MARVELL™

Marvell® QLogic®
QConvergeConsole Plug-ins for vSphere

2600 and 2700 Series Marvell QLogic Fibre Channel Adapters
578xx and 41000 Series Marvell FastLinQ Intelligent Ethernet Adapters
578xx and 41000 Series Marvell FastLinQ Converged Network Adapters

QConvergeConsole Plug-ins for vSphere

DELL Technologies

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Preface

This preface lists the supported products, specifies the intended audience, explains the typographic conventions used in this guide, lists related documents, provides technical support and contact information, and describes legal notices.

Supported Products

This user's guide provides information on installing and using the QConvergeConsole® VMware® vSphere Client Plug-in.

■ The QConvergeConsole VMware vSphere Client Plug-in (QConvergeConsole vSphere Client Plug-in) extends the capabilities of VMware vCenter Server, giving you the ability to manage adapters from Marvell installed in VMware ESX® and ESXi™ hosts using an intuitive, graphical interface. The QConvergeConsole vSphere Client Plug-in supports the following Marvell adapters:

   ❑ 2600 and 2700 Series Fibre Channel Adapters

   ❑ 578xx and 41000 Series Intelligent Ethernet Adapters

   ❑ 578xx and 41000 Series Converged Network Adapters

The interface and features of the plug-in is modeled on the QConvergeConsole tool, which is used in non-VMware environments for management of Marvell adapters. For more information, see the following links:

vCenter Server: http://www.vmware.com/products/vcenter-server/

vSphere: http://www.vmware.com/products/vsphere/

NOTE

The plug-ins on the VMware vSphere Server and vCenter Server Appliance operate identically. You can perform the same operation on both the VMware vSphere Server and the vCenter Server Appliance.

Supported Operating System

For 2600 and 2700 Series Marvell QLogic® Fibre Channel Adapters

❑ ESXi 7.0 U3

For 41000 and 45000 Series Marvell Converged Network Adapters

❑ ESXi 7.0U3

Using QConvergeConsole vSphere Plug-in

The following diagram illustrates how to manage adapters and hosts when using the QConvergeConsole VMware vSphere Client Plug-in.

```
┌──────────────────┐     ┌──────────────────────┐     ┌──────────────────────┐
│                  │     │ vCenter Server       │     │ ESXi host containing │
│                  │     │ appliance            │     │ either a FastLinQ    │
│ Host with a      │ ──▶ │ or vCenter Server    │ ──▶ │ or FC adapter,       │
│ browser          │     │ installed on a       │     │ plus the CIM         │
│ installed        │     │ Windows host or VM   │     │ Provider for either  │
│                  │     │ ┌──────────────────┐ │     │ a FastLinQ or FC     │
│                  │     │ │ HTML5 Plug-in    │ │     │ adapter              │
│                  │     │ │ installed        │ │     │                      │
│                  │     │ └──────────────────┘ │     │                      │
└──────────────────┘     └──────────────────────┘     └──────────────────────┘
```
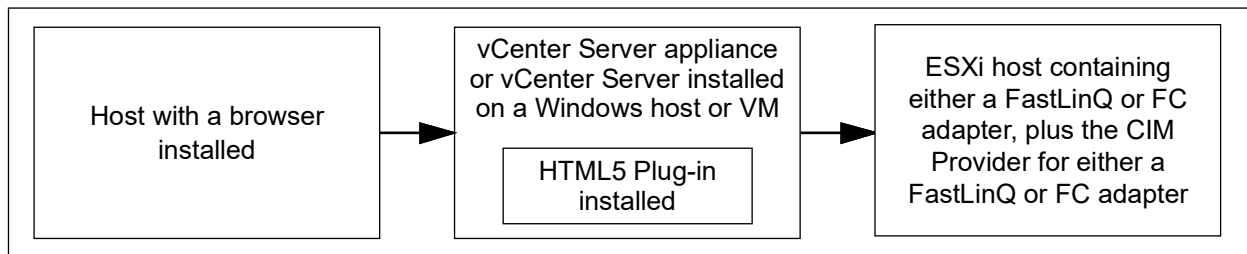
Figure i. Managing an ESXi 7.0 Host with a FastLinQ or Fibre Channel Adapter

Intended Audience

This guide is intended for use by administrators who are planning to deploy or have deployed one of the supported Marvell adapters in their VMware ESX and ESXi environments.

What Is in This Guide

This user's guide contains information you need to use the QConvergeConsole VMware vSphere Client Plug-in.

This preface explains the purpose of the plug-in, identifies this guide's intended audience, lists related documents, describes the typographic conventions used in this guide, refers you to the applicable license agreements, and provides technical support and contact information.

The remainder of this user's guide is organized into the following parts, chapters and appendices:

■ Chapter 1 QConvergeConsole vSphere Client Plug-in Overview lists the hardware, software, and operating system requirements for successful installation and operation of the QConvergeConsole vSphere Client Plug-in.

- **Chapter 2 Installing the QConvergeConsole vSphere Client Plug-in** explains how to install, uninstall, and upgrade the QConvergeConsole vSphere Client Plug-in.

- **Chapter 3 Getting Started with QConvergeConsole vSphere Client Plug-in** describes how to access the QConvergeConsole vSphere Client Plug-in from the vCenter Server, how to navigate to a host, and how to enable or disable the plug-in.

- **Chapter 4 Using the QConvergeConsole vSphere Client Plug-in** explains the features of the QConvergeConsole vSphere Client Plug-in's graphical user interface (GUI), as well as detailed instructions on how to configure and manage Marvell adapters using the GUI.

- **Chapter 5 Managing Marvell 578xx and 41000 Series Adapters** provides detailed instructions on how to use the QConvergeConsole vSphere Client Plug-in to manage Marvell 578xx and 41000 Series Adapters and connected storage devices.

- **Appendix A Installing the QLogic Adapter CIM Provider Using VUM** explains how to install the QLogic Adapter CIM Provider using the VMware Update Manager (VUM).

- **Appendix B Troubleshooting** provides troubleshooting information for the QLogic Adapter CIM Provider.

- **Appendix C Revision History** contains a list of changes made to this guide since the last revision.

At the end of this guide is a glossary with term definitions.

Related Materials

For additional information, refer to following documents that are available from the Marvell Web site, www.marvell.com:

- *Read Me, QConvergeConsole VMware vSphere Client Plug-in*

- *Release Notes, QConvergeConsole VMware vSphere Client Plug-in*

- *Read Me, QConvergeConsole VMware vSphere Web Client Plug-in*

- *Release Notes, QConvergeConsole VMware vSphere Web Client Plug-in*

- *User's Guide—Fibre Channel Adapter, 2600 Series*

- *User's Guide—Fibre Channel Adapter, 2700 Series*

- *User's Guide—Marvell® Ethernet iSCSI Adapters and Ethernet FCoE Adapters Marvell BCM57xx and BCM57xxx*

- *User's Guide—Converged Network Adapters and Intelligent Ethernet Adapters, FastLinQ 41000 Series*

For VMware vCenter and vSphere documentation, see www.vmware.com.

Documentation Conventions

This guide uses the following documentation conventions:

■ Throughout this guide, the phrase "VMware vCenter Server Plug-in" is the same as "VMware QConvergeConsole vSphere Client Plug-in."

■ **NOTE** provides additional information.

■ **CAUTION** without an alert symbol indicates the presence of a hazard that could cause damage to equipment or loss of data.

■ 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**, point to **All Programs**, point to **Accessories**, and then click **Command Prompt**.

■ Text in `Courier` font indicates a file name, directory path, or screen output. For example:

❑ To return to the root directory from anywhere in the file structure: Type `cd /root` and press ENTER.

Text in **`Courier bold`** font indicates a command. For example:

❑ 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 applicable *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.

1 QConvergeConsole vSphere Client Plug-in Overview

The QConvergeConsole vSphere Client Plug-in provides the ability to manage Marvell Fibre Channel Adapters, Converged Network Adapters, Intelligent Ethernet Adapters, and connected devices within a VMware vCenter Server environment. This plug-in is part of the Marvell QConvergeConsole suite of management tools, which includes the QConvergeConsole Web-based GUI and the QConvergeConsole CLI for other operating system environments. The plug-in provides an interactive GUI that is similar to the QConvergeConsole Web-based tool.

Features

The QConvergeConsole vSphere Client Plug-in allows users to centrally manage Marvell QLogic Fibre Channel adapters, Converged Network Adapters, and Intelligent Ethernet Adapters for all supported protocols on the QConvergeConsole page in VMware vCenter Server. The management capabilities include:

- Management for Fibre Channel, FCoE, iSCSI, and NIC adapters

- Storage and network maps that provide an end-to-end view of the adapter connections to the software and hardware components in the VMware ESX/ESXi environments.

- Updating the adapter boot code and firmware for all supported adapters

- Dynamic management of Marvell NIC partitioning (NPAR) for supported Converged Network and Intelligent Ethernet adapters, including the ability to modify partition function type and set quality of service (QoS).

- Querying and modifying driver parameters for all supported protocols.

■ Viewing and managing initiators, targets, and LUNs for Fibre Channel, FCoE, and iSCSI ports

■ Querying statistics, running diagnostics, and obtaining transceiver information

These capabilities produce the following key benefits:

■ Marvell adapters can be managed from VMware vCenter Server
■ Visibility of the virtual machine (VM) location and resource utilization
■ Accelerated infrastructure deployment
■ Simplified adapter management

System Requirements

This section lists the requirements for proper operation of the QConvergeConsole vSphere Client Plug-in.

Hardware Requirements

The QConvergeConsole vSphere Client Plug-in requires the following hardware, as shown in Figure 1-1:

■ VMware ESX or ESXi Server
■ Server to run the VMware vCenter Server
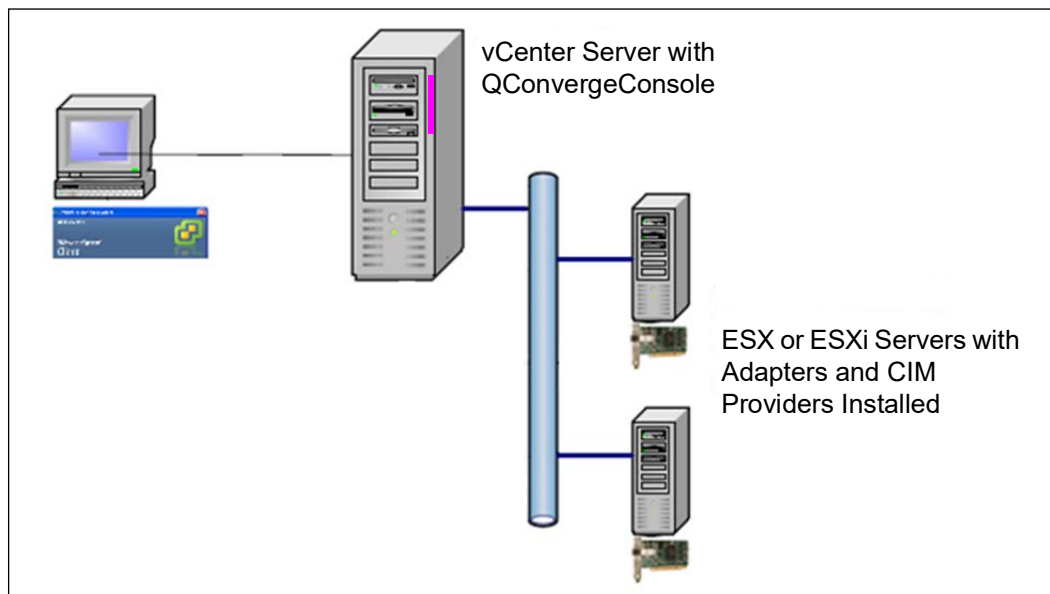
Figure 1-1. Required Hardware

Marvell provides the following components that must be installed on the ESX/ESXi Servers, Windows or Linux system and register with the vCenter Server.

ESX/ESXi Server:

- Marvell adapters with proper firmware and driver
- QLogic Adapter CIM Provider

vCenter Server:

- Software installer file to register the plug-in to the vCenter Server

The QConvergeConsole vSphere Client Plug-in requires a physical or Virtual Machine server with 200MB of free disk space and at least 4GB of RAM.

For more information about hardware requirements, see the VMware vCenter Server and vSphere documentation.

Software Requirements

The following software requirements apply:

- VMware vSphere ESX/ESXi environment *7.x*

- Any operating system, including Windows, on which one of the supported versions of VMware vCenter Server is supported by VMware

- VMware vCenter Server 7.0 or later, or vCenter Server Appliance 7.0 or later

- vSphere Client 7.0 or later

- Tomcat™ Web server (optional if you choose not to use the Tomcat server bundled with the VMware vCenter Server installation, or installing for the vCenter Server Appliance. Tomcat 7 is recommended)

- QLogic Adapter CIM Provider provides drivers for the adapters being managed

For information about software requirements to run VMware vCenter Server, vCenter Server Appliance, and vSphere Client, see the VMware vSphere product documentation.

Supported Adapters

The QConvergeConsole vSphere Client Plug-in supports the following Marvell adapters:

- 2600 and 2700 Series Fibre Channel Adapters

- 578xx and 41000 Series Intelligent Ethernet Adapters

- 578xx and 41000 Series Converged Network Adapters

Supported VMware ESX/ESXi and vCenter Server Versions

Refer to the QConvergeConsole vSphere Client Plug-in *Read Me* and *Release Notes* documents for the latest information regarding supported versions of the following:

- VMware vCenter Server
- VMware vSphere Client

To determine what version of VMware vCenter Server can manage what versions of VMware ESX and ESXi, see the VMware vSphere product documentation.

User Privilege Requirements

User privilege requirements are as follows:

- Administrator privileges on the vSphere Client system are required to install, register, and use the QConvergeConsole vSphere Client Plug-in.

- Root privileges are required on the ESX or ESXi host to install the QLogic Adapter CIM Provider drivers.

2 Installing the QConvergeConsole vSphere Client Plug-in

This chapter explains how to install and uninstall the required software in the following sections:

- Installation Package Contents
- "Installing the QConvergeConsole vSphere Client Plug-in" on page 6
- "Uninstalling the QConvergeConsole vSphere Client Plug-in" on page 13
- "Installing the QLogic Adapter CIM Provider" on page 13
- "Uninstalling the QLogic Adapter CIM Provider" on page 15

For information on installing the plug-in, refer to "Installing the QConvergeConsole vSphere Client Plug-in" on page 6.

To use the QConvergeConsole vSphere Client Plug-in, install the following software in this order:

1. **QConvergeConsole vSphere Client Plug-in**—on the Windows or Linux system and register with vCenter Server

2. **QLogic Adapter CIM Provider**—on the ESX or EQConvergeConsole VMware vSphere Client Plug-inSXi Server

Installation Package Contents

The QLogic Adapter CIM Provider and QConvergeConsole vSphere Client Plug-in package contains the following files (where `<ver_num>` indicates the current package version) needed to install both the plug-in and the CIM Providers:

- `QLogic_Adapter_vSphere_Client_Plugin_<ver_num>.exe`
The HTML5 based vSphere Client Plug-in installation package (for HTML5 based vSphere Client)

- ■ `QLogic_Adapter_Web_Client_Plugin_Linux_x64_<ver_num>.bin`
  The QConvergeConsole vSphere Web Client Plug-in installation package to be installed on 64-bit Linux servers (for HTML5 based vSphere Client)

- ■ `esx70-1.7.37\MRVL-adapter-provider_-<ver_num>-package.zip`
  The Marvell QLogic 2600, 2700 Series Adapter CIM Provider installation file

- ■ `esx70-1.1.20\MRVL-viplugin-provider_<ver_num>-package.zip`
  The Marvell FastLinQ 578*xx* and 41000 Series Adapter CIM Provider installation file for ESXi 7.0

- ■ `readme.txt`
  The Read Me document contains hardware and software requirements, operating system support, supported features, installation and removal instructions, known issues and workarounds, and support contact information.

- ■ `release_notes.txt`
  The Release Notes document lists changes, fixes, known issues, and release details.

For detailed information on installing the QConvergeConsole vSphere Client Plug-in, refer to "Installing the QConvergeConsole vSphere Client Plug-in" on page 6. For detailed information on installing the CIM Provider, refer to "Installing the QLogic Adapter CIM Provider" on page 13.

Installing the QConvergeConsole vSphere Client Plug-in

Follow the instructions in this section to install the QConvergeConsole QConvergeConsole vSphere Client Plug-in on a Linux or Windows server running Tomcat Web server (Tomcat 7 recommended) for the vCenter Server.

To install the QConvergeConsole QConvergeConsole vSphere Client Plug-in:

1. Download the `QLogic_Adapter_vSphere_Client_Plugin_<ver_num>.exe` file.

2. Run the installation using one of these methods:

   - ❑ Double-clicking the `.exe` file.
   - ❑ Typing the name of the `.exe` file in a Run window.
   - ❑ Clicking **Browse** and locating the `.exe` file.

The InstallAnywhere wizard opens, as shown in Figure 2-1.
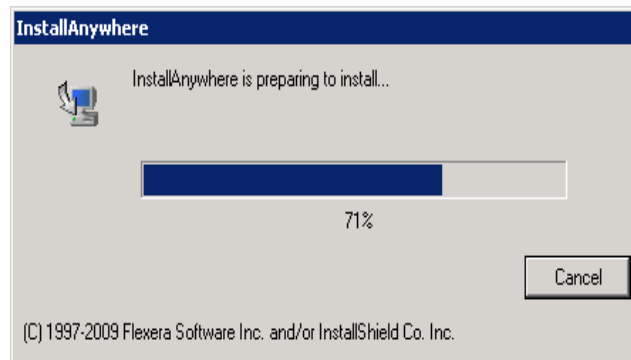
Figure 2-1. InstallAnywhere Initial Window

3.   In the QLogic Adapter VI Plug-in Registration Wizard, Introduction window (Figure 2-2), click **Next**.
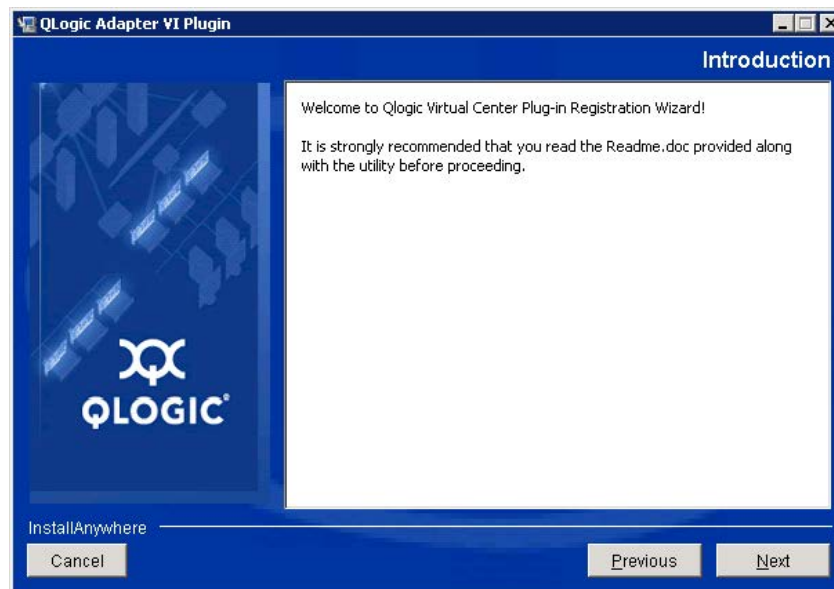
Figure 2-2. QLogic Adapter VI Plug-in Registration Wizard—Introduction

Wait while the wizard configures the plug-in (Figure 2-3).
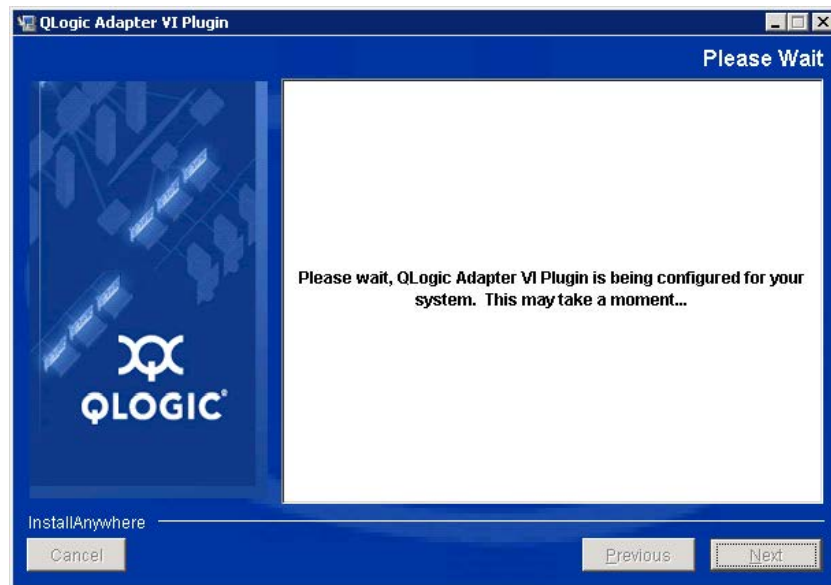
Figure 2-3. QLogic Adapter VI Plug-in—Configuration

If a previous version of the plug-in is installed on the system, select from the following options (Figure 2-4):

❑ To cancel the installation, click **Finish**.

❑ To resume the installation, click **Next**.
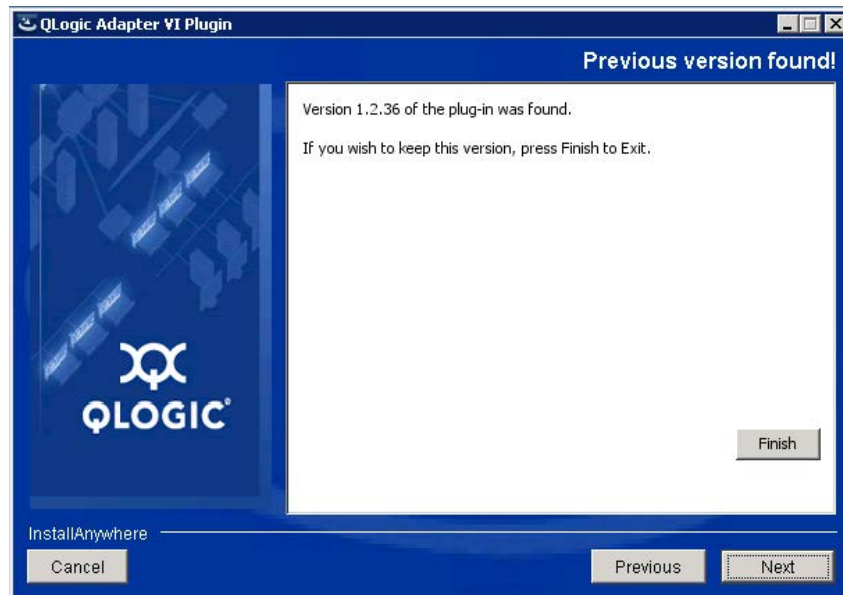
Figure 2-4. QLogic Adapter VI Plug-in—Previous Version Found Options

4. Select the installation folder, and then click **Install** (Figure 2-5).
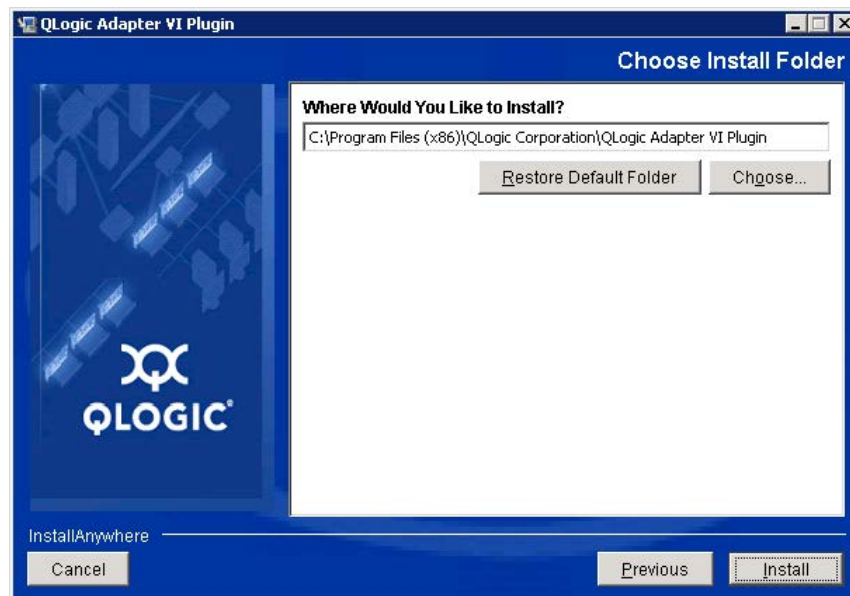
Figure 2-5. QLogic Adapter VI Plug-in—Select the Installation Folder

5. Wait while the wizard performs the installation (Figure 2-6).
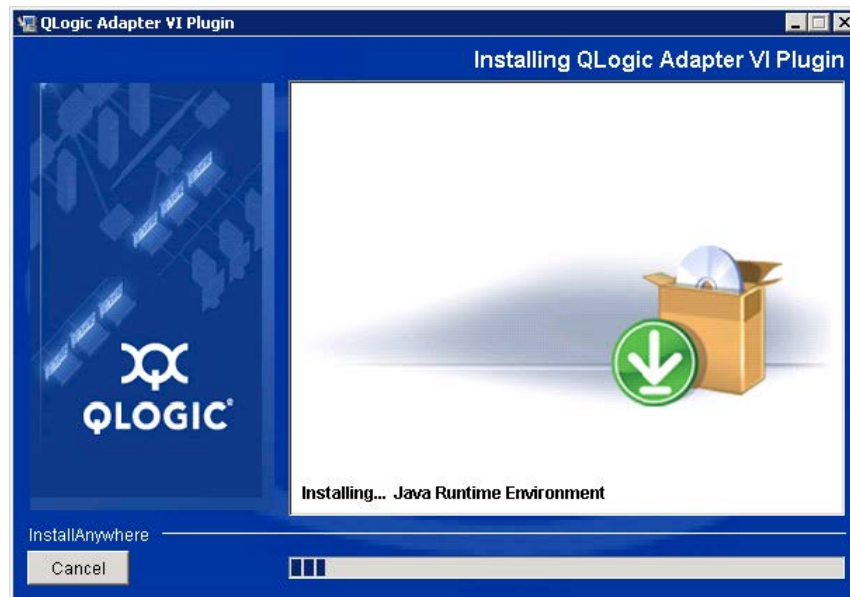
Figure 2-6. QLogic Adapter VI Plug-in—Installing the QConvergeConsole vSphere Client Plug-in

6. In the User Input window (Figure 2-7 shows an example), enter the requested information, and then click **Next** to continue.

NOTE

The **Tomcat Server IP** text box is visible since the embedded Tomcat Web services within vCenter Server are not used.

Figure 2-7. QLogic Adapter VI Plug-in—User Input Window

Wait again while the wizard finishes configuring the plug-in (Figure 2-8).
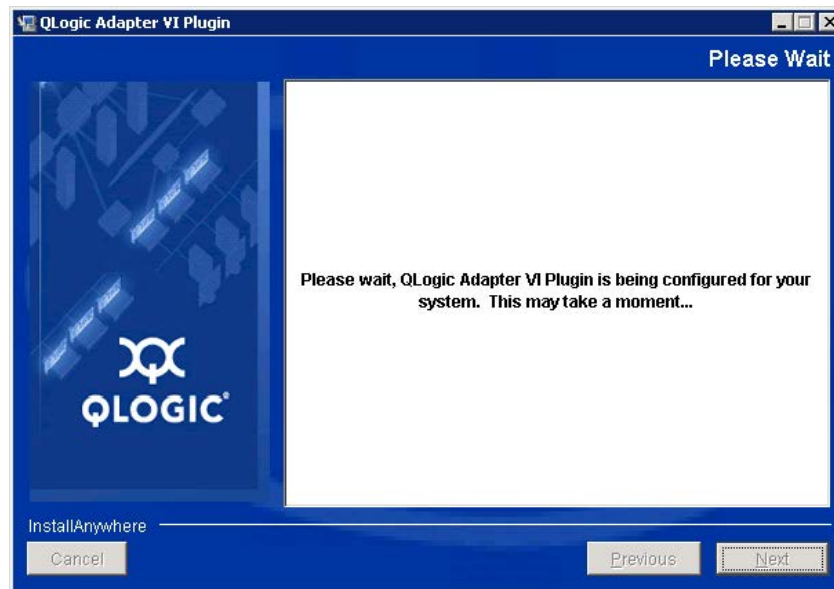
Figure 2-8. QLogic Adapter VI Plug-in—Configuration

7. Figure 2-9 appears when registration is completed. Click **Finish** to exit.

Figure 2-9. QLogic Adapter VI Plug-in—Successful Registration

8. After the installation completes, restart the Tomcat service as follows:

❑ If the QConvergeConsole vSphere Client Plug-in is installed on a server other than the vCenter Server, restart the Apache™ Tomcat service.

