IBM Flex System FC3172 2-port 8Gb FC Adapter

IBM

User's Guide

IBM Flex System FC3172 2-port 8Gb FC Adapter

User's Guide

Note: Before using this information and the product it supports, read the general information in Appendix B, "Notices" on page 29, the *Safety Information* and *Environmental Notices and User Guide* documents on the *IBM Flex System Notices for Network Devices* CD, and the *Warranty Information* document that comes with the product.

Contents

Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الآمنية

Antes de instalar este produto, leia as Informações de Segurança.

在安装本产品之前，请仔细阅读 Safety Information
（安全信息）。

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

Ennen kuin asennat tämän tuotteen, lue turvaohjeet kohdasta Safety Information.

Avant d'installer ce produit, lisez les consignes de sécurité.

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

Πριν εγκαταστήσετε το προϊόν αυτό, διαβάστε τις πληροφορίες ασφάλειας
(safety information).

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

Prima di installare questo prodotto, leggere le Informazioni sulla Sicurezza.

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

Пред да се инсталира овој продукт, прочитајте информацијата за безбедност.

Les sikkerhetsinformasjonen (Safety Information) før du installerer dette produktet.

Przed zainstalowaniem tego produktu, należy zapoznać się
z książką "Informacje dotyczące bezpieczeństwa" (Safety Information).

Antes de instalar este produto, leia as Informações sobre Segurança.

Перед установкой продукта прочтите инструкции по
технике безопасности.

Pred inštaláciou tohto zariadenia si pečítaje Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

Antes de instalar este producto, lea la información de seguridad.

Läs säkerhetsinformationen innan du installerar den här produkten.

Statement 1:

DANGER

Electrical current from power, telephone, and communication cables is hazardous.

To avoid a shock hazard:

- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**

- **Connect all power cords to a properly wired and grounded electrical outlet.**

- **Connect to properly wired outlets any equipment that will be attached to this product.**

- **When possible, use one hand only to connect or disconnect signal cables.**

- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**

- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**

- **Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.**

To Connect:	To Disconnect:
1. Turn everything OFF.	1. Turn everything OFF.
2. First, attach all cables to devices.	2. First, remove power cords from outlet.
3. Attach signal cables to connectors.	3. Remove signal cables from connectors.
4. Attach power cords to outlet.	4. Remove all cables from devices.
5. Turn device ON.	

Chapter 1. IBM Flex System FC3172 2-port 8Gb FC Adapter

This User's Guide contains instructions for installing your IBM Flex System™ FC3172 2-port 8Gb FC Adapter in an IBM Flex System compute node.

This document contains information and instructions for installing the adapter, updating the firmware, and solving problems. See the documentation that came with your IBM® compute node to install the adapter; then, return to this *User's Guide* for the information and instructions needed to complete the installation.

For information about the types of compatible devices available for IBM products, contact your IBM marketing representative or authorized reseller. For a list of supported optional devices, see http://www.ibm.com/servers/eserver/serverproven/compat/us/.

For the most up-to-date product documentation for all of your IBM Flex System products, go to the IBM Flex System Information Center at http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp.

Note:

1. Changes are made periodically to the IBM website. Procedures for locating firmware and documentation might vary slightly from what is described in this document.

2. The illustrations in this document might differ slightly from your hardware.

3. The screens that are described or referenced in this document might differ slightly from the screens that are displayed by your system. Screen content varies according to the type of IBM chassis and the firmware versions and options that are installed.

Related documentation

In addition to this *User's Guide*, the following documentation is available.

- *IBM Flex System Network Devices Basic Troubleshooting Information*

  This document is provided on the *IBM Flex System Notices for Network Devices* CD, and it contains basic troubleshooting information for your adapter.

- *IBM Flex System Enterprise Chassis Installation and Service Guide*

  This document is provided on the documentation CD for the chassis, and provides information about setting up, configuring, and troubleshooting the chassis and its components.

- *IBM Flex System Installation and Service Guide* for your IBM Flex System Compute Node

  This document is provided on the documentation CD for the compute node, and provides basic instructions for installing the adapter in the compute node.

- *Safety Information*

  This document, provided on the *IBM Flex System Notices for Network Devices* CD, contains translated caution and danger statements. Each caution and danger statement in the documentation has a number that you can use to locate the corresponding statement in your language in the *Safety Information* document.

- *Environmental Notices and User Guide*

  This document is provided on the *IBM Flex System Notices for Network Devices* CD, and it contains translated environmental notices.

- *License Agreement for Machine Code*

  This multilingual document is provided on the *IBM Flex System Notices for Network Devices* CD and it contains the IBM License Agreement for Machine Code for this product.

- *Warranty Information*

  This document, provided on the *IBM Flex System Notices for Network Devices* CD, contains warranty information for your adapter. A printed version is also included with your adapter.

- *Important Notices*

  This multilingual document provides the safety, environmental, and emission notices for your product that are required in printed format.

Notices and statements in this document

The caution and danger statements used in this document are also in the multilingual *Safety Information* document provided on the *IBM Flex System Notices for Network Devices* CD.

Each caution and danger statement is numbered for reference to the corresponding statement in the *Safety Information* document.

The following types of notices and statements are used in this document:

- **Note:** These notices provide important tips, guidance, or advice.

- **Important:** These notices provide information or advice that might help you avoid inconvenient or problem situations.

- **Attention:** These notices indicate possible damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.

- **Caution:** These statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure step or situation.

- **Danger:** These statements indicate situations that can be potentially lethal or extremely hazardous to you. A danger statement is placed just before the description of a potentially lethal or extremely hazardous procedure step or situation.

Fibre Channel overview

Fibre Channel technology is outlined in the SCSI-3 Fibre Channel Protocol (SCSI-FCP) standard. Fibre Channel is a high-speed data transport technology used for mass storage and networking.

By adding Fibre Channel adapters to the compute nodes and Fibre Channel-compatible switches or pass-thru modules to the chassis, you can attach the compute node to an external-storage area network (SAN) through the external 8 Gbps (Gigabits per second) optical ports on the I/O modules. The Fibre Channel adapter provides up to 16 Gb of full-duplex bandwidth per port.

Features and specifications

The adapter has the following features:

- *Fast!*UTIL basic input/output system (BIOS) utility program to customize the configuration parameters on the adapter and attached drives
- Support for Fibre Channel protocol SCSI (FCP-SCSI) and Fibre Channel Internet protocol (FCP-IP)
- Support for point-to-point fabric connection (F-port fabric login)
- Support for Fibre Channel service (classes 2 and 3)
- Extensible Firmware Interface (EFI) Configuration Utility
- Support for FCODE
- Support for IBM Open Fabric Manager (OFM)

The adapter has the following specifications:

Table 1. Fibre Channel adapter specifications

Type	Specification
Fiber Channel specifications	- Bandwidth: 8 Gb per second maximum at half-duplex and 16 Gb per second maximum at full-duplex per port - Support for both FCP-SCSI and IP protocols - Support for point-to-point fabric connections: F-Port Fabric Login - Support for Fibre Channel Arbitrated Loop (FCAL) public loop profile: Fibre Loop-(FL-Port)-Port Login - Support for Fibre Channel services class 2 and 3 - Support for FCP SCSI initiator and target operation - Support for full-duplex operation
Processor	Single-chip design with two completely independent 8 Gb serial Fibre Channel ports. Each port provides: - RISC processor - Integrated serializer/deserializer - Receive direct memory access (DMA) sequencer - Frame buffer - Five-channel DMA controller
Host data transfer	64-bit, 100 MHz bus-master DMA data transfers to 800 MB per second
RAM	1 MB sync burst SRAM per channel supporting parity protection
BIOS ROM	BIOS ROM 1 MB of flash memory (the flash is field programmable)
NVRAM	NVRAM 512 bytes, field programmable
Onboard DMA	Five-channel DMA controller for each port: transmit, receive, command, auto-request, and auto-response
Frame buffer FIFO	Integrated 4 KB transmit and 6 KB receive frame buffer First In First Out (FIFO) for each data channel
Dimensions	Approximately 8.4 cm × 5.3 cm (3.31 in. × 2.09 in.)
Operating power	Approximately 10 watts

Chapter 2. Installing the adapter

This chapter provides information for installing the adapter in a compute node or expansion unit, installing drivers, and configuring and managing the adapter.

