Marvell® QLogic®
UEFI Human Interface Infrastructure

2690 Series Enhanced 16GFC,
2740/2760 Series 32GFC,
2770 Series Enhanced 32GFC,
2870 Series 64GFC
Marvell QLogic Fibre Channel Adapters

User's Guide

Doc. No. BK3254602-00 Rev. M

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Preface

This guide describes the use of the Human Interface Infrastructure (HII) application to configure the Marvell® QLogic® Fibre Channel Adapters' parameters and boot-from-SAN settings.

Supported Adapters

This guide supports the following Marvell QLogic adapters:

- QLE2690
- QLE2692
- QLE2694
- QLE2694L
- QLE2740
- QLE2742
- QLE2764
- QLE2770
- QLE2772
- QLE2774
- QLE2870
- QLE2872
- QLE2874

Intended Audience

This guide is for system administrators and those responsible for configuring motherboard devices and plug-in adapters.

Related Materials

For information about downloading documentation from the Marvell Web site, see "Downloading Updates" on page vii.

Documentation Conventions

This guide uses the following documentation conventions:

- **NOTE** provides additional information.
- Text in blue font indicates a hyperlink (jump) to a figure, table, or section in this guide, and links to Web sites are shown in underlined blue. For example:
  - Table 9-2 lists problems related to the user interface and remote agent.
  - See "Installation Checklist" on page 3-6.
  - For more information, visit www.marvell.com.
- Text in **bold** font indicates user interface elements such as a menu items, buttons, check boxes, or column headings. For example:
  - Click the **Start** button, point to **Programs**, point to **Accessories**, and then click **Command Prompt**.
  - Under **Notification Options**, select the **Warning Alarms** check box.
- Text in `Courier` font indicates a file name, directory path, or command line text. For example:
  - To return to the root directory from anywhere in the file structure, type `cd /root,` and then press ENTER.
  - Issue the following command: `sh ./install.bin`
- Key names and key strokes are indicated with UPPERCASE:
  - Press CTRL+P.
  - Press the UP ARROW key.
- Text in *italics* indicates terms, emphasis, variables, or document titles. For example:
  - For a complete listing of license agreements, refer to the *QLogic Software End User License Agreement*.
  - What are *shortcut keys*?
  - To enter the date type *mm/dd/yyyy* (where *mm* is the month, *dd* is the day, and *yyyy* is the year).
- Topic titles between quotation marks identify related topics either within this manual or in the online help, which is also referred to as *the help system* throughout this document.

Technical Support

Customers should contact their authorized maintenance provider for technical support of their Marvell QLogic and FastLinQ products.

Downloading Updates and Documentation

To download firmware, software, and documentation:

1. Go to www.marvell.com.
2. Click **Support,** and then under **Tools & Resources**, click **Driver Downloads**.
3. In the Marvell Drivers window:
   a. (MUST) Under CATEGORY, select either FIBRE CHANNEL ADAPTERS or CONVERGED NETWORK ADAPTERS.
   b. (optional) Under PLATFORM/OS, select the platform/OS that matches your system.
   c. (optional) Under PART NUMBER, select the part number for your adapter.
   d. (optional) Under KEYWORDS, type a keyword describing what you are looking for.
4. Click **Apply**.
5. Locate the firmware (boot code), software (drivers, management tools), or document (documentation for user's guides) you need, and then do one of the following:
   a. Click the blue text in the DESCRIPTION column.
   b. Click the arrow in the DOWNLOAD column.

NOTE

Marvell recommends downloading the associated Read Me and Release Notes for more information. To find them, enter either **Read Me** or **Release Notes** in the KEYWORDS search box.

A message may appear asking you to review and accept the Marvell Limited Use License Agreement.

6. If applicable, read the agreement, select the check box, and then click **I ACCEPT** to accept the end license agreement and start the download.

1 Using HII

This guide provides procedures for using the Human Interface Infrastructure (HII) user interface, including:

Starting HII

To start the HII application, open the Device Manager window for your platform. For information about launching the Device Manager, consult the user's guide for your platform.

Figure 1 shows an example of a Device Manager window listing system settings and adapters (one entry for each port) that you can manage using the HII application.