Uninstalling the QConvergeConsole vSphere Client Plug-in

To remove the QConvergeConsole vSphere Client Plug-in:

1. In the Windows Control Panel, select **Add or Remove Programs**. (Windows Server 2019 or later only: Select **Programs and Features**.)

2. In the Add or Remove Programs dialog box, select the **QLogic Adapter QConvergeConsole vSphere Client Plug-in**, and then click **Change/Remove**.

3. Follow the instructions in the plug-in installer to remove the plug-in.

Installing the QLogic Adapter CIM Provider

This section describes how to install and start the QLogic Adapter CIM Provider for VMware ESX/ESXi 7.0.

NOTE

The QLogic Adapter CIM Provider for VMware ESX was generated as a vSphere Installation Bundle (VIB) file. A VIB contains the complete set of files and binaries required to install the provider on VMware ESX/ESXi. The file `MRVL-adapter-provider-<version>-package.zip` contains the VIB and the necessary metadata to install the provider on VMware ESX/ESXi.

The CIM Provider bundled with the current QConvergeConsole vSphere Client Plug-in also includes a zip bundle to be used with VMware Update Manager (VUM) for auto-deployment of the QLogic Adapter CIM Provider.

Initial Installation Methods

Initial installation methods for the QLogic Adapter CIM Provider include the following:

■ **Online**—Refer to "To install the CIM Provider on an ESXi 7.0 *host:*" on page 14.

■ **Offline**—Refer to Appendix A Installing the QLogic Adapter CIM Provider Using VUM.

■ **VUM**—Refer to Appendix A Installing the QLogic Adapter CIM Provider Using VUM. The VMware Update Manager (VUM) is a plug-in for the vCenter Server. You can use the VUM UI to install a VIB by importing the associated offline bundle package (a zip file that contains the VIB and metadata). You can then create an add-on baseline and remediate the hosts with this baseline. For details on VUM, see the vCenter Server documentation.

To install the CIM Provider on an ESXi 7.0 host:

1. Copy the `<CIM Provider installation zip file>` file to the root directory (/) of the ESXi 7.0 system.

2. Issue the `esxcli` command as follows:

   ```
   # cd /
   # esxcli software vib install -d file:///<CIM Provider
   installation zip file> --maintenance-mode
   ```

3. Reboot the system as required.

NOTE

On the ESXi system, the CIMOM (CIM object manager) may be disabled. To check to see if the CIMOM is disabled, issue the following command:

```
esxcli system wbem get
```

To enable the CIMOM, issue the following command:

```
esxcli system wbem set -e true
```

Subsequent Update Installation

To update the QLogic Adapter CIM Provider after a prior VIB installation, remove the existing VIB by following the instructions in "Uninstalling the QLogic Adapter CIM Provider" on page 15. After completing the VIB removal, install the new VIB by following the same steps in "Initial Installation Methods" on page 13.

Starting the QLogic Adapter CIM Provider

After a system startup, the Small-Footprint CIM Broker (SFCB) CIM object manager (CIMOM) in the ESX system should start automatically and load the QLogic Adapter CIM Provider when necessary. If the CIM Provider does not start automatically, refer to Appendix B Troubleshooting for information on how to manually stop, start, or restart the SFCB CIMOM.

Uninstalling the QLogic Adapter CIM Provider

You can uninstall the QLogic Adapter CIM Provider for your version of VMware. For information about removing the QLogic Adapter CIM Provider through a remote host, see the *QLogic Adapter CIM Provider and vCenter Plug-in for VMware ESX/ESXi Read Me* document.

To uninstall the QLogic Adapter CIM Provider from an ESXi 7.0 host:

1. To view the VIB list and determine the CIM Provider name (in this case, `qlogic-adapter-provider` or `viplugin-provider` for FastLinQ Adapters), issue the following command:

   # **esxcli software vib list**

2. To remove the QLogic Adapter CIM Provider, issue the following command:

   # **esxcli software vib remove --vibname qlogic-adapter-provider --maintenance-mode –f**

---

3 Getting Started with QConvergeConsole vSphere Client Plug-in

This chapter provides instructions for accessing the QConvergeConsole vSphere Client Plug-in and provides information on the plug-in's user interface, including:

■ Starting VMware vCenter Server Using the QConvergeConsole vSphere Client Plug-in

■ "Introduction to the QConvergeConsole vSphere Client Plug-in" on page 20

■ "Enabling and Disabling the QConvergeConsole vSphere Client Plug-in" on page 23

Starting VMware vCenter Server Using the QConvergeConsole vSphere Client Plug-in

If you have not done so, create a data center (select **New Datacenter**), and then add each ESX/ESXi Server to the new data center. Then, select the server from the tree on the left side to display a row of tabs on the right side. If the server has the QLogic Adapter CIM Provider and adapters installed, and if the plug-in installation and registration have been done successfully, the row of tabs includes the **QConvergeConsole** tab (see "QConvergeConsole vSphere Client Plug-in User Interface" on page 19). Click this tab to begin using the plug-in to manage adapters in vCenter Server.

If you start and connect the vSphere Client directly to an ESX/ESXi Server, the Plug-in does not appear.

To start the QConvergeConsole vSphere Client Plug-in:

1. Start the VMware vSphere Client and connect to the VMware vCenter Server by entering the IP address or its qualified domain name, user name, and password, and then click **Login**.

2. If the Security Warning dialog box appears, click **Ignore** to use the current SSL certificate.

   ❑ If you start and connect the vSphere Client directly to an ESX/ESXi Server, the QConvergeConsole vSphere Client Plug-in does not appear.

   ❑ If you have not done so, create a data center (select **New Datacenter**) and add each ESX/ESXi Server to the newly created data center.

3. In the left pane, select the IP address of the VMware ESX/ESXi Server.

4. In the right pane, click the **QConvergeConsole** tab to view the plug-in. The QConvergeConsole vSphere Client Plug-in retrieves the adapter information from the server.

> **NOTE**
>
> If the ESXi host does not have the QLogic Adapter CIM Provider and adapters installed, or if the QConvergeConsole vSphere Client Plug-in installation and registration was not successful, the **QConvergeConsole** tab is not shown.

In the right pane of VMware vCenter, the QConvergeConsole vSphere Client Plug-in appears on the page labeled with the tab **QConvergeConsole**.

To access the QConvergeConsole tab in VMware vCenter Server:

1. On a computer or server that has the VMware vSphere Client software installed, double-click the VMware vSphere Client icon to start the vSphere Client.

> **NOTE**
>
> If you start and connect the vSphere Client directly to an ESX/ESXi Server, the plug-in does not appear.

2. In the vSphere Client log-in dialog box (Figure 3-1), log in as follows:

    a. To connect to multiple hosts, type the VMware vCenter Server's IP address in the **IP address/Name** box. Or, to connect to a single host, type the host's IP address or host name in the **IP address/Name** box.

    b. Type your user name and password for the VMware vCenter Server in the appropriate boxes. You can also select the **Use Windows Session credentials** check box, if credentials are configured and applicable.

    c. Click **Login**.
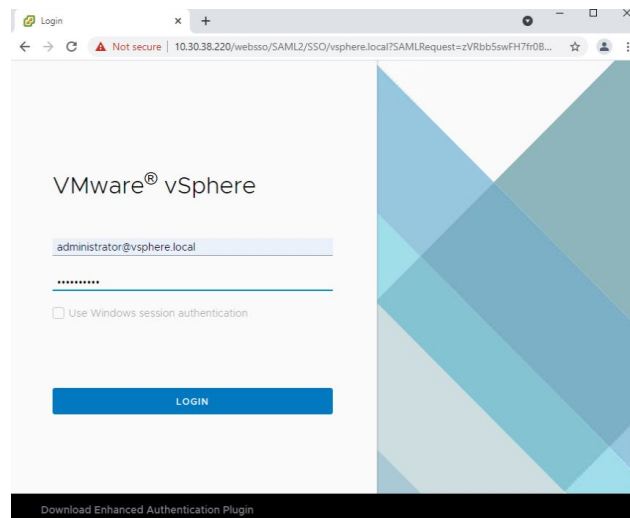
Figure 3-1. vSphere Client Login Dialog Box

VMware vCenter opens in the vSphere Client window. Figure 3-2 identifies the ESXi host node and the **QConvergeConsole** selection.

ESXi Host

QConvergeConsole Selection
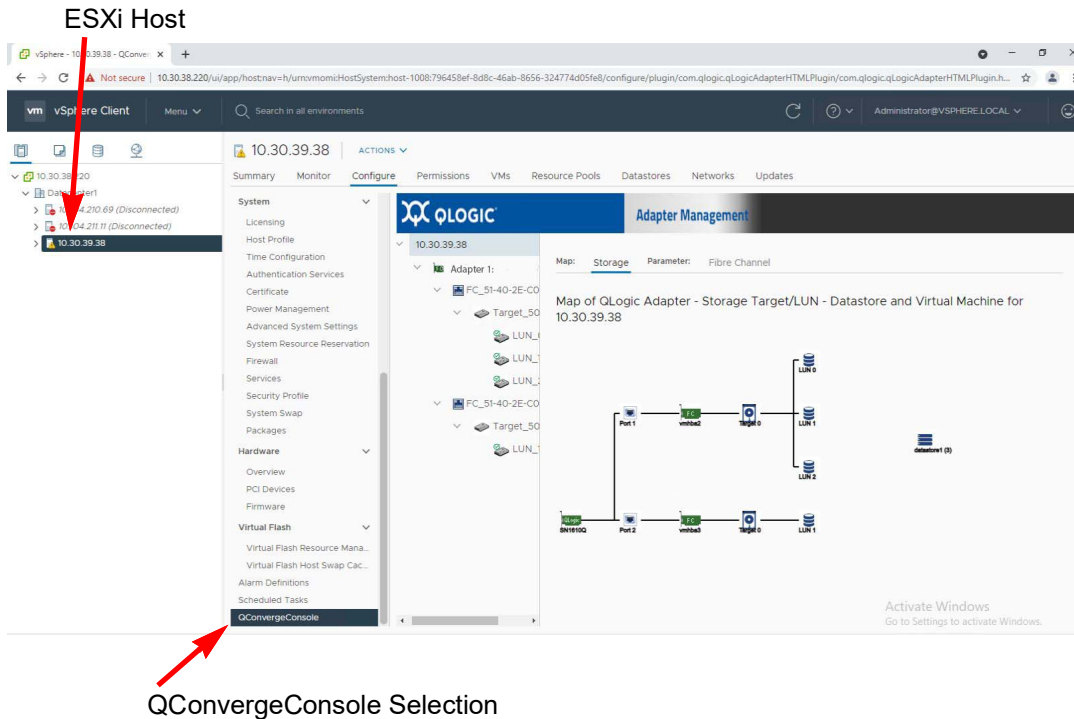
Figure 3-2. QConvergeConsole vSphere Client Plug-in User Interface

3. In the left pane of the VMware vCenter Server window under **Home, Inventory, Hosts and Clusters View**, select a VMware vSphere ESX or ESXi host.

4. In the right pane, click the **QConvergeConsole** selection.

The right pane displays the QConvergeConsole user interface, as shown in Figure 3-3. If there is no **QConvergeConsole** selection, see Appendix A Installing the QLogic Adapter CIM Provider Using VUM.

QConvergeConsole Interface in vCenter

System Tree Pane
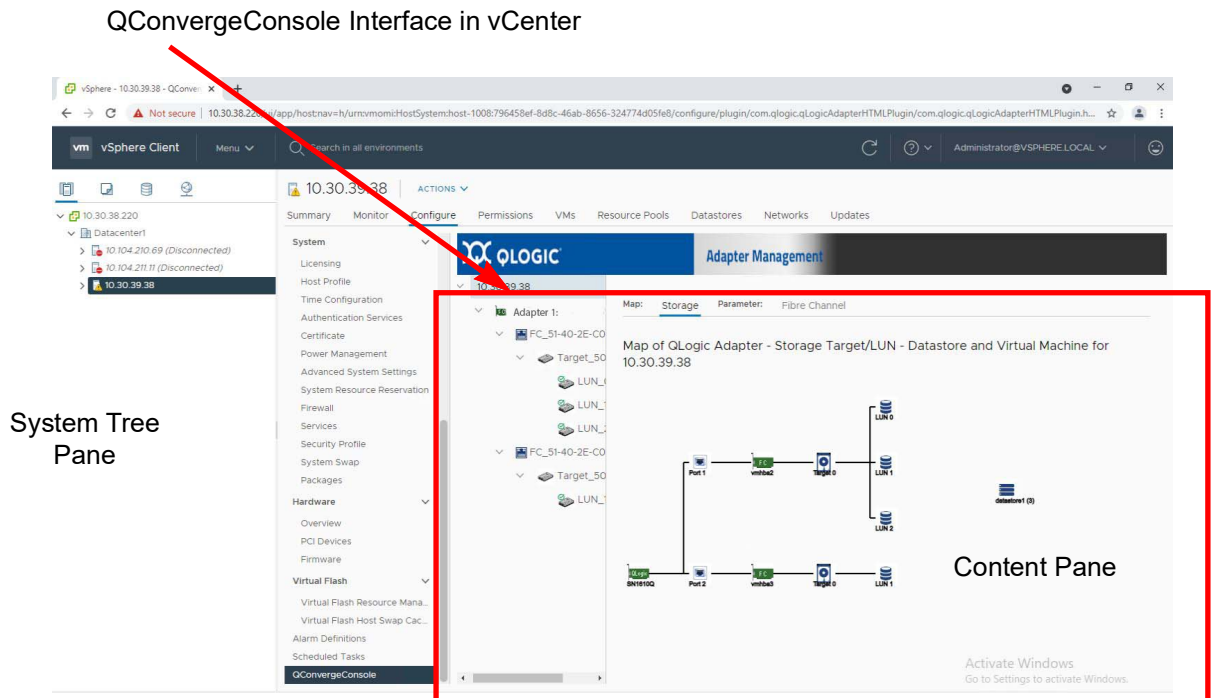
Figure 3-3. QConvergeConsole vSphere Client Plug-in User Interface

Introduction to the QConvergeConsole vSphere Client Plug-in

The QConvergeConsole vSphere Client Plug-in's graphical interface appears in the right pane of VMware vCenter Server. The interface is divided into two panes (see Figure 3-3):

- System Tree Pane
- Content Pane

Use the system tree pane to select a device to configure. The content pane then displays the configuration options for the item selected in the system tree.

System Tree Pane

The system tree resides in the left pane of the QConvergeConsole interface. The nodes of the system tree show all available ESX and ESXi hosts and their connected devices (adapters, ports, devices, and LUNs). The nodes are arranged hierarchically from host (highest level) to LUN (lowest level). You can display or hide the information in lower levels of a node, as follows:

■   Click ⊞ next to any tree node to show its list of connected devices.

■   Click ⊟ next to any tree node to hide its list of connected devices.

Each system tree node has an icon that identifies the associated device (host, adapter, port, target device, or LUN), as shown in Table 3-1.

Table 3-1. System Tree Device Icons

Icon	Meaning
	An ESXi host
	A supported QLogic Fibre Channel Adapter
	A supported Marvell Converged Network Adapter
	A supported Marvell Ethernet Adapter
	A physical adapter
	A physical port on a supported adapter
	A target device connected to an adapter port
	A LUN on a target device
	NIC PCI function on Converged Network Adapter port
	iSCSI PCI function on Converged Network Adapter port
	FCoE PCI function on Converged Network Adapter port
	PCI function disabled on Converged Network Adapter port
	578xx/41000 Series Adapters
	578xx/41000 Series Adapters FCoE
	578xx/41000 Series Adapters FCoE Port
	578xx/41000 Series Adapters Function (Link Down)
	578xx/41000 Series Adapters Function (Link Up)
	578xx/41000 Series Adapters iSCSI

Table 3-1. System Tree Device Icons (Continued)

Icon	Meaning
	578xx/41000 Series Adapters iSCSI Portal
	A LUN on a target device connected to a 578xx/41000 Series Adapters
	578xx/41000 Series Adapters Port
	A target device connected to a 578xx/41000 Series Adapters

Table 3-2 shows symbols that are added to the basic icons in Table 3-1 to indicate additional information.

Table 3-2. Special Icon Symbols

Symbol	Meaning	Example	
	Device, link, or function is down		iSCSI PCI function is down
Yellow	Device, link, or function is not connected or link is down		Fibre Channel port is down
Yellow or Green VM	Indicates whether VM is powered on or off	—	—

Content Pane

The right pane of the QConvergeConsole interface displays information and management options for the device associated with the selected system tree node. If the device has no associated management options, the content pane displays information only.

The following options are generally available in the content pane:

- **Refresh**—Click this to update the content pane with the latest information.

- **Reset**—Click this to reset relevant information.

- **Save**—Click this to save changes made to parameter values (not available if content pane contains information only).

- **Save Configuration**—Click this to save configuration changes (not available if content pane contains information only).

- **Update Adapter Flash Image**—Click this to update the Flash using the QConvergeConsole vSphere Client Plug-in.

Enabling and Disabling the QConvergeConsole vSphere Client Plug-in

> **NOTE**
>
> If the QConvergeConsole vSphere Client Plug-in installation completed successfully, you do not need to enable the plug-in; it is automatically enabled during installation. You can, however, verify if the plug-in is enabled by following these steps.

To enable or disable the QConvergeConsole plug-in:

1. In the vSphere Client window, open the **Plug-ins** menu, and then click **Manage Plug-ins**.

2. In the Plug-in Manager window under **Installed Plug-ins**, locate the QConvergeConsole plug-in.

   The plug-in's status (**Enabled** or **Disabled**) is displayed in the **Status** column, as shown in Figure 3-4.
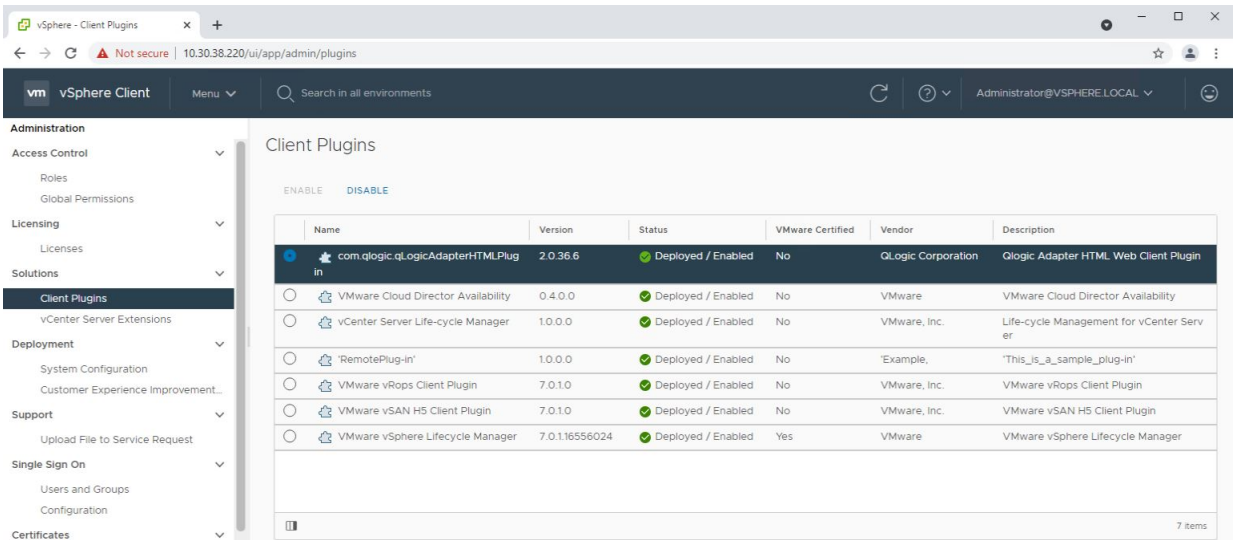
Figure 3-4. Plug-in Manager: Verifying QConvergeConsole vSphere Client Plug-in Status

3. To enable or disable the QConvergeConsole vSphere Client Plug-in, highlight the row of the item you wish to change and click the appropriate action under **Client Plugins**, as shown in Figure 3-5.
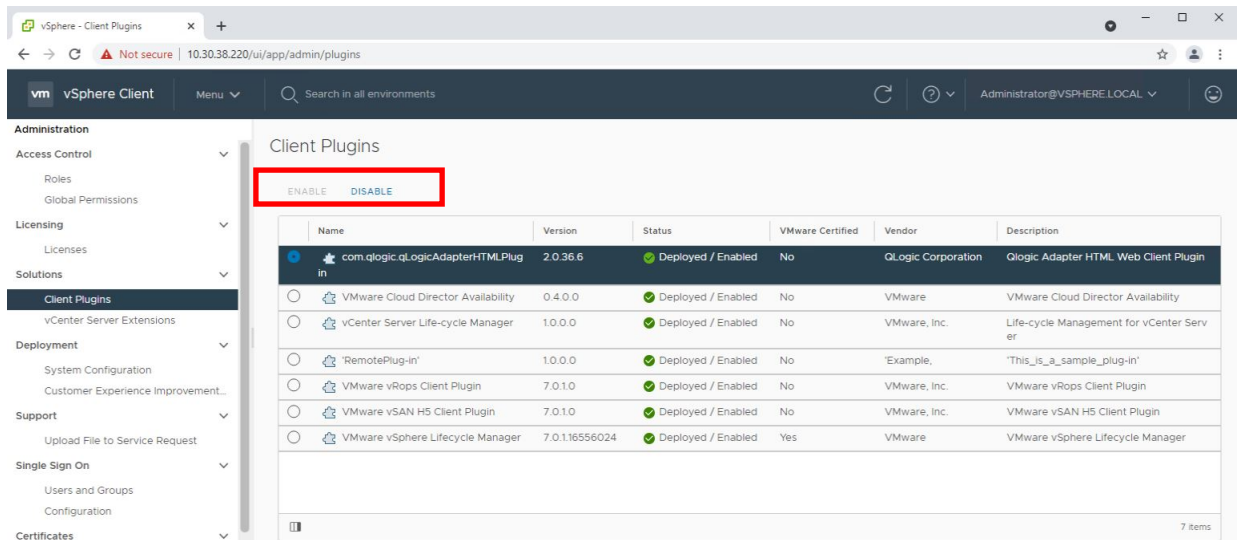
Figure 3-5. Plug-in Manager: Toggling QConvergeConsole vSphere Client Plug-in Status

4 Using the QConvergeConsole vSphere Client Plug-in

This chapter provides detailed instructions on how to use the QConvergeConsole vSphere Client Plug-in to manage Marvell adapters and connected devices, including viewing adapter and device information and updating the adapter Flash firmware.

- Managing Hosts
- "Managing Fibre Channel Adapters" on page 32
- "Viewing Target Device Information" on page 67
- "Viewing LUN Information" on page 75
- "Updating Adapter Flash" on page 76

NOTE

- For instructions on using N_Port ID Virtualization (NPIV) to create and delete virtual ports, refer to the VMware vCenter Server documentation:

  https://docs.vmware.com/en/VMware-vSphere/7.0/com.vmware.vsphere.vm_admin.doc/GUID-74DDA7F7-84AC-4251-8749-552A2678A33C.html

- For instructions on how to access the QConvergeConsole vSphere Client Plug-in, a description of the plug-in's user interface, and information on how to connect to and disconnect from hosts, refer to Chapter 3 Getting Started with QConvergeConsole vSphere Client Plug-in.

Managing Hosts

When you select an ESX or ESXi host, the content pane provides several display options. Select the option for the type of information you want to view, which are described in the following sections:

- Viewing the Storage Map

- ■ Viewing the Network Map
- ■ Setting Fibre Channel Parameters
- ■ Setting iSCSI Parameters
- ■ Setting Ethernet Parameters

Viewing the Storage Map

Next to **Map**, click **Storage** to view the host's storage map, with the host on one end and the VMs on the other end. Figure 4-1 shows an example of a storage map.
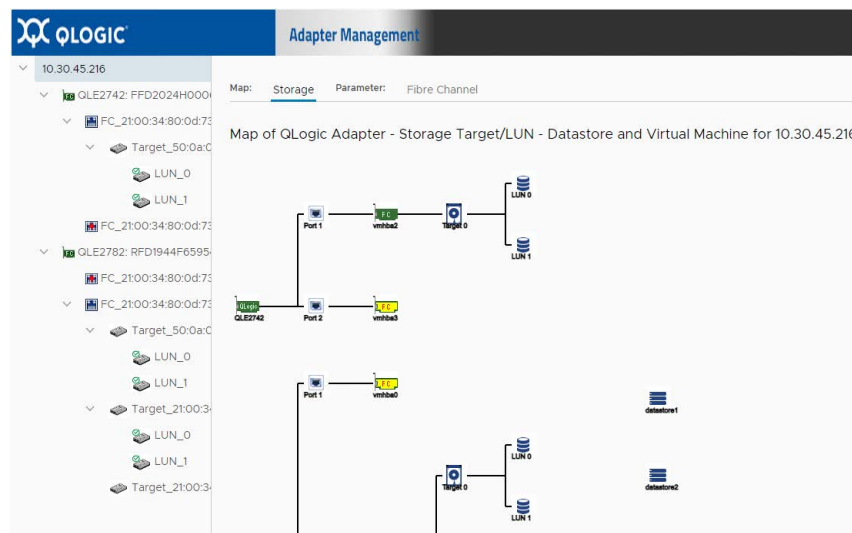
Figure 4-1. Host View—Storage Map

Viewing the Network Map

Next to **Map**, click **Network** to view the selected host's network map, as shown in Figure 4-2.
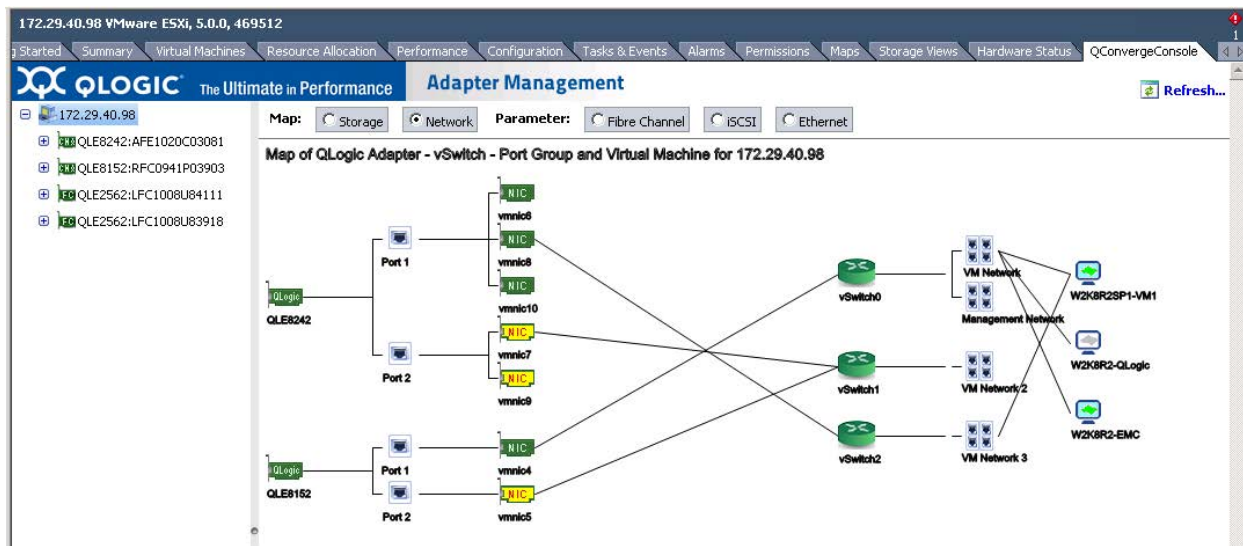
Figure 4-2. Host View—Network Map

Setting Fibre Channel Parameters

Next to **Parameter**, click **Fibre Channel** to view and edit Fibre Channel parameters for the selected host, as shown in Figure 4-3.
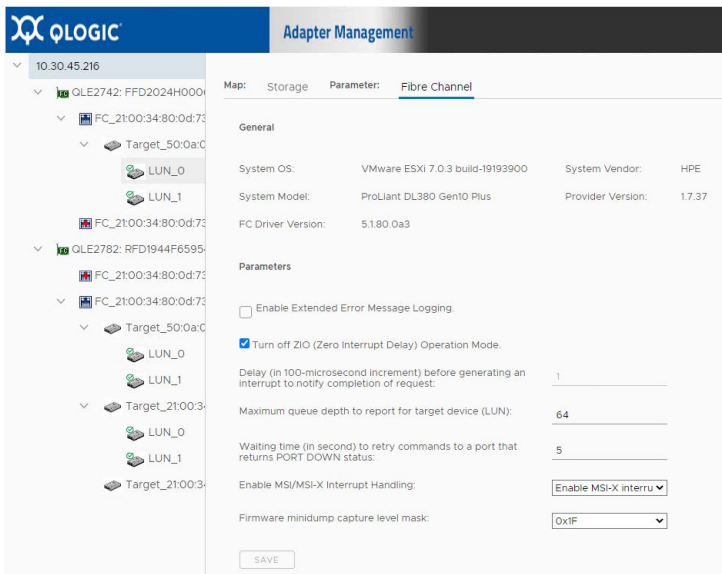
Figure 4-3. Host View—Fibre Channel Parameters

The **General** information section at the top of the window contains the following:

- **System OS:** Name and version of the host operating system
- **System Vendor:** Name of host manufacturer
- **System Model:** Model name of host
- **Provider Version:** Reduce Zoom for Plug-in version
- **FC Driver Version:** Version of the Fibre Channel driver

The **Parameters** section contains the following configurable parameters:

- **Enable Extended Error Message Logging:** Select the check box to enable extended error message logging, or clear the check box to disable extended error message logging.