See the following IBM Flex System documentation for additional information:

- The *Installation and Service Guide* for your compute node provides the hardware installation instructions for the adapter.

- The *Installation and Service Guide* for the chassis provides the hardware installation instructions for the switches and pass-thru modules.

- The *User's Guide* for your switch or pass-thru module has installation and configuration instructions for the adapter.

Installation guidelines

Before you begin installing the adapter in your compute node, read the safety information beginning on page ix and the guidelines in "Handling static-sensitive devices" on page 5. This information will help you work safely with your compute node and options.

Refer to the chassis, compute node, and network device documentation for the instructions to perform and manage system code updates. The most up-to-date versions of these documents are available at http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp.

Note: If I/O modules are installed in both I/O-module bays, both I/O modules must be of the same type. Installing a second I/O module in the chassis provides a backup I/O module in case one I/O module fails.

Handling static-sensitive devices

Attention: Static electricity can damage electronic devices, including your compute node. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them.

To reduce the possibility of damage from electrostatic discharge, observe the following precautions:

- When you work on a chassis that has an electrostatic discharge (ESD) connector, use a wrist strap when you handle modules, optional devices, or compute nodes. To work correctly, the wrist strap must have a good contact at both ends (touching your skin at one end and firmly connected to the ESD connector on the front or back of the chassis).

- Limit your movement. Movement can cause static electricity to build up around you.

- Handle the device carefully, holding it by its edges or its frame.

- Do not touch solder joints, pins, or exposed circuitry.

- Do not leave the device where others can handle and damage it.

- While the device is still in its static-protective package, touch it to any unpainted metal surface of the chassis or any unpainted metal surface on any other grounded component in the rack you are installing the device in for at least 2 seconds. (This drains static electricity from the package and from your body.)
- Remove the device from its package and install it directly into the compute node without setting down the device. If it is necessary to set down the device, place it back into its static-protective package. Do not place the device on your compute node cover or on a metal surface.
- Take additional care when handling devices during cold weather. Heating reduces indoor humidity and increases static electricity.

Installing the adapter

See the documentation that came with your IBM compute node for the instructions to install the adapter; then, return to this *User's Guide* for the instructions to configure the adapter.

Configuring the adapter

This section provides information on configuring the adapter using the following:

- Using Fast!UTIL
- Using EFI

Using *Fast!*UTIL

This section provides detailed configuration information for advanced users who want to customize the configuration of the adapter when it is installed in a chassis compute node. You can configure the adapter using the *Fast!*UTIL utility.

Starting *Fast!*UTIL

Start or restart the compute node. To access *Fast!*UTIL, press Ctrl + Q during the adapter BIOS initialization (it might take a few seconds for the *Fast!*UTIL menu to be displayed). The adapter has dual adapter ports that can be configured separately with *Fast!*UTIL. After changing the settings that are described in the "Using the Configuration Settings menu" section, *Fast!*UTIL restarts the compute node to enable the new parameters.

Important: If the configuration settings are incorrect, the adapter might not function properly. Do not modify the default configuration settings unless you are instructed to do so by an IBM support representative or in these installation instructions.

Using the Configuration Settings menu

Note: For information about Remote Boot options, contact your IBM technical support representative or review the documentation that came with your compute node or storage-expansion unit, available at http://www.ibm.com/supportportal/.

Use the options described in this section to configure the adapter. The **Configuration Settings** menu displays several options that you can use to configure your adapter. This section describes the following information:

- Selecting the adapter
- Configuring the adapter
- Configuring the selectable boot settings
- Restoring default settings

- Accessing Raw NVRAM data
- Configuring advanced adapter settings
- Scanning for Fibre Channel devices

Selecting the adapter

Use this option to select, configure, or view either of the two I/O-port addresses on the adapter.

Configuring the adapter

To configure the adapter, select **Host Adapter Settings**.

The default settings and the modifiable settings for the adapter are listed in Table 2 and are described in this section. The adapter is always point-to-point connected in the compute node or expansion unit with an I/O module that supports Fibre Channel operation.

Note: The adapter settings and default values will vary, based on the version of BIOS code installed for the adapter.

Table 2. Modifiable adapter settings

Setting	Options	Default
Host adapter BIOS	Enabled or disabled	Disabled
Frame size	512, 1024, 2048	2048
Loop reset delay	Unavailable	N/A
Adapter hard loop ID	Unavailable	N/A
Hard loop ID	Unavailable	N/A
Spin up delay	Enabled or disabled	Disabled
Connection Options	0, 1, 2	1
Fibre Channel tape support	Enabled or disabled	Enabled
Data rate	1, 2, 3, 4	2

- **Host adapter BIOS:** When this option is disabled, the read-only memory (ROM) BIOS code on the adapter is disabled, freeing space in upper memory.

- **Frame size:** This setting specifies the maximum frame length supported by the adapter: **512**, **1024**, or **2048**.

- **Loop reset delay:** This option is unavailable.

- **Adapter hard loop ID:** This option is unavailable.

- **Hard Loop ID:** This option is unavailable.

- **Spin up delay:** When this option is enabled, the BIOS code waits up to 5 minutes to discover the first drive, which allows time for the BIOS code to become operational.

- **Connection options:** Table 3 defines the connection (loop or point-to-point) preference.

Table 3. Adapter connection and data rate options

Option	Type of connection
0	Loop only
1	Point-to-point only
2	Loop preferred; otherwise, point-to-point

Note: See the device-driver installation instructions for the required operating system-specific modifications to the NVRAM. There are specific adapter settings that you cannot modify. Table 4 describes these settings and gives examples.

Table 4. Non-modifiable settings for the adapter and examples

Setting	Example
BIOS address	CD400
BIOS revision	1.04
Adapter serial number	E59719
Interrupt level	3
Adapter port name	210000096B07C703

- **BIOS address:** The BIOS address is the adapter I/O address where the BIOS code is stored when you press Ctrl + Q. This is the address of the BIOS code in ROM shadow memory.

- **BIOS revision:** The BIOS revision is the revision number of the installed BIOS code on the adapter.

- **Adapter serial number:** This number is for manufacturing use only. It does not correlate to external labels or to the adapter-port name of the adapter.

- **Interrupt level:** The interrupt level is the interrupt used by the adapter. The interrupt level can change when the operating system is installed.

- **Adapter port name:** The adapter-port name is the worldwide-port name of the adapter.

- **Fibre Channel tape support:** This setting is reserved for Fibre Channel tape support.

- **Data rate:** This rate determines the data rate for the adapter.

Table 5. Adapter data rates

Option	Data rate
1	2 Gbps
2	Auto Select
3	4 Gbps
4	8 Gbps

Configuring the selectable boot settings

To configure the selectable boot settings, select Selectable Boot Settings. For more information about boot settings, contact your IBM technical support representative.

Restoring default settings

This option is in the Configuration Settings menu. It restores the adapter default NVRAM settings.

Accessing Raw NVRAM data

This option displays the adapter NVRAM contents in hexadecimal format. This is a troubleshooting tool; you cannot modify the data.

Configuring advanced adapter settings

Use this option to view and modify advanced adapter settings.

Table 6. Advanced adapter settings

Setting	Options	Default
Execution throttle	1 - 65535	65535
LUNs per target	0, 8, 16, 32, 64, 128, 256	256
Enable LIP reset	Yes or No	No
Enable LIP full login	Yes or No	Yes
Enable target reset	Yes or No	Yes
Login retry count	0 - 255	8
Port down retry count	0 - 255	30
Operation mode	0, 5, 6	Interrupt for every I/O completion
Interrupt delay	0 - 255	0

- **Execution throttle:** This setting specifies the maximum number of commands that can run on any one port. When a port reaches its execution throttle, *Fast!*UTIL does not run new commands until the current command is completed.

