

A6795A Fibre Channel Mass Storage Adapter Installation Guide

HP-UX Networking



Manufacturing Part Number: A6795-90007

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Localized Documentation

This Installation Guide has been translated to:

日本語 <http://www.docs.hp.com/ja/index.html>

1 Fibre Channel Adapter Installation for HP-UX

This chapter contains installation prerequisites, guidelines, and procedures for the A6795A host bus adapter. This chapter addresses the following topics:

- “Prerequisites” on page 4
- “Important Patches and Updates” on page 5
- “Installing Driver Software” on page 6
- “Installing Adapter Hardware” on page 8
- “Attaching the Adapter to Other Fibre Channel Devices” on page 11
- “Verifying Installation” on page 11
- “Verifying Connectivity” on page 12
- “Interpreting Legacy Hardware Paths (HP-UX 11i v1 and 11i v2)” on page 13
- “Interpreting Lunpath Hardware Paths (HP-UX 11i v3)” on page 16

Thank you for purchasing HP I/O Cards

If you are installing an HP I/O card as an add-in device, please review this document before attempting installation.

If this card was factory installed in your server, see “Verifying Installation” on page 11.

HP welcomes your input. Please email us at:
netinfo_feedback@cup.hp.com
with comments or suggestions on HP I/O Cards or related documentation.

All product documentation, including a comprehensive Support Guide, Installation Guide, Release Notes, Support Matrix are available online at: <http://docs.hp.com>

1. Within the “Internet & Networking” category select “I/O Cards and Networking Software”
2. Select “Fibre Channel”
3. Click on the *Fibre Channel* documentation product.

Prerequisites

Before installing the adapter, follow these steps:

- Step 1.** Verify compliance with supported configurations using the *HP Fibre Channel Host Bus Adapter Support Matrix* at:
<http://docs.hp.com/en/netcom.html#Fibre%20Channel>
- Step 2.** Determine if the adapter is a Customer Replaceable Unit (CRU) using the *HP Fibre Channel Host Bus Adapter Support Matrix*. If the adapter is not a CRU, contact your HP representative for installation assistance.

Field Replaceable Units (FRUs) must be installed or replaced by qualified Hewlett-Packard service representatives only. CRUs can be installed or replaced by customers or qualified Hewlett-Packard service representatives.

- Step 3.** Check the following conditions:
- To verify that the `/usr/bin`, `/usr/sbin`, and `/sbin` directories are in the PATH, enter the following command:
`echo $PATH`
 - Verify that you have the following items:
 - Grounding wrist strap
 - Fibre Channel driver software media (included with the OS or application CD)
 - Fibre Channel host bus adapter with an optical port protector attached (not included with all adapters)
 - Verify that you have the following cabling items:
 - Fiber optic cable terminated with a duplex LC connector.
 - Cable map (optional)

Important Patches and Updates

Review the *FibrChanl-00 (td) Fibre Channel PCI Tachyon XL2 Driver for HP-UX Release Notes* located at docs.hp.com for the latest patch and dependency requirements.

Install all driver software and dependency patches before you install the adapter.

NOTE

HP recommends that you sign-up for Subscriber's Choice so you can automatically receive email notices for the latest firmware updates. Make sure you register all your products to receive the appropriate firmware update notices.

You can also go to the Business Support Center Web site at <http://www.hp.com/go/bizsupport> for the latest HP-UX 11i firmware updates. The IT Resource Center (ITRC) Web site at <http://itrc.hp.com> also provides a link to the Business Support Center.

The system firmware files, installation instructions, and release notes with detailed firmware version information can be obtained by selecting "Download Drivers and Software" at <http://www.hp.com/bizsupport>. This provides a searchable database for various products or you can follow the "Server" link to select the latest firmware download for your specific server product. Be sure to read the Release Notes for the firmware to ensure a successful update. In general, HP recommends that you update to the latest firmware available before installing or updating to HP-UX 11i v3.

