StorageWorks by Compaq

FCA2257P PCI Host Bus Adapter for Sun Solaris Installation Guide

Part Number: AA-RRA4A-TE

First Edition (May 2002)

This guide describes how to install and configure the *StorageWorks*™ FCA2257P PCI Host Bus Adapter for Sun Solaris by Compaq.

COMPAQ

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About this Guide

This installation guide provides information for installing the *StorageWorks*™ FCA2257P PCI Host Bus Adapter for Sun Solaris by Compaq.

Intended Audience

This book is intended for use by system administrators who are experienced with the following:

- Sun Solaris operating system
- Host bus adapters

Related Documentation

In addition to this guide, Compaq provides release notes for late-breaking information.

Document Conventions

The conventions included in Table 1 apply in most cases.

Table 1: Document Conventions

Element	Convention
Key names, menu items, buttons, and dialog box titles	**Bold**
File names and application names	*Italics*
User input, command names, system responses (output and messages)	`Monospace font` `COMMAND NAMES` are uppercase unless they are case sensitive
Variables	*`Monospace, italic font`*

Table 1: Document Conventions (Continued)

Element	Convention
Website addresses	Sans serif font (http://www.compaq.com)

Symbols in Text

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

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

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

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

Any enclosed surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. Enclosed area contains no operator serviceable parts.

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

Any RJ-45 receptacle marked with these symbols indicates a network interface connection.

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

Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. Contact with this surface could result in injury.

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

Power supplies or systems marked with these symbols indicate the presence of multiple sources of power.

WARNING: To reduce the risk of injury from electrical shock, remove all power cords to completely disconnect power from the power supplies and systems.

Any product or assembly marked with these symbols indicates that the component exceeds the recommended weight for one individual to handle safely.

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

Getting Help

If you still have a question after reading this guide, contact service representatives or visit our website.

Compaq Technical Support

In North America, call Compaq technical support at 1-800-652-6672, available 24 hours a day, 7 days a week.

NOTE: For continuous quality improvement, calls may be recorded or monitored.

Outside North America, call Compaq technical support at the nearest location. Telephone numbers for worldwide technical support are listed on the Compaq website: http://www.compaq.com.

Be sure to have the following information available before calling:

- Technical support registration number (if applicable)

- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions.

Compaq Website

The Compaq website has the latest information on this product, as well as the latest drivers. Access the Compaq website at: http://www.compaq.com/storage. From this website, select the appropriate product or solution.

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.

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Adapter Features

The chapter describes the features of the FCA2257P PCI to Fibre Channel Host Bus Adapter (HBA) for Sun Solaris.

PCI Adapter Features

The PCI to Fibre Channel Host Bus Adapter (HBA) for Sun Solaris is a 64-bit Fibre Channel host bus adapter with integrated non-OFC shortwave fiber optic interface. This Fibre Channel (FC) adapter operates over a peripheral component interconnect (PCI).

The PCI Adapter has the following features:

- Combines a powerful RISC processor and a fiber protocol module (FPM) with one 2-GB Fibre Channel transceiver, and a PCI local bus interface in a single-chip solution.
- Supports Fabric Loop Attach (FLA) connections.
- Supports bus master DMA.
- Supports Fibre Channel Protocol SCSI (FCP-SCSI) protocol.
- Supports point-to-point fabric connection (F-PORT FABRIC LOGIN).
- Two independent channels on a single adapter.
- Complies with:
  - — PCI Local Bus Specification, Revision 2.2.
  - — Third Generation Fibre Channel-Physical Signaling Interface (FC-PH-3) standard.
  - — U.S. and international safety and emissions standards.

Figure 1–1 shows the PCI adapter.