- **LUNs per target:** This setting specifies the number of logical unit numbers (LUNs) per device. Multiple LUN support is typically for redundant array of independent disk (RAID) enclosures that use LUNs to map drives.

- **Enable LIP reset:** This setting determines the type of loop initialization process (LIP) reset that is used when the operating system initiates a bus reset routine. When this option is set to Yes, the device driver initiates a global LIP reset to clear the target device reservations. When this option is set to No, the device driver initiates a global LIP reset with full login.

- **Enable LIP full logon:** This setting instructs the application specific integrated circuit (ASIC) chip to log in to all ports after any LIP.

- **Enable target reset:** This setting enables the device drivers to issue a Target Reset command to all devices on the loop when a SCSI Bus Reset command is issued.

- **Login retry count:** This setting specifies the number of times the software tries to log in to a device.

- **Port down retry count:** This setting specifies the number of times the software retries a command to a port that is returning port-down status.

- **Operation mode:**

Table 7. Adapter operation modes

Option	Operation mode
0	Interrupt for every I/O completion
5	Interrupt when Interrupt delay timer expires
6	Interrupt when Interrupt delay timer expires or no action

- **Interrupt delay:** This setting contains the value (in 100-microsecond increments) used by a timer to set the wait time between accessing a set of handles and generating an interrupt using direct memory access (DMA).

Scanning for Fibre Channel devices

Use this option to scan and list all the connected devices. Information about each device is listed; for example, vendor name, product name, and revision. This information is useful when you are configuring the adapter and attached devices.

Using the Fibre Channel disk utility

This option scans the Fibre Channel loop and lists all the connected devices by loop ID. You can select a Fibre Channel hard disk and do one of the following tests:

- Perform a low-level format
- Verify the disk media
- Verify the disk data (Some targets do not support this feature.)
- Select a disk device

Attention:
Performing a low-level format destroys all data on the disk.

Performing a loopback data test

The following internal loopback tests are supported:

- Internal 1-bit loopback data test
- Internal 10-bit loopback data test
- Mailbox loopback data test

Exiting *Fast!*UTIL

After you complete the configuration, select Exit*Fast!*UTIL to exit the *Fast!*UTIL menu and restart the compute node.

Using EFI

This section provides information for customizing the configuration of the adapter when it is installed in an EFI-based compute node. You can configure the adapter using the EFI Configuration utility, which provides features for the EFI environment that are similar to the *Fast!*Util utility.

Perform these steps to launch the EFI Configuration Utility:

1. Start or restart the compute node.

2. Press **F1**.

3. Select **System Settings**.

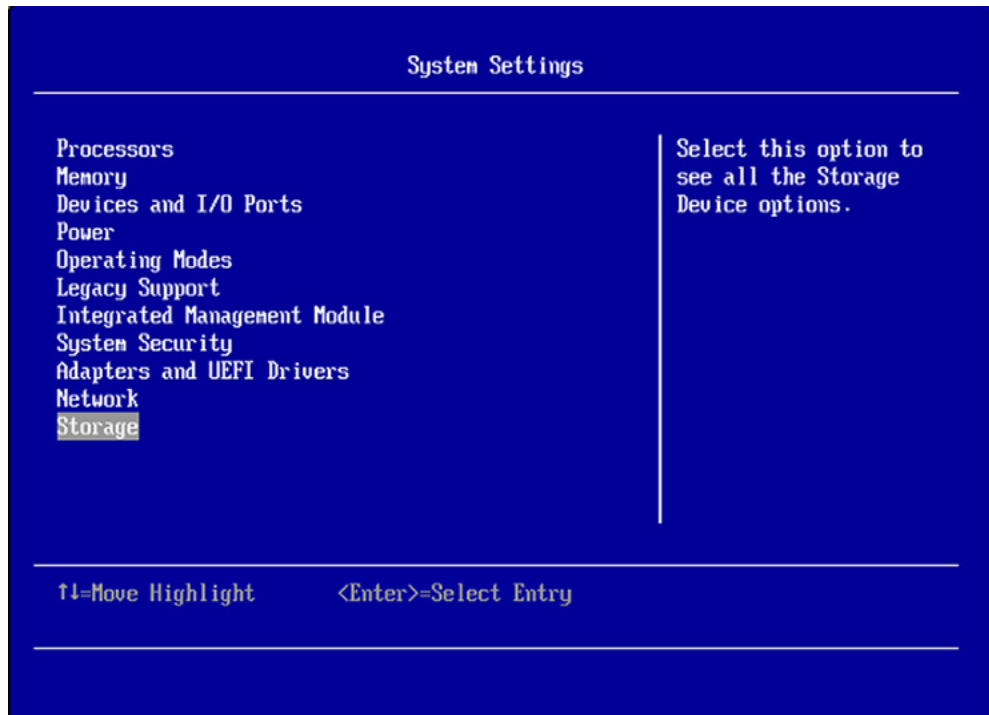   The System Settings screen appears, as shown in Figure 1.

   System Settings

   Processors   Select this option to
   Memory   see all the Storage
   Devices and I/O Ports   Device options.
   Power
   Operating Modes
   Legacy Support
   Integrated Management Module
   System Security
   Adapters and UEFI Drivers
   Network
   Storage

   ↑↓=Move Highlight   <Enter>=Select Entry

Figure 1. System Settings Screen of EFI

4. Select **Storage**.

   The Storage screen displays a list of all adapters in the system, as in Figure 2.

   Storage

   LSI Corp SAS2 MPT Controller   Select to enter FC
   IBM Flex System FC3172 2-port 8Gb FC Adapter-Port   Adapter HII
   1   Configuration menu
   IBM Flex System FC3172 2-port 8Gb FC Adapter-Port
   2

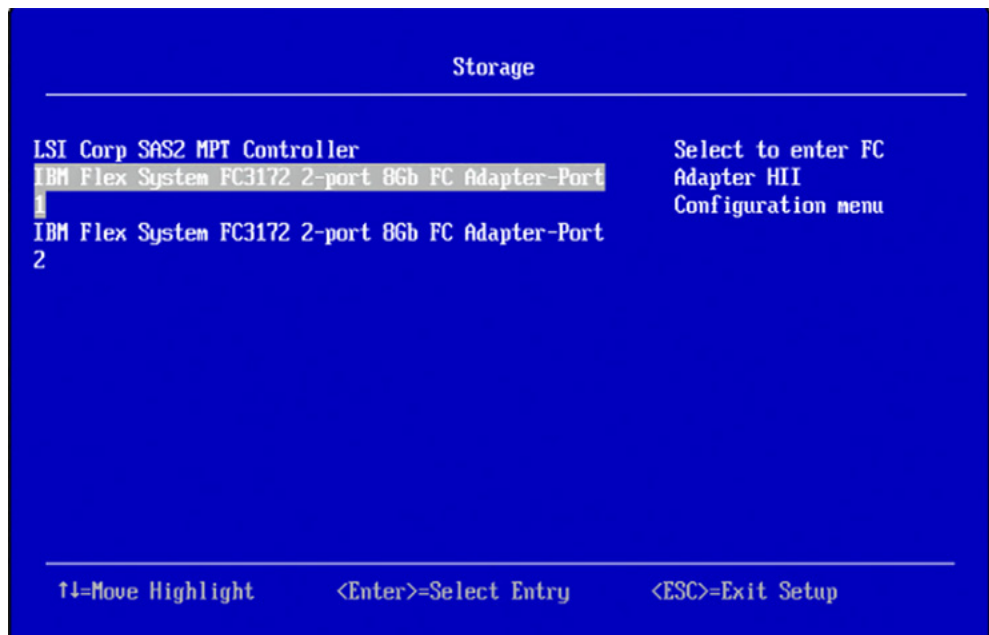   ↑↓=Move Highlight   <Enter>=Select Entry   <ESC>=Exit Setup

Figure 2. Storage Screen of EFI

5. Using the up/down arrows on your keyboard, select the adapter and port to be configured, then press Enter.

   The Adapter Configuration Main Menu appears, as shown in Figure 3.

