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This user guide provides information for the Compaq ProLiant Storage System and its applications with the following Compaq servers: ProLiant family, ProSignia, ProSignia 500, ProSignia VS, ProSignia 300, and Systempro/XL.

How this Guide is Arranged

Chapter 1 - *Introduction*

Introduces the ProLiant Storage System and lists its features and functions.

Chapter 2 - *Configuration Planning*

Provides information about various aspects of the storage system and the servers that control it. Use this chapter to plan your installation and overall system configuration.

Chapter 3 - *Installation*

Guides you through the actual installation of your storage system, including its connection to the various Compaq servers.

Chapter 4 - *Operating Information*

Provides information about the physical operating functions of the ProLiant Storage System, including status indicators and replacing hot-pluggable drives.

Chapter 5 - *Maintenance Information*

Provides troubleshooting information.

Chapter 6 - *Option Installation*

Provides step-by-step instructions for installing the Fast-Wide Duplexing Option Kit.

Appendix A - *Specifications*

Provides physical specifications for the ProLiant Storage System.

Appendix B - *Electrostatic Discharge*

Suggests ways to prevent electrostatic discharge and the damage it can cause.

Terms

Throughout this manual references to Fast-SCSI-2 and Fast-Wide SCSI-2 may be stated simply as Standard SCSI and Wide SCSI, respectively, to help avoid confusion between these terms.



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Chapter 1

Introduction

The ProLiant Storage System is a cost-effective, high performance external storage system for Compaq server products. The storage system provides up to 30.1 gigabytes of hard drive mass storage using hot-pluggable Fast-Wide SCSI-2 and Fast-SCSI-2 hard drives. All operating systems will benefit from the easy to service pluggable drive connection scheme.

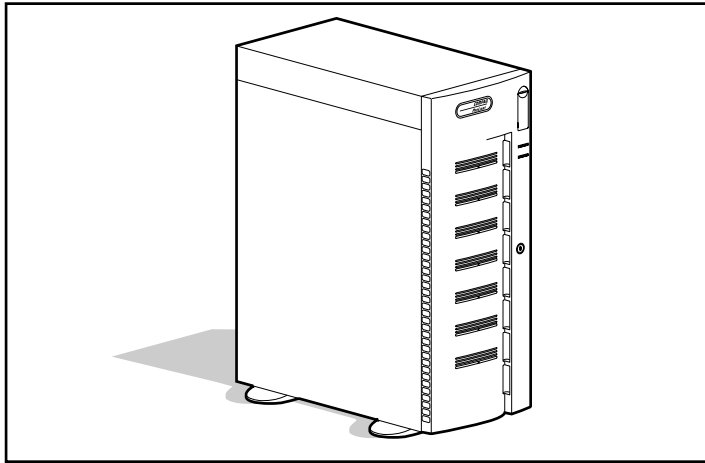


Figure 1-1. ProLiant Storage System

Identifying The Contents

Your ProLiant Storage System carton includes the following contents:

- ProLiant Storage System
- External Wide SCSI to Wide SCSI cable (part number 189646-002)
- External Wide SCSI to Standard SCSI cable (part number 199629-002)
- Power Cord
- This User Guide
- Compaq Software Support CD or Compaq SmartStart CD
- "Supports Fast-Wide SCSI-2" label and Read This First card

Features

Listed below are the standard features of the ProLiant Storage System.

- Hot-Pluggable Drive Capability. This is the ability to add or replace drives without turning off the power when used with supported operating systems or an intelligent controller.
 - Supports 16-bit Fast-Wide SCSI-2 (wide SCSI) as well as 8-bit Fast-SCSI-2 (standard SCSI) hot-pluggable drive trays
 - Seven half-height, 3-1/2 inch hard drive bays supporting up to 30.1 gigabytes of data storage
 - Ability to split the internal wide SCSI bus into two independent buses using the Fast-Wide Duplexing Option Board
 - Redundant Power Supply available installed or as an upgrade option to ensure that server access to stored data will not be interrupted due to power supply failure
 - Two status indicators on the front bezel: *Power* and *Service Required*
 - Three status indicators for each drive visible through the front bezel: *On-line*, *Drive Access* and *Drive Failure*
-

- Auto SCSI ID select (SCSI ID is automatically set based upon installed drive location)
- Drives are accessed through the front bezel
- Thermal Tracking sensor monitors internal temperature and alerts the system if overheating occurs
- Side Access Panel sensor alerts the system if the Side Access Panel is open
- Fan Monitoring sensor alerts the system if the fan fails
- Keylock security provision
- Three-year parts and labor warranty, on-site where applicable
- Physical Dimensions
 - Height: 21.9 inches (55.8 cm)
 - Depth: 17.3 inches (48.8 cm)
 - Width: 9.0 inches (22.8 cm)
- Weight: 37.0 lb. (16.8 Kg) with no hard drives installed
- 240-Watt Power Supply

Options

The following options are available for your ProLiant Storage System and may be obtained from your local Compaq Reseller or Authorized Compaq Service Provider.

Fast-Wide Duplexing Option Kit Compaq Part Number 199614-001

Duplexing, or Controller Duplexing, refers to the technique of simultaneously recording two sets of identical data (duplexing) using two completely separate data paths. This provides total data protection through data mirroring (RAID 1). Because the entire data path is duplicated, a second SCSI controller, along with its associated SCSI bus, is required. The two SCSI controllers need not be in the same server.

A ProLiant Fast-Wide Duplexing Option Kit is available to divide the seven drive bays on the single wide SCSI bus in the ProLiant Storage System into two separate wide SCSI buses of four drives and three drives. This enables:

- Separate controllers to implement advanced fault tolerant data protection methods
- Two servers to share the same storage system

The Duplexing Option may be installed by the user or by your Authorized Compaq Service Provider. Installation instructions for the Duplexing Option are included in the Fast-Wide Duplexing Option Kit and in Chapter 6 of this guide.

Redundant Power Supply

Compaq Part Number 137889-001

An optional Redundant Power Supply is available to ensure that server access to stored data will not be interrupted due to power supply failure. The Redundant Power Supply is a dual power supply with both halves running simultaneously and independently at approximately one-half power. Should one half fail, the other automatically assumes the full load.

If a failure occurs in one half of the redundant supply, front bezel indicators warn of the failure. The storage system continues operating at full capacity while the user arranges for service at a convenient time.

Installation and replacement of the Redundant Power Supply option must be performed by a Compaq Authorized Service Provider.

Chapter 2

Configuration Planning

The Compaq ProLiant Storage System can be used with a variety of SCSI controllers, hard drives, and system software.

SCSI Controllers

The ProLiant Storage System can be used with any of the following controllers:

- Compaq SMART SCSI Array Controller option board
- Compaq 32-Bit Fast-Wide SCSI-2/E Controller option board
- Compaq 32-Bit Fast-Wide SCSI-2/P Controller option board
- Integrated 32-Bit Fast-Wide SCSI-2 Controller in Compaq ProLiant 1500 servers
- Compaq 32-Bit Fast-SCSI-2 Controller option board
- Integrated 32-Bit Fast-SCSI-2 Controller in Compaq ProSignia, ProSignia 500, ProSignia 300, ProSignia VS, ProLiant 1000, 2000, 4000, and Systempro/XL servers.
- Wide-Ultra SCSI Controller (see Wide-Ultra SCSI Support below)
- SMART-2 Array Controller

All Compaq Fast-SCSI-2 controllers, including the SMART SCSI Array Controller, are capable of data transfer rates of 10 megabytes per second. Fast-Wide SCSI-2 controllers are capable of data transfer rates of 20 megabytes per second.

Wide-Ultra SCSI Support

The ProLiant Storage System /F supports the use of Wide-Ultra SCSI drives and controllers. However, even with all Wide-Ultra SCSI components (drives, controllers, and drivers), data transfer will be limited to Fast-Wide SCSI-2 rates (20 MB/s).

2-2 Configuration Planning

Most operational features of the ProLiant Storage System depend on the combination of SCSI controller and system software listed in Table 2-1.

**Table 2-1
Features Supported With These Operating Systems and Controllers****

SCSI Controller	NetWare	Windows NT	SCO UNIX	OS/2	Banyan
SMART SCSI Array Controller <i>or</i> SMART-2 Array Controller	RAID-0 RAID-1 RAID-4 RAID-5 Duplexing Hot-plug drives Hot-plug p/s Hot-plug fans Indicators	RAID-0 RAID-1 RAID-4 RAID-5 Duplexing Hot-plug drives Hot-plug p/s Hot-plug fans Indicators	RAID-0 RAID-1 RAID-4 RAID-5 Duplexing Hot-plug drives Hot-plug p/s Hot-plug fans Indicators	RAID-4 RAID-5 Duplexing Hot-plug p/s Indicators	RAID-1 RAID-4 RAID-5 Hot-plug p/s Hot-plug fans Indicators
32-Bit Fast-Wide SCSI-2 <i>or</i> Integrated 32-Bit Fast-Wide SCSI-2 <i>or</i> Wide-Ultra SCSI Controller	RAID-0 RAID-1 Hot-plug drives Hot-plug p/s Hot-plug fans Indicators	RAID-0 RAID-1 RAID-5 Hot-plug drives Hot-plug p/s Hot-plug fans Indicators	Hot-plug drives* Hot-plug p/s Hot-plug fans Indicators		
32-Bit Fast-SCSI-2 <i>or</i> Integrated 32-Bit Fast-SCSI-2	RAID-0 RAID-1 Hot-plug drives Hot-plug p/s Hot-plug fans Indicators	RAID-0 RAID-1 RAID-5 Hot-plug drives Hot-plug p/s Hot-plug fans Indicators	Hot-plug drives* Hot-plug p/s Hot-plug fans Indicators		
Two 32-Bit Fast-Wide SCSI-2 <i>or</i> Two 32-Bit Fast-SCSI-2 <i>or</i> Two Wide-Ultra SCSI Controller	RAID-0 RAID-1 Duplexing Hot-plug drives Hot-plug p/s Hot-plug fans Indicators	RAID-0 RAID-1 RAID-5 Duplexing Hot-plug drives Hot-plug p/s Hot-plug fans Indicators	Hot-plug drives* Hot-plug p/s Hot-plug fans Indicators		

* Several software products are available that support SCO UNIX for data striping, data mirroring, and fault tolerance.

