Compaq StorageWorks

PCI-to-Fibre Channel Host Bus Adapter for IBM AIX

Installation Guide

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About This Guide

This guide is designed to be used as step-by-step instructions for installation and as a reference for operation, troubleshooting, and future upgrades.

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 upper case. (**NOTE:** UNIX commands are case sensitive and will not 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

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

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

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

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

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

Symbols on Equipment

These icons may be located on equipment in areas where hazardous conditions may exist.

> Any 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. 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.

Power Supplies or Systems marked with these symbols indicate the equipment is supplied by multiple sources of power.
WARNING: To reduce the risk of injury from electrical shock, remove all power cords to completely disconnect power from the system.

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 manual material handling.

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.

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

Outside North America, call the nearest Compaq Technical Support Phone Center. Telephone numbers for world wide Technical Support Centers are listed on the Compaq website. Access the Compaq website by logging on to the Internet at http://www.compaq.com.

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

- Technical support registration number (if applicable)

- Product serial numbers

- Product model names and numbers

- Applicable error messages

- Add-on boards or hardware

- Third-party hardware or software

- Operating system type and revision level

- Detailed, specific questions

Compaq Website

The Compaq website has the latest information on this product as well as the latest drivers. You can access the Compaq website by logging on to the Internet at http://www.compaq.com/storage.

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

Description

The Compaq StorageWorks PCI-to-Fibre Channel Host Bus Adapter (HBA) for IBM AIX shown in Figure 1-1 provides high-speed Fibre Channel connectivity.

The HBA is compatible with Fibre Channel hubs, storage subsystems, and tape drives. The HBA supports the SCSI Fibre Channel Protocol, Fibre Channel Switched Fabric connectivity, and provides point-to-point Fibre Channel arbitrated loop connectivity. The HBA conforms to PCI Local Bus specification 2.1, and is fully compatible with both 32-bit and 64-bit PCI busses. The HBA accepts industry standard Gigabit Interface Converter (GBIC) modules.
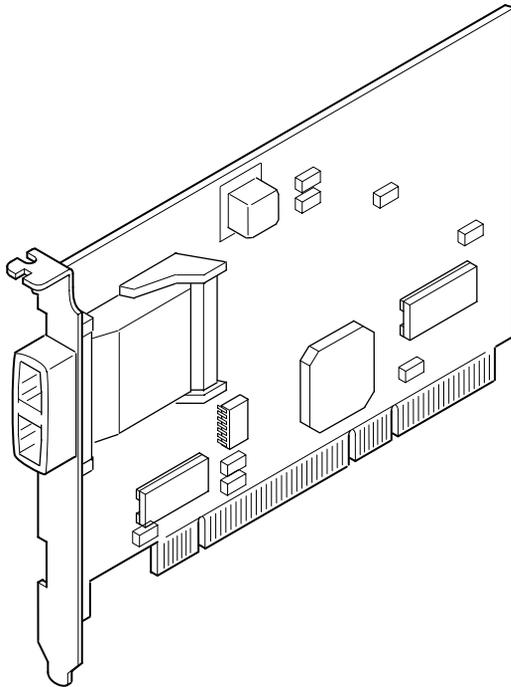
SHR-2157

Figure 1–1. HBA Adapter

PCI-to-Fibre Channel Host Bus Adapter for IBM AIX Package Contents

The package contents is shown in Figure 1–2.