Figure 3. Adapter Configuration Main Menu

6. The Main Menu lists the following configuration options:
   - Edit Adapter Settings
   - Edit Advanced Settings
   - Fibre Devices
   - Add Boot Device
   - Delete Boot Device
   - Edit Boot Settings
   - Adapter Info

   Use the arrow keys to navigate through the menu. When the option you want is highlighted, press Enter to select it.

   After you select an option, a screen displays the associated settings and their current values.

   To change the value of a setting on any of these screens:

   1. Use the up/down arrow keys to move through the settings until the one you want is highlighted. Press Enter.

   2. Either type the requested information, or scroll through the list to select the appropriate value. Press Enter.

      The screen is refreshed with the new value.

   3. To change additional settings, return to step 1.

   4. Save the change(s) by selecting **Save Changes** and then pressing Enter.

   To exit the Main Menu, select **Exit from Main Menu**.

Edit Adapter Settings

The Edit Adapter Settings screen, (Figure 4) allows you to configure the basic settings of the currently selected adapter.
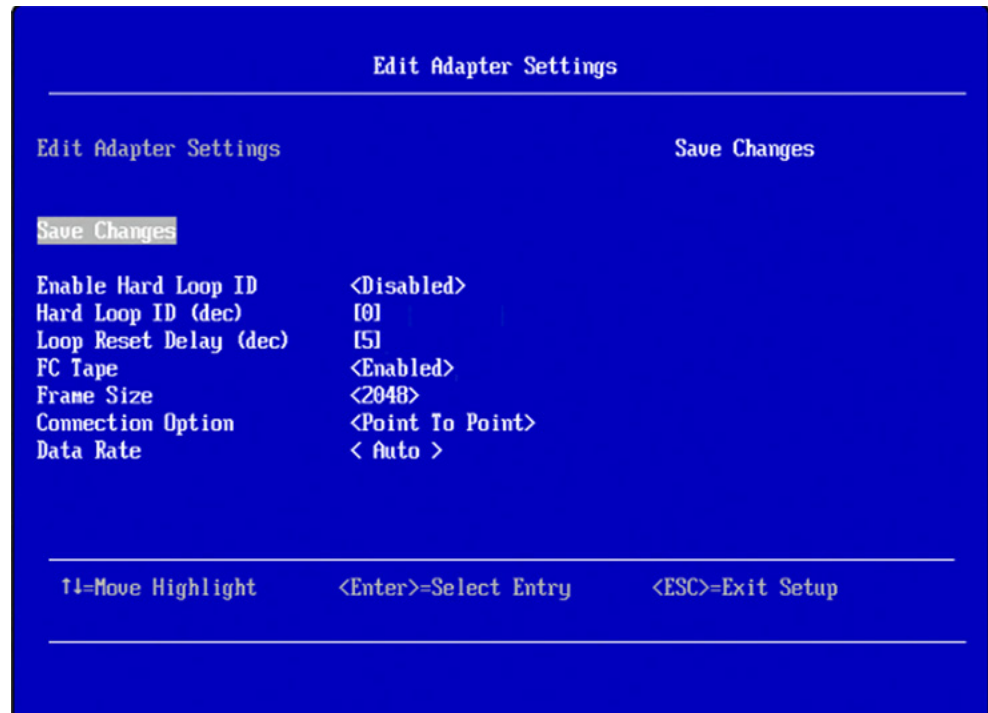
```
                          Edit Adapter Settings
    _____

    Edit Adapter Settings                             Save Changes


    Save Changes

    Enable Hard Loop ID        <Disabled>
    Hard Loop ID (dec)         [0]
    Loop Reset Delay (dec)     [5]
    FC Tape                    <Enabled>
    Frame Size                 <2048>
    Connection Option          <Point To Point>
    Data Rate                  < Auto >


    _____

      ↑↓=Move Highlight      <Enter>=Select Entry    <ESC>=Exit Setup
    _____
```

Figure 4. Edit Adapter Settings Screen of EFI

The settings on this screen include the following:

- **Enable Hard Loop ID:** If this setting is **Enabled**, the adapter will attempt to use the Loop ID specified in the `Hard Loop ID` setting. The default is **Disabled**.

- **Hard Loop ID:** If the Enable Hard Loop ID setting is enabled, the adapter attempts to use the Loop ID specified in this setting. Legal values for this setting are **0–125**. The default is **0**.

- **Loop Reset Delay:** After resetting the loop, the firmware refrains from initiating any loop activity for the number of seconds specified in this setting. The valid range of values for this setting is **0–255**. The default is **5**.

- **FC Tape:** This enables or disables FCP-2 recovery. The default is **Enabled**.

- **Frame Size:** This setting specifies the maximum frame length supported by the adapter: **512**, **1024**, or **2048**. The default is **2048**.

- **Connection Option:** This setting defines the type of connection:
  - **Loop Only**
  - **Point To Point**
  - **Loop Preferred, Otherwise Point To Point** (**default**)

- **Data Rate:** This setting determines the Fibre Channel data rate, which is one of the following: **2 Gb/s**, **Auto**, **4 Gb/s**, and **8 Gb/s**. The default is **Auto**.

To exit the Edit Adapter Settings screen, select **Back to Main Menu**.

Edit Advanced Settings

The Edit Advanced Settings screen (Figure 5) allows you to configure the advanced settings of the currently selected adapter.
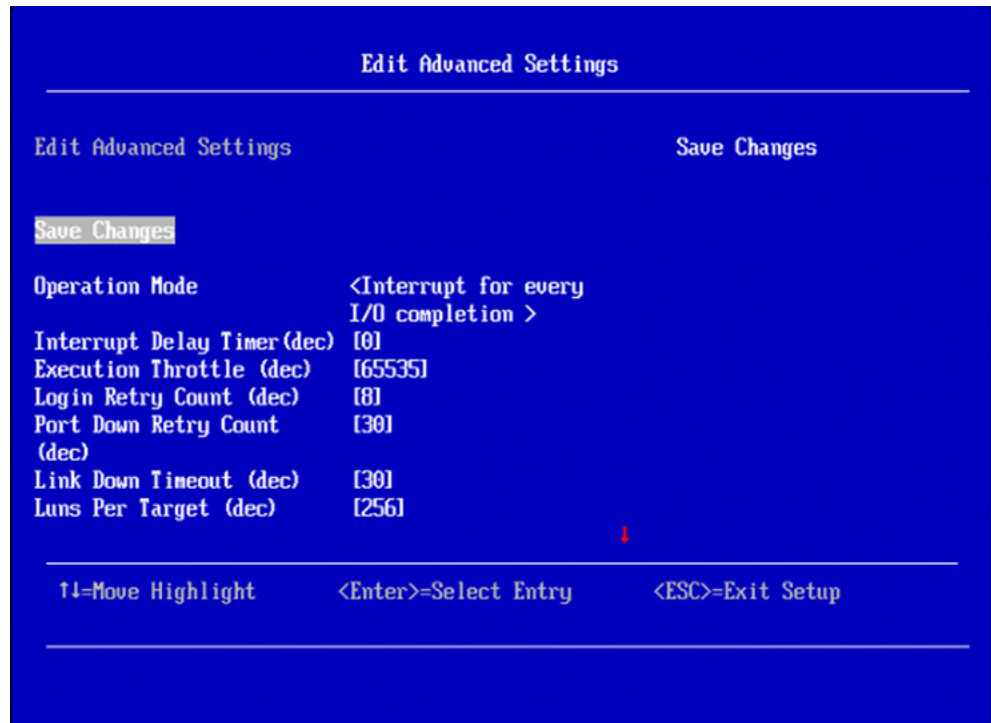

Figure 5. Edit Advanced Settings Screen of EFI

The settings on this screen include the following:

- **Operation Mode:** This setting specifies the reduced operation (RIO) modes, if supported by the software driver. RIO modes allow posting multiple command completions in a single interrupt. The default is `Interrupt for every I/O completion`.

