Compaq StorageWorks

Compaq StorageWorks 64-Bit/66-MHz Fibre Channel Host Adapter

Installation Guide

Second Edition (April 2001)
Part Number 122833-002
Compaq Computer Corporation

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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.

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 the **Enter** key.
Enter	When you are instructed to *enter* information, type the information and then press the **Enter** key.

Symbols in Text

The following symbols are found in the text of this guide to indicate different types of information.

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

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

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.

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

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

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

Weight in kg
Weight in lb

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

⚠ Important Safety Information

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

Rack Stability

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

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

Getting Help

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

Compaq Technical Support

In North America, call the Compaq Technical Phone Support Center at 1-800-OK-COMPAQ. This service is available 24 hours a day, 7 days a week. For continuous quality improvement, calls may be recorded or monitored.

Outside North America, call the nearest Compaq Technical Support Phone Center. Telephone numbers for worldwide Technical Support Centers are listed on the Compaq website. Access the Compaq website at www.compaq.com.

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

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

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 at 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**

Introduction

Fibre Channel Host Adapter

The Compaq *StorageWorks Fibre Channel Host Adapter™* is available in 64-Bit/66-MHz PCI. The option kit (part number 120186-B21) contains this StorageWorks Fibre Channel Host Adapter.

64-Bit/66-MHz Fibre Channel Host Adapter

The 64-Bit/66-MHz Fibre Channel Host Adapter is installed in a server with a PCI local bus and provides an interface between the PCI bus in the server and Fibre Channel-connected external storage systems.

The 64-Bit/66-MHz Fibre Channel Host Adapter interface to the server is the Peripheral Component Interconnect (PCI) bus. The PCI interface is a high-performance, 64-Bit/66-MHz bus with multiplexed address and data lines, and parity information. It provides a high-speed (up to 528 MB/s) path between the system board and the Host Adapter. The 64-Bit/66-MHz Fibre Channel Host Adapter is a PCI Bus Master device and conforms to the current PCI Local Bus Specification.

The Host Adapter requires the installation of a GigaBit Interface Converter (GBIC) module before the Fibre Channel cable is connected. The GBIC converts electrical signals to optical signals, and vice versa, for transmission across the Fibre Channel media. The Fibre Channel cable connector is plugged into the installed GBIC module.

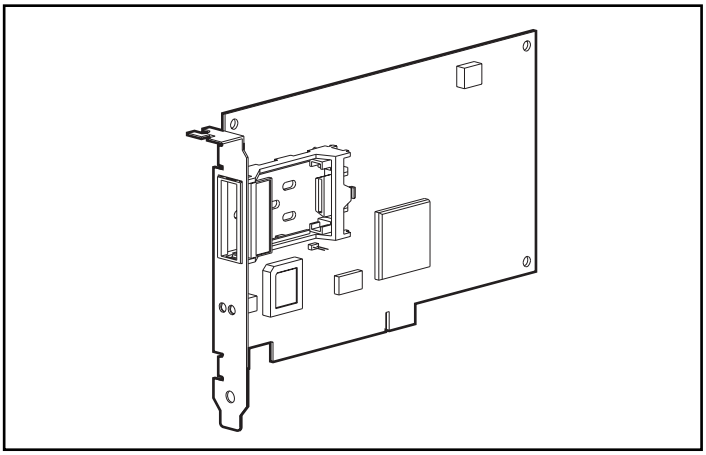

Figure 1-1. 64-Bit/66-MHz Fibre Channel Host Adapter

Chapter **2**

Installing the 64-Bit/66-MHz Fibre Channel Host Adapter

The installation of the Compaq StorageWorks 64-Bit/66-MHz Fibre Channel Host Adapter and its connection to Fibre Channel storage systems must be completed in a step-by-step process. See Table 2-1 for installation steps.

Table 2-1
64-Bit/66-MHz Fibre Channel Host Adapter Installation Steps

Step	Task	Go to Chapter/Guide
1	Run System ROMPaq.	See "Running System ROMPaq" section in Chapter 2.
2	Install the 64-Bit/66-MHz Fibre Channel Host Adapter in the server.	Refer to your server documentation for specific installation instructions.
3	Install the GigaBit Interface Converter (GBIC) module.	See the "Hardware Installation" section in Chapter 2.
4	Connect the Multi-Mode Fibre Channel cable to the 64-Bit/66-MHz Fibre Channel Host Adapter.	See the "Hardware Installation" section in Chapter 2.
5	Run the RA4100 SAN Solution Support Software CD or the Compaq SmartStart and Support Software CD to load the drivers.	See Chapters 3 through 8.

Updating System ROM

The ROM on all Compaq servers can be updated easily by flashing the ROM using a special Compaq utility called System ROMPaq. This utility replaces the existing contents of the ROM with another version stored in a disk file. This is a convenient method to distribute new firmware to update Compaq products with the latest capabilities.

IMPORTANT: Before installing the new 64-Bit/66-MHz Fibre Channel Host Adapter in the server, run System ROMPaq to update the system ROM. Follow the instructions found in the section "Creating ROMPaq Utilities using the RA4100 SAN Solution Support Software CD" to create ROMPaq utilities using the RA4100 SAN Solution Support Software CD.

NOTE: Compaq SmartStart and Support Software CD with a higher revision number than the RA4100 SAN Solution Support Software may contain an updated version of RA4100 SAN Solution software. Follow the instructions found in the section, "Creating ROMPaq Utilities using the Compaq SmartStart and Support Software CD" to create diskettes that will run the ROMPaq utilities using the Compaq SmartStart and Support Software CD.

NOTE: The System ROMPaq is used to update the system ROM in all Compaq servers that support Flash ROM.

Creating ROMPaq Utilities using the RA4100 SAN Solution Support Software CD

To run the Options ROMPaq from the RA4100 Support Software CD:

1. Boot up the system using the RA4100 Support Software CD.
2. At the menu screen, select the option, Run Options ROMPaq Utility. This will launch the utility that will detect and update the firmware.

