



# **User's Guide**

## **Converged Network Adapter**

QME8242



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# Introduction

## Overview

This guide provides technical information to system administrators for the QLogic QME8242 mezzanine card, including how to install, configure, and use the products and their functions.

## User's Guide Content

The *QLogic QME8242 Mezzanine Card User's Guide* includes the following sections

- [Hardware Installation](#) covers the hardware and software requirements, safety precautions, and a pre-installation checklist.
- [Driver Installation and Configuration](#) covers the installation of the three drivers—NIC, iSCSI, and FCoE—included with the QLogic QME8242 on Windows, Linux, and VMware operating systems.
- [Adapter Management Applications](#) covers how to use QConvergeConsole, as well as operating system-specific applications for Windows, Linux, and VMware.
- [Boot Configuration](#) provides information on booting from SAN, PXE boot setup, and iSCSI boot configuration using *Fast!UTIL*, iBFT, and DHCP.
- [Troubleshooting](#) provides troubleshooting flowcharts of steps for diagnosing adapter problems specific to NIC, iSCSI, FCoE, and ESX.
- [Specifications](#) defines the physical characteristics and power requirements, and lists supported standards, interface, and environmental specifications.
- [QConvergeConsole GUI](#) provides an overview of the QConvergeConsole web management interface.

## Functionality and Features

### Functional Description

The QME8242 is a mezzanine card with Fibre Channel over Ethernet (FCoE) and iSCSI offload for the blade server environment.

## Features

The QME8242 adapter provides the following features:

- NIC Partitioning (NPAR)
- Message Signaled Interrupts (MSI-X)
- Device management for power and SAN
- Multi-boot capability including:
  - Preboot-eXecution Environment (PXE)
  - iSCSI
  - Fibre Channel
  - Unified Extensible Firmware Interface (UEFI)
- PCIe 2.0 x8
- Dynamic Power Management (DPM)
- User diagnostics that can be run from the Command Line Interface (CLI) and the Graphical User Interface (GUI)
- Ethernet functions include:
  - 2x10 GbE with KR (copper backplane)
  - Priority and virtual LAN (VLAN) tagging
  - Jumbo frames up to 9618 bytes
- Enhanced Ethernet functions include:
  - Priority-based flow control
  - Enhanced transmission selection
  - Advanced teaming
  - VLAN configuration and management
  - Preservation of teaming and VLAN configuration information during driver upgrade
- Advanced stateless offload features include:
  - IP, TCP, and UDP checksums
  - Large Send Offload (LSO)
  - Large Receive Offload (LRO)
- Stateful offload features include:
  - iSCSI offload
  - Fibre Channel and FCoE Host Bus Adapters

- Advanced management features for iSCSI and Fibre Channel adapters, including QConvergeConsole (GUI and CLI)
- Interrupt management and scalability features including:
  - Receive Side Scaling (RSS)
  - Interrupt moderation
  - Flow control
  - Locally Administered Address (LAA)
- Enhanced optimization with MSI, MSI-X, and NetQueue

## Supported Operating Systems

The QME8242 adapter supports the following operating systems. To view the most complete and current list, refer to the QME8242 release notes.

### Windows

- Windows Server 2003 R2 SP2 x86-32 and x86-64
- Windows Server 2008 SP2 x86-32 and x86-64
- Windows Server 2008 R2 x86-64
- Hyper-V for Windows 2008 R2

### Linux

- Red Hat Enterprise Linux 5.5 x86-32 and x86-64
- Red Hat Enterprise Linux 6.0 x86-64
- SUSE Linux Enterprise Server 10 SP3 x86-64
- SUSE Linux Enterprise Server 11 SP1 x86-64

### Solaris

- Solaris 10 U9

### VMware

- ESX and ESXi 4.1 U1
- ESX and ESXi 4.0 U3

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#### **NOTE:**

For the most current versions of the OS and drivers supported by the QME8242, refer to the release notes. The release notes are supplied in the `release.txt` file. Global release notes files for the complete CD image are located at the root of the CD. Additional release notes may be provided in the directories containing the individual software components.

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## Documentation Conventions

This guide uses the following documentation conventions:

- **NOTE:** provides additional information.
- ***CAUTION!*** indicates the presence of a hazard that has the potential of causing damage to data or equipment.
- ***WARNING!!*** indicates the presence of a hazard that has the potential of causing personal injury.
- 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**:
  - ❑ **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.qlogic.com**.
- Text in **bold** font indicates user interface elements such as a menu items, buttons, check boxes, or column headings:
  - ❑ Click the **Start** button, point to **Programs**, point to **Accessories**, and then click **Command Prompt**.
  - ❑ Under **Notification Options**, select the **Warning Alarms** check box.
- Text in `Courier` font indicates a file name, directory path, or command line text:
  - ❑ To return to the root directory from anywhere in the file structure:
  - ❑ Type `cd /root` and press ENTER.
  - ❑ Enter 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 a complete listing of license agreements, refer to the *QLogic Software End User License Agreement*.
  - ❑ What are *shortcut keys*?
  - ❑ To enter the date type *mm/dd/yyyy* (where *mm* is the month, *dd* is the day, and *yyyy* is the year).
- Topic titles between quotation marks identify related topics either within this manual or in the online help, which is also referred to as *the help system* throughout this document.

## Regulatory Information

### UL and CUL Listing

This information technology equipment is UL-Listed and CUL-Listed for use with UL-Listed personal computers that have installation instructions detailing user installation of card cage accessories.

---

#### ***CAUTION!***

Power off the computer and all attached devices such as monitors, printers, and external components.

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### CE Compliance

#### Electromagnetic Compatibility

This device complies with the following standards in accordance with the European Directives 2004/108/EC:

- Immunity EN55024:1998 (Amds A1:2001, A2:2003)
- Emission EN55022:2006+A1:2007/ CISPR 22:2005+A1:2005 Class A

#### Safety (Low Voltage Directive)

This device complies with the following standard in accordance with European Directives 2006/95/EC:

- EN60950-1:2006+A11 Second Edition and IEC 60950-1 2005 Second Edition

This definition is classified as per safety standard:

- SELV: Safety Extra Low Voltage

### FCC Compliance Statement

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

---

**NOTE:**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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**CAUTION!**

If the device is changed or modified without permission from QLogic Corporation, the user may void his or her authority to operate the equipment.

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## Canadian Compliance (Industry Canada)

When tested in at least one intended host: This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the interference-causing equipment standard entitled "Digital Apparatus", ICES-003 of the Canadian Department of Communications.

Cet appareil numérique respecte les limites bruits radioélectriques applicables aux appareils numériques de Class A prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques", NMB-003 édictée par le Ministre Canadien des Communications.

## Manufacturer Declaration

This certifies that this product is in compliance with EU Directive 2004/108/EC, using the EMC standards EN55022 Class A and EN55024. This product also meets or exceeds EN60950 safety requirements. This product has been tested and verified to meet CISPR 22 Class A requirements.

I, the undersigned, hereby declare that the equipment specified above conforms to the above directive(s).

**Place:**  
QLogic Corporation  
26650 Aliso Viejo Parkway  
Aliso Viejo, CA 92656

**Date:**  
January 07, 2011

**Signature:**

**Full Name:**  
Mark Craven

**Position:**  
Engineering Manager



# 1 Hardware Installation

## Overview

This section provides the hardware and software requirements, safety precautions, a pre-installation checklist, procedures for installing the adapter and connecting it to the network, and a description of the indicators for network and link activity.

## Hardware and Software Requirements

Before you install the QME8242, verify that your system meets the following hardware and software requirements.

- **Hardware:** For port and slot assignments, refer to the blade and M1000e chassis diagram in the *Dell PowerEdge M1000e Systems Configuration Guide* for the blade and chassis.
- **Software:** For information on the supported operating systems, firmware versions, adapter drivers, and utilities, refer to the product release notes.

## Safety Precautions

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### **CAUTION!**

The adapter is being installed in a system that operates with voltages that can be lethal. Before you open the case of your system, observe the following precautions to protect yourself and to prevent damage to the system components.

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1. Remove any metallic objects or jewelry from your hands and wrists.
2. Make sure to use only insulated or non-conducting tools.
3. Before you touch internal components, verify that the system is powered OFF and is unplugged.
4. Install or remove adapters in a static-free environment. The use of a properly grounded wrist strap or other personal antistatic devices and an antistatic mat is strongly recommended.

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## Pre-Installation Checklist

1. Verify that your system meets the hardware and software requirements listed in “[Hardware and Software Requirements](#)” on page 1-1.
2. Verify that your system is using the latest BIOS.

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**NOTE:**

If you acquired the adapter software on a disk or from the Dell support website (<http://support.dell.com>), verify the path to the adapter driver files.

- 
3. Check the adapter for visible signs of damage. Never attempt to install a damaged adapter.

## Installing the Adapter

For information on adapter installation, refer to the *Dell™ PowerEdge™ Modular Systems Hardware Owner's Manual: Installing Blade Components* page. For I/O Module Mezzanine Cards, see the following link:

<http://support.dell.com/support/edocs/systems/pem/en/HOM/HTML/blades.htm#wp1527391>

## Connecting to the Network

For information on network connections, refer to the *Dell™ PowerEdge™ Modular Systems Hardware Owner's Manual: About Your System* page, *Guidelines for Installing I/O Modules* section:

<http://support.dell.com/support/edocs/systems/pem/en/HOM/HTML/about.htm#wp1184847>

# 2 Driver Installation and Configuration

## Overview

This section provides links to the following information about the three drivers—NIC, iSCSI, and FCoE—included with the QLogic QME8242:

- [Windows Driver Installation and Configuration](#)
- [Linux Driver Installation and Configuration](#)
- [VMware Driver Installation and Configuration](#)

# Windows Driver Installation and Configuration

## Installation Overview

To install and configure the QME8242 drivers on a Windows system, refer to the driver release notes and readme files included in the package. Basic installation for the drivers is included in the following sections:

- [Installing the Windows NIC Driver](#)
- [Installing the Windows iSCSI Driver](#)
- [Installing the Windows FCoE Driver](#)

You can install Windows drivers using either the graphical user interface (GUI) installer or the command line interface (CLI), as summarized in the following sections.