- **Interrupt Delay Timer:** This setting contains the value (in 100-microsecond increments) used by a timer to set the wait time between accessing (DMA) a set of handles and generating an interrupt. The default is `0`.

- **Execution Throttle:** This setting specifies the maximum number of commands executing on any one port. When a port's execution throttle is reached, no new commands are executed until the current command finishes executing. The default is `65535`.

- **Login Retry Count:** This setting specifies the number of times the software tries to log into a device. The default is `8`.

- **Port Down Retry Count:** This setting specifies the number of seconds the software retries a command to a port returning port down status. The default is `30`.

- **Link Down Timeout:** This setting specifies the number of seconds the software waits for a link to come up. The default is `30`.

- **Luns Per Target:** This setting specifies the number of LUNs per target. Multiple LUN support is typically used for RAID boxes that use LUNs to map drives. The default is `256`.

- **Enable LIP Reset:** This setting determines the type of loop initialization process (LIP) reset that is used when the operating system initiates a bus reset routine. When this is set to `Yes`, the driver initiates a global LIP reset to clear the target device reservations. When this is set to `No`, the driver initiates a global LIP reset with full login. The default is `No`.

- **Enable LIP Full Login:** This setting instructs the ISP chip to log in again to all ports after any LIP. The default is `Enabled`.

- **Enable Target Reset:** This setting enables the drivers to issue a Target Reset command to all devices on the loop when a SCSI Bus Reset command is issued. The default is `Enabled`.

Note:

Adding or deleting a target/LUN requires a reboot for changes to take effect.

Fibre Devices

The Fibre Devices screen (Figure 6) displays a list of discovered targets. This screen is read-only; there are no user-configurable settings on this screen.
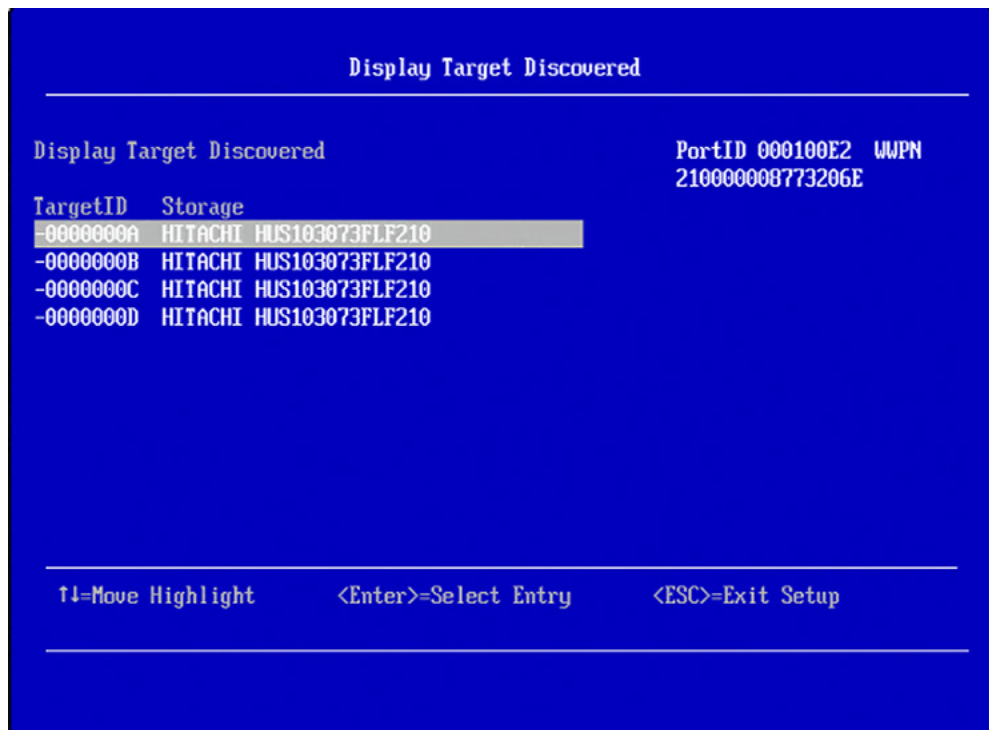

Figure 6. Fibre Devices Screen of EFI

Add Boot Device

The Add Boot Device screen (Figure 7), lets you add a boot device for the currently selected adapter. The screen initially displays a list of targets that can be added.
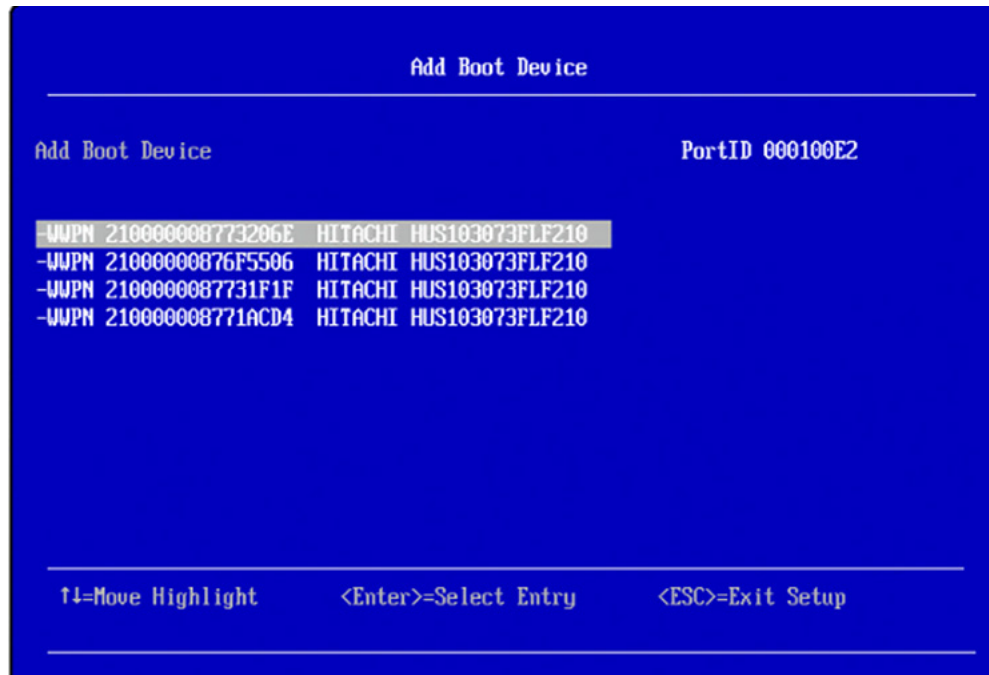
```
                          Add Boot Device
_____

Add Boot Device                                    PortID 000100E2


-WWPN 210000008773206E   HITACHI HUS103073FLF210
-WWPN 21000000876F5506   HITACHI HUS103073FLF210
-WWPN 210000008773I1F1F  HITACHI HUS103073FLF210
-WWPN 210000008771ACD4   HITACHI HUS103073FLF210






_____

  ↑↓=Move Highlight      <Enter>=Select Entry      <ESC>=Exit Setup
```

Figure 7. Add Boot Device Screen of EFI

Follow these steps to add a boot device:

1. Select a target from the list and press Enter.

2. A list of LUNs attached to the target is displayed.

3. Select the LUN you want to add and press Enter.

4. Select **Commit Changes** and press Enter.

Note:

You can add a maximum of four targets from the list. If four targets are already selected and you want to add a new target to the list, you must delete a previously added target using the Delete Boot Device screen. For more information, refer to "Delete Boot Device" on page 16.