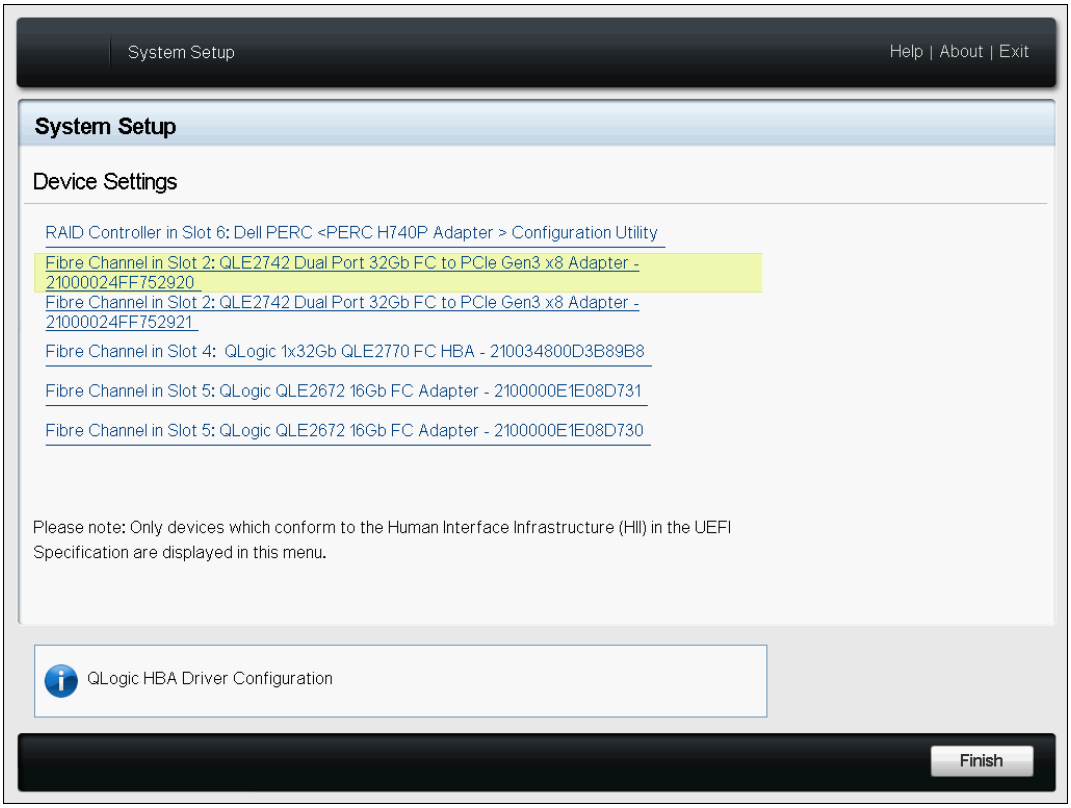

Figure 1. Device Manager Window: System Settings

- To select a device, press the press the UP ARROW or DOWN ARROW keys.
- To configure a device using HII, place the selector on an adapter port, and then press ENTER.
- To exit the Device Manager, press the ESC key.

After you select an adapter port and press ENTER, the HII application opens the Main Configuration Page (Figure 2) from which you can perform the following tasks:

- Configure operational parameters
- Configure advanced operational parameters
- Configure boot-from-SAN parameters and drive mapping
- Configure the WWN database
- Configure NVME parameters
- Display adapter information

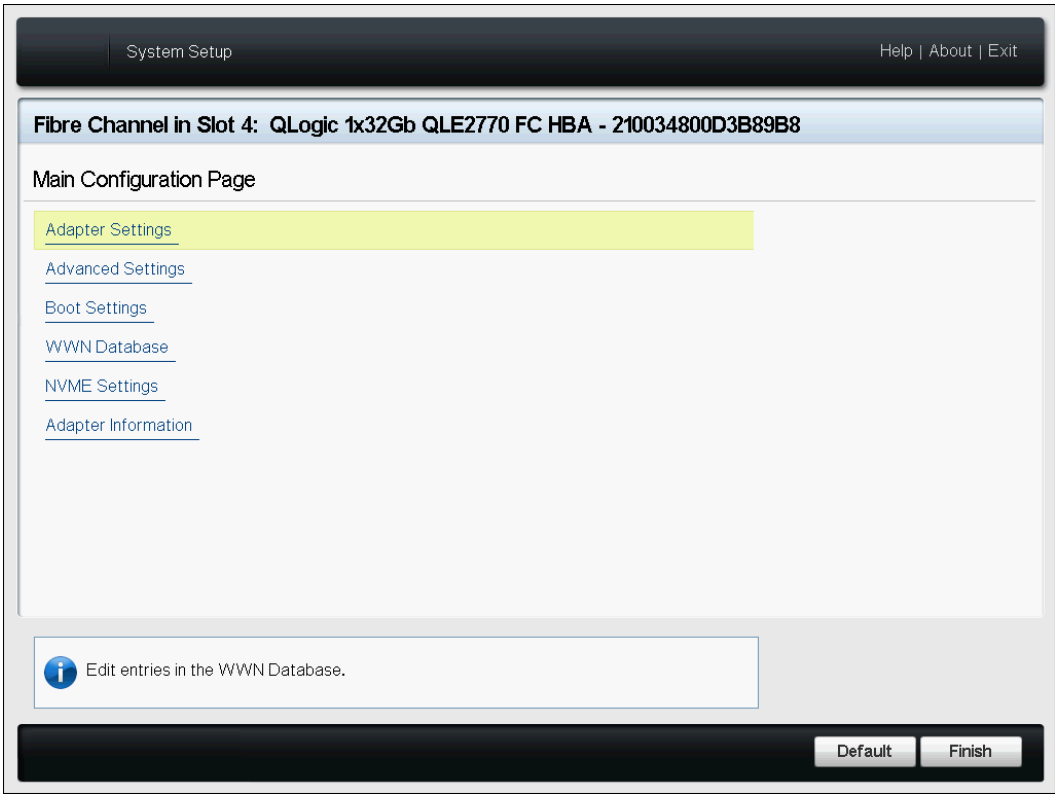

Figure 2. HII Main Configuration Page

- To select a parameter, press the UP ARROW or DOWN ARROW keys.
- To modify the selected parameter, press ENTER.