### Installing Windows Drivers and Applications Using the InstallShield Wizard

To download and run the QLogic P3P Installer (DELL) - InstallShield Wizard:

1. From the Dell web site, locate and save the `QLogic_1.0_Windows_A00.exe` self-extracting zip file to your local drive.
2. Double-click the zip file.
3. In the `C:\QLogic\Windows` folder, double-click the `setup.exe` file.
4. Run the installer:
  - You can choose to install drivers only or both drivers and applications.
  - You can choose to optionally install the VLAN and Teaming driver.

### Extracting and Installing Windows Drivers Manually

Before you begin CLI installation, use the setup installer to extract Plug and Play drivers only from the SuperInstaller as follows:

1. From the Dell web site, download the package containing `setup.exe`.
2. Extract the package to a local directory (for example, `C:\Temp\Downloads\Setup`).
3. Extract all drivers (NIC, iSCSI, and FCoE) from the package by issuing the following commands:

```
cd /d C:\Temp\Download\Setup\  
setup.exe /s  
/z"/extractdrivers="C:\Temp\Download\Setup\extractdrivers\  
/logfile="C:\Temp\Download\Setup\log.txt\""
```

The drivers are extracted to the following folder (for example):

C:\Temp\Download\Setup

4. Select the appropriate driver for the device and OS, as shown in [Table 2-1](#).
5. Install the drivers following specific procedures for the NIC, iSCSI, and FCoE drivers.

**Table 2-1. Windows Driver Installation Files**

Path and File Name	Description	Windows OS Version
<download folder>\x86\Win2003\ p3p_nic_win2k3_x86.zip	QLogic 3200 and 8200 Series NDIS Miniport Driver	Windows 2003 x86
<download folder>\x86\Win2003\ qfcoew32Stor.zip	QLogic 8100 and 8200 Series FCoE Driver	Windows 2003 x86
<download folder>\x86\Win2003\ qisw32.zip	QLogic 4000 and 8200 Series iSCSI Driver	Windows 2003 x86
<download folder>\x86\Win2003\ qlgew32n5.zip	QLogic 8100 Series NDIS Miniport Driver	Windows 2003 x86
<download folder>\x86\Win2003\ p3p_nic_win2k3_x64.zip	QLogic 3200 and 8200 Series NDIS Miniport Driver	Windows 2003 x64
<download folder>\x86\Win2003\ qfcoewx64Stor.zip	QLogic 8100 and 8200 Series FCoE Driver	Windows 2003 x64
<download folder>\x86\Win2003\ qiswx64.zip	QLogic 4000 and 8200 Series iSCSI Driver	Windows 2003 x64
<download folder>\x86\Win2003\ qlgewx64n5.zip	QLogic 8100 Series NDIS Miniport Driver	Windows 2003 x64
<download folder>\x86\Win2003R2\ p3p_nic_win2k3_x86.zip	QLogic 3200 and 8200 Series NDIS Miniport Driver	Windows 2003 R2 x86
<download folder>\x86\Win2003R2\ qfcoew32Stor.zip	QLogic 8100 and 8200 Series FCoE Driver	Windows 2003 R2 x86
<download folder>\x86\Win2003R2\ qisw32.zip	QLogic 4000 and 8200 Series iSCSI Driver	Windows 2003 R2 x86
<download folder>\x86\Win2003R2\ qlgew32n5.zip	QLogic 8100 Series NDIS Miniport Driver	Windows 2003 R2 x86
<download folder>\x64\Win2003R2\ p3p_nic_win2k3_x64.zip	QLogic 3200 and 8200 Series NDIS Miniport Driver	Windows 2003 R2 x64

**Table 2-1. Windows Driver Installation Files (Continued)**

Path and File Name	Description	Windows OS Version
<download folder>\x64\Win2003R2\qfcoewx64Stor	zipQLogic 8100 and 8200 Series FCoE Driver	Windows 2003 R2 x64
<download folder>\x64\Win2003R2\qiswx64.zip	QLogic 4000 and 8200 Series iSCSI Driver	Windows 2003 R2 x64
<download folder>\x64\Win2003R2\qlgewx64n5.zip	QLogic 8100 Series NDIS Miniport Driver	Windows 2003 R2 x64
<download folder>\x86\Win2008\p3p_nic_win2k8_x86.zip	QLogic 3200 and 8200 Series NDIS Miniport Driver	Windows 2008 x86
<download folder>\x86\Win2008\qfcoew32Stor.zip	QLogic 8100 and 8200 Series FCoE Driver	Windows 2008 x86
<download folder>\x86\Win2008\qisw32.zip	QLogic 4000 and 8200 Series iSCSI Driver	Windows 2008 x86
<download folder>\x86\Win2008\qlgew32n6.zip	QLogic 8100 Series NDIS Miniport Driver	Windows 2008 x86
<download folder>\x64\Win2008\p3p_nic_win2k8_x64.zip	QLogic 3200 and 8200 Series NDIS Miniport Driver	Windows 2008 x64
<download folder>\x64\Win2008\qfcoewx64Stor.zip	QLogic 8100 and 8200 Series FCoE Driver	Windows 2008 x64
<download folder>\x64\Win2008\qiswx64.zip	QLogic 4000 and 8200 Series iSCSI Driver	Windows 2008 x64
<download folder>\x64\Win2008\qlgewx64n6.zip	QLogic 8100 Series NDIS Miniport Driver	Windows 2008 x64
<download folder>\x64\Win2008R2\p3p_nic_win2k8r2_x64.zip	QLogic 3200 and 8200 Series NDIS Miniport Driver	Windows 2008 R2 x64
<download folder>\x64\Win2008R2\qfcoewx64Stor.zip	QLogic 8100 and 8200 Series FCoE Driver	Windows 2008 R2 x64
<download folder>\x64\Win2008R2\qiswx64.zip	QLogic 4000 and 8200 Series iSCSI Driver	Windows 2008 R2 x64
<download folder>\x64\Win2008R2\qlgewx64n6.zip	QLogic 8100 Series NDIS Miniport Driver	Windows 2008 R2 x64

## Installing the Windows NIC Driver

After you extract the files from the archive, you can use them to do a Plug and Play update or an installation. For example:

1. Start Windows Device Manager.
2. Right-click the NIC you want to update, and then select **Update Driver**.
3. Follow the directions in the Hardware Update Wizard to select the drivers you extracted.

## Installing the Windows iSCSI Driver

The QLogic iSCSI Adapter is a multifunction device. When installed in a Plug and Play system, the operating system detects two functions for each adapter: Network Controller and Ethernet Controller.

- The Network Controller refers to the iSCSI function.
- The Ethernet Controller refers to the NDIS function. Install the NDIS driver only if you want to use the adapter as an Ethernet Controller.

This section provides the most common ways of installing and upgrading the driver, as documented for each operating system.

- [Initial OS installation with the iSCSI Adapter as Boot or as Add-On](#)
- [Adding the iSCSI Adapter to the Existing OS](#)
- [Updating the Existing Driver](#)

---

**NOTE:**

For other installation procedures, consult the operating system documentation.

---

### Initial OS installation with the iSCSI Adapter as Boot or as Add-On

Refer to the appropriate procedure for your Windows 2003 or 2008 operating system.

#### Windows Server 2003

---

**NOTE:**

You must apply the Microsoft Storport update before installing or upgrading the driver. Windows Server 2003 SP2 (or later) requires Microsoft fixes KB932755 and KB939315 (or later). Windows Server 2003 SP1 requires Microsoft fixes KB932755 and KB939315 (or later). For Boot from SAN installation, use the Windows 2003 SP2 first, and then apply the KB update.

---

This procedure requires a system with a floppy drive. Before you begin, extract the drivers from the SuperInstaller (see [“Extracting and Installing Windows Drivers Manually” on page 2-2](#)).

To initially install Windows on the boot from SAN disk attached to the QLogic iSCSI Adapter:

1. Start the Windows installation procedure using the setup CD.
2. Press F6 when the following message appears:  
**Press F6 if you want to install a third-party SCSI or RAID driver....**  
**After all the standard devices have been loaded, press S to Specify Additional Device.**
3. Insert the QLogic driver diskette and press ENTER.
4. Select the QLogic iSCSI Adapter and press ENTER.
5. For Windows Server 2003, press S to use the driver on the floppy drive.
6. The following message appears:  
**Setup will load support for the following mass storage devices.**  
**QLogic iSCSI Adapter.**  
**Press Enter=Continue.**
7. Press ENTER.
8. Continue with the standard installation procedure.

### Windows Server 2008

This procedure is only necessary if installing the driver during the initial OS installation. Windows Server 2008 includes support for QME8242 iSCSI Adapters. You can perform an installation using the included driver, and then upgrade to the new driver.

To initially install the driver on the boot disk attached to the QLogic iSCSI Adapter:

1. Start the Windows installation procedure using the setup CD.
2. When you see the following message, click **Custom (Advanced)**:  
**Which type of installation do you want?**
3. When you see the following message, click **Load Driver**:  
**Where do you want to install Windows?**
4. On the **Load Driver** window, insert the QLogic software diskette, and then click **OK**.
5. To continue with the standard installation procedure, click **Next**.



## Adding the iSCSI Adapter to the Existing OS

To add the iSCSI Adapter driver to an existing Windows system, follow the appropriate procedure for your Windows platform.

### Windows 2003

This procedure requires extracting the driver to a folder on the hard drive and configuring it with the latest service pack and Windows updates. iSCSI adapters are Plug and Play devices that are compatible with your computer.

1. Insert the iSCSI adapter in the appropriate slot in the computer according to the device manufacturer's instructions.

2. Restart or turn on your computer.

When the computer starts, Windows detects the newly installed iSCSI adapter and displays the message **Found New Hardware with Fibre Channel Controller**. The Found New Hardware wizard program starts installing a device driver for the newly installed adapter.