For a matrix of minimum required system firmware for I/O adapters with HP-UX 11i v3 boot support, as well as the minimum system firmware requirements for HP-UX 11i v3, refer to the documents at <http://docs.hp.com/en/hw.html#System%20Firmware>

NOTE

Patches are available from <http://www.software.hp.com>

Installing Driver Software

NOTE Use the following instructions if the driver is provided on a CD-ROM. If the driver software is downloaded, follow the instructions provided with that file. The driver software, FibrChan1-00, may be downloaded from <http://software.hp.com>. The FibrChan1-00 bundle is also provided on the Operating Environment media or Application Release media for HP-UX 11i v3 and HP-UX 11i v2.

Install all driver software and dependency patches before you install the adapter. See the *FibrChan1-00 (td) Fibre Channel PCI Tachyon XL2 Driver for HP-UX Release Notes* available at: <http://docs.hp.com> for details.

To load the driver from a CD-ROM, do the following:

Step 1. Log in to the system as root.

Step 2. Insert the CD into the CD drive.

Step 3. Mount the CD using the following command:

```
mount /dev/dsk/<cd_rom_dev_file> /<tmp_mnt>
```

Step 4. Run `swinstall` to install the software. Enter the following command:

```
/usr/sbin/swinstall
```

The Software Selection window and the Specify Source window open.

Step 5. In the Specify Source window, change the Source Host Name if necessary. Enter the mount point of the drive in the Source Depot Path field and click **OK** to return to the Software Selection window.

Click **Help** to get more information.

Step 6. Select the appropriate software bundle for your adapter.

Step 7. Select **Mark for Install** from the **Actions** menu.

Step 8. Select **Install** from the **Actions** menu. Installation begins and the Install Analysis window opens.

Step 9. Click **OK** in the Install Analysis window to confirm that you want to install the software. The Install window opens.

View the Install window to read processing data while the software installs. When the Status field indicates Ready, the Confirmation window opens.

Step 10. Click **OK**. A second Confirmation window opens.

Step 11. Click **OK** again. The Install window opens.

Step 12. Click **Done**. The Note window opens.

Step 13. Click **OK** in the Note window to reboot. The user interface disappears and the system reboots.

Step 14. Once the system comes back up, log in as root and open the following files to see any error or warning messages that may have occurred during the installation:

```
/var/adm/sw/swagent.log
```

/var/adm/sw/swinstall.log

Step 15. Install OnlineDiag, which is available at <http://www.software.hp.com>. OnlineDiag is also available from the HP Support PLUS CD. Installation instructions are available at: http://docs.hp.com/hpux/onlinedocs/diag/st/st_inst.htm

Installing Adapter Hardware

The Online Addition and Replacement feature, OLAR for HP-UX 11i v1, or OL* for HP-UX 11i v2 and later HP-UX releases, enables PCI host bus adapters to be added or replaced without shutting down and rebooting the system, and without adversely affecting other system components. The system hardware uses slot-specific power control, combined with HP-UX operating system support, to enable these features.

Confirm whether OLAR or OL* are supported on the system in which you plan to install a Fibre Channel adapter. See the HP Fibre Channel Host Bus Adapter Support Matrix, at:
<http://docs.hp.com/en/netcom.html#Fibre%20Channel>

For detailed instructions on using OLAR on HP-UX 11i v1, see Chapter 2 of *Configuring HP-UX for Peripherals*, which can be accessed at:
<http://docs.hp.com/en/hpux11i.html>

For detailed instructions on using OL* on HP-UX 11i v2 and later HP-UX releases, see the *Interface Card OL* Support Guide* at:
<http://www.docs.hp.com/en/netsys.html#System%20Administration>

IMPORTANT Superdome systems are not intended to be maintained by customers. HP recommends that Superdome systems only be opened by a qualified HP service engineer. Failure to observe this recommendation can invalidate any support agreement or warranty to which you may be entitled.

Installing the Fibre Channel Adapter

CAUTION Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions could result in damage to equipment.

NOTE The optical port protector is used only to protect the adapter port when it is not in use. Do not use the protector as a diagnostic tool.