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Refer to Table 2-2 for the key to the terminology used in Table 2-1.

**Table 2-2
Key to Table 2-1 Terminology**

Term	Definition
RAID-0	Non-fault tolerant data striping
RAID-1	Data mirroring with data striping
RAID-4	Data guarding
RAID-5	Distributed data guarding
Duplexing	Mirrored drives attached to independent buses or controllers
Hot-plug	Hard drives can be installed or removed without powering down the system
Indicators	Drive tray <i>Drive Failure</i> and <i>On-Line</i> , and front bezel <i>Service Required</i> indicators are supported

Hot-Pluggable Drives

The ProLiant Storage System /F supports these Compaq hot-pluggable drives:

- 1.6-inch Fast-SCSI-2
- 1.6-inch Fast-Wide SCSI-2
- 1.6-inch Wide-Ultra SCSI (see Wide-Ultra SCSI Support later in this chapter)
- 1-inch Fast-SCSI-2
- 1-inch Fast-Wide SCSI-2
- 1-inch Wide-Ultra SCSI (see Wide-Ultra SCSI Support later in this chapter)

ProLiant Storage System will accept both 1-inch and 1.6-inch standard height drives. The drives may be of any storage capacity but must be mounted on Compaq hot-pluggable drive trays.

Hot-Pluggability

The ProLiant Storage System supports hot-pluggable drives. Under certain conditions these drives can be removed or installed without turning off the power to the storage system or the server. This feature eliminates interference with the operation of the server while replacing drives in some configurations. In planning your configuration it is important to understand that the hot-pluggability feature must also be supported by the operating system and controller. See Table 2-1.

Hot-pluggable drives in fault-tolerant configurations can be used to replace failed drives without powering down your system. The data on the failed drive will be automatically restored on the replacement drive.

IMPORTANT: When using NetWare software drive mirroring, the drive that contains both the DOS partition used to boot the server and the NetWare server files should not be hot-plugged. Although the system can be booted from a drive in the ProLiant Storage System, the DOS partition is not mirrored by NetWare. Therefore, if a hot-pluggable drive containing the DOS partition fails, the DOS partition will not be reconstructed from the mirrored drive. Refer to the SCSI.RDM file on the NetWare Programs From Compaq diskette for more information. This diskette can be generated from the Compaq Software Support CD or Compaq SmartStart CD provided with the ProLiant Storage System.

Hot-pluggable drives can also be used as a means to provide high-capacity direct access removable media. Systems supporting the "removable media" must be initialized with all drives in place so that they are recognized and configured into the list of available devices.

IMPORTANT: Drives used in a fault-tolerant configuration cannot be used as removable media data storage. When a drive is removed, the operating system flags it as failed and will automatically try to rebuild the lost data from the other configured drives when the failed drive is replaced.

Hot-pluggability features are dependent on operating system or SCSI controller support. Refer to README files or Release Notes on Compaq-supplied operating systems for information about hot-pluggability.



CAUTION: To prevent loss of data, drives must be removed and replaced only under certain conditions, basically when both the *Drive Access* and *On-Line* indicators are OFF. Refer to "Removing and Replacing Hot-Pluggable Drives" in Chapter 4 of this guide for information about these conditions

SCSI IDs

All devices on a SCSI bus must have unique identification numbers. The drives used with the ProLiant Storage System are automatically assigned SCSI ID numbers depending on the drive bay in which they are installed.



CAUTION: Server lockups could occur if a drive is installed in a drive bay set with a SCSI ID that is already used by another device in the server if both devices are on the same SCSI bus.

For example: assume that the SCSI controller in the server is connected to a tape drive (SCSI ID of 1) and a CD-ROM drive (SCSI ID of 6) installed in the server. If the external port of the same SCSI controller (same SCSI bus) is connected to a ProLiant Storage System, drives must be installed in the storage system drive bays with IDs from 2 through 5 to avoid using IDs 1 and 6, the same IDs that have been assigned to the internal SCSI devices

IMPORTANT: All SCSI hard drives on the same SCSI bus must be either internal (within the server) or in an external storage system, but not both. A configuration with both internal and external SCSI hard drives requires more than one single-channel SCSI controller. A multi-channel controller, such as the Compaq SMART SCSI Array Controller, supports both internal and external SCSI hard drives on separate SCSI buses.

Non-Duplexing Systems

For non-duplexing systems the SCSI IDs are assigned as shown in the figure below.

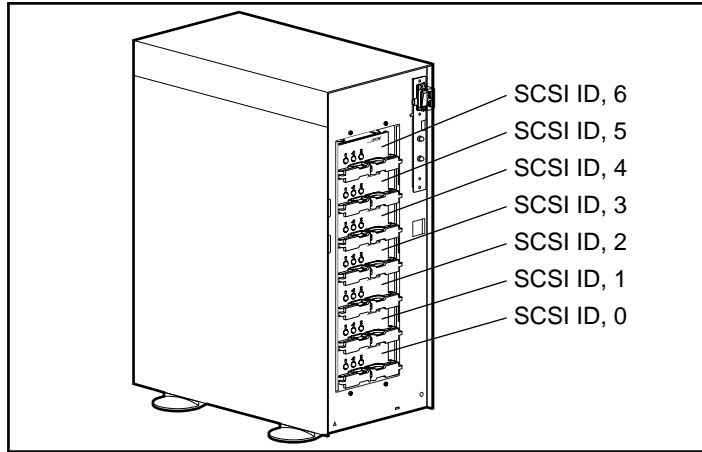


Figure 2-1. SCSI ID Numbers in Non-Duplexing Systems

Duplexing Systems

The ProLiant Fast-Wide Duplexing Option provides a method to divide the Fast-Wide SCSI-2 bus in the ProLiant Storage System into two separate buses. Each of the two buses has a unique set of SCSI IDs and must be attached to a separate SCSI controller or a separate channel of a SMART SCSI Array Controller.

Dividing the SCSI bus enables the LAN system software to implement advanced fault tolerance methods such as controller duplexing and data mirroring. This allows important data to be recovered should a failure occur in any part of the storage chain.

Another application of dividing the SCSI bus is to permit two servers to share the same storage system. In this way, two LANs with extended storage capacity can operate independently without interfering with each other.

If you have installed the Duplexing Option board, the SCSI IDs are assigned as shown in the figure below.

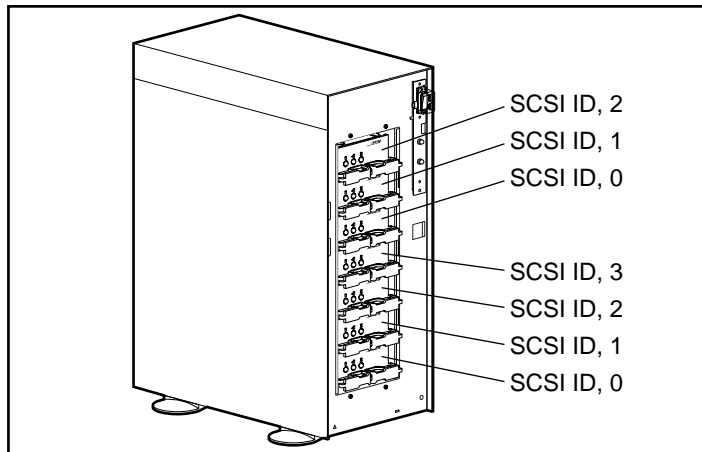


Figure 2-2. SCSI ID Numbers in Duplexing Systems

See Chapter 6 in this guide for instructions for installing the Duplexing Option in the ProLiant Storage System.

Site Selection

Choose an installation site with the following features:

- At least 3 inches (7.6 cm) of clearance at the back of the storage system for proper ventilation and cable routing.
- At least 8 inches (20.3 cm) of clearance at the front of the storage system for access to the hot-pluggable drives.
- A grounded electrical outlet that is easily accessible and located as near the storage system as possible.

Status Indicators

The LEDs on the front bezel and drive trays are indicators of conditions in the ProLiant Storage System. Some of the functions of these indicators require system software or intelligent controller support. See Tables 4-1 and 4-2 in Chapter 4, "Operating Information," for definitions of the indicators and details of the support requirements.

Chapter 3

Installation

This section describes the initial installation of a ProLiant Storage System in a network controlled by any of several Compaq servers. Please review Chapter 2, "Configuration Planning," in this guide before you begin installation of a ProLiant Storage System.

Overview

Installation of the ProLiant Storage System involves the following steps:

- Locate the appropriate equipment needed for the installation.
- Install a SCSI controller in the server if one is not already installed or integrated in the server. Follow the instructions included with the controller for installation of this option.
- Install the Fast-Wide Duplexing Option in the ProLiant Storage System if this option is to be used. Follow the instructions included with the option kit or those in Chapter 6 of this guide for installing this option.
- Connect the server to the storage system.
- Install the hard drives in the storage system.
- Power up the system.
- Configure the system.

Each of these steps is covered in more detail in the following sections.

