Intel® Fibre Channel Module HWFCM User's Guide

Order Number: D11925-001

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Important Safety Instructions

Important Safety Instructions

Read all caution and safety statements in this document before performing any of the instructions. See *Intel® Server Boards and Server Chassis Safety Information* at http://support.intel.com/support/motherboards/server/safecert.htm.

Wichtige Sicherheitshinweise

Lesen Sie zunächst sämtliche Warn- und Sicherheitshinweise in diesem Dokument, bevor Sie eine der Anweisungen ausführen. Beachten Sie hierzu auch die Sicherheitshinweise zu Intel-Serverplatinen und -Servergehäusen unter http://support.intel.com/support/motherboards/server/safecert.htm.

重要安全指导

在执行任何指令之前，请阅读本文档中的所有注意事项及安全声明。 和/或 http://support.intel.com/support/motherboards/server/safecert.htm 上的 *Intel Server Boards and Server Chassis Safety Information*（《Intel 服务器主板与服务器机箱安全信息》）。

Consignes de sécurité

Lisez attention toutes les consignes de sécurité et les mises en garde indiquées dans ce document avant de suivre toute instruction. Consultez *Intel Server Boards and Server Chassis Safety Information* rendez-vous sur le site http://support.intel.com/support/motherboards/server/safecert.htm.

Instrucciones de seguridad importantes

Lea todas las declaraciones de seguridad y precaución de este documento antes de realizar cualquiera de las instrucciones. Vea *Intel Server Boards and Server Chassis Safety Information* en http://support.intel.com/support/motherboards/server/safecert.htm.

⚠ WARNINGS

SERVER POWER ON/OFF: The push-button on/off power switch on the front panel of the server <u>does not</u> turn off the AC power. To remove AC power from the server, you must unplug the AC power cord from either the power supply or wall outlet.

HAZARDOUS CONDITIONS—POWER SUPPLY: Hazardous voltage, current, and energy levels are present inside the power supply enclosure. There are no user-serviceable parts inside it; servicing should only be done by technically qualified personnel.

HAZARDOUS CONDITIONS—DEVICES AND CABLES: Hazardous electrical conditions may be present on power, telephone, and communication cables. Turn off the server and disconnect telecommunications systems, networks, modems, and the power cord attached to the server before opening it. Otherwise, personal injury or equipment damage can result.

AVOID INJURY: Lifting the server chassis and attaching it to the rack is a two-person job. If needed, use an appropriate lifting device.

⚠ CAUTIONS

Temperature: The operating temperature of the server, when installed in an equipment rack, must not go below 5 °C (41 °F) or rise above 35 °C (95 °F). Extreme fluctuations in temperature can cause a variety of problems in your server.

Ventilation: The equipment rack must provide sufficient airflow to the front of the server to maintain proper cooling.

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About the Intel® Fibre Channel Module HWFCM

Technology Overview

Fibre Channel (FC) is a high-speed serial bus supporting its own, as well as several other upper-level protocols. The SCSI command set on top of the FC bus, as defined in the SCSI-FCP specification, is the most widely used implementation of the technology, but there are also specifications covering the HIPPI, ATM and IP protocols as well. The FCP-2 standard defines two physical interfaces for signaling, twisted-pair copper and optical cables.

As of this document, 1Gbps and 2Gbps devices are prevalent in the industry, with 4Gbps and 10Gpbs standards ratified but with few available devices. Products based on 1Gbps, 2Gbps and 4Gbps have been designed to be interoperable.

General Module Description

The Intel® Fibre Channel Module HWFCM is a PCI-X to Fibre Channel (FC) host bus adapter (HBA) designed for the Intel® Server Board SE8500HW4. The physical interface for this module was designed to take advantage of performance features on the Server Board SE8500HW4 and this special interface does not allow the module to be used in other server systems.

The Intel® Fibre Channel Module HWFCM is an intelligent, high-performance adapter with a Qlogic* ISP2322 FC controller, designed for high-end server systems. It combines a RISC processor with two 2Gbps transceivers, a 64-bit 133MHz PCI-X interface, and a Fibre Channel Protocol Manager (FPM). Both Private Loop Direct Attach (PLDA) and Fabric Loop Attach (FLA) devices are fully supported by the module. The Intel® Fibre Channel Module HWFCM operates at either 1Gbps (500 meter or less cables) or 2Gbps (300 meter or less cables).
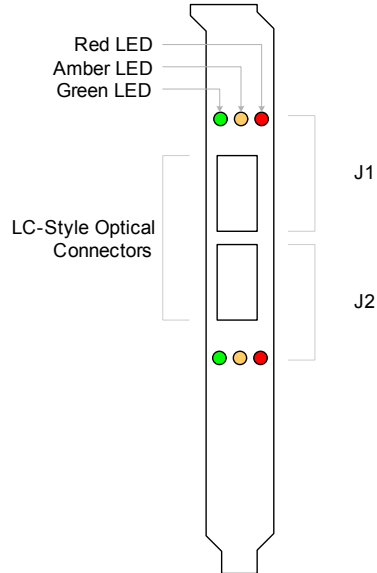
Module Components

