for enterprise customers who require a rack optimized, four-way server that delivers maximum performance and availability for highly complex, business-critical applications. Maximum performance levels are achieved through superior engineering design and the use of such industry-standard technologies as:

- Intel® Xeon Processors MP with Hyper-Threading technology

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

- PC1600 ECC Double Data Rate (DDR) SDRAM

- 64-bit, 100-MHz PCI-X I/O subsystem

- NC 7770 PCI-X Copper Gigabit network interface controller (NIC) (in a slot)

- Embedded Wide Ultra3 RAID and storage solutions

Unsurpassed availability and reliability features within the server protect against hardware failure or data errors that can result in downtime or critical data loss. New availability features include:

- Optional Advanced Memory Protection functionality (single-board mirrored memory, hot-plug mirrored memory, Hot-Add memory functionality, and online spare support)

- Standard RAID protection with transportable, Battery-Backed Write Cache for internal hard disk drives

- Three redundant fan zones (CPU, memory, and PCI-X), each able to support N+1 redundancy

The ProLiant DL580 Generation 2 server achieves unparalleled ease of manageability and serviceability with the following:

- Integration of standard remote management capability through Integrated Lights-Out (iLO) technology

- Toolless and virtually cableless mechanical design

- ROM-Based Setup Utility (RBSU)

- Redundant ROM

- Innovative advanced diagnostic capabilities (QuickFind Diagnostic Display) for troubleshooting at the server level

- New rapid deployment rack rails

- Efficient and space-saving dense form factor [4U is 17.8-cm (7-in) high]

This chapter provides an overview of the HP ProLiant DL580 Generation 2 server features and briefly describes its maximum performance, high availability, server management, and serviceability features.
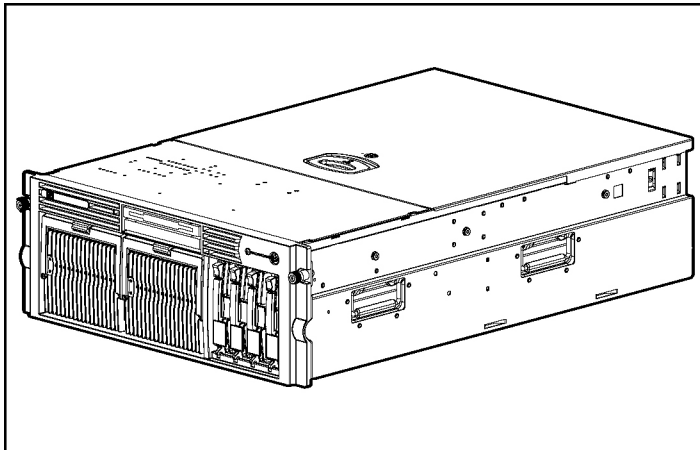
Figure 1-1: HP ProLiant DL580 Generation 2 server

Overview

The following features deliver superior four-way performance on the HP ProLiant DL580 Generation 2 server:

- Up to four Intel Xeon Processors MP with Hyper-Threading technology

- 400-MHz front-side bus

- Four-way interleaved PC1600 ECC DDR SDRAM

- 64-bit, 100-MHz, quad-peer PCI-X buses

- Embedded Wide Ultra3 RAID and storage solutions

- RJ-45 Autosensing Ethernet NIC with Wake-On Lan (WOL) support and Preboot eXecution Environment (PXE) support (installed in an expansion slot)

Key redundancy and hot-plug features create a high availability environment:

- Advanced Memory Protection technology including online spare, single-board mirrored memory, hot-plug mirrored memory, and Hot-Add memory functionality

- Embedded Smart Array 5i Plus Controller with support for 64-MB fully transportable write cache

- Redundant hot-plug fans in three zone (CPU, memory, I/O) configuration, each with N+1 redundancy

- Redundant hot-plug power supplies

- PCI-X Hot Plug

- Redundant ROM

- Optional redundant NIC

The ProLiant DL580 Generation 2 server offers a highly scalable environment with the following expansion capabilities:

- Memory expansion to 32 GB

- Four SCSI hard drive bays

- Six PCI-X slots (four hot-plug slots)

- Two slimline drive bays for a diskette drive, CD-ROM drive, or optional DVD drive

- SCSI backplane with simplex and duplex modes

The ProLiant DL580 Generation 2 server also features management and configuration tools that are the hallmark of ProLiant servers:

- Integrated Lights-Out Standard (iLO Standard)

- ProLiant Essentials software

- ProLiant Essentials scripting

- ROM-Based Setup Utility (RBSU)

- Preboot eXecution Environment (PXE)

- Redundant ROM

- Insight Manager 7 utility compatibility

- Automatic Server Recovery-2 (ASR-2)

- Integrated Management Log (IML)

- Pre-Failure Warranty on hard drives, processors, and memory

The ProLiant DL580 Generation 2 server also features ease-of-use components such as:

- Toolless serviceable chassis

- Toolless mountable sliding rack rails

- Cableless system design

- System health indicators on top of the front access panels (QuickFind Diagnostic Display)

- Front panel diagnostic lighting

- Component level diagnostic lighting

Standard Features

Processors

Hyper-Threading, a technology developed by Intel, improves the performance of IA-32 processors when executing multiple-processor (MP) capable operating systems and multi-threaded applications. With this technology, one physical processor looks like two logical processors to the operating system and applications. The two logical processors are able to execute two separate tasks (or code streams called **threads**) concurrently by using shared hardware resources.

Hyper-Threading technology is designed to improve the performance of IA-32 processors by using the multi-threaded nature of contemporary operating systems and server applications in such a way as to increase the use of the on-chip execution resources available in the Intel NetBurst micro-architecture. The integrated cache subsystem results in reduced memory access times and increased throughput and performance of the memory subsystem. Specifically, integrated Level 3 cache, which is only available on the Xeon Processor MP, provides a high-bandwidth path to memory, increasing throughput for large server workloads.

The ProLiant DL580 Generation 2 server features the following advanced processor technologies:

- Support for up to four Intel Xeon Processors MP
  - Integrated cache subsystem (Level 2 Advanced Transfer cache and Integrated Level 3 cache)
  - Intel NetBurst micro-architecture
- Hyper-Threading technology
- 400-MHz front-side bus

Memory

The ProLiant DL580 Generation 2 server provides double data rate (DDR) synchronous dynamic RAM (SDRAM) that can improve memory clock speed to at least 200 MHz. It activates output on both the rising and falling edge of the system clock rather than on just the rising edge, potentially doubling output. The ProLiant DL580 Generation 2 server features the following advanced memory technologies:

- Support for up to 32 GB of industry-standard PC1600 registered ECC DDR SDRAM memory with two memory boards installed

- ECC and Advanced ECC memory for single-bit detection and multi-bit memory error correction

- 4 x 1 interleaved memory

- Hot-Add functionality

- Optional Advanced Memory Protection (AMP)

  — User selectable through server RBSU

  — Online spare memory

  — Single-board mirrored memory

  — Dual board hot-plug mirrored memory

  — Hot-Add functionality

For more information on Hot-Add functionality, refer to the HP ProLiant DL580 Generation 2 and HP ProLiant ML570 Generation 2 Server Hot-Add Memory booklet on www.hp.com.

For more information on Advanced Memory Protection, refer to Chapter 6, "Memory."

PCI-X Expansion Slots

The ProLiant DL580 Generation 2 server offers four 64-bit, 100-MHz, peered PCI-X buses that ensure optimal availability and performance. The server provides support for six expansion slots (3.3V keyed)—four hot-plug slots and two non-hot-plug slots.

- PCI-X technology

  The ProLiant DL580 Generation 2 server features six expansion slots operating across three buses that support the latest industry-standard technology, Peripheral Component Interconnect Extended (PCI-X). This follow-on technology increases the data throughput capacity of PCI technology and minimizes bottlenecks associated with high-bandwidth devices, such as:

  — Gigabit Ethernet NICs

  — Fiber channel controllers

  — HP Smart Array Controllers

  The fourth bus is dedicated to support the embedded Smart Array 5i Plus Controller.

- Load balancing and PCI-X Hot Plug

  The server's PCI-X expansion slots operate across three separate buses to enable load balancing across multiple expansion boards. Four hot-plug slots provide enhanced availability.

Network Interface Controller

The standard slot-based NIC provided with the ProLiant DL580 Generation 2 server has the following features:

- Autosense Ethernet 802.3 standard (copper)
- PCI-X, 64-bit/133-MHz (compatible with 64-bit/66-MHz and 32-bit/33-MHz)
- WOL support
- PXE support
- Dual address cycles (DAC)

- PCI-X Hot Plug support
- Network fault tolerance

System Health Indicators

The ProLiant DL580 Generation 2 server contains several sets of LEDs that indicate the status of hardware components and settings. A new feature is the QuickFind Diagnostic Display. These LEDs, located on the front access panel, enable you to quickly diagnose a problem with a component in the server simply by referring to the access panel. The system is monitored by internal and external LEDs, including:

- Component LEDs visible on the front of the server
  — Power On/Standby button and LED
  — Internal health
  — External health
  — Hard drives
  — UID (Unit Identification) LED and button
  — Power supplies

- Component LEDs visible on the rear of the server
  — Slot-based NIC activity
  — Hot-plug expansion slots (power and fault status)
  — UID (Unit Identification) LED and button
  — iLO management NIC activity

- QuickFind Diagnostic Display (component LEDs visible at the top of the front access panel)
  — Processors
  — Processor Power Modules (PPMs)
  — Memory board
  — PCI-X expansion slots
  — Fans
  — System interlock
  — Thermtrip

For more information about system LEDs, refer to Appendix E, "System LEDs and Switches."

Integrated Lights-Out

Integrated Lights-Out (iLO) is an HP engineered, application-specific integrated circuit (ASIC) that embodies industry-leading Lights-Out management functionality on the ProLiant DL580 Generation 2 server.

Features

The iLO Standard includes basic system board management functions, diagnostics, and essential Lights-Out functionality. The iLO Standard is provided as standard on all ProLiant DL580 Generation 2 servers.

The iLO features include:

- iLO is built into every ProLiant DL580 Generation 2 server; no slot is needed.

- iLO is easy to setup and easy to use.

- iLO is always on using server auxiliary power, and it is always running regardless of the state of the server.

- iLO offers sophisticated security features, including industry-standard SSL.

The iLO Advanced can be licensed with the optional iLO Advanced Pack. The iLO Advanced offers sophisticated virtual administration features.

iLO Standard Features

The iLO Standard option is an integrated component in the ProLiant DL580 Generation 2 server and provides:

- Text-based console

- Virtual power button and reset

- Virtual indicators

- Event logs (IML and iLO log)

- Remote Diagnostics (iLO and server)

- Automatic Server Recovery

- Agent integration

- Alert forwarding and administration

- Remote firmware update

- SSL security

iLO Advanced Features (Optional)

The iLO Advanced option provides:

- Virtual floppy drive

- Virtual graphical console

- Virtual CD

- Directory services (future support)

- PKI support (future support)

SCSI Support

The ProLiant DL580 Generation 2 server provides support for both internal and external SCSI devices. The ProLiant DL580 Generation 2 server ships with an internal four-bay drive cage. The cage supports Ultra3/Ultra4 SCSI hot-plug hard drives.

- Ultra3/Ultra4-ready SCSI backplane

  — Internal SCSI backplane that is capable of supporting up to four drives

  — Cableless connection to the system board

  — Easily configured to support simplex (4x1) or duplex (2x2) mode

  — The server ships in the duplex mode

For more information on switching the server from duplex to simplex, refer to Chapter 5, "Installing Hardware Options."

The Smart Array 5i Plus Controller is an embedded hardware RAID controller that ships standard on all ProLiant DL580 Generation 2 servers. When configured with the Battery-Backed Write Cache Enabler (BBWCE), the controller provides transportable data protection and increased performance.

- Smart Array 5i Plus controller

  Features of the Smart Array 5i Plus controller include:

  — Dual Wide Ultra3 SCSI channels

  — Maximum data transfer of 160 MB/s on each SCSI channel

  — RAID 0, 1, 1+0, 5

  — 64-MB total memory for code, transfer buffers, and read/write cache

  — 64-MB memory is located on the 5i Plus Memory Module that connects directly to the system board

  — Battery connector for connection to the BBWCE

  — Support for the HP universal hot-plug tape drive

- Battery-Backed Write Cache Enabler (BBWCE)

  Features of the BBWCE include:

  — Protects against hard boot, power, controller, or system board failures

  — Provides up to 64-MB write cache memory protection (cache memory located on the 5i Plus Memory Module)

  — Fully transportable to another ProLiant DL580 Generation 2 server in the data center

  NOTE: In order to easily transport protected cache data to another ProLiant DL580 Generation 2 server, remove the BBWCE and the 5i Plus Memory Module simultaneously. The BBWCE and 5i Plus Memory Module are connected to each other using a short cable.

  — Battery charge up to 72 hours

  — Battery life up to 3 years

  — Available as standard on most models of the ProLiant DL580 Generation 2 server

Storage and Media Drives

The ProLiant DL580 Generation 2 server offers slimline drive bays for flexibility in storage and media drives. For more information about installing storage and media drives into the slimline drive bays, refer to Chapter 5, "Installing Hardware Options."

- Up to four 1-inch, hot-plug SCSI drive bays supporting either Ultra3 or Ultra4 hard drives or an HP universal hot-plug tape drive

- Two slimline drive bays occupied by:

  — One slimline 1.44-MB diskette drive

  — One slimline IDE CD-ROM drive

NOTE: An optional DVD drive can be used in either slimline drive bay.

Hot-Plug Fans

The ProLiant DL580 Generation 2 server supports redundant hot-plug fans that are divided into three zones. Each zone is independent of each other and is able to support N+1 redundancy, as indicated below:

- PCI-X expansion zone is 1+1 redundant (fans 1 and 2)

- Memory zone is 1+1 redundant (fans 3 and 4)

- CPU zone is 2+1 redundant (fans 5, 6, and 7)

NOTE: Refer to "Locating Hot-Plug Fans" in Chapter 5, "Installing Hardware Options," for an illustration of the fans and their respective zones within the server.

This zone configuration enables the server to withstand up to three fan failures, provided that they are not within the same zone. Within a zone, if the primary fan fails, the server generates a system alert and commands the redundant fan to function automatically. The subsystem of the redundant hot-plug fan protects the various server components from overheating, provides rapid serviceability, and minimizes the risk of system interruption. Features of the redundant hot-plug fans include:

- Intelligent fan controllers with variable speed support and monitoring with a system management driver installed

- Redundant hot-plug fans standard in all systems

- Individually hot-pluggable

Hot-Plug Power Supplies

Improved power supply performance ensures that a single power supply provides sufficient power to the entire system. Complete redundancy can be achieved by installing an additional hot-plug power supply.

The standard and redundant 800-W power supplies run simultaneously under normal operating conditions. The redundant hot-plug power supply ensures the delivery of electricity to the server, provides rapid serviceability, and minimizes the risk of system interruption.

In case of a loss of redundancy, the system sends an alert of the failure to the system administrator. The failure does not cause any loss of power, and the failed unit can be replaced without having to power down the server or save system data. Power supply features include:

- Support for hot-plug redundant capabilities with the second power supply installed (optional on some models)

- Accessible from the front of the server

Hot-plug power supplies also have advanced features that ease operation:

- Auto Line Sensing capability automatically selects the appropriate line voltage.

- Power Down Manager ensures that ProLiant DL580 Generation 2 servers deactivate in a manner that safeguards data and system integrity.

Standard Interfaces

The ProLiant DL580 Generation 2 server is equipped with the following standard interfaces:

- Serial connector

- Video connector

- Keyboard connector

- Mouse connector

- Two USB connectors located at the rear of the server

- RJ-45 connector for Ethernet

- RJ-45 connector for iLO system management

Video

Standard video integration in the ProLiant DL580 Generation 2 server includes:

- Integrated video controller with 64 K colors at a maximum resolution of 1600 x 1200

- Support for SVGA, VGA, and EGA graphics resolution

- 8-MB SDRAM video memory

ROM

ROM features include:

- Redundant ROM support

- Software-upgradeable firmware, including diagnostics

- ROMPaq Flash Utility to upgrade system ROM

- Smart Components for Remote ROM flash support

- Enhanced Auto-Configuration

Server Configuration and Management

HP offers an extensive set of features and optional tools to support effective server configuration and management. This section provides an overview of the following server management features that are detailed in Chapter 10, "Server Configuration and Utilities."

Integrated Features

- ROM-Based Setup Utility (RBSU)

  RBSU is an updateable configuration utility that is embedded in the server ROM. The RBSU helps you configure certain server hardware settings and prepare the server for operating system installation. The RBSU enables you to view and establish server configuration settings during initial system startup, as well as modify them after the server has been configured. With the RBSU, you can manage system options, such as the operating system, Advanced Memory Protection, standard boot order, PCI-X devices, date and time, ASR-2, server passwords, boot control order, and advanced options.

- Redundant ROM support

  Redundant ROM provides a disaster recovery mechanism for mission-critical servers. With redundant ROM support, the ProLiant DL580 Generation 2 server enables you to upgrade or configure the ROM safely. For example, if the server loses power during a ROM flash or if the flash process is interrupted in any way, the system can be restarted with the original ROM image.

  The server has a ROM image that acts as two, separate 1-MB ROMs. If the boot ROM experiences a problem, the system defaults to the previous version to maximize server availability and performance. Without this redundancy, the server would be unavailable until a special disaster recovery process restored the original ROM.

  Redundant ROM also enables you to use RBSU to switch between two ROM images for testing and evaluation purposes. If the new ROM does not meet your expectations, you can use RBSU to restore the previous ROM image. Without redundant ROM, you would need to use the ROMPaq Flash Utility to restore the previous ROM image.

- ROMPaq Utility

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

- Remote ROM Flash Utility

  The Remote ROM Flash Utility enables administrators to upgrade the system ROMs as well as the supported HP Smart Array controllers on multiple servers from a single point of execution. The ROM upgrades can be flashed either individually or batched together to perform multiple ROM upgrades in a single step.

- ROM legacy USB support

  ROM legacy USB support provides USB mouse and keyboard support for operating systems that do not support USB, as well as POST and RBSU support for keyboards. For information about operating systems currently providing USB support, refer to the operating system support matrix on the operating system support page on the HP website, www.hp.com.

- Preboot eXecution Environment (PXE)

  PXE enables servers to load and execute a network bootstrap program (NBP) from a PXE server and execute a pre-configured image. The image can be an operating system image created by software, or a boot diskette image. PXE makes it possible to configure or reconfigure a system remotely. The NIC on the ProLiant DL580 Generation 2 server contains a PXE universal service agent. When the server is connected to a network, this agent can interact with the remote PXE server to retrieve the boot image. An administrator at a management console can then install an operating system or configure the ProLiant DL580 Generation 2 server remotely.

For more detailed information about these tools and utilities, refer to Chapter 10, "Server Configuration and Utilities," the ProLiant Essentials Foundation Pack, or the Documentation CD that ships with the server.

Software Tools and Utilities

- ProLiant Essentials Foundation Pack

  The ProLiant Essentials Foundation Pack is a set of server integration tools and utilities that optimizes platform configuration and simplifies setup of servers. The CD includes the suite of ProLiant server software from diagnostics to drivers and supports the installation and integration of operating system software. The ProLiant Essentials Foundation Pack is the recommended tool for loading system software, achieving a well-integrated server, and ensuring maximum dependability and supportability.

- ProLiant Essentials Diskette Builder

  The ProLiant Essentials Diskette Builder is a utility that uses data stored on the ProLiant Essentials Foundation Pack to create support diskettes. You can create support diskettes for specific configuration needs or for software that cannot be used directly from the ProLiant Essentials Foundation Pack.

- ProLiant Essentials Scripting Toolkit

  The ProLiant Essentials Scripting Toolkit contains a set of MS-DOS-based utilities that enable you to configure and deploy servers in a customized, predictable, and unattended manner. These utilities provide scripted server and array replication for mass server deployment. They enable you to duplicate the configuration of a source server onto target systems with minimum user interaction.

- Insight Manager 7

  Insight Manager 7 provides web-based system management for ProLiant servers and any HTTP, SNMP, MIB2, or DMI v2.0-compliant device. Insight Manager 7 is installed from the Management CD. It is an easy-to-use, intuitive software utility designed for collecting server information including fault conditions, performance, security, remote management, and recovery services.

- Diagnostics Utility

  The Diagnostics Utility displays information about the server's hardware and tests the system to be sure that it is operating properly. If you used ProLiant Essentials to install your operating system, you can access the Diagnostics Utility from the ProLiant Essentials Foundation Pack.

- Automatic Server Recovery-2 (ASR-2)

  ASR-2 enables the server to boot automatically from either the operating system or from HP utilities. If a critical system failure occurs, ASR-2 automatically restarts the server and can be configured to page a designated system administrator.

- Integrated Management Log (IML)

  The IML provides a detailed log of key system events. This log also monitors the server health log and is accessible from Insight Manager 7 and the Remote Insight Lights-Out Edition II (RILOE II) option.

  NOTE: The ProLiant DL580 Generation 2 server no longer supports the first-generation RILOE board option.

- Multi-Initiator Configuration Utility

  The Multi-Initiator Configuration Utility enables administrators to configure the Integrated Dual Channel Ultra3 SCSI controller for support of HP storage and clustering options.

For more detailed information about these tools and utilities, refer to Chapter 10, "Server Configuration and Utilities," the ProLiant Essentials Foundation Pack, or the Documentation CD that ships with the server.

Security Features

Security features for the ProLiant DL580 Generation 2 server include:

- Power-on password

- Administrator password

- Network server mode

- QuickLock

- Diskette drive write control

- Removable diskette drive

- Removable CD-ROM drive

- Diskette boot override

- Serial interface control

- Configuration lock

- Security lock provision

- NVRAM write protect

Standard security features are configured through the RBSU. To access these settings, refer to Chapter 10, "Server Configuration and Utilities."

For additional information about server security features, refer to the Documentation CD and the ProLiant Essentials Foundation Pack that ships with the server.

Diagnostic Tools

The ProLiant DL580 Generation 2 server provides the following software and firmware diagnostic tools:

- Power-On Self-Test (POST)

- Insight Manager 7

- User diagnostics (DIAGS)

- Integrated Management Log (IML)

- Health Driver

For additional information concerning HP diagnostic tools, refer to the Documentation CD that ships with the server.

Warranties and Services

The ProLiant DL580 Generation 2 server has the following standard services and warranties:

- Three-Year, On-Site, Limited Global Warranty

- Next Business Day Response

- Pre-Failure Warranty

Three-Year, On-Site, Limited Global Warranty

HP covers the cost of necessary parts and labor for on-site service during the specified warranty periods. Under the global warranty, product warranty terms at the time of purchase are honored in any country where HP has a service presence. This applies to customers who may purchase a product in one country, then transfer it to another.

IMPORTANT: Customers moving HP products between certain countries or regions are asked to provide information needed to ensure that HP is prepared to provide the required level of warranty service in the destination country. For information on the HP Global Warranty Notification Process, contact an HP sales representative or authorized reseller or refer to the product website on www.hp.com.

Next Business Day Response

Response time is based on commercially reasonable best efforts. In most cases, Next Business Day response is available. In some regions and under certain supplier restraints, Next Business Day response is not always possible. In many areas, response uplifts are available for a fee. Contact the local HP service organization for response time and availability in your area or visit the HP website, www.hp.com.

Pre-Failure Warranty

The ProLiant DL580 Generation 2 server includes a Pre-Failure Warranty for processors, hard drives, and memory purchased from HP through authorized resellers. Under the terms of this warranty, supported components are eligible for replacement before they actually fail provided that you use the Insight Manager 7 application and that the system determines that the supported components have degraded below predetermined reliability thresholds within the product warranty period.

When the Insight Manager 7 application alerts you that a component may be eligible for Pre-Failure Warranty replacement, follow the on-screen instructions or contact a authorized service provider in your area. A yellow status indicator on the Insight Manager 7 control panel signals that a component is in a degraded condition and prompts you to replace the component in its pre-failure condition.

Server Registration

Registering the server provides HP with valuable information on server installation. This information helps HP serve your needs better now and in the future. To register the server, refer to

www.compaq.com/register

2

Integrated Lights-Out

The ProLiant DL580 Generation 2 server includes the Integrated Lights-Out Standard (iLO Standard). The iLO Standard provides server health and remote server management. The server also supports the optional iLO Advanced feature. For additional information on iLO Advanced, refer to the documentation provided with the option kit.

Integrated Lights-Out Standard (iLO Standard) provides server health and remote server management. The iLO Standard features are accessed from a network client using a standard web browser. In addition to other features, iLO Standard provides keyboard, mouse, and video (text and graphics) capability for a server, regardless of the state of the host operating system or host server.

The iLO Standard sub-system includes an intelligent microprocessor, secure memory, and a dedicated network interface. This design makes iLO Standard independent of the host server and its operating system. Remote access is provided by iLO Standard to any authorized network clients and alert notification is supported along with other server management functions. Using a standard Web browser, you can:

- Remotely access the console of the host server, including all text mode and graphics mode (optional) screens with full keyboard and mouse controls

- Remotely power up, power down, or reboot the host server

- Remotely boot the host server from a virtual floppy to perform a ROM upgrade or to install an operating system (optional)

- Access the Insight Manager 7 agents on a host server through iLO Standard

- Send alerts from iLO Standard regardless of the state of the host server

- Access advanced troubleshooting features provided by iLO Standard

- Launch a web browser, use Simple Network Management Protocol (SNMP) alerting, and use Insight Manager 7 to diagnose iLO Standard

Features

Integrated Lights-Out Standard offers the following features:

- Virtual Power Button

  Using any standard browser interface, iLO Standard can be used to remotely operate a host server power button. For example, if the host server is off, you can turn it on from a remote console.

- Power Cycle (Reset)

  If the remote host server is not responding, this feature enables an administrator to initiate a cold reboot to bring the server back online.

- Remote Firmware Update

  This feature ensures that iLO Standard is always up-to-date with the latest firmware available from HP. Updates to the ROM code on iLO Standard are accomplished through the browser interface.

- Virtual Private Network (VPN) support

  When used in conjunction with VPN technology, iLO Standard functionality is available around the world.

- Reset and failure sequence replay

  Video text sequences stored on the iLO Standard enable an administrator to replay server startup and shutdown sequences. The last two server resets and the last server failure may be viewed.

- Dedicated LAN network connectivity

  An Ethernet chip on the iLO Standard provides administrators with a dedicated network connection to iLO Standard. The iLO Standard provides in-band SNMP notification of server problems on a real-time basis without separate telephone connections or modem-sharing devices.
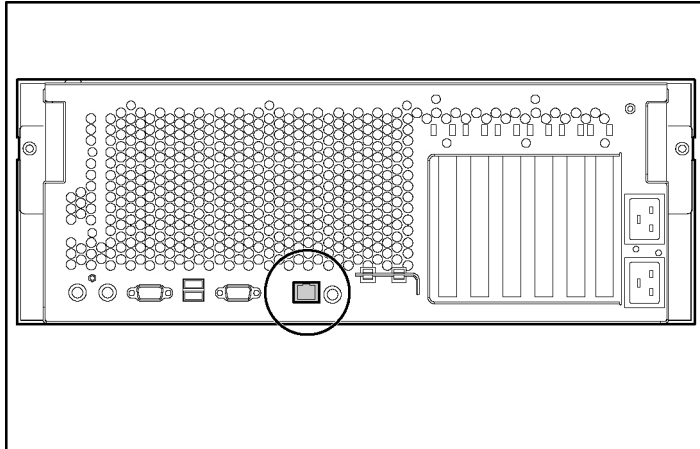
Figure 2-1: iLO Standard management port on the rear panel

- User administration and security

  The iLO Standard supports up to twelve users with customizable access rights, login names, client IP address restrictions, and advanced password encryption. Other security functions include secure password encryption, tracking of all login attempts, and record maintenance of all login failures.

- 128-bit encryption

  The iLO Standard provides strong security for remote management in distributed IT environments. Secure Sockets Layer (SSL) encryption (up to 128-bits) ensures the HTTP information is secure as it travels across the network.

- Auto configuration of IP address by means of DNS/DHCP

  The iLO Standard provides automatic network configuration. The iLO Standard comes with a default name and Dynamic Host Configuration Protocol (DHCP) client that leases an IP address from the DHCP server on the network. For systems that do not use Domain Name Service (DNS)/DHCP, iLO Standard enables static IP configuration.

  The default user name, password, and DNS name are:

  — User name: Administrator

  — Password: A random, eight-character, alphanumeric string

  — DNS name: ILO*XXXXXXXXXXXX* where the 12 *X*s are the serial number of the server in which the iLO Standard processor is located. The DNS name of the iLO Standard is configurable by the user.

  IMPORTANT: User names and passwords are case sensitive.

- Integrated Management Log

  The iLO Standard manages the Integrated Management Log of the server that can be accessed using a standard browser, even when the server is not operational. This capability can be helpful when troubleshooting remote host server problems.

- ROM-Based Configuration Utility F8

  This versatile, system-independent, ROM-Based Configuration Utility enables fast and easy setup of iLO Standard.

- Virtual Graphical Remote Console (optional)

  Graphical remote console capability is provided by iLO-Standard-embedded hardware that turns a standard browser into a virtual desktop, giving the user full control over the host server display, keyboard, and mouse. The independent console of the operating system supports text and graphic modes, displaying remote host server activities, such as shutdown and startup operations.

- Virtual Media (optional)

  With the ROM-Based Boot Drivers, an administrator can easily direct a remote host server to boot and use standard media from anywhere on the network, thus saving time and increasing efficiency by eliminating the need to visit a remote server to insert and use a diskette. This feature enables administrators to carry out any of the following functions remotely:

  — Run User Diagnostics on remote host servers

  — Apply ROMPaq upgrades to remote servers

  — Deploy an operating system on remote servers from network drives

  — Perform disaster recovery of failed operating systems

NOTE: Virtual graphical console and virtual media are optional on the ProLiant DL580 Generation 2 server. These advanced features can be licensed with the optional iLO Advanced Pack.

Integrated Lights-Out Standard Security Override

The iLO Standard Security Override enables the administrator full access to the iLO Standard processor. This is necessary in the event of a lost or forgotten administrator password and to flash the iLO Standard boot-block. The iLO Standard Security Override is located inside the server.
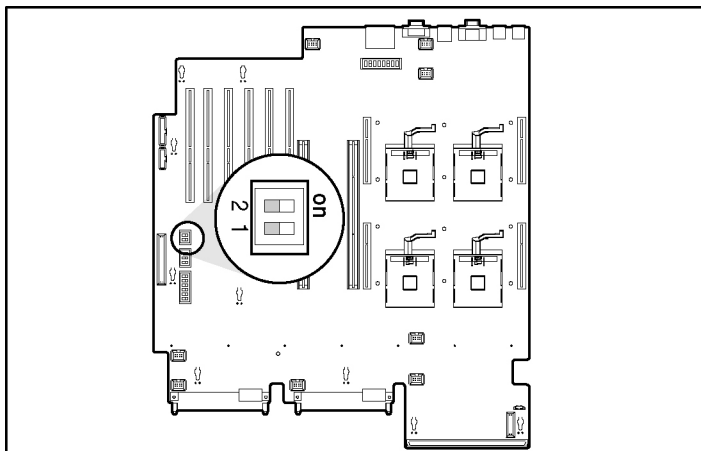
Figure 2-2: iLO Standard Security Override

The iLO Standard Security Override enables emergency access to the administrator with physical control of the server system board. Setting the iLO Standard Security Override enables login access, with all privileges, without a user ID and password.

To set the iLO Standard Security Override:

1. Power down the server. Refer to "Powering Down the Server" in Chapter 5, "Installing Hardware Options."

2. Extend the server from the rack. Refer to "Extending the Server from the Rack" in Chapter 5, "Installing Hardware Options."

3. Open the rear access panel. Refer to "Opening and Removing the Access Panels" in Chapter 5, "Installing Hardware Options."

4. Locate the iLO Standard Security Override, and move the switch from the off position to the on position.

5. Close the rear access panel. Refer to "Replacing the Access Panels" in Chapter 5, "Installing Hardware Options."

6. Restore the server to its operating position in the rack. Refer to "Extending the Server from the Rack" in Chapter 5, "Installing Hardware Options."

7. Power up the server. Refer to "Powering Up the Server" in Chapter 9, "Server Setup."

8. Logon to the iLO Standard and reset the passwords.

A warning message appears on the iLO Standard web pages indicating the iLO Standard Security Override function is currently active. An iLO Standard log entry is added recording the use of the iLO Standard Security Override. An SNMP alert may also be sent upon setting or clearing the iLO Standard Security Override function.

In the unlikely event it is necessary, enabling the iLO Standard Security Override also enables the iLO Standard boot-block to be flashed. The boot-block is exposed until the iLO Standard is reset. HP recommends the iLO Standard be disconnected from the network until the reset is complete.

To reset the iLO Standard Security Override:

1. Power down the server. Refer to "Powering Down the Server" in Chapter 5, "Installing Hardware Options."

2. Extend the server from the rack. Refer to "Extending the Server from the Rack" in Chapter 5, "Installing Hardware Options."

3. Open the rear access panel. Refer to "Opening and Removing the Access Panels" in Chapter 5, "Installing Hardware Options."

4. Locate the iLO Standard Security Override, and move the switch from the on position to the off position.

5. Replace the rear access panel. Refer to "Replacing the Access Panels" in Chapter 5, "Installing Hardware Options."

6. Restore the server to its operating position in the rack. Refer to "Extending the Server from the Rack" in Chapter 5, "Installing Hardware Options."

7. Power up the server. Refer to "Powering Up the Server" in Chapter 9, "Server Setup."

Integration with Insight Manager 7

Full integration is provided with iLO Standard and Insight Manager 7 under key operating environments. This integration:

- Provides support for SNMP trap delivery to a Insight Manager 7 console

- Provides support for a new device type, the management processor

  All iLO Standard devices installed in servers on the network are discovered in Insight Manager 7 as management processors. Management processors are associated with the servers in which they are installed.

- Provides iLO Standard hyperlinks

- Provides a hyperlink on the server device page to launch and connect to iLO Standard easily

- Enables all iLO Standard to be grouped together logically and displayed on one page, which provides access to iLO Standard from one point in Insight Manager 7

Browser Support

Microsoft Internet Explorer 5.0 or later gives full and easy access to the features of iLO Standard. This gives administrators full control of the remote host server display, keyboard, and mouse, regardless of the state of the host server or operating system to perform all remote management tasks.

Configuration and Operation

For specific information on configuring and operating iLO Standard, refer to the *Integrated Lights-Out User Guide*.

3

Smart Array 5i Plus Controller

The HP ProLiant DL580 Generation 2 server is equipped with the Smart Array 5i Plus Controller. The Smart Array 5i Plus Controller and BBWCE is a Wide Ultra3 SCSI hard drive array controller with a 64-MB read/write embedded cache and a battery-backed write enabler that provides transportable data protection and increases overall controller performance.

Overview of Controller Features

Features of the Smart Array 5i Plus Controller include:

- Dual Wide Ultra3 SCSI channels supporting up to four internal drives

- Support for the following operating systems:

  — Microsoft Windows 2000

  — Microsoft Windows NT® 4.0

  — Novell Netware 5.X and 6.X

  — Linux (Refer to the HP website for further information about Linux version support.)

- Support for the HP universal hot-plug tape drive

- Support for drive and array movement to the Smart Array 532, Smart Array 5302/5304, and Smart Array 5i controllers

- Backward capability with Wide Ultra2 SCSI devices

- 64-bit PCI-X bus master interface

- A user-selectable read or optional write cache allocation from 0 to 64 MB

- BBWCE

- Support for additional features:

    — RAID (0, 1 + 0, and 5)

    — Online RAID migration between any two levels

    — Online array capacity expansion

    — Adjustable stripe size

    — Performance monitoring with Insight Manager

    — S.M.A.R.T. paging

    — Drive pre-failure notification

    — Tagged command queuing

    — Multiple logical drives per array

    — Pre-Failure Warranty and Pre-Failure Notification for HP drives (requires Insight Manager)

    — Easy-to-use Array Configuration Utility (ACU) and browser-based Array Configuration Utility XE (ACU-XE)

    — Option ROM Configuration for Arrays (ORCA) Utility

    — Redundant ROM

Battery-Backed Write Cache Enabler

A BBWCE is included in some models with the Smart Array 5i Plus Controller. Also called the battery module, this component enables write cache, provides transportable data protection, increases overall controller performance, and maintains any cache data for up to 72 hours.

NOTE: The data protection (and the time limit) also applies if a power outage occurs. When power is restored to the system, an initialization process writes the preserved data to the hard drives.

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.

IMPORTANT: The battery module may have a low charge when it is first installed. In this case, a POST message 1794 is displayed when the server is powered up, indicating that the array accelerator is temporarily disabled. No action is required on your part, since the internal circuitry automatically recharges the batteries. The recharge process can take up to 24 hours. The array controller will function properly during this time, although without the performance advantage of the array accelerator. When the batteries are charged to 79 percent of their capacity, the array accelerator is automatically enabled.

The battery module can be removed from the server without using any tools. For detailed instructions, refer to "Installing the Battery-Backed Write Cache Enabler" in Chapter 5, "Installing Hardware Options."

⚠ **CAUTION:** When using the battery module, observe the following limitations:

- Do not transfer the battery module between different server models.

- Do not add or remove the battery module while array capacity expansion, RAID level migration, or stripe size migration is in progress.

The battery module has two LEDs, one green and one amber. When the battery module is connected to the controller and the server is powered up, the green LED indicates the status of the battery charge. When the battery is connected to the controller and the server is powered down, the amber LED indicates the status of the data retention. Refer to "Battery-Backed Write Cache Enabler" in Appendix E, "System LEDs and Switches," for more information.

⚠ **CAUTION:** After the server is powered down, wait 15 seconds and then check the illumination pattern of the LEDs before unplugging the cable from the battery module.

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

- If neither LED blinks after 15 seconds, it is safe to remove the cable from the battery module.

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

Memory

The Smart Array 5i Plus Controller and BBWCE have 64-MB total memory for code, transfer buffers, and read/write cache.

Controller Interface

The Smart Array 5i Plus Controller and BBWCE support Wide Ultra3 and Wide Ultra2 SCSI devices that use low voltage differential signaling (LVDS) on the SCSI bus.

The Smart Array 5i Plus Controller and BBWCE do not support Wide SCSI-3 devices that use the single-ended (SE) signaling protocol.

