COMPAQ

ProLiant DL320

Setup and Installation Guide

First Edition (September 2000)
Part Number 203836-001
Compaq Computer Corporation

Notice

Compaq ProLiant DL320 Setup and Installation Guide
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About This Guide

This guide is designed to be used as step-by-step instructions for installation and as a reference for operation, troubleshooting, and future upgrades. The chapters are written in a logical sequence to expedite first-time installation. An overview of the chapters follows.

The ProLiant DL320 server contains unique features and options, as well as software to enhance configuration and operation. To appreciate the server's capabilities, see Chapter 1, "Server Features."

Before beginning the server installation, you must choose an appropriate location in which to install your ProLiant DL320 server and install your internal options. See Chapter 2, "Planning the Server Installation," and Chapter 3, "Installing Hardware Options."

Installing your ProLiant DL320 server into a Compaq rack with standard rack management hardware requires the installation of the cable support bracket. See Chapter 4, "Installing the Server."

In Chapter 5, "Cabling Guidelines," you can identify all of the standard cabling configurations and learn about optional internal and external cabling configurations for the ProLiant DL320.

Configuring your ProLiant DL320 server for the first time is made easier with utilities on the Compaq SmartStart and Support Software CD. The SmartStart utility can assist you by installing drivers for hardware and operating systems. See Chapter 6, "Server Configuration and Utilities."

Compaq's standard management software includes the Integrated Management Log (IML) that records diagnostic information. Review the capabilities and functions of this software feature in Chapter 7, "Integrated Management Log."

To prevent hardware damage and loss of data, the ProLiant DL320 server is designed to operate only when all components are functioning properly. The server generates event messages and/or suspends operation if a component becomes degraded from wear or becomes unseated from its connection. Appendix E, "Troubleshooting," helps you determine the source of the error and suggests steps to remedy the situation.

The appendices at the end of this guide provide supplementary and reference information, such as regulatory notices, guidelines for preventing electrostatic damage to components, server-specific error messages you may encounter when operating this server, explanations of LED indicators and switches, troubleshooting techniques for easily pinpointing any problems encountered during operation, operating specfiications, and battery replacement for the ProLiant DL320 server.

Text Conventions

This document uses the following conventions to distinguish elements of text:

Keys	Keys appear in boldface. A plus sign (+) between two keys indicates that they should be pressed simultaneously.
USER INPUT	User input appears in a different typeface and in uppercase.
FILENAMES	File names appear in uppercase italics.
Menu Options, Command Names, Dialog Box Names	These elements appear in initial capital letters.
COMMANDS, DIRECTORY NAMES, and DRIVE NAMES	These elements appear in uppercase.
Type	When you are instructed to *type* information, type the information **without** pressing **Enter**.
Enter	When you are instructed to *enter* information, type the information and then press **Enter**.

Symbols in Text

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

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

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

IMPORTANT: Text set off in this manner presents clarifying information or specific instructions.

NOTE: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Symbols on Equipment

These symbols are located on equipment in areas where hazardous conditions may exist.

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 your 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.
 Weight kg Weight lb	This symbol indicates that the component exceeds the recommended weight for one individual to handle safely. **WARNING:** To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manual material handling.

⚠ Important Safety Information

Before installing this product, read the *Important Safety Information* document provided.

Getting Help

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

Compaq Technical Support

In North America, call the Compaq Technical Phone Support Center at 1-800-OK-COMPAQ[1]. This service is available 24 hours a day, 7 days a week.

[1] For continuous quality improvement, calls may be recorded or monitored.

Outside North America, call the nearest Compaq Technical Support Phone Center. Telephone numbers for worldwide Technical Support Centers are listed on the Compaq website. Access the Compaq website by logging on to the Internet:

http://www.compaq.com

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

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

Compaq Website

The Compaq website has information on this product as well as the latest drivers and Flash ROM images. You can access the Compaq website by logging on to the Internet:

http://www.compaq.com

Compaq Authorized Reseller

For the name of your nearest Compaq Authorized Reseller:

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

Chapter **1**

Server Features

The Compaq *ProLiant*™ DL320 ultra-dense, one-way rack server delivers performance and scalability in a flexible, easy to manage design. Optimized for quick, high-volume deployment, the ProLiant DL320 server is an excellent platform for front-end Internet services and data center environments.

ProLiant DL320 Server

The following features are standard on the ProLiant DL320 server, unless otherwise noted:

- Intel Pentium III processor, with 256-KB L2 cache and 133-MHz front-side system bus
- Single processor capability
- Support for up to 2GB of PC133-MHz ECC registered, SDRAM DIMMs
- Two embedded Compaq NC3163 Fast Ethernet network interface controllers (NICs) with 10/100 Wake on LAN (WOL) support
- Integrated ATI Rage XL Video Controller with 4-MB video memory
- Integrated Single Channel Wide Ultra2 SCSI Controller Module (SCSI models only)
- Ultra ATA/100 Controller Module (ATA models only)
- Capacity for two 1-inch ATA or SCSI non-hot-plug hard drives
- One full-length 64-bit PCI slot operating at 33 MHz

- Front panel status LED indicators
- Two Universal Serial Bus (USB) ports
- Optional CD-ROM/diskette drive assembly

ProLiant DL320 servers also support tool-free in-rack accessibility to major components.

Among its standard features, the ProLiant DL320 server has minimized cabling, an integrated processor power module, and a unit identification switch that simplifies the logistics of service procedures. The ProLiant DL320 server also supports numerous optional features, including memory upgrades, a CD-ROM/diskette drive assembly, full-graphic remote management capability, and additional connectivity for enhanced array control of internal and external storage devices via an optional PCI expansion board. In-rack serviceability is possible with an optional rack management solution that contains ball-bearing slide rails and a cable management system.

This combination of features, performance, form factor, and Compaq manageability enables the ProLiant DL320 server to support Web and application hosting and infrastructure applications while providing maximum density in rack configurations.

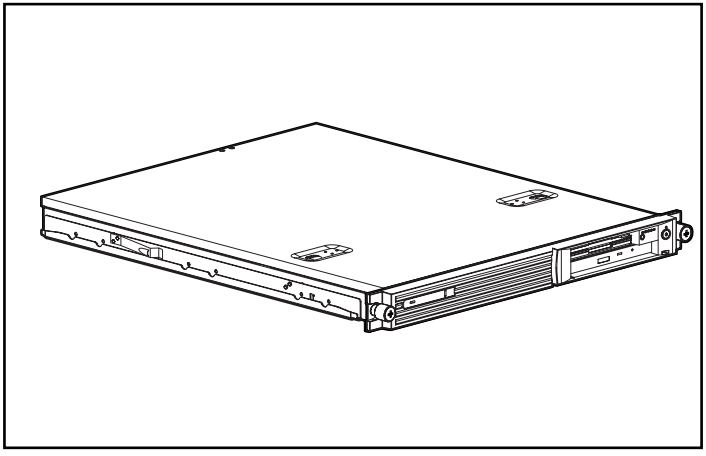

Figure 1-1. Compaq ProLiant DL320 server

Industry Support

Compaq delivers extensive testing and support for major server operating systems. Because Compaq provides an industry standard bus for expansion, you have access to thousands of high-performance PCI expansion boards, as well as support for ATA or SCSI devices.

Standard Features

The features described in the following sections are standard on all Compaq ProLiant DL320 servers, unless otherwise specified.

Processors

ProLiant DL320 servers support the following advanced processor features:

- Integrated Level 2 cache
- Integrated processor power module (PPM)
- Processor configurations and models for an Intel processor with 133-MHz front-side bus (FSB) operation

System Memory

ProLiant DL320 servers support the following memory features:

- 133-MHz registered SDRAM memory (Synchronous DRAM)
- Error checking and correcting (ECC) memory for detecting and correcting single-bit memory errors
- System memory expandable to 2 GB (four DIMM sockets)
- Support for installing a single DIMM module at a time

Expansion Slot

ProLiant DL320 servers provide support for peripheral components. The expansion slot on the PCI riser board assembly is a 64-bit PCI expansion slot that provides data transfer at up to 267 MB/s.

The PCI bus provides peripheral transactions at a system clock speed of 33 MHz.

Integrated Network Interface Controllers

The standard network interface controllers (NICs) provided with your ProLiant DL320 server have the following features:

- Two embedded Compaq NC3163 Fast Ethernet NICs 10/100 WOL with Unshielded Twisted Pair (UTP) support
- Preboot Execution Environment (PXE) support on NIC 1 for downloading a complete operating system configuration from your network
- Autosensing LAN capable of 10 or 100 Mbit/s
- Full-duplex Ethernet for two-way transmission
- Wake On LAN (WOL) support
- Two RJ-45 connectors for 10-BaseT or 100TX Ethernet

For more information about the integrated NICs, refer to the Documentation CD shipped with your server.

Internal Storage Devices

The ProLiant DL320 server can house up to four storage devices:

- Up to two 1-inch height Compaq ATA or SCSI non-hot-plug hard drives ❶
- A removable CD-ROM/diskette drive assembly ❷ including the following:
  - Low-profile 3.5-inch diskette drive
  - Low-profile CD-ROM drive

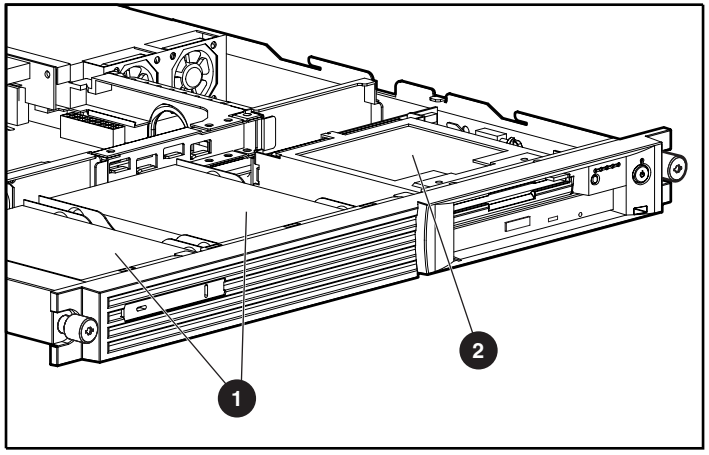

Figure 1-2. ProLiant DL320 server drive positions (front view)

Standard Interfaces

The ProLiant DL320 server is equipped with the following standard interfaces:

- Serial (teal)
- Video (blue)
- Keyboard (purple)
- Mouse (green)
- Two embedded Compaq NC3163 Fast Ethernet NICs 10/100 WOL with Unshielded Twisted Pair (UTP) support
- IDE/diskette interface for the CD-ROM/diskette drive assembly
- Interface cable connector for the Remote Insight Lights-Out Edition option
- Two Universal Serial Bus (USB) connectors

Video

Standard video integration in ProLiant DL320 servers includes the following:

- Integrated video controller with maximum resolution of 1280 × 1024 noninterlaced resolution at 16.7 million colors
- Support for SVGA and VGA graphics resolution
- 4-MB video memory

ROM

Compaq ROM features include the following:

- Compaq *ROMPaq*™ Utility for BIOS firmware upgrade
- ROM-Based Setup Utility (RBSU) for system configuration

Power Supply

The ProLiant DL320 server's standard power supply includes the following:

- 180-watt power supply
- Auxiliary power supply output for Compaq Remote Insight Lights-Out Edition PCI board and WOL network interface controllers

Optional Rack Deployment Solutions

The ProLiant DL320 server ships standard with fixed rails and supports several rack deployment options.

Sliding Rail and Cable Management System Option

The sliding rail and cable management system option allows you to mount the ProLiant DL320 server on ball-bearing rails that support in-rack serviceability. The cable management system provides a clean, effective way to route server cables.

The following figure shows the server extending from the rack on ball-bearing slide rails.

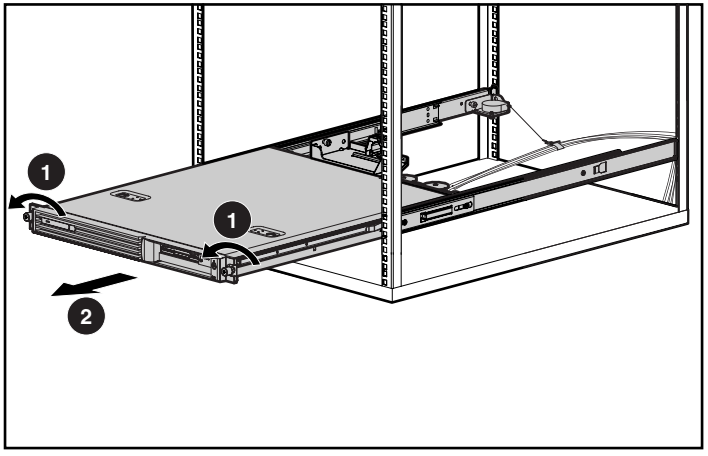

Figure 1-3. Extending the server on sliding rails

The cable management system channels the server cables along the back of the server to connection points on the rack.

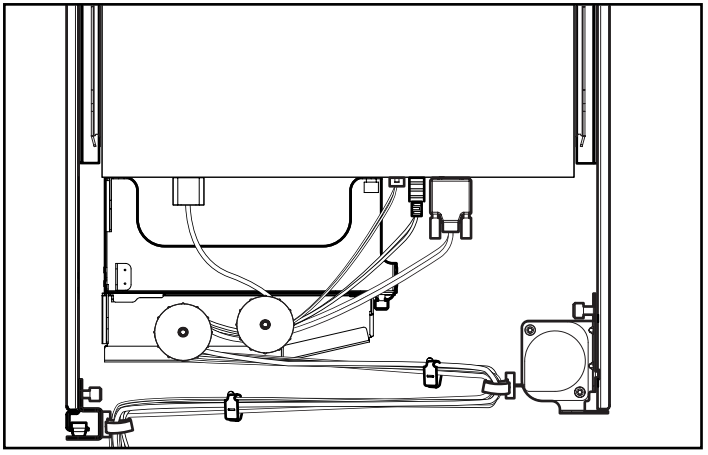

Figure 1-4. Cables routed at the rear of the server (top view of rear of server)

Telco Rack Option

The Telco rack option contains a set of variable-depth rack brackets that support installation of the ProLiant DL320 server into a Telco rack. These brackets adjust to fit several types of Telco racks. The kit contains the necessary mounting screws, brackets, and installation instructions.

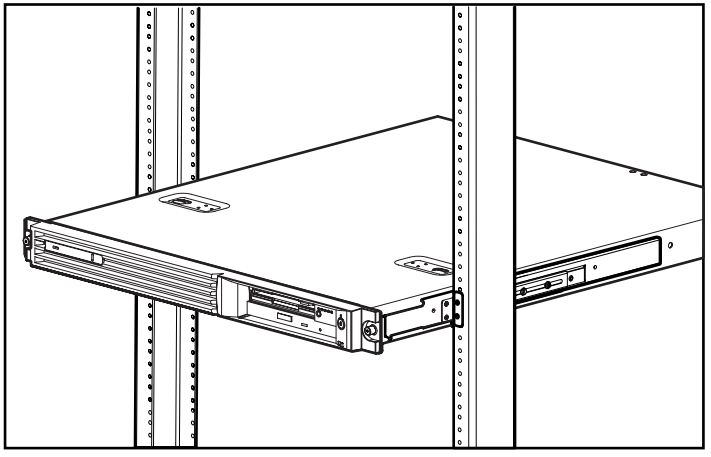

Figure 1-5. Server mounted in Telco rack

Third-Party Cabinet Rack Option

Compaq provides a third-party cabinet rack option that allows you to mount the ProLiant DL320 server in a third-party rack. The variable-depth rack rails support server installation in racks with depths of 28 to 33 inches (711 to 838 mm) with the cable management tray or depths of 22 to 33 inches (559 to 838 mm) without the cable management tray.

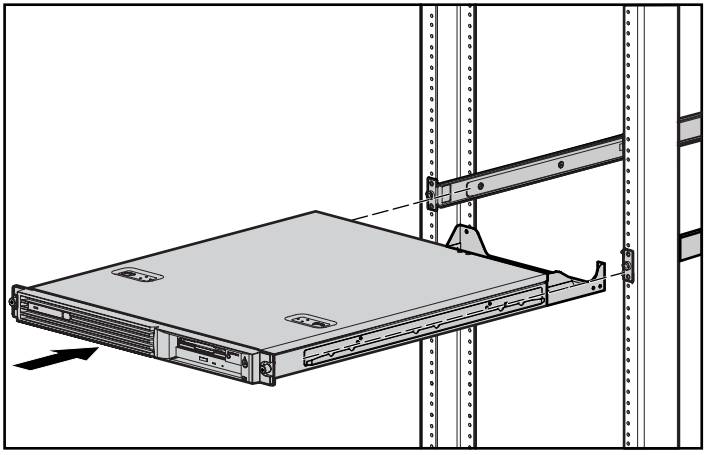

Figure 1-6. Installing the server into a third-party rack

The following figure shows the third-party cabinet rack option.

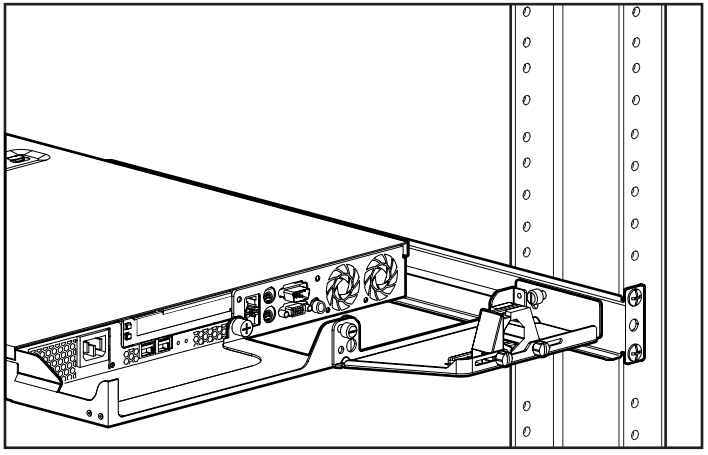

Figure 1-7. Cable tray for the third-party rack option (cables removed for clarity)

Desktop/Stackable Chassis Option

The desktop/stackable chassis option consists of a slide-on sheet metal chassis that converts the rack model ProLiant DL320 server for desktop use. When installed in the desktop chassis, the server can be deployed for nonrack use.

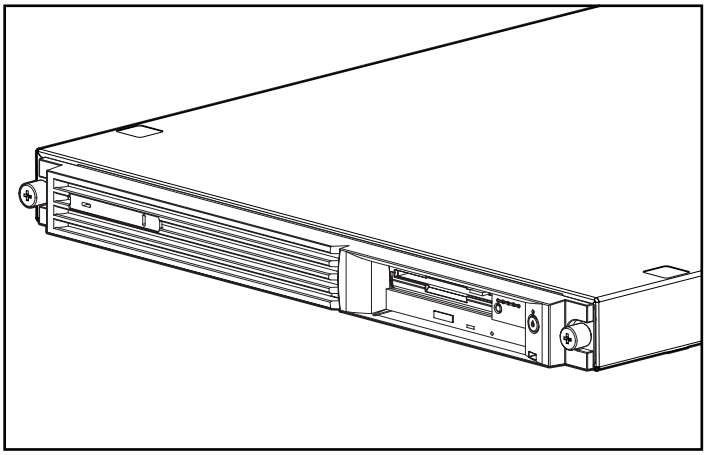

Figure 1-8. Server mounted in the desktop/stackable chassis

Compaq Remote Insight Lights-Out Edition (Optional)

The ProLiant DL320 server has standard features that support the Remote Insight Lights-Out Edition option:

- Power supply support for Remote Insight Lights-Out Edition
- Interface cable connector on the system board

NOTE: The interface cable for the Remote Insight Lights-Out Edition ships with the Remote Insight Lights-Out Edition option kit.

Warranties

The ProLiant DL320 server is equipped with several standard warranties. For more information, refer to the Important Warranty Information card shipped with your server.

Server Configuration and Management

The ProLiant DL320 server offers an extensive set of features and optional tools that support effective server management and configuration, including:

- ROM-Based Setup Utility (RBSU)
- Compaq *SmartStart*™
- *Compaq Insight Manager*™
- Automatic Server Recovery (ASR)
- Unit Identification Switches
- LED Indicators
- Compaq Remote Insight Lights-Out Edition (Optional)

ROM-Based Setup Utility (RBSU)

The ROM-Based Setup Utility (RBSU) (or **F9** setup) performs a wide range of configuration activities, including the following:

- Viewing system information
- Selecting the operating system
- Configuring system devices and installed options
- Selecting the primary boot controller
- Managing storage options

Compaq SmartStart

SmartStart, located on the SmartStart and Support Software CD, is the intelligent way to set up your Compaq server. SmartStart includes:

- ROMPaq Utility
- Driver updates
- Assisted operating system installations

For information concerning SmartStart, refer to the Server Setup and Management pack included in the shipping box.

Compaq Insight Manager

Compaq Insight Manager, which is loaded from the Compaq Management CD, is an easy-to-use software utility for collecting server information. Compaq Insight Manager performs the following functions:

- Forwards server alerts and fault conditions
- Monitors fault conditions and server performance
- Controls server security and configuration
- Remotely controls the server
- Initiates rapid recovery services

Automatic Server Recovery (ASR)

Automatic Server Recovery (ASR) enables the server to boot automatically from either the operating system or the Compaq Utilities. If a critical system failure occurs, ASR automatically restarts the server and pages a designated system administrator.

For additional information on the ASR feature, refer to the Documentation CD that shipped with your server.

Unit Identification Switches (Front and Rear)

Each ProLiant DL320 server has two unit identification switches, one on the front of the server and one on the back of the server. When activated from either the front or the rear of the server, the unit identification switches illuminate both the front and rear unit identification LEDs to provide a visual reference for service personnel.

When moving between the front and rear of a rack filled with ProLiant DL320 servers, you can use the unit identification switches to quickly identify one or more ProLiant DL320 servers that require service or maintenance.

Figure 1-9 shows the locations of the following items:

- Front unit identification switch ❶ and front unit identification LED ❷
- Rear unit identification LED switch ❸

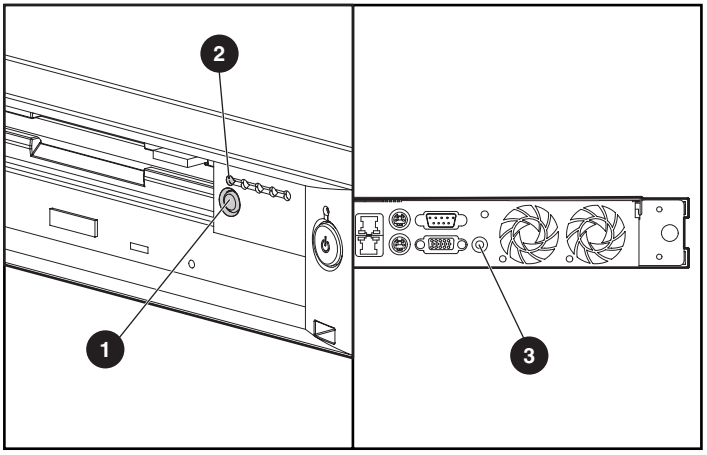

Figure 1-9. Locating the front (left) and rear (right) unit identification switches and LED indicators

LED Indicators

The ProLiant DL320 server contains several sets of LEDs that indicate the status of hardware components and settings. For a detailed explanation of LED status and locations, see Appendix D, "Status Indicators and Switches."

NOTE: The unit identification LED indicators illuminate blue.

Compaq Remote Insight Lights-Out Edition (Optional)

The Compaq Remote Insight Lights-Out Edition option is a PCI-based board that provides remote server management, regardless of the state of the host server operating system or the host CPU.

A built-in Intel i960 processor allows the Remote Insight Lights-Out Edition module to work independently of the host server operating system.

This module provides remote access and video, sends alerts, and performs other functions, even if the host server operating system is not responding.

For installation and features information, refer to the documentation that ships with your Remote Insight Lights-Out Edition and see "Installing the Remote Insight Lights-Out Edition (Optional)" in Chapter 3, "Installing Hardware Options."

Diagnostic Features

The software and firmware diagnostic features available for your use include:

- Power-On Self-Test (POST)
- Diagnostics (DIAGS)
- ROMPaq utilities to upgrade flash BIOS
- Automatic Server Recovery (ASR)

Security Features

Security features include:

- Setup Password
- Power-up Password
- Diskette Drive Control
- Diskette Write Control
- Diskette Boot Override
- Serial Interface Control
- CD Boot Override

Most security features are established through the RBSU. For information concerning server security features, refer to the SmartStart and Support Software CD included in the shipping box.

Chapter 2

Planning the Server Installation

This chapter provides information and instructions for planning the installation of your new Compaq ProLiant DL320 server.

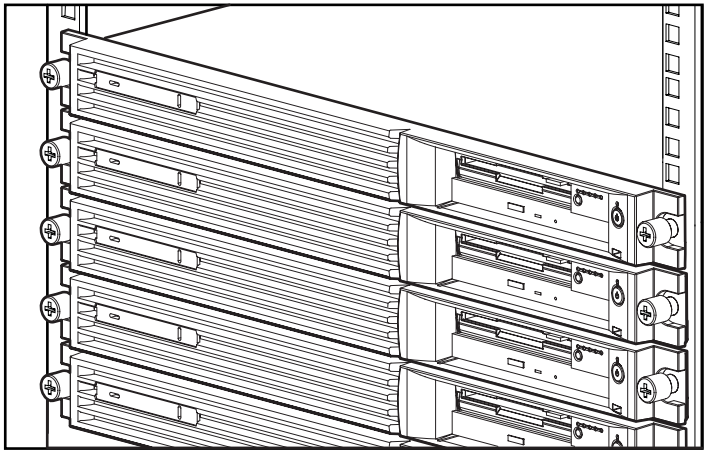

Figure 2-1. ProLiant DL320 servers installed in the rack

You can choose the optional installation service from Compaq to install your rack products. Refer to the "Optional Installation Service" at the end of Chapter 4, "Installing the Server" for additional information.

If you intend to deploy and configure multiple ProLiant DL320 servers in a single rack, consult the *Compaq ProLiant DL320 Ultra-Dense Server Deployment in Compaq Racks* white paper on the Compaq website:

http://www.compaq.com/

The Optimum Environment

When installing your Compaq ProLiant DL320 server in a rack, select a location that meets the environmental standards described in the following paragraphs.

Space Requirements

Consider the following spatial requirements when deciding where to install your rack:

- Leave a minimum clearance of 25 inches in front of the rack to allow the front door to open all the way and to allow for adequate airflow.
- Leave a minimum clearance of 30 inches in the back of the rack to allow for servicing and adequate airflow.

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 your facility's wiring and installation requirements.

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 (National Electric Code) and NFPA-75, 1992 (code for Protection of Electronic Computer/Data Processing Equipment). For electrical power ratings on options, refer to the product's 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.

- 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 (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, Compaq recommends the use of a power distribution unit (PDU) that is either permanently wired to the building's branch circuit 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. Compaq does not recommend using common power outlet strips for this equipment.

Temperature Requirements

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

The Compaq 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 should not exceed 35°C (95°F).

Airflow Requirements

CAUTION: When using a Compaq Series 7000 rack, you must install the high air flow rack door insert to provide proper front-to-back airflow and cooling.

Compaq ProLiant DL320 servers draw cool air in through the front door and exhaust warm air out the rear. Therefore, the front door of the rack must be adequately ventilated to allow ambient room air to enter the cabinet, and the rear door must be adequately ventilated to allow the warm air to escape from the cabinet. Do not block the ventilation openings.

Blanking Panels

CAUTION: Always use blanking panels to fill empty vertical spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage.

If any of the vertical space in the rack is not filled by components, the gaps between the components will cause changes in airflow through the rack and across the components. Cover these gaps with blanking panels to maintain proper airflow.

CAUTION: Avoid thermal events that could cause damage to your system by ensuring that there are at least 19.75 square inches (50.16 sq cm) of open space in the front and back rack door for each ProLiant DL320 server. If this amount of space is not available, remove the doors to allow proper ventilation.

Additional Resource Information on Rack Installations

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 Compaq website:

http://www.compaq.com

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

- Rack Builder Pro Configuration Tool

  This information allows you to simulate potential Compaq 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 rack with rack-mountable components. It also provides the following key configuration steps:

  - Site planning
  - Installing rack servers and rack options
  - Cabling
  - Coupling multiple racks together

- Rack Products Documentation CD

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

Rack Warnings and Precautions

Before beginning these procedures, make sure you understand the following warnings and cautions:

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

WARNING: To reduce the risk of personal injury or 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, make certain that the rack frame is adequately secured to the top and bottom of the building structure.

WARNING: To reduce the risk of personal injury or equipment damage, at least two people are needed to safely unload the rack from the pallet. An empty 42U rack can weigh as much as 253 lb (115 kg), can stand more than 7 ft (2.1 m) tall, and may become unstable when being moved on its casters.

Never stand in front of the rack when it is rolling down the ramp from the pallet; always handle the rack from both sides.

Server Warnings and Precautions

Before beginning these procedures, make sure 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.

CAUTION: Always operate the Compaq ProLiant DL320 server with the system access panel closed. The server cannot be properly cooled when the system access panel is removed.