Configuring Basic Port Parameters

To configure basic port parameters, select **Adapter Settings** from the Main Configuration Page (see Figure 2 on page 3), and then press ENTER. Figure 3 is an example of an Adapter Settings window showing the operational parameters.

- To select a parameter, press the UP ARROW or DOWN ARROW keys.
- To modify the selected parameter, press ENTER.

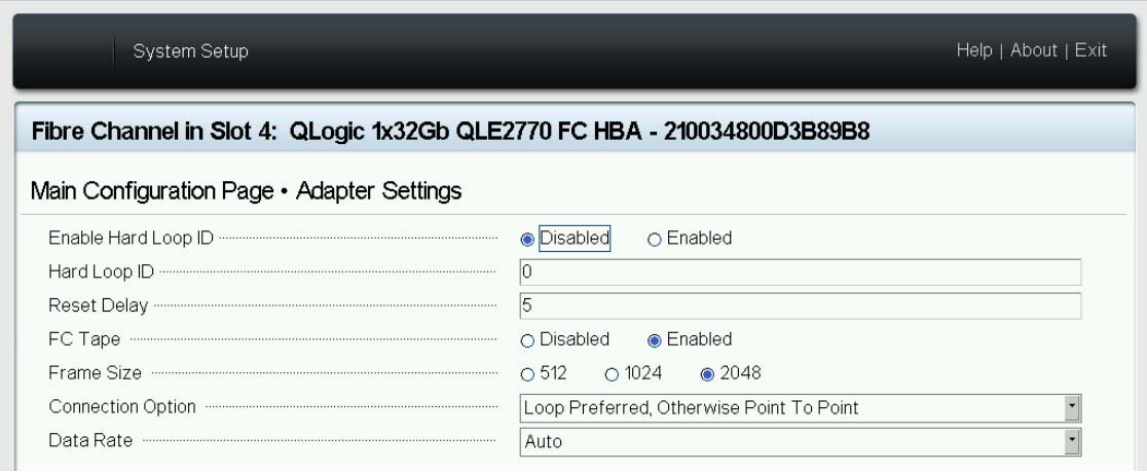

Figure 3. Adapter Settings Window

Table 1 describes the basic port parameters.

Table 1. Basic Port Parameters

Parameter	Default	Description
`Enable Hard Loop ID`	`Disabled`	Applies (`Enabled`) the hard loop identifier to the adapter port that is specified in the `Hard Loop ID` parameter. The `Disabled` setting leaves the adapter hard loop identifier undefined. This parameter applies only for speeds of 8Gbps and lower when the adapter is in loop mode.
`Hard Loop ID`	`0`	Specifies the hard loop identifier applied to the adapter port when the `Enable Hard Loop ID` parameter is enabled.
`Reset Delay`	`5`	Specifies the number of seconds to delay loop activity after a loop reset.
`FC Tape`	`Enabled`	Enables or disables FCP-2 recovery for Fibre Channel tape devices.

Table 1. Basic Port Parameters (Continued)

Parameter	Default	Description
Frame Size	2,048	Specifies the maximum frame size in bytes. The 2,112 frame size is supported only on the QLE2780 Series Adapters.
Connection Option	Loop Preferred, Otherwise Point To Point	Specifies the connection type. Loop Only is not supported on QLE2800 Series Adapters.
Data Rate	Auto	Specifies the Fibre Channel data rate. QLE2800 adapters support the following values: 16Gbps, 32Gbps, 64Gbps, and Auto. QLE2700 adapters support the following values: 8Gbps, 16Gbps, 32Gbps, and Auto. QLE2690 adapters support the following values: 4Gbps, 8Gbps, 16Gbps, and Auto. The Auto setting tells the adapter to match the detected data rate.

Configuring Advanced Port Parameters

To configure advanced port parameters, select **Advanced Settings** from the Main Configuration Page (see Figure 2 on page 3), and then press ENTER. Figure 4 is an example of an Advanced Settings window showing the advanced port parameters.

- To select a parameter, press the UP ARROW or DOWN ARROW keys.
- To modify the selected parameter, press ENTER.