3. Insert the QLogic software diskette into drive A.
4. Select **Install the software automatically (Recommended)**, and then click **Next**.
5. On the Completing the Found New Hardware Wizard, click **Finish**.
6. If Windows displays the message **System Settings Change**, Windows has finished installing a new adapter.

The software that supports your adapter requires that you restart the computer. You must restart the computer before the new settings will take effect. The message **Do you want to restart your computer now?** appears.

7. Click **Yes** to restart the computer right away.

---

#### **NOTE:**

If Windows Server 2003 automatically installs the driver for the newly added iSCSI adapter upon startup, without prompting you for a selection (for example, Windows Server 2003 installs an inbox driver), go to [“Updating the Existing Driver” on page 2-8](#).

---

### Windows Server 2008

1. Connect the device to the appropriate slot on your computer according to the device manufacturer's instructions.
2. Restart or turn on your computer.

When your computer comes up, Windows detects the newly-installed device and displays the message **Found New Hardware with Ethernet Controller**. The Found New Hardware wizard program starts installing a device driver for the newly-installed adapter.

3. Click **I don't have the disc. Show me other options**, and then click **Browse my computer for driver software (advanced)**.
4. On the **Browse for driver software** window:
  - a. Do one of the following:
    - Type **A:** \
    - Choose the folder where the extracted driver files are located
  - b. Click **Next**.

Windows displays a message, letting you know it has finished installing the driver for this device.

5. To complete the Found New Hardware wizard, click **Close**.
6. If the system displays the following prompt, click **Yes** to restart the computer immediately:

**System Settings Change. Windows has finished installing a new device. You must restart your computer before the settings will take effect. Do you want to restart your computer now?**

## Updating the Existing Driver

To install an updated version of the driver, follow the appropriate procedure for your Windows version.

### Windows 2003

1. Start the Device Manager as follows:
  - a. Click **Start** and then click **Run**.
  - b. In the **Open** dialog box, type `devmgmt.msc`, and then press ENTER.
2. Use the scroll bar to scroll down the list of hardware types, and then double-click the SCSI and RAID controllers.
3. In the devices list, double-click **QLogic iSCSI Adapter**.
4. Select the **Driver** tab, and then click **Update Driver** to start the Hardware Update Wizard.
5. Select **Install from a list or specific location (Advanced)** and then click **Next**.
6. Select **Don't search I will choose the driver to install** and then click **Next**.
7. Click **Have Disk** and then navigate to the folder containing the extracted driver.

8. When the **Select a Device Driver** dialog box opens, click **Next**.
9. On the Hardware Update Wizard: Completing the Hardware Update Wizard, click **Finish**.

### Windows Server 2008

If the driver is already installed and you want to install an updated version of the driver, follow these steps:

1. Start the Device Manager as follows:
  - a. Click **Start**, and then click **Control Panel**.
  - b. Click **Hardware and Sound**.
  - c. Click **Device Manager**.
2. Scroll down the list of hardware types, and then double-click **Storage Controller**.
3. From the list of devices, double-click **QLogic iSCSI Adapter**.
4. Click the **Driver** tab, and then click **Update Driver** to start the Hardware Update Wizard.
5. Click **Browse my computer for driver software**, and then click **Next**.
6. Enter the path to the folder containing the extracted driver and click **Next**.
7. On the **Windows has successfully updated your software** window, click **Close**.

## Installing the Windows FCoE Driver

The operating system manages and controls the driver installation process. To install the driver, follow these procedures:

- [Initial OS installation with the Converged Network Adapter as Boot or as Add-On](#)
- [Adding the Converged Network Adapter to the Existing OS](#)
- [Updating the Existing Driver](#)

This section covers the most common ways of installing and upgrading the driver, as documented for each operating system. For other installation procedures, consult the operating system documentation.

### Initial OS installation with the Converged Network Adapter as Boot or as Add-On

Refer to the appropriate procedure for your Windows 2003 or 2008 operating system.

---

## Windows Server 2003

---

### **NOTE:**

You must apply the Microsoft Storport update before installing or upgrading the driver. Windows Server 2003 SP2 (or later) requires Microsoft fixes KB932755 and KB939315 (or later). Windows Server 2003 SP1 requires Microsoft fixes KB932755 and KB939315 (or later). For Boot from SAN installation, use the Windows 2003 SP2 first, and then apply the KB update.

---

This procedure requires a system with a floppy drive. Before you begin, extract the drivers from the SuperInstaller (see [“Extracting and Installing Windows Drivers Manually” on page 2-2](#)).

To initially install Windows on the boot from SAN disk attached to the QLogic FCoE Converged Network Adapter:

1. Start the Windows installation procedure using the setup CD.
2. Press F6 when the following message appears:  
**Press F6 if you want to install a third-party SCSI or RAID driver....  
After all the standard devices have been loaded, press S to Specify Additional Device.**
3. Insert the QLogic driver diskette and press ENTER.
4. Select the QLogic FCoE Adapter and press ENTER.
5. For Windows Server 2003, press S to use the driver on the floppy drive.
6. The following message appears:  
**Setup will load support for the following mass storage devices.  
QLogic FCoE Adapter.  
Press Enter=Continue.**
7. Press ENTER.
8. Continue with the standard installation procedure.

## Windows Server 2008

This procedure requires a USB flash drive. To initially install Windows on the boot from SAN disk attached to the QLogic Fibre Channel Adapter, follow these steps:

1. Start the Windows installation procedure using the setup CD.
2. When the following message appears, click **Custom (Advanced)**:  
**Which type of installation do you want?**
3. When the following message appears, click **Load Driver**:  
**Where do you want to install Windows?**

4. At the **Load Driver** window, insert the USB flash drive in a USB port, and then click **OK**.
5. To continue with the standard installation procedure, click **Next**.

## Adding the Converged Network Adapter to the Existing OS

To add the QME8242 Converged Network Adapter driver to an existing Windows system, follow the procedure provided for your Windows version.

### Windows Server 2003

This procedure requires extracting the driver to a folder on the hard drive and configuring it with the latest service pack and Windows updates. FCoE Converged Network Adapters are Plug and Play devices that are compatible with your computer.

1. Insert the Converged Network Adapter in the appropriate slot in the computer according to the device manufacturer's instructions.
2. Restart or turn on your computer.

When the computer starts, Windows detects the newly installed Converged Network Adapter and displays the **Found New Hardware with Fibre Channel Controller** message. The Found New Hardware wizard program starts installing a device driver for the newly installed adapter.

3. Insert the QLogic software diskette into drive A.
4. Select **Install the software automatically (Recommended)**, and then click **Next**.
5. On the Completing the Found New Hardware wizard, click **Finish**.
6. If Windows displays the message **System Settings Change**, Windows has finished installing a new adapter.

The software that supports your adapter requires that you restart the computer. You must restart the computer before the new settings will take effect. The message **Do you want to restart your computer now?** appears.

7. Click **Yes** to restart the computer right away.

---

#### **NOTE:**

If Windows Server 2003 automatically installs the driver for the newly added FCoE Converged Network Adapter upon startup, without prompting you for a selection (for example, Windows Server 2003 installs an inbox driver), go to [“Updating the Existing Driver” on page 2-12](#).

---

## Windows Server 2008

Connect the Converged Network Adapter to the appropriate slot on your computer according to the device manufacturer's instructions.

Restart or turn on the computer.

## Updating the Existing Driver

To install an updated version of the driver, follow the procedure provided for your Windows version.

### Windows 2003

1. Start the Device Manager as follows:
  - a. Click **Start** and then click **Run**.
  - b. In the **Open** dialog box, type `devmgmt.msc`, and then press ENTER.
2. Use the scroll bar to scroll down the list of hardware types, and then double-click the SCSI and RAID controllers.
3. In the devices list, double-click **QLogic FCoE Adapter**.
4. Select the **Driver** tab, and then click **Update Driver** to start the Hardware Update Wizard.
5. Select **Install from a list or specific location (Advanced)** and then click **Next**.
6. Select **Don't search I will choose the driver to install** and then click **Next**.
7. Click **Have Disk** and then navigate to the folder containing the extracted driver.
8. When the **Hardware Update Wizard/Select a Device Driver** dialog box opens, click **Next**.
9. On the Hardware Update Wizard: Completing the Hardware Update Wizard, click **Finish**.

### Windows Server 2008

1. Start the Device Manager.
2. Scroll down the list of hardware types, and then double-click **Storage Controller**.
3. From the devices list, double-click **QLogic FCoE Adapter**.
4. Click the **Driver** tab, and then click **Update Driver** to start the Hardware Update Wizard.
5. Type the path to the folder containing the extracted driver, and then click **Next**.
6. On the **Windows has successfully updated your software** window, click **Close**.

# Linux Driver Installation and Configuration

## Installation Overview

To install and configure the QME8242 drivers on a Linux system, refer to the driver release notes and readme files included in the package.

---

**NOTE:**

To install the Red Hat Package Manager (RPM), issue the following command as a root user:

```
# rpm -Uvh <rpm name>
```

For example:

```
# rpm -Uvh  
qla2xxx-kmp-default-<driver-version_kernel-version>-<release>  
.x86_64.rpm
```

To uninstall the RPM, issue the following command as a root user:

```
# rpm -e <rpm>
```

For example:

```
# rpm -e  
qla2xxx-kmp-default-<driver-version_kernel-version>-<release>
```

## Installing the Linux NIC Driver

To install the Linux NIC driver, refer to the instructions (`INSTALL.txt`) provided with the individual driver package.