Red LED
Amber LED
Green LED

J1

LC-Style Optical
Connectors

J2

Figure 1. Physical Interface (rear of module)

Table 1. Activity LED States

Activity	Green	Amber	Red
System powered off	Off	Off	Off
Prior to firmware initialization	On	Off	Off
Post firmware initialization OR Loss of sync	On	Off	On
1Gbps link established	One flash, every 4s	Off	Off
1Gbs activity	One flash, every 4s	On	Off
2Gbps link established	Two flashes, every 4s	Off	Off
2Gbs activity	Two flashes, every 4s	On	Off
Firmware error	Varies	Varies	On
Beacon*	Constant flash	Constant flash	Constant flash

* Beacon is used by the Qlogic* SANSurfer FC HBA Manager software to identify a specific adapter in the system.

Installation Procedure

This section contains simplified instructions for installing the Intel® Fibre Channel Module HWFCM into either the Intel® Server Platform SR6850HW4 or Intel® Server Platform SR4850HW4. Please refer to the Product Guide for your system for detailed instructions on removing and/or installing specific components, such as top covers, air baffles, etc. Always observe safety precautions, warnings, and cautions when working inside the system.

1. Turn off all peripheral devices connected to the system.
2. Power down the system and unplug all AC power cords.
3. Remove the top cover. For detailed instructions, see "Removing the Top Cover" in the Product Guide for your system.
4. Remove the memory board or memory board air baffle from Slot C. For detailed instructions, see "Cold Removal of Memory Board" in the Product Guide for your system.
5. Record the serial number of the Intel® Fibre Channel Module HWFCM in your "Equipment Log".
6. Open the PCI retention switch for the slot that will correspond to the location of the Intel® Fibre Channel Module HWFCM.
7. Remove the expansion slot filler panel, if present.
8. Taking care not to touch the components or the gold edge connectors on the card, remove the Intel® Fibre Channel Module HWFCM from its protective wrapper.
9. Align the Intel® Fibre Channel Module HWFCM with its mating slot on the main board and lower the card into position.
10. Press the card down firmly into its slot until it seats into position.
11. Close the PCI retention switch to secure the card in the slot.
12. Attach the required cables to the card.
13. Install the memory board or memory board air baffle into Slot C. For detailed instructions, see "Cold Insertion of a Memory Board" in the Product Guide for your system.
14. Install the top cover. For detailed instructions, see "Installing the Top Cover" in the Product Guide for your system.
15. Before booting the server, power on all connected external Fibre Channel devices.

Software

This section documents the on-board and operating system software of the Intel® Fibre Channel Module HWFCM.

Option ROM

Only enable the Option ROM if your primary boot device is attached to the Intel® Fibre Channel Module HWFCM in your server. During the first boot, you should see the following information displayed during POST:

```
QLogic Corporation
QLA2322 PCI Fibre Channel ROM BIOS Version x.xx   Subsystem
Vendor ID 8086
Copyright (C) QLogic Corporation 1993-2003 All rights reserved.
www.qlogic.com

Press <CTRL-Q> for Fast!UTIL

BIOS for Adapter 1 is disabled
QLogic adapter using IRQ number 11

Checking Adapter 0 Loop 10 125
No Fibre devices found!
ROM BIOS NOT INSTALLED
```

Other QLogic-based Fibre Channel cards installed in the system will load their option ROMs after this card is finished loading.