Installation Materials

Locate the following materials needed to install the ProLiant Storage System:

- SCSI Controller if not already installed or integrated in your server (not provided with the ProLiant Storage System)
- Hot-pluggable Fast-Wide SCSI-2 or Fast-SCSI-2 drives (not provided with the ProLiant Storage System)
- External SCSI Cable (provided with the ProLiant Storage System): wide SCSI to wide SCSI cable for use with Fast-Wide SCSI-2 controllers, or wide SCSI to standard SCSI adapter cable for use with Fast-SCSI-2 controllers
- AC Power Cord (provided with the ProLiant Storage System)
- Network operating system drivers. For NetWare, see the README files on the NetWare Programs from Compaq diskette for information on software support for NetWare. All necessary drivers and software documentation are included in the Compaq Software Support or Compaq SmartStart kits provided with the ProLiant Storage System.

Installing SCSI Controllers in Servers

- If using integrated SCSI controllers, no other installation is necessary. Proceed to "Connecting the Server to the ProLiant Storage System" later in this chapter.
 - If installing a SCSI controller option, use the instructions that came with that option.
-

Installing the Fast-Wide Duplexing Option Kit

If you are installing the Duplexing option, do it at this time. Refer to Chapter 6, "Option Installation," for Fast-Wide Duplexing Option Kit installation instructions.

Connecting the Server to the ProLiant Storage System

Non-Duplexing Cable Connections

Refer to Table 3-1 to determine the SCSI cable combination required for your installation.

**Table 3-1
ProLiant Storage System Cable Requirements**

Server	SCSI Controller	SCSI Cable(s)*
ProLiant 1000, 2000, 4000	Integrated Fast-SCSI-2	Standard SCSI
ProLiant 1500, 4500, 5000	Integrated Fast-Wide SCSI-2	Wide SCSI
ProLiant 800, 2500	Integrated Wide-Ultra-SCSI	Wide SCSI
ProSignia VS, 300, 500	Integrated Fast-SCSI-2	Standard SCSI
ProSignia 200	Integrated Wide-Ultra-SCSI	Wide SCSI
Systempro/XL	Integrated Fast-SCSI-2	Standard SCSI
All	32-Bit Fast-SCSI-2	Standard SCSI
All	SMART SCSI Array	Standard SCSI + "Y"
All	32-Bit Fast-Wide SCSI-2/E	Wide SCSI
All	32-Bit Fast-Wide SCSI-2/P	Wide SCSI
All	Wide-Ultra SCSI	Wide SCSI
All	Smart-2/E Array	Wide SCSI
All	Smart-2/P Array	Wide SCSI

* Cable Notes:

- Wide SCSI:** The 6-ft. external wide SCSI to wide SCSI cable, part number 189646-002, supplied with the ProLiant Storage System. For connection to a Fast-Wide SCSI-2 or Wide-Ultra SCSI controller.
- Standard SCSI:** The 6-ft. external wide SCSI to standard SCSI adapter cable, part number 199629-002, supplied with the ProLiant Storage System. Used to adapt the storage system for use with Fast-SCSI-2 controllers.
- "Y":** The Fast-SCSI-2 dual-port breakout adapter "Y" cable furnished with the SMART SCSI Array Controller. Used to provide two standard external Fast-SCSI-2 ports from the SMART Controller.

IMPORTANT: All SCSI hard drives on the same SCSI bus must be either internal (within the server) or in an external storage system, but not both.

A configuration with both internal and external SCSI hard drives requires more than one single-channel SCSI controller. A multi-channel controller, such as the Compaq SMART SCSI Array Controller, supports both internal and external SCSI hard drives on separate SCSI buses.

If you have installed the Fast-Wide Duplexing Option in your ProLiant Storage System, proceed to the next section, "Duplexing Cable Connections," after you have completed the cabling described here. If you are not using duplexing, skip to "Installing Hard Drives in the ProLiant Storage System" later in this chapter.

Duplexing Cable Connections

If you have installed the Fast-Wide Duplexing Option Kit, then the cable connection you made in the previous section applies to the bottom four drive bays (SCSI IDs 0 through 3) in the ProLiant Storage System. The top three drive bays are routed to the connector shown in Figure 3-1. These top three bays are renumbered as SCSI IDs 0 through 2 of a *second* Fast-Wide SCSI-2 bus (Bus 2). These bays should be attached to a second SCSI controller or the second bus of a two channel SCSI controller such as the Compaq SMART SCSI Array Controller.

The same considerations that apply to the first SCSI bus also apply to the second SCSI bus. SCSI ID numbers can not be duplicated on this bus. They may, however, duplicate SCSI IDs on the first SCSI bus because the two buses are completely independent.

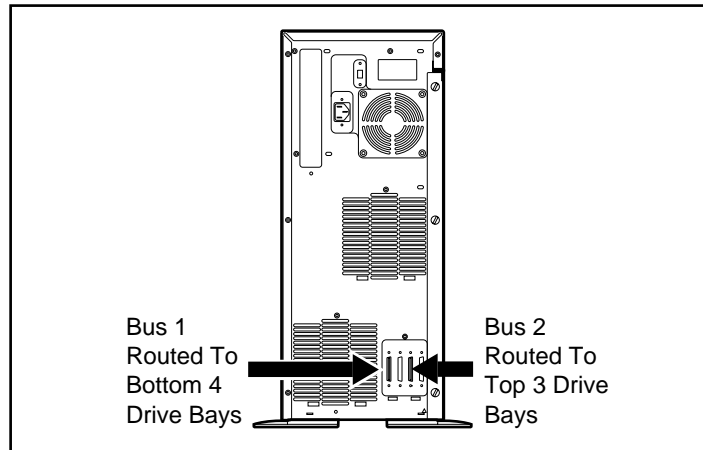


Figure 3-1. SCSI Cable Connections Using the ProLiant Duplexing Option

- If you are using a **Fast-Wide SCSI-2 controller**:
 1. Connect one end of the 6-ft. external wide to wide SCIS cable included in the Duplexing Option Kit to the Bus 2 SCSI connector on the back of the storage system. This connector is in position 3 on the connector panel and supports the three upper drive bays. See Figure 3-1.
 2. Connect the other end of the SCSI cable directly to the controller in the server.

- If you are using a **Fast-SCSI-2 controller**:
 1. Connect the wide SCSI end of the 6-ft. external wide to standard SCSI adapter cable included in the Duplexing Option Kit to the Bus 2 SCSI connector on the back of the storage system. This connector is in position 3 on the connector panel and supports the three upper drive bays. See Figure 3-1.
 2. Connect the other end of the SCSI adapter cable directly to the controller in the server. *Installing Hard Drives in the ProLiant Storage System*

Installing Hard Drives in The ProLiant Storage System

The ProLiant Storage System supports both the Compaq Fast-Wide SCSI-2 (wide SCSI) and Fast-SCSI-2 (standard SCSI) hot-pluggable drives. All Compaq hot-pluggable drives are properly configured for use in the ProLiant Storage System and are installed in the same manner as shown below.



CAUTION: Before you remove or install drives, it is advisable to discharge static electricity from your body by touching the front chassis. This prevents electrostatic discharge from causing interruptions during operation.

1. Open the front bezel.

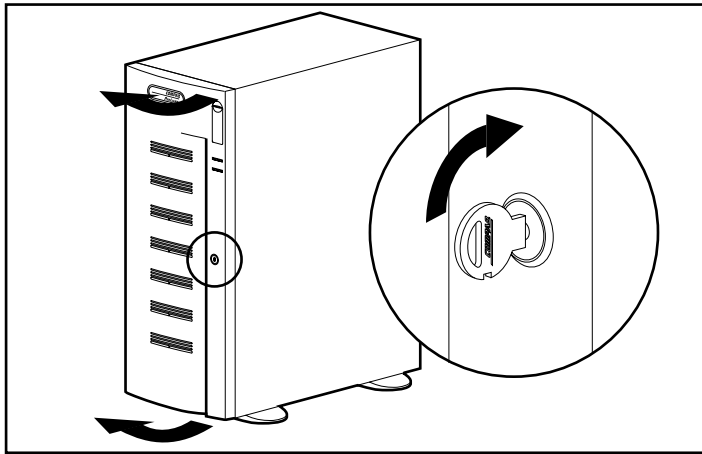


Figure 3-2. Opening the Front Bezel



CAUTION: Server lockups could occur if a drive is installed into a drive bay that has the same SCSI ID as a device in the server on the same SCSI bus.

For example: Assume that the SCSI controller is connected to a tape drive and a CD-ROM drive installed in the server. The tape drive is set to a SCSI ID of 1 and the CD-ROM drive is set to a SCSI ID of 6. If the external port of the same SCSI bus is connected to the ProLiant Storage System, drives can only be installed in storage system drive bays 0, or 2 through 5, standard, or drive bays 0, 2, or 3, duplexing. This avoids using SCSI IDs 1 and 6 which are already used in the server.

2. Select a drive bay.



CAUTION: Be very careful when installing a hot-pluggable drive to ensure that the drive is compatible with the storage system. The wide SCSI drive trays used in the ProLiant Storage System can be physically damaged you attempt to plug them into a storage system that supports only standard SCSI drive trays. Wide SCSI drive trays are identified with a label and can be used only in systems that support Fast-Wide SCSI-2. Wide SCSI storage systems also have a label on the metal panel inside the front bezel identifying it as a Fast-Wide SCSI-2 device.

A label has been supplied with your new ProLiant Storage System identifying it as a Fast-Wide SCSI-2 device. You may want to display this label in a prominent place as a helpful reminder that this storage system can accept wide SCSI drive trays.

NOTE: To verify that your storage system will accept wide SCSI drive trays, check the serial number of the storage system. If the 5th, 6th, and 7th characters in the storage system serial number are HNM, the storage system is a Fast-Wide SCSI-2 device and will accept both the standard and the wide SCSI drive trays. Example: xxxxHNMxxxxx.