- **Turn off ZIO (Zero Interrupt Delay) Operation Mode:** Select the check box to turn off ZIO mode, or clear the check box to turn on ZIO mode.

- **Delay (in 100-microsecond increment) before generating an interrupt to notify completion of request:** When ZIO mode is on, use the up and down arrows or type the delay in 100ms increments before generating an interrupt.

- **Maximum queue depth to report for target device (LUN):** Select the maximum queue depth. Allowed values are 0–65,535; the default maximum queue depth value is 64.

- **Waiting time (in seconds) to retry commands to a port that returns PORT DOWN status:** Select the number of seconds between command retry attempts when a port is down. Allowed values are 0–255. The default is 5.

- **Enable MSI/MSI-X Interrupt Handling:** Select the interrupt handling mechanism:

  - ❑ 0—Enable traditional pin-based interrupt mechanism
  - ❑ 1—Enable MSI-X interrupt mechanism (default)
  - ❑ 2—Enable MSI interrupt mechanism

- **Firmware minidump capture level mask:** Select the driver capture mask for firmware minidump:

  - ❑ 0x00—Capture mask specified by the firmware
  - ❑ 0x03—Capture mask 0x03
  - ❑ 0x0F—Capture mask 0x0F
  - ❑ 0x1F—Capture mask 0x1F (default)
  - ❑ 0x7F—Capture mask 0x7F

To save your changes, click **Save Configuration**.

Setting iSCSI Parameters

Next to **Parameter**, click **iSCSI** to view and edit iSCSI parameters for the selected host, as shown in .
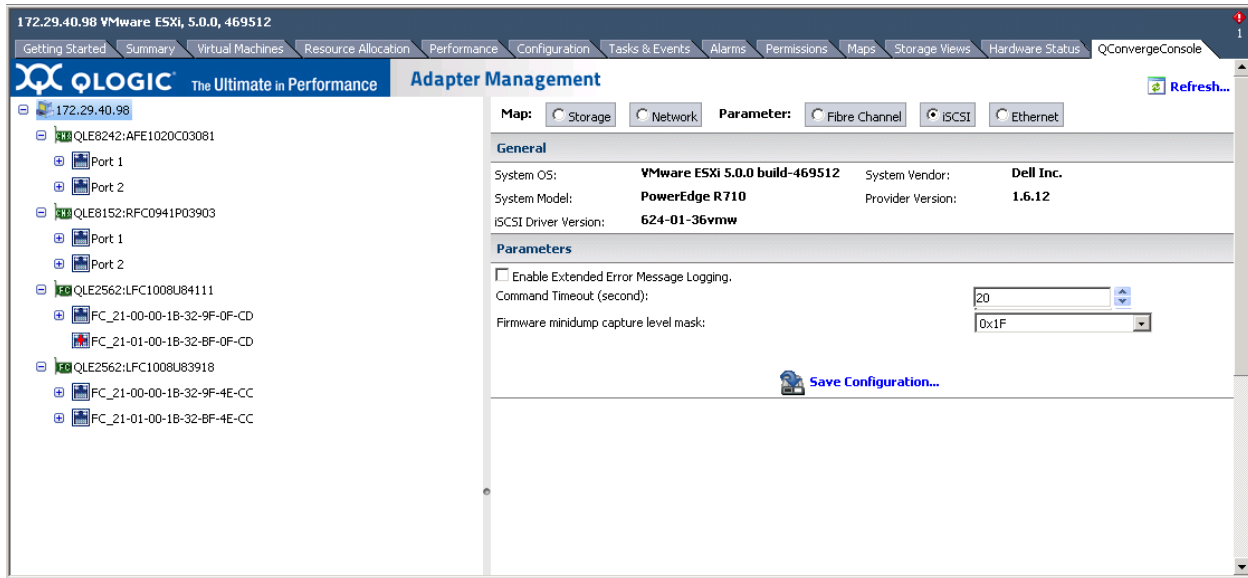
Figure 4-4. Host View—iSCSI Parameters

The **General** information section at the top of the window contains the following:

- **System OS:** Name and version of the host operating system
- **System Vendor:** Name of host manufacturer
- **System Model:** Model name of host
- **Provider Version:** Version of the QLogic Adapter CIM Provider
- **iSCSI Driver Version:** Version of the iSCSI driver

The **Parameters** section contains the following configurable parameters:

- **Enable Extended Error Message Logging:** Select the check box to enable extended error message logging, or clear the check box to disable this feature.

- **Command Timeout:** To set the command time-out in seconds, type or select a value.

- **Firmware minidump capture level mask:** Choose the driver capture mask for firmware minidump.

To save your changes, click **Save Configuration**.

Setting Ethernet Parameters

Next to **Parameter**, click **Ethernet** to view and edit Ethernet parameters for the selected host, as shown in .
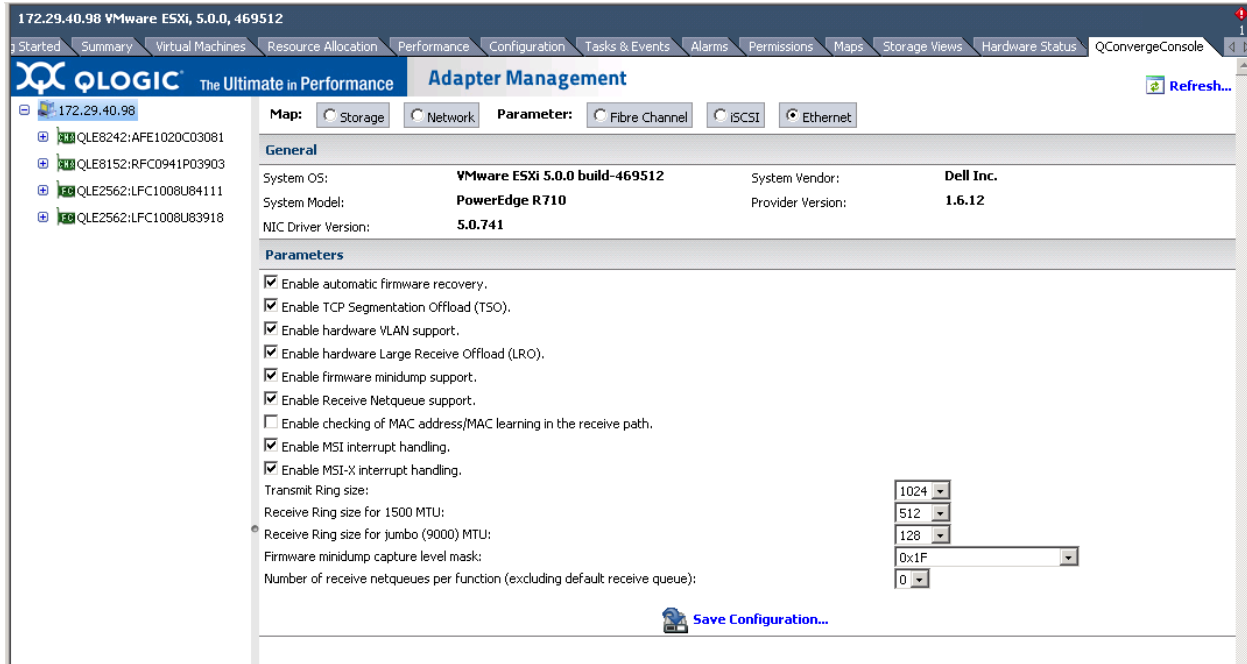
Figure 4-5. Host View—Ethernet Parameters

The **General** information section at the top of the window contains the following:

- **System OS:** Name and version of the host operating system
- **System Vendor: Name of host manufacturer**
- **System Model:** Model name of host
- **Provider Version:** Version of the CIM Provider
- **NIC Driver Version:** Version of the NIC driver

The **Parameters** section contains the following configurable parameters:

- **Enable automatic firmware recovery:** Select the check box to enable automatic firmware recovery, or clear the check box to disable this feature.

- **Enable TCP Segmentation Offload (TSO):** Select the check box to enable TCP segmentation offload, or clear the check box to disable this feature.

- **Enable hardware VLAN support:** Select the check box to enable hardware VLAN, or clear the check box to disable this feature.

- **Enable hardware Large Receive Offload (LRO):** Select the check box to enable hardware LRO, or clear the check box to disable this feature.

- **Enable firmware minidump support:** Select the check box to enable firmware minidump, or clear the check box to disable this feature.

- **Enable Receive Netqueue support:** Select the check box to enable Receive Netqueue support, or clear the check box to disable this feature.

- **Enable checking of MAC address/MAC learning in the receive path:** Select the check box to enable checking of MAC address and learning when configuring NPAR-supported devices. This feature must be enabled for NPAR configuration.

- **Enable MSI interrupt handling:** Select the check box to enable MSI interrupt handling. This parameter is enabled by default for all types of adapters.

- **Enable MSI-X interrupt handling:** Select the check box to enable MSI-X interrupt handling. If MSI-X fails at driver load time, the driver falls back to MSI.

- **Transmit Ring size:** Specify the transmit ring size for any NIC adapter. The default is adapter-dependent.

- **Receive Ring size for 1500 MTU:** Specify the 1,500 MTU receive ring size for any NIC adapter. The default is adapter-dependent.

- **Receive Ring size for jumbo (9000) MTU:** Specify the 9,000 MTU receive ring size for any NIC adapter. The default is adapter-dependent.

- **Firmware minidump capture level mask:** Choose the driver capture mask for firmware minidump, either:

  - 0x03—Capture mask 0x03
  - 0x07—Capture mask 0x07
  - 0x0F—Capture mask 0x0F
  - 0x1F—Capture mask 0x1F (default)
  - 0x3F—Capture mask 0x3F
  - 0x7F—Capture mask 0x7F
  - 0xFF—Capture mask 0xFF

- **Number of receive netqueues per function (excluding default receive queue):** Choose the quantity of receive netqueues per function:

  - Two functions—seven per function
  - NPAR—one per function

To save your changes, click **Save Configuration**.

Managing Fibre Channel Adapters

When you select a Fibre Channel adapter from the system tree, the Adapter Management window appears in the content pane, as shown in Figure 4-6.
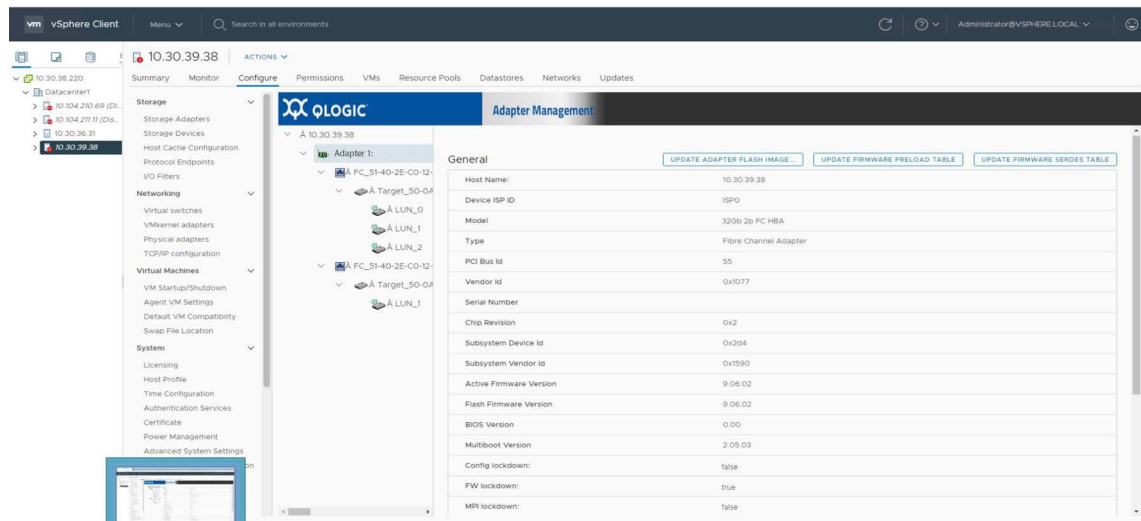
Figure 4-6. Adapter Management for Fibre Channel Adapter

Adapter Management Window

The Adapter Management window for Fibre Channel Adapters (see Figure 4-6) contains the **General** section, which displays the following read-only information:

- **Model:** Fibre Channel or FCoE adapter model
- **Type:** Either **Fibre Channel Adapter** or **Converged Network Adapter**
- **PCI Bus ID:** PCI bus number
- **Vendor ID:** Vendor ID information
- **Serial Number:** Serial number of the Fibre Channel Adapter
- **Chip Revision:** Chip revision number
- **Subsystem Device ID:** ID number of the subsystem device
- **Subsystem Vendor ID:** ID number of the subsystem vendor
- **Active Firmware Version:** Current active firmware version
- **Flash Firmware Version:** Current Flash firmware version
- **BIOS Version:** Current BIOS version
- **Multiboot Version**: Multiboot Flash kit version
- **Config lockdown:** indicates the lock down status for configuration.
- **FW lockdown:** when true, the firmware cannot be updated. See "Firmware Lockdown" on page 33.
- **MPI lockdown:** indicates the lock down status for the MPI.

The **Personality Type Configuration** section displays the following option:

■ **Personality Type:** The adapter's personality type is either **FC Only** (Fibre Channel) or **CNA** (Converged Network Adapter). The selected option indicates the adapter's current personality. To change the personality, select the other option, and then click **Save**. When instructed, reboot the machine.
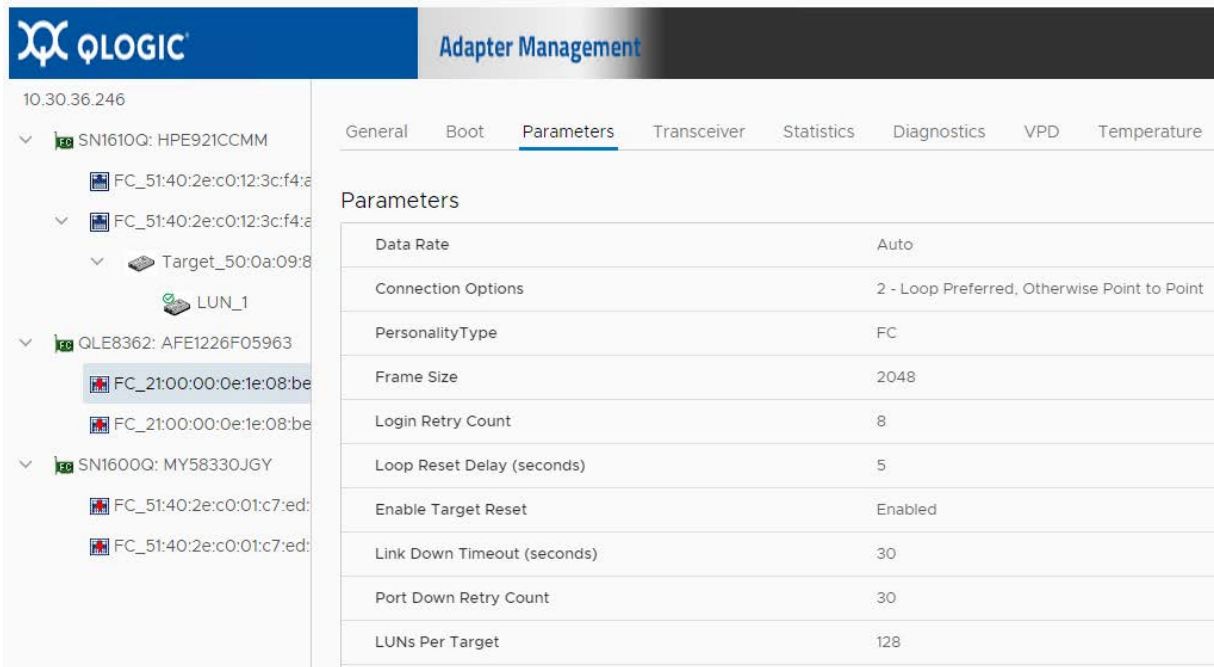
Figure 4-7. Personality Type

The **Commands** section provides controls to update the following:

■ **Update Adapter Flash Image:** Click this option to update the adapter's Flash image.

■ **Update Firmware Preload Table:** Click this option to update the firmware preload table.

■ **Update Firmware SerDes Table:** Click this option to update the firmware serializer/deserializer (SerDes) table. This option is not available for all adapters and is not shown in Figure 4-6.

Firmware Lockdown

Select an adapter in the host view system tree to view Firmware lockdown status for the adapter, as shown in Figure 4-8.

The vSphere client prevents a Flash update if the Firmware is in lockdown mode.

Figure 4-8. Firmware Lockdown

Managing a Fibre Channel Adapter Port

To manage a port on a Fibre Channel adapter, select the port in the system tree. The Adapter Management window then appears as shown in Figure 4-9.
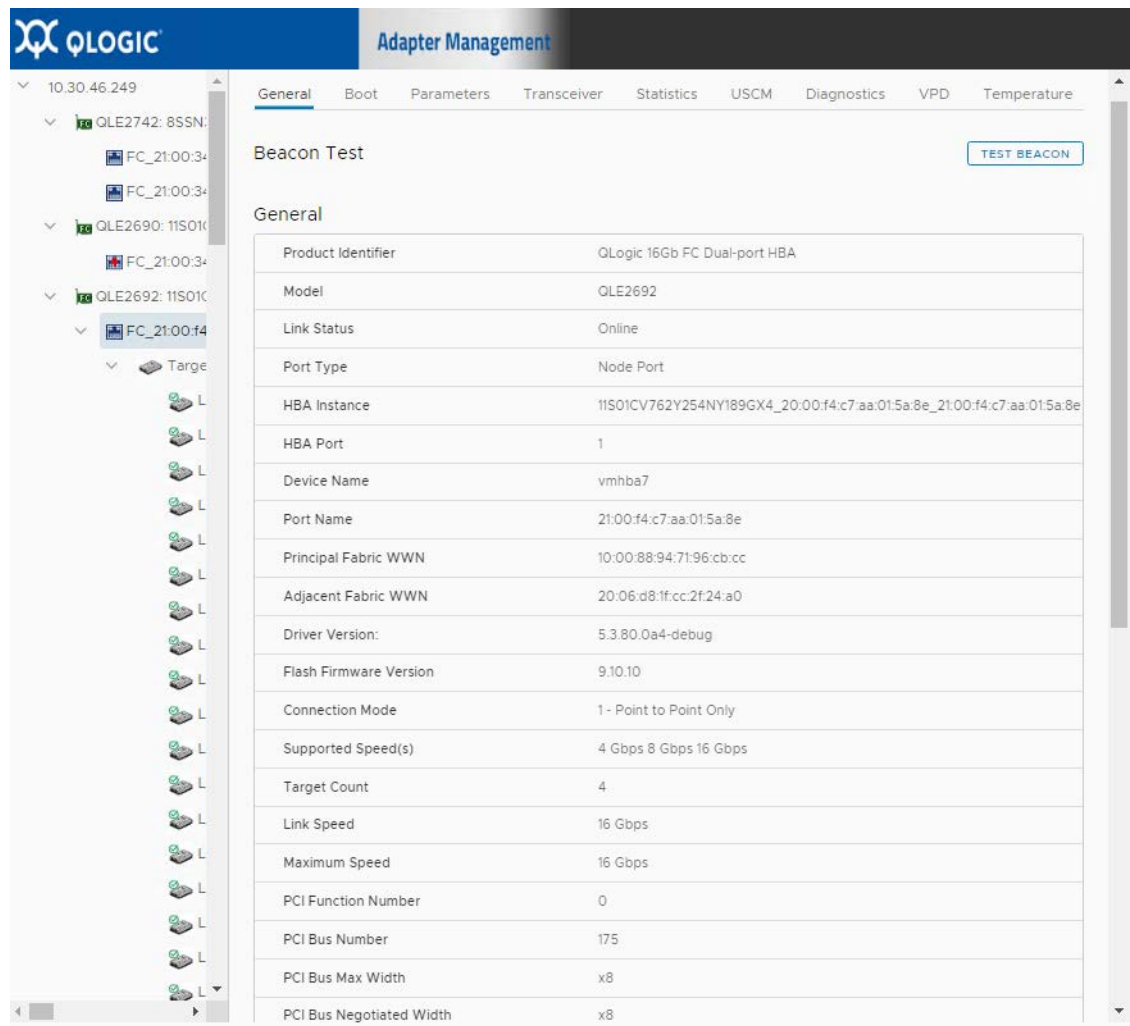
Figure 4-9. Adapter Management Window—Fibre Channel Port

The **General** information section at the top of the content pane contains the following:

- **Product Identifier**
- **Link Status**
- **Port Type**
- **HBA Instance**
- **HBA Port**
- **Device Name**
- **Port Name**
- **Principal Fabric WWN**

- **Advanced Fabric WWN**
- **Driver Version**
- **Flash Firmware Version**
- **Connection Mode**
- **Supported Speeds**
- **Target Count**
- **Link Speed**

The **Beacon Test** section of the content pane contains the following option:

- **Beacon On/Beacon Off**—Click this to toggle the beacon from on to off, or off to on.

Below the identifying information is a row of buttons, as shown in Figure 4-10:

Figure 4-10. Fibre Channel Port—Information Selection

Click the following buttons to select the information to manage on the port:

- **General**—Displays general port information
- **Boot**—Boot configuration
- **Parameters**—Firmware parameters
- **Transceiver**—Transceiver information
- **Statistics**—Statistics information
- **Diagnostics**—Diagnostic tests
- **VPD**—Vital product data (VPD) information
- **Temperature**—Temperature information

The option that appears pressed in indicates the selected information (for example, **Boot** in Figure 4-10). The information for that option appears in the content pane. The following sections describe the Fibre Channel port information types:

- Boot Configuration—Fibre Channel Port

- Firmware Parameters—Fibre Channel Port

- Transceiver Information—Fibre Channel Port

- Statistics Information—Fibre Channel Port

- Target Link Statistics

- Diagnostic Tests—Fibre Channel Port

- **VPD Information—Fibre Channel Port**

- **Temperature Information—Fibre Channel Port**

The world wide port name (WWPN) can be assigned by the fabric through a Brocade® switch if both the adapter and Brocade switch are enabled to allow fabric-assigned WWPNs. For information about enabling fabric-assigned WWPNs, see the adapter user's guide and Brocade switch documentation.

In Figure 4-11, port 21:00:00:24:ff:86:9e:59 is the BIOS boot configuration before this port has been assigned by the fabric through the Brocade switch.
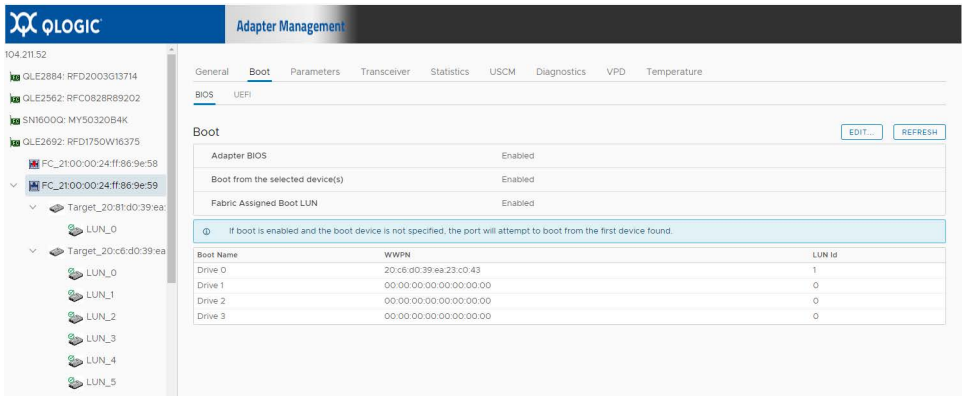
Figure 4-11. Boot Configuration for Port 21:00:00:24:ff:86:9e:59

After re-initializing the ports to enable FA-WWPN, the assigned WWNs are shown in Figure 4-12.

For forward error correction (FEC) to be enabled for a connection, the port on the Brocade switch and the connected adapter port must have FEC enabled. In Figure 4-12, FEC is enabled on port FC_51:40:2e:c0:12:3c:f4:a0.
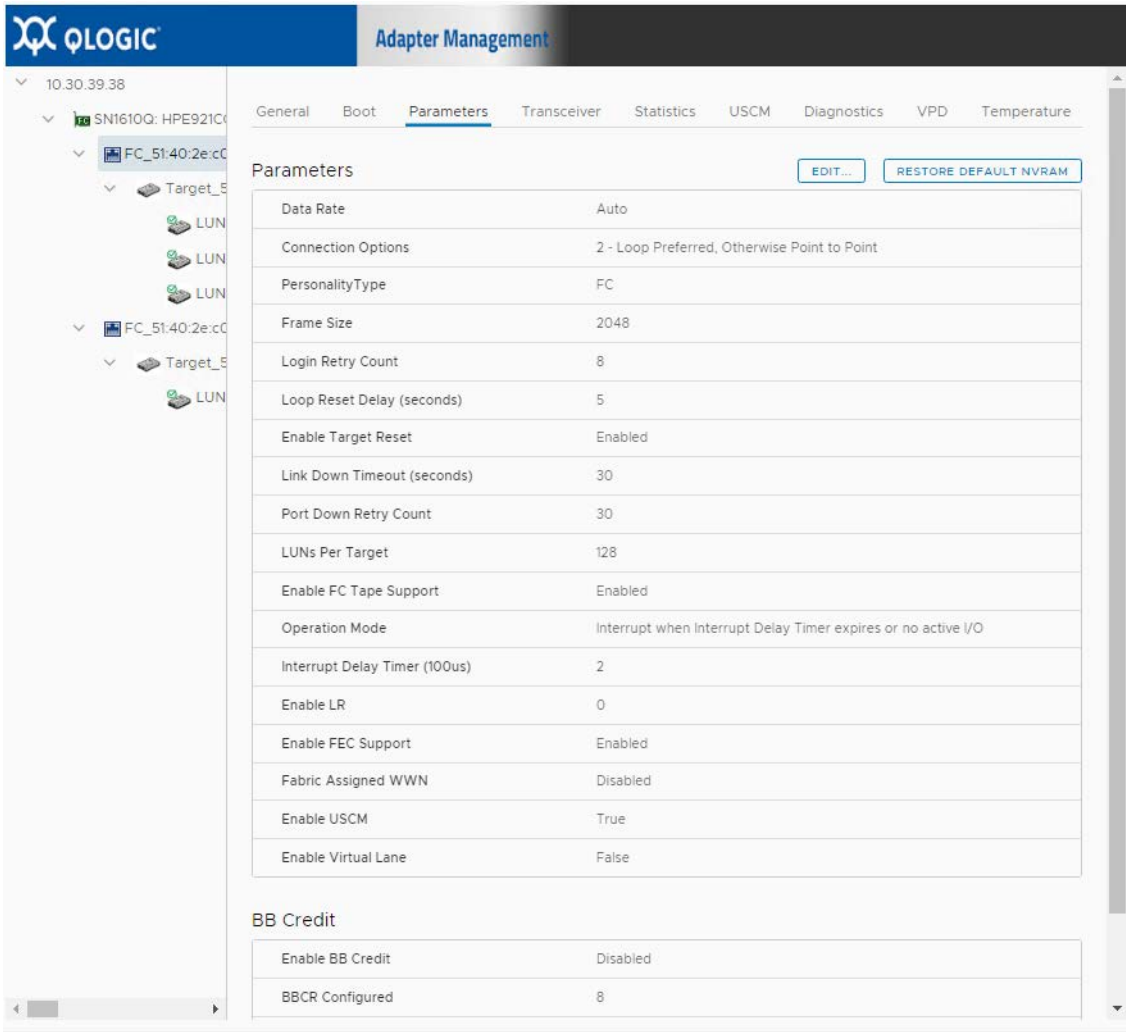
Figure 4-12. FEC Enabled on Port FC_51:40:2e:c0:12:3c:f4:a0

Boot Configuration—Fibre Channel Port

The following sections describe how to view and configure a boot configuration for a Fibre Channel port in either BIOS mode or UEFI mode.