Drive Array Technology

Drive array technology distributes data across a series of hard drives to unite physical drives into one or more logical drives. This technology enables concurrent access to data on multiple drives in the array and yields faster input/output rates than those using non-arrayed drives. You may set each logical drive in the array to a different fault-tolerant configuration. The Smart Array 5i Plus Controller and BBWCE manage the drive array independent of the host processor.

ACU-XE, a browser-based utility, helps you configure the hardware in a way that best suits your needs. Refer to the ProLiant Essentials Foundation Pack for additional information.

Fault Management Features

The array controller and the network operating system support several fault management and data reliability features that minimize the impact of hard drive defects on the system.

- **Auto Reliability Monitoring** (ARM) is a background process that scans hard drives for bad sectors in fault-tolerant logical drives. ARM also verifies the consistency of parity data in logical drives that are using RAID 5. This process assures that you can recover all data successfully if a drive failure occurs in the future. ARM operates only when you select RAID 1 or RAID 5.

- **Dynamic sector repair** by the controller automatically remaps any sectors that have media faults (detected either during normal operation or by auto reliability monitoring).

- **Drive parameter tracking** monitors more than 15 drive-operational parameters and functional tests, allowing the array controller to detect drive problems and predict drive failure before it occurs. This feature makes possible the Pre-Failure Warranty on HP hard drives.

  Parameters that are tracked include:

  — Read and write errors

  — Spin-up time

  — Cable problems

  — Functional tests such as track-to-track, one-third stroke, and full-stroke time

- **Drive failure alert features** cause an alert message to be displayed on the system monitor when drive failure occurs. Different server models use different messages for different situations.

- **Interim data recovery** occurs if a drive fails in fault tolerant configurations (RAID 1 or RAID 5). In this situation, the system will still process I/O requests, but at a reduced performance level. Replace the failed drive as soon as possible to restore performance and full fault tolerance for that logical drive. Otherwise, if another hard drive fails before data has been rebuilt, the logical volume will fail and data will be lost.

- **Predictive failure alert** is a powerful problem-prevention feature that warns you when a drive failure is imminent. This feature allows you to take corrective action with minimal effect on critical business operations. The system must use Insight Manager and an HP Smart Array controller to benefit from predictive failure alert.

  Instructions for using the predictive failure alert feature can be found in the documentation for Insight Manager software and HP Management Agents. This documentation is located on the Management CD.

  NOTE: An online spare will not become active and start rebuilding after a predictive failure alert, because the degraded drive has not actually failed yet and is still online. The online spare is activated only after a drive in the array has failed.

- **POST** or the **Array Diagnostics Utility** (ADU) also reveals imminent drive failure.

- **Recovery ROM** is a controller redundancy feature that ensures continuous system availability by providing a backup ROM. This feature protects against corruption of a ROM image (caused, for example, by power fluctuation during ROM upgrade). If corruption occurs, the server automatically restarts using the remaining good copy of the ROM image.

  When you upgrade the ROM, the inactive image (the one not being used by the system) is upgraded. No noticeable difference in operation normally occurs. When you use Recovery ROM for the first time, however, the backup ROM images are upgraded, causing a boot delay of about 20 seconds.

Other HP options, such as Insight Manager, provide additional drive failure features. Refer to an authorized reseller for more information about these products.

4

Planning the Server Installation

This chapter provides information and instructions for planning the installation of the new HP ProLiant DL580 Generation 2 server. Figure 4-1 illustrates multiple ProLiant DL580 Generation 2 servers installed in a rack.
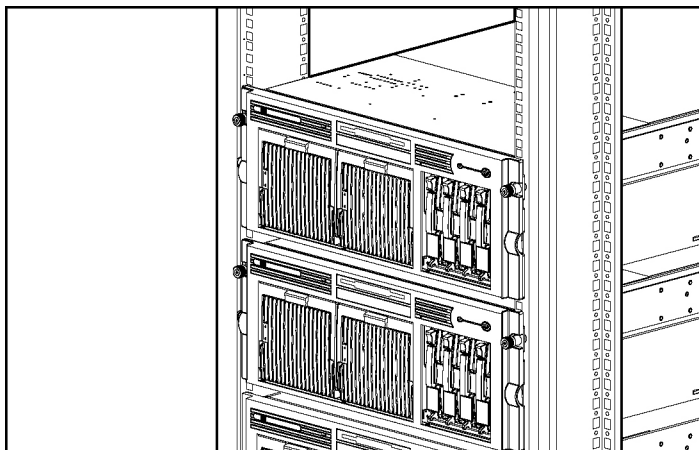
Figure 4-1: ProLiant DL580 Generation 2 servers installed in a rack

The following sections describe the server and site preparations required to correctly and safely install the server. This preparation includes:

- Optimum environment considerations

- Rack planning resources

- Rack warnings and cautions

- Server warnings and cautions

- Server shipping contents

Optimum Environment

When installing the ProLiant DL580 Generation 2 server in a rack, select a location that meets the environmental standards described in the following sections.

Space and Airflow Requirements

To enable servicing and adequate airflow, observe the following spatial requirements when deciding where to install the rack:

- Leave a minimum clearance of 63.5 cm (25 in) in front of the rack.

- Leave a minimum clearance of 76.2 cm (30 in) in the back of the rack.

- Leave a minimum clearance of 121.9 cm (48 in) from the back of the rack to the rear of another rack or row of racks.

HP servers draw in cool air through the front door and expel warm air through the rear door. Therefore, the front and rear rack doors must be adequately ventilated to allow ambient room air to enter the cabinet, and the rear door must be adequately ventilated to enable the warm air to escape from the cabinet.

IMPORTANT: Do not block the ventilation openings.

Compaq branded 9000 Series racks provide proper server cooling from flow-through perforations in the front and rear doors that provide 64 percent open area for ventilation.

△ **CAUTION:** When using a Compaq branded 7000 Series rack, you must install the high airflow rack door insert [P/N 327281-B21 (42U) and P/N 157847-B21 (22U)] to provide proper front-to-back airflow and cooling.

⚠ **CAUTION:** If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment:

- Front and rear doors: If the 42U server rack includes closing front and rear doors, you must allow 5,350 sq cm (830 sq in) of holes evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation).

- Side: The clearance between the installed rack component and the side panels of the rack must be a minimum of 7 cm (2.75 in).

Temperature Requirements

To ensure continued safe and reliable equipment operation, install or locate the system in a well-ventilated, climate-controlled environment.

The maximum recommended ambient operating temperature (TMRA) for most server products is 35°C (95°F). The temperature in the room where the rack is located must not exceed 35°C (95°F).

Power Requirements

⚠ **WARNING: To reduce the risk of personal injury, fire, or damage to the equipment, do not overload the AC supply branch circuit that provides power to the rack. Consult the electrical authority having jurisdiction over the wiring and installation requirements of your facility.**

The installation of this equipment shall be in accordance with local/regional electrical regulations governing the installation of information technology equipment by licensed electricians. This equipment is designed to operate in installations covered by NFPA 70, 1999 Edition (National Electric Code) and NFPA 75, 1992 Edition (code for Protection of Electronic Computer/Data Processing Equipment). For electrical power ratings on options, refer to the product rating label or the user documentation supplied with that option.

When installing more than one server, you may need to use additional power distribution devices to safely provide power to all devices. Observe the following guidelines:

- The power load must be balanced between available AC supply branch circuits.

- The overall system AC current load must not exceed 80 percent of the branch circuit AC current rating.

Grounding Requirements

For proper operation and safety, the server must be properly grounded. In the United States, you must install the equipment in accordance with NFPA 70, 1999 Edition (National Electric Code) Article 250 as well as any local and regional building codes. In Canada, the equipment must be installed in accordance with Canadian Standards Association, CSA C22.1, Canadian Electrical Code. In all other countries, the installation must follow any regional or national electrical wiring codes, such as the International Electrotechnical Commission (IEC) 364, parts 1 through 7. Furthermore, you must ensure that all power distribution devices used in the installation—such as branch wiring and receptacles—are listed or certified grounding-type devices.

Because of the high ground leakage currents associated with multiple servers connected to the same power source, HP recommends the use of a power distribution unit (PDU) that is either permanently wired to the branch circuit of the building or includes a nondetachable cord that is wired to an industrial-style plug. NEMA locking-style plugs or those complying with IEC 60309 are considered suitable for this purpose. HP does not recommend using common power outlet strips for this equipment.

Rack Planning Resources

The following resource information is available on rack designs and products.

The Rack Builder Pro Configuration Tool and Rack Products documentation information can be found on the HP website by following the storage link on the product website.

The entire Rack Resource CD Kit ships with all Compaq branded racks. A summary of the content of each CD follows:

- Rack Builder Pro Configuration Tool

  This information helps you to simulate potential Compaq branded rack configurations based on your input. Rack Builder Pro provides the following information:

  — Graphical preview of properly configured racks

  — Site planning data, including power requirements, cooling mandates, and physical specifications

  — Ordering information, including required components, part numbers, and appropriate quantities

- Installing Rack Products video

  This video provides a visual overview of operations required for configuring a Compaq branded rack with rack-mountable components. It also provides the following important configuration steps:

  — Site planning

  — Installing rack servers and rack options

  — Cabling

  — Coupling racks

- Rack Products Documentation CD

  The resource information on this CD enables you to view, search, and print documentation for Compaq branded racks and rack options. It also helps you set up and optimize the new Compaq branded rack in a manner that best fits your environment.

Rack Warnings and Cautions

Before installing the rack, ensure you understand the following warnings:

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

> ⚠ **WARNING: To reduce the risk of personal injury or equipment damage, be sure that:**
>
> - **The leveling jacks are extended to the floor.**
> - **The full weight of the rack rests on the leveling jacks.**
> - **The stabilizers are attached to the rack for single-rack installation.**
> - **The racks are coupled together in multiple-rack installations.**

> ⚠ **WARNING: When installing the server in a telco rack, be sure that the rack frame is adequately secured to the top and bottom of the building structure.**

> △ **CAUTION:** Always begin by mounting the heaviest item on the bottom of the rack. Continue to populate the rack from the bottom to the top.

Server Warnings and Cautions

Before installing the server, ensure you understand the following warnings and cautions:

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

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

- **Do not disable the power cord grounding plug. The grounding plug is an important safety feature.**

- **Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.**

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

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

Server Shipping Contents

The contents of the server shipping box include the following:

- ProLiant DL580 Generation 2 server

- Hardware documentation, reference information, and software products

- Power cords

- Rack-mounting hardware

Use Figure 4-2 and Table 4-1 to identify the rack-mounting hardware.
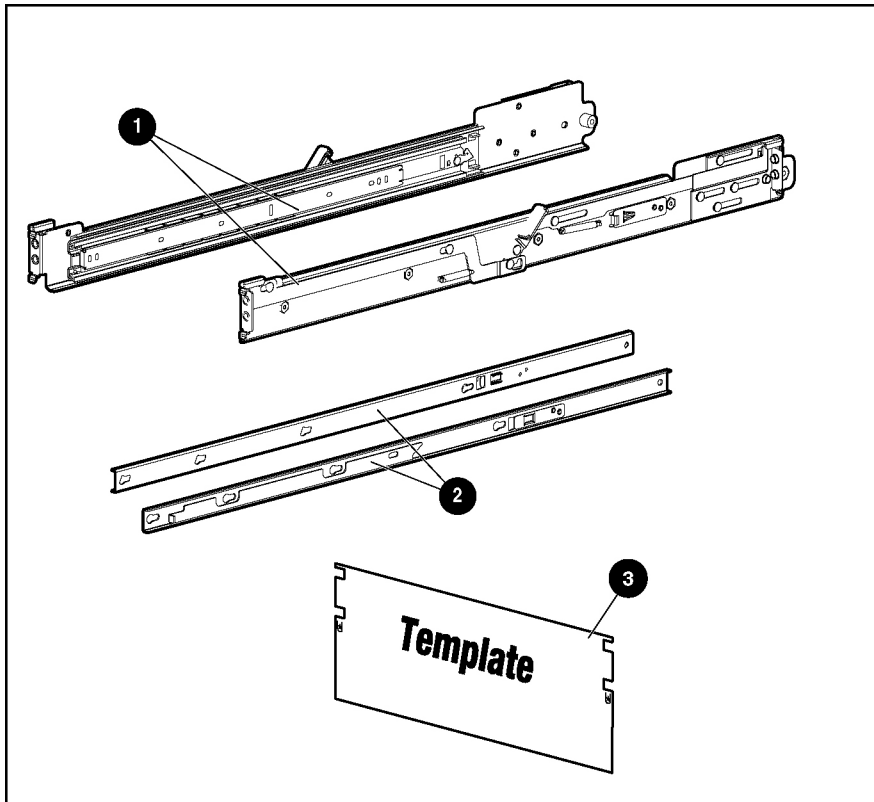
Figure 4-2: Rack-mounting hardware

Table 4-1: Rack-Mounting Hardware

Item	Description	Item	Description
1	Rack rail assemblies (2)	3	Rack template
2	Server rails (2)		

Note: Cable management components are not shown in this illustration.

Removing Shipping Bracket from PCI Basket

To remove the shipping bracket from the PCI Basket, loosen the thumbscrew (1) and remove and discard the shipping bracket (2).
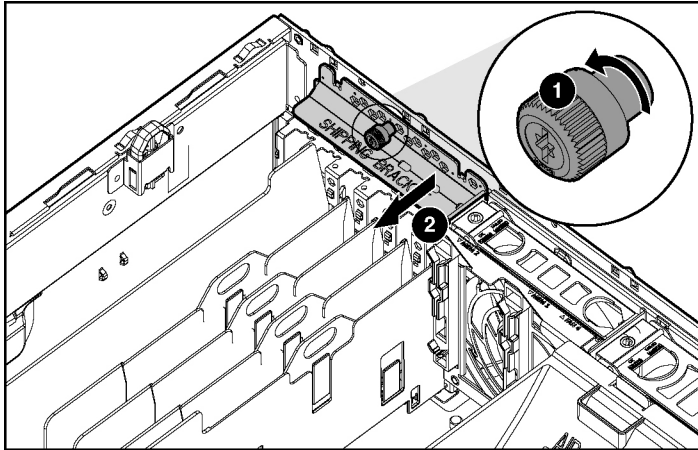
Figure 4-3: Removing the shipping bracket

NOTE: The shipping bracket is used only to secure the PCI Latches during shipment.

5

Installing Hardware Options

This chapter explains procedures for the installation of hot-plug and non-hot-plug options specific to the HP ProLiant DL580 Generation 2 server.

To streamline the installation process, read the installation instructions for all the hardware options and identify similar steps before installing the hardware options. If you encounter any problems during installation, contact an authorized reseller.

For more information about option installation procedures, refer to the following resources:

- The installation documentation that ships with the option kit

- The hardware installation and configuration poster that ships with the server

- The hardware installation and configuration labels located on the top of the front and rear access panels of the server

For more information about memory installation procedures, refer to Chapter 6 "Memory."

For more information about hot-plug expansion board installation procedures, refer to Chapter 7, "PCI-X Technology."

The following warnings apply to all procedures:

> **WARNING: The server is very heavy, up to 44.5 kg (98 lb). To reduce the risk of personal injury or damage to the equipment:**
>
> - **Remove all hot-plug power supplies to reduce the weight of the server before lifting it.**
>
> - **Observe local occupational health and safety requirements and guidelines for material handling.**
>
> - **Get help to lift and maneuver the server.**

> **WARNING: To reduce the risk of personal injury or damage to the equipment:**
> - **Heed all warnings and cautions throughout the installation instructions.**
>
> - **Allow internal system components to cool before touching any surfaces.**
>
> - **Be sure that the power to the server is turned off and that all power cords are disconnected.**
>
> - **Allow only qualified service personnel—those trained to work with products capable of producing hazardous energy levels—to install options, except when installing hot-plug power supplies or hard drives.**

> **CAUTION:** Electrostatic discharge can damage electronic components. Be sure you are properly grounded before beginning any installation procedures.

Additional Options and Procedures

The ProLiant DL580 Generation 2 server supports several additional options not discussed in this chapter, including:

- Rack Deployment Options

  The ProLiant DL580 Generation 2 server supports several rack-mounting options, including:

  — Telco rack mounting kit, which is a set of adjustable rack brackets that supports installation in telco racks. Refer to the following website for more information:

  www.racksolutions.com/hp

  — Round-hole rack option kit, which contains a set of adjustable rack brackets that supports installation and serviceability in various 48.26-cm (19-in) four-post cabinet round-hole racks.

- System Memory

  For more information on installing system memory, refer to Chapter 6, "Memory."

- Expansion Boards

  For more information on installing expansion boards, refer to Chapter 7, "PCI-X Technology."

Hot-Plug and Non-Hot-Plug Options

ProLiant servers include both hot-plug and non-hot-plug areas and components. When installing non-hot-plug options, upgrades, or replacements, you must shut off all power to the server. When installing hot-plug options, upgrades, or replacements, you can leave the server powered on.

It is recommended that you install all non-hot-plug options before completing the server setup and installation process. Non-hot-plug options include:

- Processors and PPMs

- Slimline drives (CD-ROM, diskette, or DVD)

- BBWCE

- Memory boards and DIMMs

- PCI-X expansion boards that are installed in slots 1 and 2

> ⚠ **WARNING: To reduce the risk of personal injury or damage to the equipment, HP recommends that only trained and qualified personnel install non-hot-plug components. In particular, personnel should be trained to deal with products capable of producing hazardous energy levels.**

> ⚠ **WARNING: To reduce the risk of electric shock or damage to the equipment:**
>
> - **Disconnect power from the server by unplugging all power cords from either the electrical outlet or the server.**
>
> - **Do not disable the power cord grounding plug. The grounding plug is an important safety feature.**
>
> - **Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.**
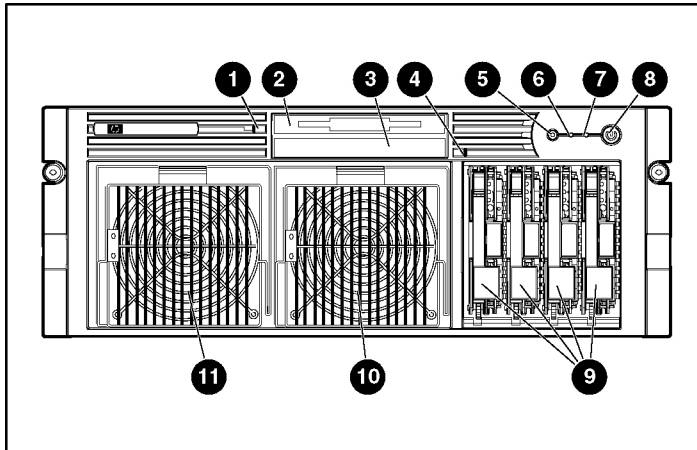
Hot-plug options include:

- Hot-plug SCSI hard drives

- Hot-plug fans

- Redundant hot-plug power supplies

- Memory board in the hot-plug mirrored memory mode or when Hot-Add functionality guidelines are met

- PCI-X Hot Plug expansion boards, slots 3 through 6

Front Panel Components

Use Figure 5-1 and Table 5-1 to identify the front panel components.

Figure 5-1: Front panel components

Table 5-1: Front Panel Components

Item	Description
1	Eject button for slimline drive bay 1
2	Slimline drive bay 1
3	Slimline drive bay 2
4	Eject button for slimline drive bay 2
5	Front Unit Identification button and LED
6	Internal health LED
7	External health LED
8	Power On/Standby button and LED
9	SCSI hot-plug hard drive bays 0 through 3
10	Primary hot-plug power supply
11	Redundant hot-plug power supply

Note: Power supplies are only redundant when both power supplies are installed.

Rear Panel Components

Use Figure 5-2 and Table 5-2 to identify the rear panel components.
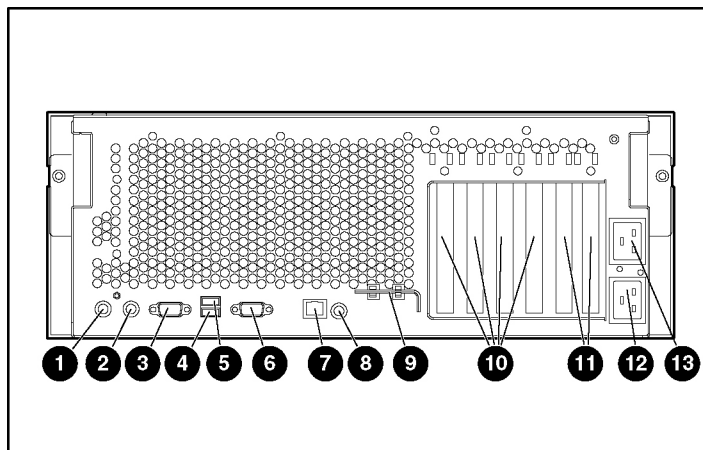
Figure 5-2: Rear panel components

Table 5-2: Rear Panel Components

Item	Description
1	Keyboard connector
2	Mouse connector
3	Video connector
4	USB connector 1
5	USB connector 2
6	Serial connector
7	Integrated Lights-Out Manager connector
8	Rear Unit Identification button and LED
9	Torx T-15 tool
10	PCI-X Hot Plug slots 3 through 6
11	PCI-X non-hot-plug slots 1 and 2 (NIC is in slot 2)
12	AC inlet (primary)
13	AC inlet two (redundant)

Preparing for an Installation

Most internal installation procedures involve either the memory or system board. Installing components onto these boards may require the following preparatory tasks:

- Powering down the server

- Locating and removing the Torx T-15 tool

- Extending the server from the rack

- Opening and removing the access panels

Powering Down the Server

To install non-hot-plug options, you must first remove all power from the system. To power down the server:

1. Back up the server data.

   NOTE: In a new server, it is only necessary to back up data after installation and configuration is complete.

2. Shut down the operating system as directed in the operating system instructions.

3. If the server is on, press the Power On/Standby button. The front Power On/Standby button LED turns amber.

4. Disconnect all power cords.

5. Disconnect any other external equipment connected to the computer.

The system is now without power, and you can safely proceed with the installation of your hardware options.

⚠ **WARNING: The system power in the ProLiant DL580 Generation 2 server does not shut off completely from the front panel Power On/Standby button. The two positions function as on and standby, rather than on and off. The standby position removes power from most of the electronics and the drives; however, portions of the power supply and some internal circuitry remain active.**

To remove all power from the system, it is necessary to disconnect the power cord from the server. In systems with multiple power supplies, disconnect all the power cords to remove power from the system.
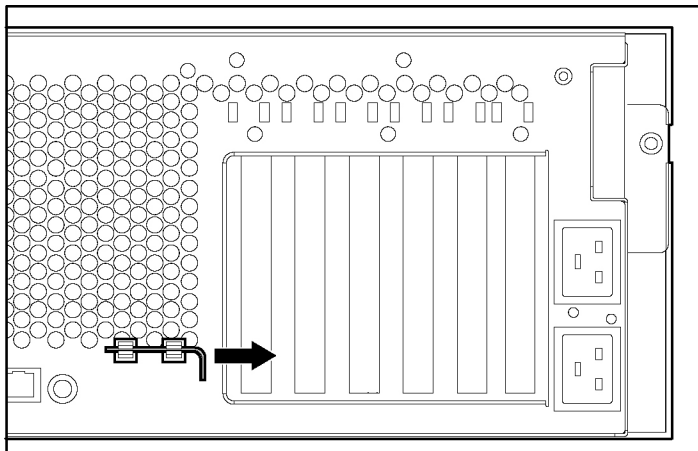
Locating and Removing the Torx T-15 Tool

Many hardware procedures in the ProLiant DL580 Generation 2 server are toolless, but a few require the removal of Torx T-15 screws that have been installed for shipping or security reasons. A Torx T-15 tool ships with the server for the removal of these screws.

To locate and remove the Torx T-15 tool:

1. Locate the Torx T-15 tool on the back of the server. It is next to PCI-X slot 6.

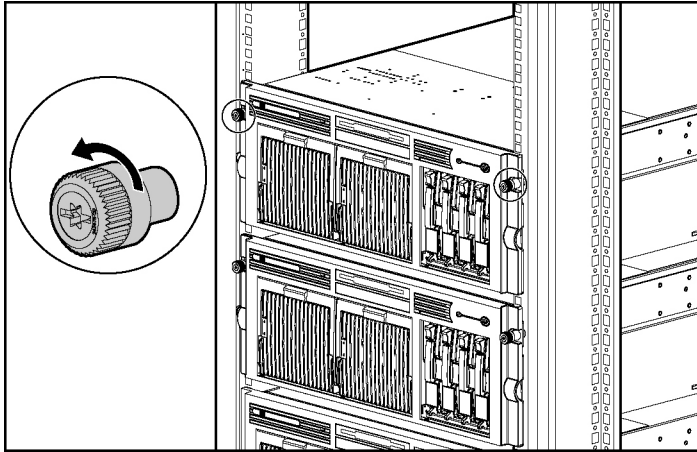2. Slide the tool out of the retaining clips.

Figure 5-3: Locating and removing the Torx T-15 tool

Extending the Server from the Rack

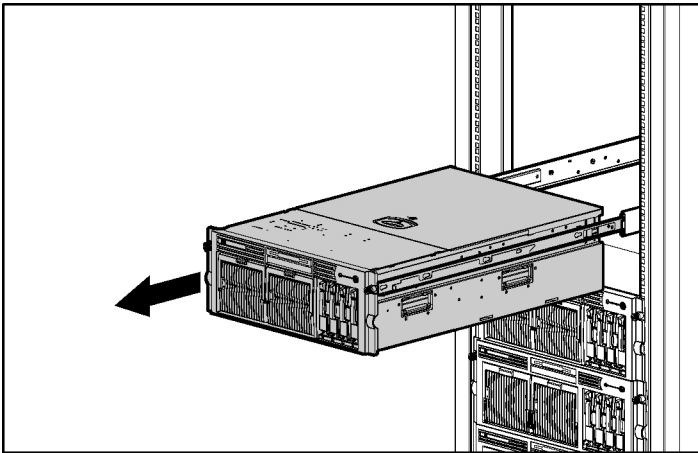To perform some installation procedures, you must extend the server from the rack.

To extend the server from the rack:

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

Figure 5-4: Loosening the front panel thumbscrews

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


Figure 5-5: Extending the server from the rack

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

3. After performing the installation procedure, reach around the front of the server to press the rail-release levers at the front of both server rails and continue to slide the server into the rack.
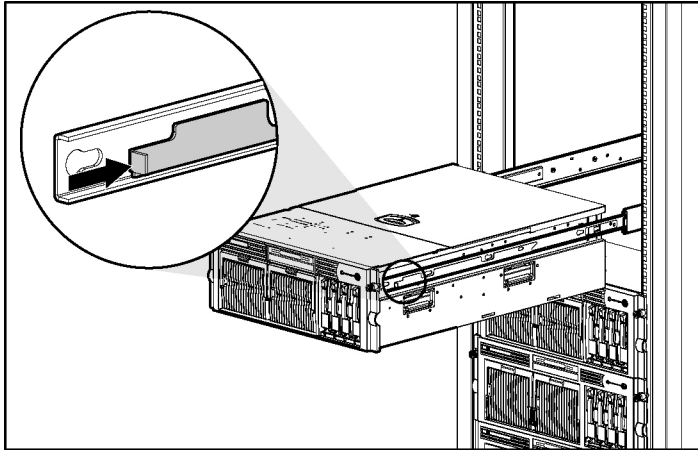
Figure 5-6: Sliding the server into the rack

Access Panels

The ProLiant DL580 Generation 2 server has front and rear access panels that may need to be opened and removed to access the system board, processors, memory slots, expansion slots, and other internal components. Observe the following warnings and cautions when removing the access panels.

> ⚠ **WARNING: Before removing the access panels for non-hot-plug hardware options, be sure that the power cords are disconnected from the electrical outlet.**

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

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

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

Opening and Removing the Access Panels

To open and remove the access panels:

1. Extend the server from the rack. Refer to "Extending the Server from the Rack" in this chapter.

2. Remove the rear access panel:

   a. Use the Torx T-15 tool, located on the back of the server, to turn the locking screw on the rear access panel counterclockwise to unlock the latch (1).

   b. Pull the tab on the rear access panel toward the rear of the server until it releases (2).
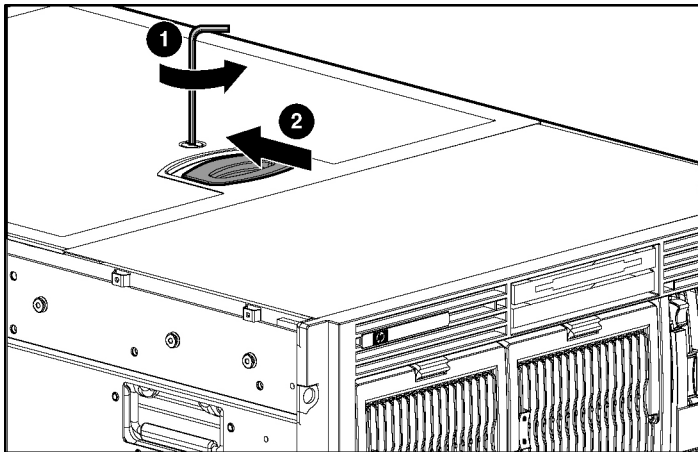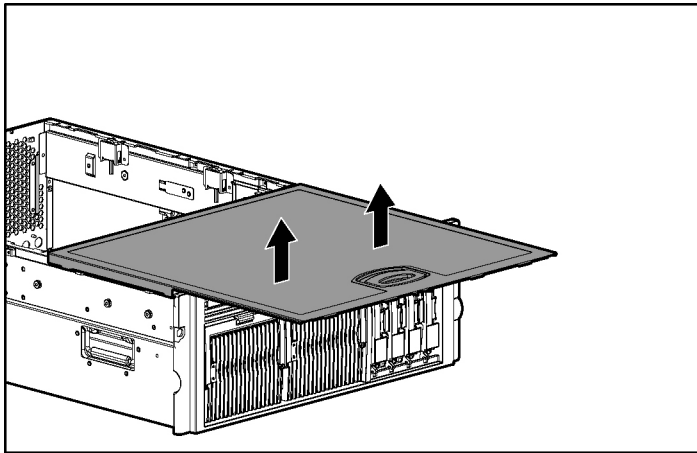

Figure 5-7: Releasing the rear access panel

c. Slide the rear access panel toward the front of the server (1).

d. Push and hold the access panel release lever down (2) while sliding the rear access panel forward about 2.54 cm (1 in).

IMPORTANT: The guide marks on the rear access panel and the server must line up before proceeding to the next step.
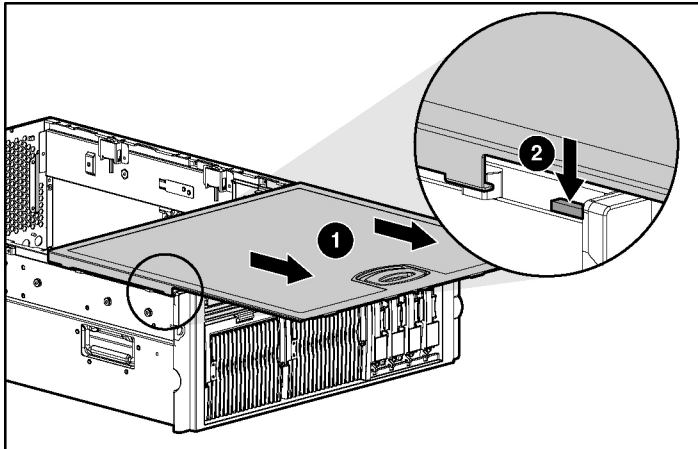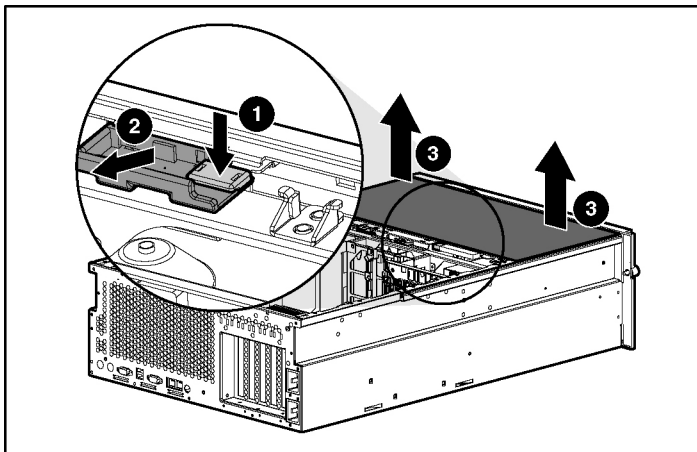

Figure 5-8: Opening the rear access panel

e. Lift the rear access panel off of the server.

Figure 5-9: Removing the rear access panel

3. Remove the front access panel:

   a. Press down on the latch at the rear of the front access panel (1).

   b. Pull back on the slate-blue handle (2).
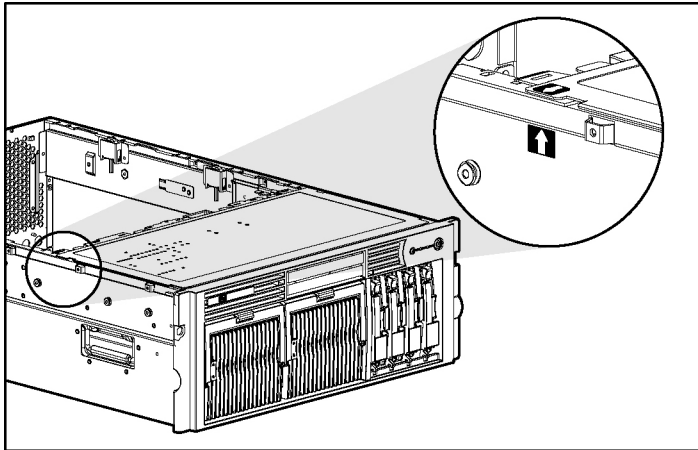
   c. Lift the access panel off (3).

Figure 5-10: Removing the front access panel
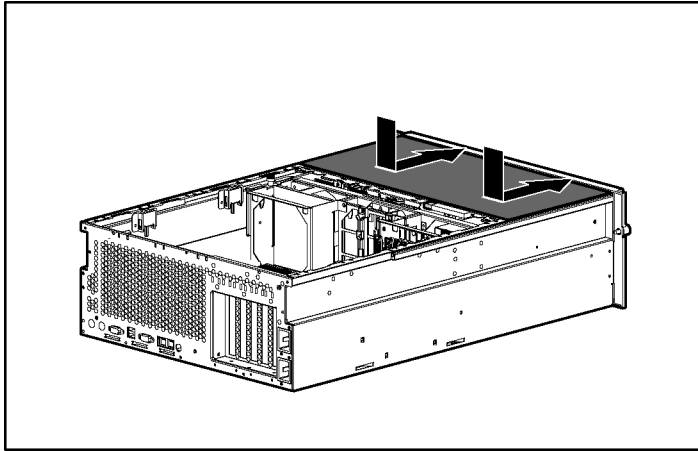
Replacing the Access Panels

To replace the access panels:

1. Place the front access panel on top of the server. Be sure to line up the guide marks on the front access panel with the corresponding server guide marks.

Figure 5-11: Lining up the guide marks

2. With even pressure, push the front access panel down and slide it toward the front of the server into the fitted slots.

Figure 5-12: Replacing the front access panel

3. Place the rear access panel on top of the server. Be sure to line up the guide marks on the rear access panel with the corresponding server guide marks.
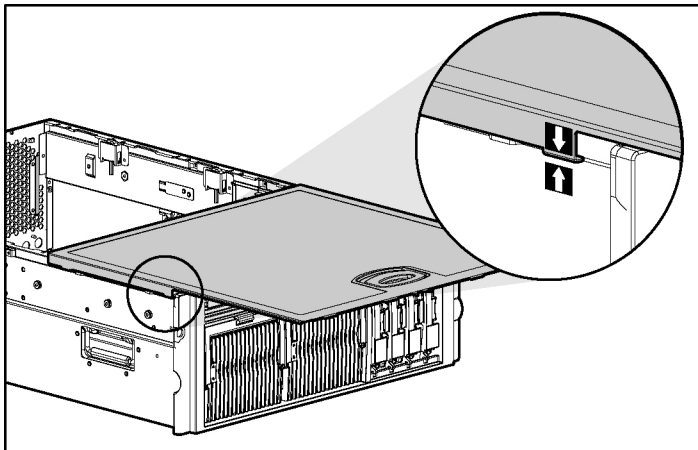

Figure 5-13: Lining up the guide marks

4. Slide the rear access panel toward the back of the server until it stops.

5. With even pressure, push the rear access panel down and slide it toward the front of the server until it seats.
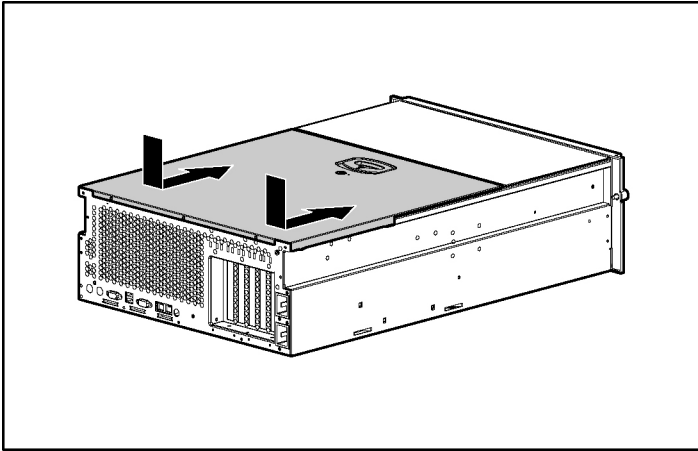

Figure 5-14: Replacing the rear access panel

6. Use the Torx T-15 tool to turn the locking screw clockwise to lock the latch.

Processors and PPMs

The ProLiant DL580 Generation 2 server supports up to four Intel Xeon Processors MP. With two or more processors installed, the server supports boot functions through the processor installed in processor socket 1. If two or more processors are installed and processor 1 fails, the server automatically boots from the next available processor (after the system boots, it will indicate that processor 1 failed).

The ProLiant DL580 Generation 2 server uses processor power modules (PPMs) to provide the proper power to each processor. Each PPM must be installed in the slot adjacent to its processor.

⚠ **CAUTION:** Processor socket 1 and PPM slot 1 must always be populated. If either is missing, the system interlock indicates the missing components, and the system will not boot.

⚠ **CAUTION:** If processors of differing speeds are installed, each processor matches the rated speed of the slowest processor.