Creating ROMPaq Utilities using the Compaq SmartStart and Support Software CD

The latest version of the ROMPaq diskettes can be created from the Compaq SmartStart and Support Software CD. The ROMPaq utilities must be run from diskettes.

Materials Needed

The following items are necessary to create ROMPaq utility diskettes:

- Compaq SmartStart and Support Software CD
- One blank diskette
- A server or workstation with a bootable CD-ROM drive. The system in which you are installing the 64-Bit/66-MHz Fibre Channel Host Adapter can be used.

Creating Diskettes

To create ROMPaq diskettes:

1. Start the server from the Compaq SmartStart and Support Software CD.
2. From the Compaq System Utilities screen, select *Create Support Software*.
3. From the Diskette Builder screen, scroll down the list and select one of the following five ROMPaq selections:
   - System ROMPaq Firmware Upgrade Diskette for Compaq Systempro/XL, ProSignia 386E5, E8, VS, 300/500, 200(P01), and 200(P05) Servers
   - System ROMPaq Firmware Upgrade Diskette for Compaq ProLiant 1000, 1500(E12), 1500(E27), 2000/4000, 4500, and 5000 Servers
   - System ROMPaq Firmware Upgrade Diskette for Compaq ProLiant 800(P02), 850R, 1200, 1600(E34), 2500, 3000, and 5500 Servers
   - System ROMPaq Firmware Upgrade Diskette for Compaq ProLiant 6000, 6500, and 7000 Servers
   - System ROMPaq Firmware Upgrade Diskette for Compaq ProLiant 800(P18) and 1600(P08) Servers
4. Follow the instructions on the screen to create the ROMPaq diskettes.

Running System ROMPaq

System ROMPaq is used to update the firmware in Compaq servers. The new storage systems have enhanced drive array capabilities and many existing servers require updated firmware to take advantage of these capabilities. Since it is difficult to determine when the firmware was last updated, Compaq recommends running the latest System ROMPaq on your server before installing a new 64-Bit/66-MHz Fibre Channel Host Adapter.

To run System ROMPaq:

1. Place the System ROMPaq diskette in the server diskette drive.
2. Start the server by turning on the power.
3. Press **Enter** at the Welcome screen.
4. At the Select A Device screen, select the server from the list of programmable devices. There may only be one item in the list. Press **Enter**.
5. At the Select An Image screen, you will see:

Device to reprogram:	your server
Current ROM revision:	date of existing ROM version
Select Firmware Images:	date of latest ROM version

   Press **Enter**.
6. Review the information on the Caution screen:

Device to reprogram:	your server
Current ROM revision:	date of existing ROM version
Selected ROM revision:	date of ROM version to be installed

   Press **Enter** to reprogram the system ROM or **Esc** (escape) to discontinue reprogramming and return to the Select An Image screen. Do **not** interrupt when "Reprogramming Firmware" appears on the screen. The system ROM is being reprogrammed.

IMPORTANT: Do **not** interrupt the reprogramming. Interrupting the ROM reprogramming will leave the firmware in an unknown state. You may not be able to boot the server if this happens. You will be notified when reprogramming is completed.

---

7. When ROMPaq has finished reprogramming the system ROM, press **Esc** to exit the System ROMPaq Utility.
8. Remove the System ROMPaq diskette and restart the server by cycling the power (cold start).

This completes the firmware update using System ROMPaq.

Hardware Installation

Install the 64-Bit/66-MHz Fibre Channel Host Adapter in an available slot in the server. Refer to the server documentation for installation instructions for option boards.

WARNING: To reduce the risk of personal injury or damage to the equipment, consult the safety information and user documentation provided with your computer before attempting this installation.

Many personal computers are capable of producing energy levels that are considered hazardous. These computers are intended to be serviced by qualified personnel trained to deal with these hazards. Do not remove enclosures or attempt to bypass any interlocks that may be provided for the purpose of removing these hazardous conditions.

NOTE: You can select any available 32-bit or 64-bit PCI slot to install the Host Adapter. For best performance, a 64-bit slot should be used.

Multi-Mode Fibre Channel Cables

Multi-Mode Fibre Channel cables are used to connect distances up to 500 meters. A shortwave GBIC module must be used with these cables. A 5-m Multi-Mode Fibre Channel Cable is included in your 64-Bit/66-MHz Fibre Channel Host Adapter kit.

IMPORTANT: To ensure product integrity, Compaq recommends a 50/125 μm multi-mode optical fiber that complies with Bellcore GR409. The cable assembly should be terminated with SC Duplex Connectors (super polished ferrule) at each end. These connectors must be NNT-SC-, Bellcore 326-, and IEC-874-19 SC-compliant.

NOTE: To connect distances between 500 meters and 10 kilometers, a single-mode Fibre Channel cable and matching pair of longwave GigaBit Interface Converters (GBIC-LWs) must be purchased. A list of fibre channel cable suppliers can be found at www.compaq.com/fibrechannel/.

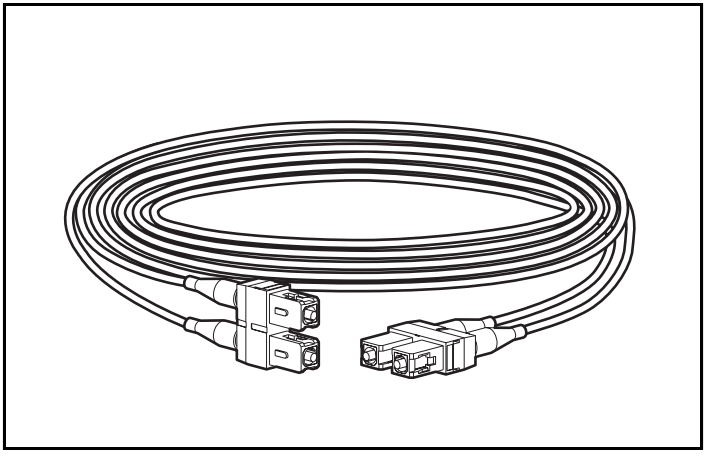

Figure 2-1. Fibre Channel cable with connectors

Shortwave GBIC Modules

Your StorageWorks 64-Bit/66-MHz Fibre Channel Host Adapter option kit contains two shortwave GBIC modules. A multi-mode Fibre Channel cable must be used with shortwave GBICs.