BIOS Mode

To view the current BIOS boot configuration, select **Boot ▸ BIOS**. The content pane appears as shown in Figure 4-13.

When **Boot** is selected, the content pane appears as shown in Figure 4-13.
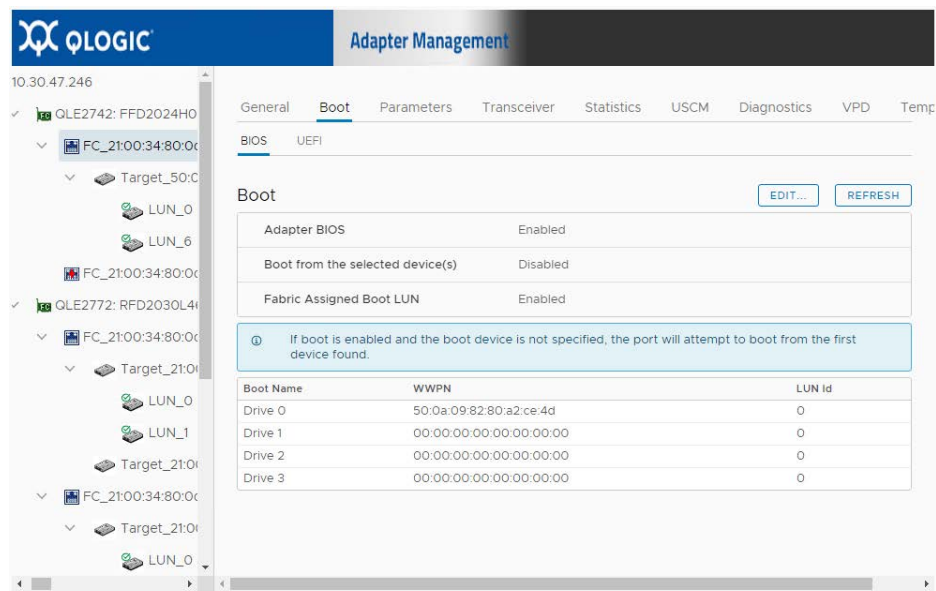
Figure 4-13. Fibre Channel Port—Boot Configuration in BIOS Mode

To change the BIOS boot mode parameters, click **Edit**. The content pane appears as shown in Figure 4-14.
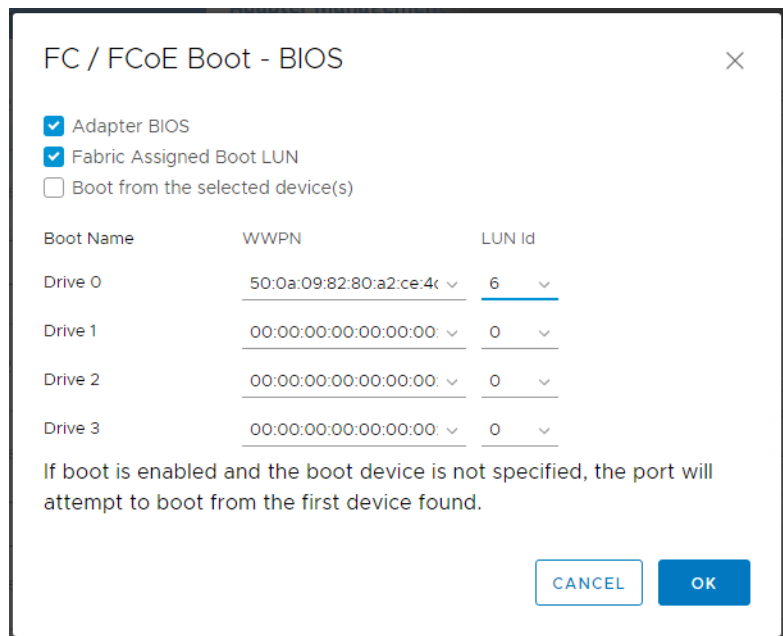
Figure 4-14. Fibre Channel Port—Boot Configuration in BIOS Mode, Setting

The content pane contains the following configurable parameters:

- **Adapter BIOS:** Select the check box to enable booting from the selected port, or clear the check box to disable booting from the port.

- **Fabric Assigned Boot LUN:** Select the check box to enable booting from the fabric assigned boot LUN, or clear the check box to disable booting from the fabric assigned boot LUN.

  When using the fabric-assigned boot LUN:

  ❑ The Fabric Assigned Boot LUN parameter must be enabled on both the initiator (adapter) and the Brocade switch for the FA-WWPN to be assigned to the adapter.

  ❑ If the Fabric Assigned Boot LUN parameter is disabled on the adapter and enabled on the Brocade switch, the FA-WWPN cannot be assigned to the adapter.

  ❑ If the Fabric Assigned Boot LUN parameter is enabled on the adapter and disabled on the Brocade switch, the FA-WWPN cannot be assigned to the adapter.

- **Boot from the selected device(s):** Select the check box to allow booting from a boot device that you specify. Clear the check box to disable this feature.

The following option is available only if **Boot from the selected device(s)** is selected**:**

- **Drive 0–3:** Specify the primary boot device by selecting its worldwide name in **Target WWN**, and then select the device's LUN ID in **LUN ID**.

To save your changes, click **Save Configuration**.

UEFI Mode

In UEFI boot configuration, you can select either **FCP** target devices or **NVMe** target namespaces in boot from SAN configuration.

FCP

To view the current UEFI boot configuration, select **Boot ▸ UEFI ▸ FCP**. The content pane appears as shown in Figure 4-15.
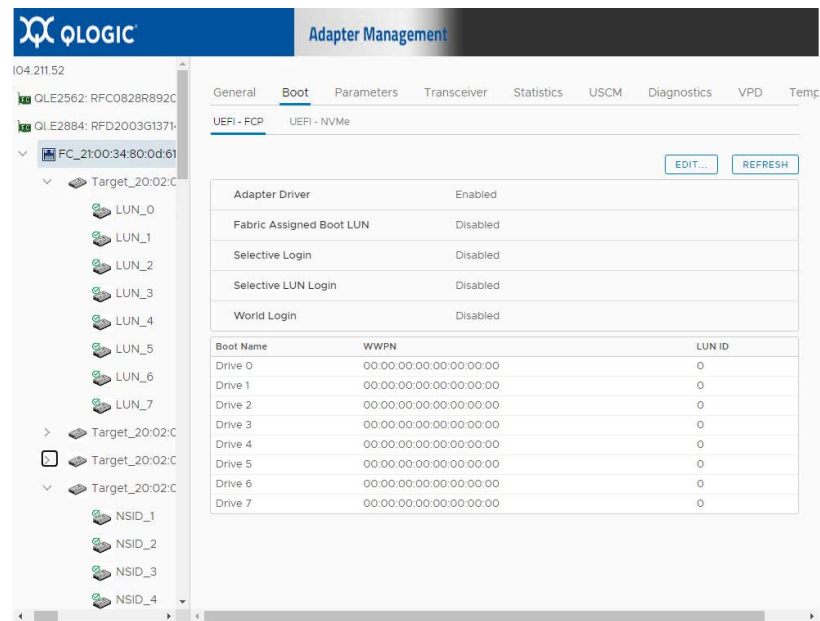
Figure 4-15. Fibre Channel Port—Boot Configuration in UEFI—FCP

To change the UEFI boot mode parameters, click **Edit**. The content pane appears as shown in Figure 4-16.

Figure 4-16. Fibre Channel Port—Boot Configuration in UEFI FCP, Setting

The content pane contains the following configurable parameters:

■ **Adapter Driver:** Select the check box to enable booting from the selected port, or clear the check box to disable booting from the port.

■ **Fabric Assigned Boot LUN:** Select the check box to enable booting from the fabric assigned boot LUN, or clear the check box to disable booting from the fabric assigned boot LUN.

When using the fabric-assigned boot LUN:

❑ The Fabric Assigned Boot LUN parameter must be enabled on both the initiator (adapter) and the Brocade switch for the FA-WWPN to be assigned to the adapter.

❑ If the Fabric Assigned Boot LUN parameter is disabled on the adapter and enabled on the Brocade switch, the FA-WWPN cannot be assigned to the adapter.

❑ If the Fabric Assigned Boot LUN parameter is enabled on the adapter and disabled on the Brocade switch, the FA-WWPN cannot be assigned to the adapter.

■ **Selective Login**

■ **Selective LUN Login**

■ **World Login**

The following device selection options are available**:**

■ **Drive 0–3:** Specify the boot device by selecting its worldwide name in **WWPN**, and then select the device's LUN ID in **LUN ID**.

NVMe

To view the current UEFI (NVMe) boot configuration, select **Boot ▸ UEFI ▸ NVMe**. The content pane appears as shown in Figure 4-17.
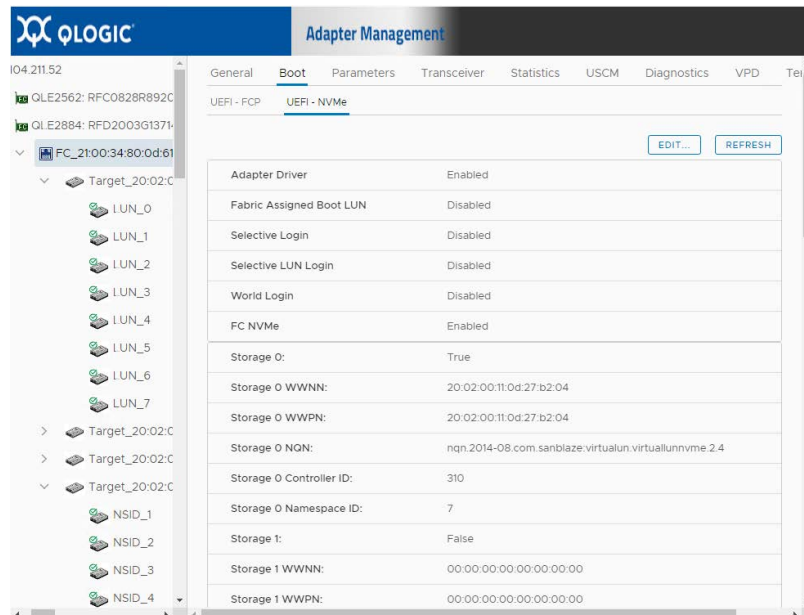
Figure 4-17. Fibre Channel Port—Boot Configuration in UEFI—NVMe

To change the UEFI (NVMe) boot mode parameters, click **Edit**. The content pane appears as shown in Figure 4-18.

Figure 4-18. Fibre Channel Port—Boot Configuration in UEFI (NVMe) Mode, Setting

The content pane contains the following configurable parameters:

- **Adapter Driver:** Select the check box to enable booting from the selected port, or clear the check box to disable booting from the port.

- **Fabric Assigned Boot LUN:** Select the check box to enable booting from the fabric assigned boot LUN, or clear the check box to disable booting from the fabric assigned boot LUN.

  When using the fabric-assigned boot LUN:

  ❑ The Fabric Assigned Boot LUN parameter must be enabled on both the initiator (adapter) and the Brocade switch for the FA-WWPN to be assigned to the adapter.

  ❑ If the Fabric Assigned Boot LUN parameter is disabled on the adapter and enabled on the Brocade switch, the FA-WWPN cannot be assigned to the adapter.

  ❑ If the Fabric Assigned Boot LUN parameter is enabled on the adapter and disabled on the Brocade switch, the FA-WWPN cannot be assigned to the adapter.

- **Selective Login**

- **Selective LUN Login**

■ **World Login**

■ **FC NVMe:** Select the check box to enable booting from the selected port and NVMe namespace or clear the check box to disable NVMe namespace selection when booting from the port.

The following device selection options are available**:**

■ **Drive 0–7:** Specify the boot device by selecting its worldwide name in **WWPN**, and then select the device's NSID in **Namespace ID**.

Firmware Parameters—Fibre Channel Port

If the **Parameters** button is selected, the content pane appears as shown in Figure 4-19.
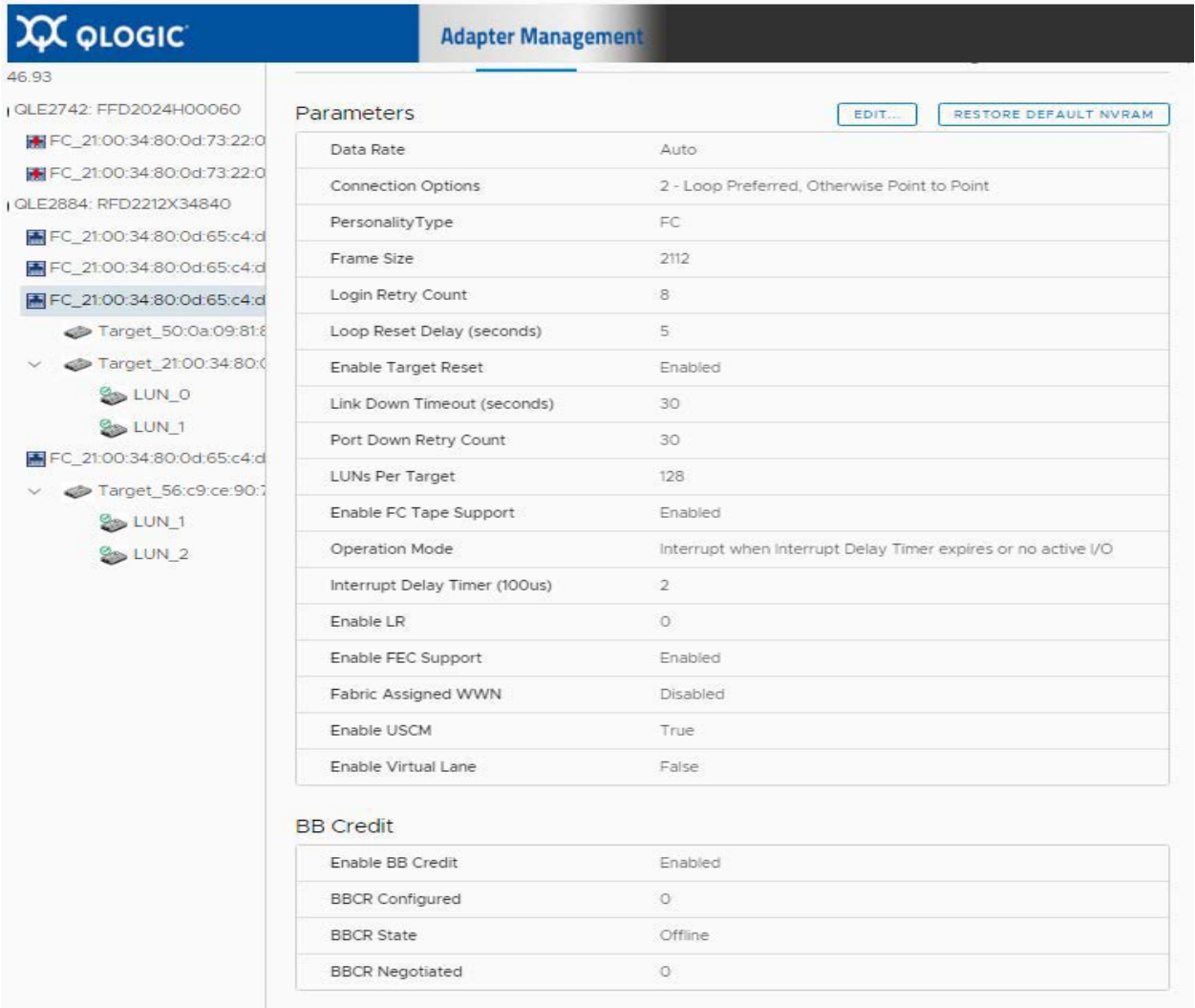
Figure 4-19. Fibre Channel Port—Firmware Parameters

The content pane contains the following configurable parameters:

- **Data Rate:** Data Rate Determines the adapter port data rate:

  - ❑ Auto: The Adapter auto negotiates data rate, default option available for Fibre Channel Adapters.

  - ❑ Data rate that the 27*xx* series Adapter supports: auto, 32Gbps, 16 Gbps, and 8 Gbps.

  - ❑ Data rate that the 26*xx* series Adapter supports: auto, 16 Gbps, 8Gbps, and 4Gbps.

- **Connection Options:** Defines the type of connection (loop or point-to-point) or connection preference.

- **Frame Size:** Specifies the maximum frame length supported by the adapter. The default size is 2,048 for both the Fibre Channel 2700/2600 Series adapters which provides maximum performance for F_Port (point-to-point) connections.

- **Login Retry Count:** Specifies the number of times the software tries to log in to a device. The default is eight retries.

- **Loop Reset Delay:** After resetting the loop, the firmware refrains from initiating any loop activity for the number of seconds specified in this setting.

- **Link Down Timeout:** Specifies the time the driver waits for the link to come up after link down before returning the I/Os. This is analogous to the Port Down Retry Count setting, which is used when the port is down. Valid values for the Link Down Timeout setting are in the range of 0–240. A value of 0 indicates that no timeout is used. A value in the range of 1–240 indicates the number of seconds that the driver waits for the link to come up before returning the I/O.

- **Port Down Retry Count:** Specifies the number of times the software retries a command to a port returning port down status. Valid values are in the range of 0–255.

- **Interrupt Delay Timer:** 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. This setting is enabled only when the Operation Mode setting is 5 or 6. When the Operation Mode setting is 0, this setting is disabled.

- **LUNs per Target:** Specifies the number of LUNs per target. Multiple LUN support is typically for RAID boxes that use LUNs to map drives. If you do not need multiple LUN support, set the number of LUNs to 0.

■ **Operation Mode:** Specifies the reduced interrupt operation (RIO) modes, if supported by the software driver. RIO modes allow posting multiple command completions in a single interrupt. When this setting is 0, the Interrupt Delay Timer setting is disabled.

■ **Enable LR:** Determines if the long range support is enabled for the given adapter port. There is also a required LR enabled SFP.

■ **Enable FEC Support:** QConvergeConsole enables forward error correction (FEC), which is a correction technique used for high-speed telecommunications devices to control errors in data transmission over unreliable or noisy communication channels. This setting is used only if the current adapter port is connected to a Brocade switch with FEC support.

■ **Fabric Assigned WWN:** Enables the Fabric Assigned WWN feature.

■ **Enable USCM.** Check this box to enable Marvell's Universal SAN Congestion Mitigation feature.

■ **Enable USCM.** Check this box to enable Marvell's Universal SAN Congestion Mitigation feature.

■ **Virtual Lane:** Check this box to enable the Virtual Lane.
When setting up virtual lanes, consider the following:

❑ This feature is available only when the adapter is connected to a supported Cisco switch running a fabric OS version that supports the equivalent feature on the fabric.

❑ USCM must be enabled to use the virtual lanes feature.

❑ By default, the USCM virtual lanes feature is disabled. USCM virtual lanes feature can be enabled on both target and initiator ports.

❑ The USCM virtual lanes feature is available only on Fibre Channel 2770 Series Adapters**.**

■ **BB Credit:** Check this box to enable buffer-to-buffer credit, 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.

To save your changes, click **Save Configuration**.

Transceiver Information—Fibre Channel Port

If the **Transceiver** button is selected, the content pane appears as shown in
Figure 4-20.

Figure 4-20. Fibre Channel Port—Transceiver Information

The content pane displays the following read-only information:

- **Vendor:** Transceiver manufacturer

- **Type:** Transceiver type

- **Identifier:** Transceiver form factor

- **Ext. Identifier:** Additional information about the transceiver

- **Part Number:** Transceiver part number

- **Speed:** Transceiver transmission speed

- **Connector:** Transceiver external optical or electrical cable type

- **Serial Number:** Transceiver serial number

- **Revision:** Vendor revision level

- **QLogic SFP installed: Yes**, if a QLogic SFP is installed; **No**, if an
  unsupported SFP is installed, or no SFP is installed.

A table at the bottom of the content pane displays information for the following transceiver characteristics: **Temperature**, **Voltage**, **Tx Bias**, **Tx Power**, and **Rx Power**. The information displayed for each of these characteristics includes:

■ **Value:** Current value

■ **Status:** Current status

■ **High Alarm:** If a datum exceeds this value, the conditions are likely to cause an inoperable link and require immediate action.

■ **High Warning, Low Warning:** Warnings indicate conditions outside the normally guaranteed bounds, but are not necessarily causes for immediate link failures.

■ **Low Alarm:** If a datum is less than this value, the conditions are likely to cause an inoperable link and require immediate action.

Statistics Information—Fibre Channel Port

If the **Statistics** button is selected, the content pane appears as shown in
Figure 4-21.
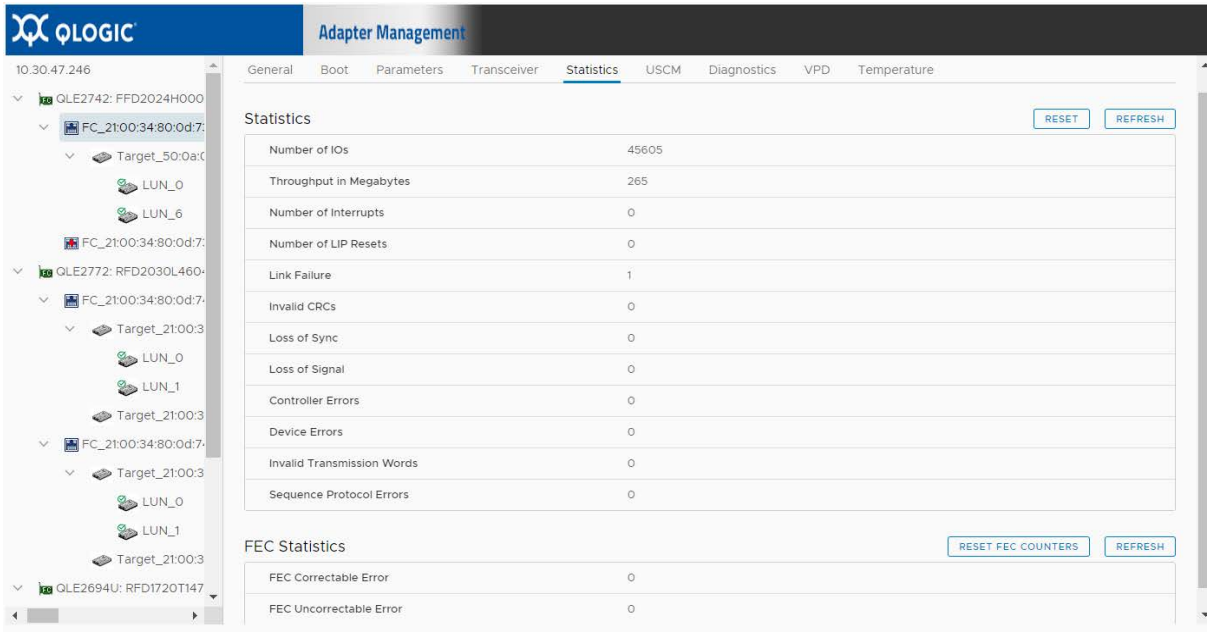
Figure 4-21. Fibre Channel Port—Statistics Information

NOTE

Selecting the **Reset** option permanently clears the counters. Any tools that
use these counters for historical trending must be readjusted.

The content pane reports the following read-only statistics information:

- **Number of IOs:** Quantity of I/Os generated by the adapter port per second

- **Throughput in Megabytes:** Throughput generated by the adapter port in
  megabytes

- **Number of Interrupts:** Quantity of interrupts

- **Number of LIP Resets:** Quantity of LIP resets

- **Link Failure:** Quantity of times the link has failed

- **Invalid CRCs:** Quantity of frames received that contain CRC failures

- **Loss of Sync:** Number of times loss of synchronization has occurred

- **Loss of Signal:** Number of times the signal was lost

- **Controller Errors:** Quantity of controller errors

- **Device Errors:** Quantity of device errors

- **Invalid Transmission Words:** Total quantity of invalid words transmitted by this adapter port

- **Sequence Protocol Errors:** Sequence protocol error count

- **FEC Statistics:** Shows the quantity of received correctable and uncorrectable FEC errors

Universal SAN Congestion Mitigation (USCM) Status and Statistics—Fibre Channel Initiator Port

> **NOTE**
>
> USCM is not supported on all 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.
>
> The Enable USCM check box must be selected to view this information (see "Firmware Parameters—Fibre Channel Port" on page 45)

USCM statistics are gathered for all ports on the Marvell QLogic FC adapter and connected targets in the configured zones with active sessions.

- USCM statistics are not gathered for other initiators in the configured zones.

- USCM is supported only on 2770 Series Adapters and QLE2690 Series Adapters.

- USCM statistics track the following types of Fabric Performance Impact Notification (FPIN) Extended Link Services (ELSs) to provide SAN congestion awareness:

FPIN ELS Statistic	Initiator Port	Target Port
Congestion	✓	—
Peer congestion	—	✓
Link integrity	✓	✓

■ USCM also displays a set of congestion mitigation statistics that reflect actions taken by the adapter to minimize the impact of congestion caused by the endpoints.

You can view the USCM congestion mitigation status and statistics; the statistics can also be reset.

Universal SAN Congestion Mitigation (USCM) Status—Fibre Channel Initiator Port

To display USCM status:

1. In the host system tree, expand a Fibre Channel adapter node to view the ports.

2. Select a Fibre Channel port to display information about the port.

3. Click the **USCM** tab (Figure 4-22).

Figure 4-22. Fibre Channel Initiator Port—USCM Status

4. (Optional) Click **REFRESH** to update the display with the current USCM status.

Not all of the port parameters described in this section are available on all systems. The parameters are based on the adapter driver version.

The USCM initiator port congestion status (Table 4-1) indicate the current status of the particular HBA port, based on congestion events (both extended link service (ELS) and signals) from the switch. At a given point in time, the HBA port is either *congested* or *healthy*. The other status indicates the severity of congestion and the time since the last congestion event.

Contact the fabric/switch vendor for more information relating to congestion severity within their products.

Table 4-1. USCM Initiator Port Status

Status	Description
Congestion Current State	Valid values are: **Healthy** **Congested**
Congestion Severity	**Warning**. Congestion is building and may have reached a severe level. **Alarm**. Congestion has reached a severe level. **None**. No congestion present. *NOTE:* For more FPIN information, see the user's guide for your switch.
Seconds Since Last Event	Event time period (in seconds) since the last congestion notification was received.
Fabric Connection Flags	**RDF Rejected**. The adapter is either not connected or does not support RDF; or the connected switch does not support USCM. **RDF Completed**. Either the connected Brocade or Cisco switch does not support virtual lanes or the virtual lane feature is disabled at the initiator port. **RDF Completed (Cisco)**. The connected Cisco switch has virtual lanes up and running. *NOTE:* RDF stands for Registration Diagnostic Function.
Virtual Lane[1]	Valid values are: **Operational** **Non-operational** **Disabled**

Table 4-1. USCM Initiator Port Status (Continued)

Status	Description
I/O Throttling[2]	Valid values are: **Active.** I/O throttling is currently active. The I/O queue depth is ramping up or down. **Disabled.** I/O throttling is disabled on the adapter. **None.** I/O throttling is not active. I/Os are running with the normal queue depth value. **NA.** I/O throttling is not supported for the adapter.

[1] Virtual Lane is supported only on 2770 Series Marvell QLogic Adapters. See "Universal SAN Congestion Mitigation (USCM) Virtual Lanes" on page 59 for more information.

[2] I/O Throttling is supported only on 2690 and 2770 Series Marvell QLogic Adapters.