⚠ **CAUTION:** Install a PPM for each processor in the system. When installing a new processor, you must also install a new PPM.

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

Failure to flash the ROM before installing processors can cause system failure.
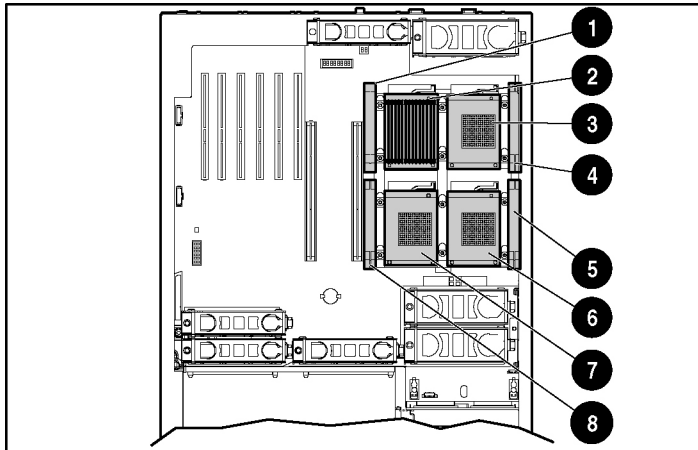
⚠ **CAUTION:** Electrostatic discharge can damage electronic components. Properly ground yourself before beginning any installation procedure. Refer to Appendix B, "Electrostatic Discharge," for more information.

Locating the Processors and PPMs

Use Figure 5-15 and Table 5-3 to identify the processors and PPMs.

Figure 5-15: Processors and PPMs

Table 5-3: Processors and PPMs

Item	Description
1	PPM slot 1 (must be populated)
2	Processor socket 1 (must be populated)
3	Processor socket 2
4	PPM slot 2
5	PPM slot 3
6	Processor socket 3
7	Processor socket 4
8	PPM slot 4

Installing a Processor and PPM

To install additional processors:

1. Power down the server. Refer to "Powering Down the Server" in this chapter.

2. Extend the server from the rack. Refer to "Extending the Server from the Rack" in this chapter.

3. Open the rear access panel. Refer to "Opening and Removing the Access Panels" in this chapter.

4. Remove the memory board from slot 1:

   a. Disengage the locking switch (1).

   b. Push the release latches inward firmly (2).

   c. Lift up the ejector levers (3).

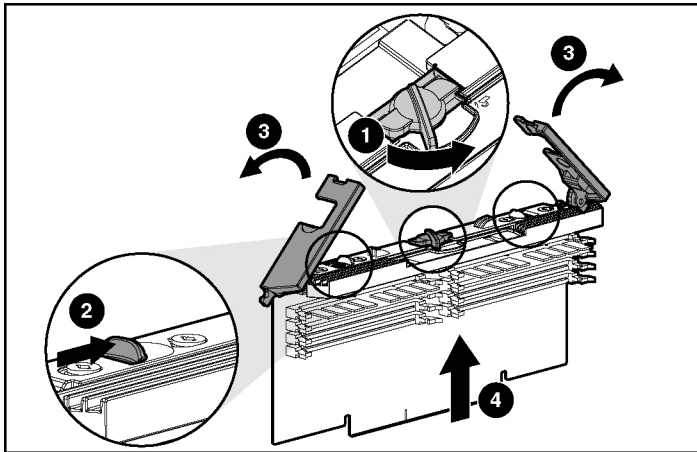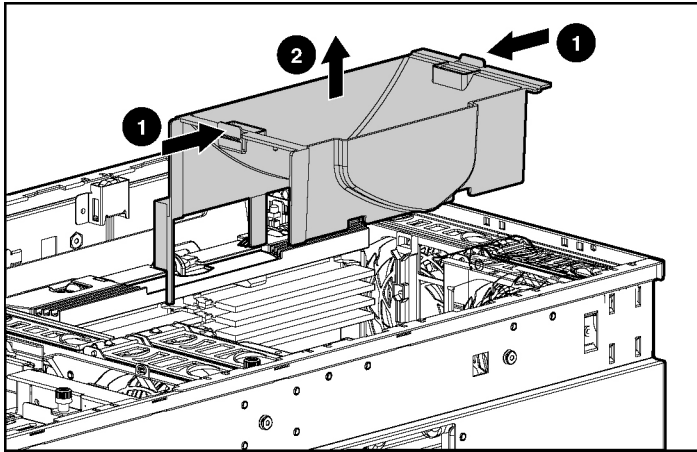   d. Pull the memory board out of the server (4).

Figure 5-16: Removing the memory board from slot 1

5. Remove the air baffle:

    a. Squeeze the tabs in on both sides of the baffle (1).

    b. Lift the baffle out of the server (2).

Figure 5-17: Removing the air baffle

6. Open the processor retaining bracket:

    a. Loosen the thumbscrew (1).

    b. Tilt the processor cage up (2).

7. Open the processor locking lever (3).

    NOTE: Observe the "open" and "closed" icons on the processor locking lever to be sure that you are performing the correct operation when opening the locking lever.
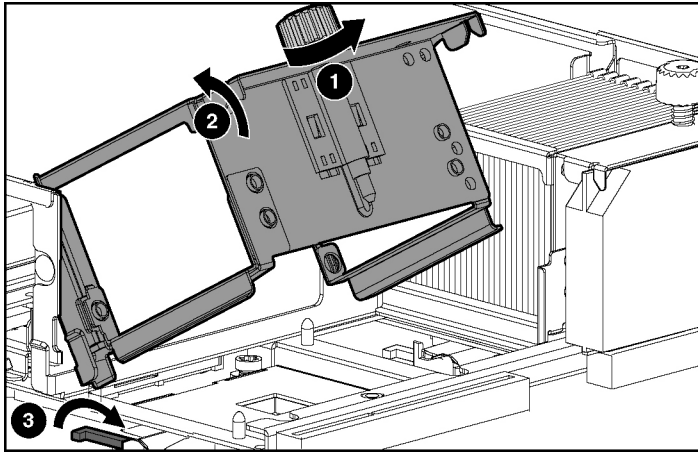
Figure 5-18: Opening the processor retaining bracket

8. Install the processor/heatsink assembly into the available processor socket:

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

   a. Determine the correct processor orientation by observing the three guide pins on the processor retaining bracket and the three corresponding guide holes on the processor/heatsink assembly.

   b. Insert the processor/heatsink assembly into the processor socket (1).

9. Close the processor locking lever (2).

   IMPORTANT: If the processor locking lever is not closed, the processor retaining bracket does not close properly.

   NOTE: Observe the "locked" and "unlocked" icons on the processor locking lever to be sure that you are performing the correct operation when closing the locking lever.
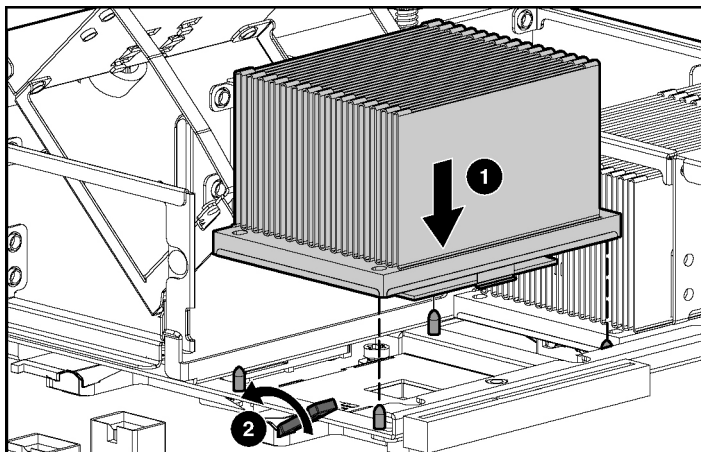
Figure 5-19: Installing the processor/heatsink assembly

10. Install the PPM into the available PPM slot. Be sure the key slot in the PPM is aligned with the key in the slot. Press firmly to seat the PPM securely in the slot.

    NOTE: PPMs with the same part number may look different, but are functionally equivalent.
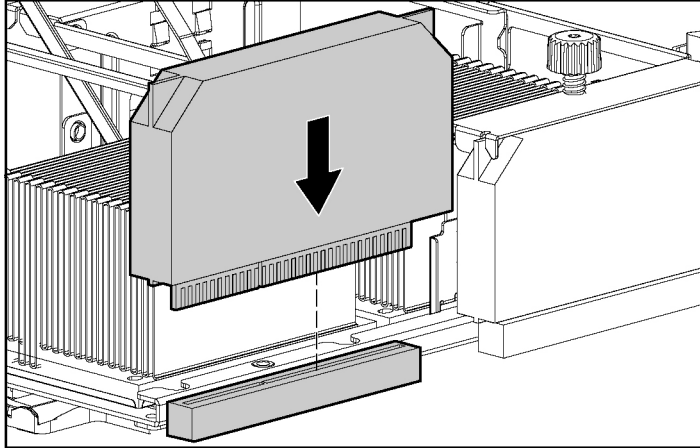
Figure 5-20: Installing the PPM

11. Close the processor retaining bracket:

    a. Lower the processor retaining bracket into position over the processor and PPM (1).

    b. Secure the processor retaining bracket by tightening the thumbscrew (2).

    ⚠ **CAUTION:** Before closing the processor retaining bracket, be sure that the processor locking lever is closed. Forcing the bracket shut may damage the processor or the processor socket.
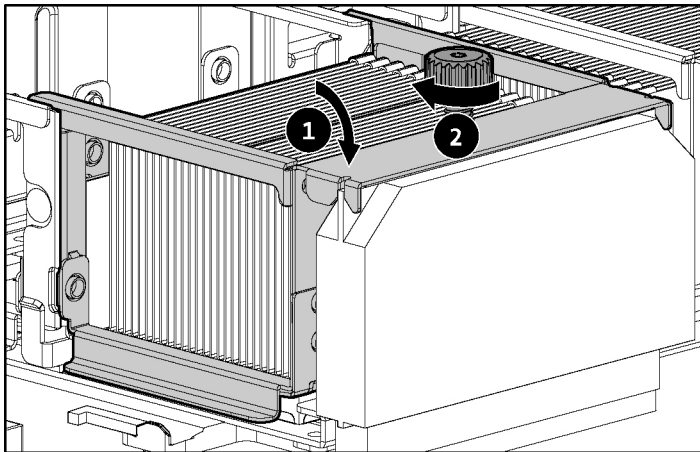
Figure 5-21: Closing the processor retaining bracket

12. Reinstall the air baffle.

13. Reinstall the memory board.

    a. Align the memory board with the memory slot and memory board guide clips.

    b. Slide the memory board into the server (1) and close the ejector levers to seat the memory board firmly (2).

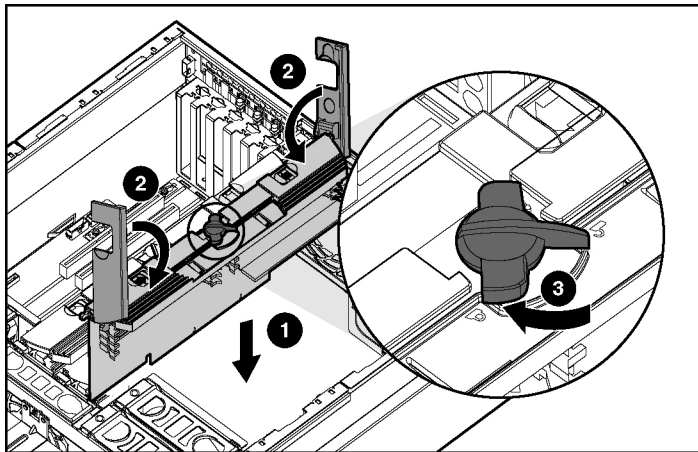   c. Engage the locking switch (3).

Figure 5-22: Reinstalling the memory board

14. Close the rear access panel.

15. Restore the server to its operating position in the rack.

16. Power up the server. Refer to Chapter 9, "Server Setup."

    NOTE: The ROM sets the processing frequency during the Power-On Self-Test (POST).

17. Be sure that the internal health LED on the front of the system is illuminated green, indicating that the system is functioning properly. For detailed information on LEDs, refer to Appendix E, "System LEDs and Switches."

18. If the LED indicates an error, refer to Appendix H, "Troubleshooting," or refer to the *HP Servers Troubleshooting Guide* on the Documentation CD for instructions.

Internal Storage and Media Areas

The ProLiant DL580 Generation 2 server ships standard with a diskette drive and an IDE CD-ROM drive in the slimline drive bays. You can replace the CD-ROM or diskette drive with a DVD drive, another diskette drive, or another CD-ROM drive. The following areas of the ProLiant DL580 Generation 2 server support installation of internal storage and media drives:

- Drive bays
    — Hot-plug hard drive
    — HP universal hot-plug tape drive
- Slimline drive bays
    — One slimline 1.44-MB diskette drive in the top slimline drive bay
    — One slimline IDE CD-ROM drive in the bottom slimline drive bay
    — An optional DVD drive in either slimline drive bay

Locating the Internal Storage and Media Drives

Use Figure 5-23 and Table 5-4 to identify the internal storage and media drives locations on the server.
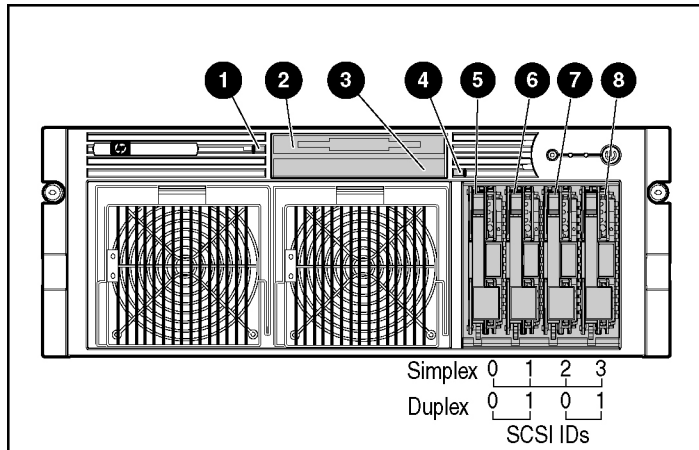
Figure 5-23: Internal storage and media drives

Table 5-4: Internal Storage and Media Drives

Item	Description
1	Eject button for slimline drive bay 1
2	Slimline drive bay 1
3	Slimline drive bay 2
4	Eject button for slimline drive bay 2
5 – 8	SCSI hot-plug hard drive bays 0 through 3

Drive Bays

The ProLiant DL580 Generation 2 server supports up to four hot-plug Ultra3 hard drives (Ultra4-ready). The server ships in duplex configuration, but the SCSI backplane can be configured for either simplex or duplex mode.

The ProLiant DL580 Generation 2 server supports installation of the following storage drives into a drive bay:

- Hot-plug hard drives

- HP universal hot-plug tape drive

## Installing a Hot-Plug Hard Drive into a Drive Bay

Installation of optional hot-plug hard drives requires the following operations:

- Determining the proper hot-plug hard drive installation order

- Following the guidelines for installing SCSI devices

- Installing the hot-plug hard drive

Determining the Proper Hot-Plug Hard Drive Installation Order

The system reads and manages the hot-plug hard drives based on the SCSI ID number assigned to each drive. For optimal hard drive management and performance, install the hard drives in the order of SCSI ID assignments. Always populate hard drive bays starting with the lowest SCSI ID.

Use Figure 5-24 and Table 5-5 to identify the hot-plug SCSI hard drives and SCSI ID numbers.
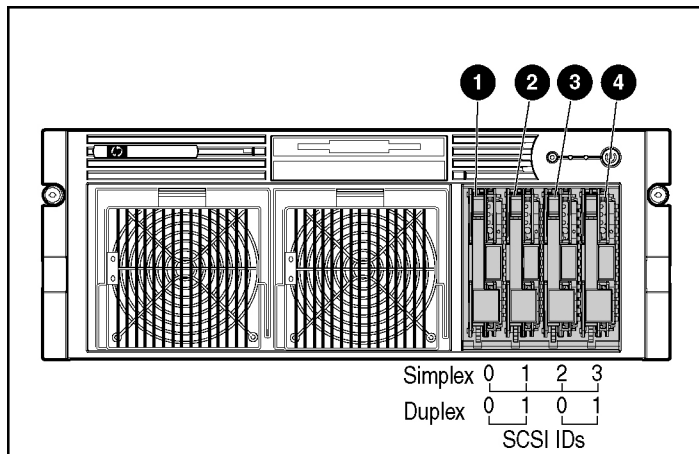
Figure 5-24: Hot-plug SCSI hard drives and SCSI ID numbers

Table 5-5: Hot-Plug SCSI Hard Drives and SCSI ID Numbers

Item	Description	Simplex SCSI ID	Duplex SCSI ID
1	SCSI hard drive 1	0	0
2	SCSI hard drive 2	1	1
3	SCSI hard drive 3	2	0
4	SCSI hard drive 4	3	1

Note: Simplex configuration equals all four drives in the server connected to one SCSI channel. Duplex configuration equals two drives per SCSI channel.

Guidelines for Installing SCSI Devices

The following guidelines apply for installing internal and external SCSI devices:

- Set the drive to standby mode as directed by the operating system instructions before adding or removing any SCSI drives.

- The server supports Ultra3 SCSI types. Mixing other drive standards degrades the overall performance of the drive subsystem.

- Use drives with the same capacity to provide the greatest storage space efficiency when the drives are grouped together into the same drive array.

Removing a Drive Blank

To remove a drive blank from the drive cage:

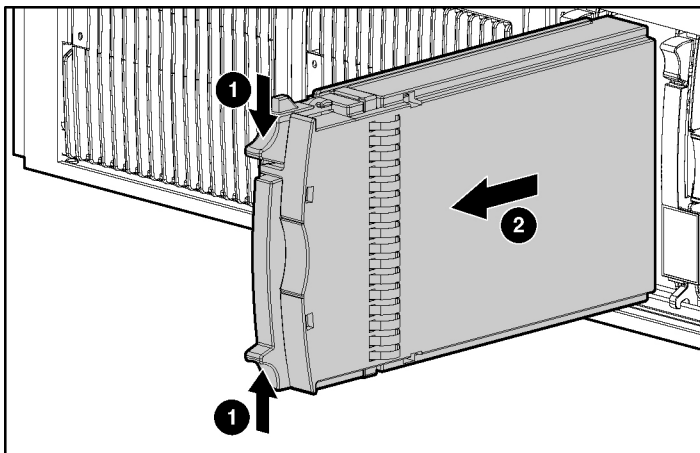1. Squeeze the ejector levers (1).
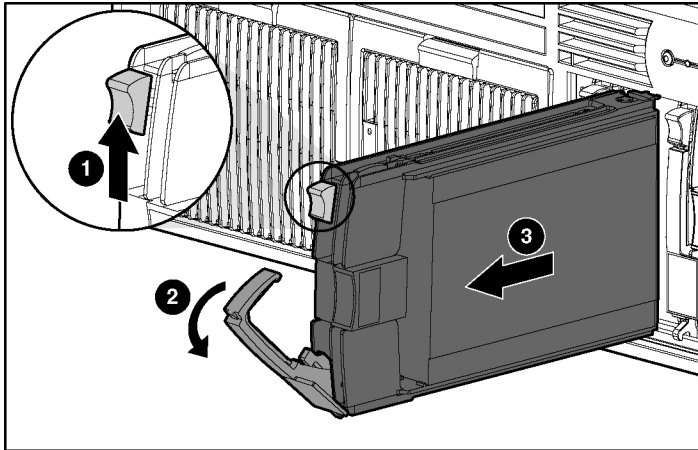
2. Remove the blank (2).

Figure 5-25: Removing a drive blank

Removing a Non-Functioning SCSI Hard Drive

To remove a non-functioning SCSI hard drive from the drive cage:

1. Press the ejector lever release button (1).

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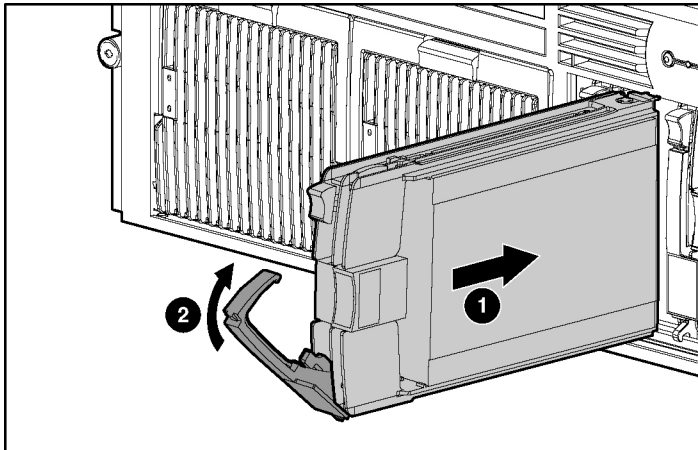
3. Remove the hard drive (3).

Figure 5-26: Removing a non-functioning SCSI hard drive

Installing a Hot-Plug SCSI Hard Drive

To install a hot-plug SCSI hard drive into the drive cage:

1. Press the ejector lever release button on the replacement hard drive to disengage the lever.

2. Insert the hot-plug SCSI hard drive into the drive cage (1). Be sure that the drive seats firmly into the connector on the SCSI backplane.

3. Close the ejector lever (2).

Figure 5-27: Installing a hot-plug SCSI hard drive

4. Be sure that the hot-plug hard drive activity LEDs on the front of the system are illuminated green, indicating that the system is functioning properly. For detailed information on LEDs, refer to Appendix E, "System LEDs and Switches."

5. If any of the LEDs indicates an error, refer to Appendix H, "Troubleshooting," or refer to the *HP Servers Troubleshooting Guide* on the Documentation CD for instructions.

Installing an HP Universal Hot-Plug Tape Drive

To install an HP universal hot-plug tape drive into the drive cage:

1. Remove the drive blank from the next available hot-plug drive bay. Refer to "Removing a Drive Blank" in this chapter.

2. HP universal hot-plug tape drives require two drive bays for installation, so you must remove two drive blanks. Repeat step 1 to remove a second drive blank.

3. Align the HP universal hot-plug tape drive with the drive bays and slide the tape drive into the drive bays until the release latch seats.
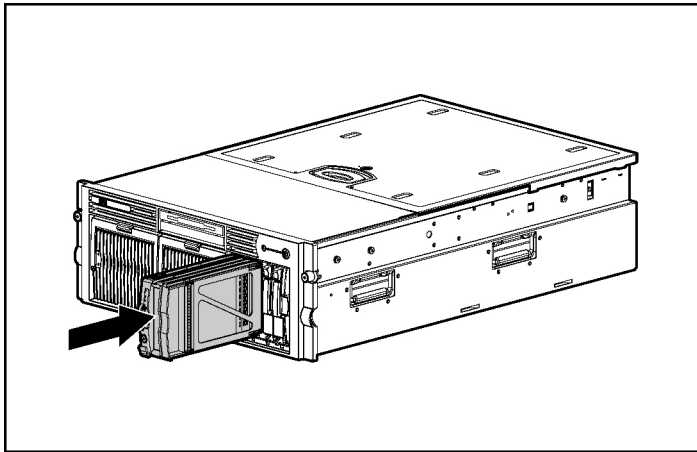
**Figure 5-28: Installing an HP universal hot-plug tape drive**

4. Be sure that the tape drive LED on the front of the tape drive is illuminated green, indicating that the system is functioning properly. For detailed information on LEDs, refer to Appendix E, "System LEDs and Switches."

5. If any of the LEDs indicates an error, refer to Appendix H, "Troubleshooting," or refer to the *HP Servers Troubleshooting Guide* on the Documentation CD for instructions.

For more information regarding installing the HP universal hot-plug tape drive, refer to the installation documentation provided with the drive.

Switching from Duplex to Simplex Mode

To switch from duplex to simplex mode:

1. Power down the server. Refer to "Powering Down the Server" in this chapter.

2. Extend the server from the rack. Refer to "Extending the Server from the Rack" in this chapter.

3. Remove the access panels. Refer to "Opening and Removing the Access Panels" in this chapter.

4. Locate the simplex/duplex switch.
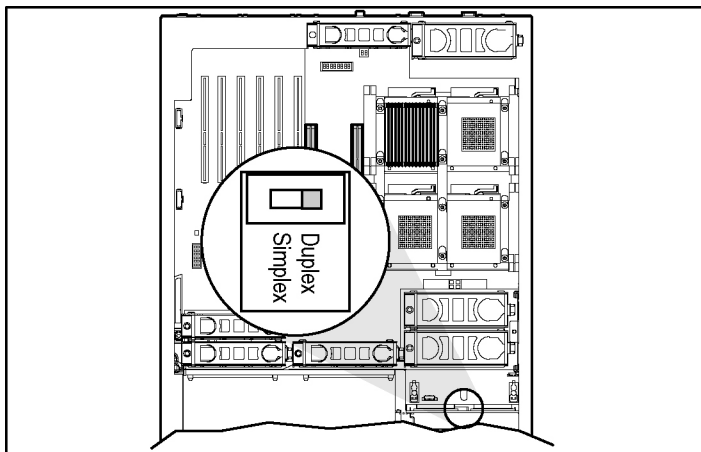
Figure 5-29: Locating the simplex/duplex switch

5. Move the switch from duplex to simplex.

6. Reinstall the access panels.

7. Restore the server to its operating position in the rack.

8. Restart the server.

9. Configure the server using the Array Configuration Utility XE (ACU-XE).

   ACU-XE, a browser-based utility, helps you configure the hardware in the way that best suits your needs. Refer to the ProLiant Essentials Foundation Pack for additional information.

Slimline Drive Bays

The ProLiant DL580 Generation 2 server supports installation of removable media drives into the slimline drive bays. Drives supported include:

- CD-ROM (standard)
- Diskette (standard)
- DVD (optional)

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

Locating the Bays
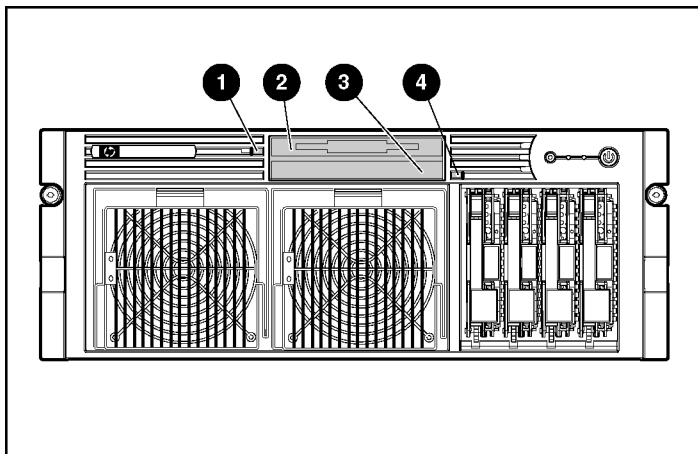
Use Figure 5-30 and Table 5-6 to identify the bays.


Figure 5-30: Slimline drive bays

Table 5-6: Slimline Drive Bays

| Item	Description	Item	Description
1	Eject button for slimline drive bay 1	3	Slimline drive bay 2
2	Slimline drive bay 1	4	Eject button for slimline drive bay 2

Removing a Media Drive

To remove a media drive:

1. Power down the server. Refer to "Powering Down the Server" in this chapter.

2. Use the Torx T-15 tool to press the appropriate ejection button (1), and pull the drive out of the bay (2).
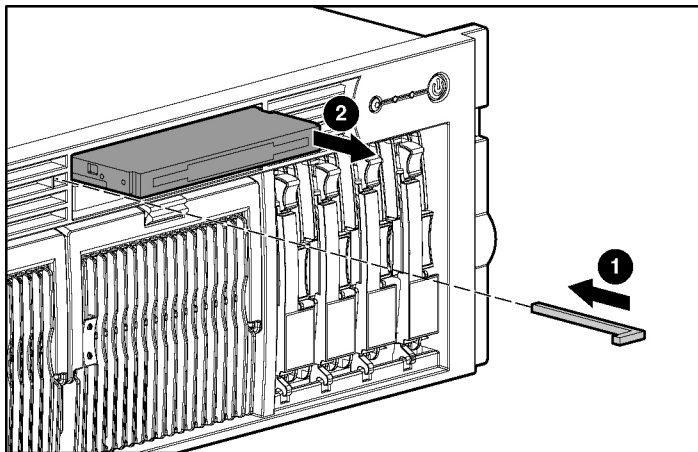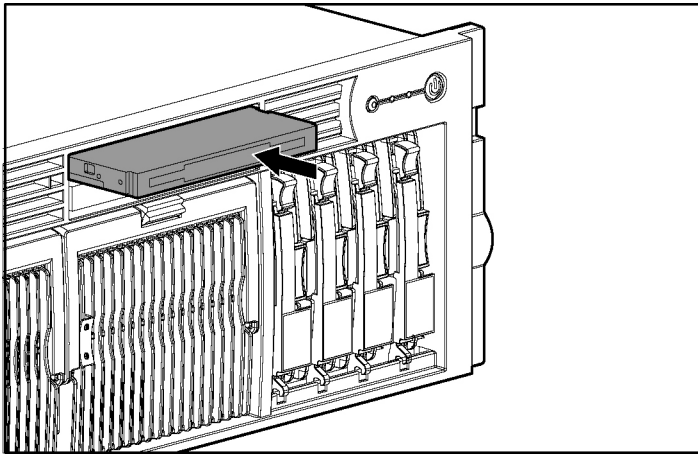

Figure 5-31: Removing a drive from bay 1
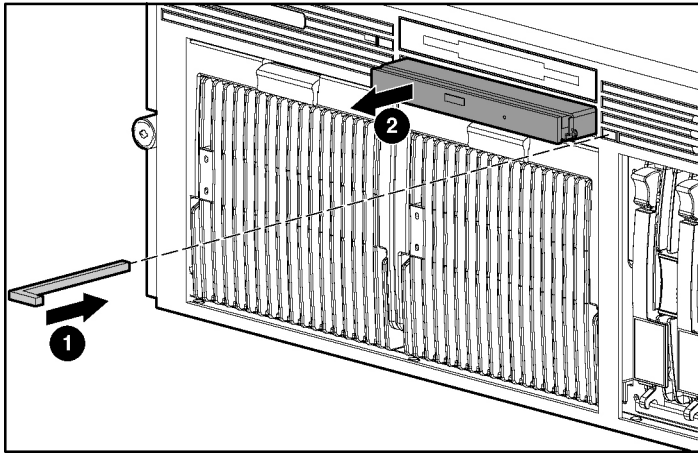
Figure 5-32: Removing a drive from bay 2

Installing a Media Drive

To install a media drive:

1. Power down the server. Refer to "Powering Down the Server" in this chapter.

2. Remove the existing drive. Refer to "Removing a Media Drive" in this chapter.

3. Insert the desired drive into the slimline drive bay until it seats.

**Figure 5-33: Installing a media drive**

Hot-Plug Fans

The ProLiant DL580 Generation 2 server supports redundant hot-plug fans that are divided into three zones. Each zone is independent of each other and is able to support N+1 redundancy, as indicated below:

- PCI-X expansion zone is 1+1 redundant (fans 1 and 2)

- Memory zone is 1+1 redundant (fans 3 and 4)

- CPU zone is 2+1 redundant (fans 5, 6, and 7)

This zone configuration enables the server to withstand up to three fan failures, provided that they are not within the same zone. Within a zone, if the primary fan fails, the server generates a system alert and commands the redundant fan to function automatically. The redundant hot-plug fan subsystem protects the various server components from overheating, provides rapid serviceability, and minimizes the risk of system interruption.

Locating Hot-Plug Fans

Use Figure 5-34 and Table 5-7 to identify the hot-plug fans.
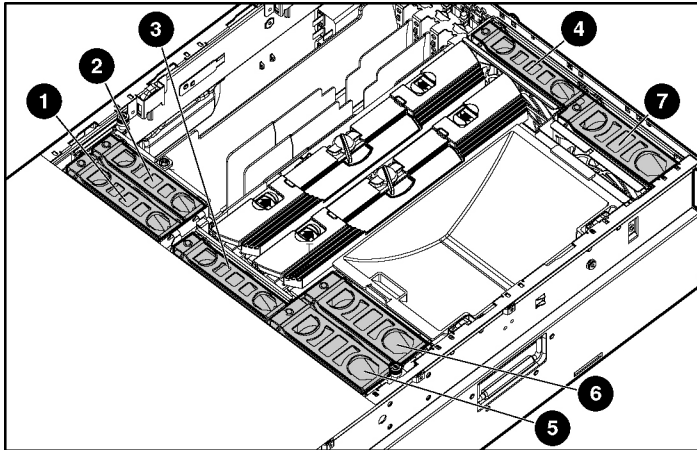
Figure 5-34: Hot-plug fans

Table 5-7: Hot-Plug Fans

Item	Description	Item	Description
1	Fan 1 (PCI-X zone)	5	Fan 5 (CPU zone)
2	Fan 2 (PCI-X zone)	6	Fan 6 (CPU zone)
3	Fan 3 (memory zone)	7	Fan 7 (CPU zone)
4	Fan 4 (memory zone)		

Removing a Hot-Plug Fan

To remove a hot-plug fan:

1. Extend the server from the rack. Refer to "Extending the Server from the Rack" in this chapter.

2. Open the rear access panel. Refer to "Opening and Removing the Access Panels" in this chapter.

3. Identify the malfunctioned fan by checking for an amber LED located at the top of each fan.

4. Remove the malfunctioning fan:

   a. Pull the tabs on the top of the fan (1).

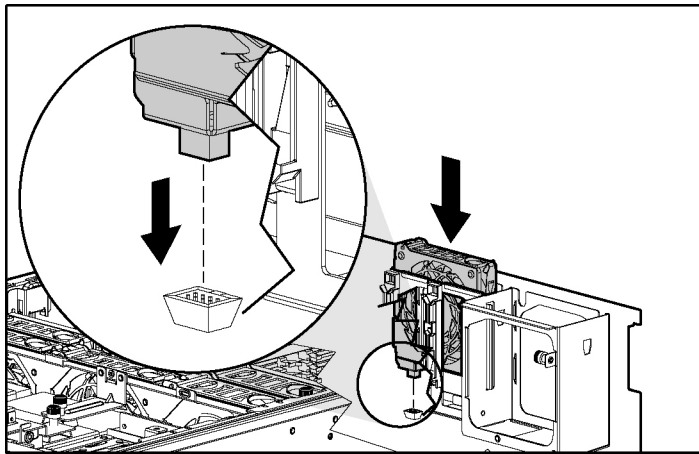   b. Lift the fan out of its cage (2).
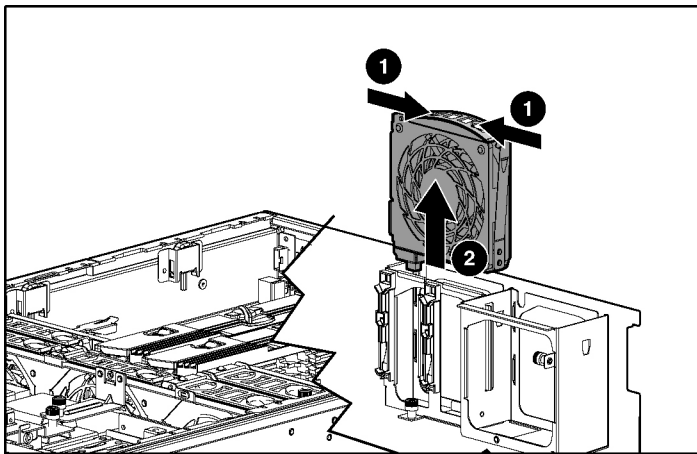
Figure 5-35: Removing a hot-plug fan

Replacing a Hot-Plug Fan

To replace a hot-plug fan:

1. Align the fan with the fan bay.

2. Slide the fan down into its bay.

3. Press down on the top of the fan until the lock engages.

Figure 5-36: Installing a hot-plug fan

4. Be sure that the LED on the fan and the internal health LED on the front panel LED assembly are illuminated green, indicating that the system is functioning properly. For detailed information on LEDs, refer to Appendix E, "System LEDs and Switches."

5. If any of the LEDs indicates an error, refer to Appendix H, "Troubleshooting," or refer to the *HP Servers Troubleshooting Guide* on the Documentation CD for instructions.

6. Close the rear access panel.

Hot-Plug Power Supplies

IMPORTANT: Do not install the power supplies until after the server is installed in the rack. Leaving the power supplies out reduces the weight of the server for purposes of rack installation.

The ProLiant DL580 Generation 2 server supports a second hot-plug power supply to provide redundant power to the system in the event of a failure in the primary power supply. You can install or replace a second hot-plug power supply without powering down the server.

Locating the Power Supplies

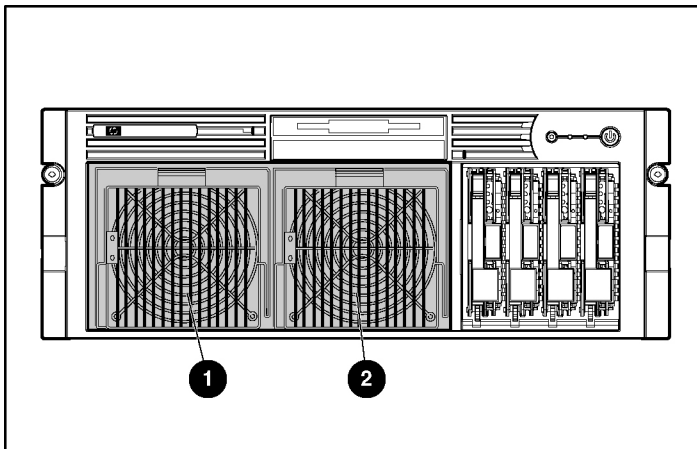Use Figure 5-37 and Table 5-8 to locate the power supplies.

Figure 5-37: Power supplies

Table 5-8: Power Supplies

Item	Description
1	Redundant hot-plug power supply
2	Primary hot-plug power supply

Removing a Redundant Hot-Plug Power Supply or Blank

To remove a redundant hot-plug power supply or blank:

1. If present, remove the Torx T-15 shipping screw from the bottom of the server with the Torx T-15 tool that is located on the back of the server.