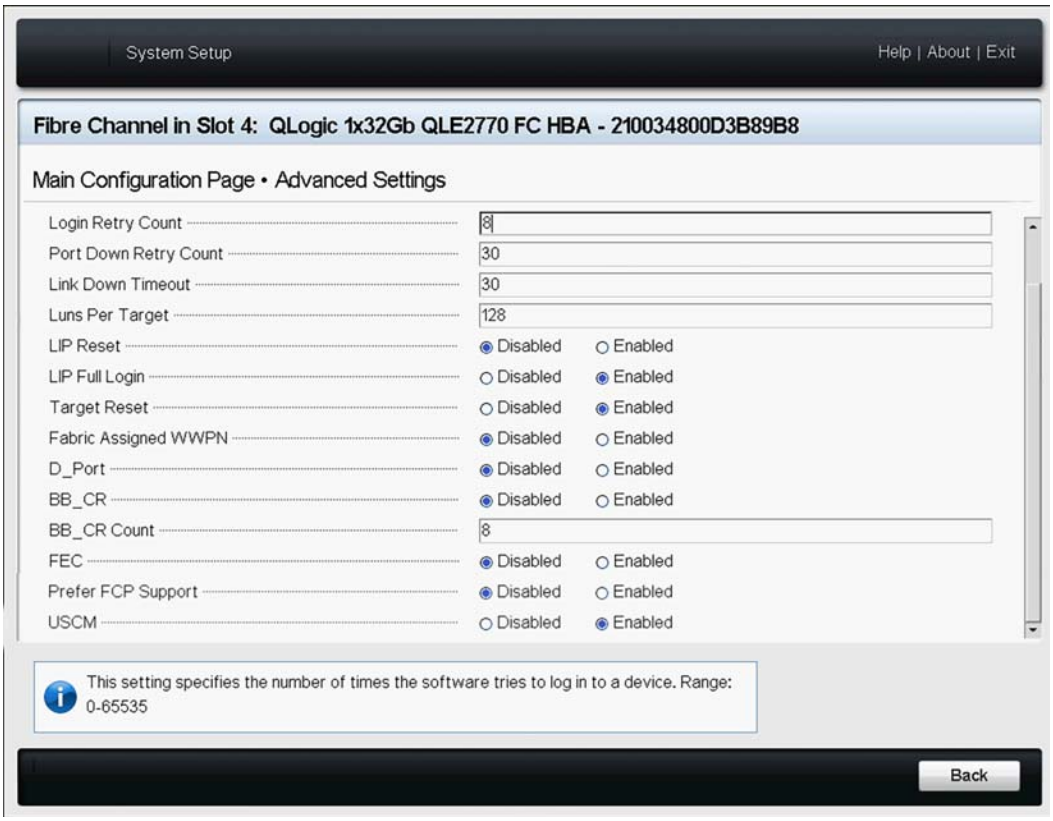

Figure 4. Advance Settings Window

Table 2 describes the advanced port parameters.

Table 2. Advanced Port Parameters

Parameter	Default	Description
`Login Retry Count`	`8`	Specifies the number of times that the adapter port will attempt to log into a device.
`Port Down Retry Count`	`30`	Specifies the time interval in seconds over which the adapter will reissue a command to a port whose status is down.
`Link Down Timeout`	`30`	Specifies the time interval in seconds that the adapter will wait for the link to recover.
`LUNs Per Target`	`128`	Specifies the number of LUNs per target device for older storage arrays that do not support the `Report LUNs` SCSI command. This parameter is ignored when the `Report LUNs` command is supported.
`LIP Reset`	`Disabled`	Specifies the type of LIP reset that is applied when the operating system resets the bus. When enabled, this parameter applies a global LIP reset to clear target device reservations. When disabled, this parameter applies a global LIP reset with full login.
`LIP Full Login`	`Enabled`	Enables or disables the adapter to log in to all ports after a LIP reset.
`Target Reset`	`Enabled`	Enables or disables the UEFI driver to issue a `Target Reset` command to all devices on the loop when a SCSI `Bus Reset` command is issued.
`Fabric Assigned WWPN`	`Disabled`	Fabric-assigned worldwide port name (WWPN) allows you to enable an adapter port to use a switch-assigned WWPN rather than the physical adapter port WWPN for communication.
`D_Port`	`Disabled`	D_Port (diagnostic port) mode allows the adapter to identify and isolate link failures resulting from faulty modules (link, cable, or SFP). D_Port mode requires a Brocade® Fibre Channel switch with the ClearLink® D_Port feature installed. For additional D_Port details, see the Brocade switch documentation.
`BB_CR`	`Enabled`	Buffer-to-buffer credit recovery (BB-CR) enables two FC peer ports (N_Port, F_Port, or E_Port) to periodically send and receive the quantity of receiver ready (R_RDY) signals transmitted. Enable the BB-CR feature to allow the peer port to recover from possible R_RDY signals lost over a lossy link.