Adding a target/LUN requires a reboot for changes to take effect.

Delete Boot Device

The Delete Boot Device screen, shown in Figure 8, lets you delete a boot device for the currently selected adapter. The screen displays a list of devices that can be deleted.
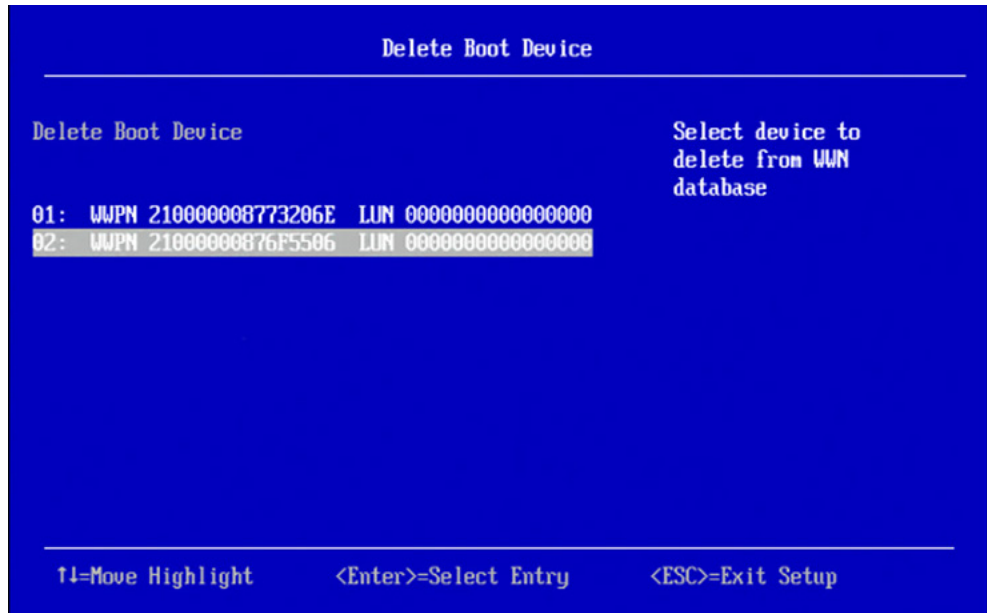
Figure 8. Delete Boot Device Screen of EFI

Follow these steps to delete a boot device:

1. Select the boot device you want to delete and press Enter.

2. The screen is refreshed with the device no longer listed.

Note:

Deleting a target/LUN requires a reboot for changes to take effect.

Edit Boot Settings

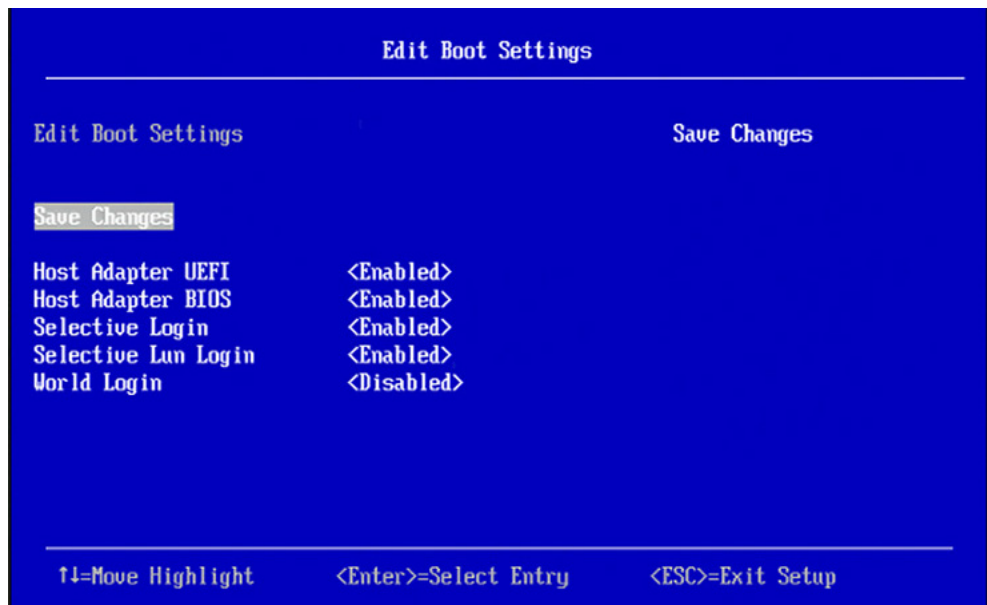The Edit Boot Settings screen, shown in Figure 9, lets you edit the boot device settings.

Figure 9. Edit Boot Settings Screen of EFI

The settings on the Edit Boot Settings screen include the following:

- **Host UEFI Enable:** Enables the UEFI driver. The default is `Enabled`.

- **Host BIOS Enable:** Enables BIOS. The default is `Disabled`.

- **Selective Login:** Specifies that the driver is to use the WWN database as a list of devices that the adapter is permitted to log in. Enable this option to limit the adapter device discovery to devices matching those in the WWN database. The default is `Disabled`.

- **Selective LUN Login:** Used with Selective Login which logs in only those devices in the adapter WWN database. If this option is not enabled, all LUNs present on any logged in device will be presented to EFI. If this option is enabled, only the LUN specified in the WWN database associated with the device will be logged into. This eliminates scanning and presenting a large number of LUNs to EFI when only one is desired. The default is `Disabled`.

- **World Login:** Used to force a World Login. This option will override all of the other login methods. If this option is enabled, the adapter will log in to all connected devices. The default is `Disabled`.

Adapter Info

The Adapter Info screen displays adapter information, as shown in Figure 10. This screen is read-only; there are no user-configurable settings on this screen.
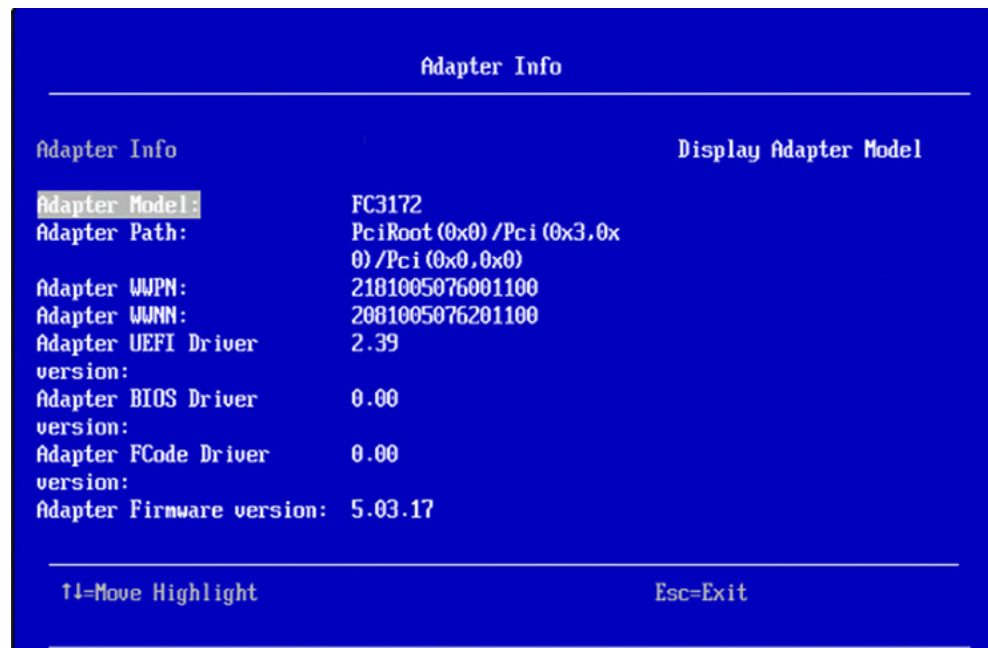

Figure 10. Adapter Info Screen of EFI

The Adapter Info screen displays the following information:

- Adapter Model
- Advanced Path
- Adapter WWPN
- Adapter WWNN
- Adapter UEFI Driver version

- Adapter BIOS Driver version
- Adapter FCode Driver version
- Adapter Firmware version

Installing device drivers

For information on obtaining and updating to the latest version of adapter firmware and device drivers, refer to Chapter 3, "Updating firmware and device drivers" on page 23.