> **IMPORTANT:** Contact your authorized service representative if any item in the package contents is missing.
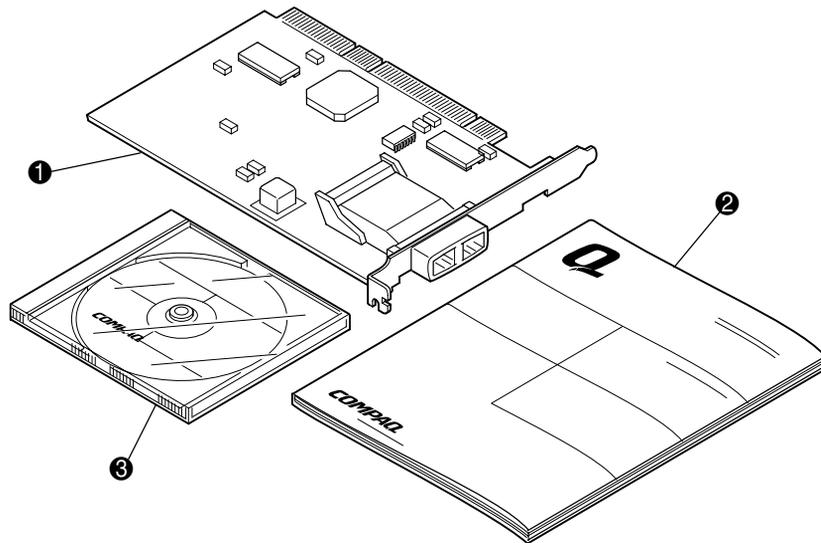
SHR-2158

❶   Host bus adapter   ❸   CD

❷   Release notes

Figure 1–2. Package contents

Key Features

- Removable hot-swappable GigaBit Interface Converter (GBIC)

- Compliance with PCI version 2.1 specification

- High performance 64-bit PCI bus master provides data transfer rates of up to 266 MBs across the PCI bus

- Supports100 MB/s Fibre Channel data transfer rates

- Three independent DMA channels

- Simultaneous multiple host and target connections

- Supports point-to-point, FC arbitrated loop, FC fabric loop connections, and FC switched fabric connectivity

- Embedded RISC processor

Chapter 2

Installing the Adapter

This chapter gives instructions for installing the Compaq StorageWorks PCI-to-Fibre Channel Host Bus Adapter (HBA) for IBM AIX in your system.

Host Bus Adapter Installation

The HBA installation is accomplished by first installing the driver.

NOTE: If you're installing a RAID subsystem on the HACMP cluster, you will need to install the HBA and it's driver into each IBM host server in the cluster.

Installing the Driver

The driver is contained on the CD-ROM provided in your package contents. The driver was designed to be installed from writable media and will need to be copied to a temporary hard disk location.

To install the driver in your host system:

1. Place the CD in your host system's CD-ROM drive.

    NOTE: Be sure you have a mount point, usually a directory in root, such as /mnt, and you know the device number of the CD-Rom drive, such as /dev/cd0.

2. Mount the CD-ROM and enter the following command:

    # mount -v cdrfs -r /dev/cd0 /mnt

3. To change directories to the location of the driver, enter the following command:

    # cd /mnt/fcdriver/pci

4. To create a directory to load the driver enter the following command:

    # mkdir /tmp/fcdriver

5. To copy the driver image enter the following command:

    # cp PC1000.image /tmp/fcdriver

6. To change directories enter the following command:

    # cd/ tmp/fcdriver

7. Install the driver by entering the following command:

    #installp -acd PC1000.image.all

Upgrading the Driver

To upgrade the driver, use the following procedure:

> **NOTE:** Write down your configuration before preceding.

1. To unmount your mounted file systems from the SAN attached storage, enter the following command:

   smit

   Go to System Storage Management, File systems, Unmount a File System, and then select the file system name that you want to unmount. Press the **Enter** key.

2. Deactivate volume groups by entering the following command:

   smit

   Go to System Storage Management, Logical Volume Manager, Volume Groups, Deactivate a Volume Group, and then select the volume groups that you want to deactivate. Press the **Enter** key.

3. Export volume groups by entering the following command:

   smit

   Go to System Storage Management, Logical Volume Manager, Volume Groups, Export a Volume Group, and then select the volume groups that you want to export. Press the **Enter** key.

4. If you are running the Platform Kit, stop the agent (if it is running). Otherwise, go to Step 5.

   > **NOTE:** To stop the agent, make sure you are in the right directory.

   a. To stop the agent, and run the script enter the following commands:
   # cd/usr/stgwks2
   #./stgwks_aix.sh

   b. Select option 3, Agent Maintenance.

   c. Select Option 3, Start/Stop the Agent.