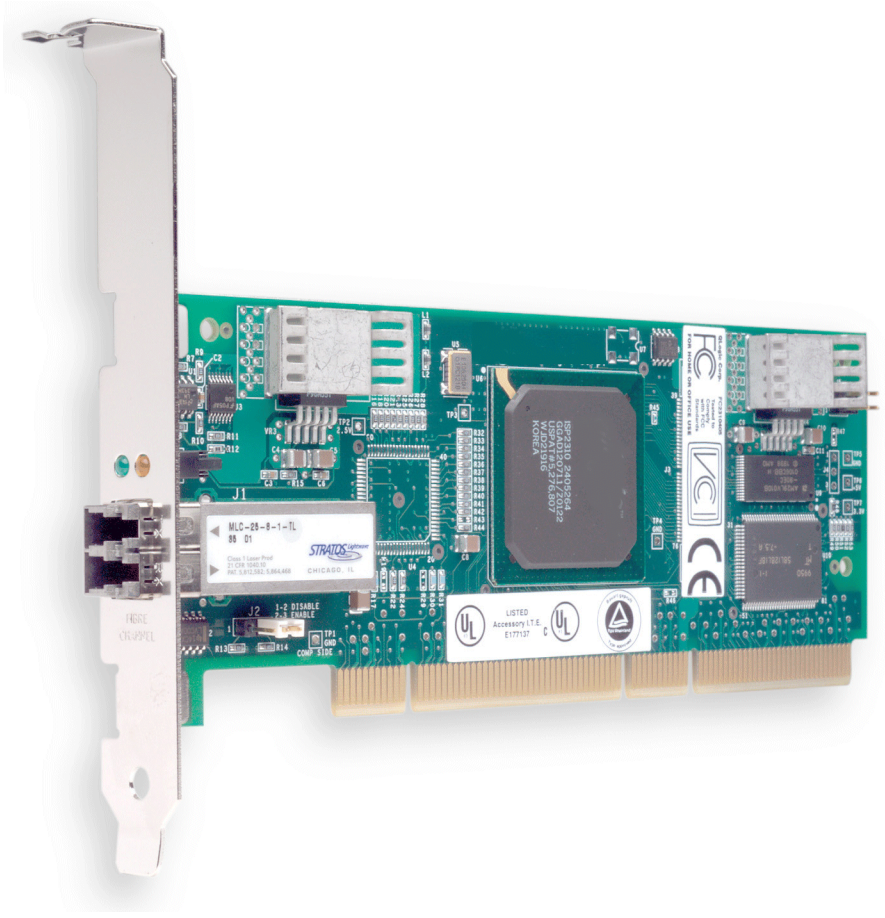

Figure 1–1: PCI Adapter

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Installing the Adapter

This chapter describes the procedure for installing the FCA2257P PCI to Fibre Channel Host Bus Adapter (HBA). This chapter includes:

- Installation Prerequisites
- Installing the Adapter
- Installing the Solaris Driver

NOTE: Refer to your host documentation for installing the HBA.

WARNING: Disconnect the host from the power source before installing the adapter. To reduce the risk of personal injury from hot surfaces, allow the internal server or workstation components to cool before touching.

CAUTION: Electrostatic discharge (ESD) can damage electronic components. Be sure you are properly grounded before beginning this procedure. See Appendix C for related ESD information.

Installation Prerequisites

Before you begin, make sure you have the following:

- A screwdriver (usually a Phillips #1).
- An optical, multimode cable with an LC duplex connector.
- A high-speed, serial data connector (HSSDC) cable that is compatible with data rates of 2 Gb/s.
- The unique serial number, located on the front of the adapter. Check the adapter and record its serial number, in the unlikely event that the NVRAM is corrupted.

Installing the Adapter

To install a PCI adapter:

1. Check the motherboard and make any necessary configuration changes to accommodate the PCI adapter.

NOTE: The PCI adapter is self-configuring. However, some motherboards require manual configuration. See the documentation supplied with your computer, or contact your computer dealer to determine if your motherboard requires configuration.

2. Shut down the system, including peripherals.
3. Remove the computer cover and save the screws.
4. Choose any available PCI slot that supports bus mastering. Most motherboards automatically assign an IRQ level and interrupt line. If your motherboard does not, you must assign the IRQ level and use **interrupt line A** for this slot.

NOTE: Some motherboards have two kinds of PCI bus slots: master and slave. The PCI adapter must be in a PCI bus master slot.