Unpacking the ProLiant DL320 Server

Unpack the server box, and locate the materials and documentation necessary for installing your server. All of the rack-mounting hardware necessary for installing the ProLiant DL320 server into the rack is included with the rack or the server.

The contents of the server box include the following:

- Compaq ProLiant DL320 server

  NOTE: Fixed server rails are factory-mounted on the ProLiant DL320 server.

- Power cord
- Hardware documentation, reference information, and software products
- Rack-mounting hardware
  - Cable support bracket ❶
  - Fixed cable tray ❷
  - Fixed rack rails ❸
  - Rack template ❹

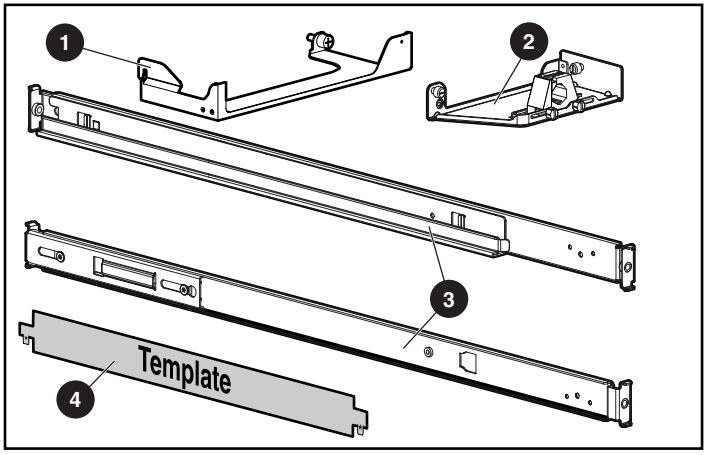

Figure 2-2. Rack-mounting hardware

In addition to these supplied items, you may need the following items:

- Application software diskettes
- Options to be installed
- Phillips screwdriver

Installing Expansion Boards and Other Major Hardware Options

For information on installing PCI expansion boards and other major hardware options, see Chapter 3, "Installing Hardware Options."

The following major hardware options are available for the ProLiant DL320 server and may be obtained from your local Compaq authorized reseller or Compaq authorized service provider:

- SCSI or ATA hard drives
- Memory
- SCSI array controllers
- PCI expansion boards
- Compaq Remote Insight Lights-Out Edition

Chapter **3**

Installing Hardware Options

This chapter provides information and procedures for installing hardware options on ProLiant DL320 servers. For complete instructions, refer to the installation documentation shipped with each option kit. Refer to the following items for an illustrated guide to installing Compaq option upgrades:

- Hardware installation and configuration poster shipped with your server
- Labels attached to the inside of the system unit access panel

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

After you install hardware options, proceed with the server installation procedures in Chapter 4, "Installing the Server."

If you encounter any problems during installation, contact your Compaq authorized reseller.

WARNINGS: 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.
- Ensure that the power to the server is turned off and that the AC power cord is disconnected before removing the access panel.

CAUTION: Always ensure that equipment is properly grounded before beginning any installation procedure. Electrostatic discharge resulting from improper grounding can damage electronic components. For more information, refer to Appendix B, "Electrostatic Discharge."

Hardware Option Procedures

This chapter includes step-by-step instructions for the following items:

- Preparing the server
  - Powering down the server
  - Removing the access panel
  - Removing the shipping/ejector key
  - Removing the PCI riser board assembly
  - Removing the center wall
  - Identifying system board components
  - Installing the center wall
  - Installing the access panel
- Installing additional memory
- Installing an expansion board
  - Identifying the expansion slot
  - Removing the expansion slot cover
  - Installing the expansion board
- Installing the Compaq Remote Insight Lights-Out Edition (optional)
- Installing a CD-ROM/diskette drive assembly (optional)
- Removing a CD-ROM/diskette drive assembly (optional)
- Installing ATA hard drives
- Installing SCSI hard drives
- Installing a Compaq Smart Array controller (SCSI drives internal)
- Installing a Compaq Smart Array controller in a System with ATA drives

Other Options

The ProLiant DL320 server also supports several rack-mounting options. For more information, see "Optional Rack Deployment Solutions" and "Desktop/Stackable Chassis Option" in Chapter 1, "Server Features."

For more information about these options, contact your Compaq authorized reseller.

Preparing the Server

To prepare the server for installation of the hardware options, you may need to complete the following procedures:

- Powering down the server
- Removing the access panel
- Removing the shipping/ejector key
- Removing the PCI riser board assembly
- Removing the center wall
- Identifying the system board components
- Installing the center wall
- Installing the access panel

Powering Down the Server

To install hardware options, you must first remove all power from the system. Use the following procedure to power down the server before installing the hardware options:

1. If you intend to install hardware options, back up your server data.
2. Shut down the operating system as directed in your operating system instructions.

NOTE: Steps 3 through 5 and Step 8 apply to servers that have already been mounted in a rack.

3. Press the Front Unit Identification switch ❶ on the server front panel. A blue LED illuminates on the server's front ❷ and rear panels.
4. Press the server Power On/Off switch ❸ to power down the server. The Power LED ❹ deactivates.

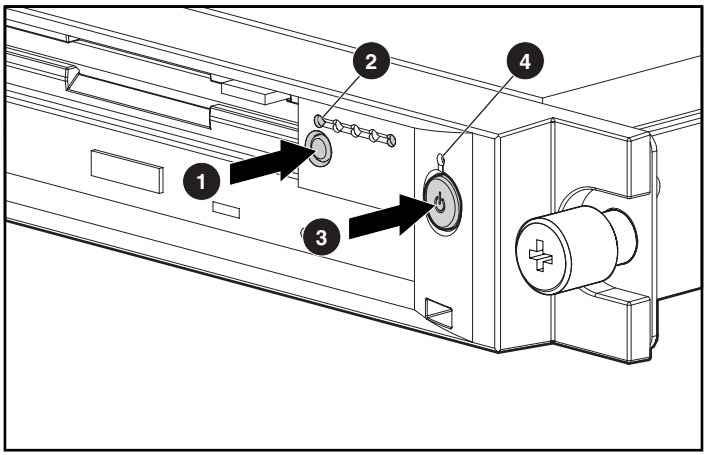

Figure 3-1. Using the Power On/Off switch to power down the server

5. Move to the rear of the rack, and locate the illuminated Rear Unit Identification LED ❶ that identifies the server you are servicing. The Rear Unit Identification LED is located in the center of the Rear Unit Identification LED switch ❷.

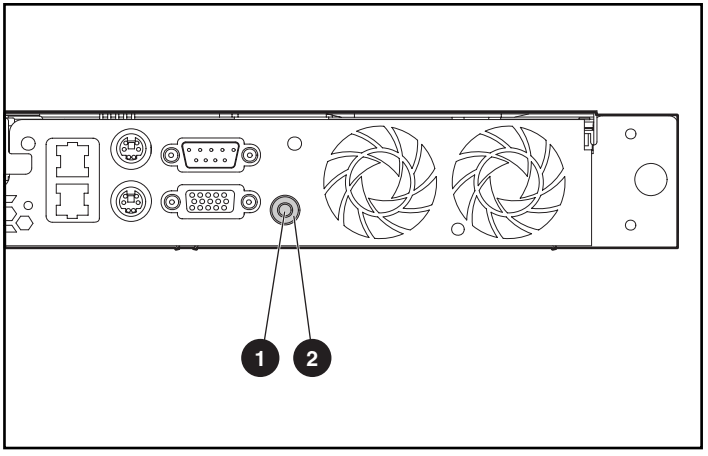

Figure 3-2. Locating the Rear Unit Identification LED switch

6. Disconnect the power cord from the server.

7. Disconnect all remaining cables on the server's rear panel, including cables extending from external connectors on expansion boards.
8. Remove the server from the rack. See "Removing the Server from the Rack" in Chapter 4, "Installing the Server."

The system is now without power, and you can safely install your hardware options.

Removing the Access Panel

To access the system board, processor, memory sockets, expansion slot, and other internal components, you must remove the access panel. Observe the following warnings and cautions.

WARNING: The system power in the ProLiant DL320 server does not completely shut off from the front panel Power On/Off switch. Portions of the power supply and some internal circuitry remain active until AC power is removed.

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

CAUTION: Do not operate the server without the access panel installed because it is required for proper airflow. Operating the server without its access panel results in improper cooling that can lead to thermal damage.

CAUTION: Before removing the server access panel, be sure that the server is powered down and that the power cord is disconnected from the server or the electrical outlet.

CAUTION: To avoid the risk of damage to your system or expansion boards, remove all AC power cords before installing or removing expansion boards. When the Power On/Off switch is in the Off position, auxiliary power is still connected to the PCI expansion slot and may damage the card.

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

Use the following procedure to remove the access panel:

1. Power down the server. See "Powering Down the Server" earlier in this chapter.
2. Remove the server from the rack. See "Removing the Server from the Rack" in Chapter 4, "Installing the Server."

   NOTE: This step applies only to servers that have already been mounted in a rack.

   NOTE: If you install the rack management solution option (ball-bearing slide rails and a cable management system), you can perform many hardware procedures without removing the server from the rack. For more information, see "Other Options" earlier in this chapter.

3. Press and hold down on the locking latches ❶.
4. Slide the access panel ❷ toward the rear of the unit about 0.5 inch (1.25 cm), and lift the panel to remove it.

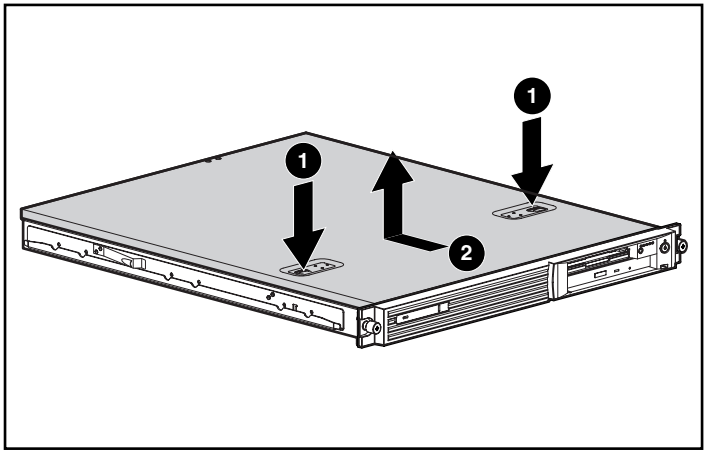

Figure 3-3. Pressing the locking latches and removing the access panel

Removing the Shipping/Ejector Key

The ProLiant DL320 server includes a shipping/ejector key that secures either the CD-ROM/diskette drive assembly or the bezel blank during shipping. This key should be removed before server deployment. It is also used to eject the assembly or the blank.

Use the following procedure to remove the shipping/ejector key:

1. Power down the server. See "Powering Down the Server" earlier in this chapter.
2. Remove the access panel. See "Removing the Access Panel" earlier in this chapter.
3. Identify and lift the key from its storage location.

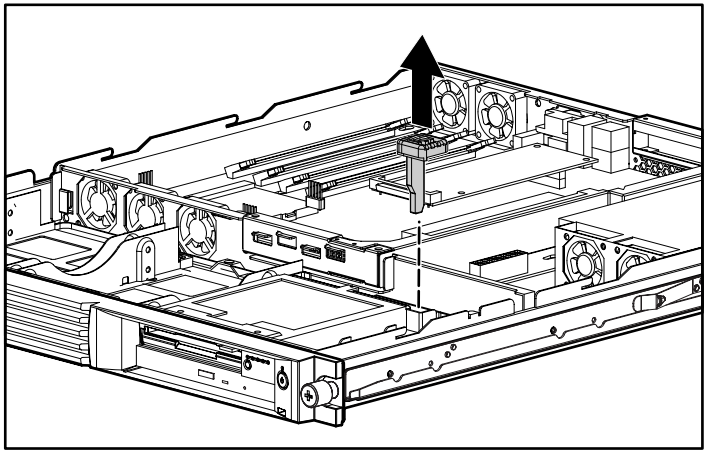

Figure 3-4. Removing the shipping/ejector key

4. Install the access panel. See "Installing the Access Panel" later in this chapter.

CAUTION: Always install the shipping/ejector key in its storage location inside the chassis before shipping the server. Failure to do so can result in damage to the CD-ROM/diskette drive assembly.

If you intend to use the CD-ROM/diskette drive assembly ejection feature frequently, leave the shipping/ejector key in the ejector port for easy access. Otherwise, store the shipping/ejector key for future use.

Removing the PCI Riser Board Assembly

To install an expansion board, you must remove the PCI riser board assembly from the chassis. An expansion board is inserted into the riser board before the assembly is reinserted into the chassis.

Use the following procedure to remove the PCI riser board assembly:

CAUTION: To avoid damaging your system or expansion boards, remove all AC power cords before installing or removing an expansion board. When the front panel power switch is in the off position, auxiliary power is still connected to the PCI expansion slot and may damage the card.

1. Power down the server. See "Powering Down the Server" earlier in this chapter.
2. Remove the access panel. See "Removing the Access Panel" earlier in this chapter.
3. Disconnect any cables leading from any existing expansion board in the system board.
4. Loosen the PCI riser board thumbscrew ❶.
5. Lift the assembly ❷ from the server chassis.

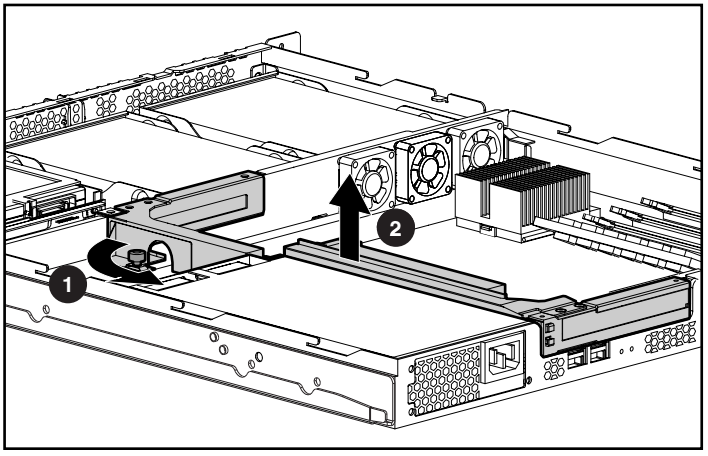

Figure 3-5. Removing the PCI riser board assembly (module removed for clarity)

CAUTION: When removing the PCI riser board assembly, avoid damage to the system board power cable.

Removing the Center Wall

To install options that require modifications to cables between the front drive area and the rear system area, you must remove the center wall. Before removing this component, you must first remove the PCI riser board assembly.

Use the following procedure to remove the center wall.

1. Power down the server. See “Powering Down the Server” earlier in this chapter.
2. Remove the access panel. See “Removing the Access Panel” earlier in this chapter.
3. Remove the PCI Riser Board Assembly. See “Removing the PCI Riser Board Assembly” earlier in this chapter.
4. Disconnect the center wall fan cables from the fan connectors on the system board.

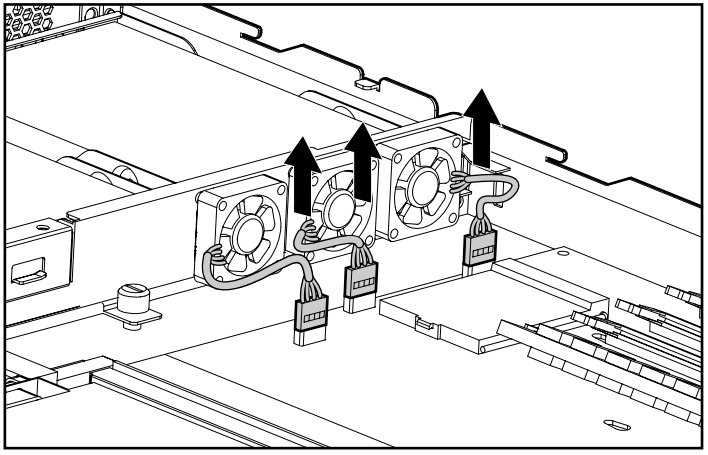

Figure 3-6. Disconnecting the center wall fan cables (processor removed for clarity)

5. Loosen the thumbscrew ❶.
6. Push in the tab ❷ next to the center wall fans to unlock the center wall from the chassis.
7. Raise the locking end ❸ of the center wall from the chassis.

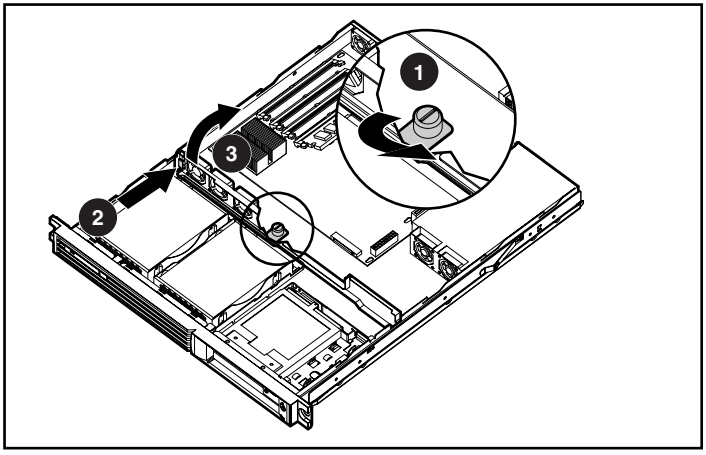

Figure 3-7. Unlocking the center wall

8. Clear the center wall alignment tab ❶ from the alignment slot ❷.

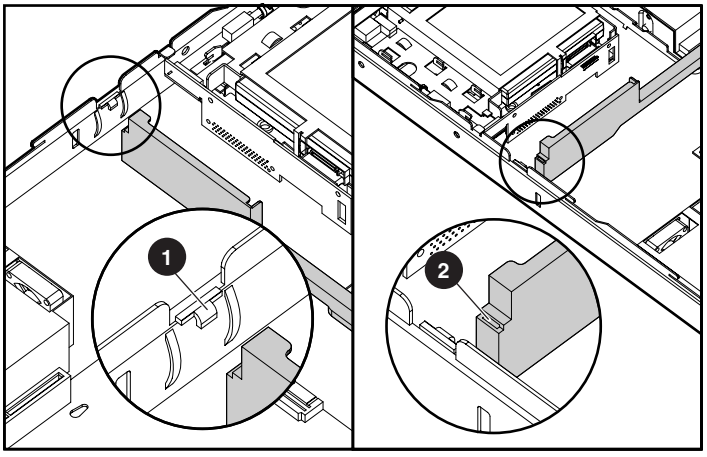

Figure 3-8. Clearing the center wall from the chassis

Identifying System Board Components

Use the following figures and table to identify the system board connectors and components.

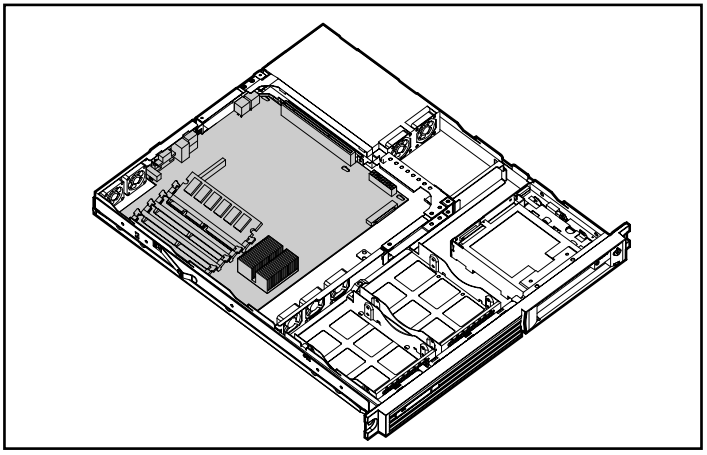

Figure 3-9. Locating the system board in the ProLiant DL320 server (PCI riser board assembly removed for clarity)

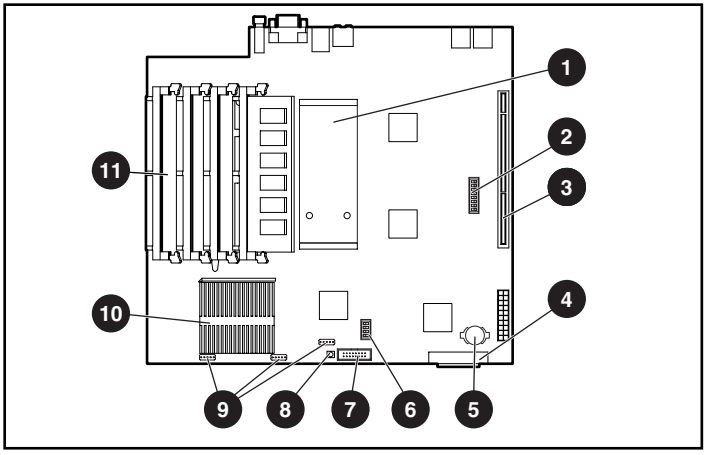

Figure 3-10. Identifying system board components

Table 3-1
System Board Connectors and Components

Location	Component	Location	Component
❶	SCSI module (SCSI models only) or ATA module (ATA models only)	❼	Remote Insight Lights-Out Edition connector
❷	System configuration switch (SW3)	❽	NMI debug button
❸	64-bit 33-MHz PCI riser board assembly connector	❾	Center wall fan connectors
❹	CD-ROM/diskette drive assembly connector	❿	Processor socket (populated)
❺	System battery	⓫	DIMM sockets (1-4)
❻	System switch (SW2)		

Installing the Center Wall

Use the following procedure to install the center wall.

1. Insert the center wall alignment tab into the center wall alignment slot.
2. Lower the locking end of the center wall ❶ into the chassis until it locks into place.

> **CAUTION:** When lowering and locking the center wall, do not pinch any of the drive cables connecting the front drive area with the rear system and power areas.

3. Tighten the thumbscrew ❷.

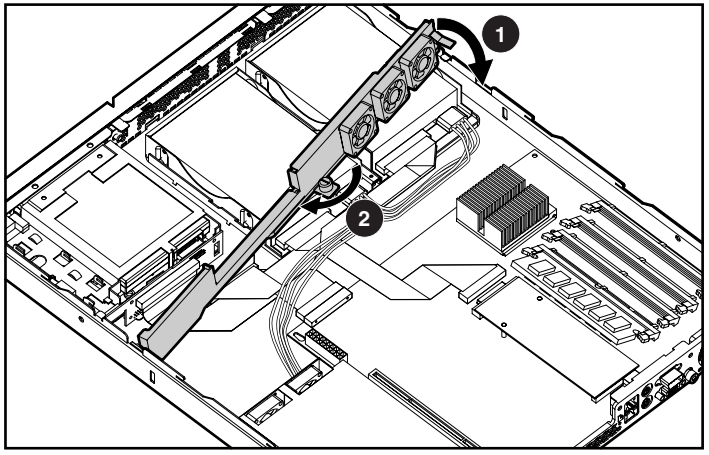

Figure 3-11. Installing the center wall

4. Reconnect the fan cables to the fan connectors.

Installing the Access Panel

After installing hardware options for your ProLiant DL320 server, replace the server access panel. Use the following procedure to install the access panel:

1. Set the access panel ❶ on top of the server, aligning the sides of the panel with the server and allowing the panel to extend past the rear of the server approximately 0.5 inch (1.25 cm).

2. Slide the access panel ❷ toward the front of the unit about 0.5 inch (1.25 cm). When the panel seats properly, the locking latches click audibly into place.

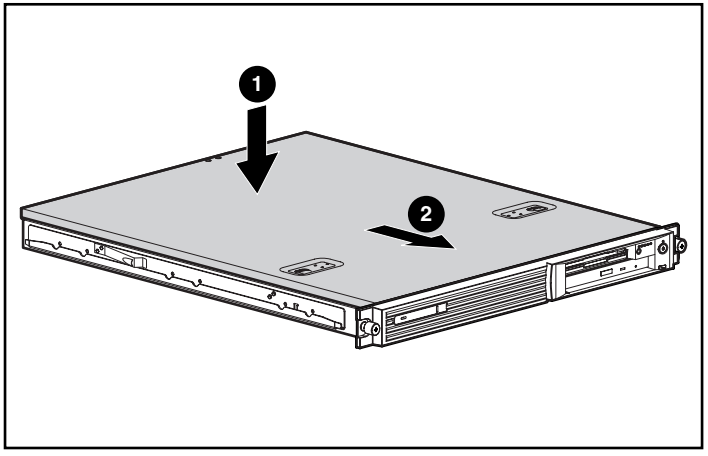

Figure 3-12. Installing the access panel

Installing Additional Memory

You can expand server memory by installing Compaq Synchronous DRAM (SDRAM). The system supports up to four 133-MHz ECC registered SDRAM Dual Inline Memory Modules (DIMMs) installed in four sockets on the system board. Memory can be added one module at a time.

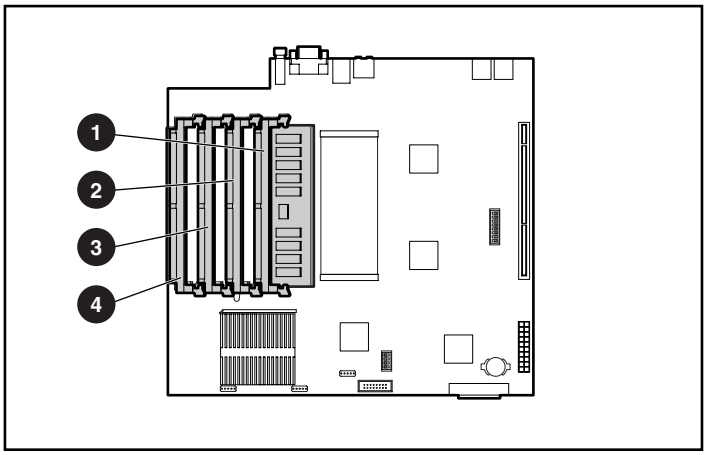

Figure 3-13. Identifying DIMM sockets on the system board

Table 3-2
DIMM Socket Identification

Location	Description
❶	DIMM socket 1 (populated)
❷	DIMM socket 2
❸	DIMM socket 3
❹	DIMM socket 4

The server ships with one DIMM installed in DIMM socket 1. You can expand server memory to 2 GB. In the maximum memory configuration, all four DIMM sockets are populated with 512-MB, 133-MHz ECC registered SDRAM DIMMs.

You must observe the following guidelines when installing additional memory:

- DIMMs installed in the ProLiant DL320 server must be 133-MHz registered SDRAM, 3.3 V, 72 bits wide, and ECC.
- All DIMMs installed must be the same speed. Do not install DIMM modules supporting different speeds. For example, you should not install DIMM modules supporting speeds of 133 MHz and 100 MHz.
- To facilitate successive DIMM installations, install the DIMMs in sequential order, starting with DIMM socket 1.

CAUTION: Use only Compaq DIMMs. DIMMs from other sources can adversely affect data integrity.

The following table lists DIMM option kits.

Table 3-3
DIMM Option Kit Part Numbers

Part Numbers	DIMM Option Kit Description
128276-B21	64-MB option kit
128277-B21	128-MB option kit
128278-B21	256-MB option kit
128279-B21	512-MB option kit

CAUTION: Electrostatic discharge can damage electronic components. Be sure you are properly grounded before beginning any installation procedure. See Appendix B, “Electrostatic Discharge,” for more information.

Use the following procedure to install a DIMM onto the system board:

1. Power down the server. See "Powering Down the Server" earlier in this chapter.
2. Remove the access panel. See "Removing the Access Panel" earlier in this chapter.
3. Use the previous figure and table to identify the correct DIMM socket to populate.
4. Open the DIMM socket latches.
5. Align the key slot in the bottom edge of the DIMM with the tab in the expansion socket.

IMPORTANT: Misaligned DIMMs do not seat.

6. Insert the DIMM ❶ at the same angle as the DIMM socket on the system board. As the DIMM enters the socket, the latches close ❷.

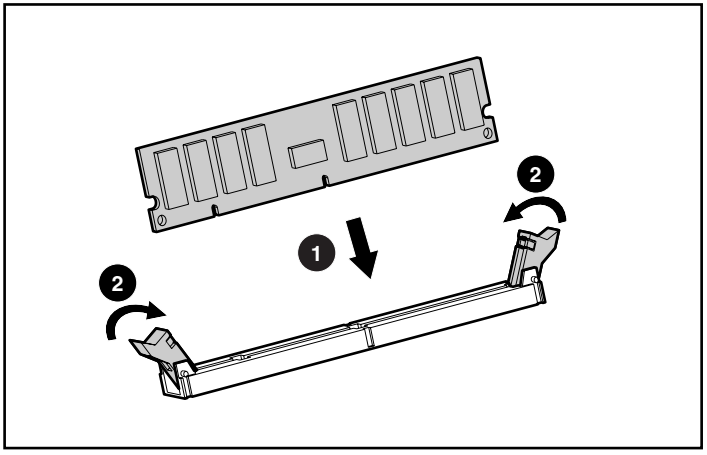

Figure 3-14. Aligning DIMM in a memory expansion socket

7. Press down firmly on the DIMM while pushing the latches inward until the latches snap into place.
8. Install the access panel. See "Installing the Access Panel" earlier in this chapter.