5. Remove the adapter device file by entering the following command:

   # rm -Rdl scisi<x>

   where <x> is the HBA number.

6. Uninstall the driver by entering the following command:

   # installp -u PC1000.driver.obj

7. Bosboot (regen kernel) by entering the following command:

   # bosboot -ad /dev/lpidevice

8. Reboot the system by entering the following command:

   # reboot

9. Login as root, enter cd/(enter the driver location) and then enter the following command:

   # installp -acd PC1000.image all

10. Disconnect the fibre cable by removing the cable from the hub or switch.

11. To run cfgmgr enter the following command:

    # cfgmgr -v

12. Verify the adapter is installed by entering the following command:

    # lsdev -Cc adapter

    You should see:

    scsi2 Available 20-60 Cambex Fibre Channel I/O Controller

13. Reconnect the fibre channel cable to the hub or switch.

14. To run cfgmgr, enter the following command:

    # cfgmgr -v

15. Verify the disks are recognized by entering the following command:

    # lsdev -Cc disk

    You should see:

    hdisk4 Available 10-80-00-5,0 Other SCSI Disk Drive

16. Import volume groups by entering the following command:

    smit

    Go to System Storage Management, Logical Volume Manager, Volume Groups, Import a Volume Group, and then select the volume groups that you want to import. Press the **Enter** key.

17. Activate volume groups by entering the following command:

    smit

    Go to System Storage Management, Logical Volume Manager, Volume Groups, Activate a Volume Group, and then select the volume groups that you want to activate. Press the **Enter** key.

18. To mount your unmounted file systems from the SAN attached storage, enter the following command:

    smit

    Go to System Storage Management, File systems, Mount a File System, and then select the file system name that you want to mount. Press the **Enter** key.

Installing the Hardware

An overview is provided below to install the HBA into your system. Refer to the documentation provided with your host system for details on opening the case and installing the HBA in an available PCI slot.

1. Power down the host server.

2. Observe proper ESD precautions (See Appendix B)

3. Install the adapter in a free PCI slot.

4. Make sure that the airflow around the HBA is not blocked.

5. Do not attach the cables from the host adapter to the fibre channel devices at this time.

6. Power up the host server.

Maintenance and Troubleshooting

This chapter gives some common solutions to problems that can occur when installing a Compaq StorageWorks PCI-to-Fibre Channel Host Bus Adapter (HBA) for IBM AIX.

The troubleshooting techniques described in this chapter do not identify all possible problems with you HBA, nor do the actions suggested remedy all problems.

Troubleshooting

Use the errpt command to identify the cause of failure. The lsdev command will provide the location of the component. For example, if errpt identifies a loose cable on the device cdal, lsdev will give an address similar to:

cdal Available 00-02-01-3,0 Cambex SCSI...

Which indicates that the adapter is in location 00-02, and the drive is at SCSI ID 3, LUN 0.

Checklist for Driver and HBA Installation

The commands listed in Table 3–1 may be used to isolate problems during installation of the Fibre Channel driver and card. Type the command shown in bold and verify the output.

Table 3–1 Installation Problems

Command	Output	
whoami	must be root	
uname -a	must give 5 fields:	
	'AIX'	
	hostname where card is installed	
	1 or higher as minor rev of AIX	
	4 as version of AIX	
	serial number of host	
lslpp - l PC1000.driver.obj	must give:	
	Fileset Path:/usr/lib/objrepos	PC1000.driver.obj
	Level 01.05.00.00 or (greater)	
	State	Committed
lsdev -Cc adapter	should print line for each card:	
	scsi\<x\>	\<x\> is a unique number for each SCSI card
	Available \<SS-SS\>	\<S\> is the location in the machine where the card is installed
Check that the number of SCSI cards and their slots are correct.		
If 'Available' then card and driver are installed.		
If 'Defined' or not listed then card was not found.		
lscfg -vl scsi4	should print more information for a card:	
Device	Location	Description
scsi2	20-60	Cambex Fibre Channel I/O Controller
	Manufacturer	Cambex
	Machine Type and Model	PC1000F
	ROS Level and ID	V2.01.19