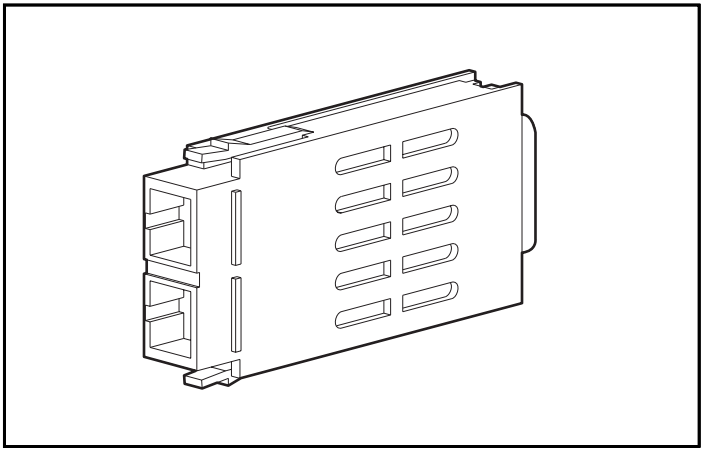

Figure 2-2. GigaBit Interface Converter (GBIC) module

Optional Longwave GBIC Modules

To connect distances between 500 meters and 10 kilometers, you must use longwave GBIC modules and a single-mode fibre channel cable. A Longwave GigaBit Interface Converter (GBIC-LW) Connector Kit (part number 340412-B21) is available.

IMPORTANT: To ensure product integrity, Compaq recommends a 9/125 μm single-mode optical fiber that complies with Bellcore GR409. The cable assembly should be terminated with SC Duplex Connectors (super polished ferrule) at each end. These connectors must be NNT-SC-, Bellcore 326-, and IEC-874-19 SC-compliant.

NOTE: Single-mode Fibre Channel cables are not provided with this kit. A list of fibre channel cable suppliers can be found at www.compaq.com/fibrechannel/.

Installing the GBIC and Fibre Channel Cable

To install the GBIC module and Fibre Channel cable:

1. Insert the GBIC module into the receptacle on the 64-Bit/66-MHz Fibre Channel Host Adapter. The GBIC module can only be installed one way. The GBIC and the guide rails inside the Host Adapter receptacle are keyed.
2. Insert one end of the Fibre Channel cable connector into the installed GBIC module. The GBIC module and the Fibre Channel cable connector are keyed to prevent an improper installation. Support the installed Fibre Channel cable to prevent a bend radius of less than 3 inches (76.2 millimeters.) Support and route the Fibre Channel cable to prevent damage from sharp edges or from being crushed by nearby equipment.

This completes the installation of the GBIC module and Fibre Channel cable in the 64-Bit/66-MHz Fibre Channel Host Adapter.

Chapter **3**

Installing Drivers for Novell NetWare

This chapter outlines the driver installation steps for Novell NetWare 4.2 and 5.1 operating systems. If you are setting up a new system with Novell NetWare, use the RA4100 SAN Solution Support Software CD when installing the Novell NetWare operating system and the device drivers.

NOTE: To install the drivers from the RA4100 SAN Solution Support Software CD, follow the instructions found inside the CD-ROM sleeve.

NOTE: Compaq SmartStart and Support Software CD with a higher revision number than the RA4100 SAN Solution Support Software may contain an updated version of RA4100 SAN Solution software. If the SmartStart and Support Software CD is used to install your operating system software, all required software, including device drivers, will be automatically installed and configured.

Before installing the drivers, you must:

- Update your system firmware by running System ROMPaq (see Chapter 2).
- Configure the hardware by running the System Configuration Utility.

Installing the Drivers

Follow the instructions in this chapter to install the drivers manually for a new installation or to upgrade the drivers in an existing NetWare server.

Driver Installation from the RA4100 SAN Solution Support Software CD

The latest Novell NetWare drivers and support files for the 64-Bit/66-MHz Fibre Channel Host Adapter are located on the RA4100 SAN Solution Support Software CD. To install the drivers from the RA4100 SAN Solution Support Software CD, follow the instructions found inside the RA4100 SAN Solution Support Software CD-ROM sleeve.

IMPORTANT: Before installing or upgrading support for your Compaq 64-Bit/66-MHz Fibre Channel Host Adapter, make sure you have installed the latest Novell Support Pack for the version of the NetWare operating system in use. Novell Support Packs can be obtained at support.novell.com

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NOTE: Compaq SmartStart and Support Software CD with a higher revision number than the RA4100 SAN Solution Support Software may contain an updated version of RA4100 SAN Solution software.

Driver Installation from the Compaq SmartStart and Support Software CD

1. From the NetWare 4.2 console, type:

   Load Install

   or

   From the NetWare 5.1 console, type:

   Load Nwconfig

2. Select *Product Options* from the menu and press **Enter**.
3. Select *Install a product not listed* and press **Enter**.
4. Press **F3** to specify a different path.
5. Insert the Compaq SmartStart and Support Software CD into the server's CD-ROM drive.
6. Do one of the following:

a. Mount the CD-ROM as a NetWare volume, enter the path, and then press **Enter**. (xxx in the volume name is the SmartStart version number.)

```
CPQSMSTxxx:\CPQSUPSW\NSSD
```

or

b. If the DOS CD-ROM driver support is loaded, enter the path and press **Enter**.

```
<CD-ROM drive letter>:\CPQSUPSW\NSSD
```

7. Press **Enter** to bypass the Welcome screen.
8. Select *Compaq NWPA Storage Support* from the menu by scrolling down to it, then press **F5** to mark the selection.

IMPORTANT: Install the SmartStart and Support Software CD as a package.