The serial number tag is located on the back panel of the storage system.

1. Install the drive as shown below.
 - a) Open both latches all the way

- b) Slide the drive into a vacant drive slot as far as it will go.
- c) Close both latches against the front of the drive. Levers on each latch should catch behind the metal lip, drawing the drive into position and securing it in place.

IMPORTANT: After installing, pull on the drive (not the latches) to see if the tray is properly seated. If you are able to remove the drive without releasing the latches, open the latches all the way and try again to seat the drive, ensuring that the levers engage the front panel and pull the drive into position.

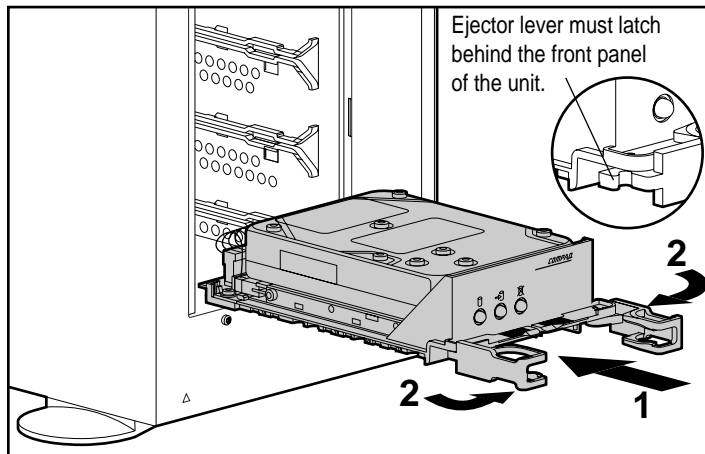


Figure 3-3. Installing Hard Drives in a ProLiant Storage System

Connecting the Power

NOTE: If your ProLiant Storage System is equipped with a Redundant Power Supply, refer to "Redundant Power Supply Option" on the next page.



CAUTION: Ensure that the voltage select switch is in the proper position (115 VAC or 230 VAC). Failure to select the correct voltage will result in damage to the equipment.

1. Set the AC Voltage Selector Switch to the correct local AC mains power voltage (115 or 230 V).
2. Install the power cable on the storage system as shown below.

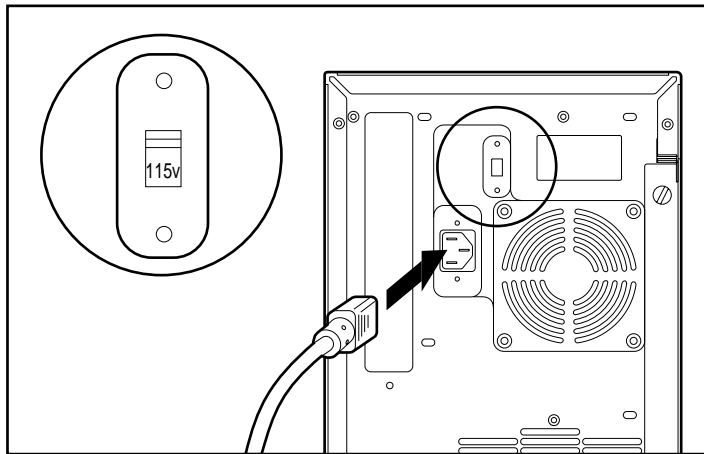


Figure 3-4. Connecting the Power Cable



WARNING: To reduce the risk of electric shock or damage to your equipment, do not disable the power cord grounding feature. This equipment is designed to be connected to a grounded (earthed) power outlet. The grounding plug is an important safety feature.



CAUTION: Be sure that the power outlet you plug your power cord into is easily accessible and located as close to the equipment operator as possible. When you need to disconnect power to the equipment, be sure to unplug the power cord from the power outlet.

3. Plug the power cable into a grounded electrical outlet.
4. Turn ON the power switch on the ProLiant Storage System and then the server.

Redundant Power Supply Option

The Redundant Power Supply option has an automatic ranging feature that internally matches the input voltage when the power cable is connected to the ProLiant Storage System. An LED replaces the voltage selector switch on the ProLiant Storage System back panel. This LED changes from green to amber to indicate a failure in the power supply while still supplying power to the storage system.

1. If your storage system is equipped with a Redundant Power Supply, install the power cable as shown below.

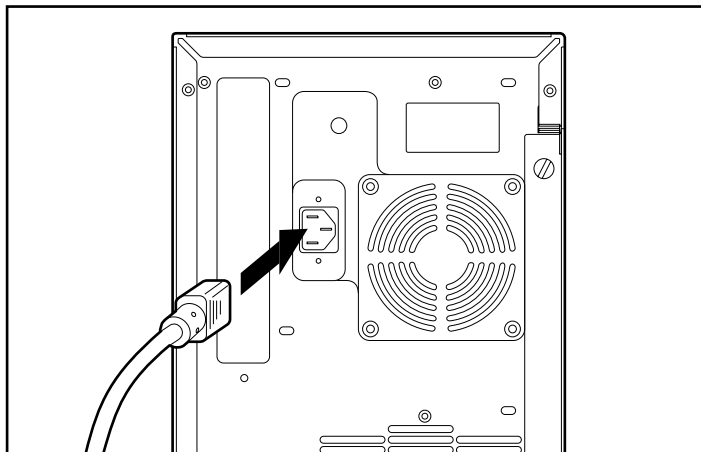


Figure 3-5. Connecting the Power Cable to the Redundant Power Supply



WARNING: To reduce the risk of electric shock or damage to your equipment, do not disable the power cord grounding feature. This equipment is designed to be connected to a grounded (earthed) power outlet. The grounding plug is an important safety feature.



CAUTION: Be sure that the power outlet you plug your power cord into is easily accessible and located as close to the equipment operator as possible. When you need to disconnect power to the equipment, be sure to unplug the power cord from the power outlet.

2. Plug the power cable into a grounded electrical outlet.
3. Turn ON the power switch on the ProLiant Storage System.
4. Turn ON the power switch on the server.

Configuring the ProLiant Storage System

Run the Compaq System Configuration Utility on your server to:

- Verify that the new SCSI IDs are recognized and configured for your system
- Verify the controller configuration

The Compaq System Configuration Utility is included on the Compaq Support Software CD for Compaq Server Products or the Compaq SmartStart CD. One of these software packages is supplied with the ProLiant Storage System. The utility may be run in one of the following ways:

- Directly from the hard drive if the utility was previously installed in the System partition
- Directly from the CD if the server supports a bootable CD-ROM drive
- From diskettes created from the CD on any system

Each of these methods is explained below.

System Configuration from the Hard Drive

Use these instructions to run the Compaq System Configuration Utility if your server has had this utility previously installed in the System partition on the boot drive.

1. Boot the server normally (warm or power down boot).
 2. Press F10 when the white square cursor is in the upper right-hand corner of the screen. Be ready, this cursor is only present for about 2 seconds during boot.
 3. Select the menu items to configure the hardware.
-

4. Select the option to review the hardware settings.
5. Select the option to view or edit details.
6. Locate the SCSI controllers and verify that the installed drives are displayed.
7. If you are using a Compaq SMART SCSI Array Controller you should verify the logical drive configuration, paying special attention to the selected fault tolerance method. For this configuration information, refer to:
 - the README files or Release Notes for Compaq supplied operating systems
 - your software documentation for other operating systems
 - the Compaq SMART SCSI Array Controller User Guide
8. Select "Save the configuration and exit."

The utility will configure your system to recognize any new controllers and devices. Reboot your system normally to begin using the added disk space on the ProLiant Storage System.

System Configuration from the CD

Use these instructions to run the Compaq System Configuration Utility if your server:

- has not had this utility previously installed on the boot drive
- has a bootable CD-ROM drive

To run the System Configuration Utility directly from the Support Software CD or SmartStart CD (the first CD, labeled "SmartStart," as part of the set of CDs in the SmartStart software package) included with the ProLiant Storage System:

1. Be sure all new hard drives are in place and the storage system is turned ON.

2. Boot the server from the CD.
3. Select "Run the System Configuration Utility" (Support Software CD) or Select "Non-SmartStart Setup" then "Configure Hardware" (SmartStart CD)
4. Select the menu items to configure the hardware.
5. Select the option to review the hardware settings.
6. Select the option to view or edit details.
7. Locate the SCSI controllers and verify that the installed drives are displayed.
8. If you are using a Compaq SMART SCSI Array Controller you should verify the logical drive configuration, paying special attention to the selected fault tolerance method. For this configuration information, refer to:
 - ❑ the README files or Release Notes for Compaq supplied operating systems
 - ❑ your software documentation for other operating systems
 - ❑ the *Compaq SMART SCSI Array Controller User Guide*
9. Select "Save the configuration and exit."

The utility will configure the system to recognize any new controllers and devices. Reboot your system normally to begin using the added disk space on the ProLiant Storage System.

Create System Configuration Diskettes

Use these instructions to run the Compaq System Configuration Utility if your server:

- has not had this utility previously installed on the boot
- drive does not have a bootable CD-ROM drive

To create and use System Configuration Utility diskettes from the Support Software CD or SmartStart CD (the first CD, labeled "SmartStart," as part of the set of CDs in the SmartStart software package) included with the ProLiant Storage System:

1. Boot a CD server or workstation from the Support Software CD and select "Create Support Software Diskettes from CD,"
or
Boot a CD server or workstation from the SmartStart CD and select "Non-SmartStart Setup," then "Create Support Software Diskettes from CD,"
or
Run the PB.EXE file from a Windows 3.1 or Windows NT system.
2. From Product Builder select "Tool Box" ⇄ "System Utilities" ⇄ "Compaq System Configuration Diskettes."
3. The program will prompt you to insert two pre-formatted diskettes and will supply labeling information while the two System Configuration diskettes are created.
4. Be sure all new hard drives are in place and the storage system is turned ON.
5. Boot the server supporting the ProLiant Storage System with the first System Configuration Utilities diskette.
6. Select the menu items to configure the hardware.
7. Select the option to review the hardware settings.
8. Select the option to view or edit details.