Install OnlineDiag, which is available at:
<http://www.software.hp.com>

OnlineDiag is also available from the HP Support PLUS CD for HP/9000 systems or the IPFxxxx CD for Itanium systems. Installation instructions are available at:
http://docs.hp.com/hpux/onlinedocs/diag/st/st_inst.htm

Install all driver software and dependent patches before you install the adapter. For more information, see FibrChanl-00 (td) Fibre Channel PCI Tachyon XL2 Driver for HP-UX Release Notes available at:
<http://docs.hp.com/en/netcom.html#Fibre%20Channel>

NOTE See the system documentation for information about how to safely shut down your system and obtain access to expansion slots.

To install the Fibre Channel adapter, follow these steps:

Step 1. Install all driver software and dependent patches.

Step 2. Shut down the system.

Step 3. Install the adapter in an available PCI-X slot.

Step 4. Attach fiber cabling to the adapter. All Fibre Channel host bus adapters that use the TD driver use a cable terminated with an LC connector.

Installing the Host Bus Adapter

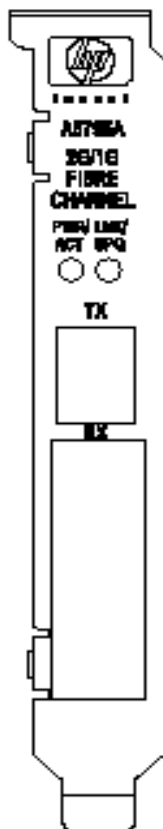
Step 1. Access the system card bay

- If the system is running, enter this command to shut it down:
`shutdown -h`
Enter `y` when prompted to continue.
- Wait for the system to shut down completely, and then power off the system by pressing the system off button.
- Ensure that the system is grounded.
- Open the system to gain access to the PCI backplane.
- Insert the card into the highest-performance PCI-X slot available.

Step 2. Install the card

- Slide the adapter edge-connector into the PCI-X slot until it is fully seated.
- Secure the card and reassemble the system.

Figure 1-1 A6795A Dual Port Fibre Channel Adapter



Attaching the Adapter to Other Fibre Channel Devices

To attach the adapter to other Fibre Channel devices, follow these steps:

1. Remove the Fibre Channel host bus adapter's optical port protector (if included).
2. Attach a connector cable to the Fibre Channel host bus adapter.
 - a. Align the slotted plug with the keyed connector.
 - b. Push the connector in until you hear it click.
3. Attach the free end of the cable to a compatible Fibre Channel device.
4. Reconnect the power cord, if necessary, and power on the system.

Table 1-1 lists the Fibre Channel cables that you can use when connecting devices to Fibre Channel host bus adapters.

Table 1-1 Cable Products

LC-LC	
221692-B21	Fibre Optic Cable 2m LC/LC Duplex 50/125 M/M
221692-B23	Fibre Optic Cable 15m LC/LC Duplex 50/125 M/M
221692-B26	Fibre Optic Cable 30m LC/LC Duplex 50/125 M/M
221692-B27	Fibre Optic Cable 50m LC/LC Duplex 50/125 M/M
LC-SC	
221691-B21	Fibre Optic Cable 2m LC/SC Duplex 50/125 M/M Optical
221691-B23	Fibre Optic Cable 15m LC/SC Duplex 50/125 M/M Optical

Verifying Installation

1. To verify the adapter installation, enter the command:

```
ioscan -f
```

2. Verify that the following drivers appear for each installed adapter. If all drivers display, proceed to the next section, Verifying Connectivity.

The `ioscan` output might look like the following. The third column represents the hardware path of the slot in which the adapter is installed. This path will be different for each installed adapter port.

Table 1-2 ioscan -f Output

	Class	I	H/W Path	Driver	S/W State	H/W Type	Description
	fc	0	1/1/0/0	td	CLAIMED	INTERFACE	HP Tachyon XL2 Fibre Channel Mass Storage Adapter

3. If the correct driver is installed, but the adapter does not show it in the `ioscan` output, the driver is not recognizing the adapter. Contact HP for assistance.