9. Press **Tab** for the Main Menu.
10. Select *Install Selected Files* by pressing **Enter**.
11. After viewing the Install Results, press **Enter**.
12. Select *To Reboot Server* and follow the on-screen instructions to load the new or upgraded device drivers on your server. Your *STARTUP.NCF* file will be updated automatically with the appropriate driver load statements.

Additional Information

Readme files containing the latest information about using Compaq options in a NetWare environment (including driver installation procedures) are included on the SmartStart and Support Software. These files are located in the \CPQSUPSW\NSSD directory. To read these help files:

- Execute *README.COM* to view and print the *STORAGE.RDM* help file.
- Alternatively, *NSSD.HLP*, a Microsoft Windows Help File, can be viewed by double-clicking the *NSSD.HLP* icon.

Chapter **4**

Installing Drivers for Microsoft Windows NT

This chapter outlines the driver installation steps for a Windows NT 4.0 or later operating system. If you are setting up a new system with Windows NT, use the RA4100 SAN Solution Support Software CD to install the drivers necessary to support the 64-Bit/66-MHz Fibre Channel Host Adapter.

NOTE: To install the drivers from the RA4100 SAN Solution Support Software CD, follow the instructions found inside the CD-ROM sleeve.

NOTE: Compaq SmartStart and Support Software CD with a higher revision number than the RA4100 SAN Solution Support Software may contain an updated version of RA4100 SAN Solution software. If the SmartStart and Support Software CD is used to install your operating system software, all required software, including device drivers, will be automatically installed and configured.

Before installing the drivers, you must:

- Update your system firmware by running System ROMPaq (see Chapter 2).
- Configure the hardware by running the System Configuration Utility. Installing the Driver

Installing the Drivers

Follow the instructions in this section to install the initial driver manually for a new 64-Bit/66-MHz Fibre Channel Host Adapter installation or to upgrade the

driver in an existing Windows NT 4.0 server with a 64-Bit/66-MHz Fibre Channel Host Adapter.

Driver Installation from the RA4100 SAN Solution Support Software CD

The latest drivers and support files for Windows NT are located on the RA4100 SAN Solution Support Software CD. To install the drivers from the RA4100 SAN Solution Support Software CD, follow the instructions found inside the CD-ROM sleeve.

NOTE: Compaq SmartStart and Support Software CD with a higher revision number than the RA4100 SAN Solution Support Software may contain an updated version of RA4100 SAN Solution software.

Driver Installation from the Compaq SmartStart and Support Software CD

Use the following steps to install or update the Microsoft Windows NT drivers:

Use the following steps to install or update the Windows NT drivers:

1. Insert the SmartStart and Support Software CD. If you have enabled AutoPlay, the System Utilities window appears.
2. Select I Agree box and click the OK button.
3. The pop-up System Utilities window appears with 2 options, as shown in the figure below.

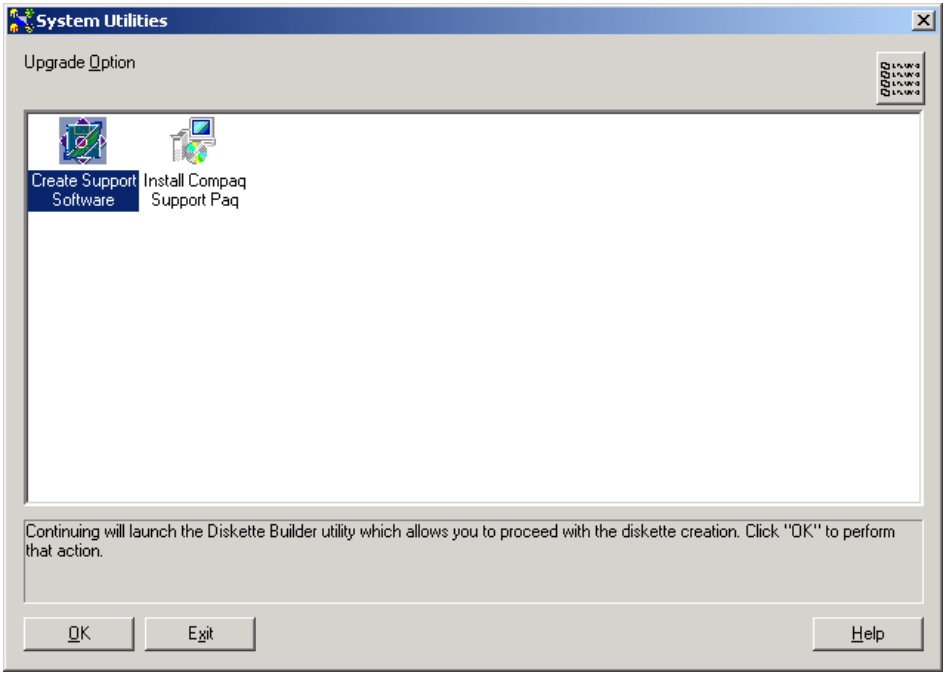

Figure 4-1. System Utilities window

4. Select option 2, Install Compaq Support Paq, and click the OK button.
5. The Compaq Remote Deployment Utility dialog box appears, as shown in Figure 4-2.