Universal SAN Congestion Mitigation (USCM) Statistics—Fibre Channel Initiator Port

To view the USCM statistics for the specified Fibre Channel Port:

1. In the host system tree, expand a Fibre Channel adapter node to view the ports.

2. Select a Fibre Channel port to display information about the port.

3. In the content pane, click the **Statistics** tab to open the Statistics page (Figure 4-23).
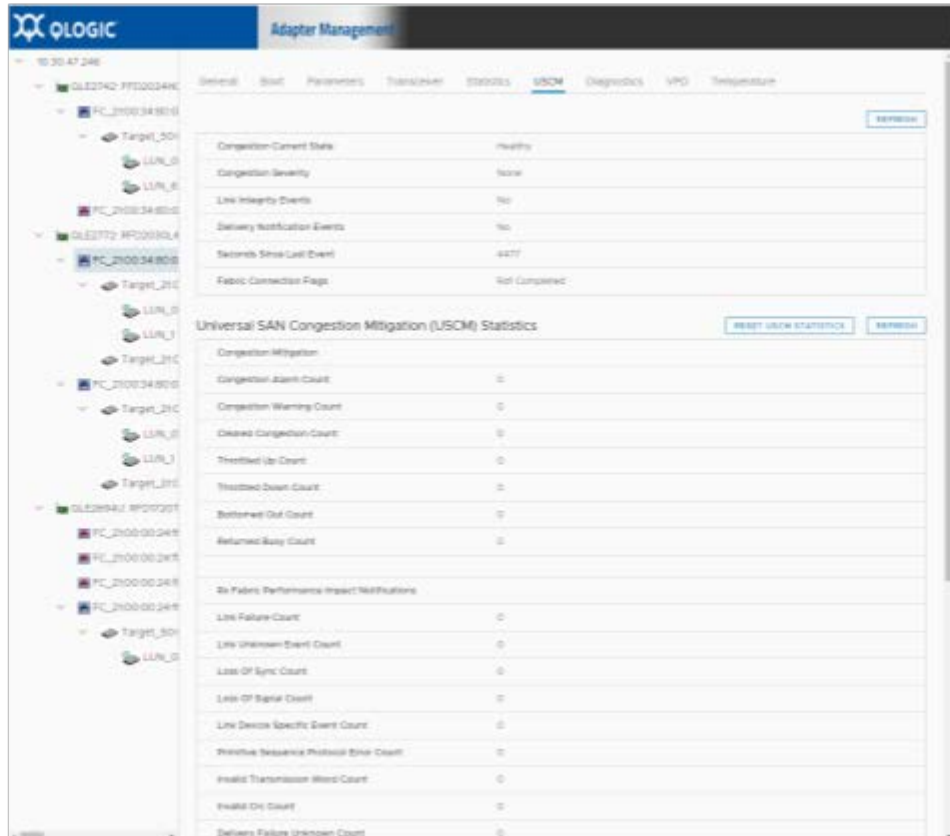
Figure 4-23. Fibre Channel Initiator Port—USCM Statistics

4. (Optional) Click **REFRESH** to update the display with the current USCM statistics.

5. (Optional) Click **RESET USCM STATISTICS** to clear port-level USCM statistics for both the specified Marvell Adapter Fibre Channel port and all the targets connected to that port.

Not all of the port parameters described in this section are available on all systems. The parameters are based on the adapter driver version.

USCM statistics are gathered for all initiator ports of this adapter.

USCM statistics are not gathered for other initiators in the configured zones.

USCM statistics for initiators provide SAN congestion awareness by tracking three types of FPINs: congestion, link integrity, and delivery.

USCM also displays a set of statistics to track the actions taken by the adapter to minimize the impact of congestion in the fabric at the initiator ports.

The initiator congestion mitigation port statistics in Table 4-2 are part of Marvell's USCM functionality that reflects actions taken by the Marvell QLogic FC adapter to mitigate the congestion, while providing visibility into the initiator port's performance as a result of SAN congestion.

Table 4-2. USCM Initiator Port Congestion Mitigation Statistics

Statistic	Description
Congestion Alarm Count	Counter for the number of alarm events in Congestion Severity.
Congestion Warning Count	Counter for the number of warning events in Congestion Severity.
Cleared Congestion Count	The number of times the congestion event was cleared for this port.
Throttled Down Count	The fabric is congested at this port. ■ Each increment indicates that the port is receiving congestion notifications from the fabric. ■ For each increment, the port decreases the I/O bandwidth. Incrementing stops when the low watermark performance for the port is reached.
Throttled Up Count	The fabric is *not* congested at this port. ■ Each increment indicates that the port is *not* receiving congestion notifications from the fabric. ■ For each increment, the port increases the I/O bandwidth (up to the maximum I/O bandwidth for the port). ■ Incrementing starts only after the Throttle Down Count increments (and congestion notifications abate). Incrementing stops when the port reaches its optimal performance.
Bottomed Out Count	This port is operating at its low watermark performance and the fabric continues to be congested at this port. ■ Each increment indicates that the port is receiving congestion notifications from the fabric. ■ This port cannot decrease the I/O bandwidth any further.

Table 4-2. USCM Initiator Port Congestion Mitigation Statistics

Statistic	Description
Returned Busy Count	The number of times the driver returns an I/O request queued by the initiator's storage stack. This request must be retried because the port is congested. The count is incremented faster when the driver is throttling down, and slower when the driver is throttling up.
Link Uncorrectable FEC Count	Shows the quantity of received uncorrectable FEC errors.

Universal SAN Congestion Mitigation (USCM) Profile— Fibre Channel Initiator Port

The USCM profile allows you to manage adapter congestion by selecting either the driver default profile settings, or customizing different profile settings for each adapter port on a case-by-case basis.

To display the USCM profile:

1. In the host system tree, expand a Fibre Channel adapter node to view the ports.

2. Select a Fibre Channel port to display information about the port.

3. Click the **USCM** tab and scroll down to view the USCM Profile Information (Figure 4-24).
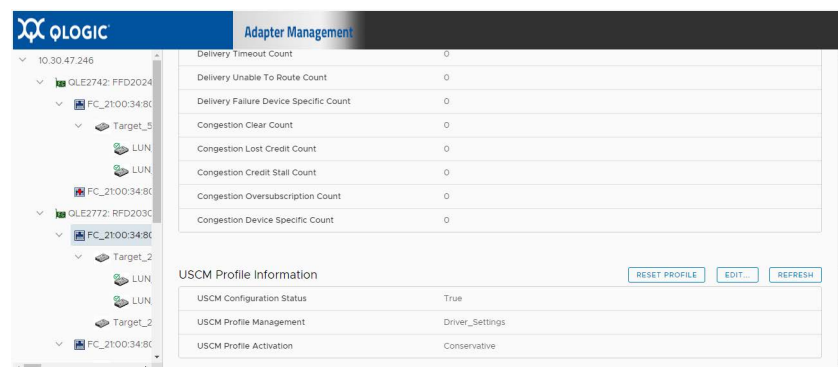
Figure 4-24. Fibre Channel Initiator Port—USCM Profile

The USCM profile parameters are described in Table 4-3.

Table 4-3. USCM Profile Display

Profile	Description
USCM Configuration Status	Indicates if the USCM feature of the specified adapter port is supported. Valid values are: **True** (default) **False**
USCM Profile Management	Indicates the current active profile setting for congestion on the specified adapter port. Valid values are: **Driver_Settings** (default). The USCM profile is set using either a Windows driver registry parameter; or a Linux or VMware ESXi driver module parameter. **NVRAM Settings**. The USCM profile is set in the adapter NVRAM.
USCM Profile Activation	Valid values are: **Monitor Only** (default). Records adapter performance and congestion history for review. No actions are taken to resolve congestion. **Conservative.** Maintains optimum throughput while gradually reducing congestion. Queue depth (outstanding I/Os) is reduced to half of the current value as part of the throttle down operation. Marvell recommends this setting for high-priority workloads. **Moderate.** Queue depth (outstanding I/Os) is reduced to one-quarter of the current value as part of the throttle down operation. **Aggressive.** Reduces congestion on priority while reducing throughput. Queue depth (outstanding I/Os) is reduced to one-eighth of the current value as part of the throttle down operation. Marvell recommends this setting for low-priority workloads.
Refresh	Reads the latest profile setting and updates this menu to show the current USCM profile.
Reset	Reverts the current USCM profile settlings by driver (driver module parameter or Windows registry settings). The command takes effect immediately; a system reboot or driver reload is not required.

To edit the USCM profiles:

1.   In the USCM Profile section, click **EDIT**.

      The Modify Profile content pane appears as shown in Figure 4-25.
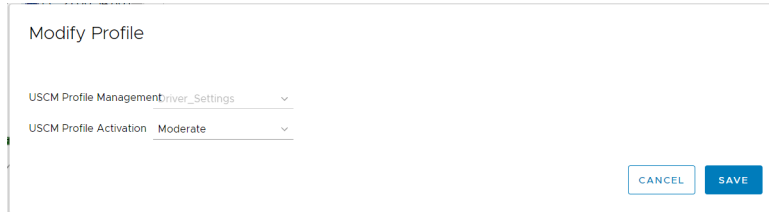
Figure 4-25. Fibre Channel Port—Edit USCM Profile

2.   Change the appropriate profile, and then click **SAVE**.

      The changes take effect immediately; a system reboot is not required.

Universal SAN Congestion Mitigation (USCM) Virtual Lanes

When setting up virtual lanes, consider the following:

■   This feature is available only when the adapter is connected to a supported Cisco switch running a fabric OS version that supports the equivalent feature on the fabric.

■   USCM must be enabled to use the virtual lanes feature. See "Firmware Parameters—Fibre Channel Port" on page 45

■   By default, the USCM virtual lanes feature is disabled.

■   USCM virtual lanes feature can be enabled on both target and initiator ports.

■   The USCM virtual lanes feature is available only on Fibre Channel 2770 and 2870 Series Adapters.

There are two ways to enable this feature: using a driver module/registry parameter (see the appropriate Marvell QLogic Adapter user's guide) or through the firmware parameters.

After the virtual lanes feature is enabled, you can view the status.

In initiator ports, the virtual lane feature works as follows:

Disabled	Virtual lanes are disabled at either the driver or the initiator port parameter (NVRAM).
Non-operational	Virtual lane negotiation with the switch failed.
Operational	Virtual lane negotiation is complete and fully functional.

In target ports, the virtual lane feature works as follows:

Slow	The current target is marked as slow device and was moved to a slow virtual lane due to congestion.
Normal	The current target is healthy. No congestion is detected.
Non-operational	Either virtual lanes is disabled at the initiator or it is not supported by the connected switch.
NA	Virtual lanes is not supported on the connected adapter and/or the driver.

Target Link Statistics

If the **Target Link Statistics** button is selected, target link statistics of the selected Fibre Channel target appears as shown in Figure 4-26.
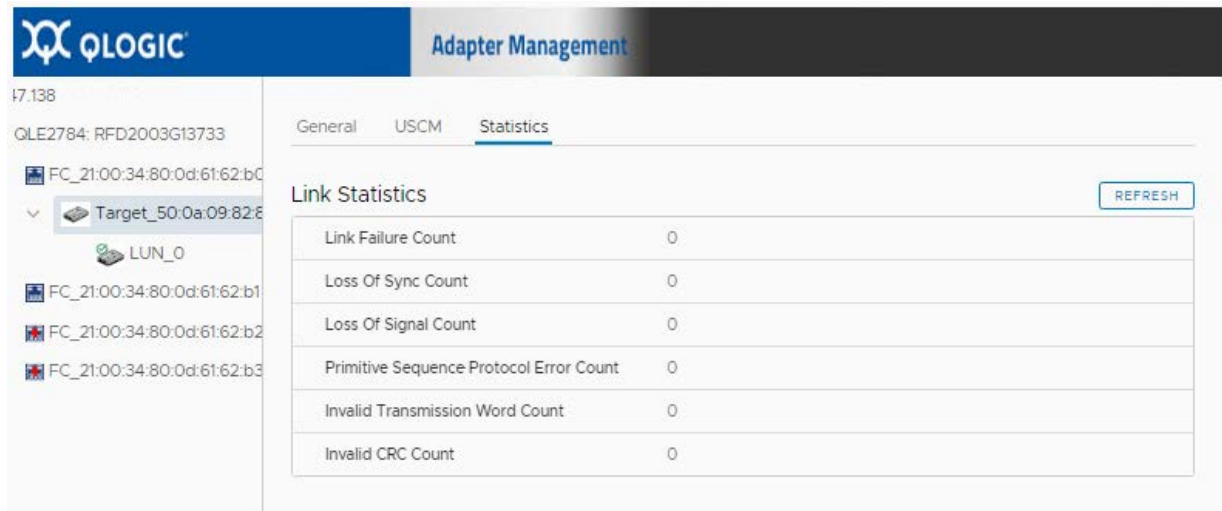
Figure 4-26. Target Link Statistics

Diagnostic Tests—Fibre Channel Port

If the **Diagnostics** button is selected, the content pane appears as shown in
Figure 4-27.
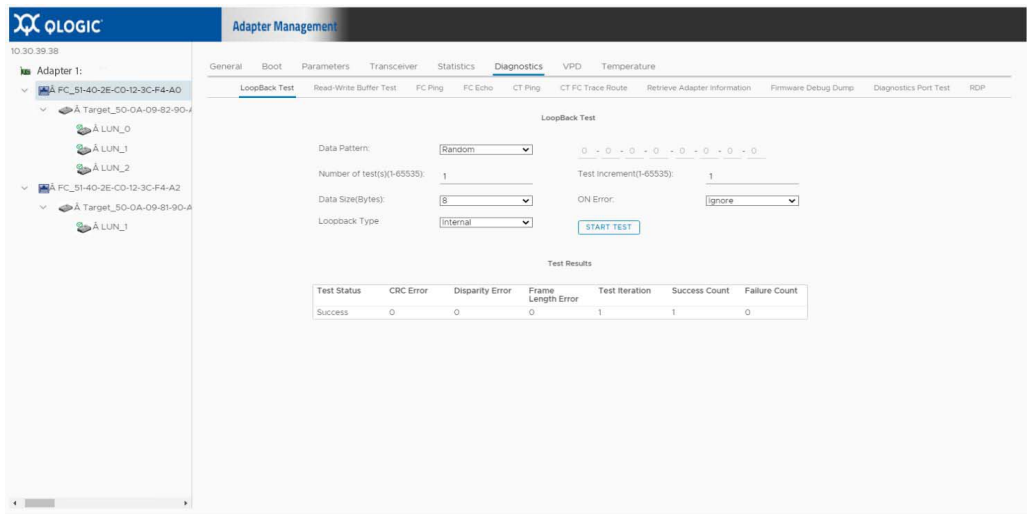
Figure 4-27. Fibre Channel Port—Diagnostics

In the content pane, select the type of diagnostic test to perform: **Loopback Test**
or **Read-Write Buffer Test**. Then, under **Test Configuration**, specify the
following test parameters:

- **Data Pattern:** Select the type of data pattern (jitter pattern) to use in the test.
  Or, type the pattern to use into the boxes provided.

  Data pattern sequences are the bit sequences that are transmitted by a
  serializer onto a link or bit sequences received by a deserializer from a link.
  The data pattern sets the test pattern for evaluating the jitter compliance of a
  Fibre Channel link. Test bit sequences have a significant impact on stressing
  the link's jitter characteristics.

  For more information see American National Standards Institute (ANSI),
  *Fibre Channel – Methodologies for Jitter and Signal Quality Specification –
  MJSQ, Annex A - Test bit sequences.*

In addition to selecting a data pattern, you must also specify the **Data Size (Bytes)**. The maximum data size available is dependent on the frame size of the device you are testing and the kind of test you are conducting. For more information about frame size, see "Firmware Parameters—Fibre Channel Port" on page 45.

❑ Loopback and echo tests support data sizes from 8 bytes to 2,048 (2K) bytes.

> **NOTE**
>
> For Linux operating systems only, the following data size values apply: 2048, 4096, 8192, up to 65535 (2K bytes to 64K bytes).

> **NOTE**
>
> Echo tests are available when the **HBA Port Connection Option** is set to **Point to Point Only**. If the connection option is set to **Loop Only**, the loopback test is available.

❑ Read/write buffer tests support data sizes from 8 bytes to 128 bytes.

Table 4-4 lists the available data patterns.

Table 4-4. Data Patterns Available for Use

Data Pattern	Bit Sequence
00	00000000
55	01010101
5A	01011010
A5	10100101
AA	10101010
FF	11111111

To set test parameters on the HBA Diagnostics page:

1. From the **Data Pattern** list, do one of the following:

    ❑   Select a data byte or compliant jitter pattern.

    ❑   Click **Customized** to specify an eight-byte pattern. Type the data in hexadecimal format (00–FF) into the eight **Customized** boxes.

    ❑   Click **Random** to randomly generate an eight-byte data pattern.

    The data size sets the quantity of bytes transferred per test per iteration when the test is run.

2. From the **Data Size** list, specify the quantity of bytes to transfer. Allowed values are 8, 16, 32, 64, 128, 256, 512, 1024, and 2048.

3. To set the test frequency, do one of the following:

    ❑   In the **Number of Tests** box, type or select the quantity of tests you want to run. Testing stops when the passes complete. The valid range is between 1 and 65,536.

    ❑   Select the **Test Continuously** check box. You determine when testing stops.

4. For **On Error**, select one of the following to determine how errors are handled. This selection applies whether you entered the quantity of tests or opted to test continuously.

    ❑   **Ignore on Error:** Ignores errors and continues the test sequence.

    ❑   **Stop on Error:** Stops the test sequence when an error is encountered.

    ❑   **Loop on Error:** Uses the same data pattern and tests until the failure is cleared.

5. In the Test Increment box, type or select the quantity of passes you want to run before the test stops. The valid range is between 1 and 10,000, and must be less than or equal to the value in the **Number of Tests** box (see step 3). For example, if the **Number of Tests** box contains 100 and the **Test Increment** box contains 15, 100 tests are run in seven passes. The first six passes run 15 tests each; the seventh pass runs 10 tests (6 × 15 + 10 = 100).

6. When you finish setting the diagnostic test parameters, you are ready to start diagnostic testing. To begin the selected test, click **Start Test**.

    When the test is finished, the test results are displayed in the **Test Result** section of the content pane.

When a target with LUNs is connected to the port, you can conduct a ping test to any target in the table. To conduct a ping test, select a target in the table, specify the quantity of tests, and then click **Start Test**. The status for each test appears in the **Result** column, as shown in Figure 4-28. The CT Ping and CT FC Trace Route ping tests are conducted in a similar fashion. However, to successfully run a CT Ping or a CT FC Trace Route ping test, the fabric must contain a Brocade switch.
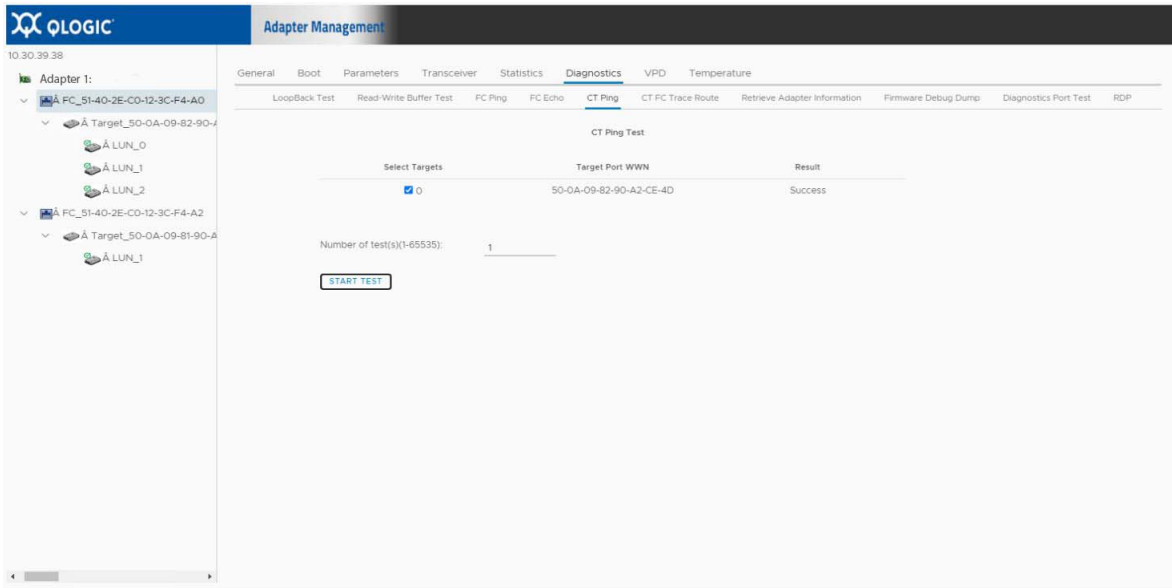
Figure 4-28. Fibre Channel Port—Ping Test Results

Retrieving Adapter Information

To view information for 2600/2700 Series Adapters, select Adapter Management, Diagnostics, then **Retrieve Adapter Information**.

Select one of the available buttons:

- **FW Table**
  Saves the Firmware Preload table contents to a readable text file.
- **NVRAM Configuration**
  Saves NVRAM contents to a readable text file.
- **SerDes Table**
  Saves the SerDes information to a readable text file.

NOTE

Information retrieved is view-only and no configuration changes can be made.

VPD Information—Fibre Channel Port

If the **VPD** button is selected, the content pane appears as shown in Figure 4-29.
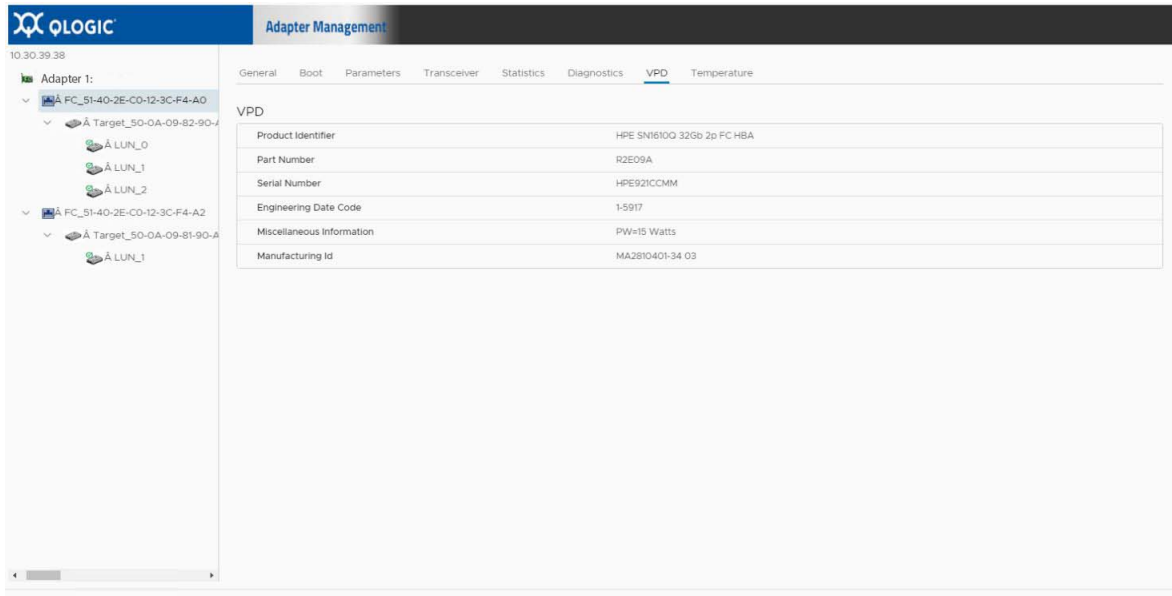
Figure 4-29. Fibre Channel Port—VPD Information

The content pane also contains the following read-only VPD information:

- **Product Identifier:** Adapter product identifier
- **Part Number:** Adapter part number
- **Serial Number:** Adapter serial number
- **Engineering Date Code:** Date code engineering uses to identify release information on an FCoE adapter port
- **Miscellaneous information:** Miscellaneous information for the 4Gb, 8Gb,16Gb, or 32Gb adapter port
- **Manufacturing ID:** Manufacturing ID of the 4Gb, 8Gb,16Gb, or 32Gb adapter

Temperature Information—Fibre Channel Port

If the **Temperature** button is selected (if available), the content pane appears as shown in Figure 4-30. To begin monitoring temperature, specify the monitoring rate, and then click **Start**. To stop monitoring, click **Stop**.
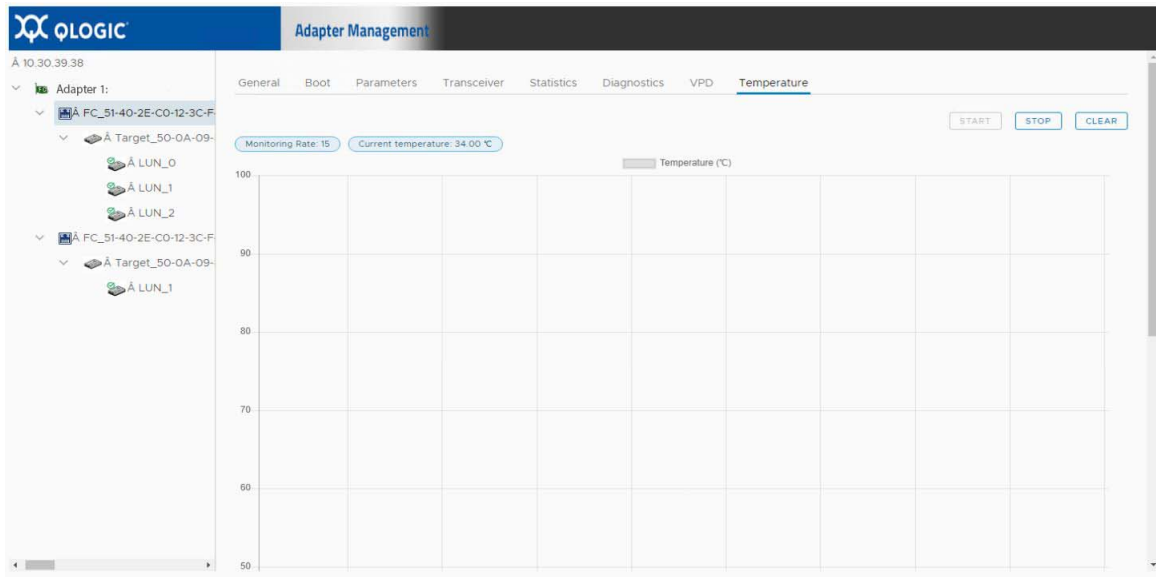
Figure 4-30. Fibre Channel Port—Temperature Information

Viewing Target Device Information

To display information on a target device connected to a port on a Fibre Channel Adapter, select the target device in the system tree. The Adapter Management window then appears as shown in either Figure 4-31 or Figure 4-32.
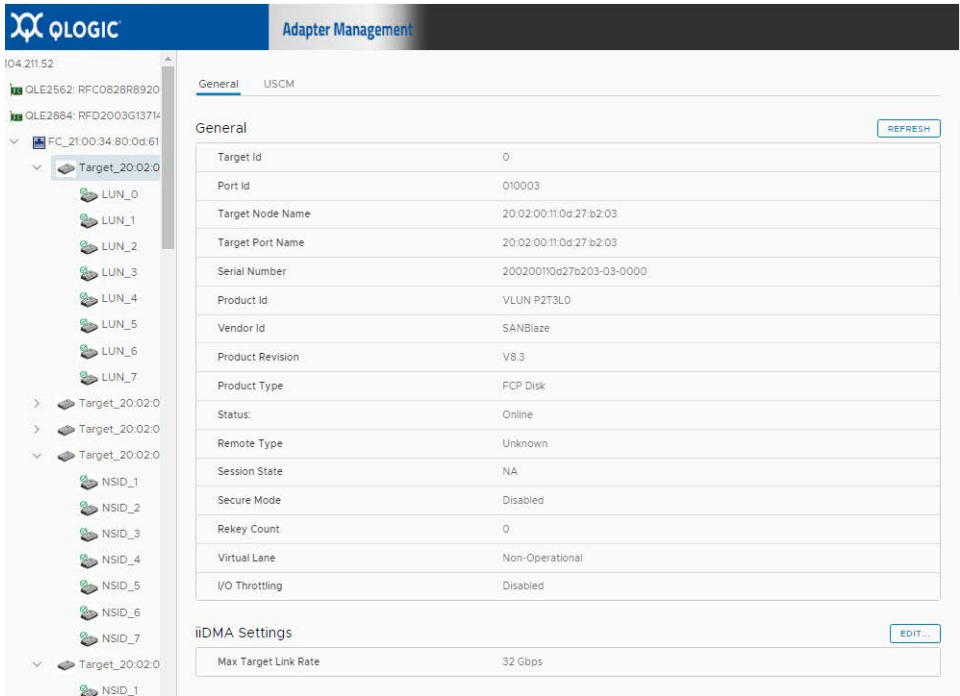
Figure 4-31. Adapter Management Window for FCP Target Device
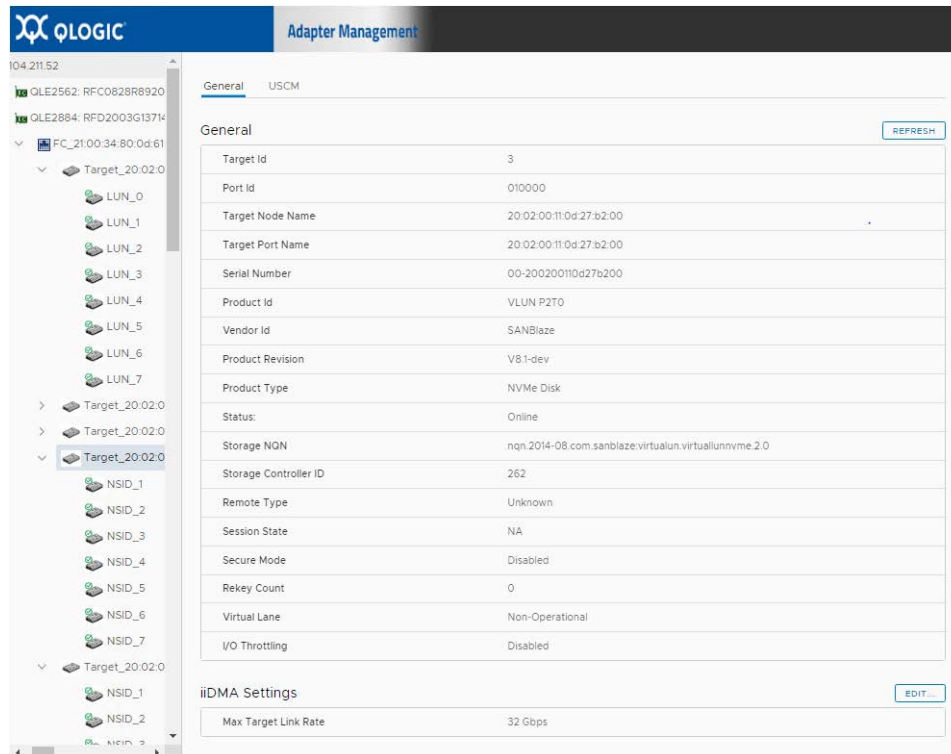
Figure 4-32. Adapter Management Window for NVMe Target Device

The Adapter Management window for target devices contains the General section, which displays read-only information for the selected target device, as follows:

General

- ■ **Target ID**
- ■ **Port ID**
- ■ **Target Node Name**
- ■ **Target Port Name**
- ■ **Serial Number**
- ■ **Product ID**
- ■ **Vendor ID**
- ■ **Product Revision**
- ■ **Product Type**
- ■ **Status**
- ■ **Storage NQN** (NVMe target device only)
- ■ **Storage Controller ID** (NVMe target device only)
- ■ **Remote Type**
- ■ **Session State**
- ■ **Secure Mode**

- **Virtual Lane**
- **I/O Throttling**

iiDMA Settings

This setting is the current maximum link rate configuration of the specified target detected on the Marvell FC port. To change this setting, click **Edit**. The iiDMA Settings box appears (Figure 4-33).
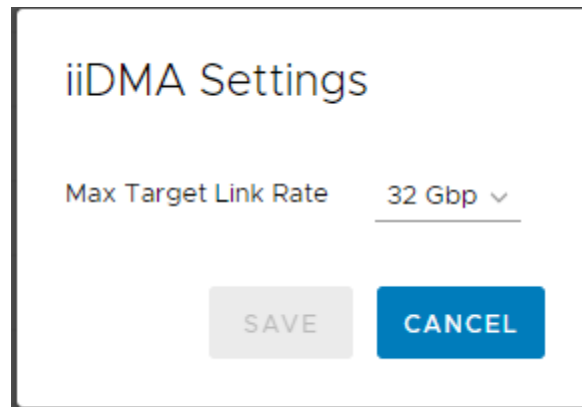
Figure 4-33. iiDMA Settings

After selecting the maximum target link rate at which data is sent for the selected FC target from the Marvell FC port, click **SAVE**.