9. Locate the SCSI controllers and verify that the installed drives are displayed.
10. If you are using a Compaq SMART SCSI Array Controller you should verify the logical drive configuration, paying special attention to the selected fault tolerance method. For this configuration information, refer to:
 - ❑ the README files or Release Notes for Compaq supplied operating systems
or
 - ❑ your software documentation for other operating systems
or
 - ❑ the *Compaq SMART SCSI Array Controller User Guide*
11. Select "Save the configuration and exit."

The utility will configure your system to recognize any new controllers and devices. Reboot your system normally to begin using the added disk space on the ProLiant Storage System.

Chapter 4

Operating Information

This section describes the operational features of the ProLiant Storage System.

Status Indicators

The ProLiant Storage System has LED status indicators located in several areas. They are used to indicate the operational status of the various sub-systems within the storage system, such as the power supply and hard drives.

Front Bezel

The front bezel indicators are shown in Figure 4-1. Table 4-1 defines each indicator state. Some of the indicator states described in Table 4-1 require support from the operating system or an intelligent SCSI controller.

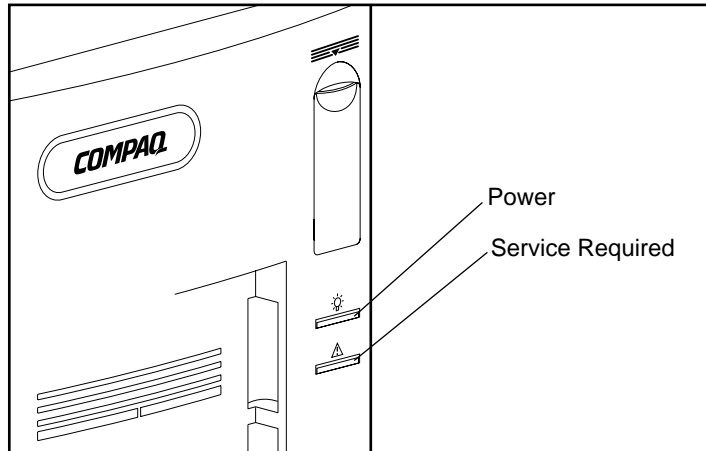




Figure 4-1. Front Bezel Indicators

**Table 4-1
Front Bezel Indicator Definitions**

Indicator	OFF	GREEN	AMBER
 Power	Power is OFF	Power is ON	Power is ON but redundant power supply indicates a failure
 Service Required	No failures	--	1. A drive has failed* <i>or</i> 2. A fan has failed <i>or</i> 3. Overheating detected <i>or</i> 4. Cover open <i>or</i> 5. A drive which was installed in a fault-tolerant configuration was removed.* <i>or</i> 6. A Redundant Power Supply has failed if the Redundant Power Supply option is installed.

* Requires system software or intelligent controller support

Redundant Power Supply

A ProLiant Storage System equipped with a Redundant Power Supply has an LED indicator on the back panel. Figure 4-2 shows the location and Table 4-2 defines the states of this indicator.

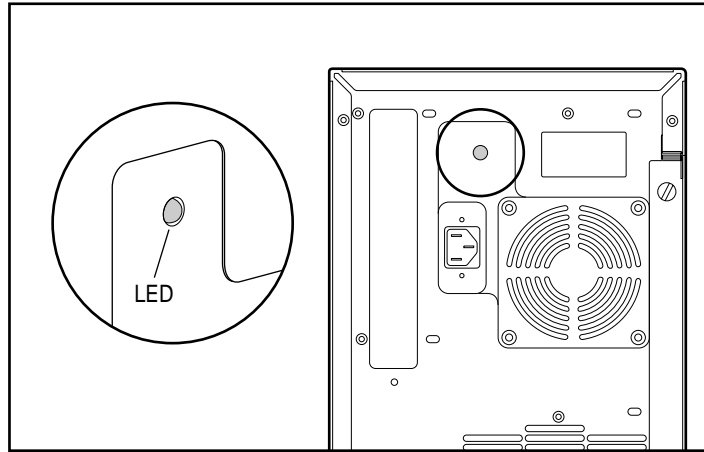


Figure 4-2. Redundant Power Supply LED Indicator on the Back Panel

Table 4-2
Redundant Power Supply Indicator Definitions

Indicator Color	Meaning
Green	Power Supply is operating normally
Amber	One of the two internal redundant supplies has failed



CAUTION: If the system is equipped with a Redundant Power Supply and the Power Indicator on the front bezel changes to amber, immediately inspect the LED indicator on the rear of the storage system. If this indicator has changed from green to amber the power supply is now operating in a non-redundant mode. Call your local Authorized Service Provider to have your power supply replaced. Long-term operation of the power supply in this mode may cause total power supply failure and result in loss of data.

Drive Trays

Each of the wide SCSI and standard SCSI hot-pluggable drive trays indicate the status of the individual drive. The indicators for all drives are visible through the window in the front bezel. Figure 4-3 shows these indicators and Table 4-3 defines the various states of each.

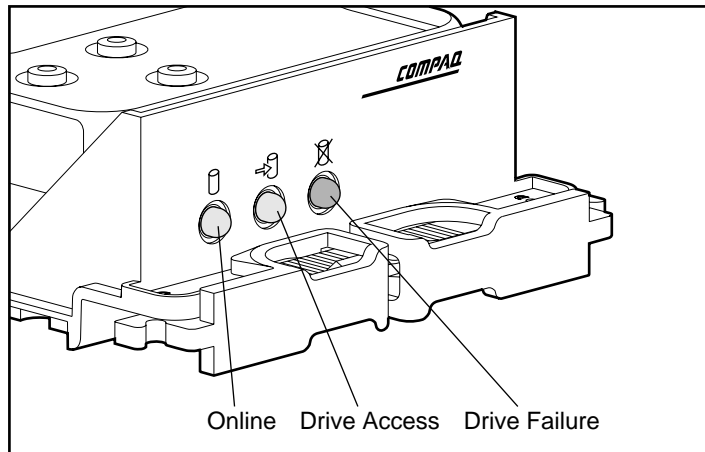





Figure 4-3. Drive Tray Indicators

Table 4-3
Drive Tray Indicator Definitions

Indicator	OFF	ON	Blinking
 On-Line*	The drive is inactive	The drive is configured and recognized by the operating system or intelligent controller	Volume reconstruction is under way
 Drive Access	The drive is not being accessed	The drive is being accessed	--
 Drive Failure*	No failure	The drive has failed and is ready for removal and replacement	--

* Requires system software or intelligent controller support

Indicator Self-Test

When the ProLiant Storage System is first powered on, or when a new drive is plugged in, the drive tray indicators turn on one at a time, from left to right. Then they all turn off at the same time. This informs the user that the lights are working. Also, when first powered on, the front bezel *Service Required* indicator turns on and off.

Removing and Replacing Hot-Pluggable Drives

Hot-pluggable drives can be replaced in the ProLiant Storage System while the power is on if the operating system supports this feature. However, to prevent loss of data or server lockup, hot-pluggable drives should be removed only when both the *On-Line* and *Drive Access* drive tray indicators are OFF. This is especially important when replacing a failed drive in a fault-tolerant configuration. If these conditions are not met, the data may not be reconstructed on the replacement drive.



CAUTION: Failure to observe these indicator conditions when replacing a failed drive in a fault-tolerant configuration may result in loss of data.

See Figure 4-4 on the next page where the proper conditions for removing drives are illustrated.

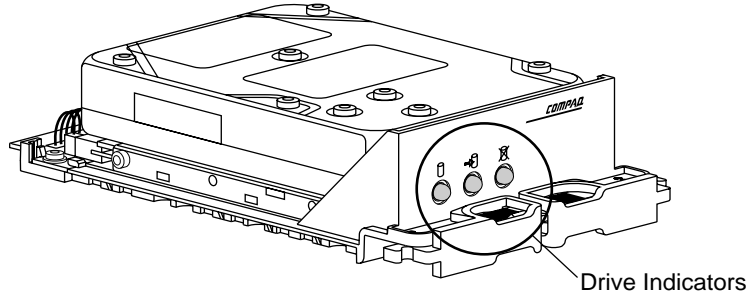
Refer to the hot-pluggable hard drive support section of your operating system or SMART SCSI Array Controller documentation for descriptions of how the operating system supports hot-pluggability and the ProLiant Storage System status indicators.



WARNING: To reduce the risk of personal injury from hot surfaces, allow the hot-pluggable drives to cool before touching any metallic surfaces.



CAUTION: Before you remove or install drives, it is advisable to discharge the static electricity from your body by touching the front chassis. This prevents electrostatic discharge from causing interruptions during operation.



	OK to remove drive if not part of fault-tolerant configuration
	OK to remove failed drive
	DO NOT remove drive
	DO NOT remove drive
	DO NOT remove drive
	DO NOT remove drive

OFF
 ON

Figure 4-4. Hot-Pluggable Drive Replacement Conditions

Side Access Panel Sensor

The ProLiant Storage System includes a sensor to detect the absence of the Side Access Panel. This feature reports the condition to the system software and turns on the *Service Required* indicator on the front bezel, but does not interrupt operation of the storage system.