5. Remove the slot cover for the slot in which you want to install the adapter.
6. Place the adapter into the slot. Carefully press the adapter into the slot until the adapter seats firmly (the switch clicks into a locked position when the adapter is seated).
7. Connect the appropriate cables from the FC devices to the J1 and J2 connectors.
8. Carefully reinstall the computer cover and insert and tighten the cover screws.

If you are unable to successfully install the adapter, refer to Chapter 3 for troubleshooting information.

Installing the Solaris Driver

This section provides instructions for installing the Solaris driver into a Solaris operating system.

To install the driver, you must be familiar with the operating system under which the Host Bus Adapter (HBA) is to operate, and have access to standard system documentation.

The software kit that is included with the HBA contains the latest version of the HBA software files at the time of shipment. Software files are updated periodically and can be obtained from the Compaq website:

http://www.compaq.com/products/storageworks/adapters.html

To install the Solaris driver to your system:

1. Log on to the system as superuser.
2. Create a temporary directory to which you can copy the driver.
3. Change the directory (`cd`) to the CD-ROM mount point. The location is normally `/cdrom`, but the location can vary. Ask your system administrator for the specific directory.
4. Change the directory (`cd`) to the Solaris directory.
5. Copy (`cp`) the *qla2300.Z* file from the CD-ROM to the temporary directory created in step 2.
6. Change the directory (`cd`) to the temporary directory created in step 2.
7. At the command prompt, enter:

   ```
   uncompress ./qla2300.Z
   ```

   This step creates a file in the same directory called *qla2300*.
8. At the command prompt, enter:

   ```
   pkgadd -d ./qla2300
   ```

You are prompted to select a driver package, as shown in the following example in which 3 was entered.

```
The following packages are available:
1   QLA2300-1QLogic QLA2300 driver
            (sparc) Solaris 2.6, Rev=X.XX

2   QLA2300-2QLogic QLA2300 driver
            (sparc) Solaris 2.7, Rev=X.XX

3   QLA2300-3QLogic QLA2300 driver
            (sparc) Solaris 2.8, Rev=X.XX

Select package(s) you wish to process (or 'all'
to process all packages). (default: all)
[?,??,q]: 3
```

NOTE: The revision number, X.XX, indicates the most recent version of the driver.

9. Enter the number associated with the Solaris version on your system.

   You are prompted to select the directory where the driver will be installed, as shown in the following example:

```
Processing package instance <QLA2300qla2300-3> from
</qla2300>

QLogic QLA2320 driver
(sparc) Solaris 2.8, Rev=X.XX

Where do you want the driver object installed (default=/kernel/drv):
```

10. Press **ENTER** to accept the default.

    The pkgadd program performs a series of checks, then posts a script warning and asks whether to continue the installation, as shown in the following example:

```
##Executing checkinstll script.
Using </> as the package base directory.
## Processing package information.
## Processing system information.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.

This package contains scripts which will be executed with super-user permission during the
process of installing this package.

Do you want to continue with the installation of <QLA2300-3> [y,n,?]
```

11. Enter **Y** to continue the driver installation. The pkgadd program notifies you when the driver installation is complete, as shown in the following example:

    ```
    Installing QLogic QLA2300 driver as <QLA2300-3>

    ## Installing part 1 of 1.
    /kernel/drv/qla2300
    /kernel/drv/qla2300.conf
    [ verifying class <none> ]
    ## Executing postinstall script

    Installation of <QLA2300-3> was successful.
    ```

12. Reboot the system to implement your changes, as shown in the following example:

    ```
    reboot -- -r
    ```

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Troubleshooting Information

The two basic types of installation problems that can cause your Host Bus Adapter (HBA) to function incorrectly are:

- Hardware Problems
- Fibre Channel Problems

This chapter provides checklists to help you determine why your HBA is not functioning.