Customize the configuration of the adapter:

- If the adapter is installed in a compute node, see "Managing the adapter using the QLogic QConvergeConsole utility" on page 19 or the documentation that came with your compute node for more information about customizing the configuration.

Managing the adapter using the QLogic QConvergeConsole utility

This section provides an overview of the QLogic® QConvergeConsole application that can be used by advanced users to customize the configuration of the adapter when it is installed in a compute node. For more detailed information, see the QConvergeConsole application online help.

Overview of QConvergeConsole

The QLogic QConvergeConsole (QCC) application is used to configure a storage area network (SAN) environment made up of Fibre Channel host bus adapters (HBAs). It is a network-capable application that can connect to and configure remote systems, enabling centralized management and configuration of an entire SAN containing HBA components, storage devices, and host systems.

You can use the QConvergeConsole application to manage and control one or more adapters that are installed on local or remote systems. The QCC application is used, along with problem determination procedures (PDPs), on new or existing installations to help diagnose Fibre Channel (FC) subsystem problems in adapters, controllers, and devices that are attached to the FC fabric or loop.

You can also perform the following operations using the QConvergeConsole application to configure devices in your system:

Disable (unconfigure) a device on a host bus adapter

When a device is set as unconfigured, it is not recognized by the HBA and is not accessible to the HBA on that system.

Enable a device

This operation adds a device and makes it accessible to the HBA on that system.

Designate a path as an alternate or preferred path

When a device is accessible from more than one adapter in the same system, you can assign one path as the preferred path and the other path as an alternate path. If the preferred path fails, the system switches to the alternate path to make sure that the transfer of data is not interrupted.

Installation and system requirements

Make sure that you are using the latest version of the QConvergeConsole application for the adapter. Go to the QLogic download Web page at http://driverdownloads.qlogic.com for the latest information about the QConvergeConsole application. The latest instructions and system requirements are in the documentation that comes with the applications.

Features

The QConvergeConsole application has the following features:

- **Unified adapter management.** QConvergeConsole provides a browser-based GUI that lets you monitor, configure, and manage your IBM FC3172 Fibre Channel adapters (as well as QLogic adapters with Fibre Channel, FCoE, Ethernet networking [NIC], and iSCSI networking protocols) from a single console.

- **Virtualization.** QConvergeConsole provides configuration pages on selected Fibre Channel ports that let you create multiple virtual ports from a single physical adapter.

- **Asset management.** QConvergeConsole allows you to connect to and disconnect from local and remote hosts. It also provides information about connected hosts and their attached IBM FC3172 adapters with connected storage devices.

- **Configuration management.** QConvergeConsole allows you to configure local and remote systems. With QConvergeConsole, you can configure IBM FC3172 adapters and connected devices. It also lets you update adapter parameters, firmware, boot code, and drivers.

- **Statistics.** QConvergeConsole provides statistics for each host and adapter port. These statistics can be collected automatically or on request. They can be reset at any time. In addition, you can export the statistics to a comma separated values (CSV) file that can be imported into other applications, for example, Microsoft Excel.

- **Reports.** QConvergeConsole provides a report facility that lets you generate reports, which you can use to view lists of all SAN assets: adapters, devices, and LUNs. After generating reports, you can view them and save them to a variety of file formats.

- **E-mail notifications.** QConvergeConsole can automatically send notifications with a copy of the current host configuration to an e-mail distribution list, thus enabling the information to be opened and analyzed from other locations.

- **Wizards.** QConvergeConsole provides some easy-to-use wizards that walk you through Flash and driver parameter file updates on Fibre Channel and Converged Network Adapters.

Utilities tab

Using the Utilities tab in the main window of the QConvergeConsole application, you can update adapter firmware and perform adapter-level configurations on a host-connected adapter.
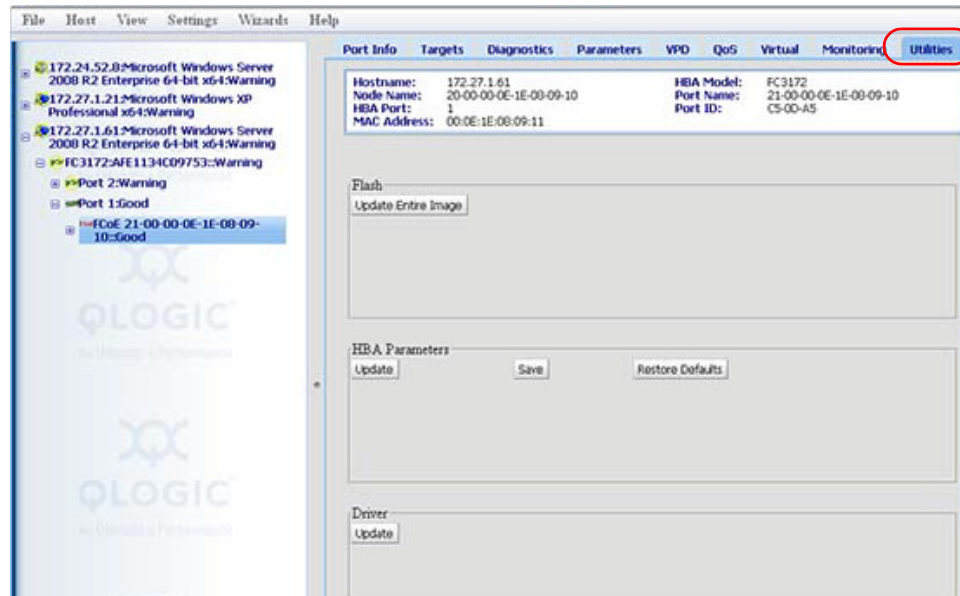
Figure 11. Utilities Tab on QConvergeConsole

Update flash

To update the flash using a flash-boot firmware .bin file that is saved on hard disk, click **Update Entire Image** in the Utilities tab of the QConvergeConsole application, and then follow the prompts to navigate to and select the file, and begin the update. For information on obtaining the latest version of adapter firmware, refer to Chapter 3, "Updating firmware and device drivers" on page 23.

Managing the adapter using the QLogic SANsurfer Command Line Interface utility

This section provides an overview of the SANsurfer CLI tool that advanced users can use to customize the configuration of the adapter installed in a compute node. For more detailed information, see the *SANsurfer FC/CNA HBA CLI User's Guide*, available at the QLogic Web site: http://driverdownloads.qlogic.com/.

Overview of SANsurfer CLI utility

The SANsurfer® FC/CNA HBA CLI tool provides a command line interface (CLI) that lets you easily install, configure, and deploy QLogic® Fibre Channel (FC) adapters, as well as QLogic Fibre Channel over Ethernet (FCoE) converged network adapters (CNAs). It also provides robust diagnostic and troubleshooting capabilities and useful statistical information to optimize SAN performance. This tool only configures adapters on the local machine (where SANsurfer is installed.)

SANsurfer FC/CNA HBA CLI can be operated in two modes:

• Interactive mode (menu-driven interface). This mode requires user intervention.

• Non-interactive mode (command line interface). Use this mode for scripting or when you want to do a single operation.

Utilities menu

The Utilities menu of the SANsurfer CLI utility lets you update adapter firmware and perform adapter-level configurations on a host-connected adapter. For detailed information on CLI commands, refer to the *SANsurfer FC/CNA HBA CLI User's Guide*.

Chapter 3. Updating firmware and device drivers

This chapter explains how to check if the adapter's firmware needs to be upgraded, and how to perform the upgrade if necessary.