The flow of air through the ProLiant Storage System is critical to adequate cooling. If the Side Access Panel is removed, the air flow is disturbed and overheating could occur.



CAUTION: The Side Access Panel must be installed when the ProLiant Storage System is operating to ensure proper cooling in the system.

Thermal Tracking Sensor

The ProLiant Storage System includes a temperature sensor to detect internal overheating. This feature reports the condition to the system software and turns on the *Service Required* indicator on the front bezel but does not interrupt operation of the storage system.



CAUTION: Continued operation of the ProLiant Storage System while overheated could result in the loss of data or damage to the hard drives.

Fan Failure Sensors

The ProLiant Storage System includes fan monitor sensors to detect a fan failure. This feature reports the condition to the system software and turns on the *Service Required* indicator on the front bezel but does not interrupt operation of the storage system. When a fan failure is detected, your operating system may shut down the drives after a pre-defined delay time. Check the documentation for your operating system for the reaction of your system to fan failures.



CAUTION: Continued operation of the ProLiant Storage System after the fan has failed could result in the loss of data or damage to the hard drives.

Chapter 5

Maintenance Information

Routine Care

To maintain the condition and performance of the ProLiant Storage System:

1. Keep liquids away from the unit.
2. Wipe the exterior with a soft, damp cloth as needed. Using cleaning products may discolor or mar the finish.
3. Occasionally clean the air vents on the front and back of the unit. Lint and other foreign matter can block the vents and limit the airflow.



CAUTION: The Side Access Panel must be installed when the unit is operating to ensure proper cooling in the system.

Troubleshooting Hints

If the front bezel *Service Required* light is on, run the Compaq Insight Manager to determine the reason for this alert.

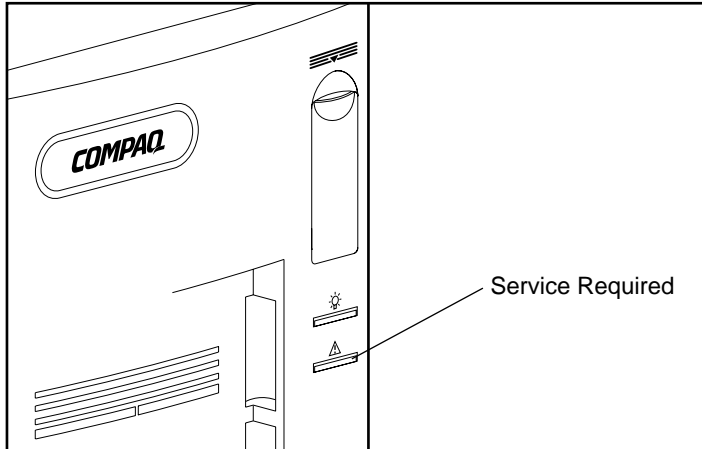


Figure 5-1. Service Required Indicator

If you do not have Compaq Insight Manager, use the following procedure:

■ **Drive Failure indicator**

Check the drive tray indicators for a *Drive Failure* indication. See Figure 5-2. These are visible through the lens in the front bezel. If the *Drive Failure* indicator on one of the drive trays is illuminated, that drive has failed.



WARNING: To reduce the risk of personal injury from hot metallic surfaces, handle the drives only by the plastic latches.

Open the front bezel and replace the failed drive. If your operating system or SMART Controller supports hot-pluggable drives, do not turn off power to the unit. Refer to "Removing and Replacing Hot-Pluggable Drives" in Chapter 4.



CAUTION: Remove a drive only if the drive tray *Drive Failure* indicator is ON and the *Drive Access* and *On-Line* indicators are OFF. Failure to observe these indicator conditions when replacing a failed drive in a fault-tolerant configuration may result in loss of data.

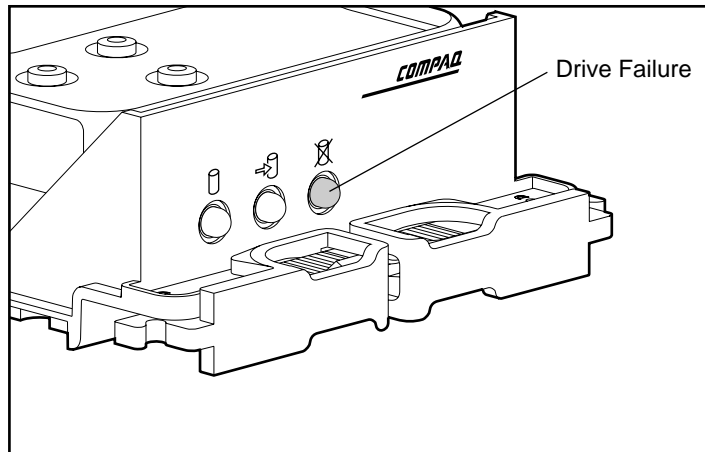


Figure 5-2. Drive Failure Indicator



CAUTION: Replace any failed drives as soon as possible. If fault protection such as mirroring or duplexing is being used, data protection will be reduced until the failed drive is replaced and restored.

Consult your operating system software documentation to find out how to restore data to the replacement drive. If using NetWare refer to the README files on the NetWare Programs from Compaq diskette for information about recovering from a drive failure or adding additional drives without affecting network operation. This diskette may be generated from the Compaq Support Software CD or Compaq SmartStart CD included with the ProLiant Storage System.

If no *Drive Failure* indicator is on, then the problem may be one of the following:

- **Side Access Panel open**
Check the Side Access Panel to ensure it is fully closed and seated.
- **Redundant Power Supply failure**
Check the *Power* indicator on the front bezel. If it is amber, a failure has occurred in the optional redundant power supply. Contact an Authorized Compaq Service Provider for service or replacement.
- **Cooling fan failure**
Check the rear fan by feeling for air flow near the fan grill at the back of the storage system. If the fan is not running, contact an Authorized Compaq Service Provider.

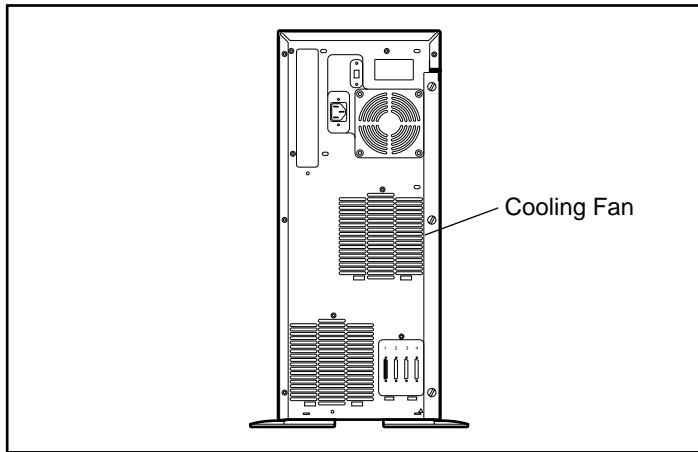


Figure 5-3. Cooling Fan Location

- **Overheating**
Ensure that the ambient temperature of the room does not exceed 40° C (104° F).
 - **Improper drive removal**
Check the installed hard drives to verify that all drives are present. It is possible that a drive was inadvertently removed from a fault tolerant configuration.
 - **Plenum Fan failure**
The plenum fan is located internally and proper operation may not be easily verified. If all of the other conditions have been investigated and the problem persists, contact an Authorized Compaq Service Provider for assistance.
-

Chapter 6

Option Installation

The ProLiant Storage System supports two optional features:

- Redundant Power Supply
- Duplexing

This chapter outlines the steps necessary to install these options.

Redundant Power Supply

The Redundant Power Supply offers additional protection against data loss due to power supply failure by providing two supplies running simultaneously within a single chassis. However, due to the potentially hazardous voltages involved, this option may only be installed by an Authorized Compaq Service Provider.

Duplexing

Duplexing allows the seven hot-pluggable drive bays to be controlled by two separate SCSI controllers by splitting the drive bay Backplane into two separate Fast-Wide SCSI-2 buses. Follow these instructions to install the Fast-Wide Duplexing Option Kit.

Tools and Software Needed

The following items will be required for installation of a Fast-Wide Duplexing Option Kit.

- Torx T-15 screwdriver or 3/16" flat-bladed screwdriver
- 3/16" nut driver
- Latest version of Compaq Diagnostics and System Configuration Utility. These are available on the Compaq Support Software CD or Compaq SmartStart CD included with the ProLiant Storage System.

Installation

Follow the steps outlined below to install the Duplexing Option Kit in your ProLiant Storage System.

1. Back up all data on all drives in the storage system before beginning the installation procedure.
2. Perform a normal system shutdown.
3. Turn OFF the server supporting the storage system.
4. Turn OFF the storage system.
5. Disconnect the external SCSI cable from the storage system.
6. Disconnect the AC mains power cord from the AC outlet, then from the storage system.
7. If a new SCSI controller is to be added to a server to support the upper three hot-pluggable drive bays in the storage system, install this controller at this time. Refer to the documentation supplied with the option board for instructions on installing the controller in your server.