Table 2. Advanced Port Parameters (Continued)

Parameter	Default	Description
BB_CR Count	8	Specifies the quantity of frame RX/TX counters maintained by the port to track R_RDYs and frames received.
FEC	Disabled	Forward error correction (FEC) improves performance and link integrity to support higher end-to-end data rates by automatically recovering from transmission errors. This setting applies only to 16Gbps speeds. At 32Gbps, FEC is mandatory and enabled, and does not require any user configuration. At 16Gbps, FEC is optional and does require user configuration. At 8Gbps, FEC is not supported.
Prefer FCP Support	Disabled	Specifies where to login on storage devices. This parameter applies to storage devices that support FCP and NVME. Enable this parameter to log into FCP LUNs on the storage device. Disable this parameter to log into NVME namespaces on the storage device.
USCM	Enabled	Enable Universal SAN Congestion Mitigation. The USCM feature helps detect and prevent both potential or actual congestion occurrences in the FC SAN environment.

NOTE

Universal SAN congestion mitigation (USCM) is supported only on the QLE2690, QLE2692, QLE2694, QLE2694L, QLE2770, QLE2772, QLE2774, QLE2870, QLE2872, and QLE2874 adapters.

- SAN congestion management (SCM) is a common noun, and describes a standards-based Fibre Channel technology.
- Universal SAN Congestion Mitigation (USCM) is Marvell's IP, and describes Marvell's capabilities that encompass SCM and additional functionalities to further assist users.

Configuring Boot-from-SAN Parameters and Drive Mapping

To configure boot-from-SAN port parameters and drive mapping, select **Boot Settings** from the Main Configuration Page (see Figure 2 on page 3), and then press ENTER.

- To select a parameter, press the UP ARROW or DOWN ARROW keys.
- To modify the selected parameter, press ENTER.

Boot Settings

Figure 5 is an example of a Boot Settings window showing the boot-from-SAN port parameters.

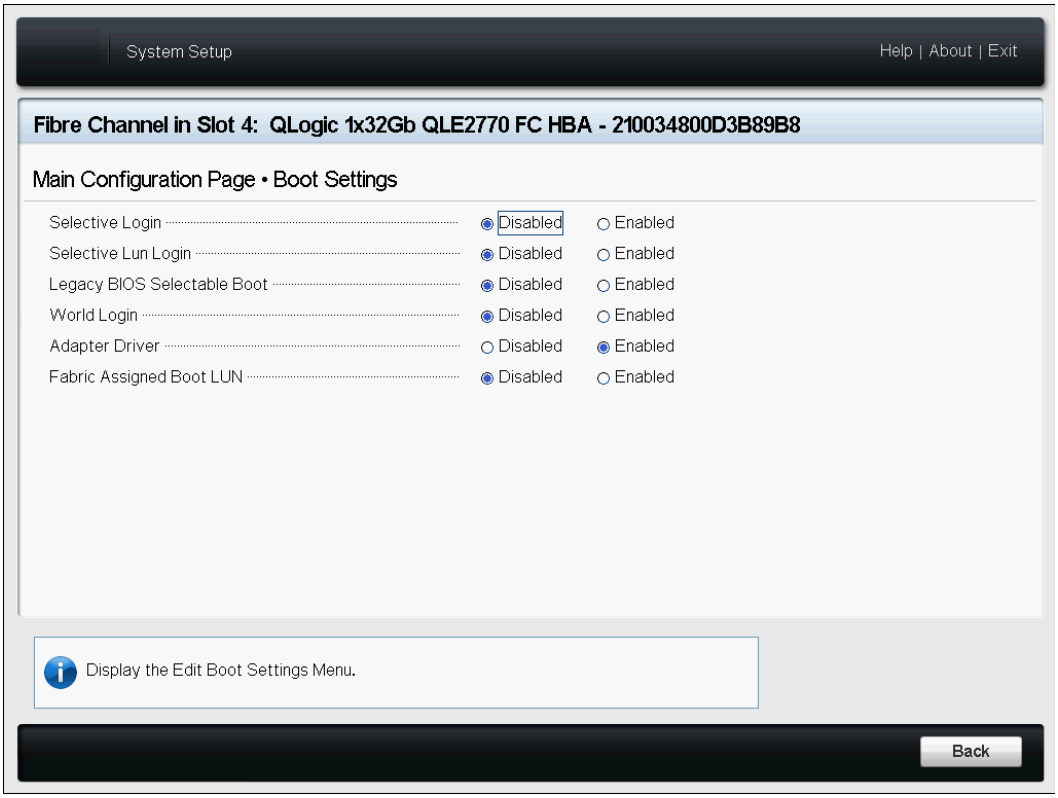

Figure 5. Boot Settings Window

Port Login Methods

The Boot Settings window provides four login modes. The login mode that is enabled determines which drives are mapped by UEFI.