NOTE If the `td` driver for an installed Tachyon adapter (A6795A) does not display, verify that the adapter is securely seated before taking additional action.

Verifying Connectivity

Once the HP Fibre Channel Mass Storage software and hardware is installed and running, type the following commands to verify mass storage hardware and software installation.

1. Check the state of all Fibre Channel hardware and interfaces. Enter the `ioscan` command and verify that the S/W State of all Fibre Channel hardware and interfaces is CLAIMED.

If the Fibre Channel device file has not been created, enter the following commands:

```
ioscan -f
insf -e
```

2. Verify that all devices you attached to the Fibre Channel adapter are listed in the `ioscan` output. For example, if you have a direct attach Fibre Channel device attached to the system, the `ioscan` output might look like the following:

```
8/12.8.0.255.0.1.0 sdisk CLAIMED DEVICE DGC C3400WDR5
```

The example above is the hardware path of LUN0 of a directly attached Fibre Channel Mass Storage device with Loop ID of 1. For details on interpreting hardware paths for Fibre Channel devices, see *Interpreting Legacy Hardware Paths (HP-UX 11i v1 and 11i v2)* and *Interpreting Lunpath Hardware Paths (HP-UX 11i v3)*.

3. HP Fibre Channel Mass Storage installation is verified if the `ioscan` output lists all mass storage devices attached to the adapter. If any attached devices are not listed or appear as UNCLAIMED, see the *Troubleshooting and Maintenance* chapter of the *HP Fibre Channel Adapters Support Guide*.

Interpreting Legacy Hardware Paths (HP-UX 11i v1 and 11i v2)

Example 1-1, Example 1-2 and Example 1-3 illustrate the Fibre Channel hardware path format:

Example 1-1 Hardware Path for a Public Loop Device

Adapter Domain Area Port Bus Target LUN
 | | | | | |
0/1/2/0.1.19.255.15.4.0

Example 1-2 Hardware Path for a Direct Fabric Attach Device

Adapter Domain Area Port Bus Target LUN
 | | | | | |
0/1/2/0.1.19.255.0.0.0

Example 1-3 Hardware Path for a Private Loop Device

Adapter Domain Area Port Bus Target LUN
 | | | | | |
0/1/2/0.8.0.255.0.1.0

Table 1-3 describes each field in the hardware path.

Table 1-3 Hardware Path Field Descriptions

Field	Value	Fibre Channel Topology of HBA	
		Fabric Topologies	Private Loop
Adapter	The hardware path of the Fibre Channel adapter through which the Logical Unit Number (LUN) is seen. For multiport adapters, this field describes a specific port on the adapter.		
Domain	Dependent on the Fibre Channel topology of the HBA.	Typically the Domain ID of the switch to which the target device is attached, taken from the most significant byte of the N_Port ID of the target device.	8 HP-UX uses a Domain ID of 8 to indicate private loops. Fibre Channel switches seen by HP-UX hosts cannot be configured with domain ID of 8.

Table 1-3 Hardware Path Field Descriptions (Continued)

Field	Value	Fibre Channel Topology of HBA	
		Fabric Topologies	Private Loop
Area	Depends on the Fibre Channel topology of the HBA.	<p>Taken from the second byte of the N_Port ID of the target device.</p> <p>On some switches, the second byte of the N_Port ID encodes the switch port to which the device is connected. The encoding method depends on the switch. See your switch manual to interpret this field.</p>	0
Port	Depends on the Fibre Channel topology of the HBA and the target device, and on the LUN addressing method used.	For LUNs with Peripheral Device Addressing, the value of this field is always 255.	
		For other LUN methods, the value of this field is the least significant byte of the N_Port ID of the target device.	For other LUN methods, the value of this field is the Loop ID of the target device.
Bus	Depends on the Fibre Channel topology of the HBA and the target device, and on the LUN addressing method used.	For LUNs with Peripheral Device Addressing, the value of this field is the upper 4 bits of the least significant byte of the N_Port ID of the target device.	For LUNs with Peripheral Device Addressing, the value of this field is the upper 4-bits of the Loop ID of the target device.
		<p>For LUNs with Logical Unit Addressing, the value is the Bus Number field of the LUN.</p> <p>For LUNs with Volume Set Addressing (Flat Space Addressing), the value is bits 7 - 13 of the LUN.</p>	
Target	Depends on the Fibre Channel topology and the LUN addressing method used.	<p>For LUNs with Peripheral Device Addressing, the value of this field is the lower 4-bits of the third byte of the N_Port ID of the target device.</p> <p>This field usually corresponds to the Arbitrated Loop Physical Address (AL_PA) of the target device.</p>	With Peripheral Device Addressing, the value of this field is the lower 4-bits of the Loop ID of the target device.
		<p>For LUNs with Logical Unit Addressing, the value is the Target field of the LUN.</p> <p>For LUNs with Volume Set Addressing (Flat Space Addressing), the value is bits 3 - 6 of the LUN.</p>	
LUN	Depends only on the LUN addressing method used.		