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

8. Remove the Side Access Panel.
-

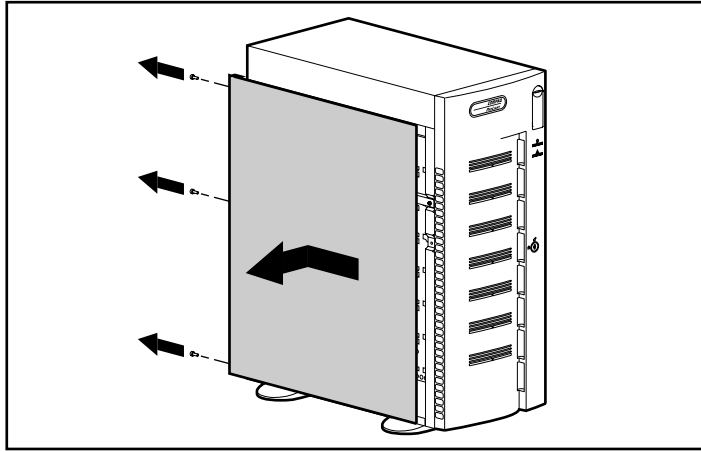


Figure 6-1. Removing the Side Access Panel

9. Remove the brace.

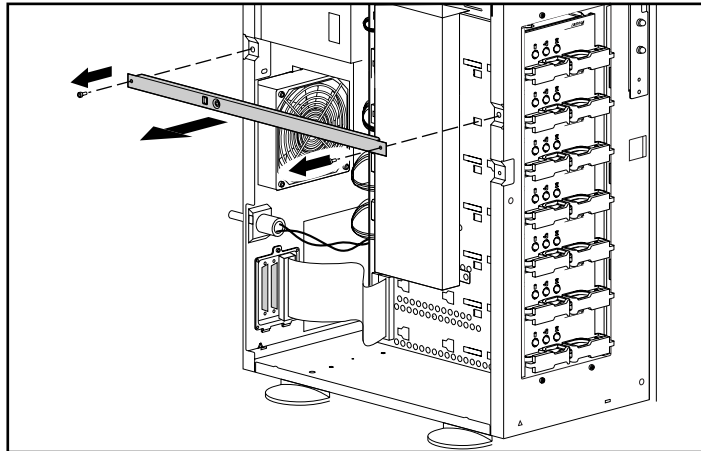


Figure 6-2. Removing the Brace

10. Locate the Pass-through board on the Backplane and carefully remove it. This is best accomplished by alternately pulling each end of the Pass-through board straight out a little at a time until all pins are out of the sockets. Be careful not to bend the connector pins on the back of the Pass-through board. Protect the Pass-through board from damage and store it in a safe place. It may be needed in the future if the Duplexing Option is removed from your ProLiant Storage System.

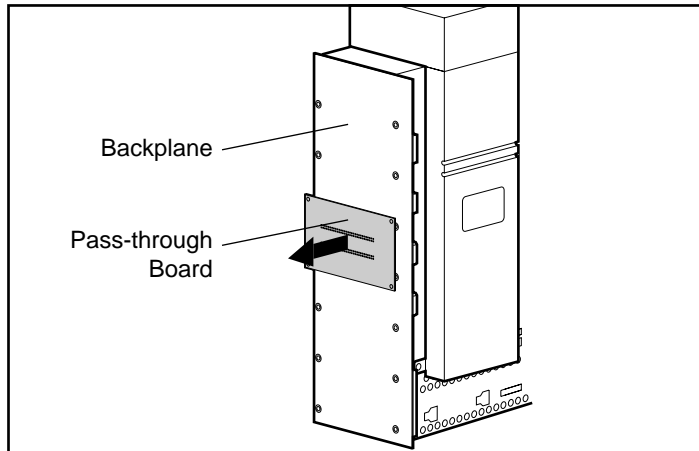


Figure 6-3. Removing the Pass-Through Board from the ProLiant Storage System Backplane

11. Locate the plastic standoff in the Duplexing Option Kit and install it in the appropriate hole on the drive cage Backplane. See Figure 6-4.

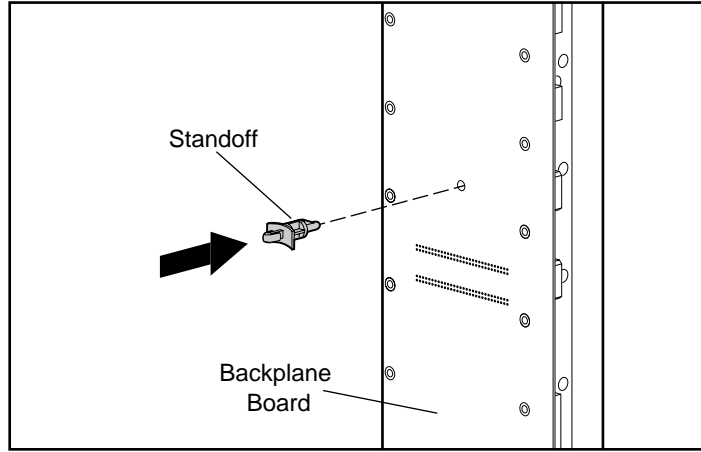


Figure 6-4. Installing the Standoff

12. Orient the Duplexing board as shown in Figure 6-5. Install it onto the Backplane by carefully aligning the double rows of pins on the board with the mating sockets on the Backplane as in Figure 6-6. Be sure to observe the locations of the keying pins and align the plastic standoff with its mating hole in the Duplexing board. Gently but firmly press the board onto the Backplane as far as it will go. The standoff will snap into place in the Duplexing board.

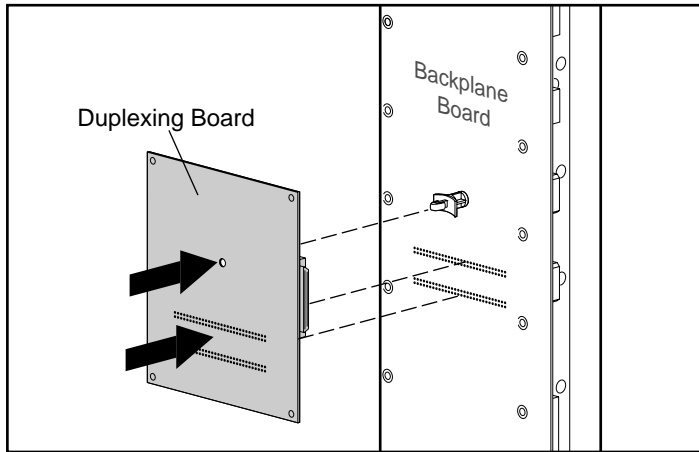


Figure 6-5. Installing the Duplexing Option Board

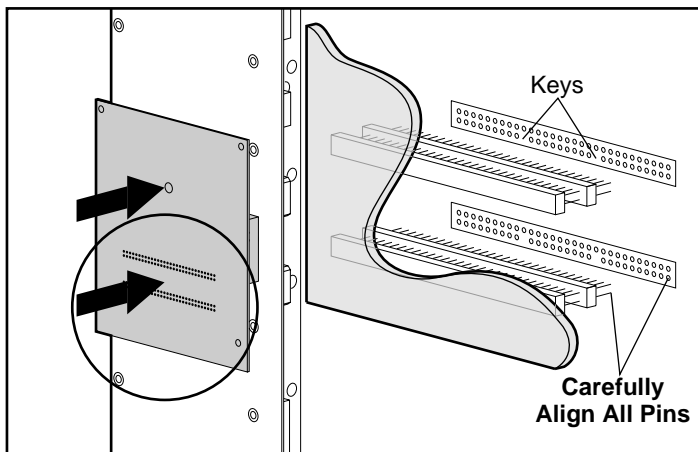


Figure 6-6. Aligning the Pins on the Duplexing Option Board

NOTE: To remove the Duplexing Option Board at any time, squeeze the protruding tabs on the plastic standoff to allow it to slip through the hole as the board is gently pulled away from the backplane.

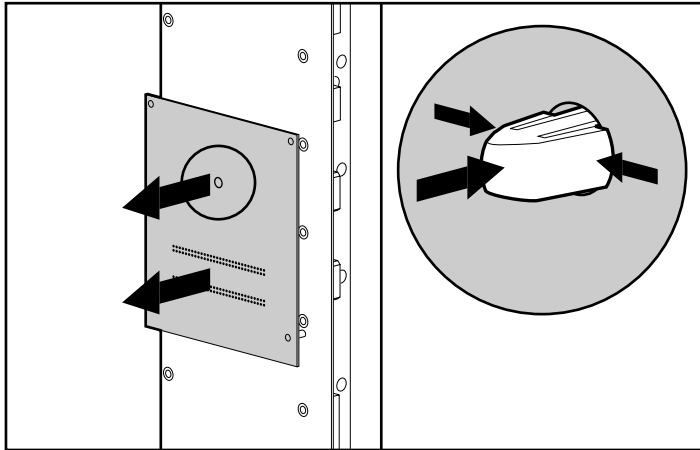


Figure 6-7. Removing the Duplexing Option Board

13. Locate the connector panel on the back of the storage system.

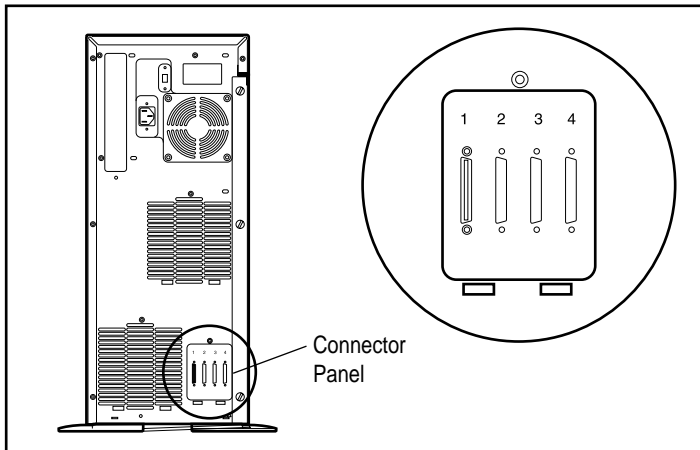


Figure 6-8. Locating the Connector Panel

14. Remove the cover from position 3 in the connector panel on the back of the storage system. Skipping the second location allows more room for working with the external SCSI cables on the back of the storage system.