BIOS Flash Options

The `intcutil` utility is a Microsoft* DOS* utility that performs flash and NVRAM programming on QLogic-based HBAs. This section defines the command-line options for the `intcutil` utility and gives some examples of common usage. There are two types of command-line options available:

- BIOS flash options
- NVRAM options

In the following option examples, the variable *xxxx* indicates the HBA address. This address can be determined by typing in the following at the command line:

```
intcutil
```

Press <Enter> and information similar to the following will display on your screen:

```
NOVRAM and FLASH Programming Utility Version x.xx
QLA2322 Adapter found at I/O Address: 3000
QLA2322 Adapter found at I/O Address: 3200
…
```

`intcutil` Command-line Options

Table 2. `intcutil` BIOS Options

Parameter	Description
/F *xxxx*	Writes the BIOS flash at QLogic* HBA address *xxxx*. If no address is specified, the BIOS flash is written to all adapters. If the flash already contains a valid BIOS, the existing NVRAM defaults are preserved.
/O <filename.ext>	Specifies the BIOS binary file name. Use <filename.ext> instead of QLxxRXX.BIN.
/M	When used, no prompt displays for the I/O address.
/Q	Enables quiet mode, where no messages are displayed on the screen.
/C *xxxx*	Verifies the BIOS flash of the QLogic HBA at address *xxxx*. If no address specified, the BIOS flash is verified for all QLogic HBAs.
/S *xxxx*	Displays the QLogic HBA serial number at address *xxxx*. If no address is specified, then the serial numbers of all QLogic HBAs are displayed.
/T *xxxx*	Displays the QLogic HBA port name at address *xxxx*. If no address is specified, then the port names of all QLogic HBAs are displayed.
/U *xxxx*	Updates the NVRAM defaults (with the NVRAM files) in the BIOS at QLogic HBA address *xxxx*. If no address is specified, than the NVRAM defaults are updated for all HBAs. This option also updates the NVRAM. If the SSVID/SSID in the NVRAM files do not match those in the NVRAM, the NVRAM and the BIOS will not be updated.
/V *xxxx*	Displays the current BIOS version number of the QLogic HBAs at address *xxxx*. If no address is specified, then the BIOS version numbers of all QLogic HBAs are displayed.
/W *xxxx*	Copies the BIOS flash to file QL1xROM.SAV at QLogic HBA address *xxxx*.

Table 3. `intcutil` NVRAM Options

Parameter	Description
/D *xxxx*	Copies the NVRAM to file QL1xNVRM.SAV at QLogic HBA address *xxxx*.
/L *xxxx*	Writes the NVRAM at QLogic HBA address *xxxx*. If no address is specified, then the NVRAM is written to all HBAs.
/N <filename.ext>	Specifies the NVRAM file name. Use <filename.ext> instead of NVRMxxX.DAT.
/X *xxxx*	Verifies the NVRAM of the QLogic HBA at address *xxxx*. If no address is specified, then the NVRAM for all QLogic HBAs is verified.

`intcutil` Examples

The NVRAM can only be written/updated using the production options (`/p` and `/t`) under one of the following conditions:

- The QLogic HBA NVRAM is blank.
- The QLogic HBA has a subsystem vendor ID/subsystem ID (SSVID/SSID) that does not match IDs in the current NVRAM files.

Once the NVRAM has been initialized, the BIOS and NVRAM can be updated as described below.

The following examples apply to QLogic HBAs with valid BIOS and NVRAM contents.

To write the flash in all QLogic HBAs in a system without being prompted for the I/O address and not changing the current NVRAM settings, use:

```
intcutil /f
```

To write the NVRAM and change defaults in the BIOS, use:

```
intcutil /u
```

To write the NVRAM in all QLogic HBAs in a system without being prompted for the I/O address, use:

```
intcutil /l
```

To write the NVRAM using an NVRAM file with non-standard QLogic names, use:

```
intcutil /l /n <filename.ext>
```

Note: In the example above, the existing SSID/SSVID in the NVRAM must match those in the provided NVRAM files.

Operating System Driver Installation and Configuration

Refer to the `readme.txt` file included with the driver for specifics on operating system installation. Refer to Section 2, "Driver Parameters," in the Qlogic document, *Troubleshooting Guide 2-Gbps Fibre Channel Host Bus Adapters,* for information regarding driver parameters.

QLogic* SANSurfer* FC HBA Manager

The QLogic SANsurfer FC HBA Manager is a simple and easy-to-use device management tool for the installation, configuration, and management of QLogic-based HBAs. The software includes, but is not limited to: asset management, remote configuration, monitoring, physical identification (beacon), and loading of drivers onto multiple devices at one time.

The QLogic SANsurfer FC HBA Manager is compatible with QLogic's entire line of FC HBA products, enabling IT organizations to leverage their existing investment of QLogic FC HBAs. Unlike other HBA management applications, which require customers to use multiple applications and utilities to configure and manage HBAs, QLogic SANsurfer FC HBA Manager is a complete self-contained, all inclusive application that streamlines SAN management.