LUN Addressing Method	Value of LUN field in Fibre Channel hardwarePath.
Peripheral Device Addressing	The Target or LUN field of the Logical Unit Number.
Logical Unit Addressing	The LUN field of the Logical Unit Number.
Volume Set Addressing (Flat Space Addressing)	Bits 0 - 2 of the Logical Unit Number.

For more information about the fields in the Logical Unit Number, please see the SCSI Architecture Model - 3 (SAM-3) standards document.

Fibre Channel devices can connect to a fabric using a Direct Fabric Attach. Direct Fabric Attach devices do not have an AL_PA and the least significant byte of their N_Port ID is usually 0. This is dependent on the switch implementation. Not all switches adhere to this scheme.

Some switches enable devices in Private Loop mode to connect to a fabric. These switches typically translate the Private Loop device as a Direct Fabric Attach device to the rest of the fabric. These switches also typically translate the rest of the fabric as Private Loop devices to the Private Loop device.

Interpreting Lunpath Hardware Paths (HP-UX 11i v3)

Lunpath hardware paths are a new representation of hardware paths introduced on HP-UX 11i v3, as part of the new agile representation of mass storage devices. For more details, see the *Next Generation Mass Storage Stack HP-UX 11i v3* white paper at <http://docs.hp.com/en/netsys.html#Storage%20Area%20Management>.

This section describes how to interpret address elements in lunpath hardware paths. It also shows how to map between the legacy hardware path and lunpath hardware path formats.

Components of Lunpath Hardware Paths

The lunpath hardware path has three parts:

1. The *HBA path* is composed of a series of bus-nexus addresses, separated by a slash (/). It is identical to the HBA portion of a legacy hardware path.
2. The *target address* is transport-specific. With Fibre Channel, it is a port identifier. When printed by I/O commands like `ioscan`, the target address is separated from the HBA path by a period (.) and is printed in hexadecimal notation.
3. The LUN address is a SCSI 64-bit LUN identifier, built from the address method and the LUN number. When printed by I/O commands, it is separated from the target address by a period (.) and is printed in hexadecimal notation.

The following table provides four examples:

Table 1-4

Lunpath Hardware path	HBA path	Target address	LUN address
0/5/1/ 0.0x50060e8004276e12.0x4000000000000000	0/5/1/0	0x50060e8004276e12	0x4000000000000000
0/4/1/ 0.0x500805f300083899.0x4010000000000000	0/4/1/0	0x500805f300083899	0x4010000000000000

Fibre Channel

The *target address* for a Fibre Channel device is the target port's worldwide port name (WWPN). The `fcmsutil` command with the `get remote` option displays the WWPN as the Target Port World Wide Name. In this example, the WWPN is `0x500805f300083899`:

```
# fcmsutil /dev/td0 get remote all

Target N_Port_id is = 0x010700
Target state = DVS_READY
Symbolic Name =
Port Type = N_PORT
SLER Capable (supports Retry & TRID) = NO
Target Port World Wide Name = 0x500805f300083899
Target Node World Wide Name = 0x500805f300083890
```