2. Press the release button on the locking lever upward (1).

3. Pull down on the locking lever (2).

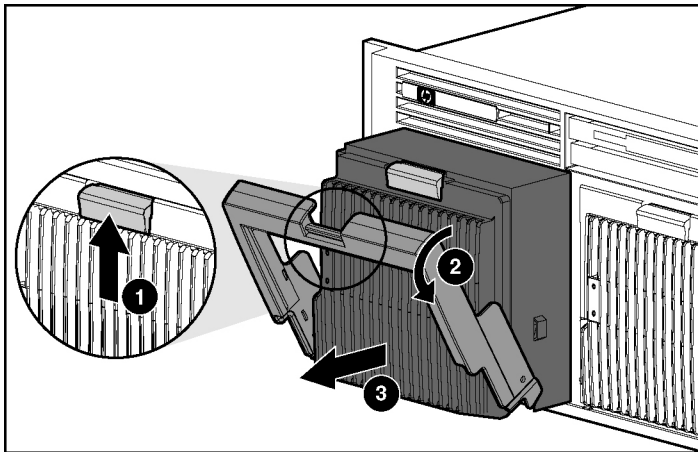4. Remove the power supply or blank out of the bay (3).

Figure 5-38: Removing a power supply or blank

Installing a Redundant Hot-Plug Power Supply

To install a redundant hot-plug power supply:

1. Remove the protective cover from the connector pins on the new redundant power supply, if present.

2. Open the lever by pushing the lever release button upward.

3. Slide the power supply into the empty bay until it locks into place (1).

4. Close the locking lever (2).
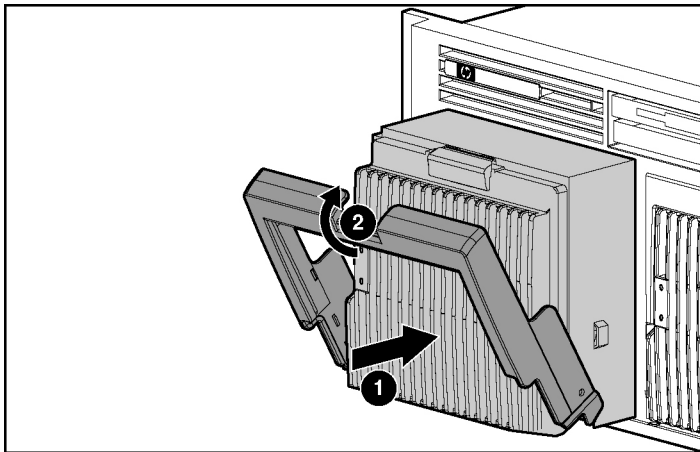
Figure 5-39: Installing a redundant hot-plug power supply

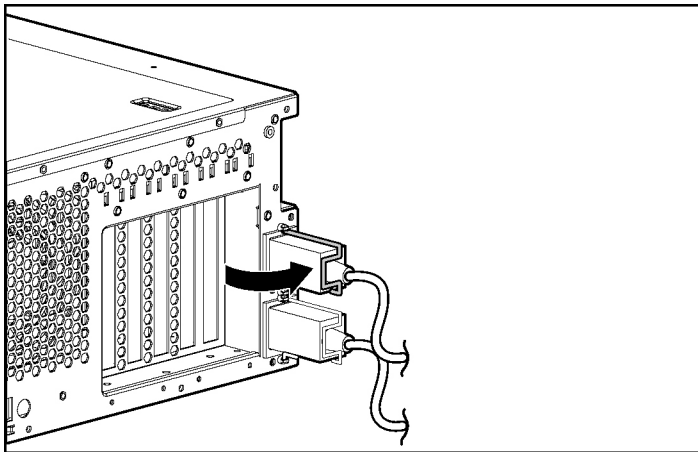5. For shipment or for optional added security, install the retaining screw, which ships in a plastic bag with the power supply option kit. The pre-drilled hole for the screw is located on the bottom of the server.

6. Connect the power cord to AC inlet two.
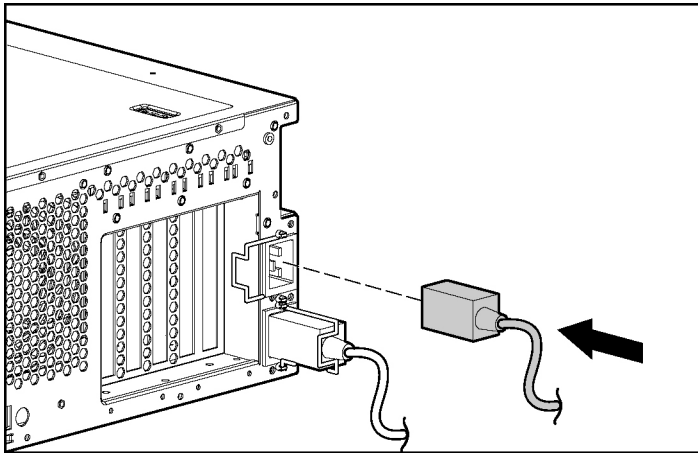
Figure 5-40: Connecting the power cord

7. Secure the power cord with the retaining clip.

Figure 5-41: Securing the power cord with the retaining clip

8. Be sure that the power LEDs on the power supply are green, indicating that the power supplies are working. For information about the power supply LED, refer to "Hot-Plug Power Supply LEDs" in Appendix E, "System LEDs and Switches."
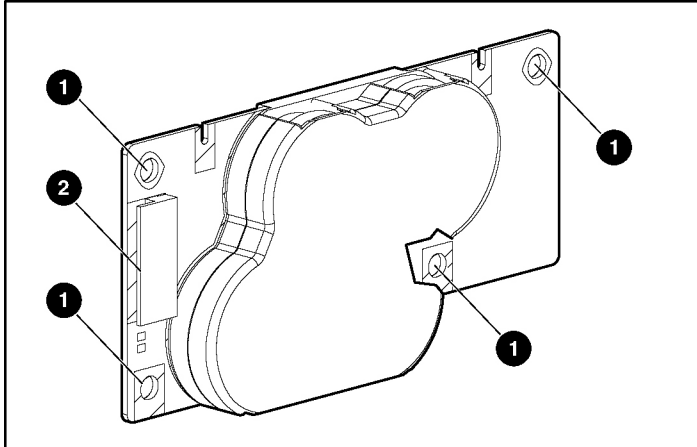
Battery-Backed Write Cache Enabler

The BBWCE, also called the battery module, enables write cache, provides transportable data protection, increases overall controller performance, and maintains any cache data for up to 72 hours.

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.

Locating the Battery-Backed Write Cache Enabler

Use Figure 5-42 and Table 5-9 to identify the parts of the BBWCE.

Figure 5-42: Battery-Backed Write Cache Enabler

Table 5-9: Battery-Backed Write Cache Enabler

Item	Description
1	Mounting holes
2	Cable connector

Installing the Battery-Backed Write Cache Enabler

To install the BBWCE:

1. Power down the server. Refer to "Powering Down the Server" in this chapter.

2. Extend the server from the rack. Refer to "Extending the Server from the Rack" in this chapter.

3. Remove the access panels. Refer to "Opening and Removing the Access Panels" in this chapter.

4. Remove all PCI-X cables and any cards that may be installed. Refer to Chapter 7, "PCI-X Technology."

5. Pull up on the two plastic rivets to disengage them from the front fan cage (1).

6. Pull up on the side of the basket at the front of the server and tilt it up to a 45° angle (2).

7. Slide the entire basket forward and lift the basket out of the chassis (3).
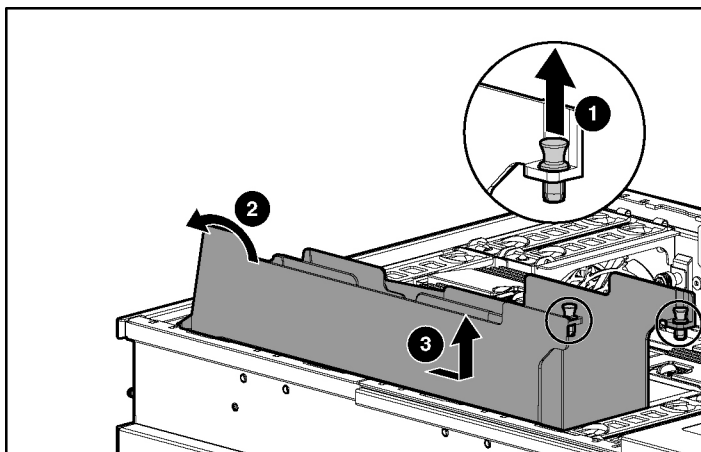
Figure 5-43: Removing the PCI-X expansion board basket

8. Remove the memory board. Refer to "Installing a Processor and PPM" in this chapter.

9. Remove the air baffle. Refer to "Installing a Processor and PPM" in this chapter.

10. Remove hot plug fans 1, 2, 3, 5, and 6 from the front fan cage. Refer to "Removing a Hot-Plug Fan" in this chapter.

11. Remove the front fan cage by disengaging the three thumbscrews (1) and lifting the cage out of the server (2).
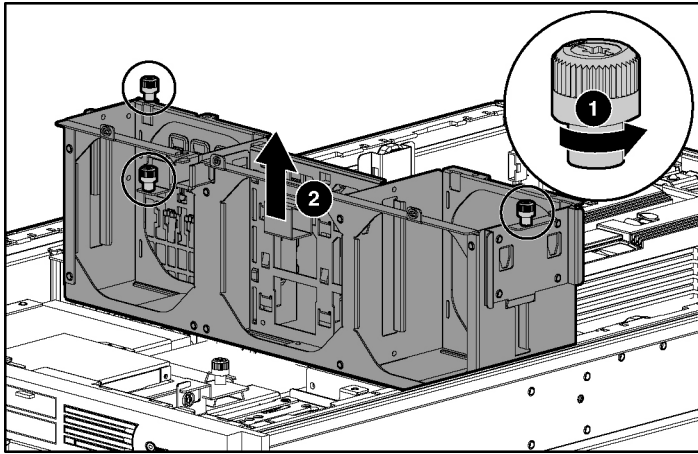
Figure 5-44: Removing the front fan cage

12. Align the BBWCE with the four standoffs along the inside wall of the chassis, and press the enabler onto the standoffs until it is securely seated.
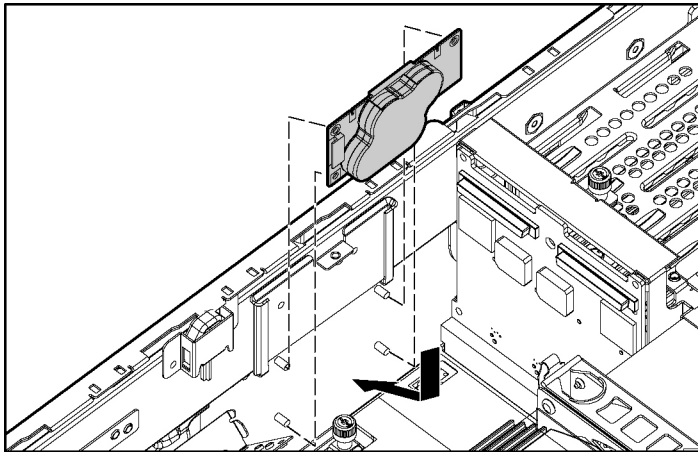
Figure 5-45: Installing the BBWCE

13. Connect the cable to the BBWCE (1) and to the 5i Plus Memory Module on the system board (2).
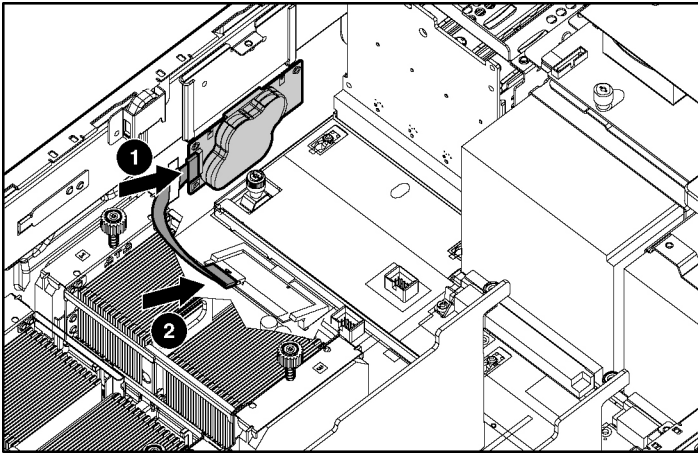
Figure 5-46: Connecting the cable to the BBWCE

14. Secure the cable to the clip that is located on the server wall next to the BBWCE.

15. Reverse steps 1 through 12 to restore the server.

Once the BBWC is installed, it takes up to 24 hours to completely charge the battery.

6

Memory

This chapter explains the procedures associated with the memory system in the HP ProLiant DL580 Generation 2 server. Topics include:

- Memory boards

- Advanced ECC (standard) memory technology

- Advanced Memory Protection modes

    — Online spare memory technology

    — Single-board mirrored memory technology

    — Hot-plug mirrored memory technology

    — Hot-Add functionality

- Software

- Configuring the memory

- Installation, removal, and replacement procedures

For more information specific to Advanced Memory Protection, refer to the following resources:

- The white paper on Advanced Memory Protection on the ProLiant website on the HP website, www.hp.com.

- The Advanced Memory Protection multimedia on the Documentation CD

- The installation documentation that ships with the memory option kit

- The hardware installation and configuration poster that ships with the server

- The hardware installation and configuration labels located on the top of the front and rear access panels of the server

For more information on configuring the memory through the RBSU, refer to the *ROM-Based Setup Utility User Guide* on the Documentation CD.
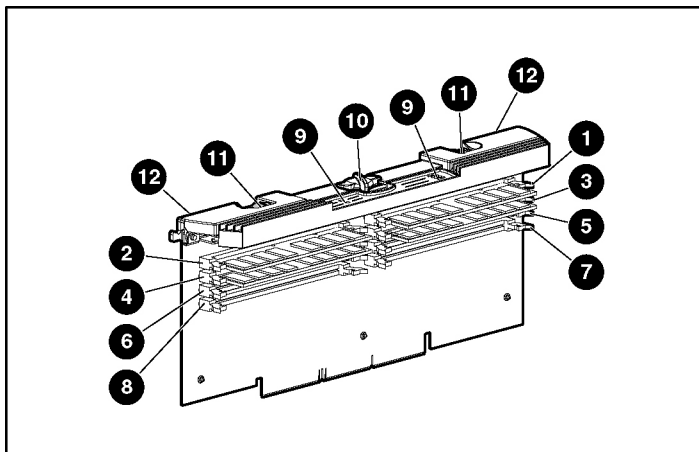
Memory Boards

The ProLiant DL580 Generation 2 server can support up to two memory boards to either expand system memory or to enable dual-board mirroring memory and hot-plug capabilities.

This section provides the following information about the memory boards:

- Parts of the memory board

- Memory board LEDs

- Memory board slot locations

Use Figure 6-1 and Table 6-1 to identify the parts of the memory board.

Figure 6-1: Memory board

Table 6-1: Parts of the Memory Board

Item	Description
1	DIMM slot 1, bank A
2	DIMM slot 2, bank A
3	DIMM slot 3, bank A
4	DIMM slot 4, bank A
5	DIMM slot 5, bank B
6	DIMM slot 6, bank B
7	DIMM slot 7, bank B
8	DIMM slot 8, bank B
9	LEDs
10	Locking switch
11	Release latches
12	Ejector levers

Use Figure 6-2 and Tables 6-2 through 6-5 to identify icons and LEDs and their status on the memory board. Each table represents the LEDs for a specific memory mode. Make sure you are referring to the correct table for the specific mode.
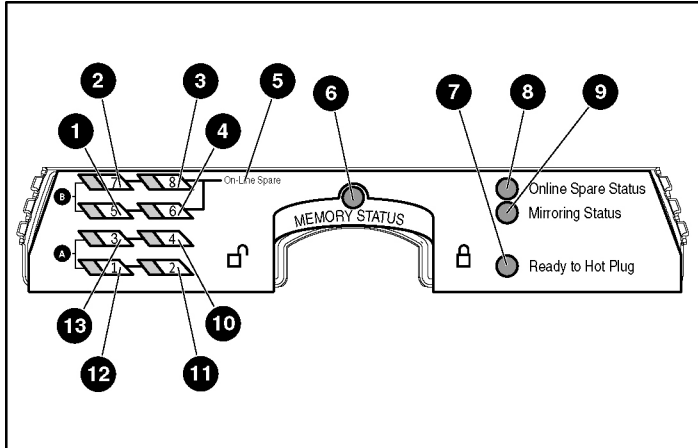

Figure 6-2: Memory board LEDs

Table 6-2: Advanced ECC (Standard) Memory Mode

Item	Description	Indicator	Status
1 – 4 and 10 – 13	DIMMs 1 – 8	Off	DIMM is not installed.
		Green	DIMM is installed.
		Amber	Memory error has occurred on this DIMM.
		Flashing amber	Configuration error has occurred.
6	Memory Status	Off	Memory board is offline.
		Green	Memory board is online.
		Flashing green	Memory board is busy.
		Amber	Memory error has occurred on this memory board.
7	Ready to Hot Plug	Off	Do not remove memory board—advanced ECC memory does not support hot-removal of boards.
	All LEDs	Off	Memory board is not seated properly or locking switch is not engaged; memory board can be removed safely.
		Flashing amber	**CAUTION:** Memory board is in use; relock it immediately.

Table 6-3: Online Spare Memory Mode

| Item	Description	Indicator	Status
5	Online Spare text	Off	Bank is not configured as an online spare bank.
		Green	Bank is configured as an online spare bank.
		Flashing green	Failure has occurred and online spare bank is active.
6	Memory Status	Off	Memory board is offline.
		Green	Memory board is online.
		Flashing green	Memory board is busy.
		Amber	Memory error has occurred on this memory board.
7	Ready to Hot Plug	Off	Do not remove memory board—online spare memory does not support hot-plug capability.
8	Online Spare Status	Off	Memory board is not configured for online spare memory.
		Green	Online spare memory is functioning properly.
		Amber	Memory error has occurred and system has failed over to the online spare bank.
	All LEDs	Off	Memory board is not seated properly or locking switch is not engaged; memory board can be removed safely.
		Flashing amber	**CAUTION:** Memory board is in use; relock it immediately.

Table 6-4: Single-Board Mirrored Memory Mode

Item	Description	Indicator	Status
1 – 4 and 10 – 13	DIMMs 1 – 8	Off	DIMM is not installed.
		Green	DIMM is installed.
		Amber	Memory error has occurred on this DIMM.
		Flashing amber	Configuration error has occurred.
6	Memory Status	Off	Memory board is offline.
		Green	Memory board is online.
		Flashing green	Memory board is busy.
		Amber	Memory error has occurred on this memory board.
7	Ready to Hot Plug	Off	Do not remove memory board—single-board mirrored memory does not support hot-plug capability.
9	Mirroring Status	Off	Memory board is not configured for mirrored memory.
		Green	Single-board mirrored memory is functioning properly.
		Amber	Memory error has occurred and system has failed over to the mirrored bank.
	All LEDs	Off	Memory board is not seated properly or locking switch is not engaged; memory board can be removed safely.
		Flashing amber	**CAUTION:** Memory board is in use; relock it immediately.

Table 6-5: Hot-Plug Mirrored Memory Mode

Item	Description	Indicator	Status
1 – 4 and 10 – 13	DIMMs 1 – 8	Off	DIMM is not installed.
		Green	DIMM is installed.
		Amber	Memory error has occurred on this DIMM.
		Flashing amber	Configuration error has occurred.
6	Memory Status	Off	Memory board is offline.
		Green	Memory board is online.
		Flashing green	Memory board is busy.
		Amber	Memory error has occurred on this memory board.
7	Ready to Hot Plug	Off	Do not remove memory board—memory board is not ready for removal.
		Green	Okay to remove memory board.
9	Mirroring Status	Off	Memory board is not configured for mirrored memory.
		Green	Hot-plug mirrored memory is functioning properly.
		Amber	Memory error has occurred and system has failed over to the mirrored board.
	All LEDs	Off	Memory board is not seated properly or locking switch is not engaged; memory board can be removed safely.
		Flashing amber	**CAUTION:** Memory board is in use; relock it immediately.

Use Figure 6-3 and Table 6-6 to identify the memory board slots on the system board.
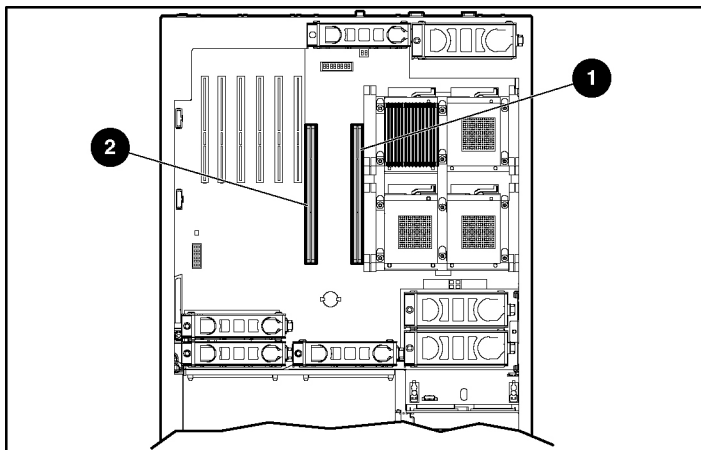
Figure 6-3: Memory board slots

Table 6-6: Memory Board Slots

Item	Description
1	Memory board slot 1
2	Memory board slot 2

Advanced ECC (Standard) Memory Technology

This section details the features and DIMM installation requirements for advanced ECC memory.

Features

Advanced ECC memory has the following features and advantages:

- The ProLiant DL580 Generation 2 server supports up to 32 GB of system memory. Each memory board supports up to 16 GB of system memory using 2-GB DIMMs.

- Advanced ECC memory detects both single-bit and multi-bit errors, and corrects single-bit errors. It can also detect and correct multi-bit errors that occur within a single DRAM chip on a DIMM, thereby providing limited fault tolerance.

  — Hot-Add functionality allows you to upgrade the amount of server memory without powering down or rebooting the server. To use this functionality, you need Windows Server 2003 Enterprise Edition, system BIOS, and a Hot-Add memory driver. For more information, refer to the *HP ProLiant DL580 Generation 2 and HP ProLiant ML570 Generation 2 Server Hot-Add Memory* booklet on www.hp.com.

DIMM Installation Requirements

Observe the following DIMM configuration requirements when installing DIMMs:

- DIMMs must be installed in groups of four, one bank at a time.

- DIMMs within a group must be identical. Installing DIMMs of different capacities into the same bank prevents the system from booting.

- Bank A must always be populated. To ease subsequent DIMM installations, install the DIMMs in sequential order (bank B next, then bank A on memory board 2, and then bank B on memory board 2).

- Be sure that memory board slot 1 is populated.

- Use only industry-standard PC1600 registered ECC DDR SDRAM DIMMs.

IMPORTANT: HP recommends that you use only HP DIMMs. Third-party DIMMs may have additional installation requirements. For information about third-party DIMM installations, refer to the Advanced Memory Protection white paper on the ProLiant website at www.hp.com.

IMPORTANT: You must power down the server before installing additional DIMMs, unless you are using Hot-Add functionality.

Advanced Memory Protection Modes

The ProLiant DL580 Generation 2 server supports four types of Advanced Memory Protection modes: online spare memory, single-board mirrored memory, hot-plug mirrored memory, and Hot-Add memory functionality. All modes include Advanced ECC protection.

Online Spare Memory Technology

Features

Online spare memory uses an online spare bank to provide additional memory protection. Online spare memory has the following features and advantages:

- Online spare memory provides DIMM failover capabilities for single-bit correctable errors. This feature is enabled when one bank of DIMMs on one memory board is configured as an online spare bank. If a DIMM on either memory board exceeds the HP defined limit for single-bit correctable errors, indicating that it may fail, the system fails over to the online spare bank.

- If one memory board is installed, the ProLiant DL580 Generation 2 server supports up to 8 GB of system memory and 8 GB of online spare memory using 2-GB DIMMs.

- If two memory boards are installed, the ProLiant DL580 Generation 2 server supports up to 24 GB of system memory and 8 GB of online spare memory using 2-GB DIMMs.

IMPORTANT: DIMMs in the online spare bank must be of equal or greater capacity than the DIMMs in the remaining banks.

Online spare memory can be configured with either one or two memory boards. Bank B on the memory board in slot 1 is the online spare bank, even if two memory boards are installed. The online spare bank can provide memory protection for up to three other banks: one bank on the memory board in slot 1 and two banks on the memory board in slot 2. If any DIMM in these three banks exceeds the HP defined limit for single-bit correctable errors, indicating that it may fail, the system performs the following actions:

- Copies the contents of the degraded bank to the online spare bank

- Deactivates the failing bank

- Activates the online spare bank

- Provides notification of the DIMM failure using the memory board LEDs, the front-panel internal health LED, Insight Manager 7, and the QuickFind Diagnostic Display.

This process occurs without intervention or server interruption, and enables you to replace the degraded DIMM at your convenience during a regularly scheduled shutdown.

DIMM Installation Requirements

In addition to the DIMM configuration requirements for advanced ECC memory, observe the following DIMM configuration requirements when installing DIMMs for online spare memory:

- Memory board slot 1 must be populated.

- Bank B on the memory board in slot 1 is the online spare bank, even if two memory boards are installed, and must be populated when the server is configured for online spare memory.

- DIMMs installed in the online spare bank must be of equal or greater capacity than each of those in the remaining banks on both memory boards.

IMPORTANT: If memory board slot 1 is not populated, the system automatically switches to advanced ECC memory and displays an error message during POST.

Single-Board Mirrored Memory Technology

Features

Single-board mirrored memory uses mirrored banks on a single memory board to provide a comprehensive level of protection against two common types of memory errors. Single-board mirrored memory has the following advantages:

- Single-board mirrored memory provides protection against both single-bit and multi-bit errors. If a DIMM on the memory board has a multi-bit error the system reads from the mirrored bank instead.

- If configured for single-board mirrored memory, the ProLiant DL580 Generation 2 server can support up to 8 GB of system memory and 8 GB of redundant memory using 2-GB DIMMs.

IMPORTANT: DIMMs in the redundant bank must be configured identically to the bank they are mirroring.

IMPORTANT: If a DIMM exceeds the HP defined limit for single-bit correctable errors, the system will not fail over to the redundant bank, but will notify you of the condition through Insight Manager 7.

Single-board mirrored memory is configured with one memory board only, which must be installed in memory board slot 1. Bank B mirrors bank A. If any DIMM in bank A or bank B has a multi-bit error, the system performs the following actions:

- Rereads the correct data from the redundant memory bank

- Performs all future reads from the redundant memory bank

- Provides notification of the DIMM failure using the memory board LEDs, the front panel internal health LED, Insight Manager 7, and the QuickFind Diagnostic Display

This process occurs without intervention or server interruption, and enables you to replace the degraded DIMM at your convenience during a regularly scheduled shutdown. Multi-bit errors are detected at the bank level rather than the DIMM level, so if a multi-bit error occurs, all DIMMs in the bank must be replaced.

As long as no errors have occurred on the memory board, the system periodically switches the bank it reads from to be sure that both banks are monitored for memory errors.

DIMM Installation Requirements

In addition to the DIMM configuration requirements for advanced ECC memory, observe the following DIMM configuration requirements when installing DIMMs for single-board mirrored memory:

- The board must be installed in memory board slot 1.

- Bank B mirrors bank A. Bank A must always be populated.

- DIMMs in the mirrored bank must be configured identically to the bank they are mirroring.

IMPORTANT: If memory board slot 1 is not populated, the system automatically switches to advanced ECC memory and displays an error message during POST.

Hot-Plug Mirrored Memory Technology

Features

Hot-plug mirrored memory uses an additional memory board to provide complete memory redundancy. Hot-plug mirrored memory has the following features and advantages:

- Provides protection against both single-bit and multi-bit errors

  If a DIMM on one memory board has a multi-bit error, the system reads from the other memory board instead.

- Enables hot-replace capabilities, which help minimize server downtime

- Supports up to 16 GB of system memory and 16 GB of redundant memory using 2-GB DIMMs

IMPORTANT: If a DIMM exceeds the HP defined limit for single-bit correctable errors, the system will not fail over to the redundant banks, but will notify you of the condition through Insight Manager 7.

To use hot-plug mirrored memory, you must install a second memory board. Both memory boards must be configured identically (DIMMs must be the same capacity), and Dual-Board Memory Mirroring Mode must be selected in RBSU. If any DIMM has a multi-bit error, the system performs the following actions:

- Rereads the correct data from the redundant memory board

- Performs all future reads from the redundant memory board

- Provides notification of the DIMM failure using the memory board LEDs, the front-panel internal health LED, Insight Manager 7, and the QuickFind Diagnostic Display

This process occurs without intervention or server interruption and enables you to hot-replace the failed or degraded DIMM at your convenience. Multi-bit errors are detected at the bank level rather than the DIMM level, so if a multi-bit error occurs, all four DIMMs in the bank must be replaced.

As long as no errors have occurred on the memory board, the system periodically switches the bank it reads from to be sure that both sets are monitored for memory errors.

Hot-plug mirrored memory also provides hot-plug replacement capability. The server hot-plug capability enables you to hot-replace a memory board that has a failed or degraded DIMM on it. You can remove the memory board, replace the DIMMs, and then reinstall the memory board while the server is running, preventing server downtime. Once the board is re-installed, the system automatically returns to mirrored status. You can also perform a non-hot-plug replacement of failed or degraded DIMMs during a scheduled shutdown.

DIMM Installation Requirements

In addition to the DIMM configuration requirements for advanced ECC memory, observe the following DIMM configuration requirements when installing DIMMs for hot-plug mirrored memory:

- Two memory boards must be installed.

- Both memory boards must be configured identically. Corresponding banks (for instance, bank A on the memory board in slot 1 and bank A on the memory board in slot 2) must be populated with DIMMs of the same capacity.

Observe the following DIMM configuration requirements when performing a hot replacement:

- Do not remove the memory board unless the "Ready to Hot Plug" LED is green.

- If you replace a DIMM, the new DIMM must be a PC1600 registered ECC DDR SDRAM DIMM of the same capacity as the DIMM you are replacing.

For a complete description of a hot-plug procedure, refer to "Installation, Removal, and Replacement Procedures" in this chapter.

Hot-Add Memory Functionality

Hot-Add functionality allows you to upgrade the amount of memory or add advanced memory protection to the server without powering down or rebooting the server. This functionality eliminates server downtime and service interruption when performing a memory upgrade.

Features

Hot-Add memory functionality can be used in two ways:

- An additional memory board of the same configuration as the existing board can be installed into the available slot on a server configured for Advanced ECC mode, in effect doubling the amount of memory in the server.

- If a server is pre-configured for Dual-Board Hot-Plug Memory Mirroring mode, the second memory board functions as a mirror of the first one when added.

More more information on Hot-Add functionality, refer to the *HP ProLiant DL580 Generation 2 and HP ProLiant ML570 Generation 2 Server Hot-Add Memory* booklet on the Documentation CD or in the Reference Library on www.hp.com.

System Requirements

- Windows Server 2003 Enterprise Edition operating system

- System ROM dated January 2003 and later

- Advanced System Management Controller Driver, version 5.28 and later

Memory Mode Options

- Advanced ECC mode with a single memory board

  — Install an additional memory board to double the memory

- Dual-Board Hot-Plug Memory Mirroring mode

  — Install an additional memory board to use for mirroring protection

  — Change the memory board currently used for mirroring protection to use for additional memory

IMPORTANT: Hot-Add is not supported when the server is in Online Spare mode or Single-Board Memory Mirroring mode.

DIMM Installation Requirements

In addition to the DIMM configuration requirements for advanced ECC memory, both memory boards must be configured identically. Corresponding banks (for instance, bank A on the memory board in slot 1 and bank A on the memory board in slot 2) must be populated with DIMMs of the same capacity.

If any DIMM configuration errors are found on the newly inserted board, the LEDs for the DIMMs that are incorrect flash amber several seconds after the board is inserted. An invalid DIMM error could occur because the DIMM is not the same type as the corresponding DIMM on the existing board or because a DIMM is installed on the new board that was unpopulated on the existing board.

If a DIMM configuration error is detected, unlock the board and remove it to make any DIMM configuration corrections. The board can then be re-inserted and the Hot-Add procedure completed normally.

If a board insertion is aborted because of a DIMM configuration error, the Advanced System Management Controller Driver is notified. It will log in the Integrated Management Log (IML) and the NT Eventlog that a Board Insertion was attempted and suffered from a DIMM configuration error.

If a DIMM configuration error is detected, the System ROM aborts the board insertion. No negative effects exist for the system operation.

Software

The following software components of the memory system provide memory configuration and management capabilities:

- ROM-Based Setup Utility (RBSU)

- Insight Manager 7

IMPORTANT: The optional online spare memory, single-board mirrored memory, and hot plug mirrored memory features do not require special software drivers and are operating system independent.

Configuring the Memory

Configuring or upgrading the server memory system requires configuring both hardware and software. To configure the memory:

1. Remove the memory board. Refer to "Removing a Memory Board" in this chapter.

2. Install the required DIMMs based on the desired memory configuration. Be sure to follow all DIMM installation requirements. Refer to "DIMM Installation Requirements" specific to the desired memory configuration in this chapter.

3. Install required memory boards. Refer to "Installing a Memory Board" in this chapter.

4. Configure the DIMMs:

   a. Power on the server.

   b. Press the **F9** key to enter RBSU.

   c. Select **Advanced Options**.

   d. Change **POST Speed Up** to **Disable**.

   e. Press any key to return to the RBSU main menu.

   f. Select **System Options**.

   g. Select **Advanced Memory Protection**.

   h. Select the desired memory mode.

   i. Press the **Esc** key twice to go back to the main RBSU menu.

   j. Press the **F10** key to exit RBSU. The server reboots and tests all memory in the system.

   k. Once the memory has been tested, re-enable **POST Speed Up** for faster system boot, if desired.

IMPORTANT: To reconfigure the memory mode after initial setup, you must reboot the system and enter RBSU.

Installation, Removal, and Replacement Procedures

DIMM and memory board installation, removal, and replacement procedures can be either hot-plug or non-hot-plug procedures, depending on how the server is configured.

- You cannot perform hot-plug procedures when the system is configured for:
  - Advanced ECC memory (unless it is configured for Hot-Add memory)
  - Online spare memory
  - Single-board mirrored memory

- You cannot perform hot-replace procedures when the system is configured for advanced ECC memory.

- You can perform a hot-replacement procedure when the server is configured for:
  - Hot-plug mirrored memory, enabling you to replace failed or degraded DIMMs without powering down the server
  - Hot-Add functionality, which allows you to upgrade the amount of server memory without powering down the server.

The replacement procedures in this section apply to both hot-plug and non-hot-plug memory procedures, except as noted.

> △ **CAUTION:** Be sure to power down the server when performing these procedures in a server that is not configured for hot-plug mirrored memory or Hot-Add memory functionality.

When the ProLiant DL580 Generation 2 server is configured for hot-plug mirrored memory, you can perform a hot-replacement. Hot-replacement enables you to remove a memory board, remove a failed or degraded memory, replace the DIMMs, and reinstall the memory board, all without powering down the server or experiencing server downtime.

Observe the following warnings when performing a hot-plug replacement procedure:

> ⚠ **WARNING: Always comply with all electrostatic and thermal guidelines to prevent bodily injury and ensure a properly functioning system when performing hot-plug operations. For detailed information, refer to "About this Guide" in the front of this guide and Appendix B, "Electrostatic Discharge."**

> ⚠ **WARNING: To reduce the risk of personal injury from hazardous energy or damage to the equipment when working on energized servers:**
>
> • **Remove all watches, rings, and any other loose fitting jewelry.**
>
> • **Avoid the use of conductive tools inside the server that could bridge live parts.**

Removing a Memory Board

> △ **CAUTION:** Electrostatic discharge can damage electronic components. Be sure you are properly grounded before beginning any installation procedure.

To remove a memory board:

1. If the server is not configured for hot-plug mirrored memory, you must power down the server. Refer to "Powering Down the Server" in Chapter 5, "Installing Hardware Options."

   Hot-replacement procedure: If the server is configured for hot-plug mirrored memory, skip to step 2.

2. Open the rear access panel. Refer to "Opening and Removing the Access Panels" in Chapter 5, "Installing Hardware Options."

   Hot-replacement procedure: Determine which memory board you want to remove by locating the memory board with an amber memory status LED and one or more amber DIMM status LEDs. The "Ready to Hot Plug" LED must be green, indicating that you can perform a hot-plug procedure.

   NOTE: If the "Ready to Hot Plug" LED is off on both boards, you must power down the server before replacing DIMMs.

3. Disengage the locking switch (1).

   Hot-replacement procedure: After turning the locking switch, the LEDs turn off, except the amber LEDs. Wait until all green LEDs are off before proceeding. Make note of which DIMM status LED remains illuminated amber. This is the DIMM you need to remove and replace.

   > **CAUTION:** Do not attempt to unlock the memory board in an operational server when the "Ready to Hot Plug" LED is not green. This will generate an audible alarm and cause the memory board LEDs to flash amber. Proceeding to remove the memory board after the audible and visible alarms causes system failure.

   > **CAUTION:** To prevent system failure, do not remove the memory board from the server until the memory status LED stops blinking.

4. Press the release latches inward firmly (2) and lift up the ejector levers (3).

5. Pull the memory board out of the server (4).

   Hot-replacement procedure: While the memory board with the failed or degraded DIMM is being replaced, the system continues to read and write from the operational memory board.
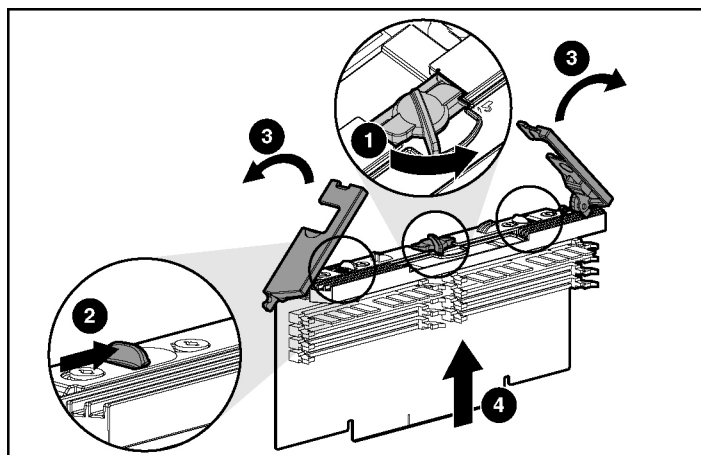
Figure 6-4: Removing the memory board

Removing a DIMM

To remove a DIMM:

1. Remove the memory board. Refer to "Removing a Memory Board" in this chapter.

2. Place the memory board on a level surface.

3. Open the DIMM slot latches (1) and remove the DIMM from the DIMM slot (2).
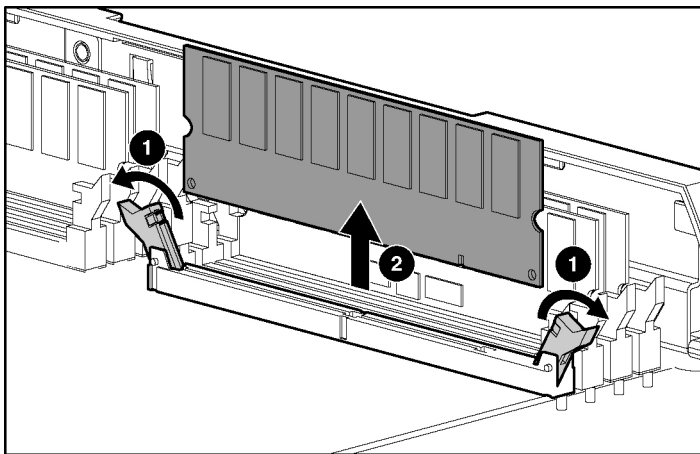
Figure 6-5: Removing a DIMM

Installing a DIMM

To install a DIMM:

1. Remove the memory board. Refer to "Removing a Memory Board" in this chapter.

2. Observe all DIMM installation requirements for the desired memory mode. Refer to the "DIMM Installation Requirements" sections for each mode in this chapter.