Installing an Expansion Board

To install an expansion board, complete the following procedures:

- Identifying the expansion slot
- Removing the PCI riser board assembly
- Removing expansion slot covers
- Installing the expansion board
- Installing the PCI riser board assembly

Identifying the Expansion Slot

Use the following figure and table to identify the ProLiant DL320 server expansion slot.

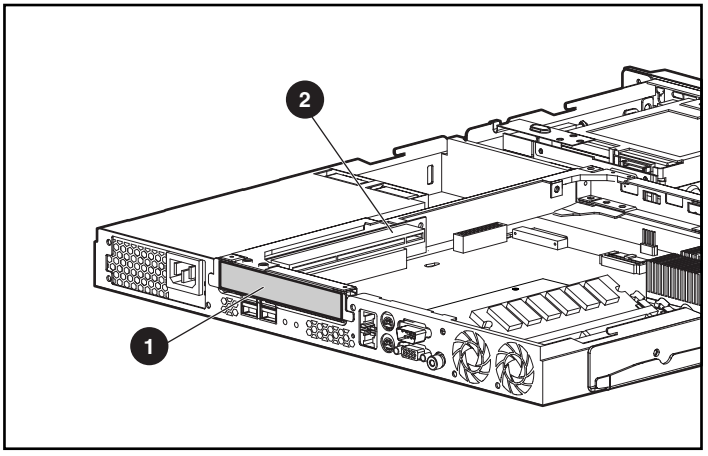

Figure 3-15. Identifying the expansion slot

Table 3-4
Expansion Slot Components

Location	Slot
❶	Expansion slot cover
❷	64-bit PCI slot with 267-MB/s data transfer

Removing the Expansion Slot Cover

Before installing an expansion board, you must remove the expansion slot cover to allow the board's connectors to extend from the rear of the server.

> **CAUTION:** Do not operate the server unless an expansion board or expansion slot cover is installed in the slot. Failure to do so results in improper cooling that can lead to thermal damage.

Use the following procedure to remove the expansion slot cover:

1. Power down the server. See "Powering Down the Server" earlier in this chapter.
2. Remove the access panel. See "Removing the Access Panel" earlier in this chapter.
3. Remove the PCI riser board assembly. See "Removing the PCI Riser Board Assembly" earlier in this chapter.
4. Remove the expansion slot cover by pressing outward in its inner face, as illustrated below.

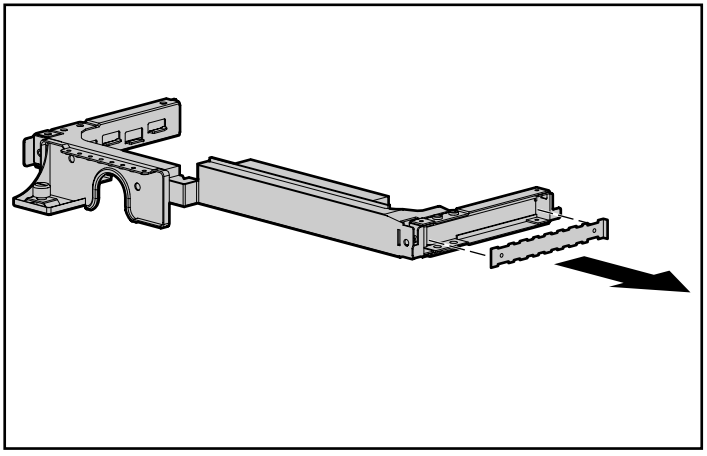

Figure 3-16. Removing the expansion slot cover

> **CAUTION:** Do not discard the expansion slot cover. If you decide to remove your PCI expansion board in the future, you must install the expansion slot cover to maintain proper cooling.

Installing the Expansion Board

Use the following procedures for installing an expansion board:

> **CAUTION:** To avoid the risk of damage to your system or expansion boards, remove all AC power cords before installing or removing expansion boards. When the front panel power switch is in the Off position, auxiliary power is still connected to the PCI expansion slot and may damage the card.

1. Power down the server. See "Powering Down the Server" earlier in this chapter.
2. Remove the access panel. See "Removing the Access Panel" earlier in this chapter.
3. Remove the PCI riser board assembly. See "Removing the PCI Riser Board Assembly" earlier in this chapter.
4. Remove the expansion slot cover. See "Removing the Expansion Slot Cover" earlier in this chapter.
5. Insert an expansion board into the expansion slot by aligning the expansion board with the guiding groove and sliding the expansion board into the slot until the board seats firmly.

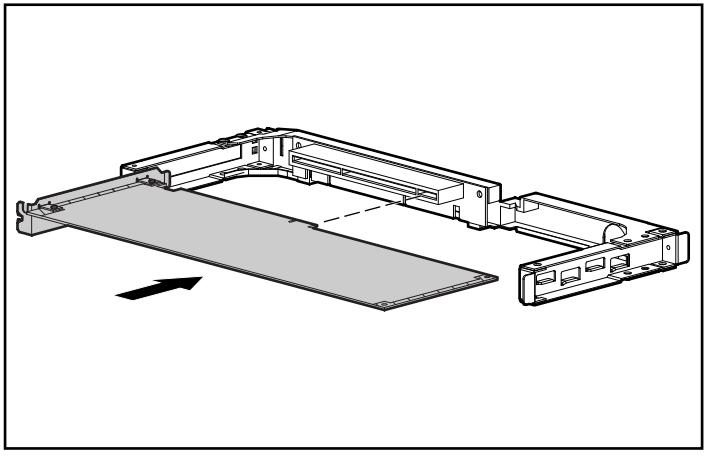

Figure 3-17. Installing an expansion board into the PCI riser board assembly

> **IMPORTANT:** If the expansion board ships with an ISA extender bracket, remove it from the expansion board before inserting the board into the PCI riser board assembly.

6. Install the PCI riser board assembly:

   a. Lay the PCI riser board assembly in the chassis, and ensure that the system power cable is clear of the PCI riser board thumbscrew plate.

   b. Align the tabs ❶ along the lower rear corners of the assembly with the retainers ❷ on the rear panel of the chassis.

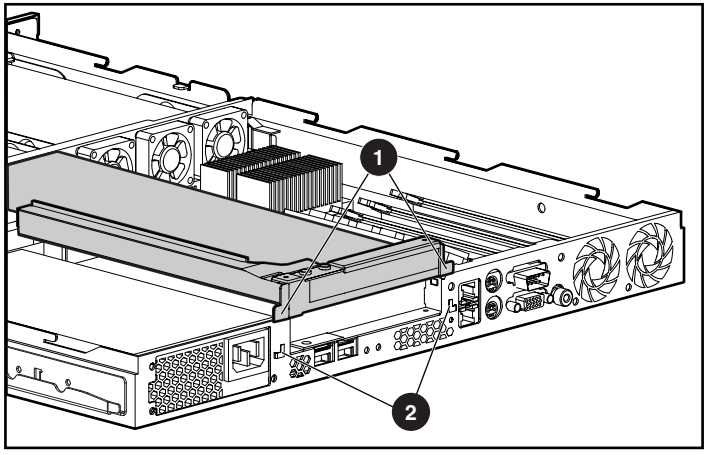

Figure 3-18. Aligning the rear edge of the PCI riser board assembly with the chassis

c. Press down firmly ❶ above the 64-bit expansion slot until the assembly is seated in the expansion slot.

CAUTION: The ProLiant DL320 server does not power up if your PCI riser board assembly is not properly seated.

d. Tighten the PCI riser board thumbscrew ❷.

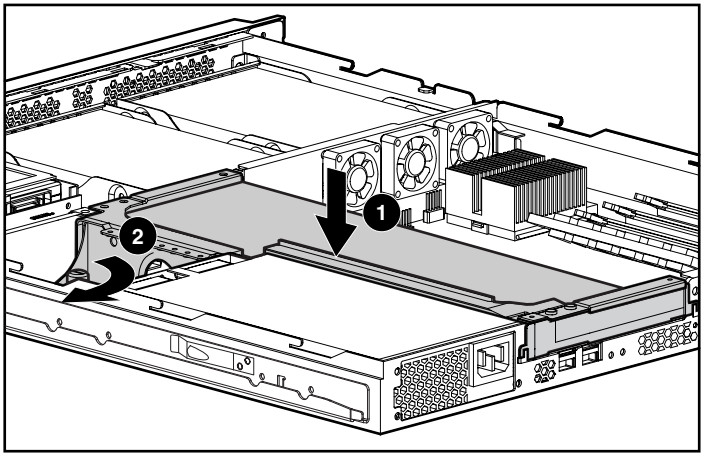

Figure 3-19. Installing the PCI riser board assembly

7. Attach any cabling required for operating the expansion board.
8. Install the access panel. See "Installing the Access Panel" earlier in this chapter.

Installing the Compaq Remote Insight Lights-Out Edition (Optional)

The Compaq Remote Insight Lights-Out Edition is a PCI-based, single-board computer that contains a built-in processor and fully supports keyboard, mouse, and PCI video functions. With the Remote Insight Lights-Out Edition installed in the ProLiant DL320 server, you can use a standard Web browser and Compaq Insight Manager to access and remotely manage your server from any console on the network, regardless of the state of the host operating system.

Using a standard Web browser (launched through Compaq Insight Manager) with the Remote Insight Lights-Out Edition, you can do the following:

- Remotely access the console of the host server, including all text- and graphics-mode screens with full keyboard and mouse controls
- Remotely power on, power off, or reboot the host server
- Remotely boot the host server from a diskette drive installed in a network client
- Access the Compaq Insight Management Agents on a host server through the Remote Insight Lights-Out Edition
- Receive alerts from the Compaq Remote Insight Lights-Out Edition, regardless of the state of the host server operating system
- Access advanced troubleshooting features provided by the Compaq Remote Insight Lights-Out Edition
- Launch a Web browser, use Simple Network Management Protocol (SNMP) alerting, and manage the Remote Insight Lights-Out Edition with Compaq Insight Manager

For more information on the Compaq Remote Insight Lights-Out Edition, refer to the *Compaq Remote Insight Lights-Out Edition Installation and User Guide* included with the option kit.

To install the Compaq Remote Insight Lights-Out Edition, perform the following steps:

1. Identify the adapter cable that ships with your Compaq Remote Insight Lights-Out Edition option kit.
2. Power down the server. See “Powering Down the Server” earlier in this chapter.

3. Remove the access panel. See “Removing the Access Panel” earlier in this chapter.
4. Remove the PCI riser board assembly. See “Removing the PCI Riser Board Assembly” earlier in this chapter.
5. Remove the PCI expansion slot cover. See “Removing the Expansion Slot Cover” earlier in this chapter.
6. Insert the Compaq Remote Insight Lights-Out Edition into the expansion slot, and secure the PCI riser board assembly in the chassis. For detailed information, see Steps 5 and 6 of “Installing the Expansion Board” earlier in this chapter.
7. Connect the Compaq Remote Insight Lights-Out Edition to its connector on the ProLiant DL320 system board.

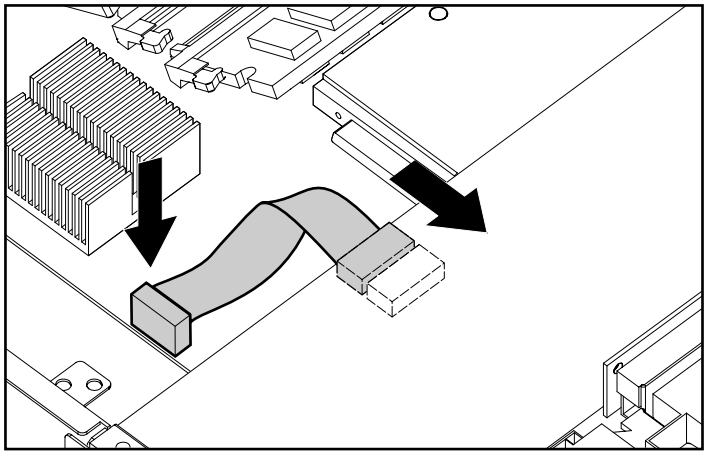

Figure 3-20. Cabling the Compaq Remote Insight Lights-Out Edition to the system board

8. Install the access panel. See “Installing the Access Panel” earlier in this chapter.
9. Insert the server into the rack. See “Inserting the Server into the Rack” in Chapter 4, “Installing the Server.”
10. Fasten the thumbscrew that secures the fixed cable tray to the server. See “Attaching the Fixed Cable Tray” in Chapter 4, “Installing the Server.”
11. Reconnect the power cord and peripheral devices. See “Connecting the Power Cord and Peripheral Devices” in Chapter 4, “Installing the Server.”

12. Locate the Compaq Remote Insight Lights-Out Edition external connectors on the rear panel of the server.

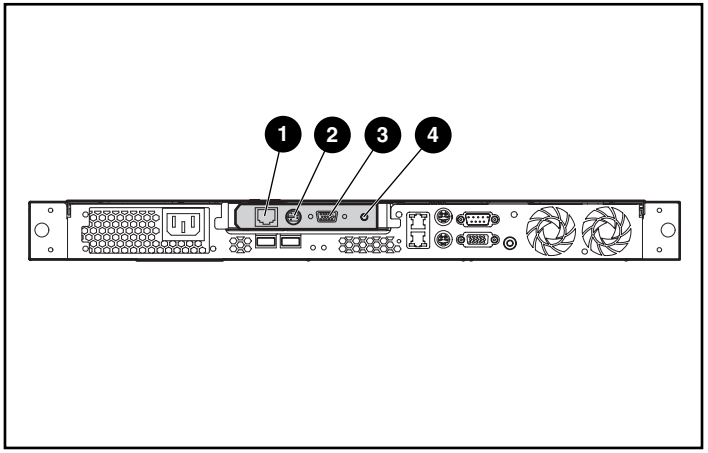

Figure 3-21. Compaq Remote Insight Lights-Out Edition external connectors

Table 3-5
Compaq Remote Insight Lights-Out Edition External Connectors

Location	Connector
❶	RJ-45 connector
❷	Keyboard/mouse connector (not used with ProLiant DL320 servers)
❸	Video connector
❹	AC adapter connector (not used with ProLiant DL320 servers)

13. Disconnect your video cable from the video connector on the rear of the server.

CAUTION: Always connect your video cable to the external video connector on the Remote Insight Lights-Out Edition expansion board. When Remote Insight Lights-Out Edition is installed in the ProLiant DL320 server, the video connector on the server's rear panel will not function.

14. Install the cable support bracket and insert the server into the rack. See "Installing the Cable Support Bracket on the Server" and "Inserting the Server into the Rack" in Chapter 4, "Installing the Server."
15. Connect your video cable to the external video connector on the Remote Insight Lights-Out Edition.

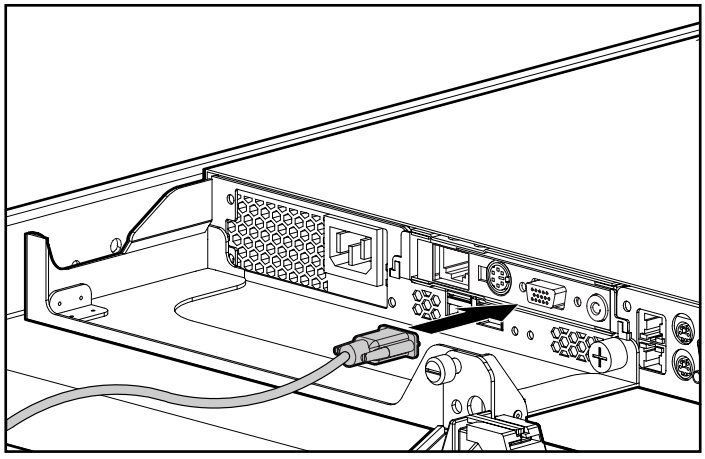

Figure 3-22. Connecting the video cable to the Remote Insight Lights-Out Edition external video connector

NOTE: The server's high-density design may prevent some video plugs from fully seating on the Remote Insight Lights-Out Edition. However, the design does support video plugs with a height that is less than or equal to 0.62 inch.

16. Connect your LAN cable to the external RJ-45 connector on the Remote Insight Lights-Out Edition.

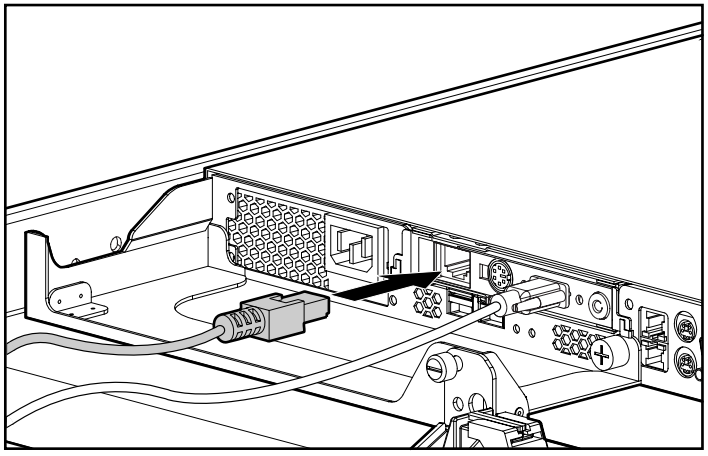

Figure 3-23. Connecting the LAN cable to the Remote Insight Lights-Out Edition external RJ-45 connector

IMPORTANT: To allow LAN access to the Remote Insight Lights-Out Edition, you must attach the LAN cable to the RJ-45 connector on the Remote Insight Lights-Out Edition. The standard RJ-45 connectors on the server's rear panel do not provide network access to the Remote Insight Lights-Out Edition.

17. Power up the server. See "Powering Up the Server" in Chapter 4, "Installing the Server."

Installing a CD-ROM/Diskette Drive Assembly (Optional)

You can install an optional CD-ROM/diskette drive assembly, consisting of a low-profile diskette drive and a low-profile CD-ROM drive combined into one unit. This assembly can be removed for use in another ProLiant DL320 server or to prevent unwanted software installation.

CAUTION: Do not operate the server without a bezel blank or CD-ROM/diskette drive assembly installed. Improper cooling can damage the system.

Use the following procedures to install the CD-ROM/diskette drive assembly:

1. Power down the server. See "Powering Down the Server" earlier in this chapter.
2. Locate the shipping/ejector key.
   - ❑ If the shipping/ejector key is located in the ejector port, proceed to Step 3.
   - ❑ If the shipping/ejector key is located in its storage location inside the chassis, see "Removing the Shipping/Ejector Key" earlier in this chapter, and perform all the steps under that heading. Then, proceed with Step 3.
3. Insert the end of the shipping/ejector key into the CD-ROM/diskette drive assembly ejector port, located immediately below the Power On/Off switch on the server front panel.

4. Push the shipping/ejector key ❶ into the slot approximately 0.5 inch (1.25 cm) to eject the bezel bank ❷.

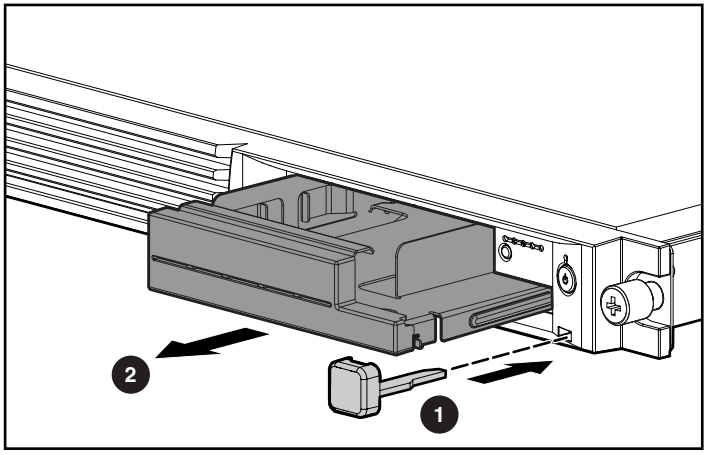

Figure 3-24. Ejecting the bezel blank

5. Install the CD-ROM/diskette drive assembly in the empty bay.

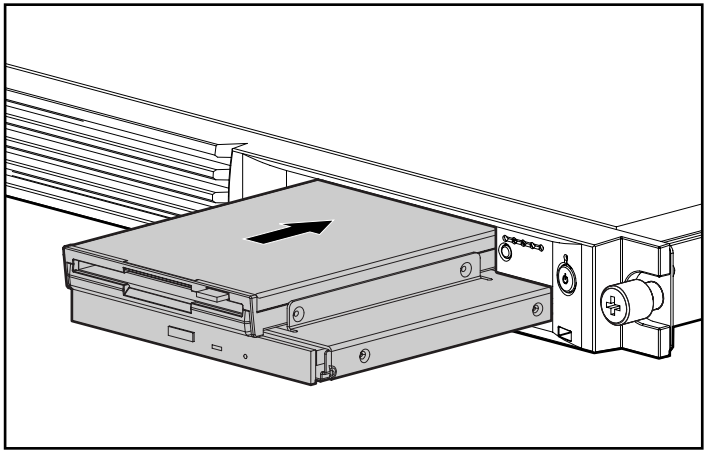

Figure 3-25. Installing a CD-ROM/diskette drive assembly

6. Keep your shipping ejector key. If you retrieved your shipping/ejector key from inside the server, install the access panel and install the server into the rack. See "Installing the Access Panel" earlier in this chapter, and see Chapter 4, "Installing the Server."

CAUTION: Before shipping the server, install the shipping/ejector key in its storage location inside the chassis. Failure to do so can result in damage to the CD-ROM/diskette drive assembly.

NOTE: Keep your shipping/ejector key for future use.

Removing a CD-ROM/Diskette Drive Assembly (Optional)

CAUTION: Always install the bezel blank after removing the CD-ROM/diskette drive assembly to maintain proper airflow and cooling. Failure to do so can result in thermal damage to the system.

Use the following procedures to remove the CD-ROM/diskette drive assembly:

1. Power down the server. See "Powering Down the Server" earlier in this chapter.
2. Remove the CD-ROM/diskette drive assembly by using the same procedure for ejecting the bezel blank. See "Installing the CD-ROM/Diskette Drive Assembly" earlier in this chapter.
3. Align the bezel blank with the empty bay, and slide the blank fully into the chassis.

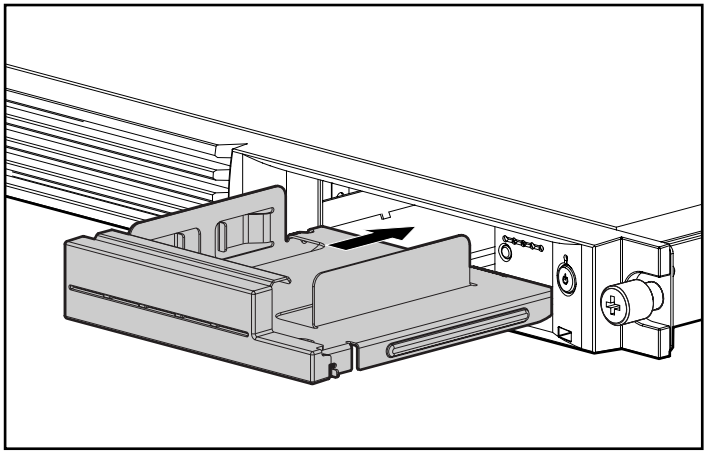

Figure 3-26. Aligning and installing the bezel blank

CAUTION: Before shipping the server, install the shipping/ejector key in its storage location inside the chassis. Failure to do so can result in damage to the CD-ROM/diskette drive assembly.

4. If you retrieved your shipping/ejector key from inside the server, install the access panel and install the server into the rack. See "Installing the Access Panel" earlier in this chapter and see Chapter 4, "Installing the Server."

NOTE: Keep your shipping/ejector key for future use.

Guidelines for Installing Hard Drives

The ProLiant DL320 server contains two drive bays for internal mass storage devices. The server ships standard with two 1-inch drive trays. The following sections provide general guidelines and installation procedures for upgrading the hard drives.

Guidelines for ATA Hard Drives

When installing ATA hard drives to your ProLiant DL320 server, observe the following general guidelines:

- Do not add more than two ATA devices per channel. ProLiant DL320 servers have two ATA channels.
- Set the jumpers on both ATA drives to Cable-Select mode. Doing so enables the ATA cable to set a unique address, such as Device 0 or Device 1, for each hard drive.

NOTE: Refer to the documentation shipped with your hard drive to determine how to set the jumpers on your ATA hard drives to Cable-Select mode.

Guidelines for SCSI Hard Drives

When installing SCSI hard drives to your Compaq ProLiant DL320 server, you must assign each SCSI hard drive a unique ID. The system begins searching the drive with the lowest numbered ID for a bootable partition. The jumpers on a factory-installed hard drive are set to ID 0. For illustration purposes in this document, we assume the devices are numbered ID 0 and ID 1, with ID 0 containing the desired boot partition.

Use only supported hard drives in the Compaq ProLiant DL320 server. For a listing of supported drives, refer to the ProLiant DL320 Quickspecs at the Compaq website:

http://www.compaq.com

CAUTION: Installing unsupported hard drives may damage your system by consuming power and generating heat in excess of the server's operating tolerance.

This condition may result in a loss of system and/or data integrity.

NOTE: Refer to the documentation shipped with your hard drive to determine how to set the jumpers on your SCSI hard drives.

Hard Drive Identification Numbers

The ProLiant DL320 server standard configuration consists of two 1-inch hard drive trays.

ATA hard drives installed in the ProLiant DL320 server appear as Devices 0 and 1, as shown in the following illustration.

IMPORTANT: Always populate hard drive bays starting with the lowest ATA Device number or SCSI ID number.

NOTE: ATA hard drives are configured through the Cable-Select mode.

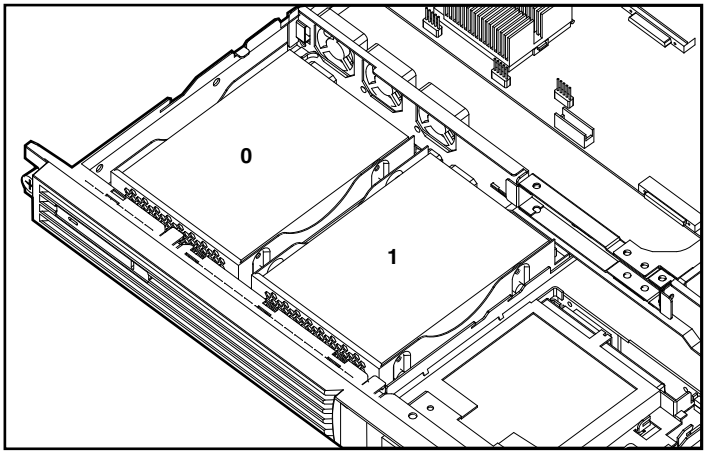

Figure 3-27. ATA device numbers or recommended SCSI ID numbers (drive cables removed for clarity)

Installing External Storage Devices

You can connect optional mass storage devices to the Compaq ProLiant DL320 server through optional SCSI controller or array controller expansion boards. For more information about cabling external storage devices, see Chapter 5, "Cabling Guidelines."

For additional information on configuring your server, refer to the Documentation CD shipped with your server.

Installing ATA Hard Drives

Use the following procedure to install ATA hard drives into the empty hard drive bay of an ATA-model ProLiant DL320 server.

1. Prepare your ATA hard drives by performing the following steps:
   a. Review "Guidelines for ATA Hard Drives" earlier in this chapter to ensure proper jumper settings and hard drive configuration.
   b. Refer to the documentation that ships with your hard drive option kit to ensure that your ATA hard drives are set to Cable-Select mode.

   NOTE: Steps 2 through 4 apply only to servers that have already been mounted in a rack.

2. Back up any data residing on any hard drives currently configured to your server.
3. Power down the server. See "Powering Down the Server" earlier in this chapter.
4. Remove the server from the rack. See "Removing the Server from the Rack" in Chapter 4, "Installing the Server."

   NOTE: If you install the rack management solution option (ball-bearing slide rails and a cable management system), you can perform many hardware procedures without removing the server from the rack. For more information, see "Other Options" earlier in this chapter.

5. Remove the access panel. See "Removing the Access Panel" earlier in this chapter.
6. Identify the tray into which you intend to install your ATA hard drive. See "Hard Drive Identification Numbers" earlier in this chapter.

7. Remove the tray by performing the following steps:

   a. Loosen the thumbscrew ❶ securing the hard drive trays to the chassis.

   b. Slide the tray toward the rear of the server and lift ❷.