## Installing the Linux iSCSI Driver

Driver installation makes extensive use of the `build.sh` script located in the driver source (`extras/build.sh`). This section provides installation instructions for the following Linux versions:

- [Building the iSCSI Adapter Driver for RHEL 5.4 and RHEL 5.5](#)
- [Building the iSCSI Adapter Driver for SLES 10 SP3 and SLES 11](#)
- [Building the iSCSI Adapter Driver for RHEL 6.0 and SLES 11 SP1](#)

## Building the iSCSI Adapter Driver for RHEL 5.4 and RHEL 5.5

### Building and Installing the Adapter Driver

1. Go to the directory that contains the driver package file `qla4xxx-src-x.xx.xx.xx.xx-k.tar.gz`.
2. Issue the following commands:

```
# tar -xzvf qla4xxx-vx.xx.xx.xx.xx-kx.tar.gz
# cd qla4xxx-vx-x.xx.xx.xx.xx-kx
# tar -xvzf qla4xxx-src-vxx.xx.xx.xx.xx-ky.tar.gz
# cd qla4xxx-vx.xx.xx.xx.xx-kx
```
3. Build and install the driver modules from the source code by executing the `build.sh` script as follows:

```
# ./extras/build.sh install
```

The `build.sh` script does the following:

- Builds the driver `.ko` files
- Copies the `.ko` files to the appropriate directory:

```
/lib/modules/2.6.../extra/qlgc-qla4xxx
```
- Adds the appropriate directive in the `modprobe.conf` file (if applicable)

### Building the iSCSI IOCTL Driver for RHEL 5.x

1. Go to the directory that contains the IOCTL package file, `qisioctl-src-vx.xx.xx-kx.tar.gz`.
2. Issue the following commands:

```
# tar xvzf qisioctl-src-vx.xx.xx-kx.tar.gz
# cd qisioctl-src-vx.xx.xx-kx
```
3. Build and install the IOCTL module by executing the `build.sh` script as follows:

```
# ./build.sh install
```



## Manually Loading the Adapter Driver

1. Load the driver using one of the following methods:
  - To directly load the driver from the local build directory, issue the following commands:

```
# insmod  
/lib/modules/2.6.../kernel/drivers/scsi/scsi_transport_is  
csi2.ko  
# insmod qla4xxx.ko
```
  - To load the driver using modprobe, issue the following command:

```
# modprobe -v qla4xxx
```
2. To load the qsisioctl module using modprobe, issue the following command:

```
# modprobe -v qsisioctl
```
3. Start the iqlremote daemon by issuing the following command:

```
# service iqlremote start
```

## Unloading the Adapter Driver

To replace an existing inbox driver with a new out-of-box iSCSI driver, unload the existing driver and load the new driver, qsisioctl module and iqlremote daemon. To unload the driver, stop all applications using the driver and then unload the driver.

1. Stop the iqlremote daemon by issuing the following command:

```
# service iqlremote stop
```
2. Unload the qsisioctl module, by issuing the following command:

```
# modprobe -r qsisioctl
```
3. To unload the driver using modprobe, issue the following command:

```
# modprobe -r qla4xxx
```

## Rebuilding the RAM Disk with the New Driver

1. Edit the `/etc/modprobe.conf` file and add the following entry (if it is not present):

```
alias scsi_hostadapterX qla4xxx
```

Where X is based on the order of the SCSI modules being loaded.

2. To create a backup copy of the RAM disk image, issue the following commands:

```
# cd /boot
# cp initrd-[kernel version].img initrd-[kernel
version].img.bak
```

3. Rebuild the initrd image by issuing the following commands:

```
# mkinitrd -f initrd-[kernel version].img `uname -r`
```

4. Reboot to boot from the new initrd image and new driver.

---

**NOTE:**

Depending on the server hardware, the RAMDISK file name may be different.

---

## Building the iSCSI Adapter Driver for SLES 10 SP3 and SLES 11

### Building and Installing the Adapter Driver

1. Go to the directory that contains the source driver file, `qla4xxx-vx.xx.xx.xx.xx-dx.tar.gz`.

2. Enter the following commands:

```
# tar -xzvf qla4xxx-vx.xx.xx.xx.xx-dx.tar.gz
# cd qla4xxx-x.xx.xx.xx.xx-dx
```

3. Build and install the driver modules from the source code by executing the `build.sh` script as follows:

```
# ./extras/build.sh install
```

4. The `build.sh` script does the following:

- Builds the driver `.ko` files
- Copies the `.ko` files to the appropriate directory:  
`/lib/modules/2.6.../updates`
- Adds the appropriate directive in the `modprobe.conf` file (if applicable)

5. To build the iSCSI IOCTL Driver for SLES 10 SP3 and SLES 11, issue the following commands:

```
# tar xvzf qisiocctl-src-vx.xx.xx-dx.tar.gz
# cd qisiocctl-src-vx.xx.xx-dx
# ./build.sh install
```

### Manually Loading the Adapter Driver

1. To load the driver, use one of the following methods:
  - To load the driver directly from the local build directories, issue the following command:

```
# insmod /lib/modules/2.6.../updates/qla4xxx.ko
```
  - To load the driver using modprobe, issue the following command:

```
# modprobe -v qla4xxx
```
2. To load the qisiocctl module using modprobe, issue the following command:

```
# modprobe -v qisiocctl
```
3. Start the iqlremote daemon by issuing the following command:

```
# service iqlremote start
```

### Unloading the Adapter Driver

To replace an existing inbox driver with a new out-of-box iSCSI driver, unload the existing driver and load the new driver, qisiocctl module and iqlremote daemon. To unload the driver, stop all applications using the driver, and then unload the driver.

1. Stop the iqlremote daemon by issuing the following command:

```
# service iqlremote stop
```
2. Unload the qisiocctl module using the modprobe command as follows:

```
# modprobe -r qisiocctl
```
3. To unload the driver using modprobe, enter the following command:

```
# modprobe -r qla4xxx
```

### Rebuilding the RAM Disk with the New Driver

1. Edit the `/etc/sysconfig/kernel` file and add the `qla4xxx` parameter to the existing `INITRD_MODULES` line. For example:

```
INITRD_MODULES="... .. qla4xxx"
```

---

**NOTE:**

For SLES 11, edit the `/etc/modprobe.d/unsupported_modules` file to make the following change:

```
allow_unsupported_modules 1 (replace 0 by 1)
```

---

2. To create a backup copy of the RAM disk image, issue the following commands:

```
# cd /boot
# cp initrd-[kernel version].img initrd-[kernel
version].img.bak
```

3. Rebuild the initrd image by issuing the following commands:

```
# mkinitrd
```

4. Reboot the host to boot from the new initrd image with the new driver.
- 

**NOTE:**

Depending on the server hardware, the RAMDISK file name may be different.

---

## Building the iSCSI Adapter Driver for RHEL 6.0 and SLES 11 SP1

### Building and Installing the Adapter Driver

1. In the directory that contains the source driver file, `qla4xxx-src-vx.xx.xx.xx.xx.xx-k.tar.gz`, issue the following commands:

```
# tar -xzvf qla4xxx-vx.xx.xx.xx.xx.xx-cx.tar.gz
# cd qla4xxx-vx.xx.xx.xx.xx.xx-cx
```

2. Build and install the driver modules from the source code by executing the `build.sh` script as follows:

```
# ./extras/build.sh install
```

The `build.sh` script does the following:

- Builds the driver `.ko` files
- Copies the `.ko` files to the appropriate directory:  
`/lib/modules/2.6.../updates`
- Adds the appropriate directive in the `modprobe.conf` file (if applicable)

## Manually Loading the Adapter Driver

1. To load the driver, use one of the following methods:
  - To load the driver directly from the local build directories, issue the following commands:

```
# insmod /lib/modules/2.6.../kernel/drivers/scsi/  
scsi_transport_iscsi.ko  
# insmod /lib/modules/2.6.../updates/qla4xxx.ko
```
  - To load the driver using modprobe, issue the following command:

```
# modprobe -v qla4xxx
```
2. To load the qisioctl module, issue the following command:

```
# modprobe -v qisioctl
```
3. Start the iqlremote daemon by issuing the following command:

```
# service iqlremote start
```

## Unloading the Adapter Driver

To replace an existing inbox driver with a new out-of-box iSCSI driver, unload the existing driver and load the new driver, qisioctl module and iqlremote daemon. To unload the driver, stop all applications using the driver, and then unload the driver.

1. Stop the iqlremote daemon by issuing the following commands:

```
# service iqlremote stop
```
2. Unload the qisioctl module, using the modprobe command as follows:

```
# modprobe -r qisioctl
```
3. To unload the driver using modprobe, issue the following command:

```
# modprobe -r qla4xxx
```

## Rebuilding the RAM Disk

To automatically load the driver by rebuilding the RAM disk to include the driver, follow these steps:

1. To create a backup copy of the RAM disk image, issue the following command:

```
# cd /boot  
# cp initramfs-[kernel version].img initramfs-[kernel  
version].img.bak
```

2. Rebuild the initrd image with driver by issuing the following command:  

```
# mkinitrd -f initramfs-[kernel version].img `uname -r`
```
3. Reboot the host to boot from the new initrd image with new driver.

---

**NOTE:**

Depending on the server hardware, the RAMDISK file name may be different.

---

## Installing the Linux FCoE Driver

This section provides procedures for installing the Linux FCoE driver for the following operating systems:

- [Building the Driver for RHEL 5.x Linux](#)
- [Building the Driver for RHEL 6.0 Linux](#)
- [Building the Driver for SLES 10 SP3 Linux](#)
- [Building the Driver for SLES 11 and SLES11 SP1 Linux](#)

### Building the Driver for RHEL 5.x Linux

1. In the directory that contains the source driver file, `qla2xxx-src-x.xx.xx.xx.xx.xx-k.gz`, issue the following commands:

```
# tar -xzvf qla2xxx-src-x.xx.xx.xx.xx.xx-k.tar.gz  
# cd qla2xxx-src-x.xx.xx.xx.xx.xx-k
```

2. Build and install the driver modules from the source code by executing the `build.sh` script as follows:

```
# ./extras/build.sh install
```

The `build.sh` script does the following:

- Builds the driver `.ko` files.
  - Copies the `.ko` files to the appropriate `/lib/modules/2.6.../extra/qlgc-qla2xxx` directory.
3. Manually load the driver for Linux by issuing the following command:

```
# modprobe -v qla2xxx
```

To unload the driver, issue the following command:

```
# modprobe -r qla2xxx
```

4. Automatically load the driver by rebuilding the RAM disk to include the driver as follows:

- a. Edit the `/etc/modprobe.conf` file and add the following entry (if it is not present):

```
alias scsi_hostadapterX qla2xxx
```

where, *X* is based on the order of the SCSI modules being loaded.