Universal SAN Congestion Mitigation (USCM) Status and Statistics—
Fibre Channel Target

> **NOTE**
>
> USCM is not supported on all 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.
>
> The Enable USCM check box must be selected to view this information (see "Firmware Parameters—Fibre Channel Port" on page 45)

USCM statistics are gathered for all ports on the Marvell QLogic FC adapter and connected targets in the configured zones with active sessions.

- USCM statistics are not gathered for other initiators in the configured zones.

- USCM is supported only on 2690, 2770, and 2800 Series Adapters.
- USCM statistics track the following types of Fabric Performance Impact Notification (FPIN) Extended Link Services (ELSs) to provide SAN congestion awareness:

FPIN ELS Statistic	Initiator Port	Target Port
Congestion	✓	—
Peer congestion	—	✓
Link integrity	✓	✓

- USCM also displays a set of congestion mitigation statistics that reflect actions taken by the adapter to minimize the impact of congestion caused by the endpoints.

You can view the USCM congestion mitigation status and statistics; the statistics can also be reset.

To view USCM status and statistics for a Fibre Channel adapter target:

1. Expand the host system tree and select the desired target.
2. Click the **Statistics** button.

3. Use the scroll bar on the right side of the content pane to navigate to the Universal SAN Congestion Mitigation (USCM) information (status) and Universal SAN Congestion Mitigation (USCM) Statistics sections (Figure 4-34).

Figure 4-34. Fibre Channel Target—USCM Statistics and Status

4. (optional) To refresh the status information, click **REFRESH**.

   The target status attributes are refreshed.

5. (optional) To refresh the statistics information, click **REFRESH**.

   The targets statistics are refreshed.

The USCM target congestion status (Table 4-5) indicates the current status/health of connected target ports based on FPIN ELSs received from the switch.

This status includes peer congestion, link integrity, and delivery notifications, as well as details about each of these events for each active target port.

Table 4-5. USCM Target Port Status

Status	Description
Congestion Current State	See Congestion Current State.
Last Event	**Link Integrity** **Delivery** **Peer Congestion** **None**
Seconds Since Last Event	See Seconds Since Last Event.
Link Integrity Event Type	**Unknown** **Link Failure** **Loss-of-Synchronization** **Loss-of-Signal** **Primitive Sequence Protocol Error** **Invalid Transmission Word** **Invalid CRC** **Device Specific** **Reserved**
Link Integrity Event Threshold	Time (in milliseconds)
Delivery Reason Code Type	**Unknown** **Timeout** **Unable to route** **Device specific** **Reserved**
Peer Congestion Event Type	**Clear** **Lost Credit** **Credit Stall** **Oversubscription** **Device Specific** **Reserved**
Peer Congestion Event Period	Time (in milliseconds)
Virtual Lane[1]	**Slow** **Normal** **Non-operational** **N/A**

Table 4-5. USCM Target Port Status (Continued)

Status	Description
I/O Throttling[2]	Valid values are: **Active.** I/O throttling is currently active. The I/O queue depth is ramping up and down. **Disabled.** I/O throttling is disabled on the adapter. **None.** I/O throttling is not active. I/Os are running with the normal queue depth value. **NA.** I/O throttling is not supported for the adapter.

[1] Virtual Lane is supported only on 2770 and 2870 Series Marvell QLogic Adapters. See "Universal SAN Congestion Mitigation (USCM) Virtual Lanes" on page 59 for more information.

[2] I/O Throttling is supported only on 2690, 2770, and 2870 Series Marvell QLogic Adapters.

USCM statistics are gathered for all target ports connected to all initiator ports on this adapter in the configured zones with active sessions.

USCM statistics for targets provide SAN congestion awareness by tracking three types of FPINs: peer congestion, link integrity, and delivery.

USCM also displays a set of congestion mitigation statistics to track the actions taken by the Marvell QLogic FC adapter to minimize the impact of congestion in the fabric at target ports.

The target congestion mitigation port statistics in Table 4-6 are part of Marvell's USCM functionality that reflects actions taken by the adapter to mitigate the congestion, while providing visibility into the target port's performance as a result of SAN congestion.

> **NOTE**
>
> The peer congestion FPINs reflect fabric congestion at the specified target port.

Table 4-6. USCM Target Port Congestion Mitigation Statistics

Parameter	Description
Cleared Congestion Count	Counter for the number of times the congestion event was cleared for this target.
Throttled Up Count	See Throttled Up Count.
Throttled Down Count	See Throttled Down Count.

Table 4-6. USCM Target Port Congestion Mitigation Statistics

Parameter	Description
Bottomed Out Count	See Bottom Out Count.
Returned Busy Count	See Returned Busy Count.
Link Failure Count	Counter for number of link failure events.
Link Unknown Event Count	Counter for the number of unknown events.
Loss of Sync Count	Counter for the number of loss of sync events.
Loss of Signal Count	Counter for the number of loss of signal count events.
Link Device Specific Event Count	Counter for the number of device specific events.
Primitive Seq Protocol Error Count	Counter for the number of primitive sequence protocol errors.
Invalid Transmission Word Count	Counter for the number of transmission word errors.
Invalid Crc Count	Counter for the number of invalid CRC events.
Delivery Failure Unknown Count	Counter for the number of unknown events.
Delivery Timeout Count	Counter for the number of timeout events.
Delivery Unable to Route Count	Counter for the number of unable to route events.
Delivery Failure Device Specific Count	Counter for the number of device specific events.
Peer Congestion Clear Count	Counter for the number of times the peer congestion event was cleared for this target.
Peer Congestion Lost Credit Count	Counter for the number of lost credit events.
Peer Congestion Credit Stall Count	Counter for the number of credit stall events.
Peer Congestion Oversubscription Count	Counter for the number of oversubscription events.
Peer Congestion Device Specific Count	Counter for the number of device-specific events.

Table 4-6. USCM Target Port Congestion Mitigation Statistics

Parameter	Description
PUN Count	Number of priority update notifications received.
PUN Clear Count	Counter for the number of times the PUN event was cleared for this target.
Link Uncorrectable FEC Count	Shows the quantity of received uncorrectable FEC errors.

Viewing LUN Information

To display information on a LUN for a device connected to a Fibre Channel adapter port or a Converged Network Adapter port, select the LUN in the system tree. The Adapter Management window then appears as shown in Figure 4-35.

Figure 4-35. Adapter Management Window for Target Device LUN

The Adapter Management window for LUNs contains the General section, which displays read-only information for the selected LUN, as follows:

- **LUN Number**
- **LUN Size**
- **LUN WWN Unique Number**
- **LUN ID**
- **Vendor ID**
- **Product Rev Level**
- **Device Type**

Updating Adapter Flash

To update the Flash using QConvergeConsole vSphere Client Plug-in:

1. In the left pane of the QConvergeConsole page, select the adapter, and then click the **Update Adapter Flash Image** link.

2. In the Select Flash File for Update dialog box, click **Browse**.

3. In the Choose File To Upload dialog box, select the `.bin` Flash file from the extracted Flash kit package that is compatible with your adapter, and then click **Open**.

4. In the Select Flash File for Update dialog box, click **Send**.

5. Verify the current Flash version and file version, and then click **OK** to continue the update.

6. When prompted to reset the adapter to activate the firmware, click **OK** to activate the new firmware immediately, or click **Cancel** to wait until the next system reboot.

> **CAUTION**
>
> The Flash update may take several minutes to complete. Do not cancel the task or reboot the server during this time. Doing so may corrupt the firmware on the adapter.

7. When the Flash update is complete, click **OK** in the Flash update successful completion message box.

8. Click **Refresh** to verify the new firmware version.

9. If the adapter is a Converged Network Adapter, reboot the host ESX system.

5 Managing Marvell 578xx and 41000 Series Adapters

This chapter provides detailed instructions on how to use the vCenter Server Plug-in to manage Marvell 578xx/41000 Series Adapters and connected storage devices, including:

Viewing Host Maps

If you select an ESX or ESXi host, the content pane provides a few options. Select the option for the type of information you want to view, which are described in the following sections:

■ Storage Map

■ Network Map

Storage Map

Next to **Map**, click **Storage** to view the host's storage map, with the host on one end and the VMs on the other end. Figure 5-1 shows an example of a storage map with 578xx/41000 Series Adapters.
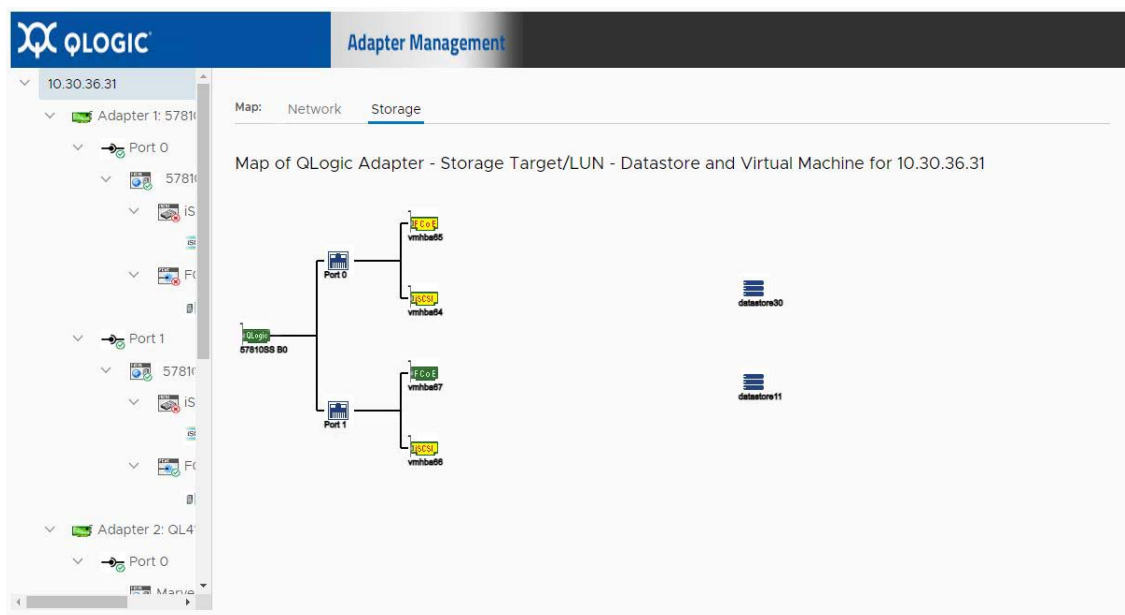
Figure 5-1. Storage Map with 578xx/41000 Series Adapters

Network Map

Next to **Map**, click **Network** to view the selected host's network map, as shown in Figure 5-2.
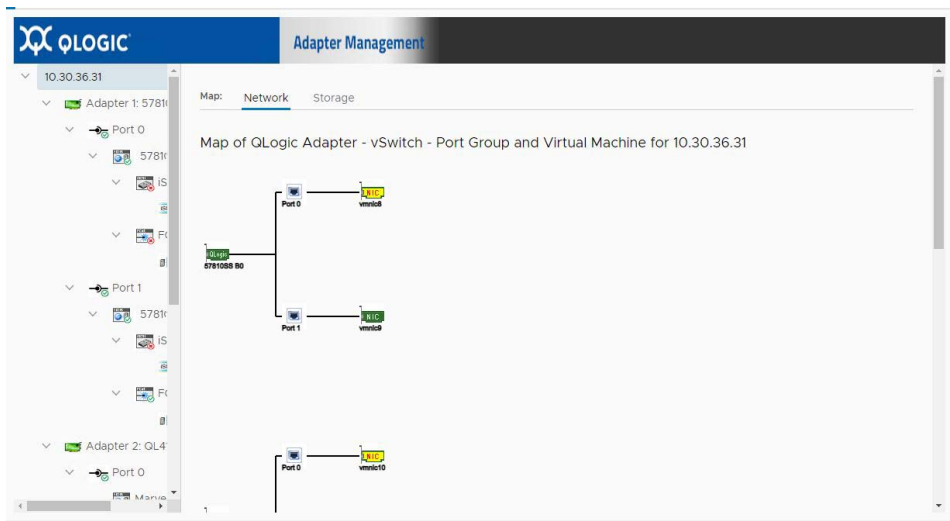
Figure 5-2. Network Map with 578xx/41000 Series Adapters

Managing 578xx/41000 Series Adapters

To manage 578xx/41000 Series Adapters, select the adapter in the system tree. The Adapter Management window appears in the content pane as shown in Figure 5-3 for 578xx/41000 Series Adapters.
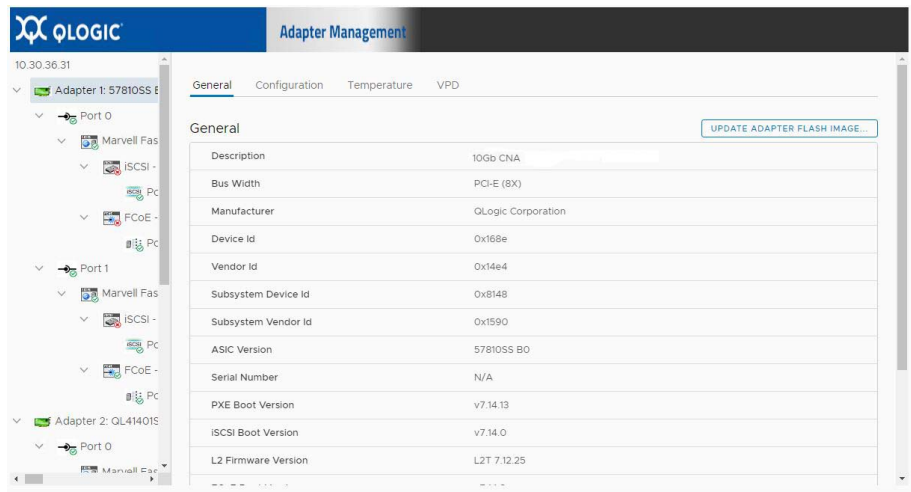
Figure 5-3. Adapter Management of Single-Function 578xx/41000 Series Adapters

The Adapter Management window displays information and provides configuration options for the selected adapter, as described in the following sections:

- Adapter Information

- Adapter Configuration

- Adapter Commands: Updating Flash Firmware

- Configuring the Flow Control, Protocol, and Bandwidth

- Starting and Stopping the Adapter Temperature Monitor

Adapter Information

The **Adapter Information** section provides the following information:

- **Description**
- **Bus Width**
- **Manufacturer**
- **Device ID**
- **Vendor ID**
- **Subsystem ID**
- **Subsystem Vendor ID**
- **ASIC Version**
- **Serial Number**
- **Firmware Versions**

Adapter Configuration

Use the **Adapter Configuration** section to configure the following:

- Changing between Single Function and Multi-Function

- Configuring single root-input/output virtualization (SR-IOV)

- Configuring Protocols (578xx/41000 Series Adapters only)

- Configuring Remote Direct Memory Access (RDMA) (41000 Series Adapters only)

- For Multi-Function, configuring flow control and bandwidth

> **NOTE**
>
> ■ If the adapter is in Single Function mode, the protocols for each port can be configured by checking the appropriate box. SR-IOV settings may also be configured for each port as shown in Figure 5-3.
>
> ■ If the adapter is in Multi-Function mode, the SR-IOV settings may be configured for each function as shown in Figure 5-4 for 578xx/41000 Series Adapters.
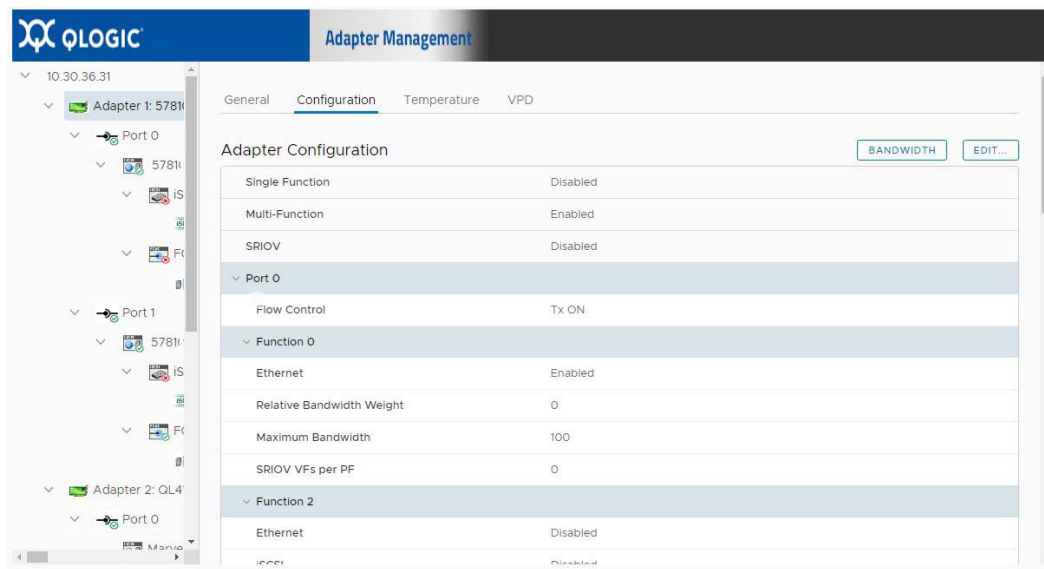
Figure 5-4. Adapter Management of Multi-Function 578xx Series Adapters

Adapter Commands: Updating Flash Firmware

Use the **Adapter Commands** section to update the flash firmware on the adapter. Click **Update Adapter Flash Image** to open a dialog box and select the firmware file. After selecting the file that is appropriate for the adapter, the adapter is updated.

Configuring the Flow Control, Protocol, and Bandwidth

<div style="border">

NOTE

- Each 578xx Series Adapter physical port may have up to two storage protocols assigned to it, with each physical port have up to two iSCSI functions, or one iSCSI function with one FCoE function.

- The 578xx/41000 Series Adapters minimum bandwidth settings for all functions on the same port must all be 0 or total 100 percent.

- Use the **Adapter Commands** section to update the flash firmware on the adapter (if available for the adapter).

- The 41000 Series Adapters can have up to 16 functions configured, with up to one storage offload protocol enabled, per physical port. The Dell 41000 Series Adapters must be in 8 function NPAR/16 function NPAREP mode, to enable either FCoE or iSCSI-Offload. The following shows how some of the functions work (on an NPAREP mode adapter):

  ❑ The first functions of a port (0 and 1 on dual port adapters and 0 - 3 on quad port adapters) are always enabled with only the Ethernet protocol (with or without RDMA) and cannot have storage protocols configured.

  ❑ The second functions of a port (2 and 3 on dual port adapters and 4 - 7 on quad port adapters) can be configured for FCoE protocol or Ethernet protocol (with or without RDMA) or hidden (disabled) On the quad port adapters, the second function of each physical port can also have the iSCSI protocol enabled.

  ❑ The third functions of each port (4 and 5 on dual port adapters) can be configured for iSCSI protocol or Ethernet protocol (with or without RDMA) or hidden (disabled). On the quad port adapters, the third function of each physical port can only have Ethernet (with or without RDMA) or be hidden (disabled).

  ❑ All remaining functions can be enabled with the Ethernet protocol (with or without RDMA) or hidden (disabled). Storage protocols cannot be configured.

  ❑ If RDMA (PVRDMA or NVMe-oF over RDMA) is available on a 41000 Series Adapter, you can enable RDMA over converged Ethernet (RoCE) or Internet wide area RDMA protocol (iWARP), on any Ethernet enabled function. Currently, iWARP is not supported on VMware.

</div>

To configure the partition protocol and bandwidth settings:

1. In the Adapter Configuration pane, click **Configure Partition Protocol and Bandwidth**.

2. In the NIC Partition Configuration dialog box:

   ❑ Select settings for flow control for each port.
   ❑ Select the protocol and bandwidth for each function.

   Figure 5-5 shows an example for an 578xx Series Adapter.
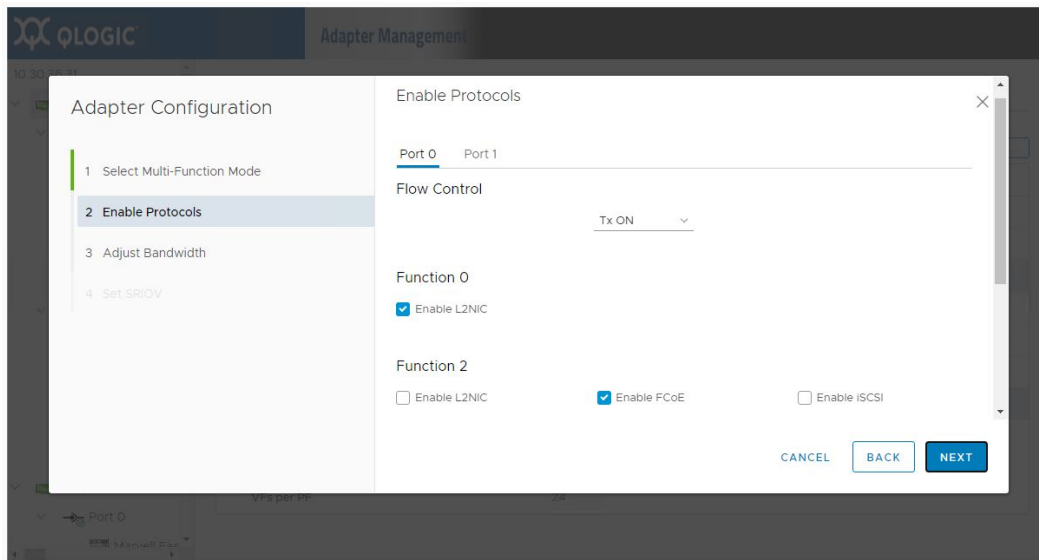
Figure 5-5. Multi-Function Edit Dialog Box for 578xx Series Adapters

Starting and Stopping the Adapter Temperature Monitor

If available for the adapter, click the **Temperature** button in the adapter pane. The Temperature page shows a graph of the temperature over time in degrees Celsius. The graph is updated at the monitoring rate indicated in the pane.

■ To start the temperature monitoring, click **Start**.
■ To stop the temperature monitoring, click **Stop**.

The monitoring rate can be changed when the sampling of the temperature has been stopped. Figure 5-6 shows the Temperature page.

Figure 5-6. Temperature Page

QinQ Configuration

For specific 578xx Series 1/10Gbps Ethernet Adapters that have the QinQ option enabled, you can use the QinQ page at the adapter level to configure QinQ for VLAN IDs on a per physical function (PF) basis.

QinQ is an implementation of the *IEEE 802.1ad* (or Q-in-Q) specification. QinQ further segregates traffic by allowing the creation of VLANs within a VLAN by adding an additional 802.1Q tag (VLAN ID field) to the Ethernet frames.

To configure QinQ:

1.   In the adapter tree, select the 578xx Series Adapter node.

2.   In the content pane, click the **QinQ** tab to view the QinQ Configuration page (Figure 5-7).

If the **QinQ** tab is not visible, QinQ is not enabled for your adapter model.
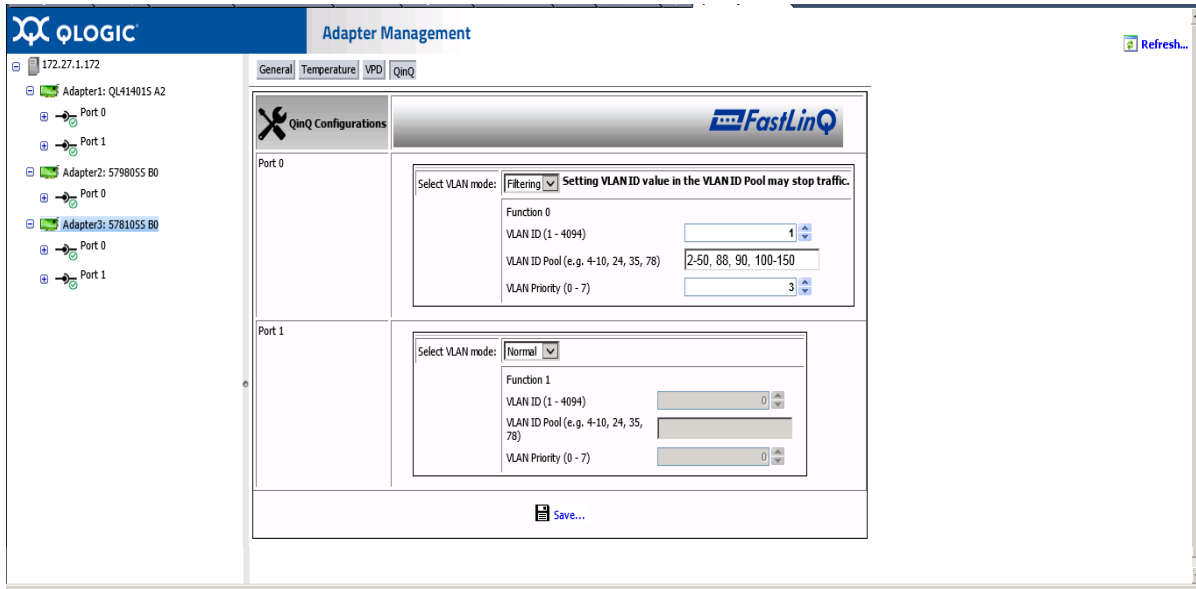
Figure 5-7. QinQ Configuration Page

3. On the QinQ page, configure the **Select VLAN mode** options as follows:

❑ **Normal** mode configures the port to operate using the standard VLAN configuration.

❑ **Filtering** mode configures the port to use QinQ VLAN packet filtering based on the VLAN IDs specified in the VLAN ID and VLAN ID Pool options.