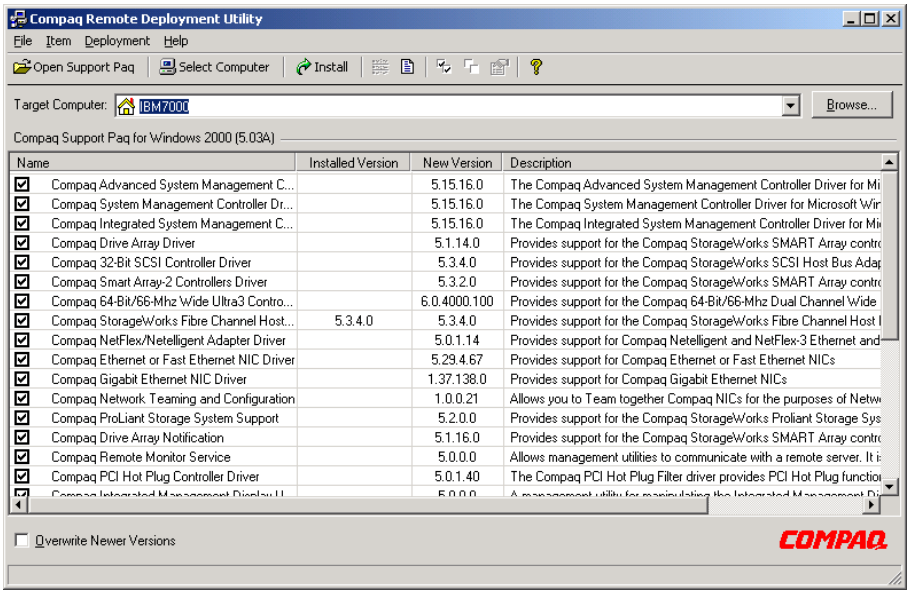

Figure 4-2. Compaq Remote Deployment Utility

6. Click the Item menu and select Deselect All.
7. Click the checkbox next to Compaq StorageWorks Fibre Channel Host Bus Adapter Drivers.
8. Click the Install button at the top of the window.
9. When the file copy is complete, you will receive a message that the installation was successful.
10. Close the Compaq Remote Deployment Utility dialog box.
11. Close the System Utility menu (Click OK if the system prompts you to restart.)

Chapter **5**

Installing Drivers for Microsoft Windows 2000

This chapter outlines the driver installation steps for a Windows 2000. If you are setting up a new system with Windows 2000, use the RA4100 SAN Solution Support Software CD to install the drivers necessary to support the 64-Bit/66-MHz Fibre Channel Host Adapter.

NOTE: To install the drivers from the RA4100 SAN Solution Support Software CD, follow the instructions found inside the CD-ROM sleeve.

NOTE: Compaq SmartStart and Support Software CD with a higher revision number than the RA4100 SAN Solution Support Software may contain an updated version of RA4100 SAN Solution software. If the SmartStart and Support Software CD is used to install your operating system software, all required software, including device drivers, will be automatically installed and configured.

Before installing the drivers, you must:

- Update your system firmware by running System ROMPaq (see Chapter 2).
- Configure the hardware by running the System Configuration Utility.

Installing the Drivers

Follow the instructions in this section to install the initial driver manually for a new 64-Bit/66-MHz Fibre Channel Host Adapter installation or to upgrade the

driver in an existing Windows 2000 server with a 64-Bit/66-MHz Fibre Channel Host Adapter.

Driver Installation from the RA4100 SAN Solution Support Software CD

The latest drivers and support files for Windows 2000 are located on the RA4100 SAN Solution Support Software CD. To install the drivers from the RA4100 SAN Solution Support Software CD, follow the instructions found inside the CD-ROM sleeve.

NOTE: Compaq SmartStart and Support Software CD with a higher revision number than the RA4100 SAN Solution Support Software may contain an updated version of RA4100 SAN Solution software.

Driver Installation from the Compaq SmartStart and Support Software CD

Use the following steps to install the Microsoft Windows 2000 drivers:

1. Insert the Compaq SmartStart and Support Software CD. If you have enabled AutoPlay, the System Utilities window appears.
2. Select I Agree box and click the OK button.
3. The pop-up System Utilities window appears with 2 options, as shown in the figure below.

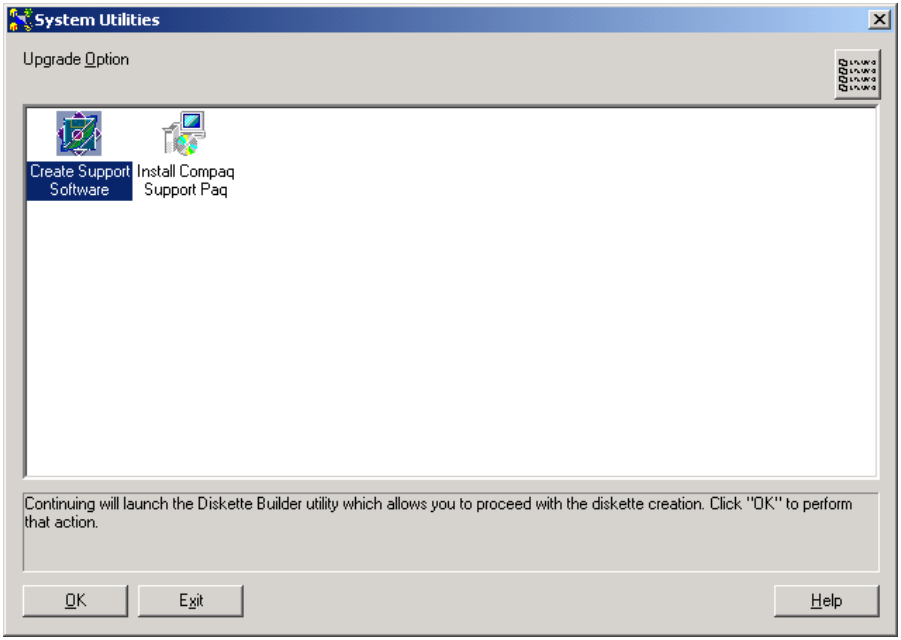

Figure 5-1. System Utilities window

4. Select option 2, Install Compaq Support Paq, and click the OK button.
5. The Compaq Remote Deployment Utility dialog box appears, as shown in the figure below.