   IMPORTANT: Follow all DIMM configuration requirements carefully. If the DIMMs are not configured properly, you receive an error message during POST and the DIMM LEDs blink amber.

3. Align the keyed portion of the bottom of the DIMM with the tab in the DIMM.

4. Press the DIMM firmly into the slot (1) and push the latches into place (2).

   IMPORTANT: The bottom edge of the DIMM is designed so that it fits into the DIMM slot only one way.
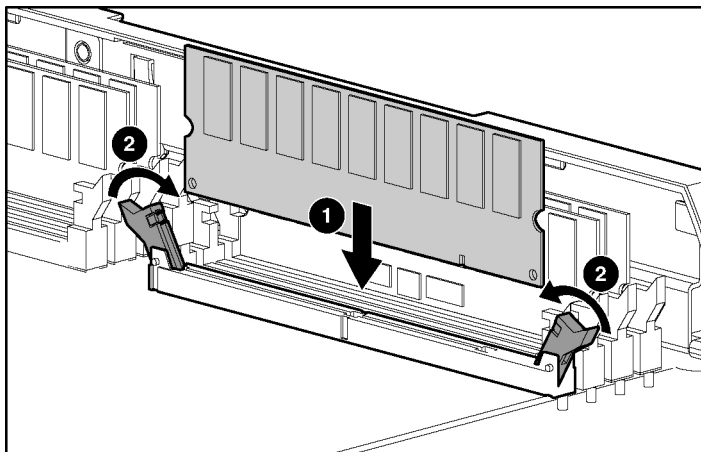
Figure 6-6: Installing a DIMM

Installing a Memory Board

To install a memory board:

1. Align the memory board with the memory slot and memory board guide clips.

2. Slide the memory board into the server (1) and close the ejector levers (2).

   Hot-replacement procedure: Any LEDs that were amber when the board was removed from the server now illuminate amber again.

   IMPORTANT: The LEDs relight amber during this step to enable you to verify again which DIMM failed. If you have already replaced the failed DIMM, disregard the amber LEDs. The LEDs change back to green after the locking switch is engaged.

3. Engage the locking switch (3).

   Hot-replacement procedure: All LEDs now turn off except the memory status LED, which flashes green while data are copied from one memory board to the other. This process may take up to a minute to complete. When the copying process is complete, the other LEDs will re-illuminate as described in Table 6-7.

   > **CAUTION:** Do not remove the memory board while the memory status LED is flashing because the memory board is transferring data. Removing the memory board during data transfer causes system failure.
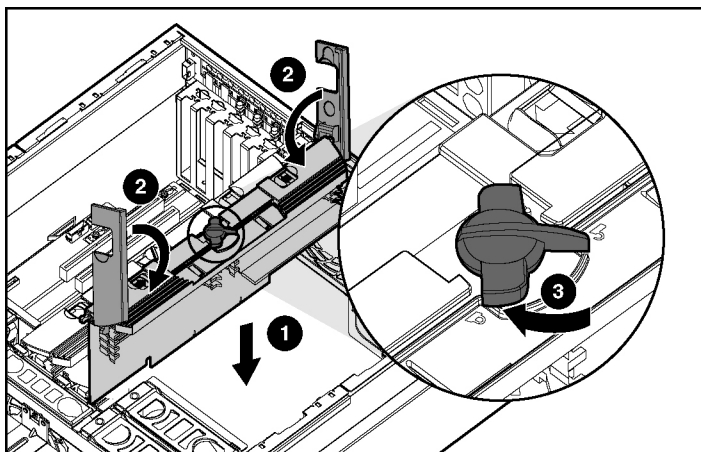
Figure 6-7: Installing a memory board

4. If the server is not currently configured for hot-plug mirrored memory, power up the server. Refer to "Powering Up the Server" in Chapter 9, "Server Setup."

   Hot-plug procedure: If the server is configured for hot-plug mirrored memory, skip to step 7.

5. Configure the memory. Refer to "Configuring the Memory" in this chapter.

6. Reference the LEDs on the top of the memory board to be sure that the memory is functioning properly. The following table describes what the LEDs look like for each memory configuration when the DIMMs and memory board are installed and functioning properly. For more information on LEDs, refer to Appendix E, "System LEDs and Switches."

Table 6-7: Memory LED States on a Properly Configured Memory Board

| LED | Memory Configuration | | | |
	Advanced ECC (Standard Memory)	Online Spare Memory	Single-Board Mirrored Memory	Hot-Plug Mirrored Memory
Memory Status	Green	Green	Green	Green
DIMMs 1-8, if populated	Green	Green	Green	Green
Online Spare Status	Off	Green	Off	Off
Mirroring Status	Off	Off	Green	Green
Online Spare text*	Off	Green	Off	Off
Ready to Hot Plug	Off	Off	Off	Green

*If two memory boards are installed, the online spare text is only illuminated for the memory board in slot 1.

7. If any of the LEDs are illuminated solid amber, indicating a failed DIMM, or blinking amber, indicating improper DIMM configuration, refer to the *HP Servers Troubleshooting Guide* on the Documentation CD for instructions.

After all memory installation and hardware configuration procedures are complete, close the access panels and return the server to its operation position in the rack.

7

PCI-X Technology

This chapter provides the following information:

- A brief discussion of the enhanced performance delivered by Peripheral Component Interconnect Extended (PCI-X) technology over Peripheral Component Interconnect (PCI) technology

- An explanation of how to operate PCI-X Hot Plug technology

For more information specific to hot-plug technology, refer to the following resources on the Documentation CD:

- The *PCI Hot Plug Administration Guide*

- The PCI-X Hot Plug animation and additional information

The ProLiant DL580 Generation 2 server contains six expansion slots using the new PCI-X protocol. These six slots include four with PCI-X Hot Plug capability.

PCI and PCI-X Expansion Boards

The ProLiant DL580 Generation 2 server supports the installation of both PCI and PCI-X expansion boards.

- PCI 33-MHz, 66-MHz

- PCI-X 66-MHz, 133-MHz

NOTE: PCI-X 133-MHz expansion boards operate at 100-MHz.

Slot Architecture and Buses

Each of the six PCI-X expansion slots in the ProLiant DL580 Generation 2 server operates at a maximum frequency of 100 MHz and is managed across three data buses. The server facilitates load balancing by having no more than two slots per bus. Use Figure 7-1 and Table 7-1 to identify the PCI-X expansion slots and buses.
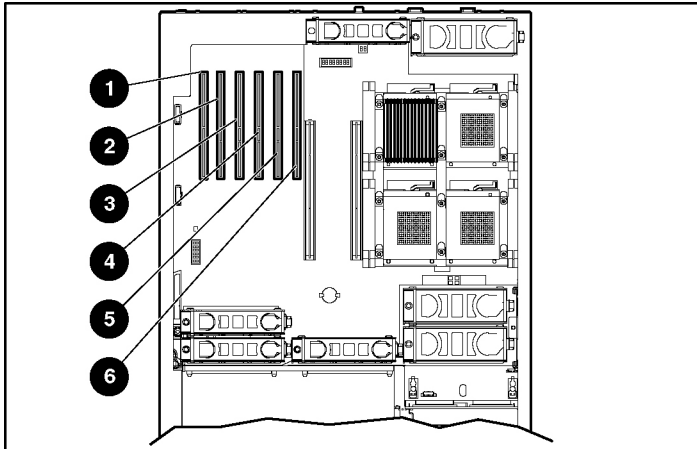
Figure 7-1: PCI-X expansion slots and buses

Table 7-1: Expansion Slots and Buses

Item	Slot	
1	Slot 1 (non-hot-plug)	Shared PCI-X bus 10, 100 MHz
2	Slot 2 (non-hot-plug)	
3	Slot 3 (hot-plug)	Shared PCI-X bus 6, 100 MHz
4	Slot 4 (hot-plug)	
5	Slot 5 (hot-plug)	Shared PCI-X bus 2, 100 MHz
6	Slot 6 (hot-plug)	
NOTE: All PCI-X slots are 64-bit, 100-MHz capable, 3.3-V keyed.		

Performance Balancing

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

- Populate slots from the center of the server to ensure optimal thermal conditions. Slot 6 is in the center of the server and has the best cooling.

- Populate slots across different buses before populating two slots on the same bus.

Table 7-2 provides a guideline for slot population order based on the above recommendations.

NOTE: HP recommends that the optional RILOE II board be populated in slot 1 due to internal cabling requirements.

NOTE: The slot population order that follows is a recommendation only; any PCI or PCI-X expansion board may reside in any slot.

Table 7-2: Recommended PCI-X Expansion Slot Population Order

Slot Number	Population Order	
6	1	Shared PCI-X bus 2
5	4	
4	2	Shared PCI-X bus 6
3	5	
2	3	Shared PCI-X bus 10
1	6	

The system BIOS detects the PCI-X devices in the slots in this order:

5-6-3-4-1-2

For more information about PCI-X bus architecture and numbering, refer to the white paper, *PCI Bus Numbering in a Windows NT Environment*, on the product website at www.hp.com.

PCI-X Hot Plug Technology

HP ProLiant DL580 Generation 2 servers support PCI-X Hot Plug technology. PCI-X Hot Plug and the operating system of the server work together to enable the following hot-plug operations:

- Hot replacement of expansion boards

  You can replace a failed expansion board with an identical expansion board without powering down the server.

- Hot addition of expansion boards

  You can install new expansion boards in previously empty slots without powering down the server.

- Hot upgrade of expansion boards

  You can replace an expansion board with a different expansion board without powering down the server.

PCI-X Hot Plug features enable you to remove, upgrade, and add PCI or PCI-X expansion boards without powering down the server by either using the PCI-X Hot Plug button or the PCI-X Hot Plug Utility software. Any expansion board can be placed in a PCI-X Hot Plug slot. However, PCI-X Hot Plug device drivers and operating system support are required to enable the PCI-X Hot Plug feature.

PCI-X Hot Plug Requirements

PCI-X Hot Plug is backward compatible, and system components fit into one of two categories: hot-plug aware or non-hot-plug aware. The server **must** have all the following to be PCI-X Hot Plug-capable:

- PCI-X Hot Plug system hardware (available in this server)

- PCI-X Hot Plug device drivers (installed from the ProLiant Essentials Foundation Pack)

- An operating system that supports PCI-X Hot Plug technology

For information about specific operating systems with PCI-X Hot Plug support, refer to the operating system support matrix available from the operating system support page on the HP website.

⚠ **CAUTION:** Before adding or removing any PCI-X Hot Plug devices, be sure to remove power to the slot using the PCI-X Hot Plug application or the PCI-X Hot Plug button. Failure to do so could result in critical errors.

IMPORTANT: If any of the three required components are not available, the system is fully functional, though not PCI-X Hot Plug-capable.

PCI-X Hot Plug Utility

HP SmartStart provides the PCI-X Hot Plug Utility for each operating system supported by the ProLiant DL580 Generation 2 server. The PCI-X Hot Plug Utility is delivered as part of the ProLiant Support Pack, which is available on the ProLiant Essentials Foundation Pack and on the product website at www.hp.com.

The PCI-X Hot Plug Utility is the user interface of the PCI-X Hot Plug architecture. The application performs the following functions:

- Slot control

- PCI-X Hot Plug option configuration

- Expansion board status monitoring and reporting

For more information, refer to the ProLiant Essentials Foundation Pack.

PCI-X Hot Plug Button

The PCI-X Hot Plug button provides PCI-X Hot Plug hardware control without requiring you to first run the PCI-X Hot Plug Utility software. Press the port-colored PCI-X Hot Plug button once to power down or power up a slot. You can cancel an action by pressing the button again within 5 seconds. When you press the button, the system automatically stops or starts expansion board drivers. Use Figure 7-2 and Table 7-3 to locate the PCI-X Hot Plug button.

Hot-Plug PCI-X Expansion Slot LEDs

One green and one amber LED are associated with each hot-plug expansion slot to identify the status of the slot. The LEDs are visible from the rear of the server or from inside the server when the rear access panel is open. Use Figures 7-2 through 7-4, and Tables 7-3 through 7-4 to assist in locating the LEDs and identifying their status.
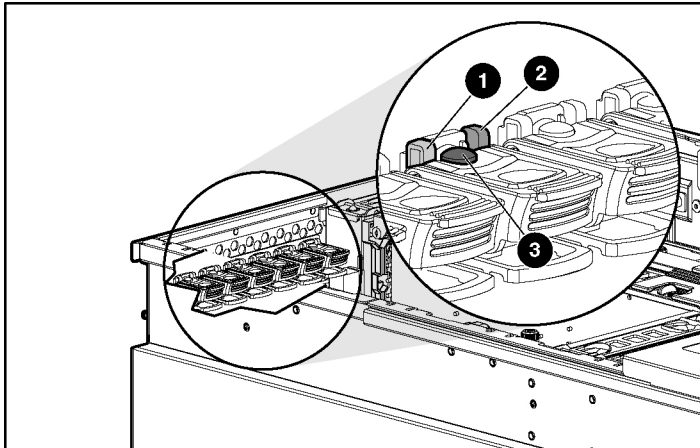
Figure 7-2: Internal expansion slot LEDs and the PCI-X Hot Plug button

Table 7-3: Internal Expansion Slot LEDs and the PCI-X Hot Plug Button

Item	Description
1	Fault LED (amber)
2	Power LED (green)
3	PCI-X Hot Plug button (port)
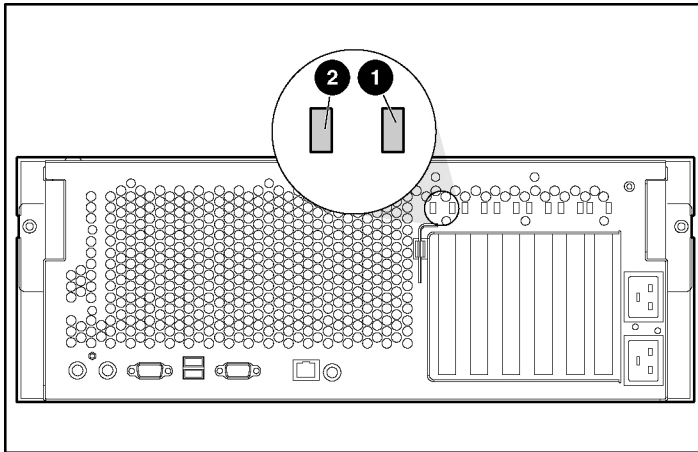
Figure 7-3: External expansion slot LEDs

Table 7-4: External Expansion Slot LEDs

Item	Description
1	Power LED (green)
2	Fault LED (amber)

Table 7-5 identifies PCI-X Hot Plug slot activity status according to LED description.

Table 7-5: PCI-X Expansion Slot LEDs

LED	State	OK to Open	Slot Status
Power	On	No	Power is currently applied to the slot. Do **not** open the expansion slot latch. The slot is functioning normally.
Fault	Off		
Power	On	No	Power is currently applied to this slot, but the slot needs **attention** for a possible problem with the slot, expansion board, or driver. Do **not** open the expansion slot latch.
Fault	On		
Power	Flashing	No	The power slot is being turned off or on, which may take several minutes. Do **not** open the expansion slot latch. Press the PCI-X Hot Plug button to cancel the operation.
Fault	On or off		
Power	Off	Yes	Power to this slot is turned off, but this slot needs **attention**. There may be a problem with the slot, expansion board, or driver.
Fault	On		
Power	Off	Yes	The power to the slot is off. An expansion board may be installed in this slot.
Fault	Off		

Note: If the any of the LEDs indicates an error, refer to Appendix H, "Troubleshooting," for more information.

Performing PCI-X Hot Plug Operations

Before adding or removing an expansion board, you must install:

- The PCI-X Hot Plug device drivers (installed from the ProLiant Essentials Foundation Pack)

- An operating system that supports PCI-X Hot Plug technology

For information about specific operating systems with PCI-X Hot Plug support, refer to the operating system support matrix available from the operating system support page on the HP website.

To install an operating system, refer to Chapter 9, "Server Setup."

> ⚠ **WARNING: To reduce the risk of personal injury from hazardous energy or of damage to the equipment when working on energized servers:**
>
> - **Remove all watches, rings, and any other loose fitting jewelry.**
>
> - **Avoid the use of conductive tools inside the server that could bridge live parts.**

IMPORTANT: Illustrations in the following procedures show how to use the PCI-X Hot Plug button, instead of a utility, to power down and power up the expansion slot. For information about procedures using utilities and PCI-X Hot Plug applications, refer to "PCI-X Hot Plug Utilities" in this chapter.

Removing a PCI-X Hot Plug Expansion Board

The ProLiant DL580 Generation 2 server includes a PCI-X slot divider and ejector to ensure slot safety and to facilitate expansion board removal.

To remove an expansion board from a PCI-X Hot Plug slot:

1. Extend the server from the rack. Refer to "Extending the Server from the Rack" in Chapter 5, "Installing Hardware Options."

2. Open the rear access panel. Refer to "Opening and Removing the Access Panels" in Chapter 5, "Installing Hardware Options."

3. Identify the PCI-X Hot Plug expansion slot that you want to remove and the PCI-X Hot Plug button that manages it.

> △ **CAUTION:** Do not attempt this hot-plug operation if the operating system does not provide PCI-X Hot Plug support or if you do not have the appropriate device drivers installed. Failure to properly execute a hot-plug operation can halt the system.

4. Press the port PCI-X Hot Plug button or use the PCI-X Hot Plug Utility to power down the PCI-X Hot Plug slot. Be sure that the slot is powered down by observing the flashing green LED until it turns off.
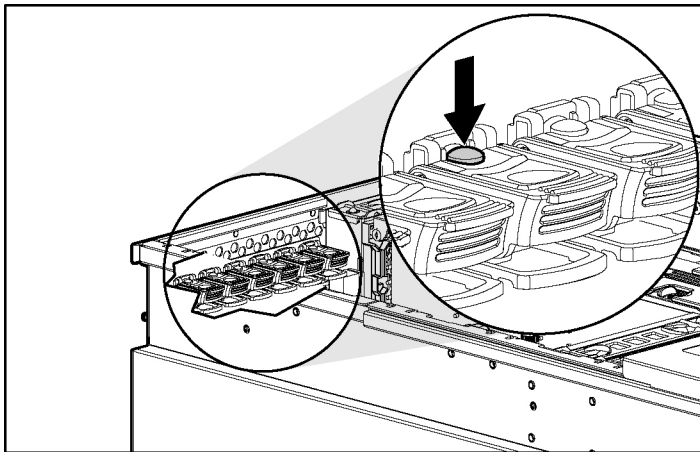
Figure 7-4: Powering down the slot

5. When the power LED for the slot is off, disconnect any cables connected to the selected expansion board.

6. If you are removing a full-length board, open the PCI-X retaining clip by pushing it toward the center wall to lock it in the open position.
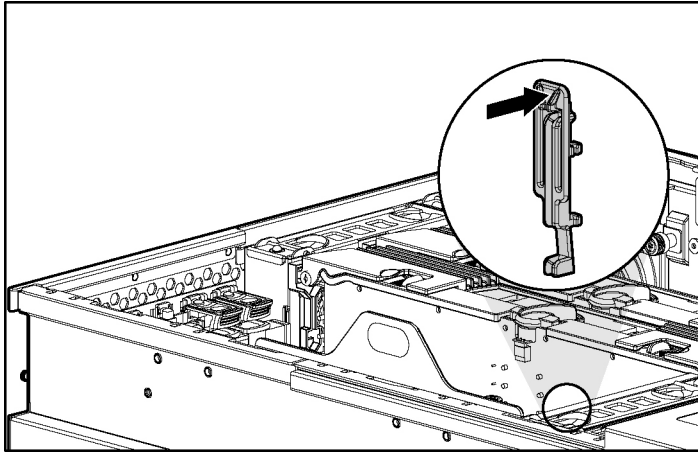
Figure 7-5: Locking the PCI-X retaining clip open

7. Press the expansion slot latch down to release (1).

8. Flip the latch up to open the slot (2).

9. Pull upward on the expansion board release handle (3) to eject the expansion board from the slot connector and lift the expansion board out of the server (4).
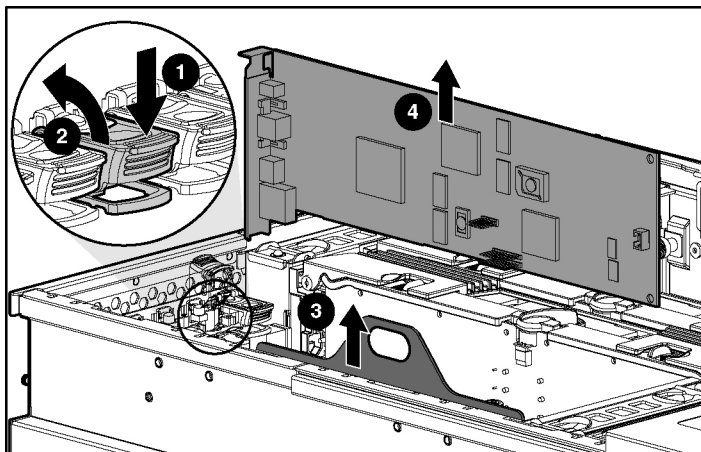
Figure 7-6: Removing the expansion board

Installing or Replacing a PCI-X Hot Plug Expansion Board

To install or replace an expansion board into a PCI-X Hot Plug slot:

1. Extend the server from the rack. Refer to "Extending the Server from the Rack" in Chapter 5, "Installing Hardware Options."

2. Open the rear access panel. Refer to "Opening and Removing the Access Panels" in Chapter 5, "Installing Hardware Options."

3. If you are replacing a hot-plug expansion board, refer to "Removing a PCI-X Hot Plug Expansion Board" in this chapter.

4. Identify the PCI-X Hot Plug expansion slot that you want to populate and the PCI-X Hot Plug button that manages it.

⚠️ **CAUTION:** Do not attempt this hot-plug operation if the operating system does not provide PCI-X Hot Plug support or if you do not have the appropriate device drivers installed. Failure to properly execute a hot-plug operation can halt the system.

5. Press the port PCI-X Hot Plug button or use the PCI-X Hot Plug Utility to power down the PCI-X Hot Plug slot.

⚠️ **CAUTION:** Be sure that the slot LED is off before installing the expansion board.
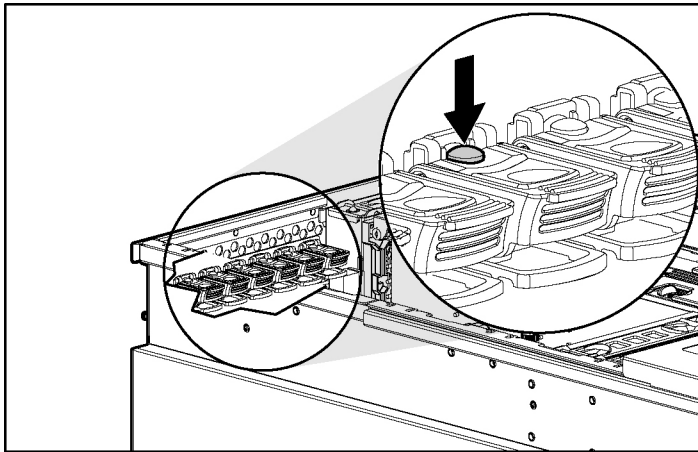
Figure 7-7: Powering down the slot with the PCI-X Hot Plug button

6. Press down on the expansion slot latch to release it (1).

7. Open the latch toward the rear of the unit (2).

8. Remove the expansion slot cover (3).
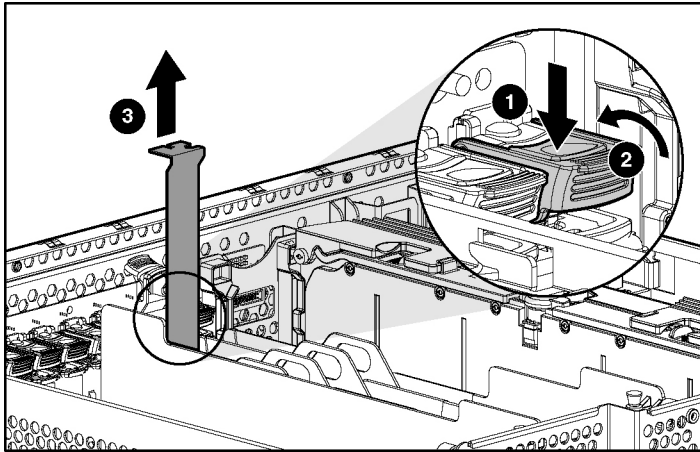
Figure 7-8: Releasing the expansion slot latch and removing the expansion slot cover

9. If you are installing a full-length board, press the PCI-X retaining clip toward the center wall to lock it in the open position.
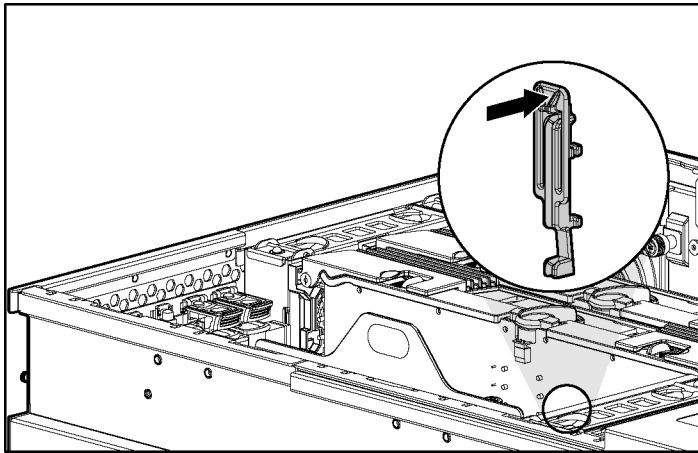
Figure 7-9: Locking the PCI-X retaining clip open

10. Install the expansion board in the slot and apply even pressure to seat the board securely (1).

11. Flip the expansion slot latch down and lock it into place (2).
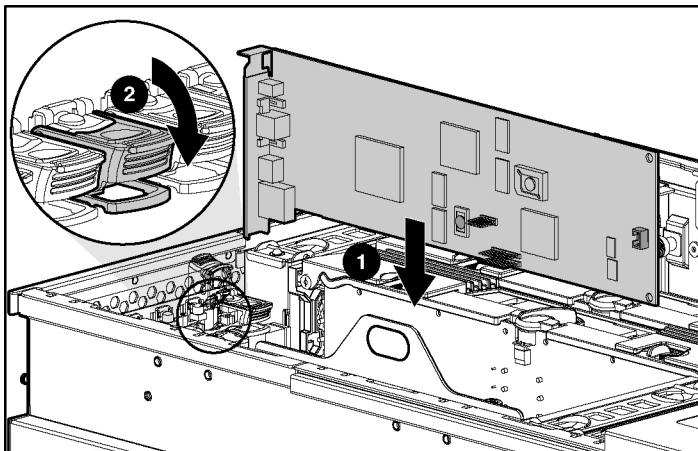
Figure 7-10: Installing a PCI-X Hot Plug expansion board

12. Close the PCI-X retaining clip (for full-length expansion boards only).
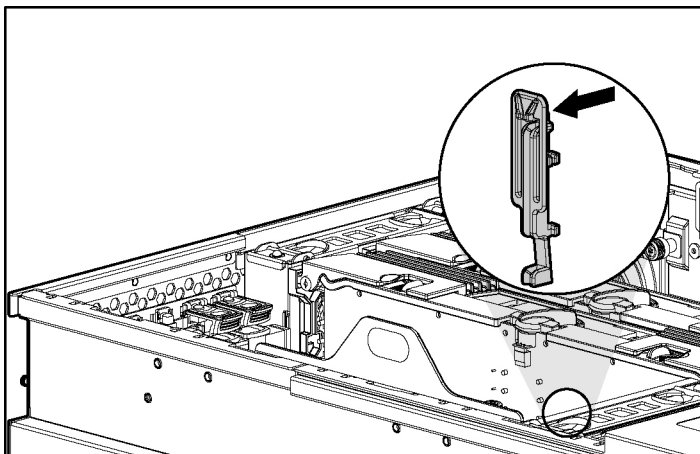
Figure 7-11: Securing the PCI-X retaining clip

13. Connect any required cables to the expansion board.

14. Press the PCI-X Hot Plug button or use the PCI-X Hot Plug Utility to power up the PCI-X Hot Plug slot.

15. Wait until the amber LED is off and the green LED stays on to be sure that you have installed the board properly.

16. Replace the rear access panel. Refer to "Replacing the Access Panels" in Chapter 5, "Installing Hardware Options."

17. Restore the server to its operating position in the rack.

18. Configure the expansion board using the documentation and software that ships with the expansion board.

    NOTE: For information about using a PCI-X Hot Plug Utility for installations with system drivers, refer to "PCI-X Hot Plug Utilities" in this chapter.

Installing a Non-Hot-Plug Expansion Board

△ **CAUTION:** To avoid risk of damage to the system or expansion boards, remove all AC power cords before installing or removing non-hot-plug expansion boards. With the front panel Power On/Standby button in the standby position, auxiliary power is still connected to the expansion slots and may damage the board.

To install an expansion board in a non-hot-plug PCI-X expansion slot:

1. Power down the server. Refer to "Powering Down the Server" in Chapter 5, "Installing Hardware Options."

2. Extend the server from the rack. Refer to "Extending the Server from the Rack" in Chapter 5, "Installing Hardware Options."

3. Remove the access panels. Refer to "Opening and Removing the Access Panels" in Chapter 5, "Installing Hardware Options."

4. Identify the PCI-X expansion slot you want to populate. Slots 1 and 2 are the non-hot-plug slots.

5. Press down on the expansion slot latch to release it (1).

6. Open the latch toward the rear of the unit (2).

7. Remove the expansion slot cover (3).
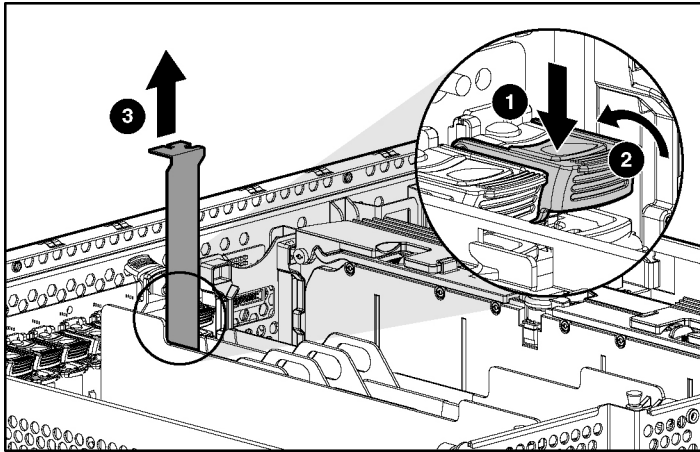
Figure 7-12: Releasing the expansion slot latch and removing the expansion slot cover

8. If you are installing a full-length board, press the PCI-X retaining clip toward the center wall to lock it in the open position.
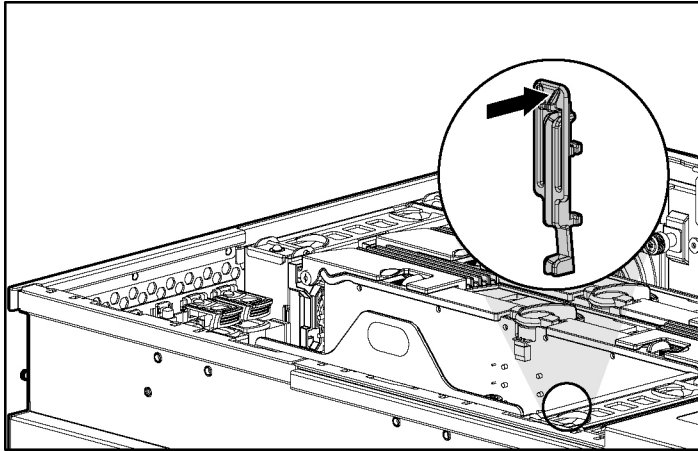
Figure 7-13: Locking the PCI-X retaining clip open

9. Align the expansion board with the groove on the PCI retaining clip opposite the removed expansion slot cover (for full-length expansion boards only).

10. Install the expansion board in the slot and apply even pressure to seat the board securely (1).

11. Flip the expansion slot latch down and lock it into place (2).
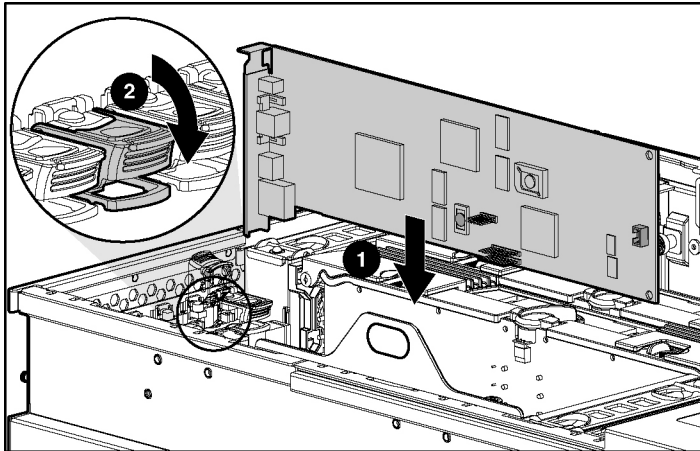
Figure 7-14: Installing a PCI-X expansion board

12. Close the PCI-X retaining clip (for full-length expansion boards only).
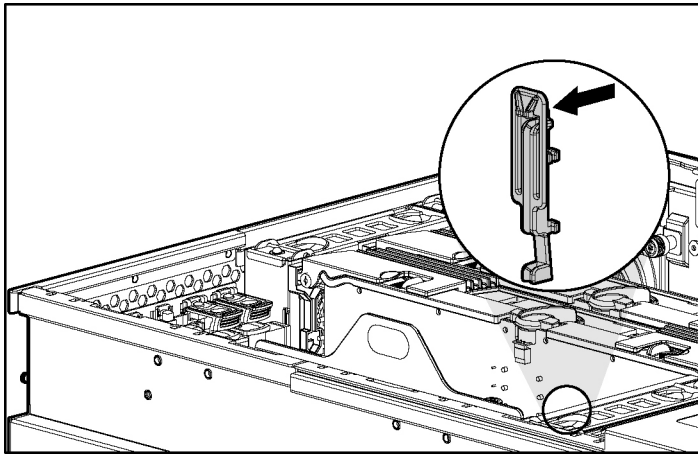
Figure 7-15: Securing the PCI-X retaining clip

13. Connect any required cables to the expansion boards.

14. Replace the rear access panel. Refer to "Replacing the Access Panels" in Chapter 5, "Installing Hardware Options."

15. Restore the server to its operating position in the rack.

16. Power up the server. Refer to Chapter 9, "Server Setup."

17. Be sure that the internal health LED on the front panel LED assembly is illuminated green, indicating that the system is functioning properly. For detailed information on LEDs, refer to Appendix E, "System LEDs and Switches."

If the LED indicates an error, refer to Appendix H, "Troubleshooting," or refer to the *HP Servers Troubleshooting Guide* for instructions.

PCI-X Hot Plug Utilities

In partnerships with Microsoft and Novell, HP has developed software support implementations for each operating system. HP is promoting standardization with operating system software leaders to ensure the broad availability of PCI-X Hot Plug technology. Each operating system supplier is responsible for its own implementation of the software.

- Microsoft Windows NT operating system

  The PCI-X Hot Plug Utility for Windows NT is the graphical interface for management of PCI-X Hot Plug functions. Refer to the "PCI-X Hot Plug Utility for Windows NT" section in this chapter.

- Microsoft Windows 2000 operating system

  The Windows 2000 operating system contains native support for PCI-X Hot Plug functionality and monitoring. For more information, refer to the documentation that ships with the operating system.

- Novell NetWare operating system

  The Novell NetWare Configuration Manager Console is the user interface for management of PCI-X Hot Plug functions. Refer to the "Novell NetWare Configuration Manager Console" section in this chapter.

For more information about PCI-X Hot Plug technology, refer to

www.compaq.com/products/servers/technology

PCI-X Hot Plug Utility for Windows NT

The PCI-X Hot Plug Utility for Windows NT (located on the ProLiant Essentials Foundation Pack) enables you to view the status of the PCI-X Hot Plug slots and to initiate actions such as replacing a failed expansion board.

The Windows NT PCI-X Hot Plug Utility screen is divided into three sections:

- Top

  This area enables you to connect to a remote computer by typing the server name in the combo box, selecting a server from the combo box, or clicking **Browse** to bring up a selection dialog. Clicking **Refresh** refreshes the PCI-X Hot Plug information for the current server.

- Middle

  The list control displays information about the PCI-X Hot Plug slots on the current server: LEDs, location, expansion board name (if any), and the status of the slot and/or expansion board. The columns can be sorted and resized, and some can be hidden. These commands are accessible by right-clicking the mouse on a column header.

- Bottom

  The filter drop-down list box can be used to define the slots shown: clicking **Power** toggles the power to the currently selected slot, **Help** brings up the standard **Help Finder** dialog, and **Exit** exits the utility.

Novell NetWare Configuration Manager Console

The Novell NetWare Configuration Manager Console (NCMCON) user interface enables you to view status information on PCI-X slots and control features, such as removing and adding PCI-X Hot Plug expansion boards all from one focal point.