- **Force World Login** forces all drives to be mapped by UEFI. This mode takes precedence over the other login modes.
- **Selective Login** allows you to specify which drives are mapped by UEFI. The WWN Database window (see Figure 6 on page 12) contains the drives that will be mapped. This mode has medium precedence.
- **World Login** is used when all other login modes are disabled. In this mode, all drives will be mapped by UEFI.
- **Fabric Assigned Boot LUN** obtains drive information from the FC switch, which must support the Fabric Assigned Boot LUN feature. This mode has medium precedence.

Boot-from-SAN and Drive Mapping

Table 3 describes the boot-from-SAN and drive mapping parameters.

Table 3. Boot-from-SAN and Drive Mapping Parameters

Parameter	Default	Description
`Selective Login`	`Disabled`	Login method that restricts device logins to the adapter port to those devices in the WWN Database (`Enabled`), or allows any device to log in (`Disabled`).
`Selective LUN Login` [a]	`Disabled`	Login method that restricts LUN logins to the adapter port to those LUNs associated with a device in the WWN Database (`Enabled`), or allows any LUN associated with a device to log in (`Disabled`).
`Legacy BIOS Selectable Boot`	`Disabled`	Controls boot drive selection in Legacy BIOS mode. For additional information, refer to the HBA BIOS documentation.
`World Login`	`Disabled`	Login method that enables or disables forced world login. When enabled, this parameter allows all devices to log in to the adapter, overriding all other login methods. Enabling `World Login` is typically done to troubleshoot Fibre Channel link and target device issues, and can significantly increase the boot time if there are many devices connected to the adapter.

Table 3. Boot-from-SAN and Drive Mapping Parameters (Continued)

Parameter	Default	Description
`Adapter Driver`	`Disabled`	Enables or disables the UEFI driver. The boot time is shorter when the UEFI driver is disabled. To boot from a Fibre Channel disk, the UEFI driver must be enabled.
`Fabric Assigned Boot LUN`	`Disabled`	Fabric-based boot LUN discovery (F-BLD) allows you to eliminate the manual boot LUN configuration process of each adapter from individual servers. Instead, the adapters can query the SAN fabric at boot time to retrieve boot LUN configuration information. When the boot LUN configuration is available from the fabric, the server retrieves the information and boots from the SAN.

[a] If `Selective LUN Login` is `Disabled`, LUNs are ignored. All LUNs are mapped for each WWPN entry when `Selective Login` is `Enabled`.
If `Selective LUN Login` is `Enabled`, the one LUN associated with the WWPN entry is mapped (when `Selective Login` is `Enabled`).

Configuring the WWN Database

To configure the list of storage devices in the WWN database, select **WWN Database** from the Main Configuration Page (see Figure 2 on page 3), and then press ENTER. Figure 6 is an example of a WWN Database window showing the list of storage device WWPNs and storage device LUNs.

- To move the selector about in the parameter list, press the press the UP ARROW or DOWN ARROW keys.
- To modify the selected parameter, press ENTER.