- b. Create a backup copy of the RAMDISK image by issuing the following commands:

```
# cd /boot
# cp initrd-[kernel version].img initrd-[kernel
version].img.bak
# mkinitrd -f initrd-[kernel version].img `uname -r`
```

---

**NOTE:**

Depending on the server hardware, the RAMDISK file name may be different.

---

- c. To load the driver, reboot the host.

## Building the Driver for RHEL 6.0 Linux

1. In the directory that contains the source driver file, `qla2xxx-src-x.xx.xx.xx.xx-k.gz`, issue the following commands:

```
# tar -xzvf qla2xxx-src-x.xx.xx.xx.xx-k.tar.gz
# cd qla2xxx-src-x.xx.xx.xx.xx-k
```

2. Build and install the driver modules from the source code by executing the `build.sh` script as follows:

```
# ./extras/build.sh install
```

The `build.sh` script does the following:

- Builds the driver `.ko` files.
- Copies the `.ko` files to the appropriate `/lib/modules/2.6.../extra/qlgc-qla2xxx` directory.

3. Manually load the driver for Linux by issuing the following command:

```
# modprobe -v qla2xxx
```

To unload the driver, issue the following command:

```
# modprobe -r qla2xxx
```

4. Automatically load the driver by rebuilding the RAM disk to include the driver as follows:

- a. Edit the `/etc/modprobe.conf` file and add the following entry (if it is not present):

```
alias scsi_hostadapterX qla2xxx
```

where, *X* is based on the order of the SCSI modules being loaded.

- b. Create a backup copy of the RAMDISK image by issuing the following commands:

```
# cd /boot
# cp initramfs-[kernel version].img initramfs-[kernel
version].img.bak
# mkinitrd -f /boot/initramfs-[kernel version].img `uname
-r`
```

---

**NOTE:**

Depending on the server hardware, the RAMDISK file name may be different.

---

- c. To load the driver, reboot the host.

## Building the Driver for SLES 10 SP3 Linux

1. In the directory that contains the source driver file, `qla2xxx-src-vx.xx.xx.xx.xx.x-k4.tar.gz`, issue the following commands:

```
# tar -xzvf qla2xxx-src-vx.xx.xx.xx.xx.x-k4.tar.gz
# cd qla2xxx-x.xx.xx.xx.xx.x-k4
```

2. Build and install the driver modules from the source code by executing the `build.sh` script as follows:

```
# ./extras/build.sh install
```

The `build.sh` script does the following:

- Builds the driver `.ko` files.
- Copies the `.ko` files to the appropriate `/lib/modules/2.6.../updates` directory.
- Adds the appropriate directive in the `modprobe.conf` file (if applicable).



3. Manually load the driver for Linux.
  - To load the driver using modprobe, issue the following command:

```
# modprobe -v qla2xxx
```
  - To unload the driver using modprobe, issue the following command:

```
# modprobe -r qla2xxx
```
4. Automatically load the driver by rebuilding the RAM disk to include the driver as follows:
  - a. Edit the `/etc/sysconfig/kernel` file to modify the `INITRD_MODULES` directive and append "qla2xxx" to the string. For example:

```
INITRD_MODULES=".... qla2xxx"
```

where, `qla2xxx` is appended to the end of the directive.
  - b. Create a backup copy of the RAMDISK image by issuing the following commands:

```
# cd /boot
# cp initrd-[kernel version] initrd-[kernel version].bak
# mkinitrd
```

---

**NOTE:**

Depending on the server hardware, the RAMDISK file name may be different.

---
  - c. To load the driver, reboot the host.

### Building the Driver for SLES 11 and SLES11 SP1 Linux

1. In the directory that contains the source driver file, `qla2xxx-src-vx.xx.xx.xx.xx.xx-k4.tar.gz`, issue the following commands:

```
# tar -xzvf qla2xxx-src-vx.xx.xx.xx.xx.xx-k4.tar.gz
# cd qla2xxx-x.xx.xx.xx.xx.xx-k4
```
2. Build and install the driver modules from the source code by executing the `build.sh` script as follows:

```
# ./extras/build.sh install
```

The `build.sh` script does the following:

- Builds the driver `.ko` files.
- Copies the `.ko` files to the appropriate `/lib/modules/2.6.../updates` directory.
- Adds the appropriate directive in the `modprobe.conf` file (if applicable).

3. Manually load the driver for Linux.

- Edit the `/etc/modprobe.d/unsupported_modules` file (SLES 11 only) to make the following change:

```
allow_unsupported_modules 1 (replace 0 by 1)
```

- To load the driver using `modprobe`, issue the following command:

```
# modprobe -v qla2xxx
```

- To unload the driver using `modprobe`, issue the following command:

```
# modprobe -r qla2xxx
```

4. Automatically load the driver by rebuilding the RAM disk to include the driver.

- Edit the `/etc/modprobe.d/unsupported_modules` file (SLES 11 only) to make the following change:

```
allow_unsupported_modules 1 (replace 0 by 1)
```

- Create a copy of the current RAMDISK by issuing the following commands:

```
# cd /boot
# cp initrd-[kernel version].img initrd-[kernel
version].img.bak
# mkinitrd
```

---

**NOTE:**

Depending on the server hardware, the RAMDISK file name may be different.

---

5. To load the driver, reboot the host.

# VMware Driver Installation and Configuration

## Installation Overview

To install and configure the QME8242 drivers on a VMware system, refer to the driver release notes and readme files included in the package.

## Installing the ESX NIC Driver

The operating system manages and controls the driver installation process. To install the NIC Driver for VMware ESX/ESXi 4.0.x and 4.1, follow the procedures in this section.

---

**NOTE:**

This section provides the most common ways of installing and upgrading the driver. For other installation procedures, consult the operating system manuals.

---

This section provides procedures for the following:

- [Installing the Driver for Devices as Part of a New ESX Installation \(ESX Only\)](#)
- [Updating an Existing Driver or Installing a New Driver for an Existing ESX Installation with esxupdate \(ESX Only\)](#)
- [Updating an Existing Driver or Installing a New Driver for an Existing ESX or ESXi Installation with vihostupdate \(ESX and ESXi\)](#)
- [Verifying the Version of the Installed Driver](#)

## Installing the Driver for Devices as Part of a New ESX Installation (ESX Only)

---

**NOTE:**

You will need the ESX installation DVD.

- 
1. Place the ESX installation DVD in the DVD drive of the host.
  2. Restart the host.
  3. Accept the terms of the license agreement.
  4. Select a keyboard type.
  5. When prompted for Custom Drivers, select **Yes** to install custom drivers.
  6. Click **Add** to eject the ESX installation DVD.
  7. Place the driver CD in the DVD drive of the ESX host.

8. Select driver module to import drivers to the ESX host.
9. Click **Next** to continue.  
A dialog box displays the following message: **Load the system drivers.**
10. Click **Yes**.
11. After loading the driver module, continue installing ESX.  
After the drivers are installed, you are prompted to swap the driver CD with the ESX installation DVD.

### Updating an Existing Driver or Installing a New Driver for an Existing ESX Installation with `esxupdate` (ESX Only)

1. Power on the ESX host and log into an account with administrator capability.
2. Place the driver CD in the CD-ROM drive of the ESX host.
3. Mount the driver CD.
4. Navigate to `<cd mount point>/offline-bundle/` and locate the `<offline-bundle>.zip` file.
5. To install drivers using the offline bundle, issue the `esxupdate` command as follows:

```
esxupdate --bundle=<offline-bundle>.zip --nodeps --nosigcheck  
--maintenancemode --nocache update
```

### Updating an Existing Driver or Installing a New Driver for an Existing ESX or ESXi Installation with `vihostupdate` (ESX and ESXi)

1. Power on the ESX or ESXi host.
2. Place the driver CD in the CD-ROM drive of the host where either the vSphere CLI package is installed or vMA is hosted.
3. Mount the driver CD.
4. Navigate to `<cd mount point>/offline-bundle/` and locate the `<offline-bundle>.zip` file.
5. To install drivers using the offline bundle, issue the `vihostupdate` command as follows:

```
vihostupdate <conn_options> --nosigcheck --install --bundle  
<offline-bundle>.zip
```

For more details on `vihostupdate`, see the *vSphere Command Line Interface Installation and Reference Guide*.

## Verifying the Version of the Installed Driver

1. Power on the ESX or ESXi host.
2. Verify the installed package in the system by issuing the following command:

```
esxupdate query --vib-view | grep -i <driver-version /  
package-name>
```

The driver version is embedded in the VIB-ID (first field of the output).

## Installing the ESX iSCSI Driver

The operating system manages and controls the driver installation process. To install the driver, follow the steps in this section.

This section provides procedures for the following:

---

### **NOTE:**

This section provides the most common ways of installing and upgrading the driver. For other installation procedures, consult the operating system manual(s).

---

- [Installing the Driver for Devices as Part of a New ESX Installation \(ESX Only\)](#)
- [Updating an Existing Driver or Installing a New Driver for an Existing ESX Installation with esxupdate \(for ESX Only\)](#)
- [Updating Existing Drivers or Installing New Drivers for an Existing ESX or ESXi Installation with vihostupdate \(for Both ESX and ESXi\)](#)
- [Verifying the Version of the Installed Driver](#)

## Installing the Driver for Devices as Part of a New ESX Installation (ESX Only)

---

### **NOTE:**

You will need the ESX installation DVD to begin.

---

1. Place the ESX installation DVD into the DVD drive of the host.
2. Restart the host.
3. Read and accept the terms of the license agreement.
4. Select a keyboard type.
5. When prompted for Custom Drivers, select **Yes** to install custom drivers.
6. To eject the ESX installation DVD, click **Add**.