The *LUN address* for a Fibre Channel device is a 64-bit LUNid. The LUNid is composed of two bits representing the addressing method, fourteen bits representing the LUN number of the device, and 48 reserved bits, as shown in the table:

Table 1-5

Addressing Method (2 bits)	LUN Number (14 bits)	Reserved (48 bits)
00 – Peripheral Device Addressing	0x00-0x3fff	0x00
01 – Volume Set Addressing (Flat Space Addressing)		
10 – Logical Unit Addressing		

Since the LUN address is printed in hexadecimal, the first hexadecimal digit contains both the addressing method and the start of the LUN number. For example, the first 16 bits of the LUN address 0x400f000000000000 is binary 010000000001111. The leading 01 is the addressing method (Volume Set Addressing, also known as Flat Space Addressing) and the remaining bits represent the LUN number (15). Thus, the LUN address 0x400f000000000000 represents LUN number 15, using the Flat Space Addressing method. You can perform this decoding using the `scsimgr` command to display the LUN's `lunid` attribute. For example:

```
# scsimgr get_attr -H 0/2/1/0.0x500805f300083899.0x400f000000000000 -a lunid

SCSI ATTRIBUTES FOR LUN PATH : 0/2/1/0.0x500805f300083899.0x400f000000000000

name = lunid
current =0x400f000000000000 (LUN # 15, Flat Space Addressing)
default =
saved =
```

The *legacy hardware path* format for Fibre Channel disks encodes the target port identifier and LUN id as virtual hardware elements. It has the following format:

```
HBA_path.domain.area.port.controller.target.lun
```

The *domain* represents the Fibre Channel switch, the *area* is the specific port on the Fibre Channel switch into which the target is plugged. The *domain*, *area*, and *port* values are extracted from the target port identifier as shown in the table:

Table 1-6

Domain (8 bits)	Area (8 bits)	Port (8 bits)
0-255	0-255	0-255

The *controller*, *target*, and *lun* values are extracted from the LUN id as shown in the table:

Table 1-7

Controller (7 bits)	Target (4 bits)	LUN (3 bits)
0-63	0-15	0-7

To convert a lunpath hardware path to a legacy hardware path, use the `scsimgr get_info` command on the target's hardware path to display the `port_id`, which contains the *domain*, *area*, and *port* values. Extract the *controller*, *target*, and *lun* values from the LUN id.

The following example uses lunpath hardware path `0/2/1/0.0x500805f300083899.0x4011000000000000`:

```
# scsimgr get_info -H 0/2/1/0.0x500805f300083899

STATUS INFORMATION FOR TARGET PATH : 0/2/1/0.0x500805f300083899

Generic Status Information

SCSI services internal state           = IDLE
Port id                                = 0x10700
Protocol                                = fibre_channel
Protocol revision                       = 4.3
Port name                                = 0x500805f300083899
Node name                                = 0x500805f300083890
LUN paths registered (active/inactive) = 12
```

A `port_id` of `0x10700` yields a *domain* value of 1, an *area* value of 7, and a *port* value of 0.

The LUN address of `0x4011000000000000`, which represents LUN id `0x11`, yields a *controller* value of 0, a *target* value of 2 and a *lun* value of 1.

The resultant legacy hardware path is `0/2/1/0.1.7.0.0.2.1`.

To confirm this mapping, use the `ioscan -m hwpath` command, as follows:

```
# ioscan -m hwpath -H 0/2/1/0.0x500805f300083899.0x4011000000000000

Lun H/W Path      Lunpath H/W Path                      Legacy H/W Path
=====
64000/0xfa00/0x4
                0/2/1/0.0x500805f300083899.0x4011000000000000 0/2/1/0.1.7.0.0.2.1
```

A Regulatory Information

FCC Statement (For U.S.A.)

Federal Communications Commission Radio Frequency Interference Statement

WARNING 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 might cause undesired operation.

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 instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Hewlett-Packard's system certification tests were conducted with HP-supported peripheral devices and cables, such as those received with your system. Changes or modifications to this equipment not expressly approved by Hewlett-Packard could void the user's authority to operate the equipment.