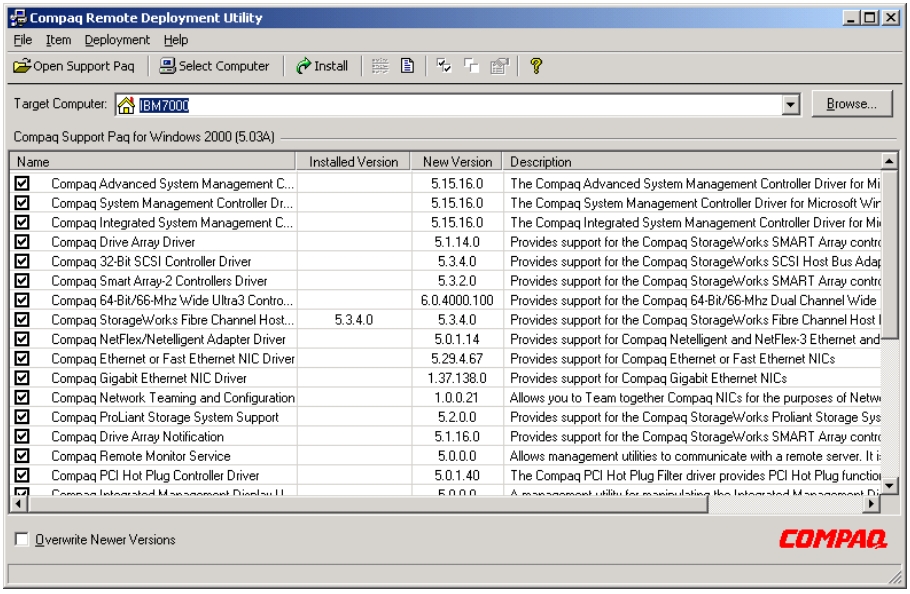

Figure 5-2. Compaq Remote Deployment Utility

6. Click the Item menu and select Deselect All.
7. Click the checkbox next to Compaq StorageWorks Fibre Channel Host Adapter Drivers.
8. Click the Install button at the top of the window.
9. When the file copy is complete, you will receive a message that the installation was successful.
10. Close the Compaq Remote Deployment Utility dialog box.
11. Close the System Utilities menu. Click OK if the system prompts you to restart.

Updating the 64-Bit/66-MHz Fibre Channel Host Adapter Driver using Compaq SmartStart and Support Software CD

1. Insert the Compaq SmartStart and Support Software CD. If you have enabled AutoPlay, the System Utilities window appears.
2. Select I Agree box and click the OK button.
3. The pop-up System Utilities window appears with 2 options, as shown in Figure 5-3.

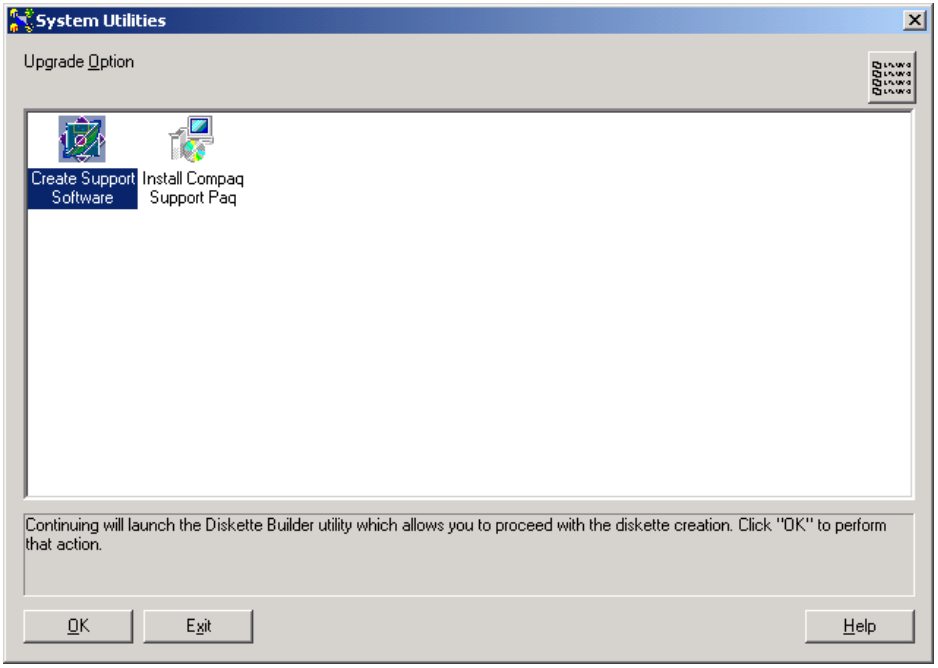

Figure 5-3. System Utilities window

4. Select option 2, Install Compaq Support Paq, and click the OK button.
5. The Compaq Remote Deployment Utility dialog box appears, as shown in Figure 5-4.

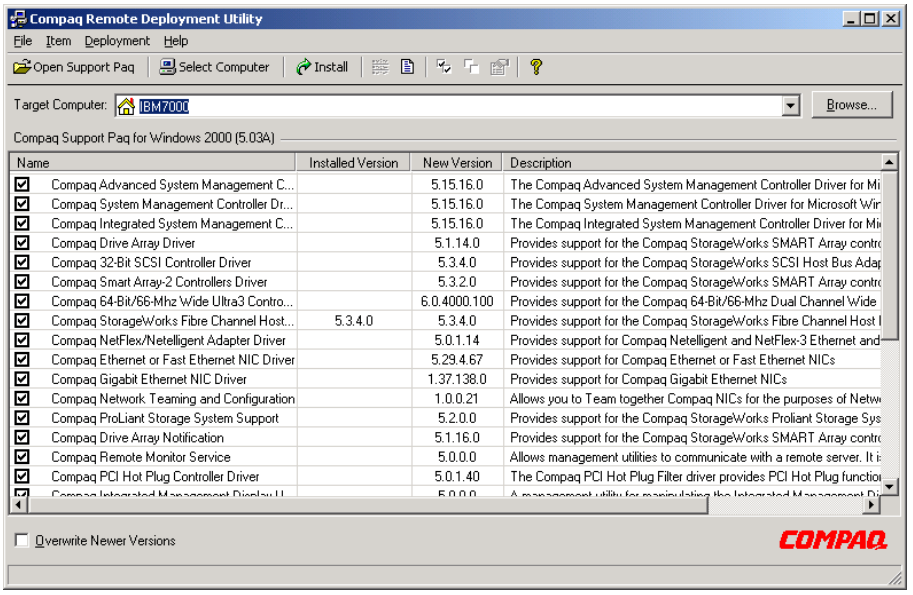

Figure 5-4. Compaq Remote Deployment Utility

6. Click the Item menu and select Deselect All.
7. Click the checkmark next to Compaq StorageWorks Fibre Channel Host Adapter Drivers.
8. Click the checkmark box at the bottom left of the window to select Overwrite Newer Versions.
9. Click the Install button at the top of the window.
10. When the file copy is complete, you will receive a message that the installation was successful.
11. Close the Compaq Remote Deployment Utility dialog box.
12. Close the System Utility menu (Click OK if the system prompts you to restart.