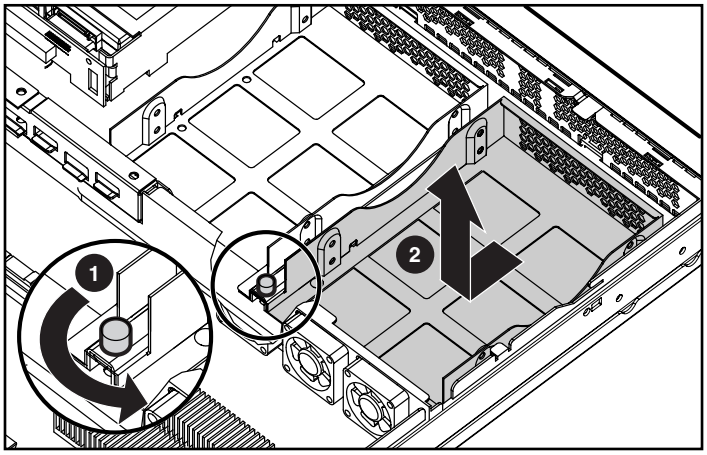

Figure 3-28. Removing the hard drive tray for ATA Device 0

IMPORTANT: ProLiant DL320 servers for ATA hard drive users ship with the ATA cables already installed. The module ends of the cables are threaded through the opening in the center wall and connected to the ATA module, while the cables' device connectors lay in the hard drive bay.

8. Align the new hard drive in the tray ❶, and secure it with four 6-32 Phillips-head screws ❷.

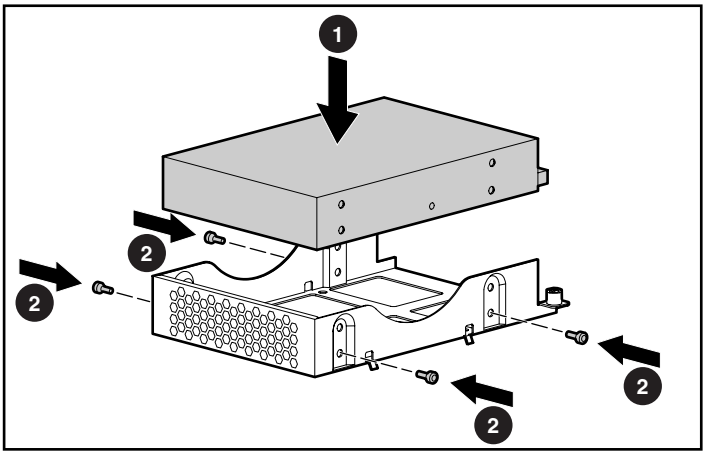

Figure 3-29. Securing a hard drive into a hard drive tray

IMPORTANT: Ensure that you install your hard drives with the data and power connectors along the bottom of the tray and facing away from the front grill.

NOTE: The Phillips screws for this operation are shipped along the top edge of the PCI riser board assembly.

9. Install the hard drive tray into the chassis, and secure it by tightening its hard drive tray thumbscrew.

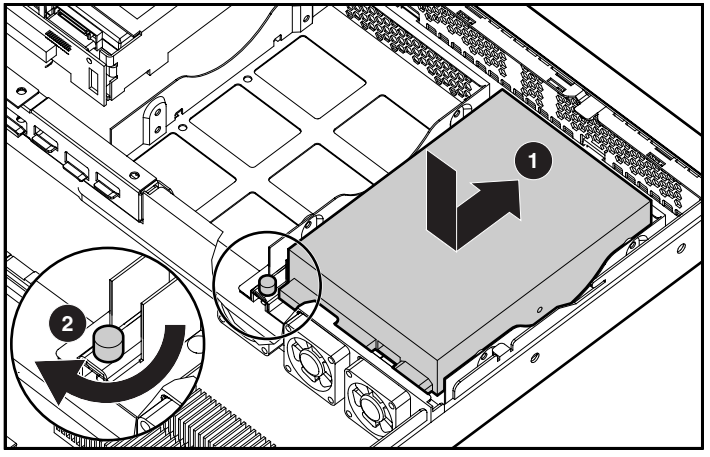

Figure 3-30. Installing a hard drive tray into the chassis

10. Repeat Steps 7 through 9 to install a second ATA hard drive.
11. Connect the ATA Device 0 Cable ❶ to your ATA Device 0 hard drive and the ATA Device 1 Cable ❷ to your ATA Device 1 hard drive.

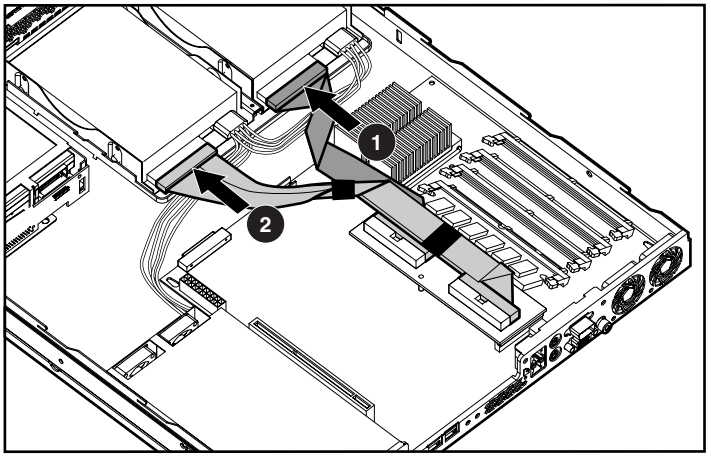

Figure 3-31. Cabling your ATA hard drives (center wall and PCI riser board assembly removed for clarity)

12. Connect the hard drive power cable to your ATA hard drives.

IMPORTANT: When connecting the power cable to your hard drives, ensure that the connectors are installed with the red wire facing right (as viewed from the front of the server).

13. Install the access panel. See "Installing the Access Panel" earlier in this chapter.
14. Install the server in the rack. See "Inserting the Server into the Rack" in Chapter 4, "Installing the Server."
15. Power up the server. See "Powering up the Server" in Chapter 4, "Installing the Server."

Installing SCSI Hard Drives

The following procedure describes how to install SCSI hard drives into the empty hard drive bay of a SCSI-model ProLiant DL320 server.

1. Prepare your SCSI hard drives by performing the following steps:
   a. Review "Guidelines for SCSI Hard Drives" earlier in this chapter to ensure proper jumper settings and hard drive configuration.
   b. Refer to the documentation that ships with your hard drive option kit to ensure that only one of your SCSI hard drives is set to SCSI ID 0.

   NOTE: Steps 2 through 4 apply only to servers that have already been mounted in a rack.

2. Back up any data residing on any hard drives currently configured to your server.
3. Power down the server. See "Powering Down the Server" earlier in this chapter.
4. Remove the server from the rack. See "Removing the Server from the Rack" in Chapter 4, "Installing the Server."

   NOTE: If you install the rack management solution option (ball-bearing slide rails and a cable management system), you can perform many hardware procedures without removing the server from the rack. For more information, see "Other Options" earlier in this chapter.

5. Remove the access panel. See "Removing the Access Panel" earlier in this chapter.
6. Identify the tray into which you intend to install your SCSI hard drive. See "Hard Drive Identification Numbers" earlier in this chapter.

7. Remove the tray by performing the following steps:

   a. Loosen the thumbscrew ❶ securing the hard drive trays to the chassis.

   b. Slide the tray toward the rear of the server and lift ❷.

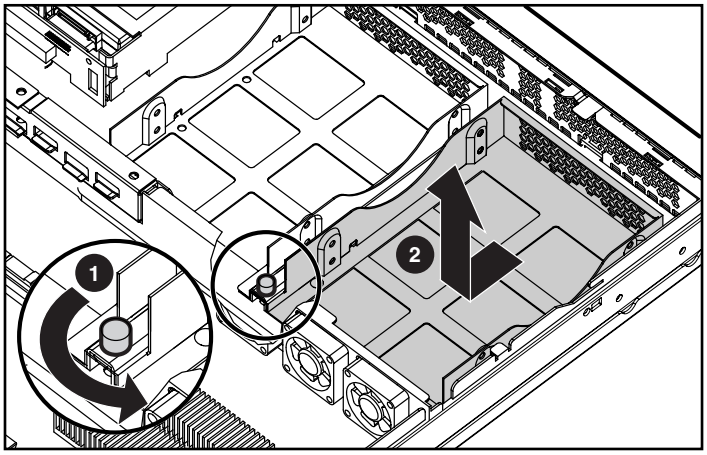

Figure 3-32. Removing the hard drive tray for SCSI ID 0

IMPORTANT: ProLiant DL320 servers for SCSI hard drive users ship with the SCSI cable already installed. The controller end of the cable is threaded through the opening in the center wall and connected to the SCSI module, while the cable's device connectors lay in the hard drive bay.

8. Align the new hard drive in the tray ❶, and secure it with four 6-32 Phillips-head screws ❷.

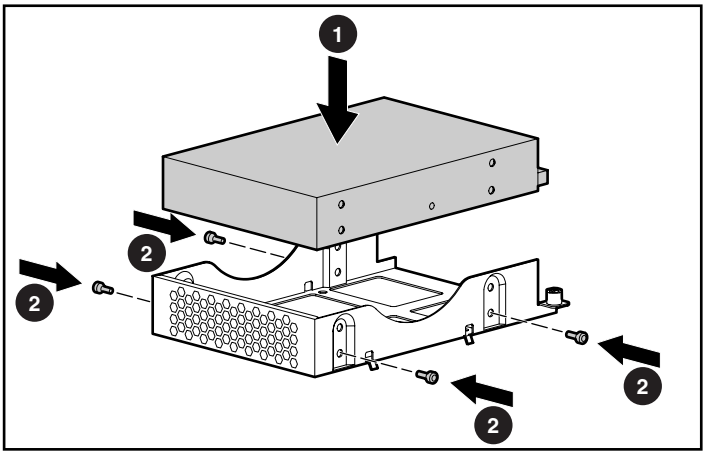

Figure 3-33. Securing a hard drive into a hard drive tray

IMPORTANT: Ensure that you install your hard drives with the data and power connectors along the bottom of the tray, facing away from the front grill.

NOTE: The Phillips screws for this operation are shipped along the top edge of the PCI riser board assembly.

9. Install the hard drive tray into the chassis ❶ and secure it by tightening its thumbscrew ❷.

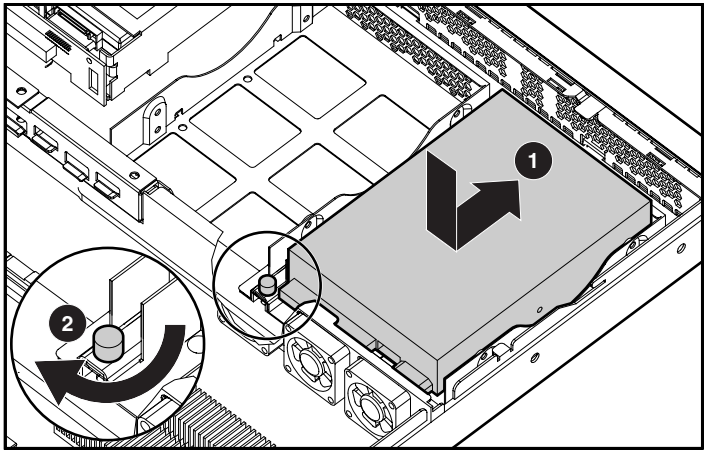

Figure 3-34. Installing a hard drive tray into the chassis

10. Repeat Steps 7 through 9 to install a second SCSI hard drive.
11. Connect the SCSI cable and the hard drive power cable to your SCSI hard drives.

IMPORTANT: When connecting the power cable to your hard drives, ensure that the connectors are installed with the red wire facing right (as viewed from the front of the server).

12. Install the access panel. See "Installing the Access Panel" earlier in this chapter.
13. Install the server in the rack. See "Inserting the Server into the Rack" in Chapter 4, "Installing the Server."
14. Power up the server. See "Powering up the Server" in Chapter 4, "Installing the Server."

Installing a Compaq Smart Array Controller (SCSI Drives Internal)

The ProLiant DL320 server enables users to configure an optional array controller in the PCI expansion slot and use the controller to manage the server's internal hard drives.

For management of external devices only, the procedure for installing a Smart Array Controller is equivalent to installing any expansion board.

Perform the following procedures to configure a Smart Array Controller in the PCI expansion slot to manage your internal SCSI hard drives.

NOTE: Steps 1 through 3 apply only to servers that have already been mounted in a rack.

1. Back up the data residing on the hard drives.
2. Power down the server. See "Powering down the Server" earlier in this chapter.
3. Remove the server from the rack. See "Removing the Server from the Rack" in Chapter 4, "Installing the Server."

NOTE: If you install the rack management solution option (ball-bearing slide rails and a cable management system), you can perform many hardware procedures without removing the server from the rack. For more information, see "Other Options" earlier in this chapter.

4. Remove the access panel. See "Removing the Access Panel" earlier in this chapter.

NOTE: Steps 5 and 6 are necessary only if you apply your array controller across your internal hard drives.

5. Remove the SCSI module by pinching the tops of the support posts ❶ and lifting the SCSI module ❷ from the system board.

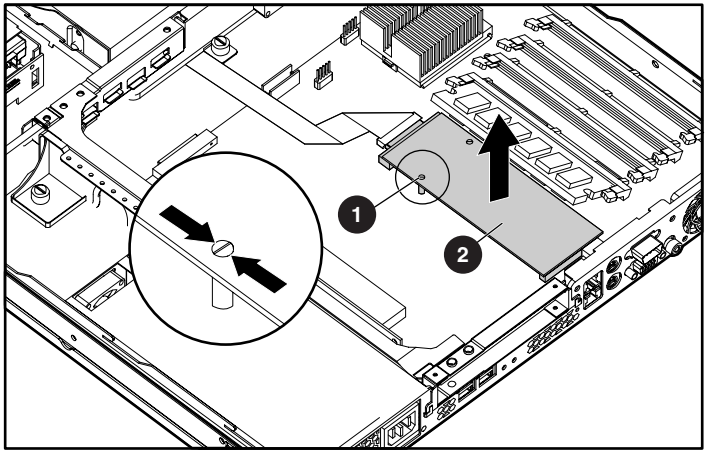

Figure 3-35. Removing the SCSI module from the system board

6. Disconnect the SCSI module from the SCSI cable.
7. Remove the PCI riser board assembly. See "Removing the PCI Riser Board Assembly" earlier in this chapter.

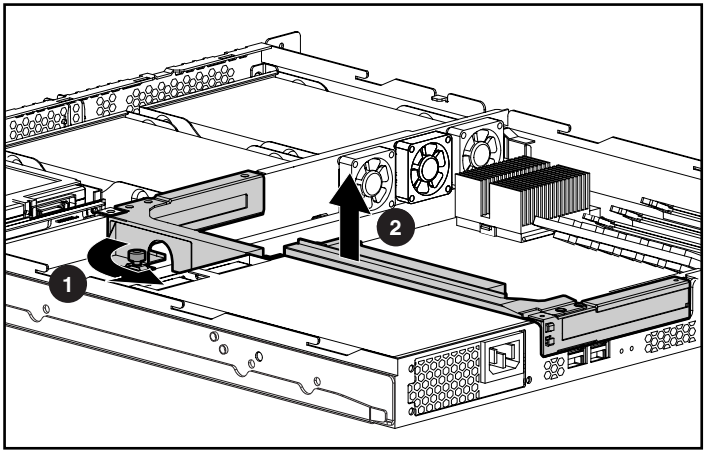

Figure 3-36. Removing the PCI riser board assembly

8. Remove the expansion slot cover. See "Removing the Expansion Slot Cover" earlier in this chapter.

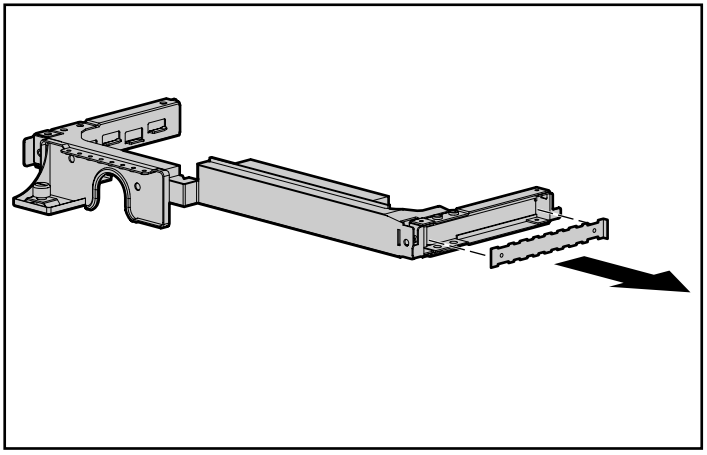

Figure 3-37. Removing the expansion slot cover

9. Install the array controller expansion board into the PCI riser board assembly by aligning the expansion board with the guiding groove and sliding the expansion board into the slot until the board seats firmly.

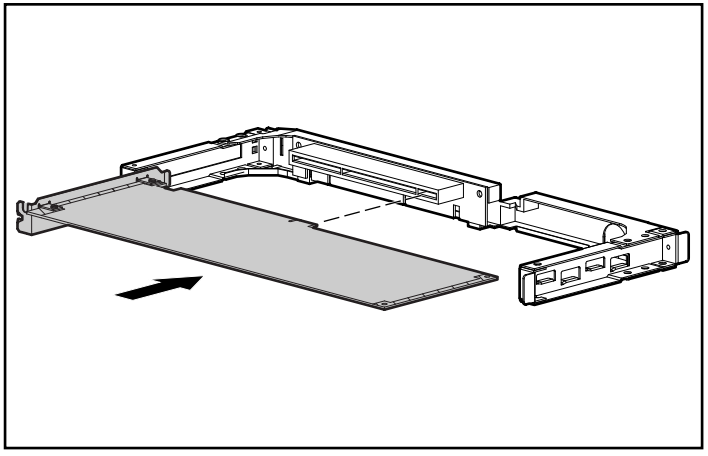

Figure 3-38. Installing the array controller expansion board into the PCI riser board assembly

10. Install the PCI riser board assembly by performing the following steps:

    a. Lay the PCI riser board assembly in the chassis, and ensure that the system power cable is clear of the PCI riser board thumbscrew plate.

b. Align the tabs ❶ along the lower rear corners of the PCI riser board assembly with the retainers ❷ on the rear panel of the chassis.

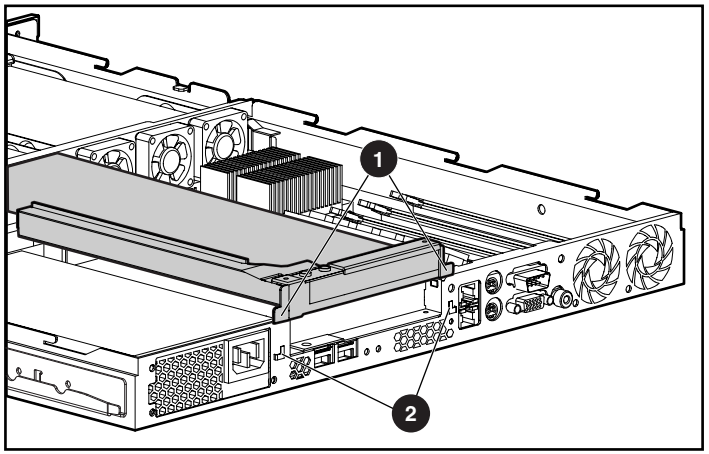

Figure 3-39. Aligning the PCI riser board assembly

c. Press downward firmly above the 64-bit expansion slot ❶ until the PCI riser board assembly is seated in the expansion slot.

d. Tighten the PCI riser board thumbscrew ❷.

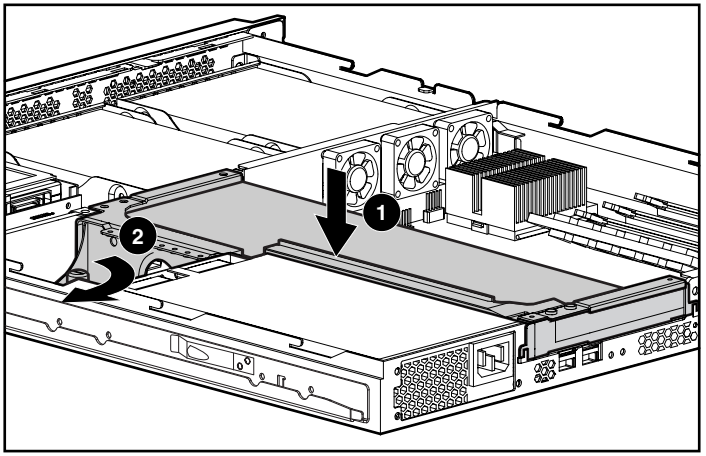

Figure 3-40. Installing the PCI riser board assembly

11. Connect the SCSI cable to the array controller in the PCI expansion slot.

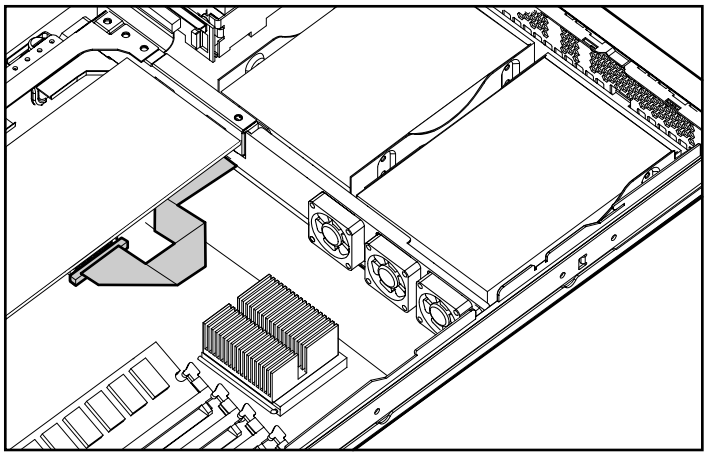

Figure 3-41. Connecting the SCSI cable to the array controller

12. Install the access panel. See “Installing the Access Panel” earlier in this chapter.
13. Install the server in the rack. See “Inserting the Server into the Rack” in Chapter 4, “Installing the Server.”
14. Configure any devices attached to the array controller. Refer to the documentation that ships with your array controller.
15. Power up the server. See “Powering up the Server” in Chapter 4, “Installing the Server.”
16. Rebuild the data on your internal hard drives with the backup data from Step 1.
17. Resume normal server operations.

Installing a Compaq Smart Array Controller in a System with ATA Drives

Compaq offers a two-device SCSI cable as an option for installing SCSI hard drives and a Compaq Smart Array controller into a ProLiant DL320 server with ATA hard drives. To perform this installation, refer to the documentation that shipped with your option kit.

CAUTION: When supporting a mixed environment of ATA drives and SCSI drives in a ProLiant DL320 server, the ATA drive must be the boot device.

NOTE: When using the Smart Array controller to manage internal drives, you must remove the ATA module.

NOTE: Refer to the documentation that ships with your Smart Array controller for restrictions on using both internal and external SCSI connectors.

NOTE: You can run ATA drives internally while running external SCSI drives.

Use the following procedures to install two internal SCSI hard drives with RAID management into a ProLiant DL320 server with ATA hard drives:

1. Review the "Guidelines for Installing Hard Drives" earlier in this chapter to ensure proper jumper settings and hard drive configuration.

   NOTE: Steps 2 through 4 apply only to servers that have already been mounted in a rack.

2. Back up the data residing on any ATA hard drives in your server.
3. Power down the server. See "Powering Down the Server" earlier in this chapter.
4. Remove the server from the rack. See "Removing the Server from the Rack" in Chapter 4, "Installing the Server."

   NOTE: If you install the rack management solution option (ball-bearing slide rails and a cable management system), you can perform many hardware procedures without removing the server from the rack. For more information, see "Other Options" earlier in this chapter.

5. Remove the access panel. See "Removing the Access Panel" earlier in this chapter.
6. Remove the PCI riser board assembly. See "Removing the PCI Riser Board Assembly" earlier in this chapter.

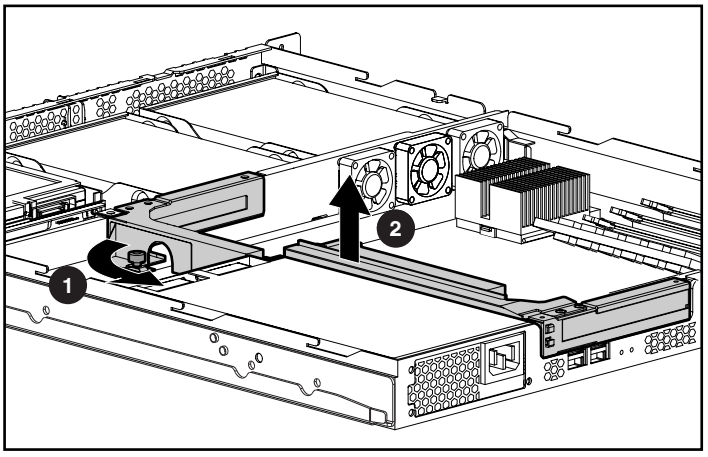

Figure 3-42. Removing the PCI riser board assembly (module removed for clarity)

IMPORTANT: Perform Steps 7 through 12 only if you wish to replace your ATA hard drives with internal SCSI hard drives.

7. Remove the hard drive trays by performing the following steps:
   a. Disconnect the ATA cable and the hard drive power cable from any existing ATA hard drives.
   b. Loosen the thumbscrews securing the hard drive trays to the chassis.
   c. Slide the hard drive trays toward the rear of the chassis, and lift the trays from the chassis.
8. Remove the center wall. See “Removing the Center Wall” earlier in this chapter.

9. Remove the ATA module from the system board by unlocking the support posts ❶, lifting the ATA module from the system board ❷, and disconnecting the ATA cables from any hard drives ❸.

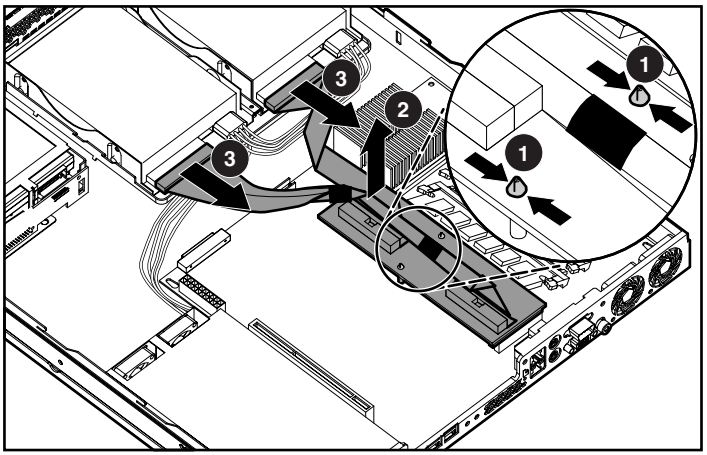

Figure 3-43. Removing the ATA module from the system board

10. Install the SCSI hard drives by performing the following steps:
    a. Remove any existing ATA hard drives from the hard drive trays.
    b. Secure the SCSI hard drives in the hard drive trays.

IMPORTANT: Ensure that you install your hard drives with the data and power connectors along the bottom of the tray, facing away from the front grill.

IMPORTANT: The Phillips screws for this operation are shipped along the top edge of the PCI riser board assembly.

    c. Install the trays into the hard drive bays, and secure them by tightening their thumbscrews.
    d. Connect the SCSI cable and hard drive power cable to your SCSI hard drives.

IMPORTANT: When connecting the power cable to your hard drives, ensure that the connectors are installed with the red wires facing right (as viewed from the front of the server).

11. Lay the SCSI cable flat across the center wall area of the chassis.
12. Install the center wall. See "Installing the Center Wall" earlier in this chapter.

13. Install your Smart Array Controller in the PCI expansion slot by performing the following steps:

    a. Remove the expansion slot cover. See "Removing the Expansion Slot Cover" earlier in this chapter.

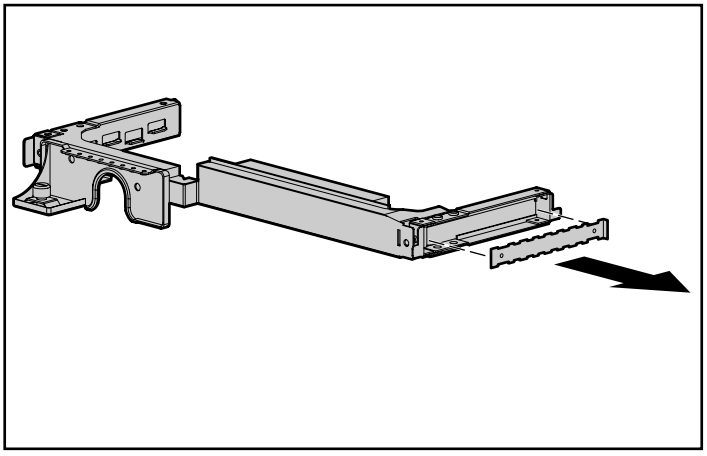

Figure 3-44. Removing the expansion slot cover

    b. Install the Smart Array controller by aligning the board with the guiding groove and sliding it into the slot until it seats firmly.