❑ **QinQ** mode configures the port to use QinQ VLAN packet filtering based on the specified VLAN ID.

4. If you selected **Filtering** or **QinQ** mode in Step 3, select from the following values for each port function:

❑ **VLAN ID** must be within the range of 0–4094, where 0 indicates no VLAN ID. In QinQ mode, the VLAN ID cannot be 0.

❑ **VLAN ID Pool** (available in Filtering mode only) must specify a set of ID numbers in the range of 1-4094. You can specify the ID numbers as either a comma-separated list, a range indicated by a dash (-), or a combination of a comma-separated list and a dash-specified range.

❑ **VLAN Priority** must be within the range of 0–7.

NOTE

If you set the same value for **VLAN ID** and **VLAN ID Pool**, traffic may stop. This is a known issue.

In **Filtering** mode, enter valid values for the **VLAN ID** or the **VLAN ID Pool** or both. Both fields may have valid values, which cannot both be 0 and empty at the same time for the same PF.

The maximum quantity of VLAN IDs (specified in the **VLAN ID** option and the **VLAN ID Pool** option for each port function) for the entire adapter is 256.

---

5. To save the QinQ configuration, click **Save**.

6. If a message indicates that the QinQ configuration update is successful, reboot the system.

Viewing Port Information for 578xx/41000 Series Adapters

To view information for ports on 578xx/41000 Series Adapters, select the appropriate port in the system tree. The Adapter Management window shows the following port information:

- **Port Number**
- **Link State**
- **Link Speed**
- **Duplex Setting**
- **Bus Number**
- **Device Number**
- **Media Type**
- **NIC Driver Version**
- **FCoE Driver Version**
- **iSCSI Driver Version**

Figure 5-8 shows the port information for 57xxx/41000 Series Adapters.
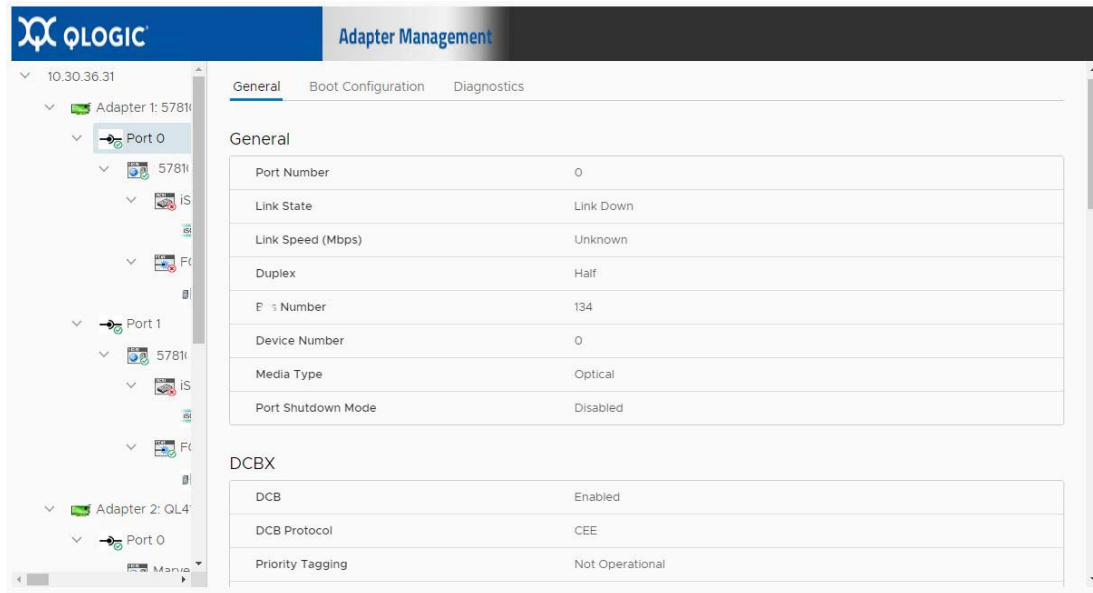
Figure 5-8. Port Information for 578xx/41000 Series Adapters

If data center bridging exchange (DCBX) information is available, it is shown as part of the port information.

DCBX information includes:

- **DCB State** (enabled or disabled)
- **DCB Protocol**
- **Priority**
- **Priority Flow Control (PFC)**
- **Enhanced Transmission Selection (ETS)**

DCBX Advanced information includes:

- **Local MIB:**

  - **ETS** (enabled or disabled)
  - **PFC** (enabled or disabled)
  - **Configuration mismatch**
  - **Networking**, **FCoE**, and **iSCSI HBA PRI** (priorities)
  - **PFC** (priority flow control) **Enabled/Disabled on Priorities**
  - **Networking**, **FCoE**, and **iSCSI HBA PGID** (priority group ID)
  - **PGID(*x*) BW(%)** (bandwidth percent)

- **Remote MIB:**

  - **Remote application priority willing** (enabled or disabled)
  - **Remote PFC willing**

❑ **Remote ETS willing**
❑ **Remote ETS recommendation valid**
❑ **Remote FCoE PRI**
❑ **Remote iSCSI PRI**
❑ **Remote PFC Enabled/Disabled on Priorities**
❑ **Remote Networking**, **FCoE**, and **iSCSI PGID** (priority group ID)
❑ **Remote PGID(*x*) BW(%)** (bandwidth percent)

Figure 5-9 shows the port information with DCBX information.
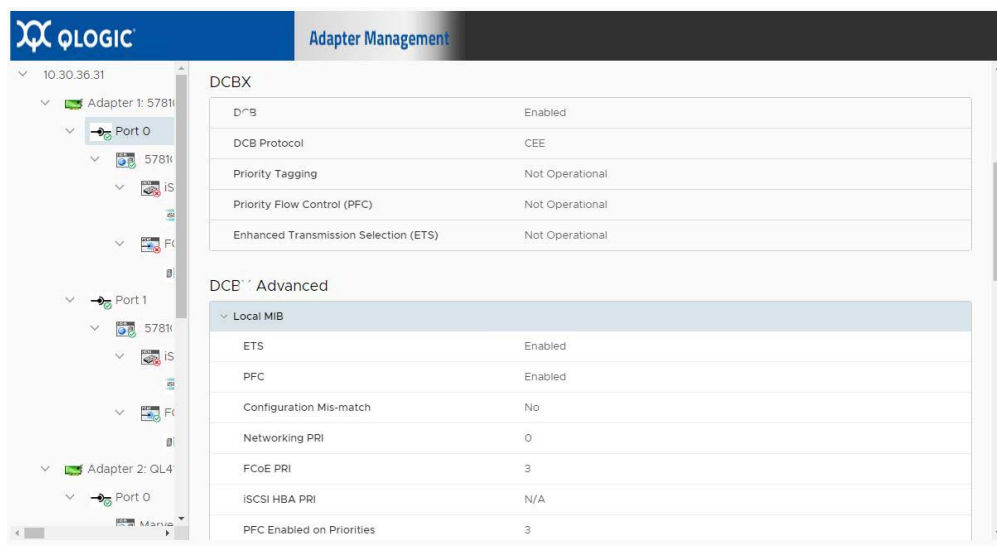
Figure 5-9. Port Information with DCBX Information

Configuring Port Boot Options

If the adapter has the ability to boot from external storage, the following boot configuration options for each boot method are available:

■ **MBA** (see Configuring MBA Boot)

■ **iSCSI Boot** (see Configuring iSCSI Boot)

■ **FCoE Boot** (see Configuring FCoE Boot)

Configuring MBA Boot

To configure the MBA boot:

1. In the QConvergeConsole system tree, select an adapter, and then select the appropriate port.

2. In the content pane on the right, click **Boot Configuration**.

3. Click the **MBA** button.

4. On the MBA Configurations page, complete the following:

a. Select the **Option ROM** check box to enable the ROM option, or clear the check box to disable it.

b. Select one of the options for **Boot Protocol**.

Options for 578xx Series Adapters:

- **None**
- **PXE**
- **FCoE Boot** (if available)
- **iSCSI Boot** (if available)

Options for 41000 Series Adapters:

- **None**
- **PXE**
- **iBFT**

Note that selecting **PXE** will disable the **iSCSI** (offload) **Boot**. Selecting **iBFT** will disable the **iSCSI** (offload) **Boot**, and set the **iSCSI Boot Mode** to non-offload.

c. Select one of these options for **Boot Strap Type**:

- **Auto**
- **BBS**
- **Int 18h**
- **Int 19h**

d. Select the **Hide Setup Prompt** check box to enable the **Hide Setup Prompt**, or clear the check box to disable the prompt for preboot comprehensive configuration management (CCM) on 578*xx* Adapters.

e. Select one of the following **Setup Key Stroke** options for preboot CCM on 578*xx* Adapters:

- **Ctrl-S**
- **Ctrl-B**

f. Select a value (from 0 to 14) in the **Banner Message Timeout** box for preboot CCM on 578*xx* Adapters.

g. Select the appropriate **Link Speed** option:

- **AutoNeg** (auto negotiation)
- **SmartAN** (smart auto negotiation (if available))
- **1Gbps**
- **10Gbps**
- **25Gbps** (if available)
- **40Gbps** (if available)
- **50Gbps** (if available)

■ **100Gbps** (if available)

    h.   Select the **Pre-boot Wake on LAN** check box to enable the Pre-boot Wake on LAN option, or clear the check box to disable it.

    i.   Select the **VLAN Mode** check box to enable VLAN Mode, or clear the check box to disable it.

    j.   Set a value (from 1 to 4094) in the **VLAN ID (1..4094)** box.

    k.   Set a value (from 0 to 7) for the **Boot Retry Count** option.

5.   Click **Save**.

Figure 5-10 shows the boot configuration pane for MBA parameters.
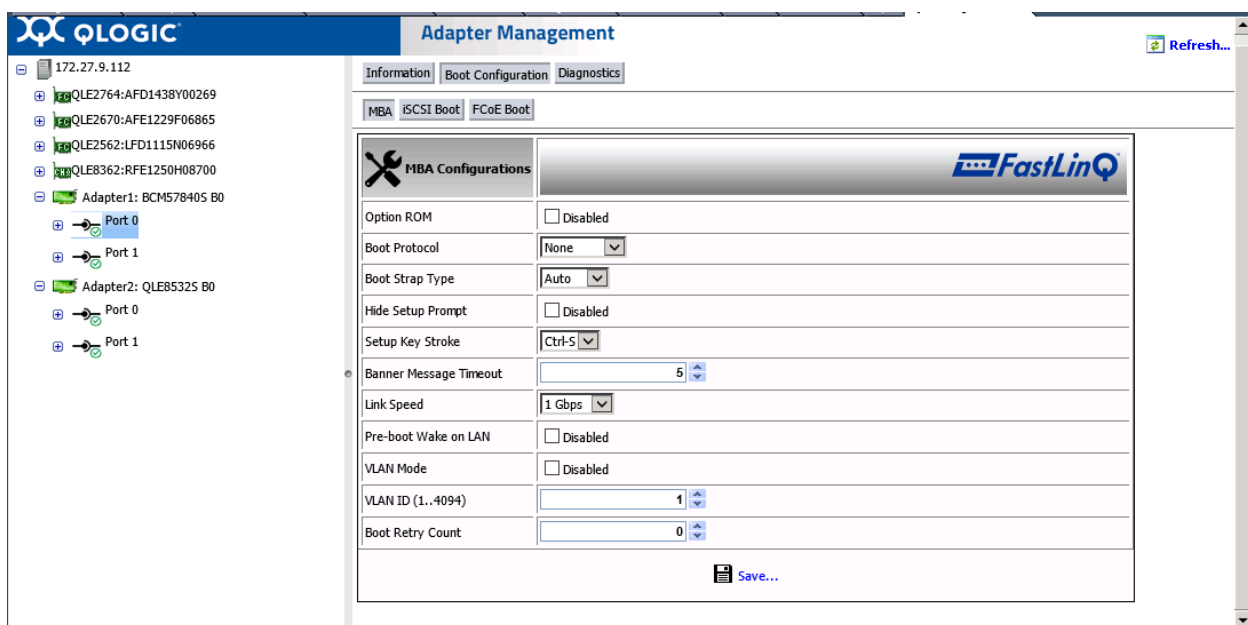
Figure 5-10. Boot Configuration Panel for MBA Parameters

Configuring iSCSI Boot

This section describes how to set up the iSCSI boot configuration.

Configuring General Parameters

To configure the iSCSI general parameters:

1.   In the QConvergeConsole system tree, select an adapter, and then select the appropriate port.

2.   In the content pane on the right, click **Boot Configuration**.

3.   Click the **iSCSI Boot** button.

4. Under **Configure General Parameters**, complete the following:

    a. Select the **iSCSI Boot Enabled (offload)** check box to enable the iSCSI Boot offload mode, or clear the check box to disable it.

       Note that this check box option is only available when **Boot Mode** is set to **Offload**. Also, enabling iSCSI offload mode will set the **MBA Boot Protocol** to **None**. This feature is only applicable to 41000 Series Adapters. The 578*xx* adapters do not support hardware iSCSI boot on VMware.

    b. For the **Boot Mode**, select **Non-offload or Offload**.

       Note that selecting **Non-offload** sets the MBA Boot Protocol to **iBFT**. Selecting **Offload** and enabling the iSCSI Boot (offload) sets the **MBA Boot Protocol** to **None**. This feature is only applicable for 41000 Series Adapters. The 578*xx* adapters do not support hardware iSCSI boot on VMware.

    c. Select the **TCP/IP Parameters via DHCP** check box to enable the TCP/IP parameters via DHCP, or clear the check box to disable it.

    d. Select the **iSCSI Parameters via DHCP** check box to enable the iSCSI parameters via DHCP, or clear the check box to disable it.

    e. Select the **CHAP Authentication** check box to enable the CHAP authentication, or clear the check box to disable it.

    f. Select **Enabled** or **Disabled** in the **Boot to iSCSI target*** option. (not applicable to 41000 Series Adapter).

    g. Type the DHCP vendor ID in the **DHCP Vendor ID** box.

    h. Set a value (from 0 to 255) in the **Link Up Delay Time** box.

    i. Select the **Use TCP Timestamp**[1] check box to enable the TCP time stamp, or clear the check box to disable it.

    j. Select the **Target as First HDD**[1] check box to enable the target as first HDD, or clear the check box to disable it.

    k. Set a value (from 0 to 60) in the **LUN Busy Retry Count**[1] box.

    l. Select **IPv4** or **IPv6** for the **IP Version** option.

    m. Select the **HBA Boot Mode**[1] check box to enable the HBA boot mode or clear the check box to disable it.

5. Click **Save**.

shows the **Configure General Parameters** section in the iSCSI Boot Configuration window.

---

[1] This option does not apply to 41000 Series Adapters.

Configuring Initiator Parameters

To configure the iSCSI initiator parameters:

1. In the QConvergeConsole system tree, select an adapter, and then select the appropriate port.

2. In the content pane on the right, click **Boot Configuration**.

3. Click the **iSCSI Boot** button.

4. Under **Configure Initiator Parameters**, complete the following:

   a. Type the IP address in the **IP Address** box.

   b. Type the subnet mask in the **Subnet Mask** box.

   c. Type the default gateway in the **Default gateway** box.

   d. Type the primary DNS in the **Primary DNS** box.

   e. Type the secondary DNS in the **Secondary DNS** box.

   f. Type the iSCSI name in the **iSCSI Name** box.

   g. Type the CHAP ID in the **CHAP ID** box.

   h. Type the CHAP secret key in the **CHAP Secret** box.

5. Click **Save**.

   Figure 5-11 on page 94 shows the Configure Initiator Parameters section in the iSCSI Boot Configuration window.

Configuring Primary/Secondary Target Parameters

To configure the iSCSI primary and secondary target parameters:

1. In the QConvergeConsole system tree, select an adapter, and then select the appropriate port.

2. In the content pane on the right, click **Boot Configuration**.

3. Click the **iSCSI Boot** button.

4. Under Configure **Primary Target Parameters**, complete the following:

   a. Select the **Connect** check box to enable connect, or clear the check box to disable it.

   b. Type the IP address in the **IP Address** box.

   c. Type a value in the **TCP Port** box.

   d. Type a value in the **Boot LUN** box.

   e. Type the iSCSI name in the **iSCSI Name** box.

   f. Type the CHAP ID in the **CHAP ID** box.

g. Type the CHAP secret key in the **CHAP Secret** box.

h. Complete Step 5 as needed.

5. Under **Configure Secondary Target Parameters**, complete the following:

a. Select the **Connect** check box to enable connect, or clear the check box to disable it.

b. Type the IP address in the **IP Address** box.

c. Type a value in the **TCP Port** box.

d. Type a value (from 0 to 255) in the **Boot LUN** box.

e. Type the iSCSI name in the **iSCSI Name** box.

f. Type the CHAP ID in the **CHAP ID** box.

g. Type the CHAP secret key in the **CHAP Secret** box.

6. Click **Save**.

Figure 5-11 on page 94 shows the **Configure Primary Target Parameters** and **Configure Secondary Target Parameters** section in the Configure iSCSI Boot Parameters window.

Configuring MPIO Parameters

> **NOTE**
>
> This feature is not applicable to 41000 Series Adapters.

To configure the MPIO parameters:

1. Select the appropriate port in the QConvergeConsole system tree.

2. Click **Boot Configuration**.

3. Click the **iSCSI Boot** option.

4. Complete the following in the **Configure MPIO Parameters** pane:

a. Select the **Enable MPIO** check box to enable MPIO, or clear the check box to disable it.

b. Select a MAC address from an adapter (or select **None**) for the **Secondary Device**.

c. Select the **Use Independent Target Portal** check box to enable the use of independent target portal, or clear the check box it to disable it.

d. Select the **Use Independent Target name** check box to enable the use of independent target name, or clear the check box to disable it.

5. Click **Save**.

Figure 5-11 shows the **Configure MPIO Parameters** section in the iSCSI Boot Configuration window for 578xx Series Adapters.
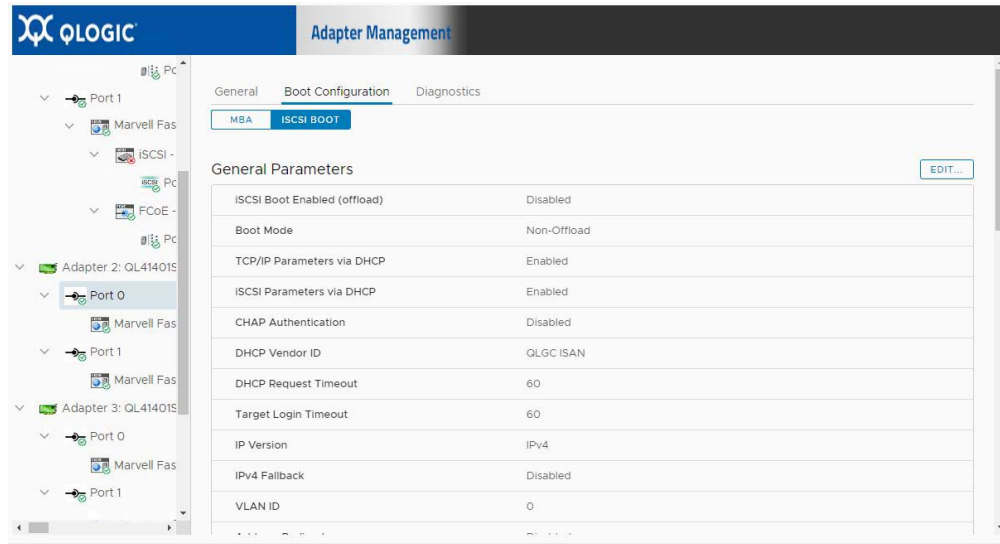
Figure 5-11. iSCSI Boot Configuration Pane for 578xx Series Adapters

Configuring FCoE Boot

This section describes how to configure general and target FCoE boot.

Configuring General Parameters

To configure the FCoE general parameters:

1. In the QConvergeConsole system tree, select an adapter, and then select the appropriate port.

2. In the content pane on the right, click **Boot Configuration.**

3. Click the **FCoE Boot** button.

4. Under **Configure General Parameters**, complete the following:

   a. Select the **Boot to FCoE target**[1] check box to enable boot to FCoE target, or clear the check box to disable it.

   b. Select the **Target as First HDD**[1] check box to enable target as first HDD, or clear the check box to disable it.

   c. Set a value (from 0 to 255) in the **Link Up Delay Time** box.

   d. Set a value (from 0 to 60) in the **LUN Busy Retry Count**[1] box.

   e. Set a value (from 0 to 8) in the **Fabric Discovery Timeout** box.

---

[1] This option does not apply to 41000 Series Adapters.

> f. Select the **FCoE HBA Boot Mode**[1] check box to enable the FCoE HBA Boot Mode, or clear it to disable it.

5. Click **Save**.

Figure 5-12 shows the **Configure General Parameters** section in the Configure FCoE Boot Parameters window.

Configuring Target Parameters

To configure the FCoE target parameters:

1. In the QConvergeConsole system tree, select an adapter, and then select the appropriate port.

2. In the content pane on the right, click **Boot Configuration**.

3. Click the **FCoE Boot** button.

4. Under **Configure Target Parameters**, complete the following:

> a. Select the appropriate **Port WWN** check box(es) to enable the port WWN to be connected, or clear the check box to disable it.
>
> b. Type the port worldwide name in the **Port WWN** boxes.
>
> c. Set a value (from 0 to 255) in the **Boot LUN** box.

5. Click **Save**.

Figure 5-12 shows the **Configure General Parameters** section in the Configure FCoE Boot Parameters window.
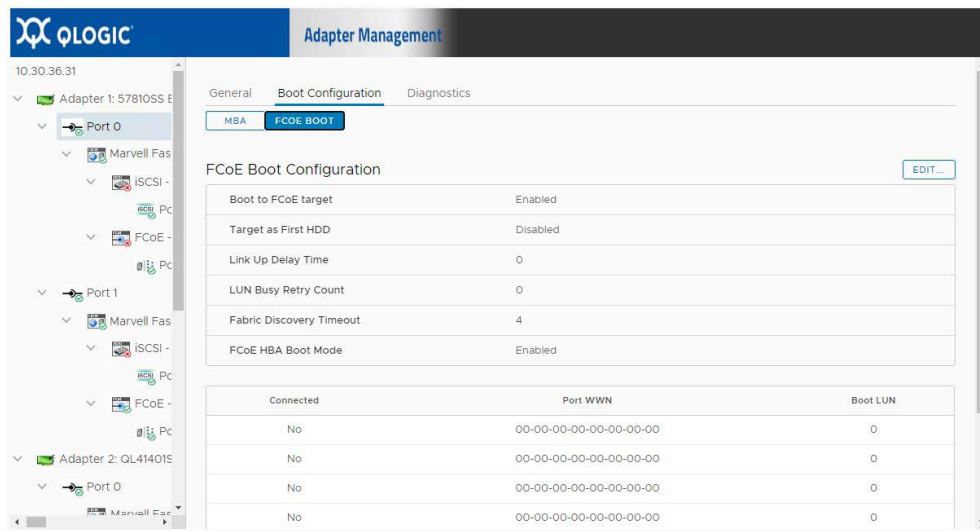
Figure 5-12. FCoE Boot Configuration Panel

Configuring Link Settings

If your 578xx/41000 Series Adapters support SmartAN™ (smart auto negotiation), then the QConvergeConsole vSphere Client Plug-in has the Link Settings option, as shown in Figure 5-13.
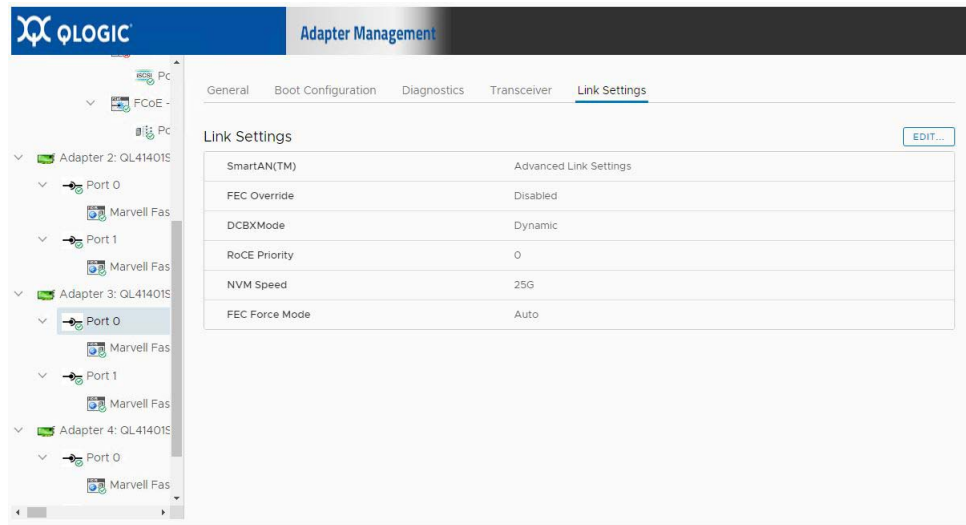
Figure 5-13. Link Settings

On the Link Settings page, the adapter port can be configured for **Smart AutoNeg** or **Advanced Link Settings**. Selecting **Advanced Link Settings** allows you to configure the speed and FEC modes. The available speeds vary based on the speed capability of the adapter.

The **Smart AutoNeg** option may also appear in the **MBA Boot Configuration** list of available speeds. Changing the speed on the Link Settings page also changes the speed in the **MBA Boot Configuration** list.

Running Adapter Port Diagnostics

This section describes how to run a port diagnostic test.

To run a port diagnostic test:

1. In the QConvergeConsole system tree, select an adapter, and then select the appropriate port.

2. In the content pane on the right, click **Diagnostics**.

3. Specify the test type to run by selecting the appropriate **Test** check box or boxes, as shown in Figure 5-14:

   ❑ **Control Registers**
   ❑ **Internal Memory**

- ❑ **EEPROM**
- ❑ **Interrupt**
- ❑ **Loopback MAC**[1]
- ❑ **Loopback PHY**
- ❑ **LED**
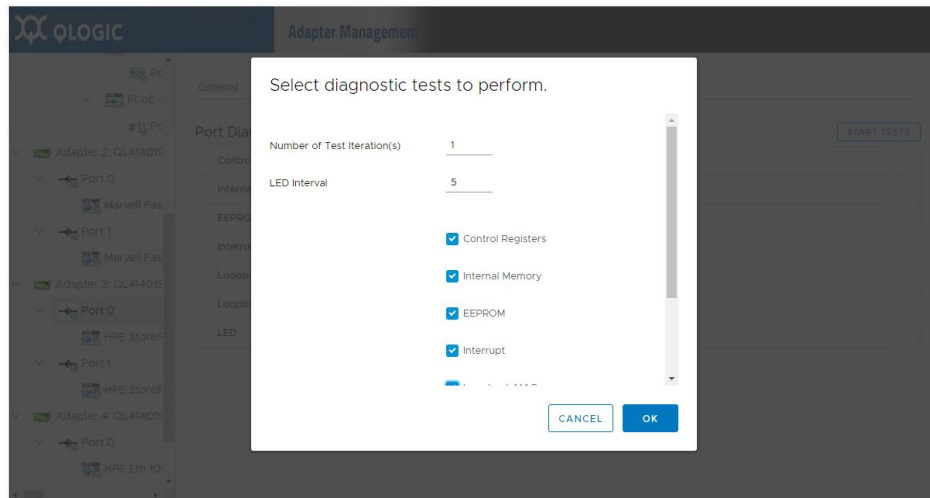
Figure 5-14. Diagnostics Pane

4.   Select a value in the **LED Interval** box.

5.   Select the number of iterations of each test in the **Number of Loops** box.

---

[1] This option does not apply to 41000 Series Adapters.

6. Click **Start Test**.

NOTE

After the test is complete, the Diagnostics page as shown in Figure 5-15 shows the result.
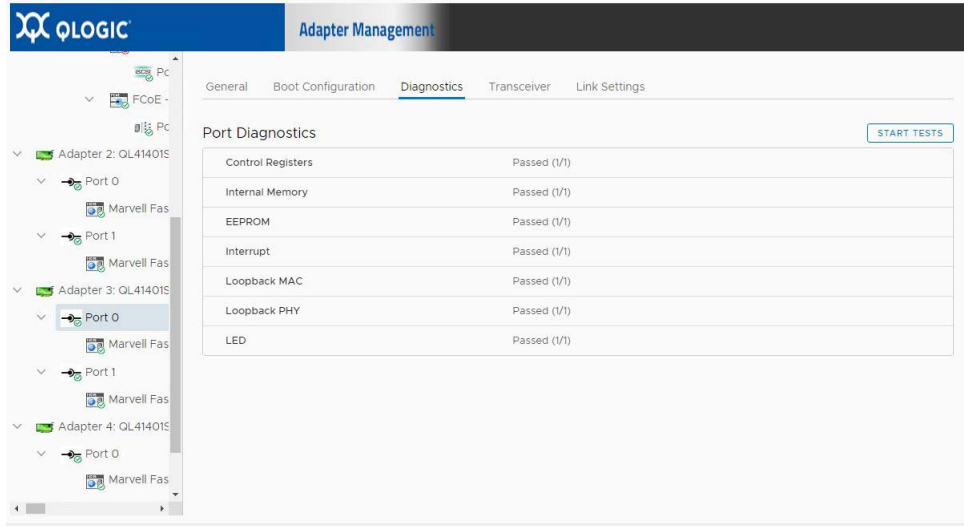
Figure 5-15. Diagnostics Pane Test Results

Viewing Function Information for 578xx/41000 Series Adapters

To view information for functions on 57xxx/41000 Series Adapters, select the function in the system tree. The Adapter Management window shows the function information and function Ethernet statistics.