Navigating the NCMCON Menus

The NCMCON interface constantly retrieves and displays the status of all the slots. If any errors occur, the appropriate error message displays. To navigate through these menus, follow these guidelines:

- From the **Main** menu, use the arrow keys to move up and down the list of slots. The current line is highlighted.

- Press the **Enter** key to go to the **Slot Options** menu. Use the arrow keys to highlight the correct option and press the **Enter** key to select that option. If you press the **Enter** key when a non-hot-plug slot is highlighted, the **Slot Detail** screen displays.

- If at any point you want to return to the **Main** menu, press the **Esc** key.

- Press the **F1** key for online help.

- Hot replacement of expansion boards

  This option enables you to replace a failed expansion board with an identical expansion board. This action applies power to and configures the slot.

- Hot addition of expansion boards

  This option enables you to add an expansion board into an empty slot.

Viewing Slot Detail Information

To view slot detail information:

1. From the **Main** menu, highlight the slot and expansion board information to be viewed.

2. Press the **Enter** key.

3. Select **Slot Detail Information** from the **Slot Options** menu.

Removing an Expansion Board

To remove an expansion board:

1. From the **Main** menu, highlight the slot and expansion board to be removed.

2. Press the **Enter** key to go to the **Slot Options** menu.

3. Use the arrow keys to highlight **Remove Expansion Board** and press the **Enter** key. NCMCON then processes the remove request.

4. Be sure that the slot has a status of POWERED down and the green LED is no longer illuminated.

5. Open the expansion slot latch.

6. Remove the expansion board from the slot. NCMCON updates the status of the slot.

Replacing an Expansion Board

To replace an expansion board:

1. Remove the expansion board from the slot.

2. Be sure that the slot has a status of POWERED down and the green LED is not illuminated.

3. Install the new expansion board in the slot.

4. Close the expansion slot latch.

5. When the new expansion board is detected, NCMCON automatically asks if you want to configure and apply power to the slot:

   — If you answer Yes, power is applied to the slot, the green LED illuminates, and the status of the slot on the console changes to READY.

   — If you answer No, the console status does not change.

6. Press the **Enter** key to go to the **Slot Options** menu.

7. Use the arrow keys to highlight **Replace Adapter** and press the **Enter** key. NCMCON processes the replace request.

Adding an Expansion Board

To add an expansion board:

1. From the **Main** menu, highlight the slot into which the expansion board is to be added.

2. Press the **Enter** key to go to the **Slot Options** menu.

3. Use the arrow keys to highlight **Add Adapter** and press the **Enter** key. NCMCON then processes the request.

4. Be sure that the slot has a status of POWERED down and the green LED is no longer lit.

5. Install the new expansion board in the slot.

6. Close the expansion slot latch.

7. When the new expansion board is detected, NCMCON automatically asks if you want to configure and apply power to the slot.

   — If you answer Yes, power is applied to the slot, the green LED illuminates, and the status of the slot changes to READY.

   — If you answer No, the console status does not change.

8. Press the **Enter** key to go to the **Slot Options** menu.

Novell NetWare Operating System Messages

Novell NetWare uses the following list of messages to indicate errors during PCI-X Hot Plug operations:

- **Expansion Board Not Same**—The expansion board is not the same as the expansion board being replaced. The hot-plug replacement cannot continue.

- **Card Functioning**—The expansion board in the slot is currently functioning. The Add/Replace is ignored.

- **Driver in Use**—The expansion board is currently in use. Do you wish to force removal?

- **Driver Loaded**—The driver for the expansion board is currently loaded and must be unloaded manually. Unload the driver and select again.

- **General Failure**—Could not perform the action because of a system failure.

- **No Hot-Plug Driver**—The hot-plug driver is not responding. Check to be sure the device driver CPQSBD.NLM is loaded.

- **Remove Not Supt**—The Remove action is not supported for the expansion board/slot.

- **Switch Open**—The slot cannot be initialized because the switch is open. Close the switch and try Add/Replace again.

- **Unknown Slot**—The Add/Remove was performed on an unknown slot. Try the command again.

- **Replace Load Driver**—The expansion board is successfully replaced. Please load the driver at this time.

8

Installing the Server in a Rack

This chapter provides the required procedures for mounting an HP ProLiant DL580 Generation 2 server into a Compaq branded or industry-standard 19-in rack. For more information, refer to Chapter 4, "Planning the Server Installation." Server cabling and configuration are discussed in Chapter 10, "Server Configuration and Utilities"and Appendix D, "Cabling Guidelines."

This chapter specifically addresses:

- Server installation overview
- Preparing the rack for server installation
    - Measuring with the rack template
    - Installing the rack rail assemblies
- Preparing the server for rack installation
    - Attaching the server rails
    - Removing the power supplies
- Installing the server into the rack
    - Loading the server into the rack rails
    - Attaching the cable management system reel assemblies
    - Reinstalling the power supplies
- Securing the server in the rack for shipping
- Connecting the AC power cord and peripheral devices
- Securing cables with the cable management harness

Server Installation Overview

Installing the server in the rack requires the following actions:

1. Select an appropriate site for the server based on the environmental and stability requirements discussed in Chapter 4, "Planning the Server Installation."

2. Unpack the server and locate the rack-mounting hardware described in the "Server Shipping Contents" section of Chapter 4, "Planning the Server Installation."

3. Install any expansion boards or hardware options such as memory. To install the major hardware items, refer to Chapter 5, "Installing Hardware Options" or follow the installation instructions provided in each hardware option kit.

4. To minimize server weight, remove the hot-plug power supplies and do not install hot-plug hard drives until the server is mounted in the rack.

5. Use the rack template to identify the proper location for the server.

6. Attach rack-mounting hardware to the server and to the rack.

7. Slide the server into the rack.

8. Attach the cable management solution to the server and to the rear of the rack.

9. With the exception of additional memory and most PCI-X boards, run the ROM-Based Setup Utility (RBSU) after you install the hardware options. To run RBSU, refer to the Server Setup and Management pack that ships with the server.

If you have any problems, contact an authorized reseller. For more information on configuring the server, refer to Chapter 10, "Server Configuration and Utilities."

Preparing the Rack for Server Installation

To prepare the rack for a server installation:

- Measure with the rack template

- Install the rack rail assemblies

Measuring with the Rack Template

The rack template provides an easy and reliable way to properly position the rack rail assemblies in the rack.

- The template is two-sided and is printed with arrows that show you where to insert rack rail assemblies on the front and back of the rack.

- Use a pencil to mark the top and bottom edges of the template against the rack supports, identifying where the server fits and providing a starting point for installing the next unit.

⚠ **WARNING: Always mount the heaviest item on the bottom of the rack and work from the bottom to the top.**

⚠ **WARNING: Reduce the risk of personal injury or damage to the equipment by ensuring that the rack leveling feet extend to the floor and support the full weight of the rack. Each rack must be level and stable. Racks that are not coupled require stabilizers. This must be done before you perform any work on the rack.**

Refer to the *Rack Planning and Installation Guide* on the Documentation CD that accompanies the Compaq branded rack for more information on leveling feet and stabilizers.

IMPORTANT: Determine the place in the rack for the server **before** you start installing the rack rail assemblies. To remind you of the proper placement of the server in the rack, refer to the Rack Builder report you printed when you planned the rack configuration with the Rack Builder tools provided with the Compaq branded rack.

To identify the required space and location for the server with the template:

1. Identify the front side of the template.

2. Starting at the bottom of the rack, or at the top of a previously mounted component, secure the template against the front of the rack by pressing the two push tabs. Match the hole pattern on the template with the holes on the vertical rails of the rack.
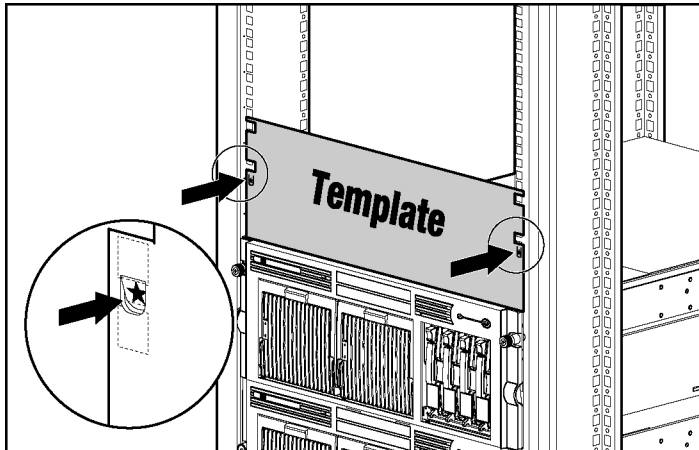
Figure 8-1: Measuring with the template

3. Align the template so that the sides of the template are even with the sides of the rack. Tick marks on the vertical rails of the rack help you maintain the proper alignment.

    NOTE: Tick marks on the vertical posts of the rack mark off U-spaces in the rack configuration and help to maintain the proper alignment.

4. Using a pencil, mark the locations on the rack where you insert the rack rail tabs (1).

5. On the rack, mark the top and bottom edges of the template (2). This step helps you align a template for the next component.
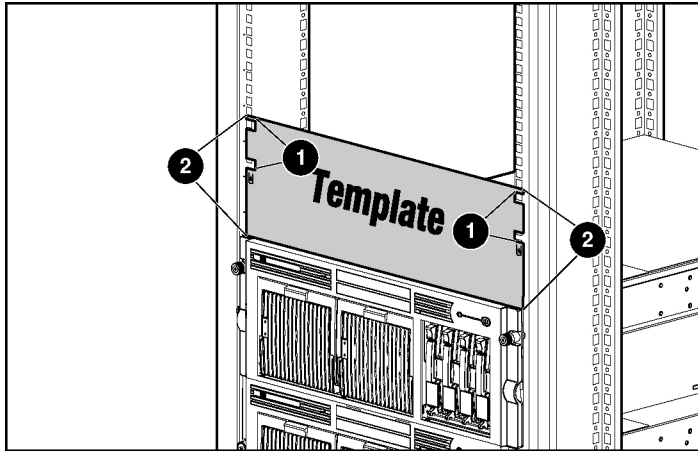
Figure 8-2: Marking the rack for server installation

6. Move to the rear of the rack and turn the template over so you can use the backside of the template.

7. Repeat steps 2 through 5 with the back of the template on the rear of the rack.

   IMPORTANT: On the rear of the rack, make pencil marks on the **inside** of the vertical rails. These markings guide you in installing rack rails into the interior of the rack frame.

8. Remove the template from the rack.

Installing the Rack Rail Assemblies

To install the rack rail assemblies into the rack:

1. From the front of the rack, identify the rear rack holes on the inside of the vertical rack that you marked with the template.

2. Pull the rail compression lever toward you.
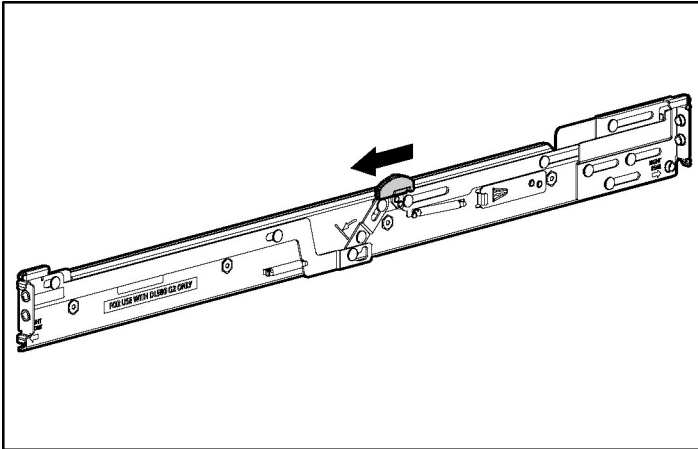
Figure 8-3: Pulling the rail compression lever

3. Insert the two rail tabs from the end of the rack rail assembly into the marked holes on the inside of the rear of the rack.
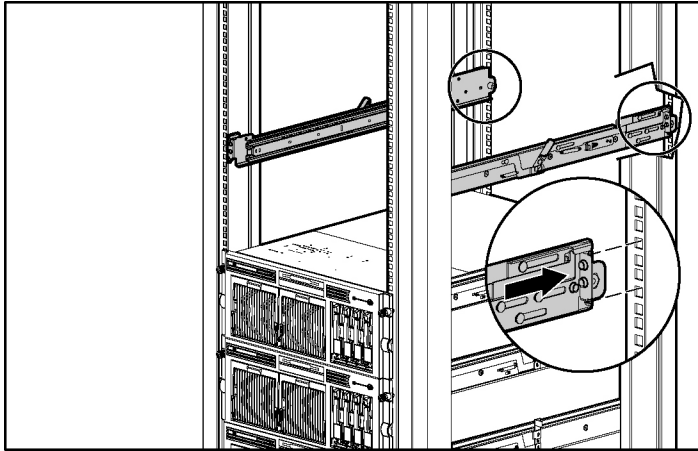
Figure 8-4: Inserting the rail tabs on the rear of the rack

4. Adjust the rack rail depth by sliding it forward.

5. Insert the two rail tabs from the rack rail assembly into the marked holes on the inside of the front of the rack.
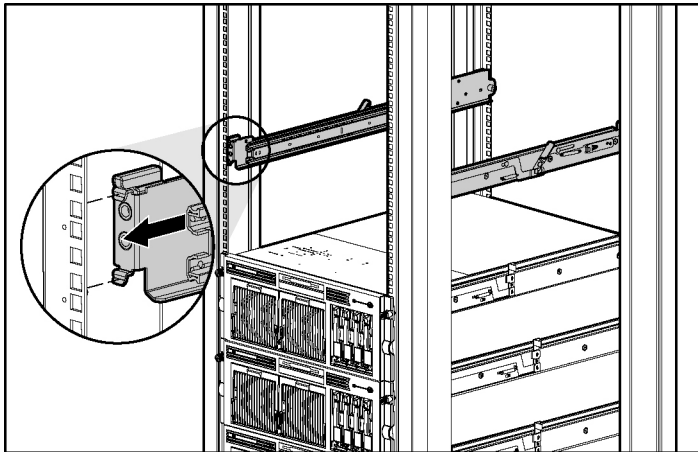
Figure 8-5: Inserting the rail tabs on the front of the rack

6. Release the rail compression lever to seat the tabs in the rack post.

7. Repeat steps 1 through 6 for the other rail.

Preparing the Server for Rack Installation

To prepare the server for rack installation:

- Attach the server rails

- Remove the power supplies

Attaching the Server Rails

To attach the server rails on the ProLiant DL580 Generation 2 server:

IMPORTANT: Install the server rails with the smooth side of the rail against the server chassis.

1. Align the four keyholes on one of the server rails above the four spools on the side of the chassis.

2. Press the rail against the side of the chassis and slide toward the front of the server to snap and lock the rail into place.
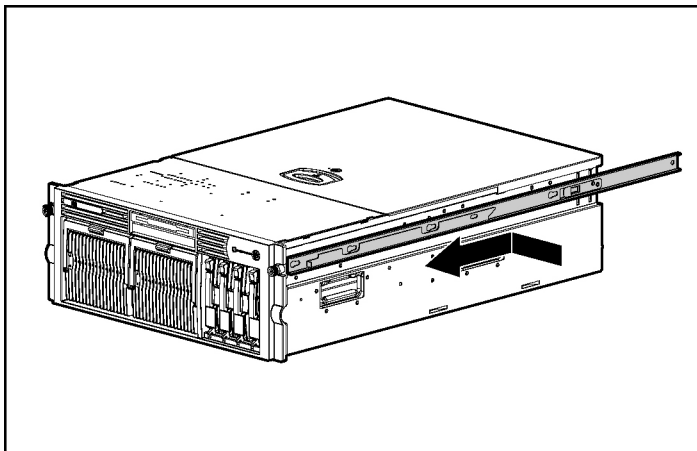
Figure 8-6: Attaching a server rail to the chassis

IMPORTANT: Be sure that the first rail is firmly anchored to the chassis before attaching the second rail.

3. Repeat steps 1 and 2 to secure the second rail to the server.

Removing the Power Supplies

To make moving and lifting the server more manageable, HP recommends that all power supplies be removed from the server. To remove the power supplies, refer to "Removing a Redundant Hot-Plug Power Supply or Blank" in Chapter 5, "Installing Hardware Options."

> ⚠ **WARNING: The server is very heavy, up to 44.5 kg (98 lb). To reduce the risk of personal injury or damage to the equipment:**
>
> - **Remove all hot-plug power supplies to reduce the weight of the server before lifting it.**
>
> - **Observe local occupational health and safety requirements and guidelines for material handling.**
>
> - **Get help to lift and maneuver the server.**

Installing the Server in the Rack

To complete the server rack installation:

- Load the server into the rack rails.
- Attach the cable management system reel assemblies.
- Reinstall the power supplies.

Loading the Server into the Rack Rails

⚠ **CAUTION:** To avoid destabilizing the rack, install servers starting from the bottom of the rack.

To install the server in the rack:

1. Pull the inner slide rail forward from each rack rail assembly until it locks into place (1).

2. Slide the inner bearing race forward until it stops (2).
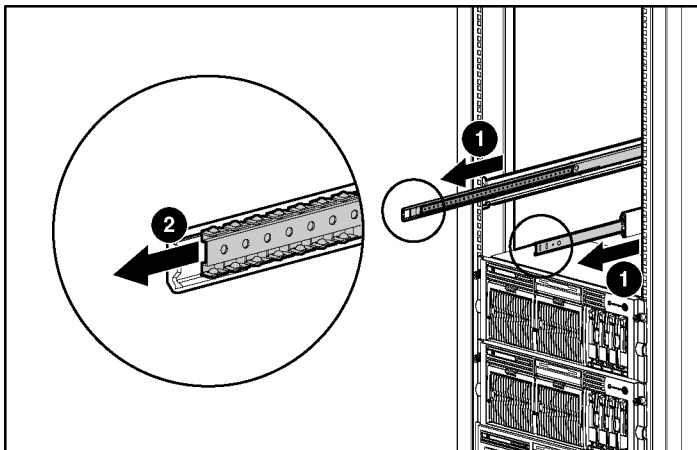
Figure 8-7: Locking the inner slide rails into place

3. Use two people to lift the server by its four lift handles (1) and carefully align the open ends of the server rails on the rear of the server with the extended bearing race and inner slide rail of the rack rail assemblies (2).

4. Insert the server rails into the extended inner slide rails on both sides, and then slowly slide the server into the rack. Continue sliding the server backward until the rail-release levers engage the rack rail assemblies (3).
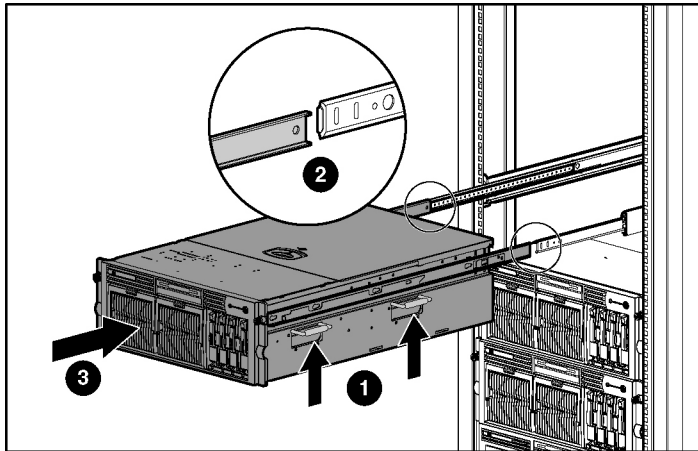
Figure 8-8: Loading the server onto the rack rails

⚠ **CAUTION:** Keep the server parallel to the floor when sliding the server rails into the standard rack rails. Tilting the server up or down can result in damage to the rails.

5. Reach around the front of the server to press the rail-release levers at the front of both server rails, and continue to slide the server into the rack.
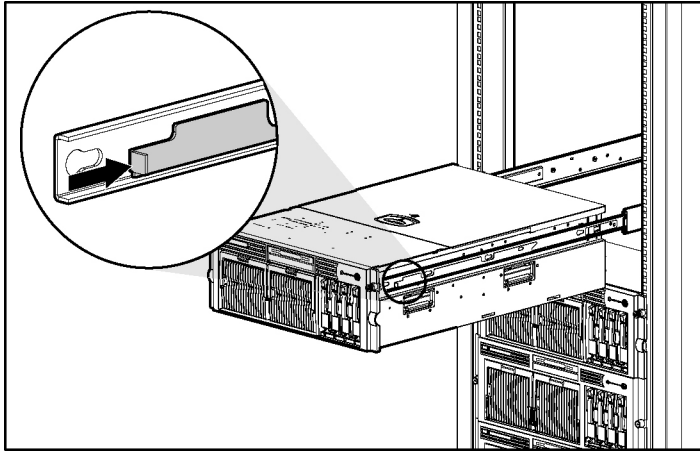
Figure 8-9: Sliding the server to the rear of the rack

6. Once the server reaches the rear of the rack, slide it all the way back out of the rack until the rack assembly is fully extended and the rails lock. This action initializes the rail lock for future use.

7. Press the rack levers at the front of the server rails to release the lock, and slide the server all the way back into the rack.

8. Tighten the thumbscrews to secure the server to the rack.
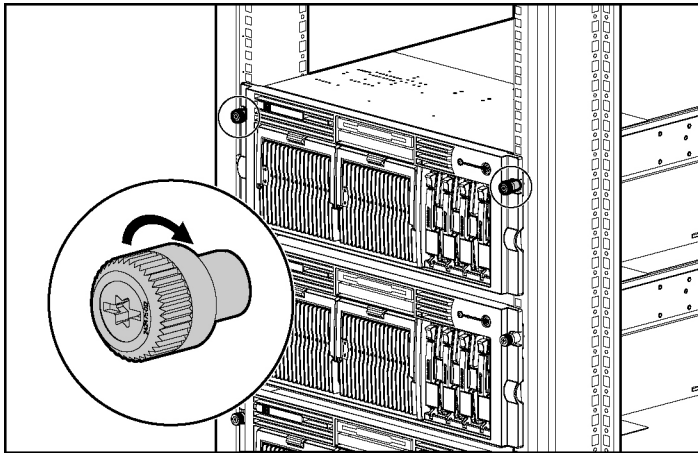
Figure 8-10: Tightening the thumbscrews

Reinstalling the Power Supplies

To reinstall the power supplies, reverse the procedure "Removing a Redundant Hot-Plug Power Supply or Blank" from Chapter 5, "Installing Hardware Options."

Connecting the Power Cord and Peripheral Devices

After the server has been installed in the rack, connect the power cord and peripheral devices to the connectors located on the rear panel of the server. Refer to Figure 8-11 and Table 8-1 to identify the location of the connectors.

> ⚠ **WARNING: To reduce the risk of electric shock or fire, do not plug telecommunications/telephone connectors into the NIC connectors.**

IMPORTANT: If the RILOE II is installed in the server, be sure that you connect the video cable into the video connector on the rear of the RILOE II expansion board. The standard video connector on the server rear panel is not used when the RILOE II is installed. For more information, refer to the documentation that ships with the RILOE II option kit.

Use Figure 8-11 and Table 8-1 to identify connectors on the rear panel of the rack server.
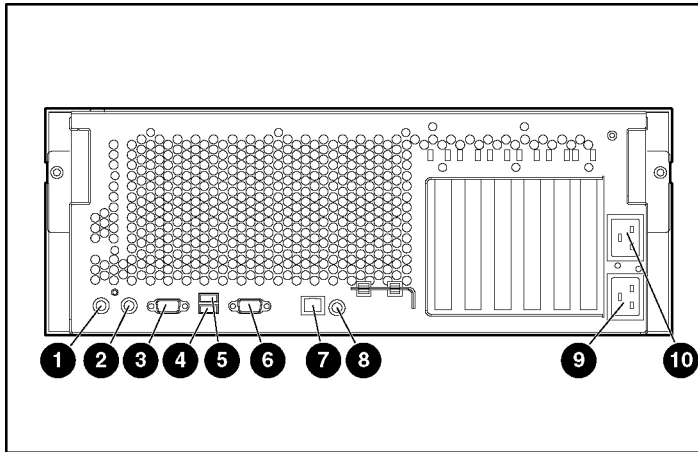
Figure 8-11: Rear panel connectors

Table 8-1: Rear Panel Connectors and Components (Rack Server)

Item	Description	Item	Description
1	Keyboard connector	6	Serial connector
2	Mouse connector	7	Integrated Lights-Out Network port connector
3	Video connector	8	Rear Unit Identification LED button
4	USB connector 1	9	AC inlet (primary)
5	USB connector 2	10	AC inlet (secondary)

Connecting the Power Cord

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

- **Do not disable the power cord grounding plug. The grounding plug is an important safety feature.**

- **Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.**

- **Do not route the power cord where it can be walked on or pinched by items placed against it. Pay particular attention to the plug, electrical outlet, and the point where the cord extends from the server.**

To connect the power cord:

1. Plug it in to the appropriate power supply AC power connector. The power connector for the primary power supply is inlet number one; the power connector for the redundant hot-plug power supply is inlet number two.
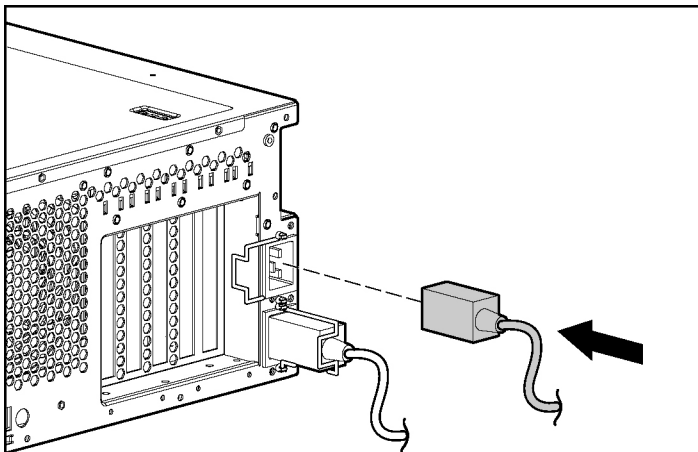
Figure 8-12: Connecting the power cord

2. Secure the retaining clip onto the power cord.
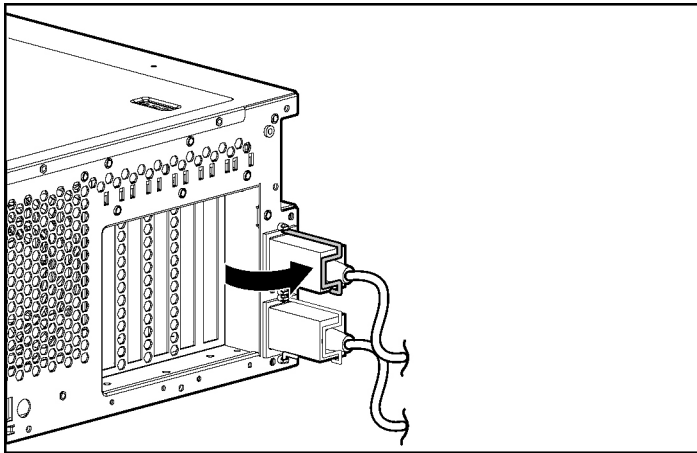
Figure 8-13: Securing the retaining clip

Attaching the Cable Management Arm

The cable management arm ships with a round-hole bracket and a square-hole bracket. Use the appropriate bracket instructions for the server rack.

Attaching the Cable Management Arm to a Square-Hole Rack

IMPORTANT: If attaching the cable management arm to a round-hole rack, refer to "Attaching the Cable Management Arm to a Round-Hole Rack."

1. Slide the bracket onto the rack (1).

2. Insert the bracket hooks into the square holes on the rack, and then push down to secure (2).

3. Tighten the thumbscrew to stabilize the cable management arm on the rack (3).
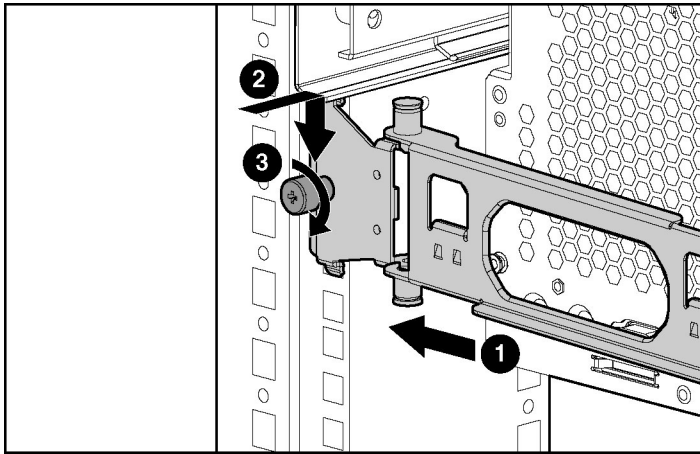
**Figure 8-14: Securing the cable management arm to the
square-hole rack**

Attaching the Cable Management Arm to a Round-Hole Rack

1. Remove the square-hole bracket from the cable management arm by pulling out the spring-activated fasteners (1), and then pulling out the bracket (2).
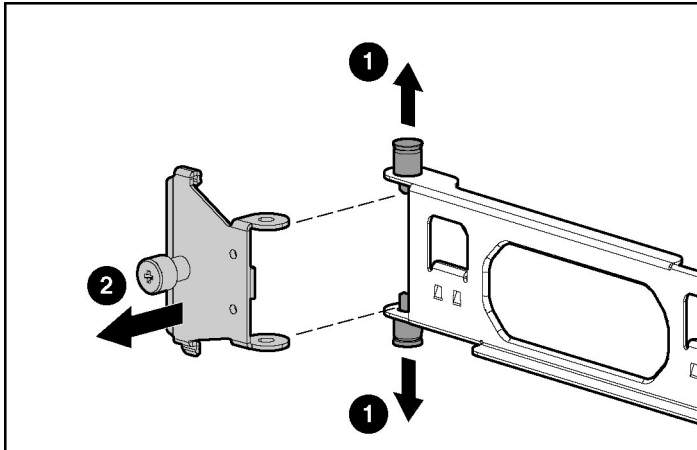
Figure 8-15: Removing the square-hole bracket

2. Attach the round-hole bracket by pulling the spring-activated fasteners on the cable management arm out (1), and then inserting the bracket in between them (2).
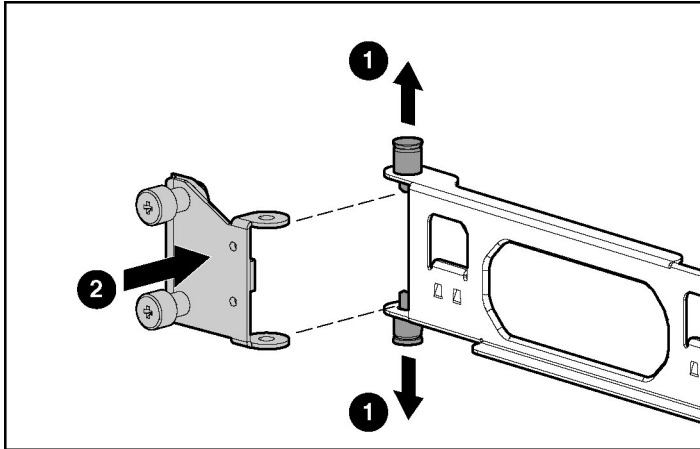
Figure 8-16: Attaching the round-hole bracket to the cable management arm

3. Slide the bracket onto the rack (1).

4. Attach the cable management arm to the round-hole rack, and then secure the thumbscrews (2).
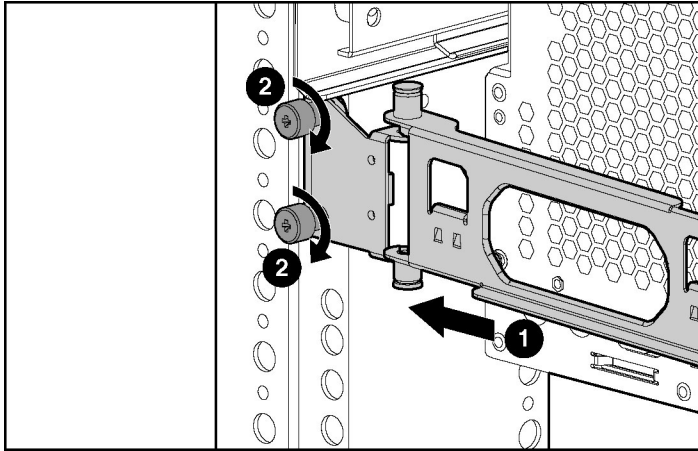
Figure 8-17: Attaching the cable management arm to the round-hole rack

Attaching the Cable Management Arm to the Server

1. Loosen the thumbscrews on the front of the server to enable the server to slide forward.
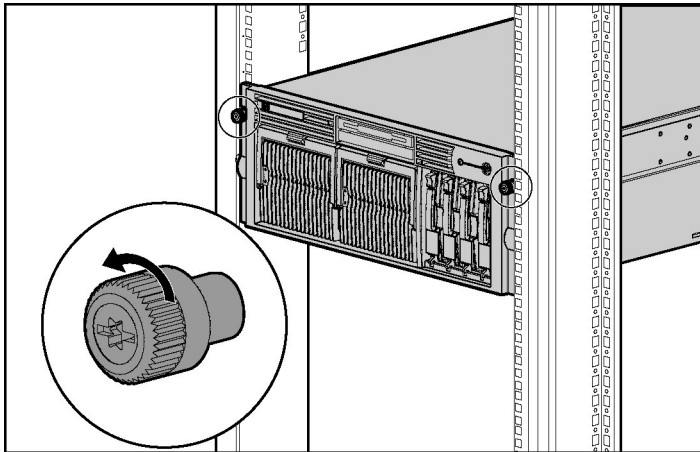
Figure 8-18: Sliding the server forward in the rack

2.   Align the keyholes on the cable management arm with the posts on the server (1), and then secure with the thumbscrew (2).
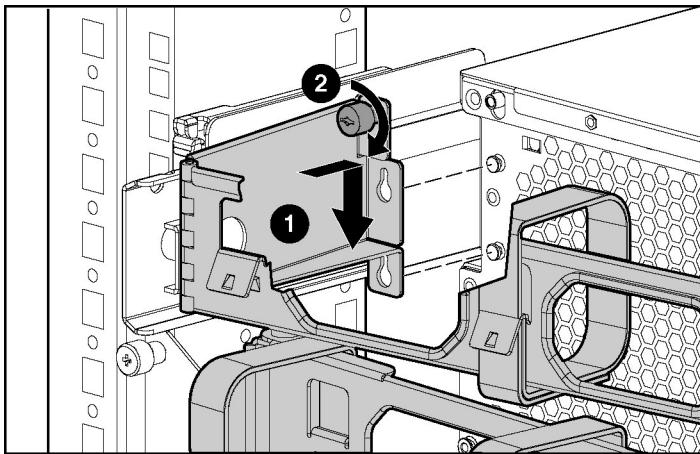
Figure 8-19: Attaching the cable management arm to the server

Securing the Cables to the Cable Management Arm

1. Align the pivot points of the cable management arm by sliding the server as needed.
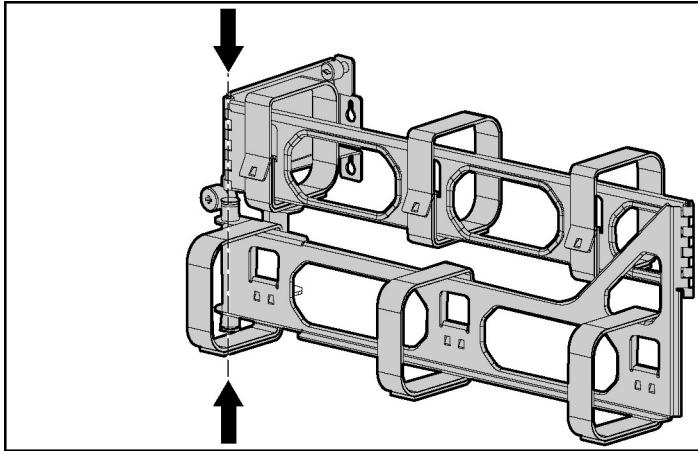
Figure 8-20: Aligning the cable management arm pivot points

2. Pivot the arm away from the server.
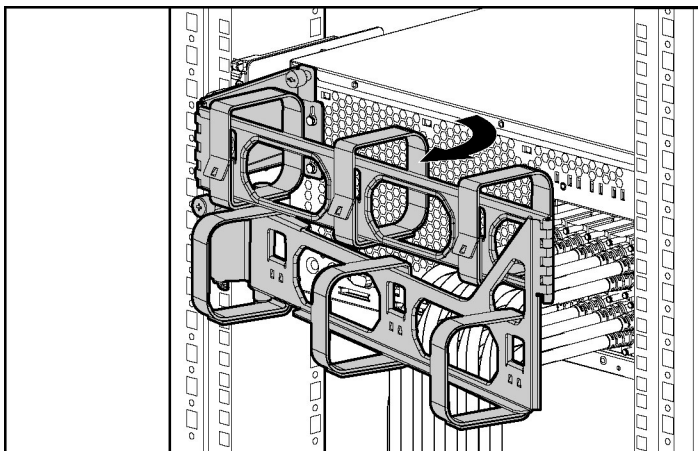
Figure 8-21: Pivoting the cable management arm

3. Secure the cables to the inside of the cable management arm using the Velcro straps.
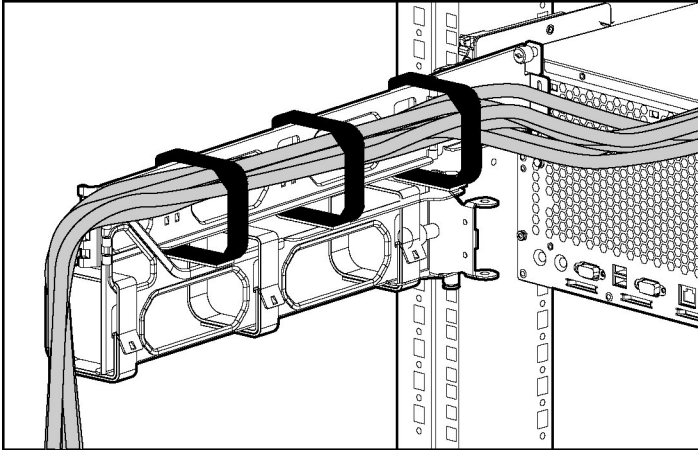
Figure 8-22: Securing cables to the cable management arm

4. Close the cable management arm and finish securing the cables.
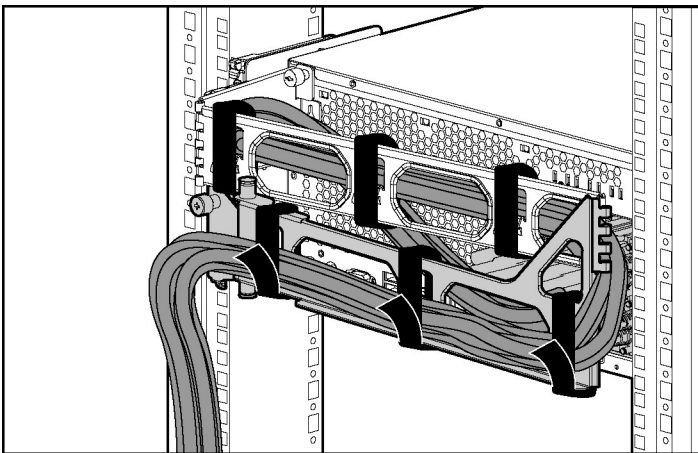
Figure 8-23: Closing the cable management arm

5. Secure the server to the rack.

9

Server Setup

This chapter explains procedures for powering up the server, installing an operating system, and registering the server. It also provides information concerning routine maintenance.