Table 3–1 Installation Problems (Continued)		
	Serial Number	642
	Displayable Message	Cambex Fibre Channel I/O Controller
	Network Address	500502E01000082
	Device Specific (ZO)	Build: MFtl
	Device Specific (YL)	P2-I2/Z1
cfgmgr -v >/tmp/cfg.log 2>&1	Should identify the card and configure it. If cfg.log contains the ID 77100021 and no driver is found, then the driver is not installed.	
	If an MCA card is present but not configured, then check for and remove the reset jumper on the card.	
lsattr -El scsi<x>	for each <x> device should give:	
	id 0 Adapter card SCSI ID True	
Make sure that the ID value does not conflict with any other host or device on the same Fibre Channel loop. The other attributes will be different on each card.		
During boot, the number displayed when configuring the adapter is 0x911 (FC adapter).		
/usr/lpp/cbxfc/mbtest scsi<x>	This test code may be used to get the Fibre Channel status from the adapter or from attached devices. Type mbtest -help for more information about how to use this command.	
/usr/lpp/cbxfc/sctest scsi<x>	This test code maybe used to get IOCINFO information from the adapter, or to see the results of SCSI Inquiry or TestUnitReady commands to SCSI devices attached to the adapter. Type sctest -help for more information about how to use this command.	
/usr/lpp/cbxfc/runtrace	This should be run to start a trace if Cambex support requests a trace of the card failure. To stop the trace and generate a trace report, enter:	
trcstop; trcrpt > /tmp/trc.log		

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 (for example, 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 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.

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, TX 77269-2000

Or call 1-281-514-3333

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

Modifications

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

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.

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.

Japanese Notice

ご使用になっている装置にVCCIマークが付いていましたら、次の説明文を
お読み下さい。

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準
に基づくクラスB情報技術装置です。この装置は、家庭環境で使用すること
を目的としていますが、この装置がラジオやテレビジョン受信機に近接して
使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。

VCCIマークが付いていない場合には、次の点にご注意下さい。

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に
基づくクラスA情報技術装置です　この装置を家庭環境で使用すると電波
妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ず
るよう要求されることがあります。

Taiwanese Notice (July 14, 1998)

警告使用者：

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

Laser Devices

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

Laser Safety Warnings

Do not use a laser GBIC with this card, unless it meets the safety requirements of a class 1 laser as specified by the US Food and Drug Administration Center of Drug and Radiological Health (CDRH) 21 CFR 1040.10, 1040.11 and by IEC 825-1.

> ⚠️ **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.

Appendix **B**

Electrostatic Discharge

To prevent damaging the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

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.

Appendix **C**

Specifications

Specifications

This appendix provides the specifications for the Compaq StorageWorks PCI-to-Fibre Channel Host Bus Adapter (HBA) for IBM AIX.

Table C–1 lists the HBA specifications.

Table C–1 HBA Specifications

Specification	Value
Temperature (operating)	32°F to 131°F (0°C to 55°C)
Temperature (non-operating)	-4°F to 158°F (-20°C to 70°C)
Operating humidity	10% to 90% non-condensing
Non-operating humidity	5% to 95% non-condensing
Dimensions 　Product 　Shipping	(HxWxD) 1.27 x 17.5 x 10.7 cm (0.5 x 6.88 x 4.2 in) 5.7 x 26 x 19 cm (2.25 x 10.25 x 7.5 in)
Weight 　Product 　Shipping	 0.34 kg (0.55 lbs) 0.68 kg (1.50 lbs)
Power Dissipation	15W maximum
Current Requirement	3A maximum
Input Voltage Requirement	5V $\pm$ 5%

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