Hardware Problems

- Are all of the circuit cards installed securely in the system?
- Are all of the cables securely connected to the correct connectors? Be sure that the FC cables that attach from the HBA connectors to the device are connected correctly. For example, the optical transmit connector on the board should be connected to the optical receive connector on the device. Some connectors require a firm push to ensure proper seating. An easy way to check is to switch the connectors on either the HBA or the device, then reboot your system.
- Is the HBA installed correctly in the slot? Is it seated firmly in the slot?
- Are all external peripherals properly powered up?

Fibre Channel Problems

- Were all of the FC devices powered up before you powered up the system?
- Are all cables properly connected?

A

Specifications

Specifications

This appendix provides the specifications for the FCA2257P PCI to Fibre Channel Host Bus Adapter (HBA) for Sun Solaris.

Environmental Specifications

Table A–1 lists the HBA environmental specifications.

Table A–1: HBA Environmental Specifications

Environment	Minimum	Maximum
Operating temperature	0°C/32°F	55°C/131°F
Storage temperature	-20°C/-4°F	70°C/158°F
Relative humidity (noncondensing)	10%	90%
Storage humidity (noncondensing)	5%	95%

Adapter Specifications

Table A–2 lists the PCI HBA specifications

Table A–2: PCI HBA Specifications

Type	Specification
Host bus	Conforms to *PCI Local Bus Specification*, Revision 2.2
Fibre Channel specifications	Bus type: fiber optic media Bus transfer rate: 200 MB/s maximum at half duplex 400 MB/s maximum at full duplex Interface chip: SP2300
Central processing unit (CPU)	Single-chip design that includes a RISC processor, Fibre Channel protocol manager, DMA controller, integrated serializer/deserializer (SEREDES) and electrical transceivers that can auto-negotiate a data rate of 1 GB/s or 2 GB/s.
RAM	256B
NVRAM	256KB, field programmable
Flash	128KB of flash ROM in two 64KB, software selectable banks, field programmable
Onboard DMA	Five channel DMA controller: two data and one command, one auto-DMA request, and one auto-DMA response. Integrated frame buffer FIFOs (4KB receive and 6KB transmit) for each data channel.
Connectors	LC-style connector that supports non-OFC, multimode fiber optic cabling using a small form factor optical transceiver module.
Form factor	17.78 cm x 10.67 cm (7.0 in x 4.2 in)
Operating power	Less than 15 W

B

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

The rating label on the device shows the classification (A or B) of the equipment. Class B devices have an FCC logo or FCC ID on the label. Class A devices do not have an FCC logo or ID on the label. After the class of the device is determined, refer to the corresponding statement in the sections below.

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.

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.)

To identify the device, refer to the part, series or model number found on the product.

Modifications

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

Network and Serial 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.

Japanese Notice

Japanese Class A Notice

に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Laser Devices

All Compaq systems equipped with a laser device comply with safety standards, including International Electrotechnical Commission (IEC) 825. With specific regard to the laser, the equipment complies with laser product performance standards set by government agencies as a Class 1 laser product. The product does not emit hazardous light; the beam is totally enclosed during all modes of customer operation and maintenance.

Laser Safety Warnings

WARNING: To reduce the risk of exposure to hazardous radiation:
Do not try to open the laser device enclosure. There are no user-serviceable components inside.
Do not operate controls, make adjustments, or perform procedures to the laser device other than those specified herein.
Allow only Compaq authorized service technicians to repair the laser device.

Compliance with CDRH Regulations

The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration implemented regulations for laser products on August 2, 1976. These regulations apply to laser products manufactured from August 1,1976. Compliance is mandatory for products marketed in the United States.

Compliance with International Regulations

All Compaq systems equipped with laser devices comply with appropriate safety standards including IEC 825.

Label

The transceiver on the adapter is a Class I laser product. It complies with IEC 825-1 and FDA 21 CFR 1040.10 and 1040.11. The transceiver must be operated under recommended operating conditions.

CLASS I LASER PRODUCT

C

Electrostatic Discharge

To prevent damaging the system, you must take precautions when setting up the system or when handling parts. A discharge of static electricity from a finger or other conductor may damage system adapters or other static-sensitive devices. This type of damage can 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.
- Always make sure you are 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 grounding, 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 a Compaq authorized reseller install the part.

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

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