Powering Up the Server

To power up the server:

1. Press the Power On/Standby button on the front of the server.

2. Observe the system power LED. When the system powers up, the LED illumination changes from amber to green.

After the server has successfully powered up, you can begin the configuration process.

Installing an Operating System

To install an operating system on a new or previously unconfigured server, you must configure the server with the RBSU.

To configure the server for the first time:

1. Install all of the selected hardware options. Refer to Chapter 5, "Installing Hardware Options," for detailed instructions.

2. Power up the server.

3. Press the **F9** key to launch RBSU.

4. When prompted, select a language.

5. Select the operating system you want to install on the server. The ProLiant DL580 Generation 2 server supports the following operating systems:

   — Microsoft Windows NT and Windows 2000

   — Linux

   — Novell NetWare

   — Sun Solaris Intel Platform Edition

   A dialog box displays, indicating that the system configuration is complete.

6. Select the memory protection you have chosen for the server.

7. Press the **F10** key to exit RBSU or press any other key to return to the RBSU main menu.

8. After RBSU configures the hardware for the first time, use ProLiant Essentials to install an operating system.

   a. Insert the ProLiant Essentials Foundation Pack or the operating system installation CD.

   b. Restart the server.

   c. Follow the instructions provided by ProLiant Essentials Foundation Pack software or the operating system manufacturer.

For more information about using RBSU or the ProLiant Essentials utility to configure the server, refer to Chapter 10, "Server Configuration and Utilities" and the *ROM-Based Setup Utility User Guide.*

For the most current information about operating system support on ProLiant DL580 Generation 2 servers, refer to the operating system support matrix on the product page at www.hp.com.

If you choose to create a backup of the hardware configuration, you can use the Configuration Replication Utility. For more information, refer to the "ProLiant Essentials Scripting Toolkit" section in Chapter 10, "Server Configuration and Utilities."

Registering the Server

You can register the server from the following website:

www.compaq.com/products/registration

Routine Maintenance

The *HP ProLiant DL580 Generation 2 Server Maintenance and Service Guide* provides specific information required for general maintenance and component replacement, including:

- Spare part numbers

- Removal and replacement procedures

- Diagnostic tools

The *HP ProLiant DL580 Generation 2 Server Maintenance and Service Guide* can be accessed through the Documentation CD or the product website at www.hp.com.

10

Server Configuration and Utilities

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

- ROM-Based Setup Utility (RBSU)

- Enhanced Auto-Configuration Process

- Redundant ROM Support

- ROMPaq Utility

- Smart Components for Remote ROM Flash

- ROM Legacy USB Support

- ProLiant Essentials Foundation Pack

- ProLiant Essentials Diskette Builder

- SmartStart Scripting Toolkit

- Insight Manager 7

- Diagnostics Utility

- Automatic Server Recovery-2 (ASR-2)

- Integrated Management Log (IML)

- Survey Utility

ROM-Based Setup Utility

The RBSU is a configuration utility that is embedded in the server ROM. The RBSU helps you configure certain server hardware settings and prepare the server for operating system installation without using diskettes. The RBSU enables you to view and establish server configuration settings during initial system startup, as well as modify them after the server has been configured.

RBSU performs a wide range of configuration activities including:

- Configuring system devices and installed options

- Viewing system information

- Selecting the operating system

- Selecting the primary boot controller

- Managing storage options

- Configuring advanced memory protection (online spare memory, single-board mirrored memory, and hot-plug mirrored memory)

In addition, RBSU includes other features, which are outlined in the "Using RBSU" section in this chapter.

Navigating RBSU

To navigate RBSU, use the following keys:

- To access RBSU, press the **F9** key during power up.

- To navigate the menu system, use the arrow keys.

- To make selections, press the **Enter** key.

- To exit RBSU, press the **F10** key.

- To return to the previous menu, press the **Esc** key.

Saving RBSU Configuration Settings

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.

Using RBSU

RBSU does not run automatically. The first time you power up the server, the system defaults to Windows 2000 and waits so you can select a different operating system by using RBSU. Press the **F9** key to enter RBSU. While you are in RBSU, press any key to return to the RBSU main menu or press the **F10** key to exit RBSU.

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

RBSU is divided into a series of menu selections designed to configure specific areas of the system. The primary menus are as follows:

- System Options
- PCI-X Devices
- Standard Boot Order (IPL)
- Date and Time
- Server Passwords
- Automatic Server Recovery
- Server Asset Tags
- Advanced Options
- Utility Language

For a complete explanation of RBSU features and functions, refer to the *ROM-Based Setup Utility User Guide* on the Documentation CD.

System Options

The System Options menu is for overall system configuration settings. The following selections are included in this menu:

- **OS Selection** prompts you to select the operating system. This option automatically selects appropriate advanced settings for the selected operating system and must be set before the operating system installation.

- **Embedded COM Port A** enables you to either enable the embedded COM port A at the specified resource setting or disable the option.

- **Embedded Mouse Port** enables you to either enable the embedded mouse at the specified resource setting or disable the option.

- **Integrated Diskette Controller** enables you to enable or disable the floppy controller.

- **NUMLOCK Power-On State** enables you to enable or disable the keyboard NUMLOCK feature at server startup.

- **Embedded NIC PXE Support** enables the user to enable or disable PXE support for the NIC.

- **Diskette Write Control** enables you to configure the write control of the removable media drive (diskette drive). The options are read and write or read only.

- **Diskette Boot Control** enables you to have the system boot from the removable media device (diskette drive).

PCI-X Devices

The **PCI-X Devices** menu option enables you to view and assign the IRQs for all PCI-X devices.

Standard Boot Order (IPL)

The **Standard Boot Order** (IPL) menu option enables you to configure the order of devices used to start an operating system. This feature can be set to select which device the system scans first.

Date and Time

The **Date and Time** menu option enables you to set the system date and time.

Server Passwords

The **Server Passwords** menu enables you to set up passwords to limit access to the system and its setup options. The following selections are available in this menu:

- **Administrator Password** enables you to assign an administrator password. This password prevents unauthorized users from modifying the setup options.

- **Power-On Password** enables you to assign a power-on password. This password prevents unauthorized users from powering on the system.

- **Network Server Mode** enables the user to disable or enable the capability of the system to boot with a locked keyboard or without a keyboard. To unlock the keyboard, enter the Power-On Password.

- **QuickLock** enables you to lock the keyboard and prompts you for the power-on password to unlock the keyboard.

IMPORTANT: If you forget your password, you can clear all passwords by resetting the system maintenance switch. Refer to "System Board Switches" in Appendix E, "System LEDs and Switches."

Automatic Server Recovery

The **Automatic Server Recovery** menu includes the following items:

- **Automatic Server Recovery** enables you to enable or disable the Automatic Server Recovery option.

- **Thermal Shutdown** enables you to disable or enable the system automatic shutdown feature caused by a thermal caution event. This option is enabled by default. HP does not recommend disabling this feature.

Server Asset Tags

The **Server Asset Tags** menu enables you to access the Server Info Text. **Server Info Text** enables you to identify the system with an Asset Tracking Number.

Advanced Options

The **Advanced Options** menu enables you to configure advanced options of the system. The following selections are available in this menu:

- **MPS Table Mode** enables you to change the APIC table setting. The APIC table setting is automatically set by the OS Selection setting.

- **POST Speed Up** enables you to enable or disable the complete memory test.

- **Wake On LAN** enables you to enable or disable Wake On LAN Support.

- **Erase Non-volatile Memory** enables you to reset the configuration settings to their factory defaults.

- **Advanced Memory Protection** enables you to choose one of the following memory modes:

  — **Advanced ECC support** sets the system to use the standard four-way DIMM configuration.

  — **Online spare with ECC support** tests the DIMM configuration and sets the system to use the online spare memory feature. An error message is displayed during POST if the DIMMs are not configured correctly.

— **Single-board mirrored memory with ECC support** tests the DIMM configuration and sets the system to use the single-card mirrored memory feature. An error message is displayed during POST if the DIMMs are not configured correctly.

— **Dual-board hot-plug mirrored memory with ECC support** tests the DIMM configuration and sets the system to use the dual-card mirrored memory feature. An error message is displayed during POST if the DIMMs are not configured correctly.

Utility Language

The **Utility Language** menu enables you to set the display language for RBSU. The following choices are available:

- English
- French
- Italian
- German
- Spanish
- Japanese

Table 10-1 identifies the default settings for options in primary RBSU menus. For a complete explanation of RBSU features and functions, refer to the *ROM-Based Setup Utility User Guide* on the Documentation CD.

Table 10-1: RBSU Default Settings

Menu/Option	Default Setting
System Options	
OS Selection	Windows 2000 Windows Server 2003
Embedded COM Port A	COM 1; IRQ 4
Embedded COM Port B	COM 2; IRQ 3
Integrated Diskette Controller	Enabled
NUMLOCK Power-On State	Off
NIC PXE Support	Enabled
Diskette Read/Write Control	Read and write
Diskette Boot Control	Enabled
IPL Device Boot Order	
CD-ROM	IPL: 1
Diskette Drive (A:)	IPL: 2
Hard Drive (C:)	IPL: 3
PXE	IPL: 4
Server Passwords	
Set Administrator Password	None
Set Power-On Password	None
Network Server Mode	Disabled
QuickLock	Disabled
Automatic Server Recovery	
ASR Status	Enabled
ASR Timeout	10 minutes
Thermal Shutdown	Enabled

Table 10-1: RBSU Default Settings *continued*

Menu/Option	Default Setting
Server Asset Tags	
Server Info Text	None
Advanced Options	
MPS Table Mode	AutoSet Table
Hot-Plug Resources	AutoSet
Post Speed Up	Enabled
POST F1 Prompt	Enabled
Wake On LAN	Disabled
ROM Selection	Use current ROM
Erase Non-volatile Memory	Off
Set CPU Corrected	None (choose 1 or 2)
NMI Debug Button	Enabled
Custom POST Message	None
Processor Hyper-Threading	Enabled
Advanced Memory Protection	
Standard ECC Support	Enabled
Online Spare Support	Disabled
Single-Board Mirrored Memory Support	Disabled
Dual-Board Hot-Plug Mirrored Memory Support	Disabled

Configuring the Memory

To configure memory through RBSU:

1. Press the **F9** key to enter RBSU.

2. Select **Advanced Options**.

3. Select **Advanced Memory Protection**.

4. Select the memory mode.

5. Press the **Enter** key.

6. Press the **Esc** key twice to return to the main RBSU menu.

Enhanced Auto-Configuration Process

During the power-up sequence that occurs the first time that the server is booted, the system ROM automatically configures the entire system without any user intervention.

By default setting, the system is configured for Microsoft Windows 2000. To change any default settings in the auto-configuration process, load RBSU by pressing the **F9** key. This allows you to select the language, operating system, and primary boot controller for the server. Once these settings are set according to your preference, exit RBSU and reboot the server.

The system then attempts to boot first from a bootable CD before booting from the hard drive. For normal operating system installation, insert the operating system installation CD into the CD-ROM drive. If ProLiant Essentials Foundation Pack supports an assisted installation for the operating system you are installing, insert ProLiant Essentials into the CD-ROM drive for an assisted installation.

If a POST error occurs, the system halts, pending a user selection from the menu. To continue the boot process, press the **F1** key, or select one of the other options on the menu.

Redundant ROM Support

The ProLiant DL580 Generation 2 server enables you to upgrade or configure the ROM safely with redundant ROM support. The server has a 4-MB ROM that acts as two, separate 2-MB ROMs. In the standard implementation, one side of the ROM contains the current ROM program version, while the other side of the ROM contains a backup version.

Safety and Security Benefits

When you flash the system ROM, ROMPaq writes over the backup ROM and saves the current ROM as a backup, enabling you to switch easily to the existing ROM version if the new ROM becomes corrupted for any reason. This feature protects the existing 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 in the lower right corner of the screen.

2. Select **Advanced Options**.

3. Select **Redundant ROM**.

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.

When the server 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, the server automatically enters the ROMPaq disaster recovery mode. To perform this procedure, refer to the "ROMPaq Disaster Recovery" section in Appendix H, "Troubleshooting."

ROMPaq Utility

Flash ROM enables you to upgrade the firmware (BIOS) with system or option ROMPaq utilities. To upgrade the BIOS, insert a ROMPaq diskette into the diskette drive and boot the system.

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.

Smart Components for Remote ROM Flash

Smart Components for Remote ROM Flash enables Microsoft Windows NT 4.0 and Windows 2000 operating system administrators to efficiently upgrade and manage system and array controller ROMs. This tool has the following features:

- Works offline and online

- Integrates with other HP software maintenance, deployment, and operating system tools

- Automatically checks for hardware, firmware, and operating system dependencies, and installs only the correct ROM upgrades required by each target server

ROM Legacy USB Support

When using operating systems that support USB, the ProLiant DL580 Generation 2 server supports USB devices, including, but not limited to:

- CD-ROM drives

- Diskette drives

- Keyboard

- Mouse

For other operating systems, the ROM provides USB support for keyboard and mouse, but not for CD-ROM or diskette drives.

ROM Legacy USB support is available during POST, DOS, and while the operating system is running. The ROM does not support hot-plug events for the USB keyboard or USB mouse at any time. The maximum device support is two USB keyboards, two USB mouse devices, and one layer of hubs.

IMPORTANT: The ProLiant Essentials Foundation Pack Windows 95 environment does not support a USB mouse. During the ProLiant Essentials process, you must use a legacy PS/2 mouse.

For a list of operating systems supported by the ProLiant DL580 Generation 2 server, refer to the operating system support matrix on the product website at www.hp.com.

To determine whether an operating system supports a particular feature, refer to the operating system feature matrix on the operating system support page on the HP website.

ProLiant Essentials Foundation Pack

The ProLiant Essentials Foundation Pack is the recommended method for loading system software, thereby achieving a well-integrated server and ensuring maximum manageability and supportability. The ProLiant Essentials Foundation Pack contains diagnostic utilities and ROMPaq tools.

IMPORTANT: Do not use the ProLiant Essentials Foundation Pack to load system software if you purchased the system with a factory-installed operating system. Refer to the *Factory-Installed Operating System Software User Guide* for software installation guidelines.

The ProLiant Essentials Foundation Pack software enables you to perform the following functions:

- Auto-detect and configure the server hardware and drive arrays.

- Install any major server operating system using packaged product CDs.

- Install the latest HP optimized drivers, ROMPaqs, and management agents.

- Deploy and maintain multiple servers using Integration Server.

- Create and copy standard server configuration scripts using the Scripting Toolkit and Configuration Replication Utility.

- Test ProLiant server hardware.

- Create support software diskettes that enable you to update the drivers.

For more information about the ProLiant Essentials Foundation Pack, refer to the documentation that ships with the server.

ProLiant Essentials Diskette Builder

The ProLiant Essentials Diskette Builder is a utility that uses data stored on the ProLiant Essentials Foundation Pack to create support diskettes. You can create support diskettes for specific configuration needs or for software that cannot be used directly from the ProLiant Essentials Foundation Pack. Use the ProLiant Essentials Diskette Builder to create the following support diskettes:

- Array Configuration Utility

- Operating system support

- Server utilities

- Erase utility

- System and Option ROMPaq

To run the Diskette Builder, you need the following:

- A PC with one of the following operating systems:
  — Microsoft Windows 95
  — Microsoft Windows 98
  — Microsoft Windows NT
  — Microsoft Windows 2000
- Several 1.44-MB diskettes

NOTE: All existing data on the diskettes is overwritten.

Insert the ProLiant Essentials Foundation Pack in the workstation drive. The CD automatically runs the Diskette Builder utility. However, if the PC does not support the "auto-run" feature, use Windows Explorer and enter the following command line:

    CD-ROM DRIVE:\DSKBLDR\DSKBLDR.EXE

SmartStart Scripting Toolkit

The SmartStart Scripting Toolkit is a set of DOS-based utilities that enables you to configure and deploy servers in a customized, predictable, and unattended manner. These utilities provide scripted server and array replication for mass server deployment and duplicate the configuration of a configured source server onto target systems with minimum user interaction.

The Configuration Replication Utility is a stand-alone DOS utility that duplicates the settings of an operating RBSU-configured server by saving the server configuration to a scripted file. You can edit and modify settings in the scripted file at the subset level. For example, you can change ASR-2 settings without having to change settings for boot controller order.

For more information, 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 Management CD in the *OVERVIEW.HLP* file.

IMPORTANT: You must install and use Insight Manager 7 to benefit from the 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, in conjunction with ProLiant Essentials Foundation Pack software, enables you to effectively deploy and manage configurations throughout the enterprise using the 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 utilization, 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 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

The Diagnostics utility displays information about the server hardware and tests the system to ensure it is operating properly. The utility is accessible directly from the ProLiant Essentials Foundation Pack without booting the server.

Automatic Server Recovery-2

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, ABEND (abnormal end), or 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.

ASR-2 increases server availability by restarting the server 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 Integrated Management Log (IML) records hundreds of events and stores them in an easy-to-view form. The IML time-stamps each event with one-minute granularity.

Identifying Severity Levels

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

IML requires HP operating-system-dependent drivers. Refer to the ProLiant Essentials Foundation Pack for instructions on installing the appropriate drivers.

Viewing the Log

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

- From within the Insight Manager 7

- From within the Survey Utility

- From within operating-system-specific IML viewers

    — For NetWare, HP IML Viewer

    — For Windows NT, Event Viewer or HP IML Viewer

    — For Linux, HP IML Viewer Application

Insight Manager 7

Insight Manager 7 is a server management tool that provides in-depth fault, configuration, and performance monitoring of hundreds of HP servers from a single management console. The system parameters that are monitored describe the status of all key server components. By being able to view the events that may occur to these components, you can take immediate action.

Use the instructions in the following section to view and print the event list from within Insight Manager 7. You can also mark a critical or caution event as repaired after the affected component has been replaced. For example, when a failed fan is replaced, you can mark the event as repaired, which lowers the severity of the event.

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 the Insight Manager 7, select the appropriate server; then select **View Device Data**. The selected server is displayed 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 the Insight Manager 7, select the appropriate server. The selected server is displayed with buttons around its perimeter.

2. Click **Configuration**.

3. Click **Recovery**.

4. Click **Print**.

Survey Utility

The Survey Utility is a serviceability tool available for Microsoft Windows NT, Novell NetWare, Linux, and UnixWare that delivers online configuration capture and comparison to maximize server availability. It is available on the Management CD in the Server Setup and Management pack, or it is available by following the support link on the product website at www.hp.com.

Refer to the Management 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.

A

Regulatory Compliance Notices

Regulatory Compliance Identification Numbers

For the purpose of regulatory compliance certifications and identification, the HP ProLiant DL580 Generation 2 server is assigned a series number. The series number can be found on the product label, along with the required approval markings and information. When requesting certification information for this product, always refer to this series number. This series number should not be confused with the marketing name or model number for the ProLiant DL580 Generation 2 server.

Federal Communications Commission Notice

Part 15 of the Federal Communications Commission (FCC) Rules and Regulations has established Radio Frequency (RF) emission limits to provide an interference-free radio frequency spectrum. Many electronic devices, including computers, generate RF energy incidental to their intended function and are, therefore, covered by these rules. These rules place computers and related peripheral devices into two classes, A and B, depending upon their intended installation. Class A devices are those that may reasonably be expected to be installed in a business or commercial environment. Class B devices, including personal computers, are those that may reasonably be expected to be installed in a residential environment. The FCC requires devices in both classes to bear a label indicating the interference potential of the device as well as additional operating instructions for the user.

The rating label on the device shows which class (A or B) the equipment falls into. Class B devices have an FCC logo or FCC ID on the label. Class A devices do not have an FCC logo or FCC ID on the label. Once the class of the device is determined, see the following corresponding statement.

Class A Equipment

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.

Class B Equipment

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. 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. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio or television technician for help.

Declaration of Conformity for Products Marked with the FCC Logo—United States Only

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For questions regarding the product, contact:

Hewlett-Packard Company
P. O. Box 692000, Mail Stop 530113
Houston, Texas 77269-2000

or call 1-800-652-6672. (For continuous quality improvement, calls may be recorded or monitored.)

For questions regarding this FCC declaration, contact:

Hewlett-Packard Company
P. O. Box 692000, Mail Stop 510101
Houston, Texas 77269-2000

or call 281-514-3333.

To identify this product, refer to the part, series, or model number found on the product.

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.

Mouse Compliance Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Canadian Notice (Avis Canadien)

Class A Equipment

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.

Class B Equipment

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

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

European Union Notice

Products with the CE Marking comply with both the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.

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

- EN55022 (CISPR 22)—Electromagnetic Interference

- EN50082-1 (IEC801-2, IEC801-3, IEC801-4)—Electromagnetic Immunity

- EN60950 (IEC950)—Product Safety

Japanese Notice

ご使用になっている装置にVCCIマークが付いていましたら、次の説明文を
お読み下さい。

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準
に基づくクラスB情報技術装置です。この装置は、家庭環境で使用すること
を目的としていますが、この装置がラジオやテレビジョン受信機に近接して
使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。

VCCIマークが付いていない場合には、次の点にご注意下さい。

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に
基づくクラスA情報技術装置です　この装置を家庭環境で使用すると電波
妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ず
るよう要求されることがあります。

BSMI Notice

<div align="center">

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。

</div>

Laser Devices

All HP systems equipped with a laser device comply with safety standards, including International Electrotechnical Commission (IEC) 825. With specific regard to the laser, the equipment complies with laser product performance standards set by government agencies as a Class 1 laser product. The product does not emit hazardous light; the beam is totally enclosed during all modes of customer operation and maintenance.

Laser Safety Warnings

⚠ **WARNING: To reduce the risk of exposure to hazardous radiation:**

- **Do not try to open the laser device enclosure. There are no user-serviceable components inside.**

- **Do not operate controls, make adjustments, or perform procedures to the laser device other than those specified herein.**

- **Allow only authorized service technicians to repair the laser device.**

Compliance with CDRH Regulations

The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration implemented regulations for laser products on August 2, 1976. These regulations apply to laser products manufactured from August 1, 1976. Compliance is mandatory for products marketed in the United States.

Compliance with International Regulations

All HP systems equipped with laser devices comply with appropriate safety standards including IEC 825.

Laser Product Label

The following label or equivalent is located on the surface of the HP supplied laser device.

CLASS 1 LASER PRODUCT

This label indicates that the product is classified as a CLASS 1 LASER PRODUCT. This label appears on a laser device installed in your product.

Laser Information

Laser Type	Semiconductor GaAIAs
Wave Length	780 nm +/- 35 nm
Divergence Angle	53.5 degrees +/- 0.5 degrees
Output Power	Less than 0.2 mW or 10,869 W·m-2 sr-1
Polarization	Circular 0.25
Numerical Aperture	0.45 inches +/- 0.04 inches

Battery Replacement Notice

The 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. Replacement is to be done by an authorized service provider using the HP spare designated for this product. For more information about battery replacement or proper disposal, contact an authorized reseller or your authorized service provider.

> **WARNING: The 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 HP 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, an authorized service technician, or their agents.

Power Cords

The power cord set included in the server meets the requirements for use in the country where you purchased your server. If you need to use this server in another country, you should purchase a power cord that is approved for use in that country.

The power cord must be rated for the product and for the voltage and current marked on the product's electrical ratings label. The voltage and current rating of the cord should be greater than the voltage and current rating marked on the product. In addition, the diameter of the wire must be a minimum of 1.00 mm² or 18AWG, and the length of the cord must be between 6 feet (1.8 m) and 12 feet (3.6 m). If you have questions about the type of power cord to use, contact your authorized service provider.

Route power cords so that they will not be walked on, or pinched by, items placed upon them or against them. Pay particular attention to the plug, electrical outlet, and the point where the cords exit from the product.

B

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 ± 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.

- Use heel straps, toe straps, or boot straps 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.

C

System Battery

HP ProLiant DL580 Generation 2 servers have memory devices that require a battery to retain stored information.

Battery Replacement

When the server no longer automatically displays the correct date and time, you may need to replace the battery that provides power to the real-time clock. Under normal use, battery life is usually about 5 to 10 years. Use an HP 220-mAh lithium, 3-volt replacement battery.

> ⚠ **WARNING: To reduce the risk of electric shock or damage to the equipment:**
>
> - **Do not disable the power cord grounding plug. The grounding plug is an important safety feature.**
>
> - **Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.**
>
> - **Disconnect power from the server or other product by unplugging the power cord from either the electrical outlet or the server or other product.**

Use the following procedure to install a new battery:

1. Power down the server. Refer to "Powering Down the Server" in Chapter 5, "Installing Hardware Options."

2. Extend the server from the rack. Refer to "Extending the Server from the Rack" in Chapter 5, "Installing Hardware Options."

3. Remove the rear access panel. Refer to "Opening and Removing the Access Panels" in Chapter 5, "Installing Hardware Options."

4. Locate the battery on the system board.
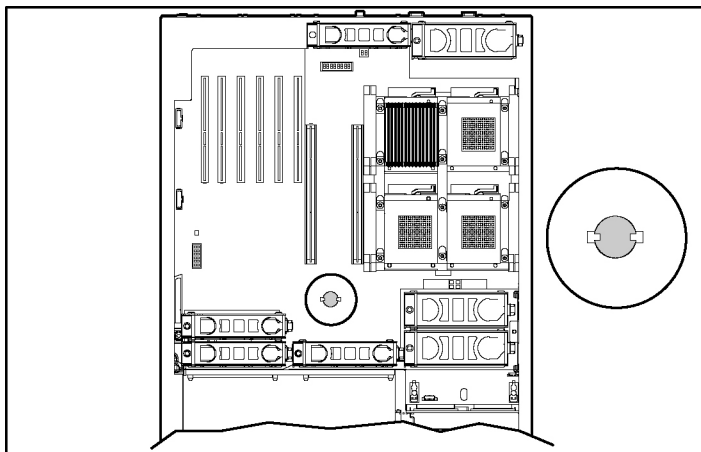
Figure C-1: Battery location on the system board

5. Remove the existing battery.
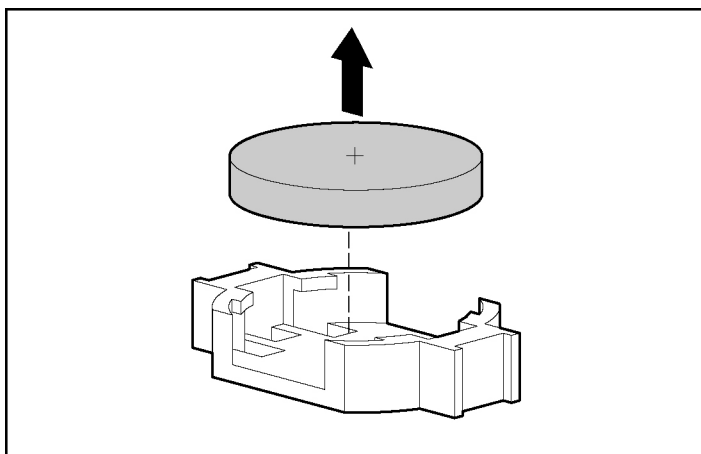
Figure C-2: Removing a battery

6. Install the new battery.
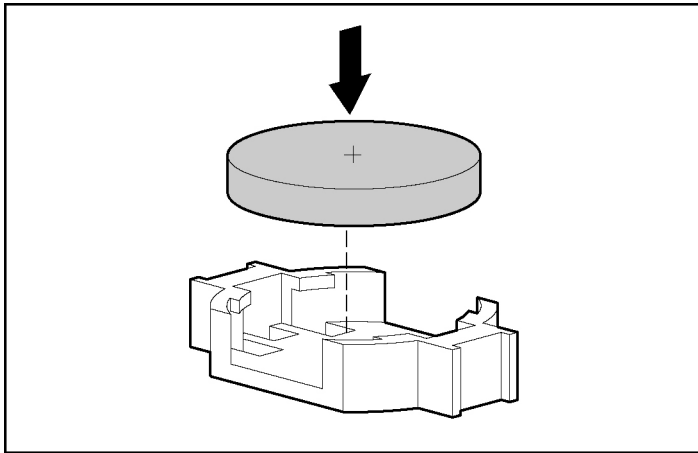
Figure C-3: Installing a new battery

7. Close the rear access panel.

8. Restore the server into the rack.

9. Run the RBSU to reconfigure the system with the new battery.

D

Cabling Guidelines

This appendix provides guidelines that help you make informed decisions about cabling the server and hardware options to optimize performance.

Internal Cabling Configurations

The following sections explain internal cabling configurations for the ProLiant DL580 Generation 2 server. These sections include the following cabling procedures:

- Hot-plug SCSI hard drives (for optional controllers)

- Battery backed write cache enabler (BBWC)

- 30-pin Remote Insight Lights-Out Edition II (RILOE II) board

Hot-Plug SCSI Hard Drives

Figures D-1 and D-2 show cabling an optional SCSI controller to the 4 x 1 drive cage in both duplex and simplex modes. Refer to Chapter 5, "Installing Hardware Options," for information on simplex and duplex modes.
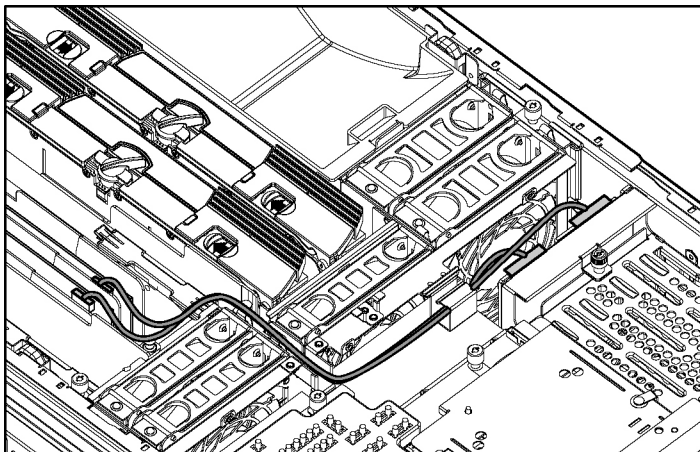
Figure D-1: Cabling the SCSI backplane to SCSI (duplex mode)
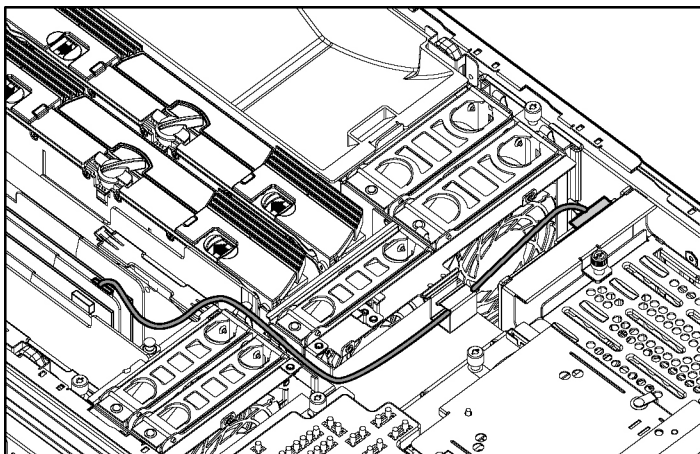
Figure D-2: Cabling the SCSI backplane to SCSI (simplex mode)

Battery-Backed Write Cache Enabler Connector Cable

Figure D-3 shows how to connect the BBWCE module to the 5i Plus Memory Module.
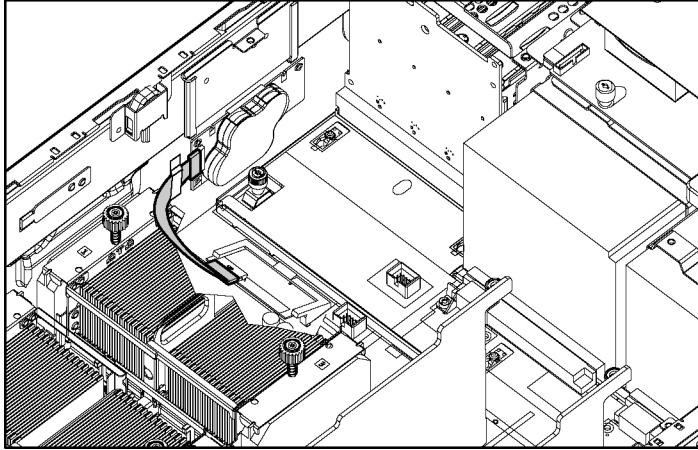
Figure D-3: Cabling the BBWCE module to the 5i Plus Memory Module

Once you have connected the cable, secure the cable in the clip that is on the side of the server next to the BBWCE connector.

30-Pin Remote Insight Lights-Out Edition II Board

To connect the RILOE II board to the server:

1. Connect the 30-pin connector on the remote insight internal cable to the 30-pin remote insight connector on the RILOE II. This is located on the edge of the board.

2. Connect the 30-pin connector on the other end of the remote insight internal cable to the 30-pin remote insight connector on the server system board.
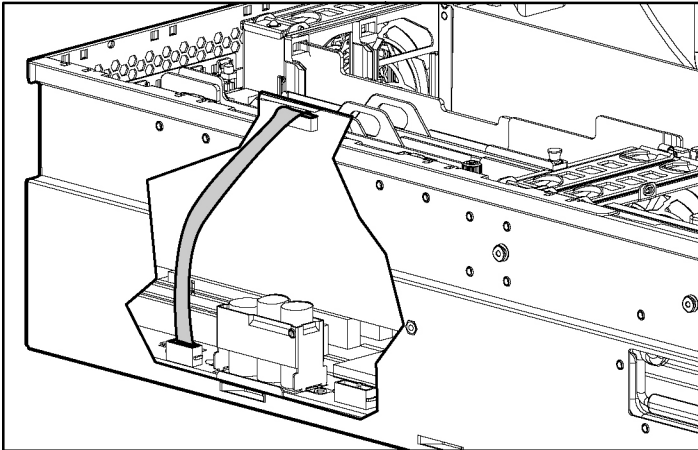
Figure D-4: Cabling the RILOE II to the system board

E

System LEDs and Switches

This appendix provides information about locating and using system LEDs and switches in the HP ProLiant DL580 Generation 2 server. For additional information about troubleshooting procedures, refer to Appendix H, "Troubleshooting."

System LEDs

The ProLiant DL580 Generation 2 server contains several sets of LEDs that indicate the status and settings of hardware components. This appendix discusses the following types and locations of LEDs:

- Front panel

- Hot-plug SCSI hard drive

- Hot-plug fans

- Hot-plug power supplies

- PCI-X Hot Plug

- Memory board

- Battery-Backed Write Cache Enabler (BBWCE)

- QuickFind Diagnostic Display

Front Panel LEDs

The front panel has four LEDs that indicate the status of the server. Use Figure E-1 and Table E-1 to identify the location and status of each of the LEDs.
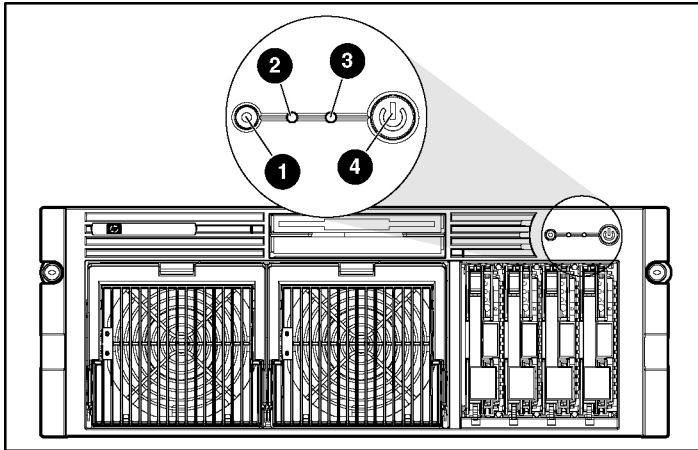
Figure E-1: Front panel LEDs

Table E-1: Front Panel LEDs

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

Hot-Plug SCSI Hard Drive LEDs

The hard drive LEDs, located on each physical drive, are visible on the front of the server or external storage unit. They provide activity, online, and fault status for each drive when configured as part of an array and attached to a powered-on controller. Their behavior may vary depending on the status of other drives in the array. Use Figure E-2 and Table E-2 to identify the location and status of each of the LEDs.
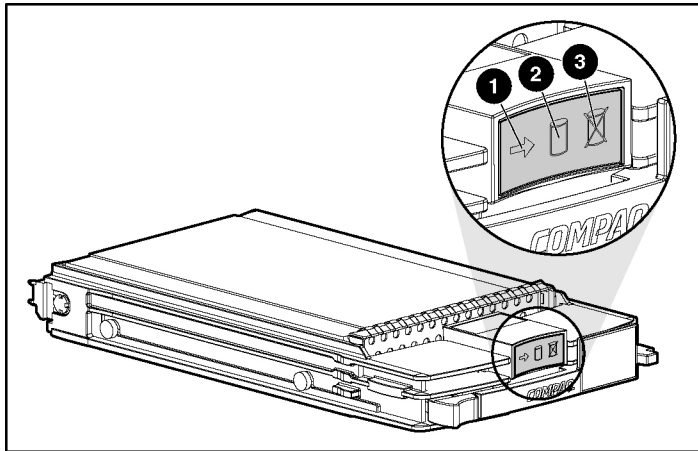
Figure E-2: Hot-plug SCSI hard drive LEDs

Table E-2: Hot-Plug SCSI Hard Drive LEDs

Item	Description	Status
1	Drive activity	On = Drive activity
		Off = No drive activity
2	Online status	Flashing = Online activity
		Off = No online activity
3	Fault status	Flashing = Fault-process activity
		Off = No fault-process activity

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

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

Hot-Plug Fan LED

In the ProLiant DL580 Generation 2 server, the seven hot-plug system fans are installed as dual-fan assemblies. Each assembly is monitored by an LED attached to the system board and read from the top of the assembly inside the chassis.