Chapter **6**

Installing Drivers for SCO OpenServer 5.0

This chapter outlines the driver installation steps for the SCO OpenServer 5.0 operating system for the 64-Bit/66-MHz Fibre Channel Host Adapter. If you are setting up a new system, download the drivers from the Compaq website at www.compaq.com.

Before installing the drivers, you must:

- Update your system firmware by running System ROMPaq (see Chapter 2).
- Configure the hardware by running the System Configuration Utility.

Installing the Drivers

Follow the instructions in this section to install the driver manually for a new 64-Bit/66-MHz Fibre Channel Host Adapter installation or to upgrade the drivers in an existing SCO OpenServer 5.0 server with a new 64-Bit/66-MHz Fibre Channel Host Adapter.

The latest drivers and support files for SCO OpenServer 5.0 can be downloaded from the Compaq website at www.compaq.com.

Alternately, you can use the latest version of the Compaq SmartStart and Support Software CD-ROM to install the drivers necessary to support the 64-Bit/66-MHz Fibre Channel Host Adapter. To access these files, you will need to create a set of Compaq Extended Feature Supplement (EFS) Diskettes from SmartStart and Support Software CD.

NOTE: If you use the Compaq SmartStart and Support Software CD to install the operating system, all software, including device drivers, will be automatically installed and configured for the 64-Bit/66-MHz Fibre Channel Host Adapter.

Materials Needed to Install Drivers using Compaq SmartStart and Support Software CD

The following items are necessary to create a set of Compaq EFS diskettes:

- Compaq SmartStart and Support Software CD
- Five blank diskettes
- A server or workstation with a bootable CD-ROM drive running Windows

NOTE: You can use the system in which you are installing the 64-Bit/66-MHz Fibre Channel Host Adapter.

Creating the EFS Diskettes

To create the EFS diskettes:

1. Start the server from the SmartStart and Support Software CD.

CAUTION: Starting a server that already has the operating system installed to the SmartStart and Support Software CD may erase the disk drive.

2. From the Compaq System Utilities screen, select *Create Support Software*.
3. From the Diskette Builder screen, select *Create Support Software Diskettes.*
4. Scroll through the list and select *SCO OpenServer 5.0 EFS.*
5. Follow the instructions on the screen to create and label the diskettes.

Accessing Installation Information

To access driver installation information for systems running SCO OpenServer 5.0:

1. Place the documentation diskette in the diskette drive of a server capable of reading a DOS formatted diskette.
2. Use a text editor or other utility to read or print the *README.EFS* file from the diskette.

Follow the instructions in this file to install the 64-Bit/66-MHz Fibre Channel Host Adapter driver in a server running SCO OpenServer 5.0.

Chapter **7**

Installing Drivers for Linux

This chapter outlines the driver installation steps for the Linux operating system for the 64-Bit/66-MHz Fibre Channel Host Adapter. If you are setting up a new system, download the drivers from the Compaq website at www.compaq.com/linux.

Before installing the drivers, you must:

- Update your system firmware by running System ROMPaq (see Chapter 2).
- Configure the hardware by running the System Configuration Utility.

Installing the Drivers

Follow the instructions in this section to install the driver manually for a new 64-Bit/66-MHz Fibre Channel Host Adapter installation or to upgrade the drivers in an existing Linux server with a new 64-Bit/66-MHz Fibre Channel Host Adapter.

The latest drivers and support files for Linux can be downloaded from the Compaq website at www.compaq.com/linux.

Alternately, you can use the latest version of the Compaq SmartStart and Support Software CD-ROM to install the drivers necessary to support the 64-Bit/66-MHz Fibre Channel Host Adapter. To access these files, you will need to create a set of Compaq Extended Feature Supplement (EFS) Diskettes from the SmartStart and Support Software CD.

NOTE: If you use the latest version of the Compaq SmartStart and Support Software CD to install the operating system, all software, including device drivers, will be automatically installed and configured for the 64-Bit/66-MHz Fibre Channel Host Adapter.

Materials Needed to Install Drivers using Compaq SmartStart and Support Software CD

The following items are necessary to create a set of Compaq EFS diskettes:

- SmartStart and Support Software CD
- Five blank diskettes
- A server or workstation with a bootable CD-ROM drive running Windows

NOTE: You can use the system in which you are installing the 64-Bit/66-MHz Fibre Channel Host Adapter.

Creating the EFS Diskettes

To create the EFS diskettes:

1. Start the server from the SmartStart and Support Software CD.

CAUTION: Starting a server that already has the operating system installed to the SmartStart and Support Software CD may erase the disk drive.

2. From the Compaq System Utilities screen, select *Create Support Software*.
3. From the Diskette Builder screen, select *Create Support Software Diskettes.*
4. Scroll through the list and select *Linux.*
5. Follow the instructions on the screen to create and label the diskettes.

Installing Linux Fibre Channel Driver for Red Hat 6.2

NOTE: The FC-AL driver (cpqfc.o) will install on all servers using the Compaq StorageWorks 64-Bit/66-MHz Fibre Channel Host Adapter.

To install the fibre channel driver, follow the instructions below:

1. Insert the floppy disk containing the drive and type the following instructions into the command screen:

   mount -t msdos /dev/fd0 /mnt /floppy

2. Type cp cpqfc.o /lib/modules/*/scsi

   NOTE: The asterisk denotes the kernal version number 2.2.14-5

3. Type cd /lib/modules/*/scsi and press Enter.
4. Type insmod cpqfc.o and Press enter.

Depending on your configuration, driver may requireup to thirty seconds to initialize.