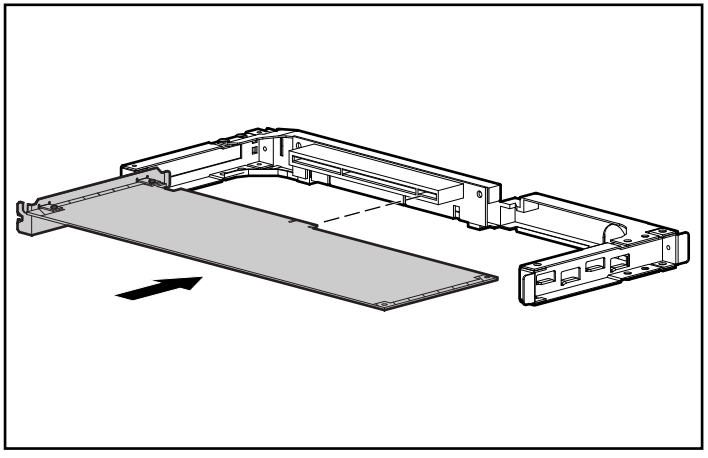

Figure 3-45. Installing the array controller expansion board into the PCI riser board assembly

14. Install the PCI riser board assembly:

a. Lay the PCI riser board assembly in the chassis, and ensure that the system power cable is clear of the PCI riser board assembly thumbscrew plate.

b. Align the tabs ❶ along the lower rear corners of the PCI riser board assembly with the retainers ❷ on the rear panel of the chassis.

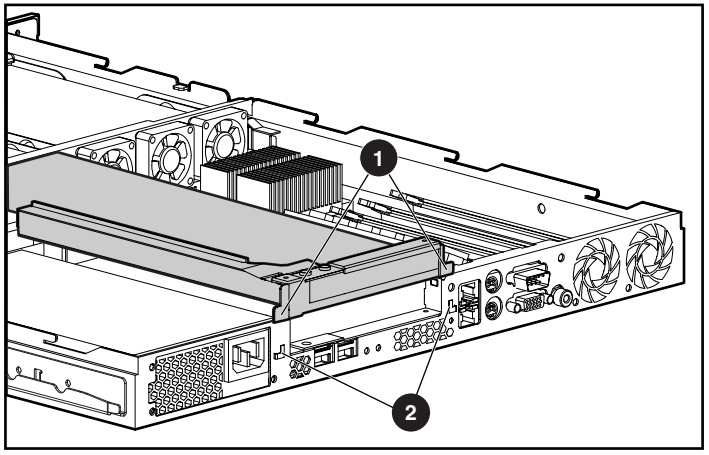

Figure 3-46. Aligning the rear edge of the PCI riser board assembly with the chassis

c. Press down firmly along the 64-bit expansion slot ❶ until the PCI riser board assembly is seated in the expansion slot.

d. Tighten the PCI riser board assembly thumbscrew ❷.

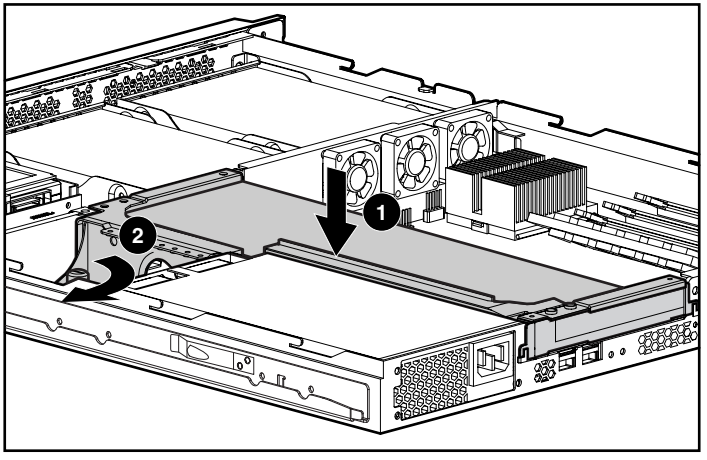

Figure 3-47. Installing the PCI riser board assembly

15. If you have installed internal SCSI hard drives, connect the system connector of the SCSI cable to the Compaq Smart Array controller in the expansion slot.
16. Install the access panel. See “Installing the Access Panel” earlier in this chapter.
17. Install the server into the rack. See “Inserting the Server into the Rack” in Chapter 4, “Installing the Server.”
18. Configure any external cables to the Smart Array controller.
19. Power up the server. See “Powering up the Server” in Chapter 4, “Installing the Server.”
20. Rebuild the data on your internal hard drives with the backup data from Step 2.

Chapter **4**

Installing the Server

Server Installation Overview

The following steps give an overview of the required procedures for installing ProLiant DL320 servers:

IMPORTANT: If you intend to deploy and configure multiple ProLiant DL320 servers in a single rack, consult the *Compaq ProLiant DL320 Ultra-Dense Server Deployment in Compaq Racks* white paper on the Compaq website:

http://www.compaq.com

IMPORTANT: Before beginning the following procedures, refer to the *Important Safety Information* guide that shipped with your server.

1. Select an appropriate site for your rack.

   For environment requirements, see "The Optimum Environment," in Chapter 2, "Planning the Server Installation." For information on rack planning, refer to the Rack Planning and Information Guide online document. This guide can be found on the Rack Information Library CD, or the information can be downloaded from the Compaq website:

   http://www.compaq.com

2. Unpack the server and rack-mounting hardware.

   See "Unpacking the ProLiant DL320 Server" in Chapter 2, "Planning the Server Installation."

3. Install a PCI expansion board.

   See Chapter 3, "Installing Hardware Options." Refer to the option kit documentation for detailed instructions.

4. Install other options.

   Other options include additional memory, hard drives, expansion boards, and external storage devices. See Chapter 3, "Installing Hardware Options." Refer to the individual option kits for detailed instructions. Before you run the System Configuration Utility, install hardware options (with the exception of additional memory and most PCI boards). The System Configuration Utility is run during the SmartStart portion of the installation sequence.

IMPORTANT: Do not attempt to change the factory settings for reserved switches. Inaccurate settings can seriously degrade system performance.

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5. Set internal switches, if necessary. For detailed information on relevant switches, see Appendix D, "Status Indicators and Switches."
6. Use the rack template to identify the proper location for server installation. See "Measuring with the Template," later in this chapter.
7. Install the fixed rack rails. See "Attaching the Fixed Rack Rails to the Rack," later in this chapter.
8. Install the fixed cable tray for managing cables on the server rear panel.

   These cables include keyboard, mouse, monitor, network, and power cables. See "Attaching the Fixed Cable Tray," later in this chapter.

9. Mount the server in the rack. See "Inserting the Server into the Rack," later in this chapter.
10. Connect the power cord and peripheral devices. See "Connecting the Power Cord and Peripheral Devices," later in this chapter.
11. Secure the power cord and peripheral device cables in the fixed cable tray. See "Securing the Cables in the Fixed Cable Tray," later in this chapter.

Server Installation Procedures

To install your rack-mounted server into a Compaq rack, complete the procedures described in the following subsections:

1. Measuring with the template
2. Attaching the fixed rack rails to the rack
3. Attaching the fixed cable tray
4. Inserting the server into the rack

CAUTION: When using a Compaq Series 7000 rack, you must install the high air flow rack door to provide proper front-to-back airflow and cooling.

Measuring with the Template

The rack template provides an easy and reliable way to properly position the fixed rack rails in the rack.

Using the template, you can identify the proper holes for inserting the tabs on the fixed rack rails. You can 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.

CAUTION: Always mount the heaviest item on the bottom of the rack, and work from the bottom to the top.

IMPORTANT: Determine the server's place in the rack **before** you start installing the fixed rack rails. To remind you of the proper placement of the server in the rack, refer to the Rack Builder report you printed when you planned your rack configuration.

IMPORTANT: The template is two-sided (front and back) and printed with arrows that show you where items will be inserted, both for the fixed rack rails and for the thumbscrews that will secure the server faceplate to the front of the rack.

Use the rack template to identify the required space and location for your server:

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.

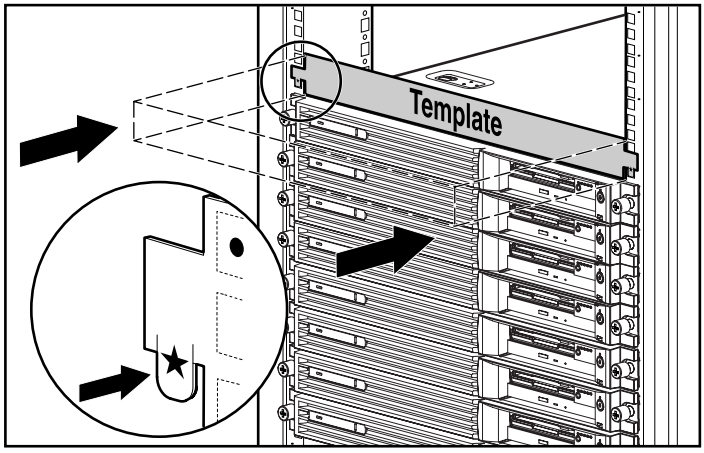

Figure 4-1. Measuring with the template

3. Align the template so that the sides of the template are squared up with the sides of the rack. Tick marks on the rack's vertical rails help you maintain the proper alignment. The tick marks allow you to count U-spaces.

4. Using a pencil, mark the locations ❶ on the rack where the fixed rack rail tabs will be inserted.

5. On the rack, mark the top and bottom edges of the template ❷. This step helps you align a template for the next component.

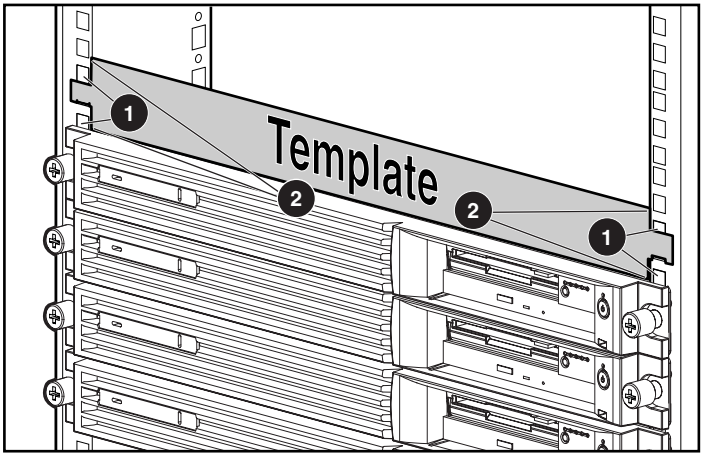

Figure 4-2. Marking the rack for server installation

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.

8. After marking the front and rear of the rack, remove the template from the rack. Attach the fixed rack rails to the rack. See the following subsection, “Attaching the Fixed Rack Rails to the Rack.”

Attaching the Fixed Rack Rails to the Rack

Use the following procedures to attach the fixed rack rails to the rack:

1. Complete the procedures for measuring with the template. See "Measuring with the Template" earlier in this chapter.
2. Move to the rear of the rack.
3. Identify the front holes you will use to secure the front tabs of the fixed rack rail.

IMPORTANT: Ensure that the inner side of the fixed rack rail (rail guide) faces the inside of your rack.

4. Carefully align the two front tabs on the front of the fixed rack rail with the holes identified at the front of the rack.

NOTE: 1U of space is left empty in the drawing for clarity purposes. The ProLiant DL320 server should be installed in every U from the bottom of the rack. This arrangement provides maximum density. Work from the bottom of the rack up, filling all spaces.

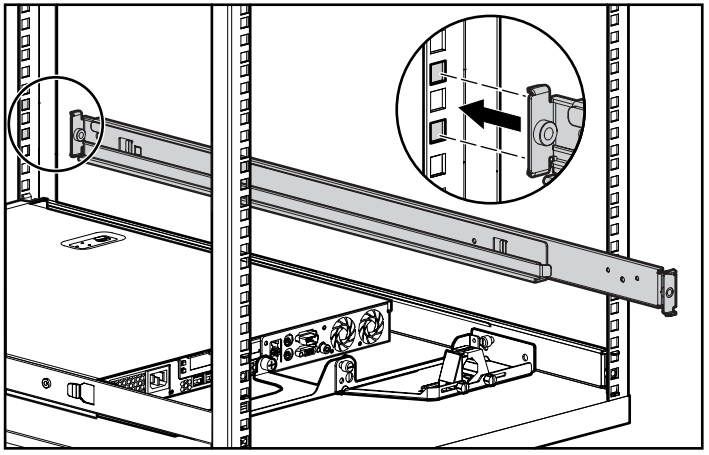

Figure 4-3. Aligning and inserting the fixed rack rail (rear view)

5. Insert the front tabs of the fixed rack rail into the rack.

6. Compress the fixed rail rack toward the front of the rack until you can align the rear tabs with the inner holes at the back of the rack.

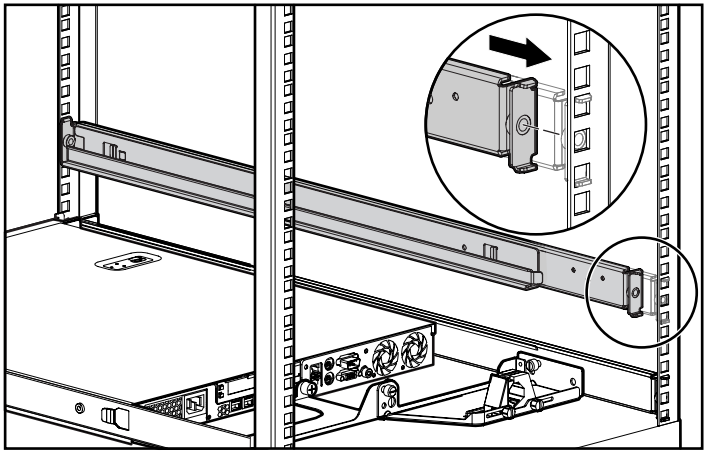

Figure 4-4. Aligning the rear tabs of the fixed rack rail with the rear holes (rear view)

7. Insert the rear tabs into the rear holes, and release the rail. The rail should lock in place securely.

8. Repeat steps 2 through 7 for the second fixed rack rail. Figure 4-5 shows a completed installation of the fixed rack rails.

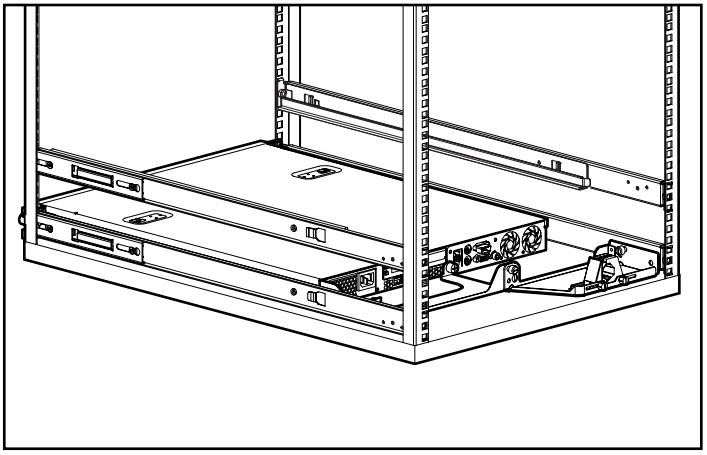

Figure 4-5. Fixed rack rails installed in the rack, ready for server installation (rear view)

After both fixed rack rails are installed, you are ready to use the procedure for "Attaching the Fixed Cable Tray."

Attaching the Fixed Cable Tray

Use the following procedure to attach the fixed cable tray:

1. Move to the rear of the rack.
2. Insert the tabs on the right edge of the fixed cable tray into the slots on the rack rail ❶.
3. Fasten the rail thumbscrew ❷ that secures the fixed cable tray to the rail.

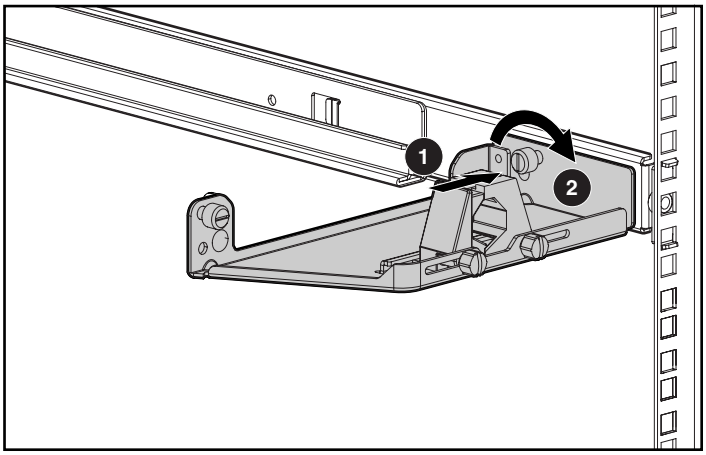

Figure 4-6. Inserting and attaching the fixed cable tray (rear view)

After attaching the cable tray to the rack, you are ready to begin the procedure for "Inserting the Server Into the Rack."

Installing the Cable Support Bracket on the Server

The Cable Support Bracket enables the ProLiant DL320 server to use the rack management solutions available for the ProLiant DL360.

Use the following procedure to attach the Cable Support Bracket.

1. Remove the access panel. See "Removing the Access Panel" in Chapter 3, "Installing Hardware Options."
2. Insert the alignment tab into the alignment slot ❶ above the left corner of the server rear panel.
3. Tighten the thumbscrews ❷ to secure the cable support bracket to the server rear panel.

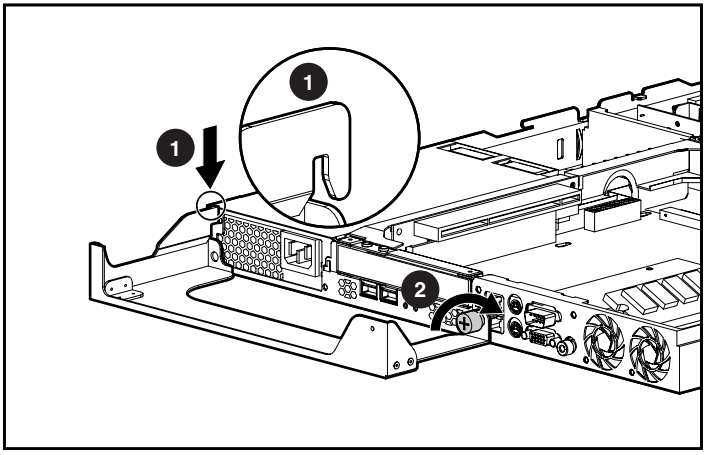

Figure 4-7. Installing the cable support bracket

4. Install the access panel. See "Installing the Access Panel" in Chapter 3, "Installing Hardware Options."

Inserting the Server into the Rack

CAUTION: To avoid destabilizing the rack, install multiple servers, starting from the bottom of the rack.

NOTE: The Compaq ProLiant DL320 server ships with standard factory-mounted fixed server rails for simplified rack installation.

Use the following procedures to insert the server into the rack:

1. Move to the front of the rack.
2. Ensure that you have completed the procedure for "Attaching the Fixed Rack Rails to the Rack" earlier in this chapter.
3. Align the rear end of the fixed server rails ❶ (on the sides of the server) with the front end of the fixed rack rails ❷.

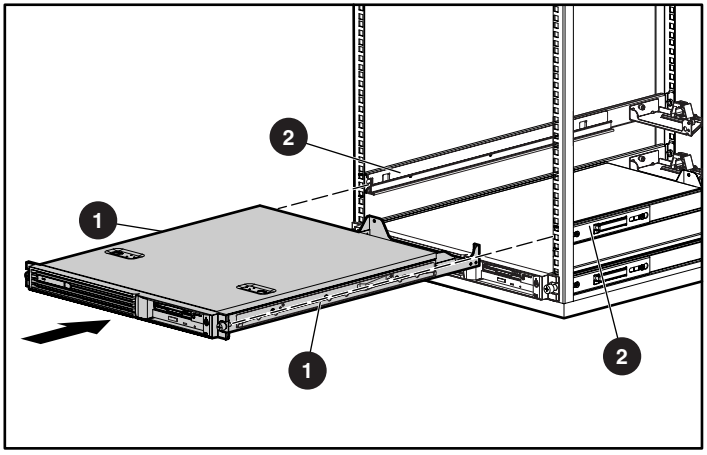

Figure 4-8. Aligning the rear end of the fixed server rails with the front end of the fixed rack rails

NOTE: 1U of space is left empty in the drawing for clarity purposes. The ProLiant DL320 server should be installed in every U from the bottom of the rack. This arrangement provides maximum density. Work from the bottom of the rack up, filling all spaces.

WARNING: To avoid personal injury, press the rail release latches and slowly slide the server into the rack. The rail-release latches can pinch your fingertips.

4. Insert the server into the rack, ensuring that the fixed server rails slide inside the fixed rack rails.

> **CAUTION:** Keep the server parallel to the floor when sliding the fixed server rails into the slide rails. Tilting the server can damage the rails.

5. Slide the server fully into the rack.
6. Position the front panel thumbscrews through the holes on both sides of the rack and into the round, threaded holes in the front of the fixed rack rail.
7. Tighten the thumbscrews by turning them clockwise.
8. At the rear of the rack, fasten the server thumbscrew that secures the fixed cable tray to the server.

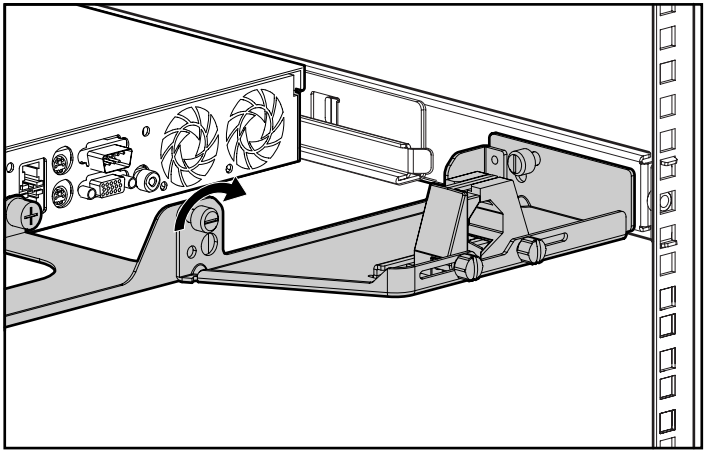

Figure 4-9. Fastening the cable tray to the server

After installing the server in the rack, you are ready to begin the procedure for "Connecting the Power Cord and Peripheral Devices."

Connecting the Power Cord and Peripheral Devices

After you attach the fixed cable tray, you can connect the power cord and peripheral devices to the connectors located on the rear panel of the server. Icons on the back of the server identify the function of each connector.

WARNING: To reduce the risk of electrical shock or fire, do not plug telecommunications/telephone connectors into the NIC connectors.

CAUTION: If the Remote Insight Lights-Out Edition is installed in your server, ensure that you connect your video cable into the video connector on the rear of the Remote Insight Lights-Out Edition. The standard video connector on the server rear panel is not used when the Remote Insight Lights-Out Edition is installed. For more information, see the documentation that ships with this option.

Use the following figure and table to identify connectors, and follow the connection order to attach your cables and power cord. The location numbers in the figure and table correspond to the connection order for the peripheral cables and power cord.

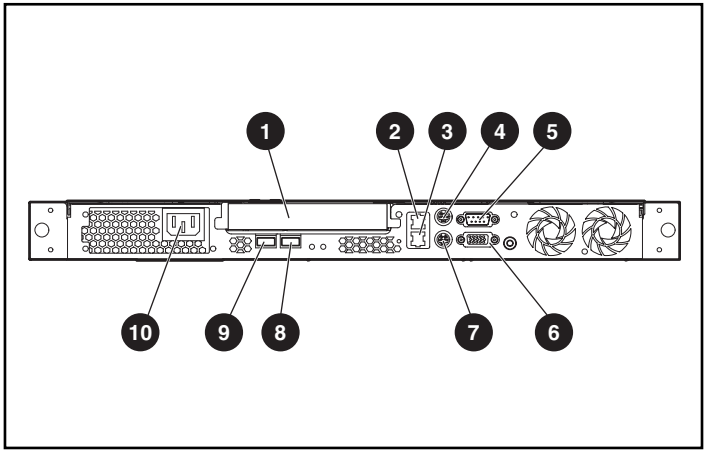

Figure 4-10. Rear panel connectors on the ProLiant DL320 server

CAUTION: Always follow the cabling order for the ProLiant DL320 server. Using an improper cabling sequence can result in electrical damage to peripheral devices.

Table 4-1
Rear Panel Connectors and Connection Order

Location	Connector
❶	Expansion slot
❷	RJ-45 Fast Ethernet connector for NIC 2
❸	RJ-45 Fast Ethernet connector for NIC 1 (supports PXE)
❹	Mouse connector
❺	Serial connector
❻	Video connector
❼	Keyboard connector
❽	USB 1 connector
❾	USB 2 connector
❿	Power connector

Note: The location numbers in this table correspond to the connection order for the peripheral cables and power cord.

CAUTION: Do not route the power cord in a place where it can be walked on or pinched by items placed against it. Pay particular attention to the plug, electrical outlet, and the point at which the cord exits from the server.

Securing the Cables in the Fixed Cable Tray

After attaching the fixed cable tray and connecting the power cord and peripheral devices, you must secure all cabling. Use the following procedures to secure the cables in the fixed cable tray:

1. Loosen the clamp thumbscrews ❶ on both sides of the cable clamp.
2. Open the cable clamp ❷.

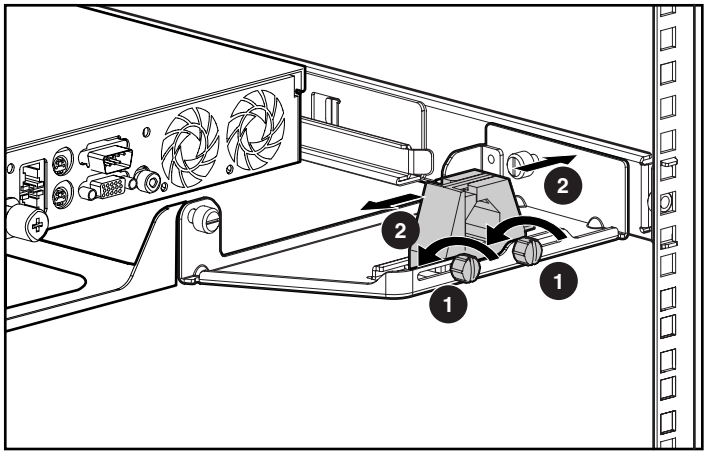

Figure 4-11. Opening the cable clamp (cables removed for clarity)

3. Starting with the peripheral device cables on the left, route all of the cables and cords into the cable clamp.

4. After all the cables are routed, close the cable clamp ❶.
5. Tighten the clamp thumbscrews ❷ to hold the cable clamp in place.

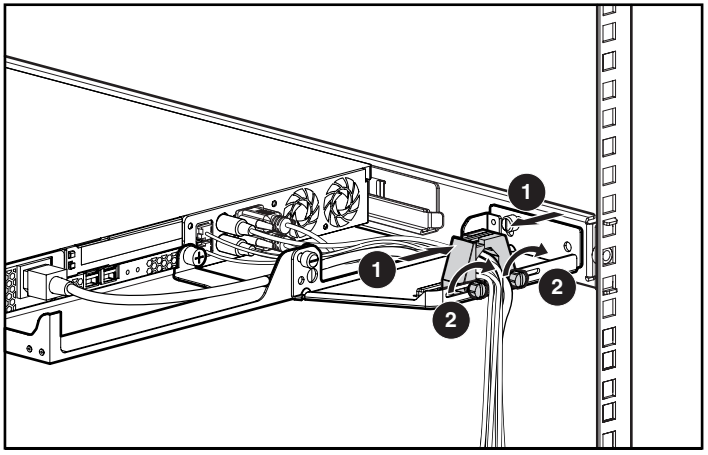

Figure 4-12. Closing the cable clamp on routed cables

6. Route the cables to the side of the rack.

Powering Up the Server

After connecting the cables to the server, you are ready to power on the ProLiant DL320 server.

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.

WARNING: Do not place anything on power cords or cables. Arrange the cords so that no one can accidentally step on or trip over them. Do not pull on a cord or cable. When unplugging the cord from the electrical outlet, grasp the cord by the plug.

Use the following procedures to power up the server:

1. To power up the server, press the Power On/Off switch.

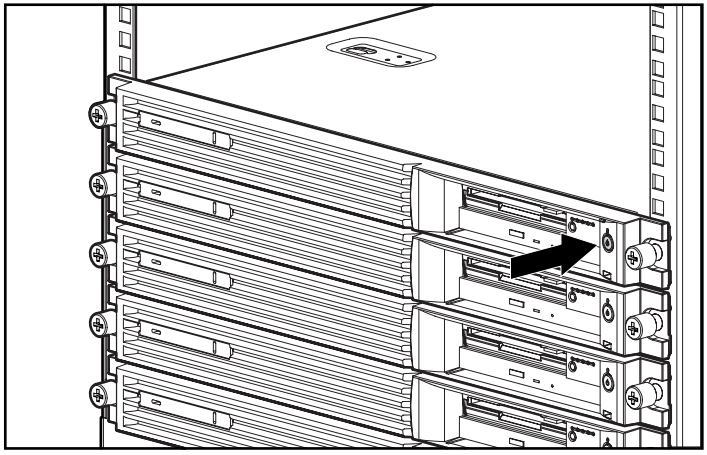

Figure 4-13. Powering up the server

2. Use the LED information in the following table to identify a successful power-on sequence.

After the server has successfully powered on, you can begin the configuration process. See Chapter 6, “Server Configuration and Utilities.”