The hot-plug fan LED provides a visual reference for the status of each fan. Verify the status of the fans by noting the color of the LED at the fan location. Use Figure E-3 and Table E-4 to identify the location and status of each of the LEDs.
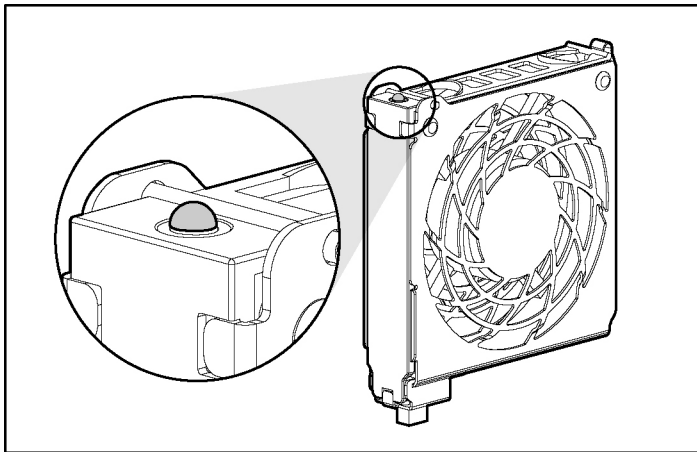
Figure E-3: Hot-plug fan LED

Table E-4: Hot-Plug Fan LED

LED Status	Description
Off	Power is not applied to the fan
Green	Power is applied to the fan and the fan is functional
Amber	Fan failure

Hot-Plug Power Supply LEDs

Determine the hot-plug power supply status by noting the color of the LED on the power supply unit. Use Figure E-4 and Table E-5 to identify the location and status of each of the LEDs.
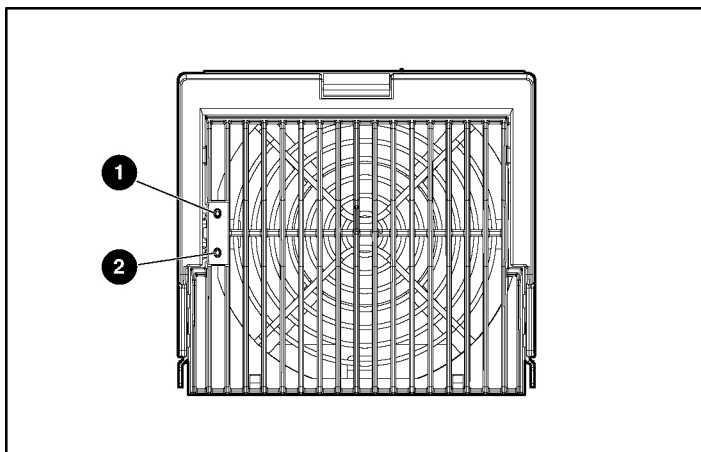
Figure E-4: Hot-plug power supply LEDs

Table E-5: Hot-Plug Power Supply LED Combinations

1 Power LED (green)	2 Fault LED (amber)	Status
Off	Off	No AC power
Off	On	No power to this specific power supply Or Power supply failure
Blinking	Off	AC power present System in standby mode
On	Off	Power supply on and working properly
On	Blinking	Power supply current limit exceeded

PCI-X Hot Plug LEDs

The PCI-X Hot Plug LEDs at each expansion slot provide a visual reference of the status of each board slot. The LEDs are viewed from the rear of the server or by opening the rear access panel. Use Figures E-5 and E-6, and Tables E-6 and E-7 to identify the location and status of each of the LEDs.
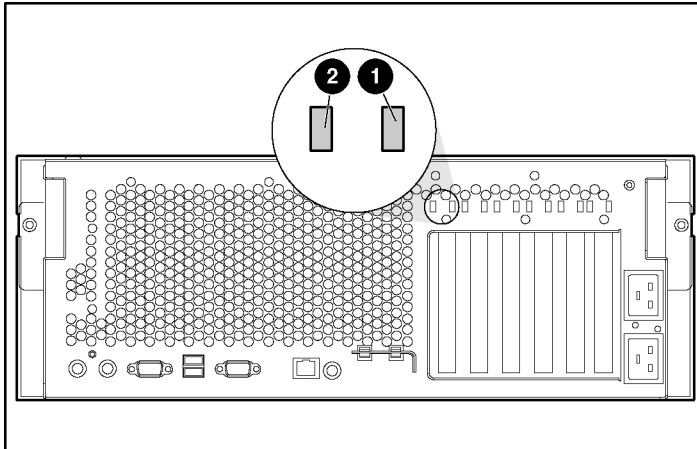
Figure E-5: External PCI-X Hot Plug LEDs

Table E-6: External PCI-X Hot Plug LEDs

Item	Component
1	Power LED (green)
2	Fault LED (amber)
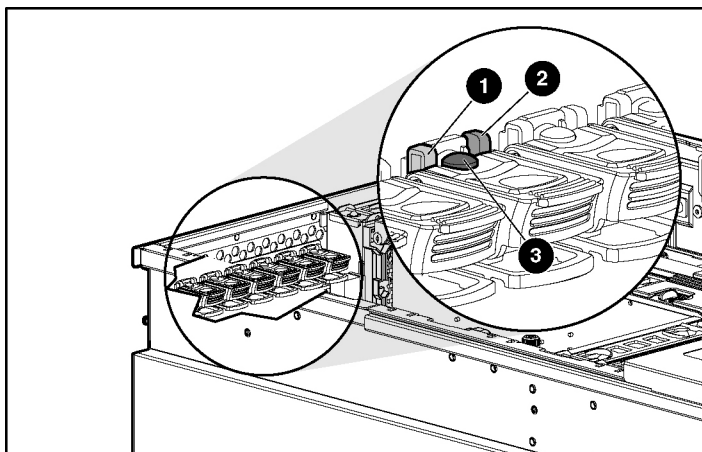
Figure E-6: Internal PCI-X Hot Plug LEDs and button

Table E-7: Internal PCI-X Hot Plug LEDs and Button

Item	Description	Status
1	Slot fault LED (amber)	On = Slot requires attention. There may be a problem with the slot, the PCI-X board, or the driver. Check the green LED before opening the slot.
		Off = Slot does not require attention.
2	Slot power LED (green)	On = Power is applied to the slot. Do **not** open.
		Blinking = Power to slot is being turned off or on. This process may take several minutes. Do not open the slot release lever until the green LED is completely off. Do **not** open.
		Off = You may replace or remove a board in this slot only.
3	PCI-X Hot Plug button (port)	

Note: If the any of the LEDs indicates an error, refer to Chapter 7, "PCI-X Technology" or Appendix H, "Troubleshooting," for more information.

Memory Board LEDs

Use Figure E-7 and Table E-8 to identify the memory board LEDs and their statuses.
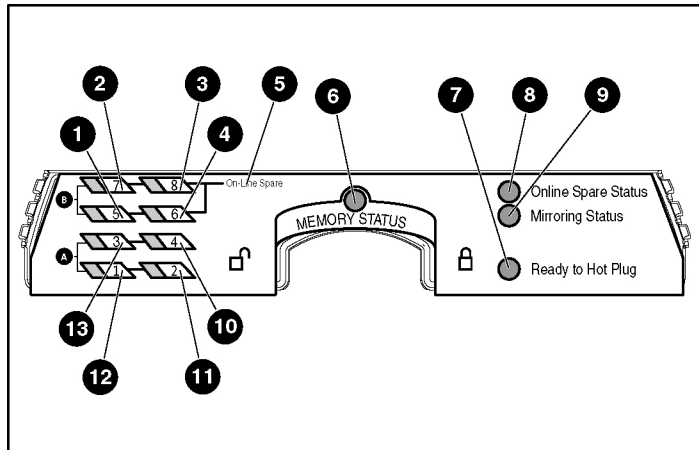
Figure E-7: Memory board LEDs

Table E-8: Advanced ECC (Standard) Memory Mode

Item	Description	Indicator	Status
1 – 4 and 10 – 13	DIMMs 1 – 8	Off	DIMM is not installed.
		Green	DIMM is installed.
		Amber	Memory error has occurred on this DIMM.
		Flashing amber	Configuration error has occurred.
6	Memory Status	Off	Memory board is offline.
		Green	Memory board is online.
		Flashing green	Memory board is busy.
		Amber	Memory error has occurred on this memory board.
7	Ready to Hot Plug	Off	Do not remove memory board—advanced ECC memory does not support hot-removal of boards.
	All LEDs	Off	Memory board is not seated properly or locking switch is not engaged; memory board can be removed safely.
		Flashing amber	**CAUTION:** Memory board is in use; relock it immediately.

Table E-9: Online Spare Memory Mode

Item	Description	Indicator	Status
5	Online Spare text	Off	Bank is not configured as an online spare bank.
		Green	Bank is configured as an online spare bank.
		Flashing green	Failure has occurred and online spare bank is active.
6	Memory Status	Off	Memory board is offline.
		Green	Memory board is online.
		Flashing green	Memory board is busy.
		Amber	Memory error has occurred on this memory board.
7	Ready to Hot Plug	Off	Do not remove memory board—online spare memory does not support hot-plug capability.
8	Online spare Status	Off	Memory board is not configured for online spare memory.
		Green	Online spare memory is functioning properly.
		Amber	Memory error has occurred and system has failed over to the online spare bank.
	All LEDs	Off	Memory board is not seated properly or locking switch is not engaged; memory board can be removed safely.
		Flashing amber	**CAUTION:** Memory board is in use; relock it immediately.

Table E-10: Single-Board Mirrored Memory LEDs

Item	Description	Indicator	Status
1 – 4 and 10 – 13	DIMMs 1 – 8	Off	DIMM is not installed.
		Green	DIMM is installed.
		Amber	Memory error has occurred on this DIMM.
		Flashing amber	Configuration error has occurred.
6	Memory Status	Off	Memory board is offline.
		Green	Memory board is online.
		Flashing green	Memory board is busy.
		Amber	Memory error has occurred on this memory board.
7	Ready to Hot Plug	Off	Do not remove memory board—single-board mirrored memory does not support hot-plug capability.
9	Mirroring Status	Off	Memory board is not configured for mirrored memory.
		Green	Single-board mirrored memory is functioning properly.
		Amber	Memory error has occurred and system has failed over to the mirrored bank.
	All LEDs	Off	Memory board is not seated properly or locking switch is not engaged; memory board can be removed safely.
		Flashing amber	**CAUTION:** Memory board is in use; relock it immediately.

Table E-11: Hot-Plug Mirrored Memory LEDs

Item	Description	Indicator	Status
1 – 4 and 10 – 13	DIMMs 1 – 8	Off	DIMM is not installed.
		Green	DIMM is installed.
		Amber	Memory error has occurred on this DIMM.
		Flashing amber	Configuration error has occurred.
6	Memory Status	Off	Memory board is offline.
		Green	Memory board is online.
		Flashing green	Memory board is busy.
		Amber	Memory error has occurred on this memory board.
7	Ready to Hot Plug	Off	Do not remove memory board—memory board is not ready for removal.
		Green	Okay to remove memory board.
9	Mirroring Status	Off	Memory board is not configured for mirrored memory.
		Green	Hot-plug mirrored memory is functioning properly.
		Amber	Memory error has occurred and system has failed over to the mirrored board.
	All LEDs	Off	Memory board is not seated properly or locking switch is not engaged; memory board can be removed safely.
		Flashing amber	**CAUTION:** Memory board is in use; relock it immediately.

Battery-Backed Write Cache Enabler

When the BBWCE is connected to the controller and the server is powered on, the green LED indicates the status of the battery charge. When the battery is connected to the controller and the server is powered down, the amber LED indicates the status of the data retention. Use Figure E-8 and Table E-12 to identify the location and status of each of the LEDs.
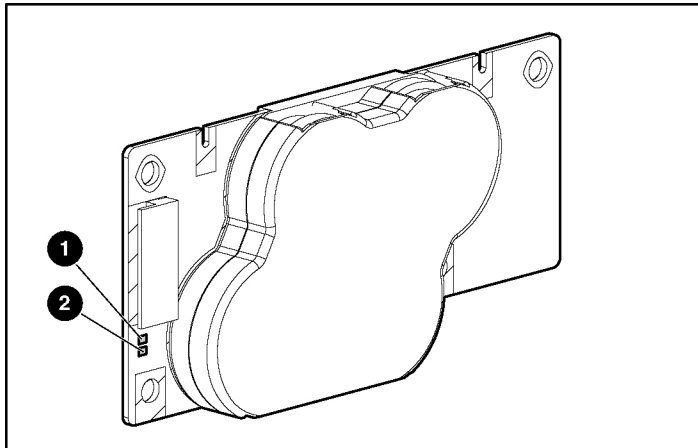
Figure E-8: BBWCE LEDs

Table E-12: BBWCE LEDs

Server Status	LED Color	LED Status	Battery Module Status
Server is on and has normal run time	Green	On	Fast charging
	Green	Off	Trickle-charging
	Amber	On	Short in the connection of one or more of the four button cells within the battery module
	Amber	Blinking	Open in the circuit between the positive and negative terminals of the battery module
	Amber	Off	Battery module status is normal

continued

Table E-12: BBWCE LEDs *continued*

Server Status	LED Color	LED Status	Battery Module Status
Server is on and is in the first 30 seconds after power-up	Amber or green	On	Temporary lock-out state, data was lost due to cable being detached
Server is off and is in data retention mode	Amber	Blinking every 15 seconds	User data held in write cache is being backed up

CAUTION: After the server is powered down, wait 15 seconds and then check the illumination pattern of the LEDs before unplugging the cable from the battery module.

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

- If neither LED blinks after 15 seconds, it is safe to remove the cable from the battery module.

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

QuickFind Diagnostic Display

A new feature on the ProLiant DL580 Generation 2 server is the LEDs that are located on the front access panel. These LEDs enable you to quickly diagnosis a problem with a component in the server simply by referring to the top of the system. Use Figure E-9 and Table E-13 to identify the location and status of each of the LEDs.
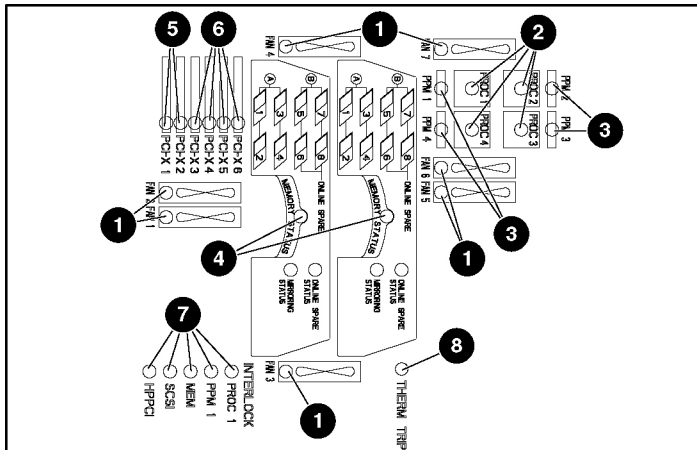
Figure E-9: QuickFind Diagnostic Display LEDs

Table E-13: QuickFind Diagnostic Display LEDs

Item	Description	Status
1	Hot-plug fans	
2	Processors	
3	PPMs	
4	Memory	Amber = Failure detected
5	Non-hot-plug PCI-X	Off = Normal
6	Hot-plug PCI-X	
7	Interlock	
8	Thermtrip	

System Board Switches

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

The ProLiant DL580 Generation 2 server has three switch banks:

- System maintenance switch (SW4)

- System ID switch (SW7)

- iLO/Spread Spectrum switch (SW8)

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

System Maintenance Switch (SW4)

Use Figure E-10 and Table E-14 to identify the system maintenance switch location and settings. The system maintenance switch:

- Enables or disables the diskette boot option

- Enables or disables power-on password protection

- Clears all configuration information from nonvolatile RAM

- Prevents system nonvolatile RAM from accepting configuration changes

- Prepares the server to accept ROMPaq disaster recovery operations
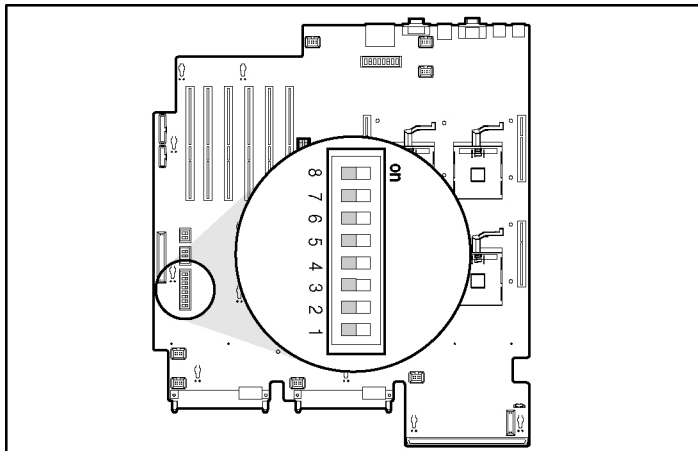
Figure E-10: System maintenance switch (SW4)

Table E-14: System Maintenance Switch (SW4)

Position	Default	Function	Description	Settings
1		Reserved		
2	Off	Lock configuration	Enables or disables configuration changes in nonvolatile RAM (NVRAM)	**Open (off)** Configuration can be changed. **Closed (on)** Configuration is locked and cannot be changed.
3		Reserved		
4	Off	Diskette boot override	Enables or disables booting from diskette drive Both settings enable you to read from and write to the diskette after the system completes the boot sequence.	**Open (off)** The diskette drive boot is controlled by the configuration. **Closed (on)** The diskette drive boots regardless of the configuration.
5	Off	Password disable	Enables or disables password protection.	**Open (off)** Power-on password is enabled. **Closed (on)** Power-on password is disabled.
6	Off	Configuration validation	Invalidates nonvolatile RAM (NVRAM) configuration information	**Open (off)** NVRAM is valid. **Closed (on)** NVRAM is invalid, and configuration is lost.
7	Off	Boot-block enabler		**Open (off)** Boot block is disabled. **Closed (on)** Boot block is enabled.

continued

Table E-14: System Maintenance Switch (SW4) *continued*

Position	Default	Function	Description	Settings
8	Off	Hot spare boot enabler		**Open (off)**
				Hot spare boot is disabled.
				Closed (on)
				Hot spare boot is enabled.

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

Enabling ROMPaq Disaster Recovery Mode

A corrupted system ROM requires you to recreate the ROM BIOS by using the ROM Flash Utility. This can be accomplished only when the system is in disaster recovery mode. Set configuration switches 1, 4, 5, and 6 on the system maintenance switch block to "on" to enable disaster mode.

IMPORTANT: Before enabling ROMPaq disaster recovery mode, refer to the *HP Servers Troubleshooting Guide* for complete instructions on disaster recovery.

System ID switch (SW7)

Use Figure E-11 and Table E-15 to identify the system ID switch location and settings.
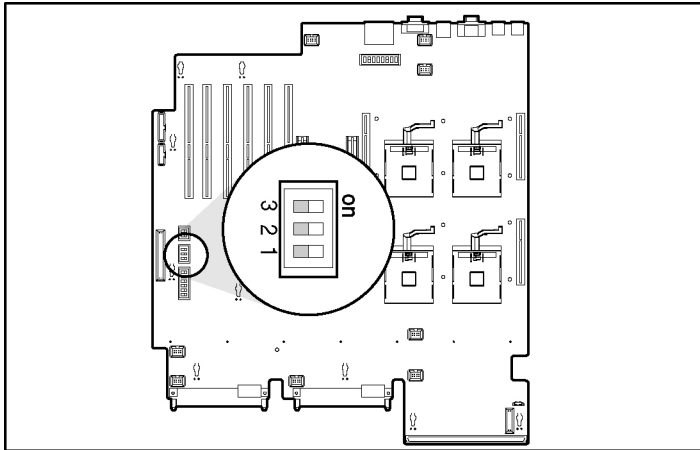
Figure E-11: System ID switch (SW7)

Table E-15: System ID Switch (SW7)

Position	Default	Function	Description	Settings
1 through 3	Chassis ID	Used to allow 8 ID combinations, if used as another system.		

iLO/Spread Spectrum Switch (SW8)

The iLO/Spread Spectrum switch (SW8) is a two-position switch that is used for miscellaneous purposes. The iLO security override switch allows the administrator full access to the iLO processor. This access is necessary if the administrator lost their password or if the iLO boot-block needs to be flashed. Use Figure E-12 and Table E-16 to identify the iLO/Spread Spectrum switch location and settings.
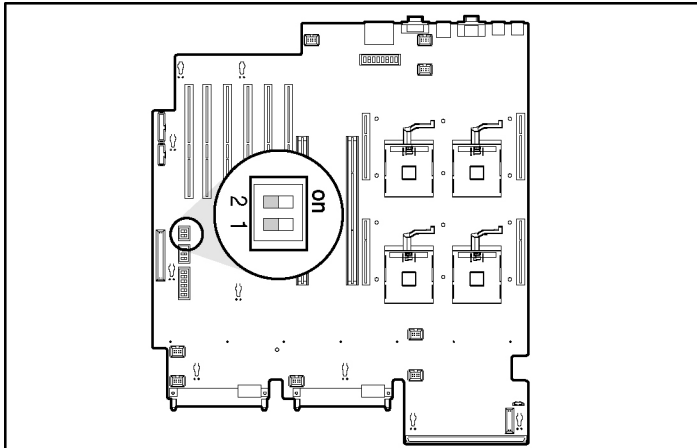
Figure E-12: iLO/Spread Spectrum switch (SW8)

Table E-16: iLO/Spread Spectrum Switch (SW8)

Position	Default	Function	Description	Settings
1	Off	iLO security override	The override allows the administrator full access to the iLO processor.	**Open (off)** Normal **Closed (on)** Override
2	Off	Spread spectrum enabler		**Open (off)** Clock spread spectrum is disabled. **Closed (on)** Clock spread spectrum is enabled.

F

Server Error Messages

Use POST error messages to assist in troubleshooting and performing basic diagnostic functions in the HP ProLiant DL580 Generation 2 server. For a complete listing of error messages and other troubleshooting information, refer to the *HP Servers Troubleshooting Guide* provided on the Documentation CD or online on the product page at www.hp.com.

G

Server Specifications

Server Specifications

This appendix provides operating and performance specifications for the HP ProLiant DL580 Generation 2 server.

Table G-1: Server Specifications

Feature	Units
Dimensions	
Height	17.5 cm (6.88 in)
Depth	69.2 cm (27.25 in)
Width	46.3 cm (19.0 in)
Weight	30.8 kg, minimum (68 lb, minimum)
	44.5 kg, maximum (98 lb, maximum)
International input requirements	
Rated input voltage	180 V to 264 V
Rated input frequency	47 Hz to 63 Hz
Rated input current	6 A
U.S. input requirements	
Rated input voltage	90 V to 132 V
Rate input frequency	47 Hz to 63 Hz
Rated input current	12 A

continued

Table G-1: Server Specifications *continued*

Feature	Units
Power supply output power	
Rated steady-state power	800 W
Maximum peak power	800 W
Temperature range	
Operating	10° to 35°C (50° to 95°F)
Non-operating	-30° to 60°C (-20° to 140°F)
Relative humidity (non-condensing)	
Operating	20% to 80%
Non-operating	5% to 90%
Maximum wet bulb temperature	38.7°C (101.7°F)
Heat dissipation	3900 BTU/Hr

H

Troubleshooting

This appendix provides specific troubleshooting information for the HP ProLiant DL580 Generation 2 server. Use it to find details about server startup and operation errors.

For information on LEDs and switches specific to the server, refer to Appendix E, "System LEDs and Switches."

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

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

This appendix includes the following topics:

- When the Server Does Not Start

  You are provided with initial instructions on what to try and where to go for help for the most common problems encountered during the initial Power-On Self-Test (POST). A successful startup requires the server to complete this test each time you power up, before the server can load the operating system and start running software applications.

- Diagnostic Steps

  If the server does not power up after you have performed initial troubleshooting procedures, use the tables in this section to identify possible reasons for the problem, possible solutions, and references to other sources of information.

- Problems After Initial Boot

  Once the server has passed the POST, you may still encounter errors, such as an inability to load the operating system. You are provided with instructions on what to try and where to go for help when you encounter errors after the server completes the POST.

- ROMPaq Disaster Recovery

  During troubleshooting, it may become apparent that the system ROM is corrupted. Because the server has redundant ROM capability, you can use the backup ROM until it is feasible to bring the server down. If both ROMs are corrupted, you will need to perform the ROMPaq disaster recovery procedure before the server will boot.

- Other Information Resources

  This section provides a list of reference information available for the server.

For troubleshooting information beyond the scope of this guide, both general and specific to ProLiant DL580 Generation 2 servers, refer to Table H-8.

When the Server Does Not Start

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

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

If the server does not start:

1. Verify that the server and monitor are plugged into a working outlet.

2. Make sure that the power source is working properly:

   a. Check the status using the system power LED.

   b. Verify that the Power On/Standby button was pressed firmly.

3. Make sure that the power supplies are working properly by checking the power supply LEDs.

   NOTE: For more information about the location and status of LEDs, refer to Appendix E, "System LEDs and Switches." For more information about power, refer to the *HP Servers Troubleshooting Guide*.

4. Check the interlock LEDs on the hood label. If any LEDs are amber, reseat the component.

5. If the system does not complete POST or start loading an operating system, refer to the *HP Servers Troubleshooting Guide*.

6. If the server is rebooting repeatedly, verify that the system is not rebooting due to a problem that initiates an ASR-2 reboot. Some operating systems reboot server when an error occurs. This is the default in Windows 2000.

7. Restart the server.

IMPORTANT: If the server does not restart, proceed to the following section, "Diagnostic Steps."

8. Check the server for the following normal power-up sequence to verify that the system meets the minimal hardware requirements and is powered up during normal operations:

   a. The power button LED turns from standby (amber) to on (green).

   b. The fans start up. It is normal for the fans to initially run at full speed and then slow down.

9. Check the monitor for the following messages that verify the system meets the minimal hardware requirements and is powered up during normal operations:

   a. ProLiant logo

   b. BIOS information

   c. Copyright information

   d. Processor initialization

   e. Multi-initiator configuration

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

   f. PXE initialization

   g. Option ROMs

   h. SCSI devices

10. The operating system loads to complete the boot process.

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

Diagnostic Steps

If the server does not power up, or powers up but does not complete POST, answer the questions in Table H-1 to determine appropriate actions based on the symptoms observed. The flow of questions reflects the usual flow of events during a power-on sequence. A flow chart following this table illustrates the recommended diagnostic steps and decision options.

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

Table H-1: Diagnostic Steps

Question	Action
Question 1: Is the system power LED off?	If no, continue to question 2. If yes, refer to Table H-2.
Question 2: Is the system power LED green?	If yes, continue to question 3. If no, refer to Table H-3.
Question 3: Is the external health LED green?	If yes, continue to question 4. If no, refer to Table H-4.
Question 4: Is the internal health LED green?	If yes, continue to question 5. If no, refer to Table H-5.
Question 5: Is the monitor displaying information?	If yes, use the POST messages for further diagnosis. Refer to Table H-6 for details. If no, refer to Table H-6.

Table H-2: Is the System Power LED Off?

Answer	Possible Reasons	Possible Solutions
Yes, it is off	The system is not connected to AC power, or no AC power is available.	Be sure that the power cord is connected to the power supply.
	A power supply problem exists. The power supply may not be connected or inserted properly, it may have a damaged connector, or it may have failed.	Be sure that the power supply is undamaged and fully seated, and then verify that the power supply LED is green when you power up the server. Refer to Appendix E, "System LEDs and Switches," for locations and states.
	A broken connection exists between the front panel LED assembly and the removable media board.	Be sure that the power switch cable assembly is inserted properly to the removable media board.
	The front panel LED assembly has failed.	Refer to the *HP Servers Troubleshooting Guide* for further options.
		If these solutions do not solve the problem, contact an authorized service provider for assistance.
No		If the system power button LED is amber, press the Power On/Standby button.
		Refer to Table H-3.

Note: For cabling configurations, refer to Appendix D, "Cabling Guidelines." For LED locations and functions, refer to Appendix E, "System LEDs and Switches."

Table H-3: Is the System Power LED Green?

Answer	Possible Reasons	Possible Solutions
No, it is off	Power On/Standby button has not been pressed firmly.	Firmly press the power button.
	A power supply problem exists. The power supply may not be connected or inserted properly, it may have a damaged connector, or it may have failed.	Be sure that the power supply is undamaged, the power supply is fully seated, and the power supply LED is green.
	The system may have experienced a short.	Check for bent connector pins and improperly seated expansion boards.
	The front panel LED assembly has failed.	Be sure that the front panel LED assembly cable is connected to the power backplane.
		If these solutions do not solve the problem, contact an authorized service provider for assistance.
Yes		If the system power button LED is green, refer to Table H-4.

Note: For cabling configurations, refer to Appendix D, "Cabling Guidelines." For LED locations and functions, refer to Appendix E, " System LEDs and Switches."

Table H-4: Is the External Health LED Green?

Answer	Possible Reasons	Possible Solutions
No, it is amber	One power supply has failed; therefore, power supply redundancy is lost.	Be sure that each installed power supply is securely connected to an AC power source.
		Locate the amber power supply LED to identify the failed power supply.
		Contact an authorized service provider for replacement parts and service.
No, it is red	All installed power supplies have experienced a failure.	Remove all AC power from power supplies and reconnect to clear the error condition.
		Replace the power supply. Contact an authorized service provider for replacement parts and service.
Yes		Refer to Table H-5 if the external health LED is green.

Note: For cabling configurations, refer to Appendix D, "Cabling Guidelines." For LED locations and functions, refer to Appendix E, "System LEDs and Switches."

Table H-5: Is the Internal Health LED Green?

Answer	Possible Reasons	Possible Solutions
For component failure identification (amber LED), check the hood label.		
No, it is amber	A processor is in pre-failure condition.	Use internal component failure LEDs to identify:
	A DIMM is in pre-failure condition.	• Missing components
	One memory bank is valid, but another bank is missing a DIMM.	• Degraded components
		• Failed components
	One memory bank is valid, but another bank has mismatched DIMMs installed.	• Improperly installed components
		For corrective procedures, refer to the maintenance and service guide on the Documentation CD that ships with the server.
	One memory bank is valid, but another bank has an unsupported DIMM type installed.	
	A redundant fan has failed.	Contact an authorized service provider for replacement parts and service.

continued

Table H-5: Is the Internal Health LED Green? *continued*

Answer	Possible Reasons	Possible Solutions
No, it is red	A processor has failed.	Use internal component failure LEDs to identify:
	Processor 1 is not installed.	
	A processor is an unsupported type.	• Missing components
		• Failed components
	Processor voltage requirements are mismatched.	• Improperly installed components
		• Thermal event
	Processor does not have an associated PPM installed.	For corrective procedures, refer to the maintenance and service guide on the Documentation CD that ships with the server.
	A PPM has failed.	
	A DIMM has experienced a multibit error.	
	DIMM pairs have mismatched DIMMs.	Contact an authorized service provider for replacement parts and service.
	DIMMs are missing.	
	DIMMs are an unsupported type.	
	A required fan has failed.	
	A thermal event has occurred.	
	A component is not properly seated.	Check the interlock LEDs on top of the front access panel. Be sure that all components are seated securely.
	Memory board is missing.	Add the memory board.
Yes		If the internal health LED is green, refer to Table H-6.

Note: For LED locations and functions, refer to Appendix E, "System LEDs and Switches."

Table H-6: Is the Monitor Displaying Information?

Answer	Possible Reasons	Possible Solutions
No	The monitor may not have power.	Be sure that the monitor AC power cord is plugged in and that the monitor power button has been pressed.
	Video may not be connected properly.	If a video card is installed, be sure that the video cable is properly connected.
		If a RILOE II expansion board is installed, verify that the video cable is connected to the video connector on this expansion board.
		Verify the video connections. Refer to the *HP Servers Troubleshooting Guide*.
	Non-volatile RAM (NVRAM) may be corrupted.	Clear NVRAM. Refer to the **Caution** following the table. Refer to Appendix E for the correct switch setting.
		Are there any audible indicators, such as a series of beeps? A series of beeps is the audible signal indicating the presence of a POST error message. Refer to the *HP Servers Troubleshooting Guide* for a complete description of each beep sequence and the corresponding error messages.
	The system ROM and redundant ROM may be corrupted.	If the system ROM and redundant ROM are corrupt, refer to "ROMPaq Disaster Recovery" in this chapter for instructions on performing a recovery procedure.
		If these steps do not solve the problem, contact an authorized service provider for assistance.
Yes		Video is available for diagnosis. Determine the next action by observing POST progress and error messages. Refer to the *HP Servers Troubleshooting Guide* for a complete description of each POST error message.

> △ **CAUTION:** Clearing NVRAM deletes your configuration information. Refer to the server maintenance and service guide for complete instructions before performing this operation or data loss could occur.

Problems After Initial Boot

Once the server has passed POST, you may still encounter errors, such as an inability to load the operating system. Use Table H-7 to troubleshoot server installation problems that occur after the initial boot.

Refer to the *HP Servers Troubleshooting Guide* for more information.

Table H-7: Problems After Initial Boot

Problem	Possible Reasons	Possible Solutions
System cannot load ProLiant Essentials Foundation Pack.	ProLiant Essentials Foundation Pack requirement not performed.	Check the ProLiant Essentials Release Notes provided in the ProLiant Essentials Online Reference Information on the ProLiant Essentials Foundation Pack.
	CD-ROM drive is not properly seated.	Reseat CD-ROM drive.
	Insufficient memory is available.	A rare Insufficient Memory message may display the **first** time ProLiant Essentials is booted on certain unconfigured systems. Cold-boot the machine with the ProLiant Essentials Foundation Pack inserted in the CD-ROM drive to correct the problem.
	Existing software is causing conflict.	Run the System Erase Utility. Read the **Caution** at the end of the table. Refer to the instructions in the *HP Servers Troubleshooting Guide*.

continued

Table H-7: Problems After Initial Boot *continued*

Problem	Possible Reasons	Possible Solutions
ProLiant Essentials fails during installation.	Error occurs during installation.	Follow the error information provided. If it is necessary to reinstall, run the System Erase Utility. Read the **Caution** at the end of the table. Refer to the instructions in the *HP Servers Troubleshooting Guide*.
	CMOS is not cleared.	Run the System Erase Utility. Read the **Caution** at the end of the table. Refer to the instructions in the *HP Servers Troubleshooting Guide*.
Server cannot load operating system.	Required operating system step was missed.	Follow these steps: 1. Note at which phase the operating system failed. 2. Remove any loaded operating system. 3. Refer to the operating system documentation. 4. Install the operating system again.
	Installation problem occurred.	Refer to the operating system documentation and to the ProLiant Essentials Release Notes on the ProLiant Essentials for Servers CD. Run RBSU and check the OS Selection menu.
	Problem was encountered with the hardware you have added to the system.	Refer to the documentation provided with the hardware. Refer to Appendix D, "Cabling Guidelines" to identify correct SCSI bus cabling configuration for the unit.
	Problem was encountered with hardware added to a new configure-to-order system (where available).	You must complete the factory-installed operating system software installation before adding new hardware to the system. Be sure you are following the instructions provided in the *Factory-Installed Operating System Software Installation Guide*. Remove the new hardware and complete the software installation. Then, reinstall the new hardware.

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

Refer to the *HP Servers Troubleshooting Guide* 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

ROMPaq Disaster Recovery

A corrupted system ROM requires that you recreate the ROM BIOS by a process called disaster recovery. This operation can be accomplished only when the system is in disaster recovery (emergency repair boot) mode. When both system ROMs are corrupt, the system defaults into disaster recovery mode automatically and the server emits two extended beeps.

IMPORTANT: Before performing this operation, refer to the *HP Servers Troubleshooting Guide* for complete instructions on disaster recovery.

To perform ROMPaq disaster recovery:

1. Power down the server. Refer to Chapter 5, "Installing Hardware Options."

2. Extend the server from the rack. Refer to Chapter 5, "Installing Hardware Options."

3. Remove the rear access panel. Refer to Chapter 5, "Installing Hardware Options."

4. Set system maintenance switches 2 and 6 to the "on" position. For the location of these switches, refer to Appendix E, "System LEDs and Switches."

5. Power up the server. After the system powers on, it repeatedly emits two long beeps. Refer to Chapter 9, "Server Setup."

6. Power down the server again. If necessary, perform a forced shutdown by pressing the power button for 4 seconds.

7. Set system maintenance switches 2 and 6 back to the default position (off).

8. Replace the access panels. Refer to Chapter 5, "Installing Hardware Options."

9. Restore the server in the rack. Refer to Chapter 5, "Installing Hardware Options."

10. Power up the system.

11. Insert a ROMPaq diskette with the latest system ROM that you have downloaded by following the support link on the product page at www.hp.com.

    IMPORTANT: The ROMPaq will flash both sides of the redundant ROM. This process may take up to 10 minutes.

12. Wait until the server emits three rising beeps, indicating the completion of the ROM flash process.

13. Restart the server.

Other Information Resources

Refer to the following additional information for help.

Table H-8: Troubleshooting Resources

Resource	Description
HP Servers Troubleshooting Guide	This is a resource for obtaining troubleshooting information that is beyond the scope of this document. It includes general hardware and software troubleshooting information for all ProLiant servers, a complete list of error messages along with explanations of probable causes, and a list of remedial measures. This guide resides on the Documentation CD that ships with the server. To be sure that you have the most up-to-date copy of the *HP Servers Troubleshooting Guide* document, visit the product website at www.hp.com.
HP ProLiant DL580 Generation 2 Server Maintenance and Service Guide	This resource provides a complete list of all replacement parts available, along with instructions on removal and replacement. Locate this guide on the Documentation CD that ships with the server and on the product website at www.hp.com.
	Follow the link for maintenance and service guides and download the document provided for the server.
Other Online Documentation	Product Bulletin QuickSpecs
	OS Support Matrix

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

Index