7. Place the driver CD in the DVD drive of the ESX host.
8. Select the driver module to import drivers to the ESX host.
9. To continue, click **Next**.
10. On the **Load the system drivers?** message box, click **Yes**.
11. After loading the driver module, continue installing ESX.

After the drivers are installed, you are prompted to swap the driver CD with the ESX installation DVD.

### Updating an Existing Driver or Installing a New Driver for an Existing ESX Installation with `esxupdate` (for ESX Only)

1. Power on the ESX host and log into an account with administrator capability.
2. Place the driver CD in the DVD drive of the ESX host.
3. Mount the driver CD.
4. Navigate to `<cd mount point>/offline-bundle/`, and then locate the `<offline-bundle>.zip` file.
5. Install the driver using the offline bundle by issuing the `esxupdate` command as follows:

```
esxupdate --bundle=<offline-bundle>.zip update
```

### Updating Existing Drivers or Installing New Drivers for an Existing ESX or ESXi Installation with `vihostupdate` (for Both ESX and ESXi)

1. Power on the ESX or ESXi host.
2. Place the driver CD in the CD-ROM drive of the host where either the vSphere CLI package is installed or the vSphere Management Agent (VMA) is hosted.
3. Mount the driver CD.
4. Navigate to `<cd mount point>/offline-bundle/`, and then locate the `<offline-bundle>.zip` file.
5. Install the driver using the offline bundle by issuing the `vihostupdate` command as follows:

```
vihostupdate <conn_options> --install --bundle  
<offline-bundle>.zip
```

---

#### **NOTE:**

For more details on `vihostupdate`, see the *vSphere Command Line Interface Installation and Reference Guide*.

---

## Verifying the Version of the Installed Driver

1. Power on the ESX or ESXi host.
2. Verify the installed package in the system by issuing the following command:

```
esxupdate query --vib-view | grep -i <driver-version /  
package-name>
```

The driver version is embedded in the VIB-ID (first field of the output).

## Installing the ESX FCoE Driver

The operating system manages and controls the driver installation process. To install the driver, follow the steps in this section.

---

### NOTE:

This section provides the most common ways of installing and upgrading the driver. For other installation procedures, consult the operating system manuals.

---

This section provides procedures for the following:

- [Installing the Driver for Devices as Part of a New ESX Installation \(ESX Only\)](#)
- [Updating an Existing Driver or Installing a New Driver for an Existing ESX Installation with esxupdate \(for ESX Only\)](#)
- [Updating an Existing Driver or Installing a New Driver for an Existing ESX or ESXi Installation with vihostupdate \(for Both ESX and ESXi\)](#)
- [Verifying the Version of the Installed Driver](#)

For other installation procedures, consult the operating system manuals.

## Installing the Driver for Devices as Part of a New ESX Installation (ESX Only)

---

### NOTE:

You will need the ESX installation DVD to begin.

---

1. Place the ESX installation DVD in the host DVD drive.
2. Restart the host.
3. Read and accept the terms of the license agreement.
4. Select a keyboard type.
5. When prompted for Custom Drivers, select **Yes** to install custom drivers.

6. To eject the ESX installation DVD, click **Add**.
7. Place the driver CD in the ESX host DVD drive.
8. Select the driver module from which to import drivers to the ESX host, and then click **Next**.
9. On the **Load the system drivers?** message box, click **Yes**.
10. After loading the driver module, continue installing ESX.

After the driver is installed, you are prompted to swap the driver CD with the ESX installation DVD.

### Updating an Existing Driver or Installing a New Driver for an Existing ESX Installation with `esxupdate` (for ESX Only)

1. Power up the ESX host and log in as the administrator.
2. Place the driver CD in the DVD drive of the ESX host.
3. Mount the driver CD.
4. Navigate to `<cd mount point>/offline-bundle/`, and then locate the `<offline-bundle>.zip` file.
5. Install the driver using the offline bundle by issuing the following command:  

```
esxupdate --bundle=<offline-bundle>.zip update
```

### Updating an Existing Driver or Installing a New Driver for an Existing ESX or ESXi Installation with `vihostupdate` (for Both ESX and ESXi)

1. Power on the ESX or ESXi host.
2. Place the driver CD in the DVD drive of the host where either the vSphere CLI package is installed or the vSphere Management Agent (VMA) is hosted.
3. Mount the driver CD.
4. Navigate to `<cd mount point>/offline-bundle/`, and then locate the `<offline-bundle>.zip` file.
5. Install the driver using the offline bundle by issuing the following command:

```
vihostupdate <conn_options> --install --bundle  
<offline-bundle>.zip
```

For more details on `vihostupdate`, see the *vSphere Command-Line Interface Installation and Reference Guide*.



## Verifying the Version of the Installed Driver

1. Power on the ESX or ESXi host.
2. Verify the installed package in the system by issuing the following command:

```
esxupdate query --vib-view | grep -i <driver-version /  
package-name>
```

The driver version is embedded in the VIB-ID (first field of the output).

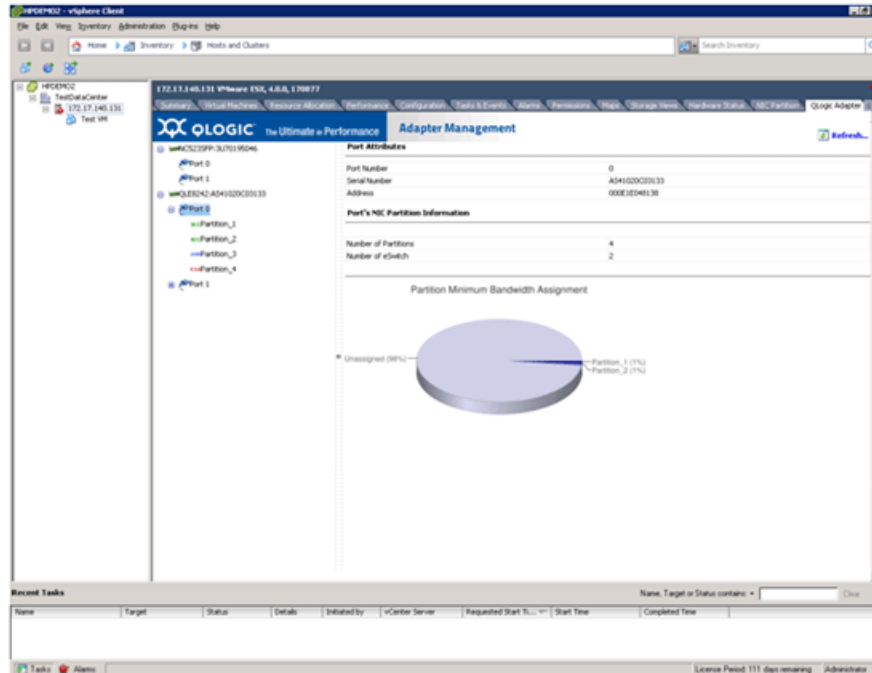
## Installing the QLogic Adapter vCenter Plug-in for ESX/ESXi

This section on installing the QLogic Adapter vCenter Plug-in contains the following:

- [Introduction](#)
- [Requirements](#)
- [Installing the QLogic Adapter CIM Provider](#)
- [Starting the QLogic Adapter CIM Provider](#)
- [Removing the QLogic Adapter CIM Provider](#)
- [Installing the QLogic Adapter vCenter Plug-in](#)
- [Starting the QLogic Adapter vCenter Plug-in](#)
- [Removing the QLogic Adapter vCenter Plug-in](#)
- [Installing the Flash Utility](#)
- [Updating the Flash](#)
- [Using the vCenter Plug-in on a Tomcat Server](#)
- [Plug-in Unregistration from a Manual Install](#)
- [Launching the Plug-in from vSphere Client](#)

## Introduction

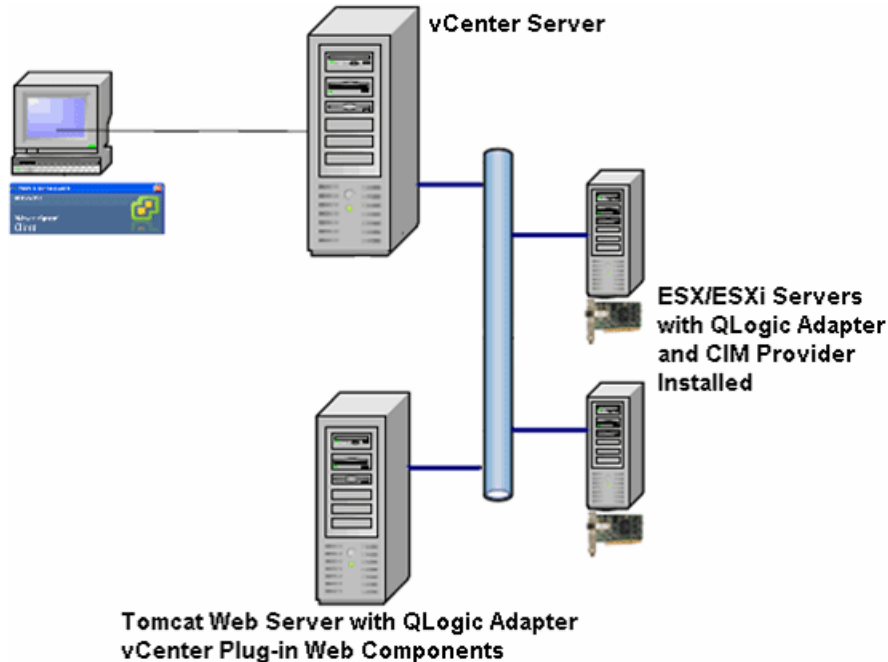
The QLogic Adapter vCenter Plug-in is a user-interface extension to the vSphere Client that allows you to manage and configure QLogic adapters, including the NIC Partitioning feature (“NIC Partitioning (NPAR)” on page 3-25), on ESX and ESXi servers. When you select an ESX or ESXi host that has QLogic adapters installed, the extension appears in the client as an additional tab named **QLogic Adapter**, as shown in Figure 2-1.