If your server does not power on successfully, or if it indicates a fault, see Appendix E, “Troubleshooting.”

Installation Sequence

CAUTION: If you are installing the operating system on your server, use the installation instructions in the following section Otherwise, follow the instructions in the "Preconfigured Operating System" section later in this chapter.

Operating System Purchased Separately

If you purchased your operating system separately, install the operating system by following the instructions on the SmartStart and Support Software CD. Refer to the Server Setup and Management pack for instructions on using SmartStart. The first time the server is configured, the SmartStart program automatically creates a necessary partition on your hard drive. This partition cannot be used for any other purpose and is not a traditional system partition.

Perform the following steps when setting up your server for the first time:

IMPORTANT: To reduce the risk of damage to your server, complete the installation process by following the detailed procedures provided later in this chapter and in other sections of the setup and installation guide.

1. Power up your server. See "Powering Up the Server" earlier in this chapter.

IMPORTANT: You can use the SmartStart and Support Software CD (recommended) or the RBSU that is embedded in the server ROM to configure certain system features.

Step 2 applies only to users who choose to configure their servers with the SmartStart and Support Software CD.

IMPORTANT: You must install the optional CD-ROM/diskette drive assembly to use Compaq SmartStart.

2. Place the SmartStart and Support Software CD in the CD-ROM drive and, power up the server again. Follow the onscreen instructions to complete the server initialization process. For SmartStart and Support Software CD initialization procedures, refer to the Server Setup and Management pack shipped with your server or see Chapter 6, "Server Configuration and Utilities."

3. Run the ROM-Based Setup Utility (RBSU) by pressing **F9** when prompted in the lower right corner of the screen. Use RBSU to verify the type of operating system and set the date and time. For information on using the RBSU to configure other server features, see Chapter 6, "Server Configuration and Utilities."
4. Install the operating system.
5. Install Compaq Insight Manager to manage the server. For Compaq Management CD initialization procedures, refer to the Server Setup and Management pack shipped with your server.

IMPORTANT: You must install and use Compaq Insight Manager to benefit from Compaq Pre-Failure Warranties on processors, hard drives, and memory modules.

6. Install any application software needed.
7. Register your server. See "Registering your Server" later in this chapter.

Preconfigured Operating System

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 by unplugging the power cord from either the electrical outlet or the server.
- Do not place anything on power cords or cables. Arrange them so that no one can accidentally step on or trip over them. Do not pull on a cord or cable. When unplugging the cord from the electrical outlet, grasp the cord by the plug.

CAUTION: Use the SmartStart and Support Software CD as recovery software only. Powering up the server from the SmartStart and Support Software CD reconfigures the system and causes all data on the server to be lost.

If you ordered your server with the operating system factory-installed, everything required to install your operating system is already on the server. Refer to the steps provided in the *Compaq Factory-Installed Operating System Software User Guide* for more information on using your operating system.

1. Power up the server. See "Powering Up the Server" earlier in this chapter.
2. Follow the on-screen instructions to complete the factory-installed operating system initialization process. After initialization is complete, the server will automatically go through POST.
3. Install the Compaq Management Agents on the server. Refer to Chapter 6, "Server Configuration and Utilities," and the Compaq Management CD for information about installing the Compaq Management Agents for your operating system.
4. After your server configuration is complete, back up your server.
5. Install any application software.
6. Register your server. See "Registering Your Server" later in this chapter.

Registering Your Server

For server registration information, refer to the Server Setup and Management pack that ships with your server, or register your Compaq server online at the Compaq website:

http://www.compaq.com/register

If you configure your server with SmartStart, you may also want use your Compaq Server Profile Diskette to register after performing the configuration. Simply follow the instructions on our website and insert the Compaq Server Profile Diskette when prompted.

Routine Maintenance

For information concerning routine maintenance and safety precautions, refer to the Documentation CD included in the Reference Information pack shipped with your server.

Removing the Server from the Rack

You may need to remove the server from the rack for service purposes or to install hardware options.

NOTE: If you install the rack management solution option (ball-bearing slide rails and a cable management system), you can perform many hardware procedures without removing the server from the rack. For more information, see "Other Options" in Chapter 3, "Installing Hardware Options."

Use the following procedures to remove the server from the rack:

1. If you intend to install hardware options, back up your server data.
2. Shut down the operating system as directed in your operating system instructions.
3. Press the front unit identification switch ❶ on the server front panel. An LED ❷ illuminates blue on the server front and rear panels.
4. Press the server Power On/Off switch ❸ to power down the server. The Power On/Off LED ❹ deactivates.

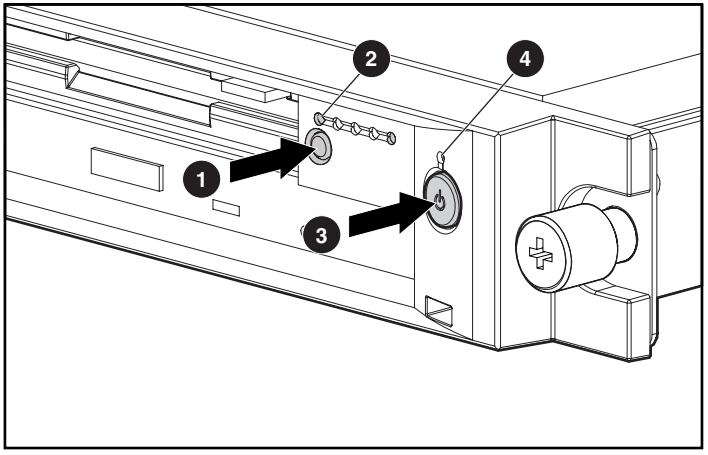

Figure 4-14. Activating the front unit identification LED and powering down the server

WARNING: The system power in the ProLiant DL320 server does not completely shut off from the front panel Power On/Off switch. Portions of the power supply and some internal circuitry remain active until AC power is removed.

5. On the server rear panel, locate the rear unit identification LED ❶ This LED is located in the center of the switch ❷.

NOTE: The rear unit identification LED illuminates blue.

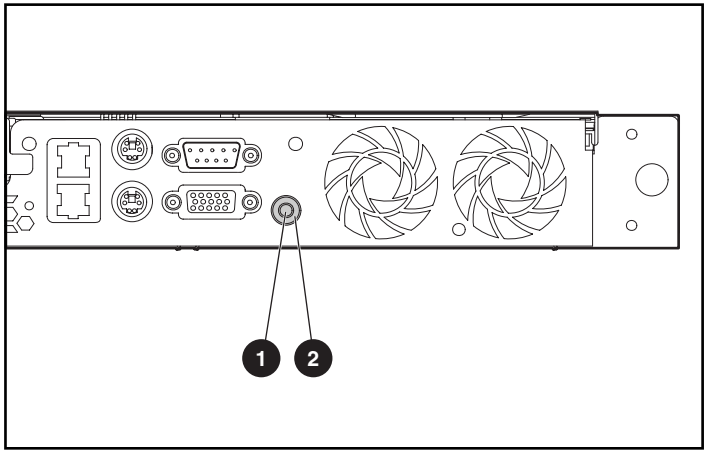

Figure 4-15. Locating the rear unit identification LED switch on the rear panel (fixed cable tray and rack removed for clarity)

6. Disconnect the power cord and cables from the server rear panel (including cables extending from expansion boards), moving from left to right.

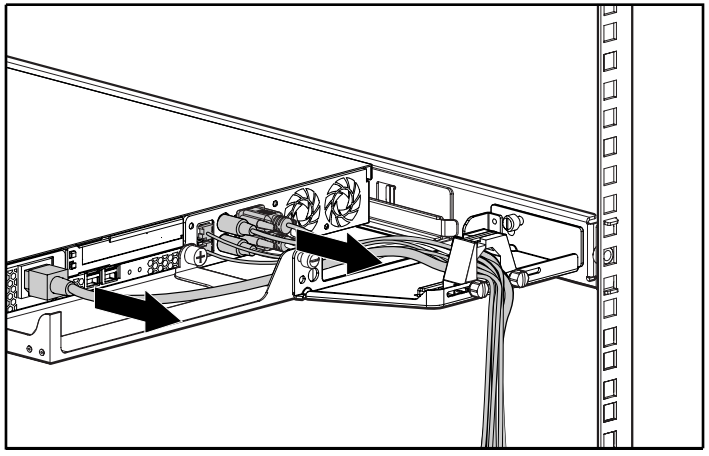

Figure 4-16. Disconnecting the power cord and cables from the server rear panel

7. Fully loosen the server thumbscrew ❶ that secures the fixed cable tray to the server.

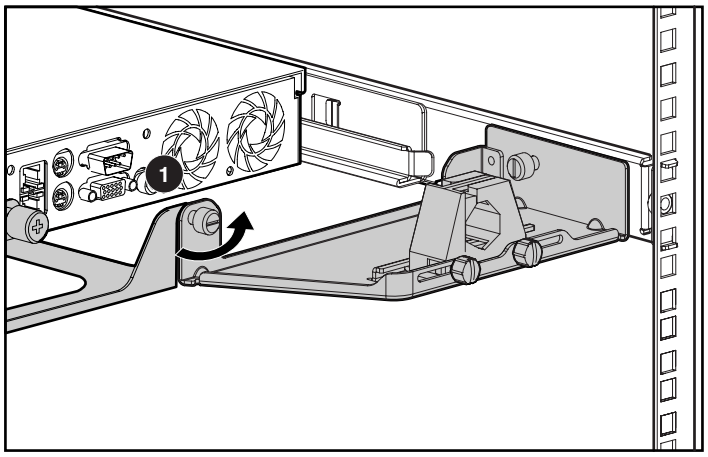

Figure 4-17. Loosening the server thumbscrew that secures the fixed cable tray to the server (cables removed for clarity)

8. Move to the front of the rack.
9. Loosen the front panel thumbscrews.
10. Grasp the front panel thumbscrews, and extend the server from the rack. The cables will remain clamped in the fixed cable tray. The rail release latches will engage automatically.

11. Press in and hold the rail release latches ❶.
12. Holding the rail release latches, extend the server until the latches clear the rack ❷.

    NOTE: 1U of space is left empty in the drawing for clarity purposes. The ProLiant DL320 server should be installed in every U from the bottom of the rack. This arrangement provides maximum density. Work from the bottom of the rack up, filling all spaces.

13. Pull the server ❸ completely out of the rack, and set it on a flat, level surface.

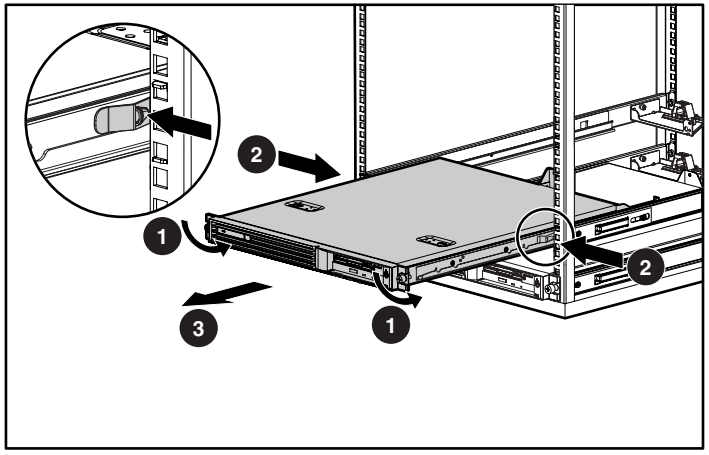

Figure 4-18. Disengaging the rail-release latches (cables removed for clarity)

Optional Installation Service

Compaq offers an optional installation service for installing your rack products. The installation service can be customized to meet your specific requirements, or it can be ordered as a CarePaq. The installation service covers the entire hardware installation process, from unpacking the components to routing the cables and running a system test.

Hardware installation service is available in all countries where Compaq has a direct or indirect service presence. Service can be ordered from—and directly provided by—a Compaq authorized service reseller. In the United States, you can order service by calling 1-800-OK-COMPAQ. In the United States, Compaq makes all of the arrangements for complete rack system installation by qualified Guaranteed Service Providers. An order form with pricing information is available from PaqFax, the Compaq fax retrieval service, at 1-800-345-1518.

Chapter **5**

Cabling Guidelines

This chapter provides guidelines that help you make informed decisions about cabling your server and hardware options for optimal performance. For complete and comprehensive information, use this chapter along with the technical information on the Hardware Configuration and Installation Poster and the labels attached to the inside of the server access panel.

Internal Cabling

The following sections explain internal cabling configurations for the ProLiant DL320 server.

Internal Cabling for Storage Devices

Internal storage devices in the ProLiant DL320 server require minimum cabling, as described in the following paragraphs.

ATA Hard Drives

The shipping configuration for your ProLiant DL320 server for ATA hard drives already contains the internal cabling required for operating internal ATA hard drives. The ATA module on the system board connects to the Device 0 drive via the ATA Device 0 Cable ❶ and connects the Device 1 drive via the ATA Device 1 Cable ❷.

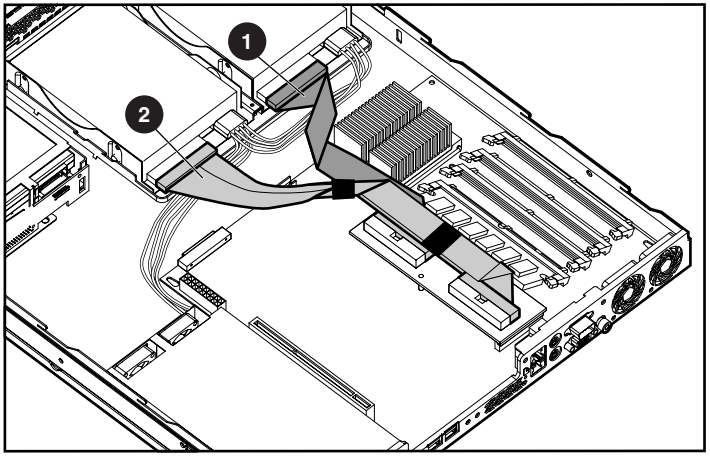

Figure 5-1. ATA drives connected properly to the ATA module on the system board (center wall and PCI riser board assembly removed for clarity)

These cables are not included in SCSI models of the ProLiant DL320 server. You can purchase an ATA hard drive option kit from a Compaq authorized reseller via the Compaq website:

http://www.compaq.com

SCSI Hard Drives from a SCSI Module

The shipping configuration for your SCSI-model ProLiant DL320 server already contains the internal cabling required for operating internal SCSI hard drives. The SCSI cable ❶ connects directly to the SCSI drive connector on the SCSI module ❷ on the system board.

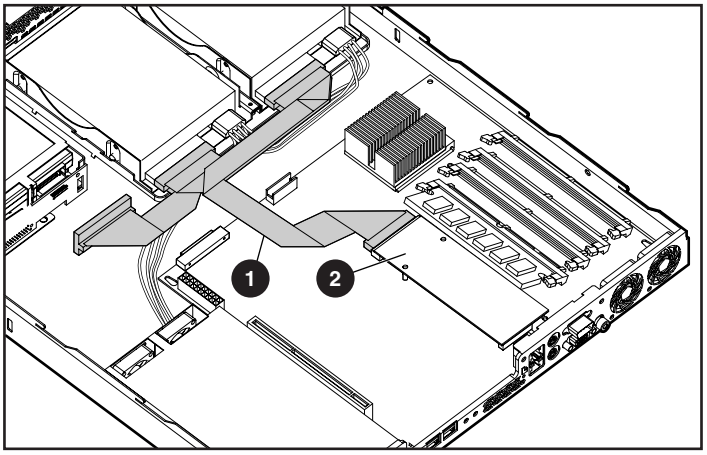

Figure 5-2. SCSI cable connected properly to the SCSI module on the system board (center wall and PCI riser board assembly removed for clarity)

This cable does not ship in ProLiant DL320 servers for ATA hard drives. You can purchase a SCSI hard drive option kit and a SCSI cable from a Compaq authorized reseller via the Compaq website:

http://www.compaq.com

SCSI Hard Drive from a PCI Expansion Board

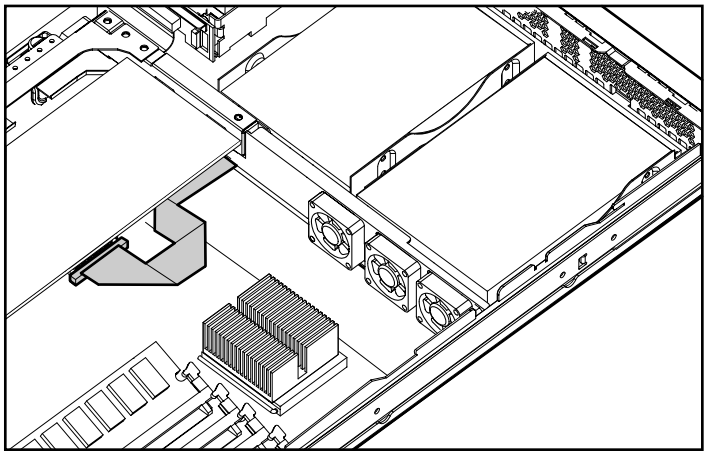

Figure 5-3. SCSI cable connected from a PCI expansion board to SCSI hard drives

For instructions on installing this cable along with a Compaq Smart Array controller, see "Installing a Compaq Smart Array Controller in a System with ATA Drives" in Chapter 3, "Installing Hardware Options."

CD-ROM/Diskette Drive Assembly

The CD-ROM/diskette drive assembly connects directly to the CD-ROM/diskette drive backplane. A cable connects the CD-ROM/diskette drive backplane to the system board.

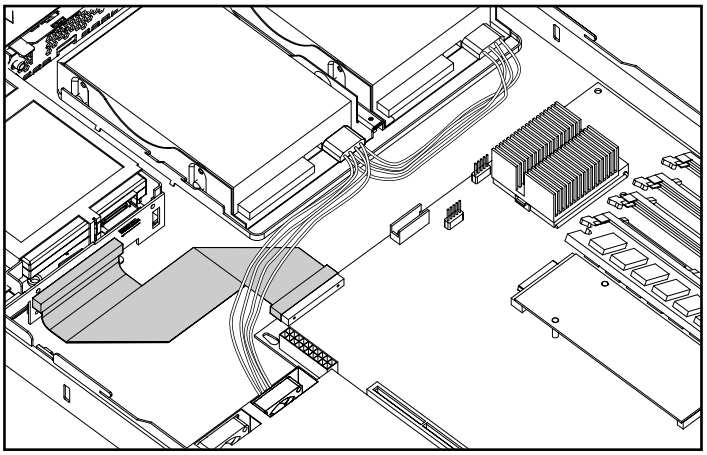

Figure 5-4. Cable routing from the CD-ROM/diskette drive assembly backplane to the system board (center wall, PCI riser board assembly and hard drive cables removed for clarity)

The ProLiant DL320 server does not support any additional internal storage devices. For detailed information on cabling external storage devices, see the "External Cabling" section later in this chapter.

Internal Cabling for ProLiant DL320 Server Options

Additional internal cabling is only required when you install optional expansion boards, such as the Remote Insight Lights-Out Edition or an internal Smart Array controller.

Smart Array Controller (Optional)

For detailed instructions on how to cable an optional Smart Array controller, see Chapter 3, "Installing Hardware Options."

External Cabling

The following sections describe the proper cabling procedures for peripheral devices and external mass storage devices supported by the ProLiant DL320 server.

Connecting the Power Cord and Peripheral Devices

Rear panel cabling on the ProLiant DL320 server must always be connected and disconnected in a specific sequence. For a detailed explanation of connectors and the proper cabling sequence, see "Connecting the Power Cord and Peripheral Devices" in Chapter 4, "Installing the Server."

CAUTION: Always follow the cabling order for the ProLiant DL320 server. Using an improper cabling sequence can result in electrical damage to peripheral devices.

Routing the Power Cord and Peripheral Device Cables

Cords and cables connected to the server rear panel are routed through a fixed cable tray that prevents loose cabling in the rear of the rack and protects connectors from damage that results when cables are disconnected improperly.

For detailed instructions on how to route cables through the fixed cable tray, see "Securing the Cables in the Fixed Cable Tray" in Chapter 4, "Installing the Server."

When multiple ProLiant DL320 servers are installed in a rack, the fixed cable trays effectively organize the rear panel cabling.

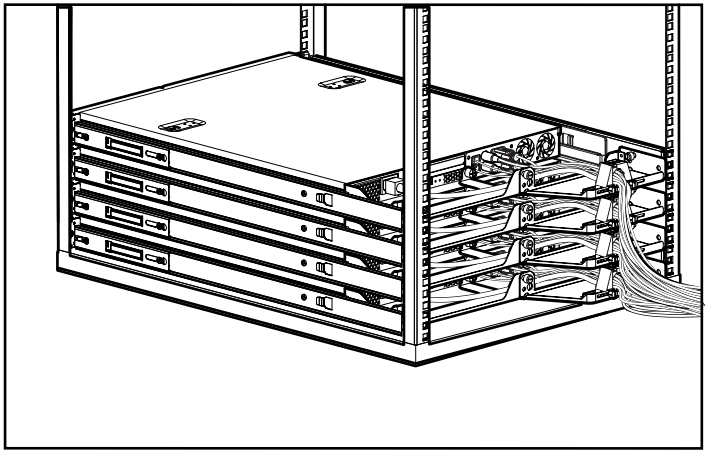

Figure 5-5. Multiple ProLiant DL320 servers installed in a Compaq rack with properly routed cabling

External Mass Storage Cabling

The ProLiant DL320 server supports external mass storage devices only through an optional PCI expansion board. For detailed information, refer to the documentation that ships with your optional PCI expansion board.

ProLiant DL320 Maximum External Storage Cabling

External storage is available only through the 64-bit expansion slot. This expansion slot accepts expansion, boards such as a Smart Array controller with external connectors, allowing rear server access to all available controller channels.

For example, one Compaq 64-bit Dual Channel Ultra3 SCSI Adapter can be installed in the ProLiant DL320 server. The adapter has two 68-pin, very high-density (VHDCI) external SCSI connectors. At 15 devices per channel, this configuration supports 30 external SCSI devices.

NOTE: Refer to the documentation that ships with your Smart Array controller for restrictions on using both internal and external SCSI connectors.

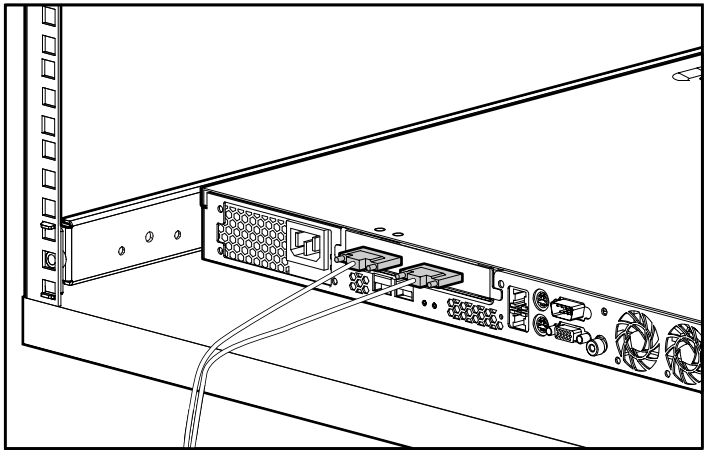

Figure 5-6. Maximum external mass storage configuration (cable support bracket and cabling removed for clarity)

Chapter **6**

Server Configuration and Utilities

This chapter provides information about the utilities and tools provided with the ProLiant DL320 server. The following tools and utilities are described in this chapter:

- ROM-Based Setup Utility (RBSU)
- ROMPaq
- SmartStart
- Compaq Insight Manager
- SmartStart Diskette Builder
- Compaq Survey Utility
- Compaq Diagnostic Utility
- Automatic Server Recovery (ASR)

ROM-Based Setup Utility (RBSU)

The RBSU performs a wide range of configuration activities, including:

- Viewing system information
- Selecting the operating system
- Configuring system devices and installed options
- Selecting the primary boot controller
- Managing storage options

In addition, the RBSU includes other features which are outlined in "Using the ROM-Based Setup Utility" later in this chapter.

Navigating the ROM-Based Setup Utility

To make selections within the RBSU, use the following keys:

- To access the RBSU, press **F9** during power up when prompted in the lower right corner of the screen.
- Use the **Arrow** keys to navigate through the menu system.
- Make selections by pressing **Enter**.
- Cancel selections by pressing **Escape**.
- Save selections and changes by pressing **F10**.

Using the ROM-Based Setup Utility

NOTE: Most of the features in the RBSU are not required for setting up your server. The options in this utility are designed for server-specific configuration issues.

The RBSU contains a series of utilities for configuring specific areas of the system. The primary menus selections are:

- System options
- PCI devices
- Boot controller order
- Date and time
- System passwords
- System identification
- Advanced options
- Utility language

System Options

The System Options menu is used for overall system configuration settings. The following is a list of selections found in this menu with an explanation of each option:

OS Selection allows the user to select the operating system. This option automatically selects appropriate advanced settings for the operating system selected and should be set before the operating system is installed.

Embedded COM Port allows the user to (1) enable the embedded rear panel serial connector at the specified resource settings or (2) disable the option.

Standard Boot Order allows the user to configure the order of devices used to start an operating system. This feature is used to prevent the system from starting from diskette or CD, and to select the device the system scans first.

Diskette Write Control allows the user to configure the write control of the removable media drive. It can be set to read and write or to read only.

Diskette Boot Control allows the user to boot the system from the removable media device.

PCI Devices

The PCI Devices menu option is used to view and assign the interrupt requests (IRQs) for all PCI devices.

Boot Controller Order

The Boot Controller Order menu option is used to view and assign the current controller order.

Date and Time

The Date and Time menu option is used to set the system date and time.

System Passwords

The System Passwords menu is used to set up passwords to limit access to the system and its setup options. The following is a list of selections in this menu with an explanation of each option:

Setup Password allows users to set a setup password. This password keeps unauthorized users from modifying the setup options.

Power-On Password allows users to set a power-on password. This password keeps unauthorized users from powering on the system.

Network Server Mode allows users to disable or enable the ability to start the system with a locked keyboard or without a keyboard. Users unlock the keyboard by entering the power-on password.

System Identification

The System Identification menu is used to identify the system. The following is a list of selections in this menu with an explanation of each option:

Asset Tag allows the user to identify the system with an asset tracking number.

Advanced Options

The Advanced Options menu is used to configure the advanced option of the system. The following is a list of selections found in this menu with an explanation of each option:

MPS Table Mode allows the user to change the Application Program Interface Controller (APIC) table setting. This setting should be automatically set by the operating system selection, but Multiple Processor Specification (MPS) table mode allows the user to override the automatic selection.

Post Speed Up allows the user to enable or disable the quick or slow start process. The slow start process performs a complete memory test.

Automatic Server Recovery allows the user to enable or disable the Automatic Server Recovery option.

Wake-On LAN (WOL) Support allows the user to enable or disable WOL support.

Floppy Controller allows the user to enable or disable the floppy controller.

Processor Serial Number allows the user to enable or disable the ability of applications to read the processor serial number.

NMI Debug Button allows the user to enable or disable the Nonmaskable Interrupt (NMI) switch. This switch is located on the system board and is disabled as the default setting.

Thermal Shutdown allows the user to disable or enable the ability of the system to shutdown due to a thermal caution event. The default for this option is enabled. Compaq does not recommend disabling this feature.

POST F1 Prompt allows the user to bypass the F1 prompt during the POST test.

Preboot Execution Environment (PXE) Options are associated with the user's ability to download operating system configurations from the network via the NIC 1 connector.

- **Embedded PXE Support** allows the user to enable or disable the user's ability to remote boot from the network via the NIC 1 connector. The default for this option is disabled.
- **User Interface** allows the user to enable or disable the servers ability to perform an unattended network boot via the NIC 1 connector. The default for this option is enabled.

Set Default Configuration allows the user to reset the configuration settings to their factory defaults.

Utility Language

The Utility Language option is used to set the language in which the RBSU displays. The user has the following choices:

- English
- Spanish
- German
- French
- Italian
- Japanese

ROMPaq

Using Flash ROM utility option in Compaq servers allows the firmware or ROM to be upgraded with system or option ROMPaq utilities. To upgrade the ROM, insert a ROMPaq diskette into the diskette drive and power up the system.

The ROMPaq Utility checks the system and provides a choice of ROM revisions to which the system can be upgraded. This procedure is the same for both system and option ROMPaq utilities.

CAUTION: Do not power down during a firmware upgrade. A loss of power during upgrade may corrupt the firmware and prevent the system from starting.

NOTE: For detailed information on procuring and installing the CD-ROM/diskette drive assembly option kit for your ProLiant DL320 server, see Chapter 3, “Installing Hardware Options.”

SmartStart and Support Software CD

The SmartStart and Support Software CD is used to load the system software, thereby achieving a well-integrated server and ensuring maximum dependability and supportability. The SmartStart CD contains diagnostic utilities and ROMPaq tools.

IMPORTANT: Do not use the SmartStart and Support Software CD for loading system software if you purchased your system with a factory-installed operating system. Refer to the *Compaq Factory-Installed Operating System Software User Guide* for software installation guidelines.