Canada

Warning: 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.

EMI (Australia and New Zealand)

This product meets the applicable requirements of the Australia and New Zealand EMC Framework.



VCCI (Japan) (PCI Card Only)

This equipment complies with the Class A category for information technology equipment based on the rules of Voluntary Control Council for Interference by Information Technology Equipment. When used in a residential area, radio interference may be caused. In this case, the user may be required to take appropriate corrective actions.

Figure A-1 VCCI Regulatory Statement

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。

EMI Statement (European Community)

NOTE This is a Class A product. In a domestic environment, this product may cause radio interference, in which case you may be required to take adequate measures.

Laser Safety Statements

Laser Safety Statements - U.S. FDA/CDRH - Optical (laser) Transceiver

CAUTION The optical transceiver provided on the network interface card contains a laser system and is classified as a “Class-I Laser Product” under a U.S. Department of Health and Human Services (DHHS) Radiation Performance standard according to the Radiation Control for Health and Safety Act of 1968. The Class I label and compliance statement are located on the optical transceiver.

To ensure proper use of this product, please read this instruction manual carefully and retain for future reference. Should the unit ever require maintenance, contact an authorized service location.

CAUTION Use of controls, adjustments or the performance procedures other than those specified herein may result in hazardous radiation exposure. To prevent direct exposure to laser beam, do not try to open the enclosure.

Laser Safety - European Union - Optical Transceiver Only


CAUTION The optical transceiver provided on the network interface card contains a laser system and is classified as a “Class 1 Laser Product” per EN 60825-1, Safety of Laser products. Class 1 laser products are considered safe and do not pose a biological hazard if used within the data sheet limits and instructions.

To ensure proper use of this product, please read this instruction manual carefully and retain for future reference. Should the unit ever require maintenance, contact an authorized service location.

CAUTION Use of controls, adjustments or the performance procedures other than those specified herein may result in hazardous radiation exposure. To prevent direct exposure to laser beam, do not try to open the enclosure.

There are no user serviceable parts nor any maintenance required for the optical transceiver. All adjustments are made at the factory before shipment to customers. Tampering with or any attempt to modify the optical transceiver will result in voided product warranty. It may also result in improper operation of the network card circuitry and possible overstress of the laser source. Device degradation or product failure may result.

A6795A Declaration of Conformity

DECLARATION OF CONFORMITY According to ISO/IEC Guide 22 and EN 45014	
Manufacturer's Name:	Hewlett-Packard Company Systems Interconnect Solutions Lab
Manufacturer's Address:	8000 Foothills Blvd. Roseville, CA 95747 USA
declares, that the product	
Product Name:	Dual Port 2Gbps/1Gbps Fibre Channel PCI-X BHA
Model Number(s):	A6826A
Product Options:	All
conforms to the following Product Specifications:	
Safety:	IEC 950:1991 + A1, A2, A3, A4 / EN 60950:1992 + A1, A2, A3, A4, A11 GB 4943-1995, IEC 825-1:1993/ EN60825-1:1994+A1, Class 1 Laser
EMC:	CISPR 22:1997 / EN 55022:1998 - Class A CNS 13438, GB 9254-1988, CFR47, Part 15 Class A CISPR 24:1997 / EN 55024:1998 IEC 61000-4-2 IEC 61000-4-3 / ENV 50204 IEC 61000-4-4 IEC 61000-4-6 IEC 61000-4-8
Supplementary Information:	
The product herewith complies with the requirements of the EMC Directive 89/336/EEC and carries the CE marking accordingly.	
1) The Product was tested in a typical configuration with Hewlett-Packard information technology equipment.	
	 ----- Tom Le, Hardware Engineer
Cupertino, CA, July, 2003	
European Contact: Your local Hewlett-Packard Sales and Service Office or Hewlett-Packard GmbH, Department HQ-TRE, Herrenberger Straße 130, D-71034 Böblingen (FAX: + 49-7031-14-3143)	