Function Information

Figure 5-16 shows function information on 578xx/41000 Series Adapters.

■ **Vital Signs:**

❑ **MAC Address**
❑ **Permanent MAC Address**
❑ **iSCSI MAC Address** (when storage is enabled)
❑ **FCoE MAC Address** (when storage is enabled)
❑ **FCoE Node WWN** (when storage is enabled)
❑ **FCoE Port WWN** (when storage is enabled)
❑ **MTU**
❑ **Flow Control**

■ **Driver Information:**

❑ **Driver Name**
❑ **Driver Version**
❑ **Driver Date**
❑ **Interface** (UP or DOWN)

■ **Multi-function:**

❑ **Physical Network MAC Address**
❑ **Physical FCoE MAC Address**
❑ **Physical iSCSI MAC Address**
❑ **Minimum Bandwidth (%)**
❑ **Maximum Bandwidth (%)**
❑ **L2NIC Protocol**
❑ **iSCSI Protocol**
❑ **FCoE Protocol**
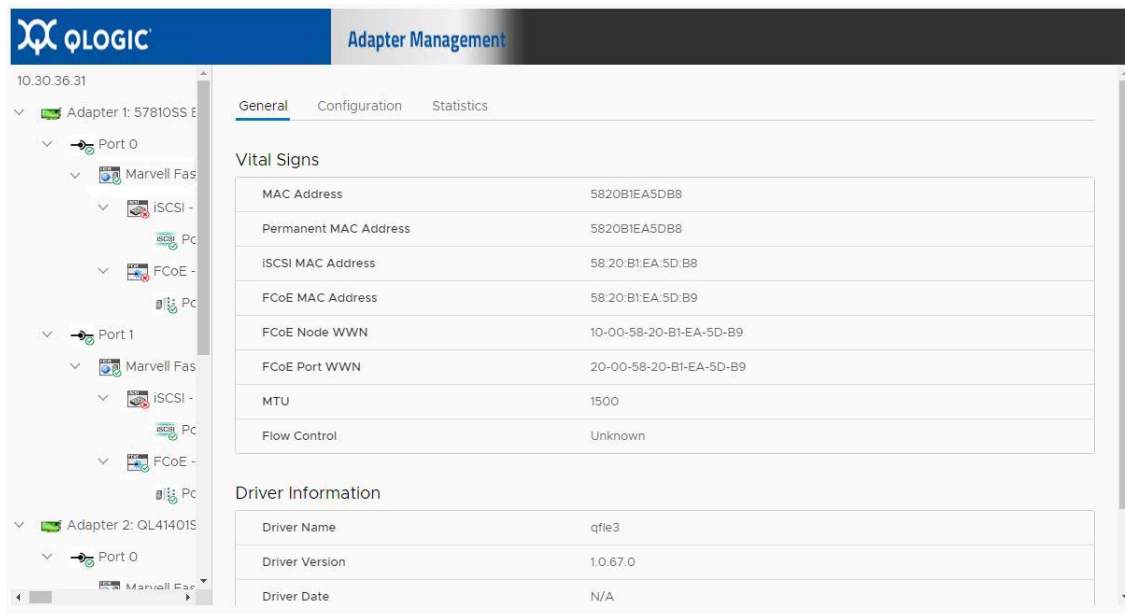
Figure 5-16. Function Information on 578xx/41000 Series Adapters

Function Ethernet Statistics

Figure 5-17 shows the function Ethernet statistics on 578xx/41000 Series Adapters. Statistics include:

■ **Packets Received**
■ **Packets Transmitted**
■ **Broadcast Frames Received**
■ **Broadcast Frames Transmitted**
■ **Directed Frames Received**

- ■ **Directed Frames Transmitted**
- ■ **Multicast Frames Received**
- ■ **Multicast Frames Transmitted**
- ■ **Carrier Sense Errors**
- ■ **Deferred Transmissions**
- ■ **Excessive Collisions**
- ■ **Late Collisions**
- ■ **Multiple Collision Frames**
- ■ **Single Collision Frames**
- ■ **Octets Received**
- ■ **Octets Transmitted**
- ■ **Receive Threshold Hits**
- ■ **Transmit Threshold Hits**

To update the statistics, click **Refresh**.
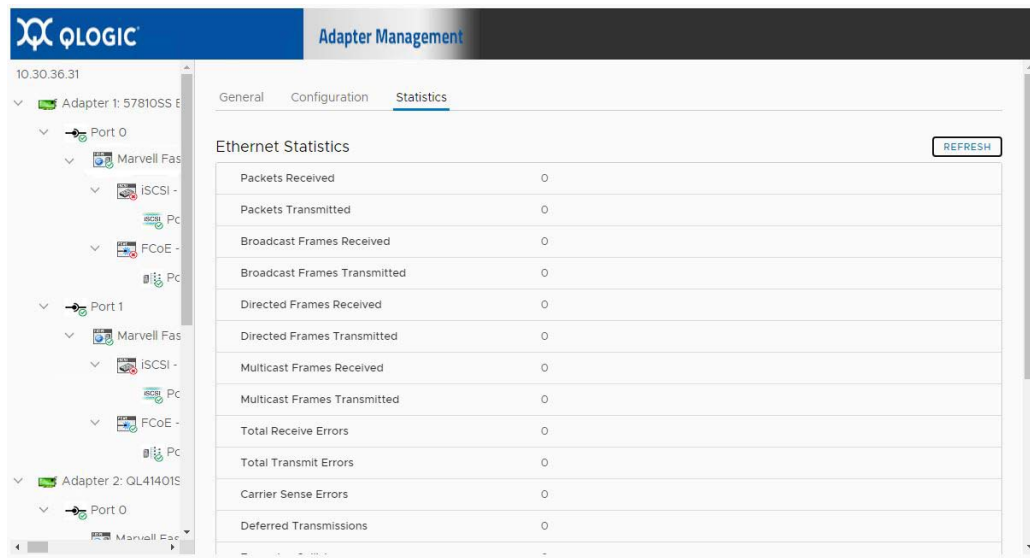
Figure 5-17. Function Ethernet Statistics on 578xx/41000 Series Adapters

Viewing iSCSI Information for 578xx/41000 Series Adapters

To view iSCSI information for 578xx/41000 Series Adapters, select the iSCSI in the system tree.

> **NOTE**
>
> iSCSI must be configured for a function in the adapter content pane.

The Adapter Management window shows the following iSCSI information:

- **Vital Signs:**
  - ❑ **MAC Address**
  - ❑ **IPv4 Address**
  - ❑ **IPv6 Address**
  - ❑ **MTU**
  - ❑ **Device ID**

- **Driver Information:**
  - ❑ **Driver Name**
  - ❑ **Driver Version**
  - ❑ **Driver Firmware Version**

Figure 5-18 shows the iSCSI information for 578xx/41000 Series Adapters.

Figure 5-18. iSCSI Information on 578xx/41000 Series Adapters

If there are active iSCSI sessions, selecting the portal in the system tree shows function information regarding the sessions. The iSCSI **Portal information** includes the **Portal IP** and each session's information, including:

- **Target**
- **Session State**
- **Target Portal**
- **Initiator Portal**
- **Initial R2T**
- **Immediate Data**
- **Max Outstanding R2T**
- **Data Sequence Order**

- **Data PDU in Order**
- **Error Recovery Level**
- **Connection ID**
- **Session Unique ID**

Figure 5-19 shows the iSCSI Portal Information for 578xx/41000 Series Adapters.

Figure 5-19. iSCSI Portal Information on 578xx/41000 Series Adapters

Viewing Information for an iSCSI Target Connected to 578xx/41000 Series Adapters

To view information for an iSCSI target connected to 578xx/41000 Series Adapters, select the iSCSI target in the system tree.

The Adapter Management window shows the following iSCSI target information:

- **Target Information:**
  - ❑ **Target IQN Name**
  - ❑ **SCSI Target Number**
  - ❑ **MAC Address**
  - ❑ **IPv4 Address**
  - ❑ **IPV6 Address**

❑   **LUN Count**

■   **Session Information:**

❑   **Target**
❑   **Session State**
❑   **Target Portal**
❑   **Initiator Portal**
❑   **Initial R2T**
❑   **Immediate Data**
❑   **Max Outstanding R2T**
❑   **Data Sequence in Order**
❑   **Data PDU in Order**
❑   **Error Recovery Level**
❑   **Connection ID**
❑   **Session Unique ID**

Figure 5-20 shows the iSCSI target attached to 578xx/41000 Series Adapters.

Figure 5-20. iSCSI Target Attached to 578xx/41000 Series Adapters

Viewing Information for an iSCSI LUN Connected to 578xx/41000 Series Adapters

To view information for an iSCSI LUN connected to 578xx/41000 Series Adapters, select the iSCSI LUN in the system tree. The Adapter Management window shows the following iSCSI LUN information:

- **iSCSI Unit Number**
- **Capacity (MB)**
- **Vendor ID**
- **Product ID**
- **Device Type**
- **Product Rev Level**

Figure 5-21 shows the iSCSI LUN Information on 578xx/41000 Series Adapters.
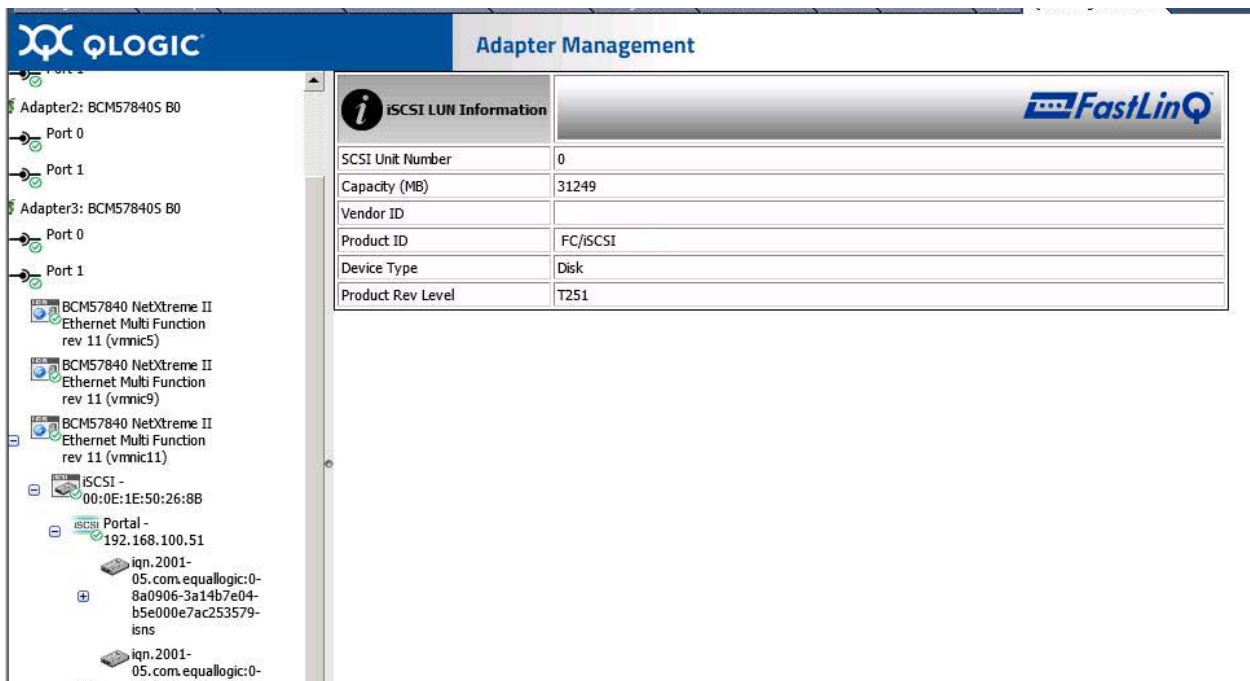
Figure 5-21. iSCSI LUN Information on 578xx/41000 Series Adapters

A Installing the QLogic Adapter CIM Provider Using VUM

This appendix provides information on how to install the QLogic Adapter CIM Provider on the ESX and ESXi Server using the VMware Update Manager (VUM).

To install the QLogic Adapter CIM Provider on an existing ESX/ESXi installation using VUM:

1. Identify one or more `offline-bundle.zip` files.

2. From vCenter Server, go to **Home** > **Update Manager**.

3. Click the **Patch Repository** tab.

4. At the top right of the window, click the **Import Patches** link.

5. Click **Finish**.

   The QLogic Adapter CIM Provider is now added to the patch repository.

6. Create a baseline and remediate the ESX/ESXi host. For more information, refer to *Installing and Administering VMware vSphere Update Manager* available from the VMware Web site:

   https://www.vmware.com/support/pubs/vum_pubs.html

B Troubleshooting

This appendix provides troubleshooting information for the QLogic Adapter CIM Provider.

CIM Provider Troubleshooting

After a system startup, the SFCB (Small-Footprint CIM Broker) CIMOM (CIM object manager) in the ESX system should start automatically and load the QLogic Adapter CIM Provider when necessary.

If the CIM Provider does not start automatically, you can manually stop, start, or restart the SFCB CIMOM by issuing the following commands.

To stop the SFCB CIMOM and the QLogic Adapter CIM Provider:

```
# /etc/init.d/sfcbd-watchdog stop
```

To start the SFCB CIMOM and the QLogic Adapter CIM Provider:

```
# /etc/init.d/sfcbd-watchdog start
```

To restart the SFCB CIMOM and the QLogic Adapter CIM Provider:

```
# /etc/init.d/sfcbd-watchdog restart
```

After starting the SFCB CIMOM, use a CIM client utility to query the QLogic Adapter CIM Provider for information.

C Revision History

Document Revision History	
Revision 1, January 21, 2021	
Revision 2, May 14, 2021	
Revision 3, December 15, 2021	
Revision 4, June 30, 2022	
Revision 5, October 21, 2022	
Revision 6, May 10, 2023	
Revision 7, December 06, 2023	
Changes	**Sections Affected**
Added section Supported Operating System	"Supported Operating System" on page x
Removed all occurrences of 2500 Series Adapter.	All sections.
Removed installation of plug-in on vCenter Server Appliance.	"Installing the QConvergeConsole vSphere Client Plug-in" on page 6
Added screenshot "Personality Type" on page 33	"Adapter Management Window" on page 32
Updated information in "VPD Information—Fibre Channel Port" on page 65	"VPD Information—Fibre Channel Port" on page 65
■ Updated the image "Firmware Parameters—Fibre Channel Port" on page 45. ■ Updated description of data rate. ■ Deleted text "FCoE 3400/8400/41000/45000 Series adapters". ■ Added option Virtual Lane.	"Firmware Parameters—Fibre Channel Port" on page 45.

Glossary

adapter

The board that interfaces between the host system and the target devices. Adapter is synonymous with *Host Bus Adapter*, *Host Channel Adapter*, *host adapter*, and *adapter board*.

adapter port

A port on the adapter board.

adapter port beacon

An LED on the adapter. Flashing it enables you to locate the adapter.

alias

A user-defined name for an adapter, adapter port, logical disk, or subsystem.

API

Application programming interface. A set of routines, protocols, and tools for building software applications. API simplifies development by providing the building blocks.

bandwidth

A measure of the volume of data that can be transmitted at a specific transmission rate. A 1Gbps or 2Gbps Fibre Channel port can transmit or receive at nominal rates of 1 or 2Gbps, depending on the device to which it is connected. This corresponds to actual bandwidth values of 106MB and 212MB, respectively.

basic input output system

See BIOS.

BIOS

Basic input output system. Typically in Flash PROM, the program (or utility) that serves as an interface between the hardware and the operating system and allows booting from the adapter at startup.

boot code

The program that initializes a system or an adapter. Boot code is the first program to run when a system or a device within a system, such as an adapter, is powered on. FCode, BIOS, and extensible firmware interface (EFI) are all forms of boot code for specific hardware/operating system environments.

Boot code for QLogic Fibre Channel Adapters is required if the computer system is booting from a storage device (disk drive) attached to the adapter. The primary function of the boot code is communication with the external boot device before the operating system is up and running. Boot code can also perform secondary functions, including managing the setup for the adapter and initializing and testing the adapter's ISP.

boot device

The device, usually the hard disk, that contains the operating system the BIOS uses to boot from when the computer is started.

cache

A temporary high-speed storage (memory) area where recently used or frequently accessed data is stored for rapid access, thus increasing the efficiency of processor operations.

CLI

Command line interface. A program interface driven by entering commands and parameters.

command line interface

See CLI.

data center bridging

See DCB.

data center bridging exchange

See DCBX.

Data Center Ethernet

See DCE™.

DCB

Data center bridging. Provides enhancements to existing 802.1 bridge specifications to satisfy the requirements of protocols and applications in the data center. Because existing high-performance data centers typically comprise multiple application-specific networks that run on different link layer technologies (Fibre Channel for storage and Ethernet for network management and LAN connectivity), DCB enables 802.1 bridges to be used for the deployment of a converged network where all applications can be run over a single physical infrastructure.

DCBX

Data center bridging exchange. A protocol used by DCB devices to exchange configuration information with directly connected peers. The protocol may also be used for misconfiguration detection and for configuration of the peer.

DCE™

Data Center Ethernet. Cisco's foundation for delivering a unified fabric in which the end-state network where LAN, SAN, and inter-process communication (IPC) traffic are converged onto a single network infrastructure. The enhancements described within Cisco Data Center Ethernet helped create the IEEE 802.1 Data Center Bridging (DCB) working group.

device

A target, typically a disk drive. Hardware such as a disk drive, tape drive, printer, or keyboard that is installed in or connected to a system. In Fibre Channel, a *target device*.

DHCP

Dynamic host configuration protocol. Enables computers on an IP network to extract their configuration from servers that have information about the computer only after it is requested.

driver

The software that interfaces between the file system and a physical data storage device or network media.

dynamic host configuration protocol

See DHCP.

embedded switch

See eSwitch.

eSwitch

Embedded switch. Functionality provided by adapters as a basic Layer 2 switch for Ethernet frames. Each physical port has one instance of an eSwitch, which supports all NIC partitioning on that physical port.

Ethernet

The most widely used LAN technology that transmits information between computer, typically at speeds of 10 and 100 million bits per second (Mbps).

FC

See Fibre Channel.

FCoE

Fibre Channel over Ethernet. A new technology defined by the T11 standards body that allows traditional Fibre Channel storage networking traffic to travel over an Ethernet link by encapsulating Fibre Channel frames inside Layer 2 Ethernet frames. For more information, visit www.fcoe.com.

Fibre Channel

A high-speed serial interface technology that supports other higher layer protocols such as SCSI and IP.

Fibre Channel over Ethernet

See FCoE.

firmware

Low-level software typically loaded into read-only memory and used to boot and operate an intelligent device.

Flash

Non-volatile memory where the boot code is saved. At times, Flash and boot code are used interchangeably.

Forward Error Correction (FEC)

A method of obtaining error control in data transmission in which the source (transmitter) sends redundant data and the destination (receiver) recognizes only the portion of the data that contains no apparent errors.

frame

Data unit consisting of a start-of-frame (SOF) delimiter, header, data payload, CRC, and an end-of-frame (EOF) delimiter.

Host Bus Adapter

An adapter that connects a host system (the computer) to other network and storage devices.

initiator

System component, such as a network interface card, that originates an I/O operation.

Internet Protocol

See IP.

Internet small computer system interface

See iSCSI.

IP

Internet protocol. A method by which data is sent from one computer to another over the Internet. IP specifies the format of packets, also called *datagrams*, and the addressing scheme.

IPv4

Internet protocol version 4. A data-oriented protocol used on a packet switched inter-network (Ethernet, for example). It is a best-effort delivery protocol: it does not guarantee delivery, ensure proper sequencing, or avoid duplicate delivery. These aspects are addressed by an upper layer protocol (TCP, and partly by UDP). IPv4 does, however, provide data integrity protection through the use of packet checksums.

IPv6

Internet protocol version 6. Next-generation version of IP that, among other things, lengthens the IP address from 32 bits to 128 bits.

iSCSI

Internet small computer system interface. Protocol that encapsulates data into IP packets to send over Ethernet connections.

jumbo frames

Large IP frames used in high-performance networks to increase performance over long distances. Jumbo frames generally means 9,000 bytes for Gigabit Ethernet, but can refer to anything over the IP MTU, which is 1,500 bytes on an Ethernet.

LED

Light-emitting diode. Status indicator on a switch, router, adapter, or other device.

light-emitting diode

See LED.

LIP

Loop initialization process. The initialization process in an arbitrated loop that occurs when the loop is powered up or a new device is added. One function of a LIP is to assign addresses. All data transmission on the loop is suspended during a LIP.

logical unit number

See LUN.

loop initialization process

See LIP.

loopback

A diagnostic tool that routes transmit data through a loopback connector back to the same adapter.

LUN

Logical unit number, a subdivision of a SCSI target. It is the small integer handle that differentiates an individual disk drive or partition (volume) within a common SCSI target device such as a disk array.

Technically, a LUN can be a single physical disk drive, multiple physical disk drives, or a portion (volume) of a single physical disk drive. However, LUNs are typically not entire disk drives but rather virtual partitions (volumes) of a RAID set.

Using LUNs, the Fibre Channel host can address multiple peripheral devices that may share a common controller.

MAC address

Media access control address. A unique hardware device identifier used in IP address assignment.

maximum transmission unit

See MTU.

media access control address

See MAC address.

message signaled interrupts

See MSI, MSI-X.

MSI, MSI-X

Message signaled interrupts. One of two PCI-defined extensions to support message signaled interrupts (MSIs), in PCI 2.2 and later and PCI Express. MSIs are an alternative way of generating an interrupt through special messages that allow emulation of a pin assertion or deassertion.

MSI-X (defined in PCI 3.0) allows a device to allocate any number of interrupts between 1 and 2,048 and gives each inter-rupt separate data and address registers. Optional features in MSI (64-bit addressing and interrupt masking) are mandatory with MSI-X.

MTU

Maximum transmission unit. Refers to the size (in bytes) of the largest packet (IP datagram) that a specified layer of a communications protocol can transfer.

multiboot

The act of installing multiple operating systems on a computer, and being able to choose which one to boot when starting the computer. Multibooting may require a custom boot loader.

N_Port

Node port. A port that connects by a point-to-point link to either a single N_Port or a single F_Port. N_Ports handle creation, detection, and flow of message units to and from the connected systems. N_Ports are end ports in virtual point-to-point links through a fabric, for example, N_Port to F_Port to F_Port to N_Port using a single Fibre Channel fabric switch.

network interface card

See NIC.

NIC

Network interface card. Computer card installed to enable a dedicated network connection.

NIC partitioning

See NPAR.

node port

See N_Port.

NPAR

NIC partitioning. The division of a single NIC port into multiple physical functions or partitions, each with a user-configurable bandwidth and personality (interface type). Personalities include NIC, FCoE, and iSCSI.

path

A path to a device is a combination of a adapter port instance and a target port as distinct from internal paths in the fabric network. A fabric network appears to the operating system as an opaque network between the adapter (initiator) and the target.

Because a path is a combination of an adapter and a target port, it is distinct from another path if it is accessed through a different adapter and/or it is accessing a different target port. Consequently, when switching from one path to another, the driver might be selecting a different adapter (initiator), a different target port, or both.

This is important to the driver when selecting the proper method of failover notification. It can make a difference to the target device, which might have to take different actions when receiving retries of the request from another initiator or on a different port.

PCI Express (PCIe)

A third-generation I/O standard that allows enhanced Ethernet network performance beyond that of the older peripheral component interconnect (PCI) and PCI extended (PCI-x) desktop and server slots.

personality

When used in the context of an adapter, the term *personality* refers to the entire adapter. It includes all the I/O ports and the functions on that adapter. For example, a QLogic adapter can have dual personality, converting from Fibre Channel to Converged Network Adapter or vice versa. Therefore, all the I/O functions and all the I/O physical ports on the adapter changes from Fibre Channel Adapter to Converged Network Adapter.

ping

A computer network administration utility used to test whether a specified host is reachable across an IP network, and to measure the round-trip time for packets sent from the local host to a destination computer.

point-to-point

Also FC-P2P. Two Fibre Channel nodes directly connected (not in a loop).

port

Access points in a device where a link attaches. There are four types of ports, as follows:

- N_Port—a Fibre Channel port that supports point-to-point topology.
- NL_Port—a Fibre Channel port that supports loop topology.
- FL_Port—a port in a fabric where an N_Port can attach.
- FL_Port—a port in a fabric where an NL_Port can attach.

port instance

The number of the port in the system. Each adapter may have one or multiple ports, identified with regard to the adapter as port 0, port 1, and so forth. To avoid confusion when dealing with a system containing numerous ports, each port is assigned a port instance number when the system boots up. So port 0 on an adapter might have a port instance number of 8, for example, if it is the eighth port discovered by the system.

QoS

Quality of service. Refers to the methods used to prevent bottlenecks and ensure business continuity when transmitting data over virtual ports by setting priorities and allocating bandwidth.

quality of service

See QoS.

RAID

Redundant array of independent disks. Fault-tolerant disks that look like either single or multiple volumes to the server.

redundant array of independent disks

See RAID.

router log

Log of messages describing events that occur on the intelligent storage router.

SAN

Storage area network. Multiple storage units (disk drives) and servers connected by networking topology.

SCM

SAN congestion management (SCM) is a common noun, and describes a standards-based Fibre Channel technology.

SCSI

Small computer system interface. A high-speed interface used to connect devices, such as hard drives, CD drives, printers, and scanners, to a computer. The SCSI can connect many devices using a single controller. Each device is accessed by an individual identification number on the SCSI controller bus.

SerDes

Serializer/deserializer. A pair of functional blocks commonly used in high-speed communications to compensate for limited input/output. These blocks convert data between serial data and parallel interfaces in each direction.

serializer/deserializer

See SerDes.

small computer system interface

See SCSI.

SR-IOV

Single root input/output virtualization.

storage area network

See SAN.

target

The storage-device endpoint of a SCSI session. Initiators request data from targets. Targets are typically disk-drives, tape-drives, or other media devices. Typically a SCSI peripheral device is the target but an adapter may, in some cases, be a target. A target can contain many LUNs.

A target is a device that responds to a requested by an initiator (the host system). Peripherals are targets, but for some commands (for example, a SCSI COPY command), the peripheral may act as an initiator.

target binding

The process in which the adapter driver binds a target ID using a target's world-wide port name (WWPN) or port ID. This binding enables the target ID to always connect to the WWPN or port ID across reboots regardless of SAN reconfiguration.

TCP

Transmission control protocol. A set of rules to send data in packets over the Internet protocol.

TLV

Type-length-value. Optional information that may be encoded as an element inside of the protocol. The type and length fields re fixed in size (typically 1—4 bytes), and the value field is of variable size. These fields are used as follows:

- Type—A numeric code that indicates the kind of field that this part of the message represents.
- Length—The size of the value field (typically in bytes).
- Value—Variable-sized set of bytes that contains data for this part of the message.

transmission control protocol

See TCP.

type-length-value

See TLV.

USCM

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 SCM feature set.

virtual logical area network

See Virtual Lanes (VLs).

vital product data

See VPD.

Virtual Lanes (VLs)

Traffic can be steered onto various virtual lanes; each lane can carry different storage protocols or sessions. This avoids congestion on one protocol or session to affect another protocol or session. When there is peer congestion, the traffic for a designated slow device can be moved to a slow virtual lane without affecting the traffic to other devices. Marvell's technology can be used with Cisco Extended Receiver Ready (ER_RDY) and Virtual Links.

VPD

Vital product data. Information provided by the manufacturer about the current working adapter. Information varies by manufacturer, or may not be provided at all.

world wide node name

See WWNN.

world wide port name

See WWPN.

WWNN

World wide node name. A unique 64-bit address assigned to a device.

WWPN

World wide port name. A unique 64-bit address assigned to each port on a device. One WWNN may contain multiple WWPN addresses.

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