Determining the adapter firmware version

Using the QConvergeConsole utility, follow these steps to find out the firmware version that is installed in the adapter:

1. In the QConvergeConsole system tree, click the adapter node.

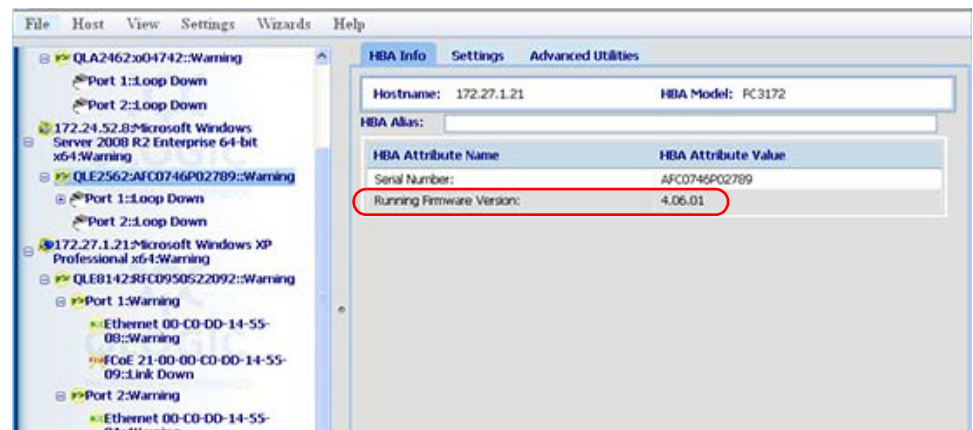2. Click the **HBA Info** tab. The **HBA Info** page displays as shown in Figure 12.

Figure 12. Firmware Version on HBA Info Page of QConvergeConsole Utility

3. The firmware version number is displayed next to **Firmware Version**.

If the firmware is not up to date, upgrade the firmware. Refer to "Updating firmware and device drivers" on page 23.

Updating firmware and device drivers

IBM periodically makes I/O adapter firmware and device driver updates available for the compute node. Provisioning is the set of actions that you take to update the firmware and device drivers and install the operating system. Several tools are available to help you update the firmware and device drivers in the provisioning process.

- IBM Flex System Manager Update Manager

  IBM Flex System Manager Update Manager acquires, installs, and manages firmware and device driver updates and monitors your compute nodes to ensure that they remain current. For more information about using the IBM Flex System Manager management software to update firmware and device drivers for the chassis components, see the *IBM Flex System Manager Installation and Service Guide*. For the latest version, go to the IBM Flex System Information Center at http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp.

- UpdateXpress System Packs

  UpdateXpress System Packs (UXSP) contain an integration-tested bundle of online, updateable firmware and device drivers for your compute node. The IBM ToolsCenter Bootable Media Creator uses UpdateXpress System Packs to update the firmware and device drivers.

  Typically, use UpdateXpress System Packs to update firmware and device drivers for a compute node that has previously been provisioned. For more information about UpdateXpress System Packs, go to http://www.ibm.com/support/entry/portal/docdisplay?lndocid=SERV-XPRESS.

- IBM ToolsCenter Bootable Media Creator

  You can use IBM ToolsCenter Bootable Media Creator to create bootable media that is suitable for applying firmware updates and running preboot diagnostics. Using IBM ToolsCenter Bootable Media Creator, you can create a single bootable image on supported media (such as CD, DVD, ISO image, USB flash drive, or set of PXE files) that bundles multiple IBM Flex System tools and updates from UpdateXpress System Packs, which contain Windows and Linux® firmware updates.

  Typically, use IBM ToolsCenter Bootable Media Creator for the initial setup of a compute node. For more information about the IBM Bootable Media Creator, see the IBM Bootable Media Creator website.

  To provision a compute node with updated firmware and device drivers by using IBM ToolsCenter Bootable Media Creator, complete the following steps:

  1. Download IBM ToolsCenter Bootable Media Creator to a computer that is connected over the management network to the IBM Flex System Manager management software that is managing the compute node.
  2. Create the bootable media of firmware and device driver updates.
  3. Connect to the IBM Flex System Manager management software that is managing the IBM Flex System chassis in which the compute node is installed.
  4. From IBM Flex System Manager Chassis Manager, select the compute node. In the Actions column, select Remote Control.

     Note:
     The user ID that you use to log in to IBM Flex System Manager management software must have sufficient user permissions to manage the compute node.

  5. From the Remote Control session, mount the bootable media (using Remote Media).
  6. Start the compute node to boot the media and install the updates.

Important:
To avoid problems and to maintain system performance, always make sure that the I/O adapter firmware and device drivers are consistent in all compute nodes in the IBM Flex System chassis.

Chapter 4. Solving problems

This chapter provides information for identifying and solving problems.

Fault indications

The FC3172 adapter provides the fault information defined in Table 8:

Table 8. Fault LED indications

LED	Indication
Amber	Various conditions including I2C access problem and flash access failure (VPD update failure, etc.)

Parts listing

The following replaceable components are available for the IBM Flex System network devices.

Replaceable components are of three types:

- **Tier 1 customer replaceable unit (CRU):** Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.
- **Tier 2 customer replaceable unit (CRU):** You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service that is designated for your server.
- **Field replaceable unit (FRU):** FRUs must be installed only by trained service technicians.

For information about the terms of the warranty, see the *Warranty Information* document.

The replaceable components in the following table are Tier 1 CRUs. If other components require replacement, see the documentation that came with those devices for instructions.

Table 9. Replaceable components

Description	CRU part number (Tier 1)
IBM Flex System FC3172 2-port 8Gb FC Adapter	69Y1941

Workaround for RHEL 6.2 systems shutting down during boot

This section describes a necessary procedure for systems running the RHEL 6.2 operating system that shut down during the boot sequence. The system will not boot successfully until this procedure is performed.

The procedure involves passing a kernel parameter to the operating system prior to boot. This also applies if you are booting to the CD prior to installing.

Follow these instructions to complete the workaround:

1. When GRUB starts to load, press any key to cancel the autoboot.

2. Navigate to the grub entry that needs to be edited.

3. Press **e** to edit the line.

4. Go to the end of the kernel line and add: **qla2xxx.ql2xfwloadbin=1**.

5. Press Enter to accept the change.

6. Press **b** to boot the line.

7. Once the operating system is booted or installed, use the qlogic-firmware rpm to update the driver firmware and rebuild the initrd.

Appendix A. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This section contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your system, and whom to call for service, if it is necessary.

Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system and any optional devices are turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system.
- Go to the IBM support website at http://www.ibm.com/supportportal/ to check for technical information, hints, and tips, download the latest firmware, drivers, and driver firmware, or to submit a request for information.

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the documentation that is provided with your IBM product. The documentation that comes with IBM systems also describes the diagnostic tests that you can perform. Most systems, operating systems, and programs come with documentation that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the documentation for the operating system or program.

Using the documentation

Information about your IBM system and preinstalled software, if any, or optional device is available in the documentation that comes with the product. That documentation can include printed documents, online documents, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to http://www.ibm.com/supportportal/ and follow the instructions.

Getting help and information from the World Wide Web

On the World Wide Web, the IBM website has up-to-date information about IBM systems, optional devices, services, and support. You can find service information for IBM systems and optional devices at http://www.ibm.com/supportportal/.

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For more information about Support Line and other IBM services, see http://www.ibm.com/services/, or see http://www.ibm.com/planetwide/ for support telephone numbers. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

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電話：0800-016-888

IBM Taiwan product service contact information:
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    Taipei, Taiwan
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    IBM-Allee 1, 71137 Ehningen, Germany
    Telephone: +49 7032 15-2937
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People's Republic of China Class A electronic emission statement

中华人民共和国 "A类" 警告声明

声 明
此为A级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，
可能需要用户对其干扰采取切实可行的措施。

Taiwan Class A compliance statement

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。

Index

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