**Figure 2-1. vSphere Client Showing QLogic Adapter Tab**

## Requirements

The QLogic Adapter vCenter Plug-in requires the following to be installed and running, as shown in the [Figure 2-2](#).



**Figure 2-2. vCenter Plug-in Requirements**

QLogic provides the following components that must be installed on the ESX or ESXi Server, vCenter Server, and Tomcat Web Server.

### ESX/ESXi Server

- QLogic adapters with the correct firmware and driver
- QLogic Adapter CIM Provider

### vCenter Server

- QLogic XML configuration file to register the plug-in to the vCenter Server

### Tomcat Web Server

- QLogic web-based extension to the vSphere Client

## Installing the QLogic Adapter CIM Provider

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

This section provides the following installation procedures for the CIM Provider:

- [Initial Installation](#)
- [Subsequent Update Installation](#)

### Initial Installation

- To install the QLogic Adapter CIM Provider using the `esxupdate` command (ESX systems only):
  1. Copy the `offline-bundle.zip` file into the root directory (`/`) of the ESX system.
  2. Issue the `esxupdate` command as follows:

```
# cd /  
# esxupdate --bundle offline-bundle.zip --nodeps  
-nosigcheck --maintenancemode update
```
- To install the QLogic Adapter CIM Provider from a remote host using the vSphere CLI `vihostupdate` command (ESXi systems only):

---

#### **NOTE:**

To update the provider from a remote host using the `vihostupdate` command, make sure that the ESXi system is in Maintenance Mode. To put the ESXi host in Maintenance Mode using the vSphere Client, select **Inventory -> Host -> Enter Maintenance Mode**.

- 
1. Copy the `offline-bundle.zip` file to any location on the host where either the vSphere CLI package is installed or vSphere Management Assistant (vMA) is hosted.
  2. Navigate to the location of the `offline-bundle.zip` file.
  3. Issue the `vihostupdate` command to install the offline bundle as follows:

```
# vihostupdate.pl <conn_options> --install --bundle  
offline-bundle.zip --nosigcheck
```
  4. Follow the on-screen instructions to complete the installation.  
You may need to reboot the ESXi system.

---

#### **NOTE:**

For more details on `vihostupdate`, refer to the documents on the *VMware vSphere Command-Line Interface Documentation* page, located here:

<http://www.vmware.com/support/developer/vcli/>

## Subsequent Update Installation

- To update the QLogic Adapter CIM Provider after a prior VIB installation:
  1. Follow the instructions in [“Removing the QLogic Adapter CIM Provider” on page 2-35](#) to remove the existing VIB.
  2. Follow the instructions in [“Initial Installation” on page 2-34](#) to install the new VIB.

## 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.

For ESX systems, you can also 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.

## Removing the QLogic Adapter CIM Provider

To remove the QLogic Adapter CIM Provider, use either the `esxupdate` or `vihostupdate` command.

- To uninstall the QLogic Adapter CIM Provider using the `esxupdate` command:
  1. Query and find the existing VIB you are updating as follows:

```
# esxupdate query --vib-view | grep qlogic
```

For example, the VIB ID may have a format similar to the following:

```
ESX/ESXi 4.0: cross_qlogic-nic-provider_400.x.x.x-000000
ESX/ESXi 4.1: cross_qlogic-nic-provider_410.x.x.x-000000
```

where `x.x.x` is the version number of the existing provider.

2. Remove the existing VIB as follows:

```
# esxupdate remove -b <vibID>
```

- To uninstall from a remote host using the `vihostupdate` command:

---

**NOTE:**

To uninstall the provider from a remote host using the `vihostupdate` command, make sure that the ESX/ESXi system is in Maintenance Mode. To put the ESX/ESXi host in Maintenance Mode using the vSphere Client, select **Inventory -> Host -> Enter Maintenance Mode**.

---

1. From a console on the host where the vSphere CLI package is installed or vMA is hosted, query to find the Bulletin ID of the existing provider:

```
# vihostupdate.pl <conn_options> --query\
```

For example, the Bulletin ID may have a format similar to the following:

```
ESX/ESXi 4.0:  
QLGC_NIC_PROVIDER-ESX-4.0.0-qlogic-nic-provider-x.x.x
```

```
ESX/ESXi 4.1:  
QLGC_NIC_PROVIDER-ESX-4.1.0-qlogic-nic-provider-x.x.x
```

where `x.x.x` is the version number of the existing provider.

2. Remove the existing VIB as follows:

```
# vihostupdate.pl <conn_options> --remove --bulletin  
<bulletinID>
```

---

**NOTE:**

For more details on `vihostupdate`, refer to the documents on the *VMware vSphere Command-Line Interface Documentation* page, located here:

<http://www.vmware.com/support/developer/vcli/>

---

## Installing the QLogic Adapter vCenter Plug-in

- To install the QLogic Adapter vCenter Plug-in:
  1. Run `QLogic_Adapter_VI_Plugin_x_x_x.exe` by either:
    - Double-clicking the file name.
    - Typing the name of the `EXE` on a command prompt.
  2. Follow the instructions in the installer to complete the installation.

## Starting the QLogic Adapter vCenter Plug-in

- To start the QLogic Adapter vCenter Plug-in:
  1. Start the VMware vSphere Client and connect to the vCenter Server by entering the IP address or name, user name, and password, and then clicking the **Login** button.
  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 vCenter plug-in does not show up.
    - If you have not already done so, create a data center and add the ESX server.
  3. In the left pane, select the IP address of the VMware server.
  4. In the right pane, click the **QLogic Adapter** tab to view the Web page. The vCenter plug-in retrieves the adapter information from the server.

---

### **NOTE:**

If the server does not have the QLogic Adapter CIM Provider and adapters installed, or if the vCenter plug-in installation and registration was not successful, the **QLogic Adapter** tab is not shown.

---

## Removing the QLogic Adapter vCenter Plug-in

- To remove the QLogic Adapter vCenter Plug-in:
  1. In the Windows Control Panel, select **Add or Remove Programs**.
  2. In the **Add or Remove Programs** dialog box, select the **QLogic Adapter vCenter Plug-in**, and then click **Change/Remove**.
  3. Follow the instructions in the QLogic Adapter vCenter Plug-in installer to remove the plug-in.

## Installing the Flash Utility

For ESX, before you perform a Flash update on QLogic Adapters using the QLogic Adapter vCenter Plug-in, ensure that the `qlflash` utility is also installed on the ESX system.

- To install the `qlflash` utility on ESX:
  1. Unzip the `esx_qlflash.zip` file, which contains the `qlflash` userworld executable.
  2. Copy the `qlflash` binary file to the `/usr/lib/vmware/bin/` directory.
  3. Add executable permission for `qlflash` by issuing the following command:

```
# chmod +x qlflash
```

4. If it does not already exist, edit and append the `/usr/lib/vmware/bin/qlflash` entry in the `/etc/vmware/UserWorldBinaries.txt` file.

- To install the `qlflash` utility on ESXi:

For ESXi, the `qlflash` utility is not required, so no additional steps are necessary.

## Updating the Flash

---

### **NOTE:**

For ESX systems, before you perform a Flash update on QLogic Adapters using the QLogic Adapter vCenter Plug-in, ensure that the `qlflash` utility is also installed. Follow the instructions in [“Installing the Flash Utility” on page 2-37](#).

---

- To update the Flash from the QLogic Adapter vCenter Plug-in:
  1. Follow the instructions in [“Starting the QLogic Adapter vCenter Plug-in” on page 2-37](#) to start the vCenter plug-in.
  2. In the left pane of the QLogic Adapter page, select the adapter, and then click the **Update Adapter Flash Image** link.
  3. In the **Select Flash File for Update** dialog box, click **Browse**.
  4. 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**.
  5. In the **Select Flash File for Update** dialog box, click **Send**.
  6. Verify the current Flash version and file version, and then click **OK** to continue the update.
  7. When asked **Do you want to reset the adapter to activate the firmware immediately after successful update?**, click **OK** if you want the new firmware to take effect immediately. Or, click **Cancel** to have the new firmware take effect after the next system reboot.
  8. Wait for the Flash update process to complete. Processing time depends on the network connection and the system configuration. Do not interrupt the update process.

---

### **CAUTION!**

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

---



9. In the **Flash update successful completion** message box, click **OK**.
10. If you clicked **OK** in [Step 7](#), you can click **Refresh** to verify the new firmware version. Otherwise, you must reboot the system for the new firmware to take effect.

## Using the vCenter Plug-in on a Tomcat Server

VMware requires that all vCenter plug-ins are web-based applications hosted on a Tomcat Server, which can be downloaded and installed on Linux and Windows systems. Here's a link to Tomcat:

<http://tomcat.apache.org/>

The QLogic Adapter vCenter Plug-in supports Tomcat 5, 6, and 7. The installer dynamically detects the Tomcat version and installs accordingly.

This section provides the following procedures for using the vCenter plug-in on a Tomcat Server:

- [Installing Tomcat on Linux](#)
- [Starting and Stopping Tomcat on Linux](#)
- [Installing Tomcat on Windows](#)
- [Starting and Stopping Tomcat on Windows](#)

### Installing Tomcat on Linux

1. Go to the following URL:

<http://tomcat.apache.org/download-55.cgi>

2. Locate the following directory and file:

```
Binary Distribution > Core > tar.gz  
(apache-tomcat-5.5.28.tar.gz)
```

3. Unzip the `tar.gz` file by issuing the following command:

```
root # tar xzf file.tar.gz
```

4. Create a symbolic link to a Tomcat directory by issuing the following command:

```
# ln -s apache-tomcat-5.5.28 tomcat
```

where setting variables include the following:

```
export JAVA_HOME=/root/gwt/jdk1.6.0_17/  
export CATALINA_HOME=/root/gwt/tomcat/
```

## Starting and Stopping Tomcat on Linux

- To start Tomcat, issue the following command:

```
# $CATALINA_HOME/bin/startup.sh
```

- To stop Tomcat, issue the following command:

```
# $CATALINA_HOME/bin/shutdown.sh
```

## Installing Tomcat on Windows

1. Go to either of the following URLs:

<http://tomcat.apache.org/download-60.cgi>

<http://tomcat.apache.org/download-70.cgi>

2. Locate the following directory and file:

```
Binary Distribution > Core > 32-bit/64-bit Windows  
Service Installer
```

3. To install the Tomcat service, get the 32-bit/64-bit Windows Service Installer, save it, and run it.

## Starting and Stopping Tomcat on Windows

1. Go to **Computer Management > Services and Application > Services > Apache Tomcat <version number>**.
2. Right-click, and then select **Start /Stop** to initiate Tomcat service, or select **Stop** to halt the Tomcat service.