To create a file system:

1. At the /root directory prompt, type mke2fs /dev/sdb and press Enter. Answer Yes to the question that appears.
2. Make a directory at the /root prompt by typing mkdir /(your directory name) and press Enter.
3. At the /root prompt, type mount /dev/sdb /(your directory name)

Repeat this step for each volume or logical drive (the next volume will be sdc, sdd, sde...).

Installing Linux Fibre Channel Driver for Red Hat 7.0

NOTE: The FC-AL driver (cpqfc.o) is already installed in the operating system.

To install the fibre channel driver, follow the instructions below:

1. Type the following instructions into the command screen:

   cd /lib/modules/2.2.16-22/scsi

2. Press Enter. Next, type the following:

   insmod cpqfc.o

Depending on your configuration, driver may require up to thirty seconds to initialize.

To create a file system:

1. At the /root directory prompt, type mke2fs /dev/sdb and press Enter. Answer Yes to the question that appears.
2. Make a directory at the /root prompt by typing mkdir /(your directory name) and press Enter.
3. At the /root prompt, type mount /dev/sdb /(your directory name)

Repeat this step for each volume or logical drive (the next volume will be sdc, sdd, sde...).

Chapter 8

Installing Drivers for SCO UnixWare

This chapter outlines the driver installation steps for the SCO UnixWare operating system that supports the 64-Bit/66-MHz Fibre Channel Host Adapter. The latest drivers and support files for SCO UnixWare can be downloaded from the Compaq website at www.compaq.com.

Before installing the drivers, you must:

- Update your system firmware by running System ROMPaq (see Chapter 2).
- Configure the hardware by running the System Configuration Utility.

Installing the Driver

Follow the instructions in this section to install the driver for a new 64-Bit/66-MHz Fibre Channel Host Adapter installation or to upgrade the driver in an existing SCO UnixWare server with a 64-Bit/66-MHz Fibre Channel Host Adapter.

The latest drivers and support files for SCO UnixWare, as well as information about installing drivers, are located on the Compaq website at www.compaq.com.

The drivers are also located on the latest version of the Compaq SmartStart and Support Software CD. To access these files, you will need to create a set of Compaq UnixWare Extended Feature Supplement (EFS) diskettes from the SmartStart and Support Software CD.

NOTE: If you install the operating system software from the latest version of the SmartStart and Support Software CD, all software, including device drivers, will be automatically installed and configured for the 64-Bit/66-MHz Fibre Channel Host Adapter.

Materials Needed to Install Drivers using Compaq SmartStart and Support Software CD

The following items are necessary to create a set of Compaq EFS diskettes for UnixWare.

- SmartStart and Support Software CD
- Five blank diskettes
- A server or workstation with a bootable CD-ROM drive running Windows

NOTE: You can use the system in which you are installing the 64-Bit/66-MHz Fibre Channel Host Adapter.

Creating the EFS Diskettes

To create the Compaq EFS diskettes for UnixWare:

1. Start the server from the SmartStart and Support Software CD.
2. From the Compaq System Utilities screen, select *Create Support Software*.
3. From the Diskette Builder screen, select *Create Support Software Diskettes*.
4. Scroll through the list and select *Compaq SCO UnixWare EFS*.
5. Follow the instructions on the screen to create and label the diskettes.

Booting to Single-User Mode

1. Start the server.
2. Bring the system up in the Single-User mode.
3. At the UnixWare Logo, press the space bar.
4. At the prompt, type the following and press **Enter**.

   ```
   INITSTATE=1
   ```

5. At the prompt, type the following and press **Enter**.

   ```
   go
   ```

6. At the login prompt, type the following and press **Enter**.

   ```
   root
   ```

7. Type your password and press **Enter**.
8. At the root prompt, type the following:

   ```
   # pkgadd –d diskette1
   ```

9. At the prompt, insert one of the Compaq EFS diskettes for UnixWare into the diskette drive. The order of diskette insertion is not important.
10. Scroll through the list and select PTFCASA to install.

Accessing the Driver Installation Information

To access the driver installation information:

1. Place the diskette labeled *Documentation Diskette* in the diskette drive of a server or computer. If you wish to print the information file, the system must be connected to a printer.
2. Restart the system.
3. Select the file named *CASA.TXT* to view or print.

Follow the instructions in this file to install the 64-Bit/66-MHz Fibre Channel Host Adapter driver in an existing UnixWare server.

Rebuilding the Kernel

After you install the driver, you must rebuild the UnixWare kernel. To rebuild the kernel:

1. Type the following command:

   ```
   # /etc/conf/bin/idbuild - B
   ```

   Press **Enter**.

2. Wait for the kernel to successfully rebuild.

3. Restart the system by typing the following command:

   ```
   # init 6
   ```

   Press **Enter**.

Appendix **A**

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 (personal computers, for example). The FCC requires devices in both classes to bear a label indicating the interference potential of the device as well as additional operating instructions for the user.

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

Class B Equipment

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

Declaration of Conformity for products marked with the FCC logo - United States only

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For questions regarding your product, contact:

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 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 Federal Communications Commission (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 your authority to operate the equipment.

Cables

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

Canadian Notice (Avis Canadien)

Class A Equipment

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

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

Class B Equipment

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

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

European Union Notice

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

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

- EN55022 (CISPR 22) - Electromagnetic Interference
- EN50082-1 (IEC801-2, IEC801-3, IEC801-4) - Electromagnetic Immunity
- EN60950 (IEC950) - Product Safety

Japanese Notice

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Taiwanese Notice

警告使用者：

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Appendix ***B***

Electrostatic Discharge

To prevent damage to 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 may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

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.
- Make sure you are always properly grounded when touching a static-sensitive component or assembly.

Grounding Methods

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

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

If you do not have any of the suggested equipment for proper grounding, have an Authorized Compaq Reseller install the part.

NOTE: For more information on static electricity, or assistance with product installation, contact your Authorized Compaq Reseller.

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