IMPORTANT: You must install an optional CD-ROM/diskette drive assembly in order to use the SmartStart and Support Software CD.

Install the SmartStart and Support Software CD after you have configured your primary operating system. Next, follow these steps:

1. With your server powered up, press the CD eject button to open the CD-ROM tray.
2. Locate the SmartStart and Support Software CD in the Server Setup and Management pack.
3. Insert the SmartStart and Support Software CD in the CD-ROM drive, and restart the system.

NOTE: Handle the CD by its edges, not by its flat surfaces.

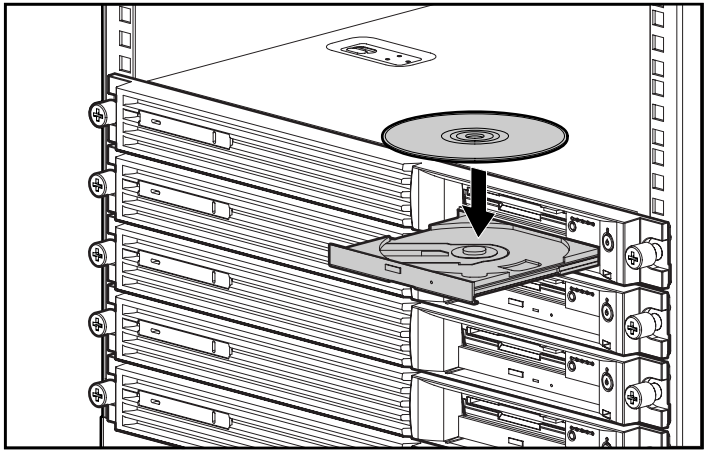

Figure 6-1. Inserting the CD into the CD-ROM drive

When the CD activity indicator is illuminated, the SmartStart installation sequence begins.

Refer to the SmartStart documentation included with your server to install the operating system, create updated driver diskettes, and run upgrade utilities.

Compaq Insight Manager

Compaq Insight Manager is the Compaq application for easily managing network devices. Compaq Insight Manager delivers intelligent monitoring and alerting as well as visual control of your Compaq devices. Documentation for Compaq Insight Manager is available on the Compaq Management CD in [CD-ROM DRIVE]:*OVERVIEW.HLP*.

IMPORTANT: You must install and use Compaq Insight Manager to benefit from Compaq's Prefailure Warranty for processors, hard drives, and memory modules.

SmartStart Diskette Builder

The SmartStart and Support Software CD contains a utility for generating support diskettes in the event they are needed or the software cannot be used directly from the SmartStart and Support Software CD. Support diskettes are created from data stored on the SmartStart and Support Software CD using the Diskette Builder utility. The support includes:

- Array Configuration Utility
- Operating System support
- Diagnostic utilities
- Server utilities
- Erase utility
- System and Option ROMPaq diskettes

To run the Diskette Builder, use a workstation running Microsoft Windows 95, Windows 98, Windows NT, or Windows 2000. You also need several 1.44-MB diskettes. All data on the diskettes will be overwritten. Insert the SmartStart and Support Software CD in the workstation drive. The CD automatically runs the Diskette Builder utility; however, if the system does not support the auto-run feature, use Windows Explorer to run [CD-ROM DRIVE]:\DSKBLDR\DSKBLDR.EXE.

Compaq Survey Utility

The Compaq Survey Utility is an online information-gathering agent that runs on servers, gathering critical hardware and software information from various sources.

The Compaq Survey Utility stores the information it gathers in *SURVEY.TXT*. This file is located in [Windows NT Drive]:\COMPAQ\SURVEY for Windows NT. If a significant change occurs between data-gathering intervals, the previous information is marked, and *SURVEY.TXT* is overwritten to reflect the latest configuration and changes. This file allows you to keep a historical record of change events for server hardware and software.

The Compaq Survey Utility automatically runs at power-up and on specified time intervals. You can modify the data-gathering interval by modifying the command line parameters.

Installing Survey

Installing Survey with SmartStart Installation

To install the Compaq Survey Utility through the SmartStart Setup process, refer to the SmartStart Installation Poster. This method installs an operating system and Compaq products on a server.

CAUTION: Do not use this method to add the Compaq Survey Utility to an existing system.

Installing Survey from Compaq Management CD

To install the Compaq Survey Utility from the Compaq Management CD on a Windows NT server, you must be logged on to the Windows NT server and have administrator access rights. Once you are logged on, enter the following at the Windows NT command prompt:

```
[CD-ROM DRIVE]:\Survey\Win-NT\Eng\Survey -i -c
```

If the target server does not have a CD drive, use Diskette Builder to create Survey utility diskettes.

Running Survey

Once the Compaq Survey Utility is installed, by default it gathers information every Wednesday at noon and at every power-up. You can use command line parameters to change the Compaq Survey Utility data-gathering interval. You can also force a one-time, immediate collection by entering the following at the Windows NT command prompt: **Survey**

Compaq Diagnostic Utility

The Compaq Diagnostic Utility is run from a diskette created from the SmartStart CD. To run Diagnostics, insert the Diagnostics diskette and restart the server. The server powers up from the diskette and runs the Diagnostics Utility.

Automatic Server Recovery (ASR)

Automatic Server Recovery (ASR) is a feature in Compaq ProLiant servers that causes the system to restart in the event of a catastrophic operating system error like a blue screen, abnormal end (ABEND), or panic. A system failsafe timer, the ASR timer is started when the Compaq System Management driver, also known as the health driver, is loaded. The timer is periodically reset during normal operation, but in the event of operating system failure, the timer expires and restarts the server. ASR minimizes server downtime by restarting the server within 10 minutes after a crash or system lock. The Compaq Insight Manager console notifies you in the event of a server ASR event. You can disable ASR from the Compaq Insight Manager console or the RBSU.

Reapplying the System ROMPaq

The System ROMPaq utility allows the factory default settings for the firmware that shipped with your server to be reestablished. You can download new versions of system or option ROMPaqs as they become available by registering your server with Compaq through the Compaq website:

http://www.compaq.com

Installing the Operating System

Processor Operating Support

The Compaq ProLiant DL320 server supports single processing configurations and provides optimized software support for the following operating systems:

- Microsoft
  - Windows NT 4.0 Server
  - Windows 2000 Server
- Linux
  - RedHat 6.2
  - SuSE 6.3
  - TurboLinux Server 7.0
  - Caldera eServer 2.3

- Solaris
  - Solaris 7 Intel Platform Edition
  - Solaris 8 Intel Platform Edition

If you use Compaq SmartStart to install the operating system, the drivers are installed automatically. When you select the Operating System Installation feature from the System Configuration Utility main menu, the utility provides prompts for simplifying the installation.

First, the utility prompts you to select the correct operating system. Use the arrow keys to select the operating system; then, press **Enter**. The utility then prompts you for the operating system CD or diskette.

Loading Compaq Device Drivers

Compaq device drivers are located on the Compaq SmartStart and Support Software CD. They are also available for download from the Compaq website:

http://www.compaq.com

IMPORTANT: Always check **README** files on Compaq SmartStart or any software support diskettes or CDs. These files can contain information about important software updates.

Microsoft Windows NT Device Drivers from Compaq

Drivers that support Microsoft Windows NT 4.0 are available either on the Compaq Support Software Diskette for Microsoft products (NT SSD) or on the Compaq SmartStart and Support Software CD. SSD drivers may be newer, and they have support for new functionality or problem fixes. If you use Compaq SmartStart to install your operating system, the drivers are installed automatically. Otherwise, you can use Compaq SmartStart to create the Compaq SSD for Microsoft Windows NT to support a manual installation of NT drivers.

For more information on driver installation, run the *README.BAT* file in the root directory of the SSD for Microsoft Windows NT. This action will load the WinHelp file *NTREADME.HLP*.

Compaq SmartStart Installation

If you use Compaq SmartStart to install the operating system, the drivers are installed automatically.

Manual Installation

If you choose not to use SmartStart to configure the server, follow this procedure:

1. Insert the Compaq SmartStart and Support Software CD into the CD-ROM drive.
2. Boot your system.
3. Select Manual Installation.
4. Follow the instructions shown onscreen.

Special Considerations

Please review the README files on the Compaq SmartStart and Support Software CD or Compaq SSD for Microsoft Windows NT diskettes for additional details. For Microsoft Windows NT 4.0:

- You must choose custom mode, not express mode.
- During a text mode installation for the adapter driver, you must choose the IDE CD-ROM (dual-channel) driver to detect the IDE CD-ROM drive.
- During the text mode installation for the disk controller adapter, you must choose Other and insert the Compaq SSD for Microsoft Windows NT to install the SCSI or array controller driver.

Linux Device Drivers from Compaq

Your server must have certain device drivers to operate with the Linux operating systems. The latest drivers, sources, support files, and driver installation instructions for Linux are available on Compaq's FTP server. Linux support diskettes for several distributions are also available on the FTP server:

ftp://ftp.compaq.com/pub/linux

The Linux Smart Array driver is present in Linux kernels 2.2.11 and newer, which is available on the Internet:

http://www.kernel.org

IMPORTANT: Your ProLiant DL320 drive activity LED does not flash when you use the Linux operating system and a nonarray SCSI controller.

Controller Driver Naming Conventions

For your convenience, the supported operating systems and their corresponding driver names are listed in the following table.

Table 6-1
Controller Driver Naming Conventions

Operating System	Driver Type	Driver File Name
Microsoft Windows NT 4.0, Windows 2000 Server	NDIS	N100NT.SYS N1000NT4.SYS
Linux RedHat 6.2 Linux SuSE 6.3 TurboLinux Server 7.0 Caldera eServer 2.3	MDI	Eepro100

Compaq Diagnostic Utility

Run the Diagnostic Utility from diskettes you create with SmartStart. To run Diagnostics, insert the Diagnostics diskette, and restart the server. The server powers up from the diskette and runs the Diagnostic Utility.

Chapter **7**

Integrated Management Log

The Compaq Integrated Management Log (IML) records events and stores them in an easy-to-view form. The IML records hundreds of events and then time-stamps each event with one-minute granularity.

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

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

IML requires Compaq operating system dependent drivers. Refer to the Compaq SmartStart and Support Software CD for instructions about installing the appropriate drivers.

Viewing the Log

You can view recorded events in the IML in several ways:

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

Compaq Insight Manager

Compaq Insight Manager is a server management tool that provides in-depth fault, configuration, and performance monitoring of hundreds of Compaq servers from a single management console. The system parameters that are monitored describe the status of all key server components. By viewing the events that may occur to these components, you can take immediate action.

You can view and print the event list from within Compaq Insight Manager by following the instructions in the following subsection. You can also mark a critical or caution event as repaired after the affected component has been replaced. For example, when a failed fan has been 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, as described above. To print the list, follow the instructions in "Viewing the Event List."

Viewing the Event List

To view the event list, follow these instructions:

1. From the Compaq Insight Manager, select the appropriate server in the network.
2. Select the **View Device Data** option. The selected server is displayed with buttons around its perimeter.
3. Select **Recovery**.
4. Select the **Compaq Integrated Management** Log option.
5. If a failed component has been replaced, select the event from the list.
6. Select the **Mark Repaired** option to update and log the event.

Printing the Event List

Perform the following steps to view the event list:

1. From the Compaq Insight Manager, select the appropriate server. The selected server is displayed with buttons around its perimeter.
2. Select **Configuration**.
3. Select **Recovery**.
4. Select **Print**.

Compaq Survey Utility

The Compaq Survey Utility is a serviceability tool available for Microsoft Windows NT 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. It is also available from the Compaq website:

http://www.compaq.com

Refer to the Compaq Management CD for information on installing and running the Survey Utility. After you have 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. Once you have opened the text file, you can print it with the print feature of the viewer.

List of Events

The event list displays the affected components and the associated error messages. Although Compaq Insight Manager and the Compaq Survey Utility display the same basic information, the format of the event list may be different depending on which tool you use to view the event list.

The following table identifies the event types (affected components) and associated event messages.

Table 7-1
Event Messages

Event Type	Event Message
Machine Environment	
Fan Failure	System Fan Failure (Fan X, Location)
Overheat Condition	System Overheating (Zone X, Location)
Main Memory	
Correctable Error threshold exceeded	Corrected Memory Error threshold passed (Slot X, Memory Module X)
	Corrected Memory Error threshold passed (System Memory)
	Corrected Memory Error threshold passed (Memory Module unknown)

continued

Table 7-1
Event Messages *continued*

Event Type	Event Message
Uncorrectable Error	Uncorrectable Memory Error (Slot X, Memory Module X)
	Uncorrectable Memory Error (System Memory)
	Uncorrectable Memory Error (Module Unknown)
Processor	
Correctable Error Threshold exceeded	Processor Correctable Error threshold passed (Slot X, Socket X)
Uncorrectable Error	Processor Uncorrectable internal error (Slot X, Socket X)
PCI Bus Error	PCI Bus Error (Slot X, Bus X, Device X, Function X)
Power Subsystem	
System Configuration Battery Low	Real-Time Clock Battery Failing
Automatic Server Recovery	
System Lockup	ASR Lockup Detected: Cause
Operating System	
System Crash	Blue Screen Trap: Cause [NT]
	Kernel Panic: Cause [UNIX]
Automatic OS Shutdown	Automatic Operating System Shutdown Initiated Due to Fan Failure
	Automatic Operating System Shutdown Initiated Due to Overheat Condition
	Fatal Exception (Number X, Cause)

Appendix **A**

Regulatory Compliance Notices

Regulatory Compliance Identification Numbers

For the purpose of regulatory compliance certifications and identification, your Compaq ProLiant DL320 server is assigned a Compaq series number. The Compaq series number for this product is Series ES1018. The series number for the Compaq ProLiant DL320 server 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 your Compaq ProLiant DL320 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 are those that may reasonably be expected to be installed in a residential environment (i.e., personal computers). The FCC requires devices

in both classes to bear labels indicating the interference potential as well as additional operating instructions for the user.

The rating label on the device shows the class (A or B) into which the equipment is categorized. 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. After determining the class of your device, refer to the corresponding class statements.

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 must 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 when the equipment is turned off and on, the user is encouraged 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 the receiver.
- Connect the equipment to 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 your product, contact Compaq at the following address:

Compaq Computer Corporation
P. O. Box 692000, Mail Stop 530113
Houston, Texas 77269-2000

or call 1-800-652-6672 (1-800-OK COMPAQ). (For continuous quality improvement, calls may be recorded or monitored.)

For questions regarding this FCC declaration, contact Compaq at the following address:

Compaq Computer Corporation
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 Compaq Computer Corporation 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 to ensure compliance with FCC rules and regulations.

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 (equivalent international standards are in brackets):

- 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。

Taiwanese Notice

警告使用者：

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

Laser Devices

All Compaq 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 Compaq 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 Compaq 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 Compaq supplied laser device.

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 GaAlAs
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

Your computer is provided with an internal lithium battery or battery pack. The battery can explode and cause personal injury if mistreated or incorrectly replaced. The battery must be replaced with a designated spare by a Compaq authorized service provider.

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

WARNING: Your computer contains an internal Lithium Manganese Dioxide, Vanadium Pentoxide, or alkaline battery pack. Improperly handled battery packs pose a risk of fire and burns. To reduce the risk of personal injury,

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

Batteries, battery packs, and accumulators should not be disposed of with the general household waste. To forward these materials for recycling or proper disposal, please use the public collection system, or return them to Compaq, your authorized Compaq partners, or their agents.

Power Cords

The power cord set included in your server meets the requirements for use in the country where you purchased your server. If you need 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 mm^2 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 Compaq authorized service provider.

IMPORTANT: Route power cords so that they will not be walked on or pinched by items placed upon or against them. To avoid pinching, pay particular attention to the plug, the electrical outlet, and the point at which the cords exit from the product.

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.

Appendix ***B***

Electrostatic Discharge

To prevent damaging the system, be aware of the precautions you must follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor can damage system boards or other static-sensitive devices. This type of damage can 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

Several methods are available 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 snugly 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 a Compaq authorized reseller install the part.

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

Appendix ***C***

Server Error Messages

POST Error Messages

The following Power-On Self-Test (POST) error messages are provided for this server, along with steps for correcting each associated problem. If your error message is not listed in this appendix, refer to the *Compaq Servers Troubleshooting Guide* for an additional listing of possible error messages generated during POST along with steps for correcting each problem.

CAUTION: Do not reseat the processor. Ignore any references to this operation in the *Compaq Servers Troubleshooting Guide*. This operation is not supported for your server. When the processor is reseated or its heatsink is removed, the thermal seal of the heatsink to the processor is broken, the thermal effectiveness of the heatsink is compromised, and you must replace the heatsink. For all issues regarding the processor, contact your Compaq authorized service provider for assistance.

Table C-1
POST Error Messages

Error Code	Audible Beeps	Probable Source of Problem	Action
ECC Single Bit Error Detected in DIMM/SIMM pair: *DIMM X*	None	A memory module failure generated a single-bit error that could not be corrected.	Run Compaq Diagnostics, and replace failed memory module as instructed.
ECC Multiple Bit Error Detected in DIMM/SIMM pair: *DIMM X*	None	A memory module failure generated a multiple-bit error that could not be corrected.	Run Compaq Diagnostics, and replace failed memory module as instructed.
Fixed Disk Parameter Table or BIOS Error System Halted	None	An error occurred while trying to communicate with the CD-ROM/diskette drive assembly. This assembly may not be seated properly.	1. Reseat the CD-ROM/diskette drive assembly. 2. Verify the media currently in the drive.
101-Option ROM Checksum Error An add-in card in your system is not working correctly. If you have recently added new hardware, remove it and see if the problem remains. If this message goes away after you remove your new hardware, there may be a problem with the add-in card.	1 long, 1 short	An expansion board in your system is not working correctly.	If you have recently added new hardware, remove it and see if the problem remains. If this message goes away after you remove your new hardware, there may be a problem with the expansion board. Review the expansion board documentation, and then try reinstalling the board.

continued

Table C-1
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
102-System Board Failure This is an unrecoverable error. Your computer needs to be serviced.	None	8237 DMA controllers, 8254 timers, etc.	Replace the system board. Run the server setup utility.
162-System Options Not Set Your system configuration has changed since your last boot (addition of a hard drive, etc.), or a loss of power to the Real-Time Clock has occurred. The Real Time Clock will lose power if the onboard battery is not functioning correctly. Pressing F1 will record the new configuration. If this message persists, you may need to replace the onboard battery.	2 short	Configuration incorrect.	Run the server setup utility and correct.
163-Time & Date Not Set The system time is invalid. This may be a result of a loss in battery power. Set the correct time and date through your operating system. If this message persists, you may need to replace the onboard battery.	2 short	Invalid time or date in configuration memory.	Run the server setup utility and correct.

continued

Table C-1
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
164-Memory Size Error The system memory size is different from the last startup. The most common reason is the addition or removal of memory to the system board. Pressing F1 will record the configuration. If this message persists, verify that the memory modules are installed correctly.	2 short	Configuration memory incorrect.	Run the server setup utility and correct.
180-Log reinitialized because length check out of bounds	None	The Integrated Management Log has been reinitialized, probably due to corruption of the log.	Event message, no action required.
201-Memory Error The memory test performed during startup failed. Removing and replacing memory modules can isolate the faulty memory. Also verify that the memory modules are installed correctly.	None	RAM failure detected.	Run Compaq Diagnostics. Replace failed assembly as instructed.
207-ECC Corrected Single Bit Errors in DIMM/SIMM PAIR(s) in Memory Module Socket(s) in Memory Module DIMM	2 short	A memory module is malfunctioning.	Run Compaq Diagnostics. Replace or remove malfunctioning memory module as instructed.

continued

Table C-1
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
301-Keyboard Error Make sure your keyboard is correctly plugged into your machine. If you are using a PS/2 keyboard, make sure the keyboard is plugged into the purple socket and not the green. Please ensure that the machine is powered OFF before removing and replacing any system cables. If it is installed correctly, make sure none of the keys are depressed. If this message persists, you may need to replace your keyboard.	None	Keyboard failure occurred.	1. Turn off the computer; then, reconnect the keyboard. 2. If this does not solve the problem, replace the keyboard.
501-Display Adapter Failure	1 long, 2 short	Integrated video controller on the system board has failed.	Replace the system board.

continued

Table C-1
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
601-Diskette Controller Error The drive is not installed correctly or has failed. Make sure that power and drive cables are connected, both to the drive and the system board. Also verify that the cables are the correct cables for your computer model. If this message persists, you may need service for your PC.	None	CD-ROM/diskette drive assembly is not seated correctly. A controller circuitry failure occurred.	1. Verify that the CD-ROM/diskette drive assembly is properly inserted. 2. Make sure the cables are attached to the backplane. 3. Replace the CD-ROM/diskette drive assembly, the cable, the backplane, or all three. 4. Research and replace the failed assembly as instructed.
806-CMOS has been reset Please power off and restore the clear CMOS switch (switch 2 on SW2)	None	Switch 2 on SW2 has been turned on, and the system configuration data has been cleared from CMOS. This switch must be returned to the default off position for normal operation and to enable you to save configuration setup data. The system must be reconfigured.	1. Remove power from the system. 2. Locate switch 2 on SW2. See Appendix D for the location of this switch. 3. Return switch 2 on SW2 to the off position. 4. Restart the system. 5. Press **F9** to run the server setup utility and configure the system. 6. Select the primary operating system. 7. Set the date and time. 8. Complete additional configuration as needed.

continued

Table C-1
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
807-The password has been cleared. Please power off and restore the clear password switch (switch 1 on SW2)	None	Switch 1 on SW2 has been turned on and the system configuration password has been cleared. Switch 1 on SW2 must be returned to the default off position for normal operation and to enable you to set a password with the server setup utility.	1. Remove power from the system. 2. Locate switch 1 on SW2. See Appendix D for the location of this switch. 3. Return switch 1 on SW2 to the off position. 4. Restart the system. 5. Press **F9**,and use the server setup utility to set a new password, if desired.
1611-Critical Fan Failure Detected, *system fan X*	None	A required fan is not properly functioning.	1. Check the fans. 2. Reseat the fan cable. 3. If this does not solve the problem, replace the fan.
1611-Critical Fan Not Present, *system fan X*	None	A required fan is not installed or is not properly connected.	1. Check the fans. 2. Reseat the fan cable. 3. If this does not solve the problem, replace the fan.
1704-Unsupported Virtual Mode Disk Operation DOS Driver Required	None	The current media in the CD-ROM/diskette drive assembly does not support virtual DMA service.	Verify the media.
1705-Locked SCSI Bus Detected	None	A SCSI controller cannot communicate with devices attached to a SCSI bus.	1. Verify the SCSI cable installation. 2. Make sure the SCSI cable has proper termination.

continued

Table C-1
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
1720-SMART Hard Drive Detects Imminent Failure Your hard disk drive is detecting an imminent failure. To prevent data loss, back up the contents of the disk, and replace the hard disk.	None	A hard drive predictive failure condition has been detected.	The indicated drive has reported a SMART predictive failure condition. It may fail at some time in the future. If this drive is part of a non-fault-tolerant configuration, back up all data before replacing the drive; then, restore all data. If this drive is part of a fault-tolerant configuration, do not replace this drive unless all other drives in the array are online. Press the **F1** key to resume.
1780-Disk 0 Failure The drive is not installed correctly or has failed. Make sure that any jumpers are set correctly, and that power and drive cables are connected, both to the drive and the system board. Also verify that the cables are the correct cables for your computer model. If this message persists, your PC may need to be serviced.	None	A hard drive/format error has been detected.	Run Compaq Diagnostics. Replace failed assembly as instructed.

continued

Table C-1
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
1781-Disk 1 Failure The drive is not installed correctly or has failed. Make sure that any jumpers are set correctly, and that power and drive cables are connected, both to the drive and the system board. Also verify that the cables are the correct cables for your computer model. If this message persists, your PC may need to be serviced.	None	Hard drive/format error detected.	Run Compaq Diagnostics. Replace the failed assembly as instructed.
1790-Disk 0 Error	None	A hard drive error or wrong drive type has been detected.	Run the server setup utility and Compaq Diagnostics, and correct. Replace the failed assembly, if instructed to do so.
1790-Disk 1 Error	None	A hard drive error or wrong drive type has been detected.	Run the server setup utility and Compaq Diagnostics, and correct. Replace failed assembly, if instructed to do so.
1801-Microcode Patch Error Missing or Invalid Processor Microcode Patch. Please contact Compaq Computer Corporation for a new ROM BIOS to support the new Processor Stepping.	None	The newly installed processor is not supported by the current system ROM.	Upgrade the system ROM or reinstall the original processor.

ADU Error Messages

All Array Diagnostic Utility (ADU) error messages provided for this server are included in the *Compaq Servers Troubleshooting Guide*. For a complete listing of possible error messages generated by ADU, along with steps for correcting each problem, refer to the *Compaq Servers Troubleshooting Guide*.

Appendix ***D***

Status Indicators and Switches

Status Indicators

The ProLiant DL320 server contains the following sets of LED indicators, which indicate the status of hardware components and settings:

- Front panel LED indicators
- Rear panel LED indicators
- Internal LED indicators

Use the following sections to determine the location and status of LEDs on your ProLiant DL320 server.

Front Panel LED Indicators

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

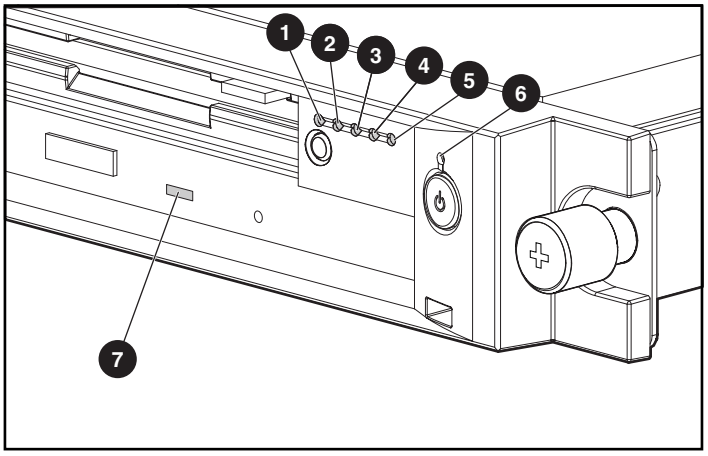

Figure D-1. Identifying the front panel LED indicators

Table D-1
Front Panel LED Indicators

Location	LED Description	Status
❶	Front unit identification	On = Local Management Off = Deactivated
❷	NIC 2 link/activity	On = Link Off = No Link Blinking = Activity
❸	NIC 1 link/activity	On = Link Off = No Link Blinking = Activity
❹	System health	Green = Good Amber = Degraded Red = Critical Error
❺	Drive activity	On = Activity Off = No Activity
❻	Power On/Off	Green = Power On Amber = Power Good Off = Power Off
❼	CD-ROM drive activity	On = Activity Off = No Activity

Rear Panel LED Indicators

The server rear panel contains three LEDs: one for the rear unit identification LED switch and two for the RJ-45 connectors. Use the following figure and table to identify each LED.

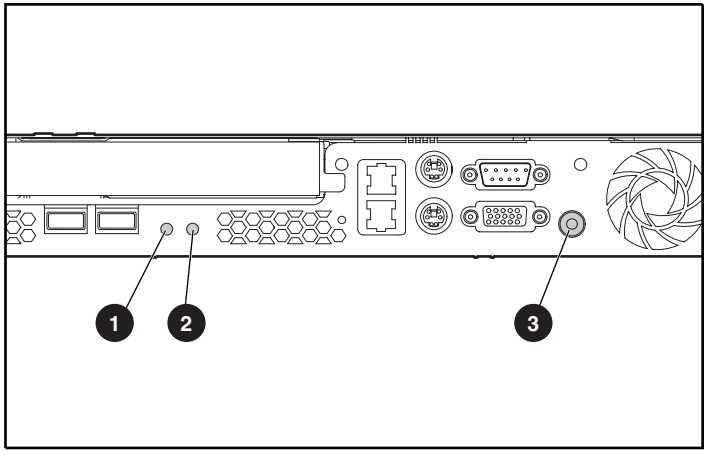

Figure D-2. Identifying the rear panel LED indicators

Table D-2
Rear Panel LED Indicators

Location	LED	Status
❶	NIC 2 link/activity	On = Link Off = No Link Blinking = Activity
❷	NIC 1 link/activity	On = Link Off = No Link Blinking = Activity
❸	Rear unit identification LED switch	Blue = activated Off = deactivated

Internal LED Indicators

The ProLiant DL320 system board contains an internal power status LED for use during troubleshooting operations. This LED indicates whether adequate power is available to the system from the power supply.