The QLogic SANsurfer FC HBA Manager is available on the QLogic web site and on the SANsurfer CD, which is a compilation of other QLogic applications, drivers, and interoperability resources. Refer to the reference section of this document for specific URLs.

Operating System Events and Error Logging

Refer to Section 5, "Translating Event and Error Logs," in the Qlogic document, *Troubleshooting Guide 2-Gbps Fibre Channel Host Bus Adapters,* for information regarding operating system events and error logging.

Specifications

Host Bus Interface Specifications

- Bus interface: 266 MHz PCI-X*
- Memory:
  - 1MB SRAM per port
  - 1MB flash
  - 4Kb NVRAM

Fibre Channel Specifications

- Data rate: 1Gps or 2Gps auto-negotiation
- Topology: FC-AL, FC-AL-2, FC-P2P, FC-SW (FL_Port and F_Port)
- Class of service: Class 3 FC
- Protocol: SCSI-FCP, IP, FC-TAPE
- Buffer credits: 3 credits available per port (2,112 byte frame payload)

Physical Specifications

- Ports: 2
- Media: multi-mode optical
- Optics: short-wave laser
- Form factor: custom to Intel® Server Platform SR4850HW4 and Intel® Server Platform SR6850HW4
- Bracket size: standard size
- Connectors: LC-style optical connectors that support non-OFC, multi-mode fibre optic cabling using small form factor optical transceiver modules

Environmental and Equipment Specifications

- Airflow: none required.
- Temperature:
  - Operating: 10°C to 35°C
  - Storage: -20°C to 70°C
- Non-Operating Humidity: 90% non-condensing relative humidity at 35ºC
- Power dissipation: 11.5W
- Cable distance:
  - 1Gbps: 500 meters 50/125 μm multi-mode fiber, 300 meters 6.25/125 μm multi-mode fiber
  - 2Gbps: 300 meters 50/125 μm multi-mode fiber, 150 meters 6.25/125 μm multi-mode fiber
- Cable: 50/125 μm or 62.5/125 μm multi-mode fiber

Software

- Applications: Qlogic* SANsurfer FC HBA Manager, Qlogic SANsurfer FC CLI
- Utilities: flash update for firmware, boot code and NVRAM
- Drivers: Microsoft* Windows* Server 2003 Enterprise Edition, Microsoft* Windows* 2000 Advanced Server; Red Hat* Linux AS 3.0; SuSE* Linux Enterprise Server 8, 9; Novell* NetWare* 6.5
- Compliance: SNIA HBA API V2, SMI-S, FC-SP/DH-CHAP, FDMI

The transceivers on this product are Class I laser products. They comply with IEC 825-1 and FDA 21 CFG 1040.10 and 1040.11. The transceivers must be operated under recommended operating conditions.

CLASS I LASER PRODUCT

Luokan 1 Laserlaite
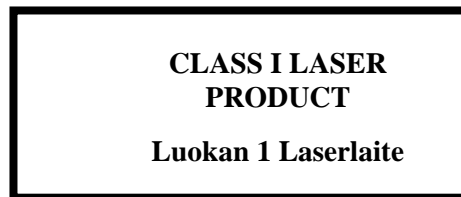
Laser Safety

FDA Notice:

- This product complies with DHHS Rules 21CFR Chapter I, Subchapter J
  - This product has been designed and manufactured according to IEC60825-1 on the safety label of laser product
- Class 1 Laser Product
  - Appareil A Laser De Classe 1
  - Laser Klasse 1 Nach IEC 60825-1
  - Luokan 1 Laserlaite
- Caution-Class 1 laser radiation when open
  - Do not view directly with optical instruments
- Attention-Radiation laser de classe 1
  - Ne pas regarder directement avec des instruments optiques
- Vorsicht—Laserstrahlung der Klasse 1 bei geöffneter Abdeckung
  - Direktes Ansehen mit optischen Instrumenten vermeiden
- Varoitus—Luokan 1 lasersäteilyä, kun laite on auki
  - Älä katso suoraan laitteeseen käyttämällä optisia instrumentteja

Additional References

Refer to the following documents for additional information:

ANSI INCITS 350-2003, SCSI Fibre Channel Protocol - 2 (FCP-2).

Troubleshooting Guide 2-Gbps Fibre Channel Host Bus Adapters (available from http://download.qlogic.com/manual/17851/FC0056702-00A.pdf)

QLogic SANSurfer Management Suite CDROM (available from http://www.qlogic.com/products/sanmgmnt/sansurfer_tool.asp)