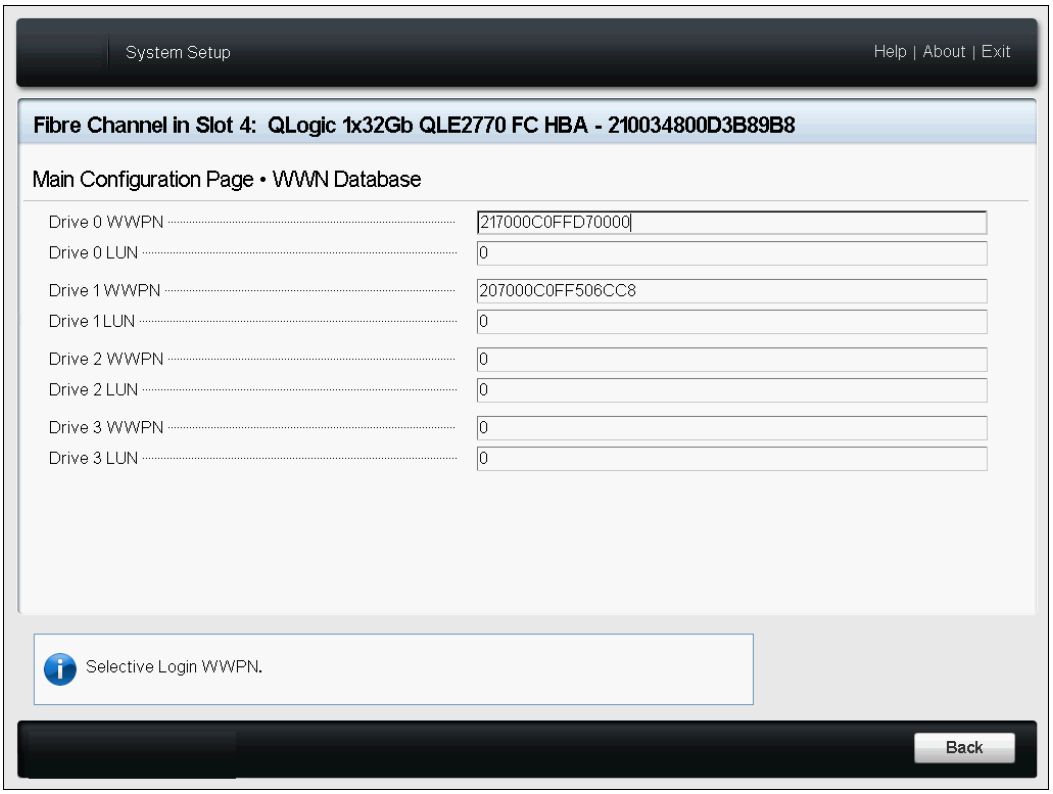

Figure 6. WWN Database Window

Configuring NVME Parameters

To configure NVMe parameters, select **NVME Settings** from the Main Configuration Page (see Figure 2 on page 3), and then press ENTER.

- To select a parameter, press the UP ARROW or DOWN ARROW keys.
- To modify the selected parameter, press ENTER.

Figure 7. NVME Settings

Each mapped NVME storage device requires the following fields to be set:

- Storage
- Storage WWPN
- Storage NQN
- Storage Controller ID
- Storage Namespace ID

Up to eight storage devices can be mapped.

NVME storage device configuration values can be obtained from the NVME storage configuration tool. Storage WWPN, WWNN, and NQN information is provided by the configuration tool.

Table Table 4 describes the fields on the HBA Configuration Page.

Table 4. NVMe Configuration Page Settings

Setting	Description
FC NVME	Enables the NVME storage feature. When enabled, the driver will search for NVME storage, based on the settings below.
Host NQN	This field identifies the FC adapter. NVME storage devices typically use this value in access lists. The default value of this field is based on the system UUID. All FC adapters in a system will have the same default Host NQN. This field can be changed, but many storage arrays expect a specific Host NQN format. See the NVME Base spec for more details about the Host NQN format. The OS driver also uses a Host NQN. The UEFI driver and OS driver must use the same Host NQN. To view the OS driver Host NQN value, use the QCC CLI tool. Use `qaucli -i` to display the OS driver Host NQN value. If the Host NQN starts with `nqn.2014-08.org.nvmexpress:uuid:`, the UUID value will be automatically populated by the driver and cannot be changed. User defined Host NQNs must not start with `nqn.2014-08.org.nvmexpress:uuid:`. An example of a user defined Host NQN is: `nqn.2014-08.com.example:nvme.host.sys.xyz`.
Host ID	This field identifies the FC adapter. The Host ID is a sequence of 32 hex digits (non-hex characters cannot be used). Example: 00112233445566778899AABBCCDDEEFF. The default value of this field is based on the system UUID. If the Host NQN field starts with `nqn.2014-08.org.nvmexpress:uuid:` and the UUID changes, the Host ID will be updated to match the new UUID.
Storage 0	Enables a specific NVME storage device. When enabled, the device will be mapped by the UEFI FC driver.
Storage 0 WWPN	The World Wide Port Name of an NVME storage device. The WWPN can be obtained from the NVME storage device configuration tool.

Table 4. NVMe Configuration Page Settings (Continued)

Setting	Description
Storage 0 WWNN	The World Wide Node Name of an NVME storage device. This field is optional. A value of 0 means ignore this field. The WWNN can be obtained from the NVME storage device configuration tool.
Storage 0 NQN	Identifies an NVME storage Subsystem. There can be multiple Subsystems attached to an NVME storage device WWPN. The Storage NQN can be obtained from the NVME storage device configuration tool.
Storage 0 Controller ID	Identifies a Controller attached to an NVME Subsystem. There can be multiple Controllers attached to an NVME Subsystem. In most cases, FFFF is the proper value for this field. A value of FFFF means any available Controller.
Storage 0 Namespace ID	Identifies a Namespace attached to an NVME Controller. There can be multiple Namespaces attached to an NVME Controller. The Namespace ID can be obtained from the NVME storage device configuration tool.

For additional information on setting up NVMe Boot-from-SAN when using ESX 7.0 or ESX 8.0 and Citrix Hypervisor, see:

- *User's Guide—Marvell® QLogic® Marvell QLogic Fibre Channel Adapters 2600 Series* (part number FC0054609-00).
- *User's Guide—Marvell® QLogic® Fibre Channel Adapters 2700 Series* (part number 83270-546-00).
- User's Guide—*Marvell® QLogic® Fibre Channel Adapters 2800 Series* (part number MA2854601-00).

Displaying Adapter Port Information

To view adapter information, select **Adapter Information** from the Main Configuration Page (see Figure 2 on page 3), and then press ENTER. The Adapter Information window (Figure 8) presents adapter and port information. To return to the main menu, press ESC.