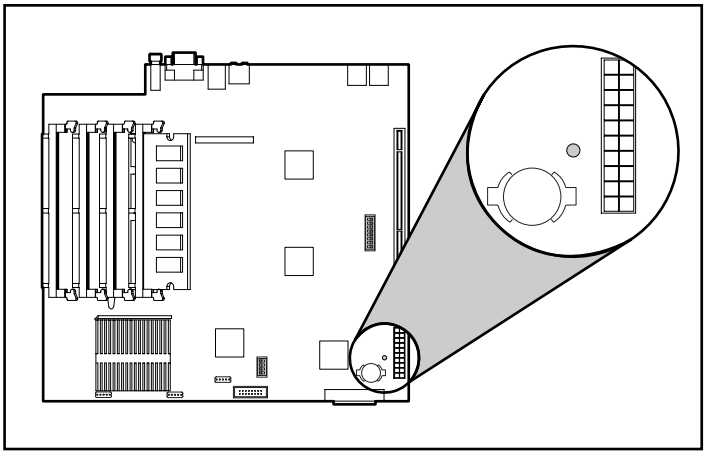

Figure D-3. Locating the power status LED

Switches and Jumpers

The ProLiant DL320 system board contains two switchbanks that may need to be modified to set configuration or to trigger special functions. These switches can cause problems if they are not correctly set.

When you add or remove a component or change a security feature, you must reconfigure the computer to recognize these changes. If the system configuration is incorrect, your computer may not work properly, and you may receive error messages on the screen.

IMPORTANT: Reserved switches are provided for use by Compaq authorized service providers only and should not be changed from the indicated default settings.

This section explains how to use each switch.

- The system switch (SW2) contains one switch for use by Compaq authorized service providers only and may be used to perform the following:
  - Clear power-up and set passwords
  - Clear all system configuration information from CMOS and nonvolatile RAM (NVRAM)
  - Enable or disable ROMPaq disaster recovery mode (also known as emergency repair boot mode)
- The system configuration switch (SW3) allows you to enable or disable integrated video, though some switches are reserved for the use of Compaq authorized service providers only.

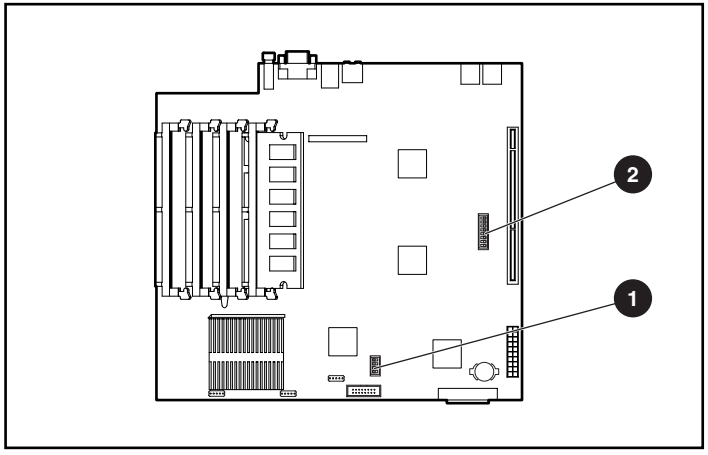

Figure D-4. Locating the system board switches

Table D-3
System Board Switches

Item	Description
❶	System switch (SW2)
❷	System configuration switch (SW3)

The following subsections provide reference information about setting the system board switches and jumpers, which is part of the reconfiguration process, along with running the ROM-Based Setup Utility (RBSU).

System Switch (SW2)

The system switch (SW2) is a four-position switch used for performing recovery and other diagnostic operations. Refer to the labels attached to the inside of the server access panel for the proper system switch settings. The following table shows the shipping configuration of SW2.

CAUTION: Clearing CMOS or nonvolatile RAM (NVRAM) deletes your configuration information. See Chapter 6 for complete instructions on configuring your server.

Table D-4
System Switch (SW2) Settings

Switch Position	Function	Default Position
S1	Clear password	Off
S2	Clear CMOS	Off
S3	Recovery mode	Off
S4	Reserved	Off

Note: "On" activates the function.

System Configuration Switch (SW3)

The system configuration switch (SW3) is an eight-position switch used for system configuration. Refer to the labels attached to the inside of the server access panel for the proper system configuration switch settings. The following table shows the shipping configuration of SW3.

Table D-5
System Configuration Switch (SW3) Settings

Switch Position	Function	Default Position
S1	VGA Disable	Off
S2	Reserved	Off
S3	Reserved	Off
S4	Reserved	Off
S5	Reserved	Off
S6	Reserved	Off
S7	Reserved	Off
S8	Reserved	Off

Note: "On" activates the function.

Clearing and Resetting System Password Settings

It may be necessary at some time to clear and reset the system password.

IMPORTANT: This method of clearing and resetting system passwords is only necessary if you do not know the current password.

Otherwise, when prompted, you can enter the password followed by a forward slash "/." This operation removes the current password and allows you to perform one of the following:

- Enter the ROM-Based Setup Utility (RBSU) and set the password to a new value.
- Leave the password value blank to disable the password feature.

When the system switch position 1 is set to the on position, the system is prepared to clear the system password.

1. Power down the server.
2. Set the switch at position 1 to the on position.
3. Restart the server, and wait for confirmation.
4. Power down the server.
5. Set the switch at position 1 to the default off position.
6. Restart the server. The password is cleared.

Clearing and Resetting System Configuration Settings

It may be necessary at some time to clear and reset system configuration settings. When the system switch position 2 is set to the on position, the system is prepared to erase all system configuration settings from both CMOS and NVRAM.

IMPORTANT: Clearing CMOS and/or (NVRAM) deletes your configuration information. See Chapter 6 for complete instructions on configuring your server.

1. Power down the server.
2. Set the system switch position 2 to the on position.
3. Power up the server.

   All configuration settings are now erased and all system operations halt.
4. Power down the server.
5. Reset the position 2 switch to the default off position.
6. Power up the server.
7. Press the **F9** key to run the ROM-Based Setup Utility (RBSU) and reset all system configuration settings.

   NOTE: For complete instructions on how to use RBSU, see Chapter 6.

Enabling ROMPaq Disaster Recovery Mode

A corrupted system ROM requires that you recreate the ROM BIOS by a process called ROM flash. This operation can be accomplished only when the system is in disaster recovery (emergency repair boot) mode. Set the system switch (SW2) position 3 to On to enable ROMPaq disaster recovery mode.

IMPORTANT: Prior to performing this operation, refer to the *Compaq Servers Troubleshooting Guide* for complete instructions on disaster recovery.

Setting the NIC Operating Mode

ProLiant DL320 servers include two embedded Compaq NC3163 Fast Ethernet NICS10/100 Wake-On-LAN. You do not need to set the NIC operating modes because the controllers automatically differentiate between the 10-Mbit and 100-Mbit environments.

Setting Hard Drive Jumpers

The ProLiant DL320 server contains two drive bays for internal mass storage devices. The server ships standard with two 1-inch drive trays. The following sections provide general guidelines and installation procedures for upgrading the hard drives.

ATA Hard Drives

When installing ATA hard drives to your ProLiant DL320 server, observe the following general guidelines:

- Do not add more than two ATA devices per channel. ProLiant DL320 servers have one accessible ATA channel.
- Set the jumpers on both ATA drives to Cable-Select mode. Doing so enables the ATA controller cable to set a unique address, such as Device 0 or Device 1, for each hard drive.

NOTE: Refer to the documentation shipped with your hard drive to determine how to set the jumpers on your ATA hard drives to Cable-Select mode.

NOTE: Device 0 is always the boot drive.

SCSI Hard Drives

When installing SCSI hard drives to your Compaq ProLiant DL320 server, each SCSI hard drive must have a unique ID. The system begins searching the drive with the lowest numbered ID for a bootable partition. The jumpers on a factory-installed hard drive are set to ID 0. For illustration purposes in this document, we assume the devices are numbered ID 0 and ID 1, with ID 0 containing the desired boot partition. Use only supported hard drives in the ProLiant DL320 server. For a listing of supported drives, please refer to the ProLiant DL320 Quickspecs on www.compaq.com.

CAUTION: Installing unsupported hard drives may damage your system by consuming power and generating heat in excess of the server's operating tolerance. This condition may result in a loss of system and/or data integrity.

NOTE: Refer to the documentation shipped with your hard drive to determine how to set the jumpers on your SCSI hard drives.

Identification Numbers for ATA and SCSI Hard Drives

The ProLiant DL320 standard configuration consists of two 1-inch hard drive trays.

ATA hard drives installed in the ProLiant DL320 server appear as Devices 0 and 1, from left to right when viewed from the front of the server.

CAUTION: When supporting a mixed environment of ATA drives and SCSI drives in a ProLiant DL320 server, the ATA drive must be the boot device.

IMPORTANT: Always populate hard drive bays starting with the lowest ATA Device number or SCSI ID number.

NOTE: ATA hard drives are configured using the Cable-Select mode.

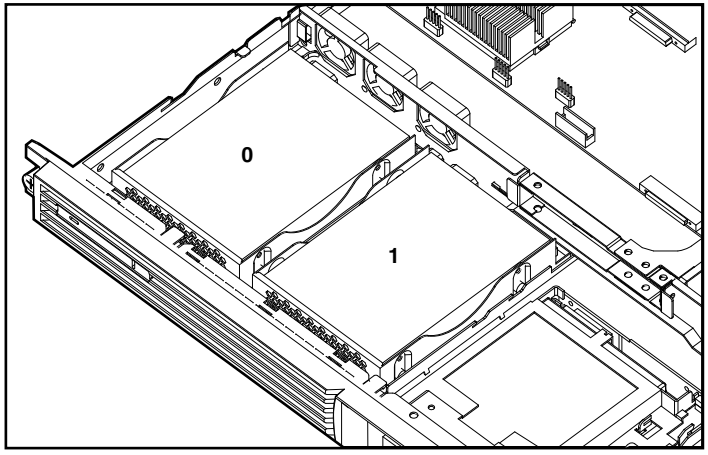

Figure D-5. ATA device numbers or recommended SCSI ID numbers

Appendix ***E***

Troubleshooting

This appendix provides step-by-step instructions for troubleshooting the most common problems encountered during the initial Power-On Self-Test (POST). The server must complete this test each time it is powered up before it can load the operating system and start running software applications.

If the server completes POST and attempts to load the operating system, see "Server Operation Problems" later in this appendix.

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

CAUTION: Do not reseat the processor. Ignore any references to this operation in the *Compaq Servers Troubleshooting Guide*. This operation is not supported for your server. When the processor is reseated or its heatsink is removed, the thermal seal of the heatsink to the processor is broken, the thermal effectiveness of the heatsink is compromised, and you must replace the heatsink.. For all issues regarding the processor, contact your Compaq authorized service provider for assistance.

When the Server Does Not Start

Follow the sequence of steps below when the server does not start:

1. Verify that the computer and monitor are plugged into a working outlet.
2. Make sure your power source is working properly:
   - ❑ Use the Power On/Off LED to check the status of the power source. See "Front Panel LED Indicators" in Appendix D for the location of the Power On/Off LED.
   - ❑ Was the Power On/Off switch pressed firmly?

     Refer to the "Power Source" section in the *Compaq Servers Troubleshooting Guide* for details on what else to check.
3. If the system does not complete the Power-On Self-Test (POST) or start loading an operating system, refer to the "General Loose Connections" section in the *Compaq Servers Troubleshooting Guide*.

   NOTE: If the server is power cycling, verify that the system is not restarting because of an Automatic Server Recovery (ASR) power-up caused by another problem. Check *Compaq Insight Manager*™ for notification of this event. See Chapter 6 for more information.
4. Restart the server.
5. Check for the following "normal power-up sequence" to verify that your system meets the minimal hardware requirements and is powered up under normal operation:
   a. The front panel Power On/Off LED turns green.
   b. The fans start.
   c. The server ROM initializes the server in the following sequence:

   NOTE: If a monitor is connected to the server, status information is displayed on the screen.

   - ❑ Video initialization. The Compaq initialization screen is displayed.
   - ❑ Processor initialization
   - ❑ Memory test
   - ❑ Memory initialization
   - ❑ Diskette drive
   - ❑ SCSI devices
   - ❑ Option ROM

d. The operating system loads to complete the boot process.

If the problem persists, continue with the following section "Diagnosis Steps."

Diagnosis Steps

If your server does not power up, or powers up but does not complete the Power-On Self-Test (POST), answer the questions in Table E-1 to determine appropriate actions based on the symptoms. You will be directed to the appropriate table in the section immediately following. This table outlines possible reasons for the problem, options available to assist in diagnosis, possible solutions available, and references to other sources of information.

Table E-1
Diagnosis Steps

Question	Action
Question 1: What is the color of the front panel Power On/Off LED?	If off, go to Table E-2. If green, go to Table E-3. If amber, go to Table E-4.
Question 2: Does the server have video?	If no, go to Table E-5. If yes, the monitor is available for diagnosis. Determine your next action by observing POST progress and error messages. See Appendix C in this guide, and refer to "POST Error Messages" in the *Compaq Servers Troubleshooting Guide* for a complete description of each POST error message.

Table E-2
The Front Panel Power On/Off LED is Off.

See "Front Panel LED Indicators" in Appendix D.

Possible Reasons	The Next Step
The system is not connected to AC power, or no AC power is available. There is a broken connection between the backplane and the CD-ROM/diskette drive assembly. A power supply problem exists. The power supply may not be connected properly, may have a damaged connector, or may have failed. A cable connection between the system board and the power supply is broken.	1. Verify AC power connections. 2. Press the Power On/Off switch. If the server does not start, further information is needed. 3. Go to Question 1 in Table E-1.

Table E-3
The Front Panel Power On/Off LED is Green.

CAUTION: Do not reseat the processor. Ignore any references to this operation in the *Compaq Servers Troubleshooting Guide*. This operation is not supported for your server. When the processor is reseated or its heatsink is removed, the thermal seal of the heatsink to the processor is broken, the thermal effectiveness of the heatsink is compromised, and you must replace the heatsink. For all issues regarding the processor, contact your Compaq authorized service provider for assistance.

See "Front Panel LED Indicators" in Appendix D.

Possible Reasons	The Next Step
A temperature violation may have caused a thermal shutdown. The system may be trapped in reset. All system fans may not be properly installed. A power supply problem may exist. CMOS may be corrupted. The system ROM may be corrupted.	If the Power On/Off LED is green, you can assume that the following is true: ■ AC power is connected to the power supply and providing adequate power. ■ The power supply 14-pin signal header cable is connected properly. ■ The connection between the system board and power switch is good. 1. Verify fan installation. 2. Verify installation of the power supply and check all connections. 3. Try clearing CMOS. If you have to clear CMOS, see Appendix D for the correct switch setting and procedure. 4. Try performing ROMPaq disaster recovery to replace a corrupted system ROM image. If you must perform ROMPaq disaster recovery, see Appendix D for the correct switch settings. Refer to the *Compaq Servers Troubleshooting Guide* for procedures on ROMPaq disaster recovery. If these steps do not solve the problem, contact your Compaq authorized service provider for assistance.

Table E-4
The Front Panel Power On/Off LED is Amber.

CAUTION: Do not reseat the processor. Ignore any references to this operation in the *Compaq Servers Troubleshooting Guide*. This operation is not supported for your server. When the processor is reseated or its heatsink is removed, the thermal seal of the heatsink to the processor is broken, the thermal effectiveness of the heatsink is compromised, and you must replace the heatsink. For all issues regarding the processor, contact your Compaq authorized service provider for assistance.

See "Front Panel LED Indicators" in Appendix D.

Possible Reasons	The Next Step
The Power On/Off switch has not been pressed.	Verify installation of the power supply and check all connections.
A power supply problem may exist. The power supply may have a damaged connector, or may have failed.	If this does not solve the problem, contact your Compaq authorized service provider for assistance.
The PCI riser board assembly may not be properly seated.	Reseat the PCI riser assembly, and restart the server. If this does not solve the problem, go to Question 2 in Table E-1.

Table E-5
Does the Server Have Video?

CAUTION: Do not reseat the processor. Ignore any references to this operation in the *Compaq Servers Troubleshooting Guide*. This operation is not supported for your server. When the processor is reseated or its heatsink is removed, the thermal seal of the heatsink to the processor is broken, the thermal effectiveness of the heatsink is compromised, and you must replace the heatsink. For all issues regarding the processor, contact your Compaq authorized service provider for assistance.

Answer	Possible Reasons	The Next Step
Yes		Video is available for diagnosis. Determine your next action by observing Power-On Self-Test (POST) progress and error messages. See Appendix C in this guide, and refer to the *Compaq Servers Troubleshooting Guide* for a complete description of each POST error message.
No	Video may not be connected properly. Switches may not be set correctly on the system board. The processor has failed. The integrated Processor Power Module (PPM) has failed.	1. If a video card is installed, make sure the video cable is properly connected. Verify the video connections. Refer to "Video Problems" in the *Compaq Servers Troubleshooting Guide*. 2. Verify the switch settings on the system board. See "System Board Switches" in Appendix D. 3. If you hear audible indicators, such as a series of beeps, a POST error message exists. See Appendix C in this guide, and refer to the *Compaq Servers Troubleshooting Guide* for a complete description of each beep sequence, and the corresponding error messages. If these steps do not solve the problem, contact your Compaq authorized service provider for assistance.

Server Operation Problems

Once your server has passed the Power-On Self-Test, you may still encounter errors, such as an inability to load your operating system. Use Table E-6 to troubleshoot server installation problems that occur after the initial startup.

For updated information on supported operating systems, log on to the Internet:

http://www.compaq.com

NOTE: If the server is power cycling, verify that the system is not restarting because of an Automatic Server Recovery (ASR) power-up caused by another problem. Check Compaq Insight Manager for notification of this event. See Chapter 6 for more information.

Refer to the *Compaq Servers Troubleshooting Guide* for the following:

- Information you will need to (1) collect when diagnosing software problems and (2) provide when contacting support
- Instructions on how to upgrade your operating system and its drivers, what recovery options are available, and advice on minimizing downtime

Table E-6
Server Operation Problems

Problem	Possible Cause	Possible Solution
System cannot load SmartStart.	Wrong version of SmartStart is being installed.	1. Check the SmartStart release notes and user documentation. 2. Refer to the Compaq website to verify the version of SmartStart.
	The CD-ROM/diskette drive assembly is not set as a bootable device.	1. Run the ROM-Based Setup Utility (RBSU). See Chapter 6 for complete instructions on the use of this utility. 2. Set the defaults, and exit the utility. 3. Rerun this utility to verify the system configuration.
	The CD-ROM/diskette drive assembly is not installed or is not properly connected.	1. Power down the server. 2. Verify that the CD-ROM/diskette drive assembly is installed. 3. Remove and reseat the CD-ROM/diskette drive assembly. 4. Check the cable between the backplane and the CD-ROM/diskette drive assembly to ensure proper connection. Refer to the *Compaq ProLiant DL320 Maintenance and Service Guide* for connection information. If the cable is not the problem, refer to "CD-ROM Problems" in the *Compaq Servers Troubleshooting Guide*.
	The diskette in CD-ROM/diskette drive assembly is preventing the system from loading.	Remove the diskette.
SmartStart fails during installation.	The operating system has not been selected.	Run RBSU, and select the primary operating system. See Chapter 6 for complete instructions.
	An error occurs during installation.	*Follow the error information provided. If you must reinstall, first run the Compaq System Erase Utility. Refer to the *Compaq Servers Troubleshooting Guide*.

***CAUTION:** The Compaq System Erase Utility causes the loss of all configuration information, as well as a loss of existing data on all connected hard drives. Please read "Compaq System Erase Utility" and the associated cautionary statements in the *Compaq Servers Troubleshooting Guide* before performing this operation.

continued

Table E-6
Server Operation Problems *continued*

Problem	Possible Cause	Possible Solution
The server cannot load the operating system.	A required operating system step was missed.	Follow these steps: 1. Note the phase at which the operating system failed. 2. Remove any loaded operating system components. 3. Refer to your operating system documentation. 4. Reinitiate installation procedures.
	An installation problem occurred.	Refer to your operating system documentation and to the SmartStart release notes.
	The primary hard drive controller installation is incorrect.	To correct this problem, see "Setting Hard Drive Jumpers" in Appendix D for complete instructions.
	The hard drive controller order is incorrect.	To correct this problem, see "Setting Hard Drive Jumpers" in Appendix D for complete instructions.
	A problem occurred after the new hardware was added to the system.	Refer to the documentation provided with the hardware. Remove the new hardware.
	A problem was encountered with hardware added to a new system ordered with a factory-installed operating 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.

Appendix ***F***

Server Specifications and Connector Interfaces

Compaq ProLiant DL320 Specifications

This appendix provides operating and performance specifications for Compaq ProLiant DL320 servers.

Table F-1
System Unit Specifications

Item	Description
Height	4.24 cm (1.67inch)
Depth	54.61 cm (21.5 inch)
Width	42.55 cm (16.75 inch)
Weight (configured with two SCSI hard drives, four DIMM modules, and a PCI expansion board)	11.15 kg (24.58 lb)
International input voltage requirements	
Rated input voltage	100 to 240 VAC
Rated input frequency	50-60 Hz
Rated input current	3.3 A, 1.7 A (110 V, 220 V)

continued

Table F-1
System Unit Specifications *continued*

Item	Description
U.S. and international input voltage requirements	
Rated input voltage	100-240 VAC
Rated input frequency	50-60 Hz
Rated input current	2A, 1A (100 to 120 VAC, 200 to 240 VAC)
Rated steady-state power	180 W
Maximum peak power	200 W (for max. duration of two minutes)
BTUs	820 BTU/hr
Temperature range	
Operating	10° to 35°C (50° to 95°F)
Nonoperating	Shipping: -40° to 60°C (-40° to 140°F)
	Storage: -20° to 60°C (-4° to 140°F)
Relative humidity (noncondensing)	
Operating	10% to 90%
Nonoperating	Shipping: 10% to 90%
	Storage: 10% to 95%
Maximum wet-bulb temperature	28°C (82°F)

Compaq ProLiant DL320 Connectors

This section contains figures and tables showing connector locations on the rear panel and the system board.

Rear Panel Connectors

The following figure and table show the connectors on the rear panel of the ProLiant DL320 server.

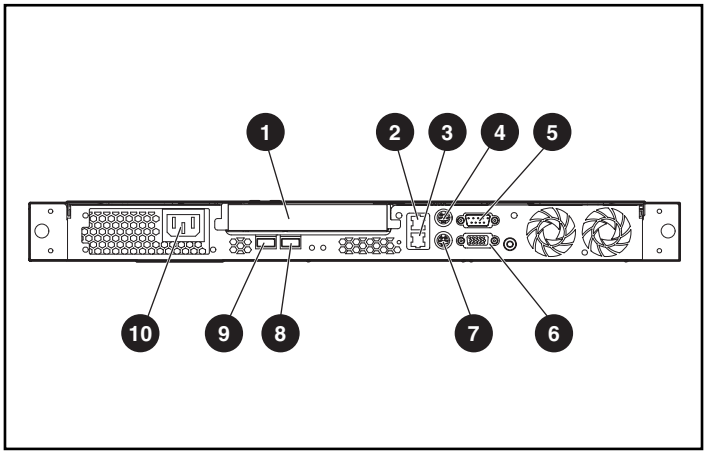

Figure F-1. Rear panel connectors

Table F-2
Rear Panel Connectors

Item	Description
❶	Expansion slot
❷	RJ-45 Fast Ethernet connector for NIC 2
❸	RJ-45 Fast Ethernet connector for NIC 1 (supports PXE)
❹	Mouse connector
❺	Serial connector
❻	Video connector
❼	Keyboard connector
❽	USB 1 connector
❾	USB 2 connector
❿	Power connector

Relevant System Board Connectors

The ProLiant DL320 system board provides a number of connectors that can be used by Compaq authorized service personnel to perform advanced diagnostics. Other connectors are used in upgrading or replacing system components. The figure and table below show locations of the system board connectors in the ProLiant DL320 server.

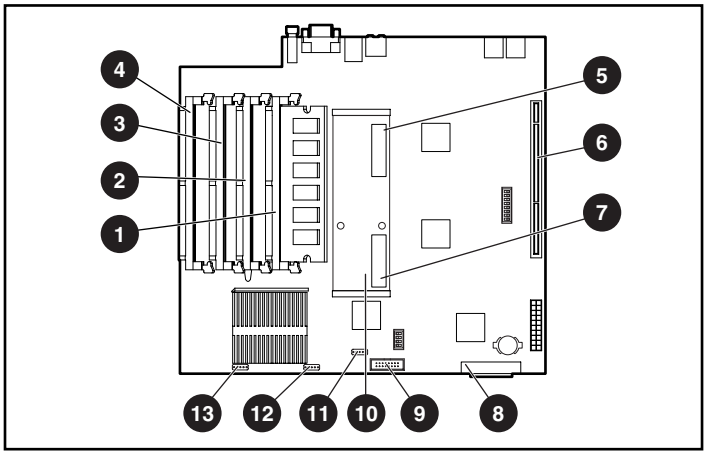

Figure F-2. Identifying the relevant system board connectors

Table F-3
System Board Connectors

Item	Description
❶	DIMM socket 1 (populated)
❷	DIMM socket 2
❸	DIMM socket 3
❹	DIMM socket 4
❺	ATA device 1 cable connector (ATA module on ATA models only)
❻	PCI riser board assembly connector
❼	ATA device 0 cable connector (ATA module on ATA models only)
❽	CD-ROM/diskette drive assembly connector
❾	Remote Insight Lights-Out Edition (optional) connector
❿	SCSI drive connector (SCSI module on SCSI models only)
⓫	Fan 1 connector
⓬	Fan 2 connector
⓭	Fan 3 connector

Appendix G

System Battery

The Compaq ProLiant DL320 server has one memory device that requires a battery for retaining stored information.

When your 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. With normal use, battery life is usually about 5 to 10 years. Replace used batteries with Compaq 540-milliampere-hour lithium, 3V replacement batteries (P/N 179322-001).

System Battery Replacement

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

- 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. If the server is on, power down completely. For detailed instructions on powering down the serve, see “Powering Down the Server” in Chapter 3, “Installing Hardware Options.”
2. Remove the access panel. See “Removing the Access Panel” in Chapter 3, “Installing Hardware Options.”

3. If an expansion board is installed, remove the PCI riser board assembly. See "Removing the PCI Riser Board Assembly" in Chapter 3, "Installing Hardware Options."
4. Locate the battery holder on the system board.
5. Remove the existing battery.

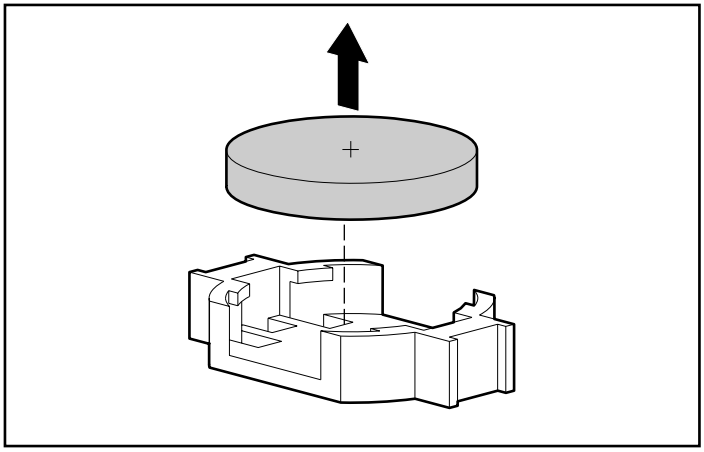

Figure G-1. Removing the old battery

6. Install the new battery.

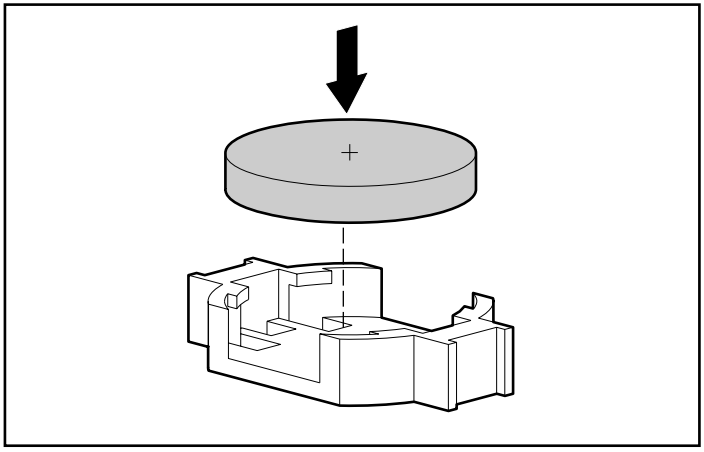

Figure G-2. Installing the new battery

7. If you removed the PCI riser board assembly in Step 3, reinstall it. See "Installing an Expansion Board" in Chapter 3, "Installing Hardware Options."

8. Install the access panel. See “Installing the Access Panel” in Chapter 3, “Installing Hardware Options.”
9. Insert the server into the rack. See “Inserting the Server into the Rack” in Chapter 4, “Installing the Server.”
10. Fasten the thumbscrew that secures the fixed cable tray to the server. See “Attaching the Fixed Cable Tray” in Chapter 4, “Installing the Server.”
11. Reconnect the power cord and peripheral devices. See “Connecting the Power Cord and Peripheral Devices” in Chapter 4, “Installing the Server.”
12. Power up the server. See “Powering Up the Server” in Chapter 4, “Installing the Server.”
13. Run the ROM-Based Setup Utility to reconfigure the system with the new battery. See Chapter 6, “Server Configuration and Utilities.”

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