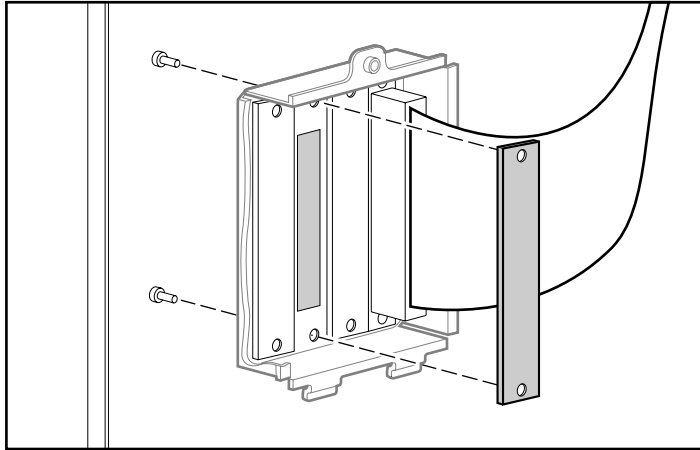


Figure 6-9. Removing the Blank Connector Hole Cover

15. Locate the SCSI ribbon cable, part number 199595-002, supplied in the Duplexing Option Kit. Orient the external connector (with the mounting flange) like the SCSI connector already installed in position 1 on the connector panel. Secure the connector in the uncovered hole in position 3 using the two threaded screwlocks provided with the Duplexing Option Kit. See Figure 6-10.



CAUTION: Be careful when tightening the screwlocks with a nut driver. They may be damaged if over-tightened. The screw threads have been treated with a thread-locking compound, so only moderate tightening is necessary.

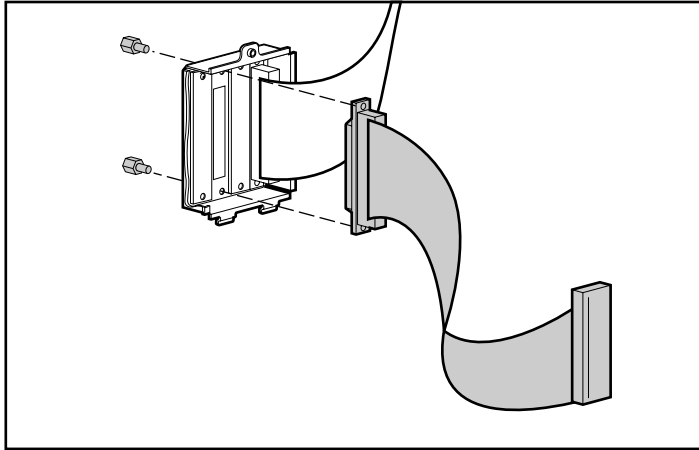


Figure 6-10. Attaching the SCSI Cable to the Connector Panel

Plug the other end of the SCSI ribbon cable into the connector on the Duplexing Option Board.

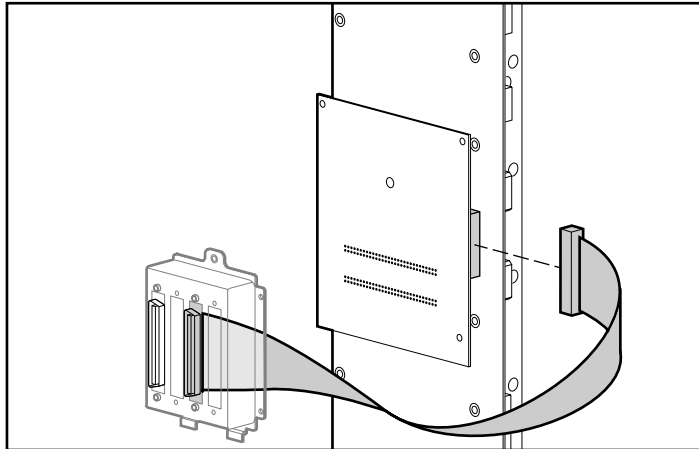


Figure 6-11. Connecting the Duplexing Option Board

17. Replace the brace.

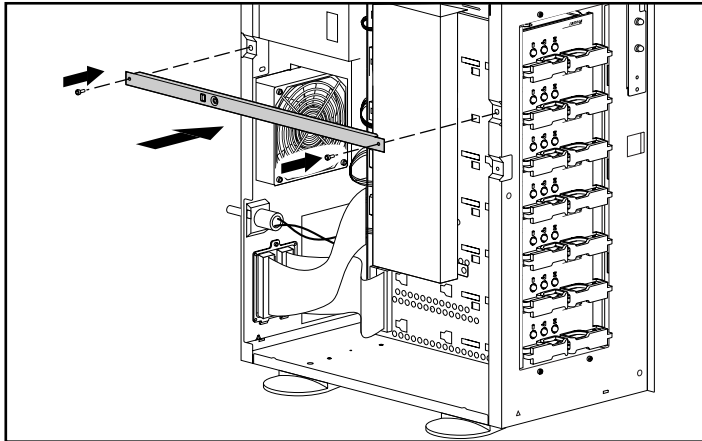


Figure 6-12. Replacing the Brace

 **CAUTION:** The Side Access Panel must be installed when the unit is operating to ensure proper cooling in the ProLiant Storage System.

18. Replace the Side Access Panel.

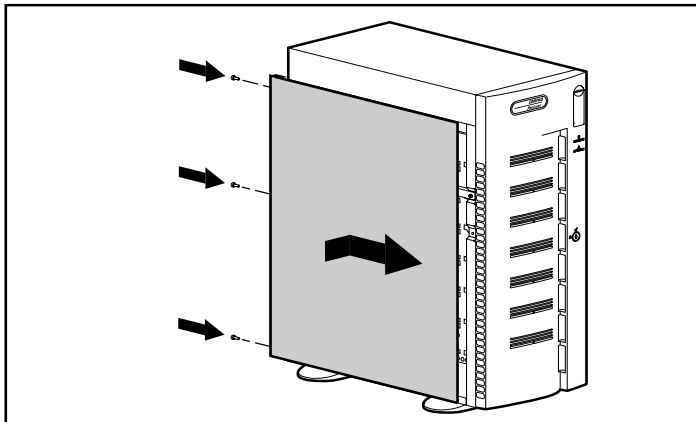


Figure 6-13. Replacing the Side Access Panel

19. To complete the installation of the Fast-Wide Duplexing Option Kit proceed to "Connecting the Server to the ProLiant Storage System" in Chapter 3.

Appendix A Specifications

**Table A-1
ProLiant Storage System Specifications**

Table Subhead	Table Subhead	Table Subhead
Dimensions (including foot)		
Height	21.9 in	55.9 cm
Depth	17.3 in	48.8 cm
Width	9.0 in	22.8 cm
Weight	37.0 lb	16.8 kg
LED indicators on front panel	Power Service Required	
LED indicators for each drive tray	Online Drive Access Drive Failure	
Input Mains Requirements		
Rated Input Voltage	100-120/220-240 V	100-120/220-240 V
Rated Frequency	50-60 Hz	50-60 Hz
Rated Input Current	6 /3 A	6 /3 A
Input Power	330 watts*	330 watts*
Heat Dissipation (max)	1126 Btu/hr*	1126 Btu/hr*
Temperature Range		
Operating	50° to 104° F	10° to 40° C
Shipping	-22° to 140° F	-30° to 60° C
Relative Humidity (noncondensing)		
Operating	20%	20%
Nonoperating	to 80% 5% to 90%	to 80% 5% to 90%

Country-Specific Requirements

Table A-2
Power Cord Set Requirements - By Country

Country	Accredited Agency	Applicable Note
Australia	EANSW	1
Austria	OVE	1
Belgium	CEBC	1
Canada	CSA	2
Denmark	DEMKO	1
Finland	SETI	1
France	UTE	1
Germany	VDE	1
Italy	IMQ	1
Japan	JIS	3
Norway	NEMKO	1
Sweden	SEMKO	1
Switzerland	SEV	1
United Kingdom	BSI	1
United States	UL	2

Notes:

1. Flexible cord must be <HAR> Type HO5VV-F, 3-conductor, 1.0 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.
2. Flexible cord must be Type SJT or equivalent, No. 18 AWG, 3-conductor. Wall plug must be a two-pole grounding type with a NEMA 5-15P (15A, 125V) or NEMA 6-15P (15A 250V) configuration.

.....

A-4 Specifications

3. Appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. Flexible cord must be Type VCT or VCTF, 3-conductor, 0.75mm² conductor size. Wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (15A, 125V) configuration.



Appendix B

Electrostatic Discharge

A discharge of static electricity from a finger or other conductor may damage printed circuit boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

Preventing Electrostatic Damage

To prevent electrostatic damage, observe the following precautions:

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

Grounding Methods

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

- Use a wrist strap connected by a ground cord to a grounded workstation or the computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm +/- 10 percent resistance in the ground cords.
- Use heel straps, toe straps, or bootstraps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.

Appendix C

Regulatory Compliance Notices

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 a label indicating the interference potential of the device as well as additional operating instructions for the user.

The rating label on the device shows which class (A or B) the equipment falls into. Class B devices have an FCC ID on the label. Class A devices do not have an FCC ID on the label. Once the class of the device is determined, refer to the following corresponding statement.

Class A Equipment

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

Avis Canadien

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

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 in order to maintain compliance with FCC Rules and Regulations.

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.

European Union (EU) Notice

Products with the CE Marking comply with both the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.

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

- EN 55022 (CISPR 22) - Electromagnetic Interference
- EN 50082-1 (IEC 801-2, IEC 801-3, IEC 801-4) - Electromagnetic Immunity
- EN 60950 (IEC 950) - Product Safety

Japanese Notice

お使い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。

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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。

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