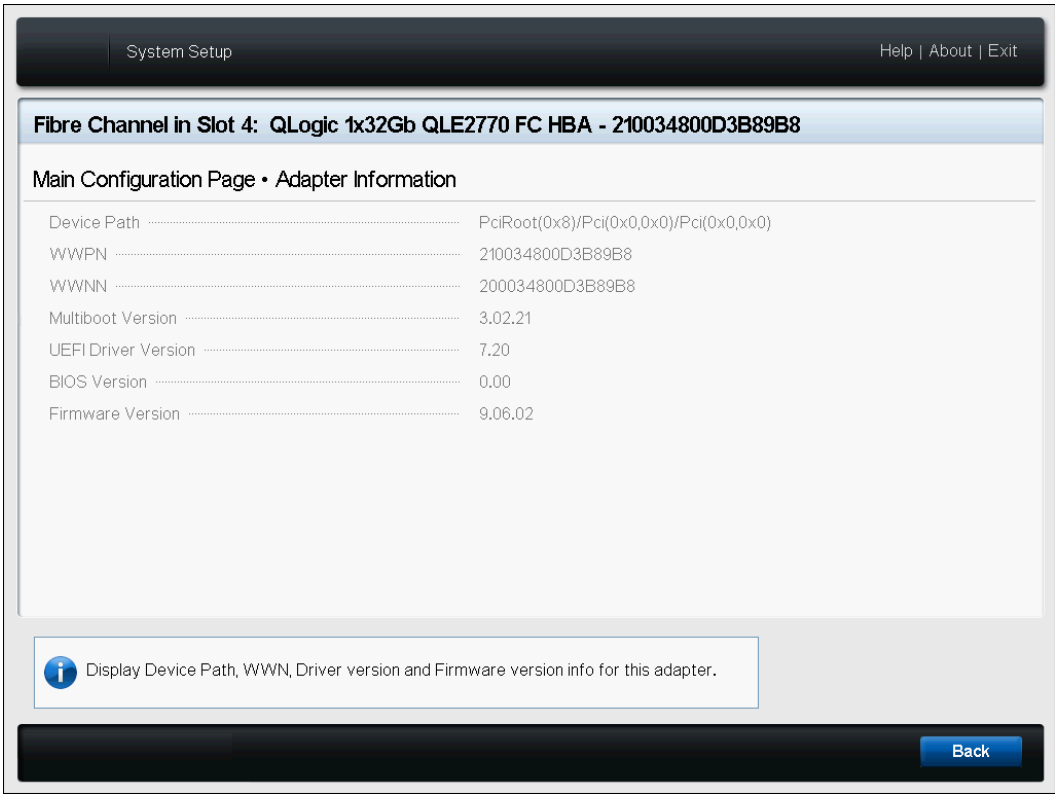

Figure 8. Adapter Information Window

Table 5 describes the adapter port information settings.

Table 5. Adapter Port Information

Parameter	Description
`Device Path`	UEFI device path of the adapter port
`WWPN`	World wide port name
`WWNN`	World wide node name
`Multiboot Version`	Multiboot version number
`UEFI Driver Version`	UEFI driver version number
`BIOS Version`	BIOS version number
`FCode Version`	FCode version number This parameter is not supported on 2770 and 2800 Series Adapters.
`Firmware Version`	Adapter firmware version number

A Revision History

Document Revision History	
Revision A, June 28, 2016	
Revision B, January 8, 2018	
Revision C, January 18, 2019	
Revision D, September 20, 2019	
Revision E, November 22, 2019	
Revision F, May 1, 2020	
Revision G, February 5, 2021	
Revision H, February 12, 2021	
Revision J, August 10, 2021	
Revision K, March 22, 2022	
Revision L, October 12, 2022	
Revision M, March 25, 2023	
Changes	**Sections Affected**
Updated Table 2 - Changed the default value of `Fabric Assigned WWPN` from `Enabled` to `Disabled`.	“Configuring Advanced Port Parameters” on page 6
Updated Table 3 - Changed the default value of `Fabric Assigned Boot LUN` from `Enabled` to `Disabled`.	“Boot-from-SAN and Drive Mapping” on page 10
Deleted the following note: Direct Attached or Node-to-Node (N2N) NVMe BFS is not currently supported. Changed ‘... NVMe Boot-from-SAN when using ESX 7.0 or ESX 8.0, see:’ to ‘... NVMe Boot-from-SAN when using ESX 7.0 or ESX 8.0 and Citrix Hypervisor, see:’.	“Configuring NVME Parameters” on page 13

Marvell first revolutionized the digital storage industry by moving information at speeds never thought possible. Today, that same breakthrough innovation remains at the heart of the company's storage, networking and connectivity solutions. With leading intellectual property and deep system-level knowledge, Marvell semiconductor solutions continue to transform the enterprise, cloud, automotive, industrial, and consumer markets. For more information, visit www.marvell.com.

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