## Installing the vCenter Plug-in on Tomcat

1. Download the QLogic Adapter vCenter Plug-in installer EXE; for example, QLogic Adapter VI Plugin 1.0.4.exe.
2. Run the installer by double-clicking the EXE or by typing the name of the EXE on a command prompt.

The InstallAnywhere installer prepares to install the QLogic Adapter vCenter Plug-in.

3. On the **Introduction** window, click **Next**.
4. On the **Please Wait** window, wait while the QLogic Adapter vCenter Plug-in is configured for your system.
5. On the **Choose Install Folder** window, either accept the default installation directory, or click **Choose** to specify a different folder.
6. Click **Install** to install files to the installation directory specified in the previous step.

A progress window shows the status of the installation.

7. On the **User Input** window, type your vCenter Server IP address, username, and password, as well as the IP address of your local Tomcat server. Then click **Next** to continue.
8. On the **Please Wait** window, wait while the QLogic Adapter vCenter Plug-in is configured for your system and registers the plug-in with the vCenter Server.
9. On the **Registration Result** window, click **Finish** to complete the plug-in installation.

### Plug-in Unregistration from a Manual Install

If you have performed a manual installation of the vCenter plug-in, you must perform a manual uninstall before running the vCenter installation wizard.

VMware provides two type of scripts for vCenter plug-in registration:

- For PowerShell scripting:

<http://communities.vmware.com/docs/DOC-4521>

- For Perl:

<http://communities.vmware.com/docs/DOC-4530>

1. Before you can use the script, download the appropriate VI SDK from VMware.

For PowerShell, download vSphere PowerCLI:

<http://communities.vmware.com/community/vmtn/vsphere/automationtools/powercli>

For Perl VI SDK, download vSphere SDK for Perl:

<http://www.vmware.com/support/developer/viperltoolkit/>

2. After you download and install the SDK and the registration script, follow VMware instructions to register the vCenter plug-in.

For example, the Perl unregister command is:

```
perl registerPlugin.pl --server="127.0.0.1"  
-username="administrator" --password="password"  
--key="com.qlogic.QLogicAdapterVIPlugIn" --action="remove"
```

3. Replace the username and password with the correct information to log into the vCenter Server.

---

## Launching the Plug-in from vSphere Client

1. Start the vSphere Client and connect to the vCenter Server. (If you start and connect the vSphere Client directly to an ESX or ESXi server, the vCenter plug-in does not appear.)
2. If you have not already done so, create a data center and add the ESX server.
3. In the left pane, select the server.  
  
A row of tabs appears in the right pane. If the server has QLogic Adapter CIM Provider and adapters installed, and if the vCenter plug-in installation and registration were successful, the **QLogic Adapter** tab appears in the tab row.
4. Click the **QLogic Adapter** tab to view a web page.

# 3 Adapter Management Applications

This chapter describes the following adapter management applications:

- [General Management with QConvergeConsole](#)
- [General Management with NIC Partitioning](#)
- [Windows Management Applications](#)
- [Linux Management Applications](#)
- [VMware Management Applications](#)

---

## General Management with QConvergeConsole

Use the QConvergeConsole utility to manage the QME8242 as follows:

- [Configuring iSCSI Offload with QConvergeConsole](#)
- [Configuring iSCSI Initiators with QConvergeConsole](#)
- [Enabling CHAP Authentication with QConvergeConsole](#)

### Configuring iSCSI Offload with QConvergeConsole

The iSCSI offload feature provides full iSCSI offloads that include header and data digest, receive Protocol Data Unit (PDU) parsing, and direct data placement. You can configure iSCSI offload parameters with the following utilities:

- QConvergeConsole GUI: graphical user interface
- QConvergeConsole CLI: interactive mode (menu driven) and non-interactive mode (command-line driven)

---

**NOTE:**

For an overview of the GUI version of QLogic's QConvergeConsole utility, see [Appendix C](#). Information on installing and starting the utility's GUI version is provided in the *QConvergeConsole User's Guide*. All procedural information for the utility is covered in the online help system.

---

For the interactive mode of the QConvergeConsole CLI, refer to the *QConvergeConsole CLI User's Guide*. For the non-interactive mode of the QConvergeConsole CLI, refer to the procedures in this section to display and modify the following:

- [Adapter-Level iSCSI Parameters](#)
- [Port-Level iSCSI Parameters](#)
- [Summary of Target Sessions](#)
- [Target Session-Level iSCSI Negotiated Parameters](#)
- [Target Session-Level Persistent iSCSI Parameters](#)

---

**NOTE:**

The current release does not support iSCSI IPv6. Support is expected in a future release.

---

#### Adapter-Level iSCSI Parameters

This section shows the commands used to display and to modify adapter-level iSCSI parameters.

## Displaying Adapter-Level iSCSI Parameters

To view the adapter configured settings, issue the `-ch` command. The positional parameter, `[hba_port_inst]`, is optional. If an `hba_port_inst` is specified, information for only that adapter is shown. If the `hba_port_inst` is not specified, information for all adapters in the system is listed.

Command line options:

```
-ch [hba_port_inst]
```

Example:

```
$qaucli -pr iscsi -ch
```

Or:

```
$qaucli -iscsi -ch
*** hba instance: 0
HBA_Alias                : QLogic QLE8242
*** hba instance: 1
HBA_Alias                : QLogic QLE8242
```

## Modifying Adapter-Level iSCSI Parameters

Use the `-nh` command to set the adapter-level parameters for single- or multi-port adapters. The positional parameter becomes `<hba_port_inst>` and a series of one or more parameter name-value pairs. To check the list of parameters, use the `-ch` option.

Command line options:

```
-nh <hba_port_inst> <config_name|config_alias> <value>
[<config_name|config_alias> <value>]
```

Example:

```
$qaucli -pr iscsi -nh HBA_ALIAS "AccountingHBA"
```

Or:

```
$qaucli -iscsi -nh HBA_ALIAS "AccountingHBA"
HBA (adapter) Parameters:
The following table lists the parameters that may be configured using
the -nh option in non-interactive mode.
```

Full Parameter Name	Alias Name	Allowable Values
-----	-----	-----
HBA_Alias	HBAALIAS	Character string

## Port-Level iSCSI Parameters

This section shows the commands used to display and to modify port-level iSCSI parameters.

### Displaying Port-Level iSCSI Parameters

Use the `-c` command to view port configured settings. The positional parameter, `[hba_port_inst]`, is optional. If the `hba_port_inst` is specified, only information for that port is shown. If the `hba_port_inst` is not specified, information on all ports in the system is shown.

Example:

```
$qaucli -pr iscsi -c 0
```

Or:

```
$qaucli -iscsi -c 0
*****
*** Displaying Port inst=0 ***
*****
*** Displaying HBA (Adapter) Level Information inst=0 ***
HBA_Alias                : QLogic QLE8242
HBA_TCP_Max_Window_Size  : 19537
HBA_Default_Fragment_Reass_Timeout : 0
HBA_Reserved_TCP_Config  : 0x00000000
HBA_Delayed_ACK          : off
*** Displaying Port General Summary Information inst=0 ***
  0. HBA: 0 Port: 1 HBA Port Instance: 0 HBA Model: QLE8242
     HBA Serial Number: (000e1e031684)qlutil_GetP3Params1:
     BoardStr=QLogic QLE8242 ; BoardId=0x26; BoardPortNum=1;
PCIFunction=5; MAC_ADDR= 0: E:1E: 3:16:85
  FW Version: 4.2.2 Type: Fibre
  IP Address: 192.168.105.208
  Alias:
  iSCSI Name: iqn.2000-04.com.qlogic:isp8214.000e1e031685.5
  User Defined IP Address.
  IPv4 Address           : 192.168.105.208
  Gateway                 : 192.168.105.178
  Subnet Mask             : 255.255.255.0

  IPv6 Protocol is currently disabled.
  iSNS                    : Disabled.
*** Displaying iSCSI Settings inst=0 ***
Force_Negotiate_Main_iSCSI_Keys      : off
iSCSI_Send_Markers                   : off(*)
iSCSI_Header_Digests                  : off
iSCSI_Data_Digests                    : off
iSCSI_Immediate_Data                  : on
iSCSI_Initial_R2T                     : off
```



```

iSCSI_Data_Seq_In_Order      : on (*)
iSCSI_Data_PDU_In_Order     : on (*)
iSCSI_CHAP_Auth              : off (*)
iSCSI_Bidi_CHAP_Auth        : off (*)
iSCSI_Snack                   : off
iSCSI_Discovery_Logout      : on
iSCSI_Strict_Login           : off
iSCSI_Error_Recovery_Level   : 0 (*)
iSCSI_Alias                   :
*** Displaying Firmware Settings inst=0 ***
FW_Marker                     : on (*)
FW_Stat_Alarm                 : off (*)
FW_Accept_AEN                 : off (*)
FW_Access_Control             : off (*)
FW_Session_Mode               : on (*)
FW_Initiator_Mode             : on (*)
FW_Target_Mode                : off (*)
FW_Fast_Posting               : off (*)
FW_Sense_Buffer_Desc          : off (*)
FW_ZIO_Enable_Mode           : off
AFW_Device_Timeouts           : on
AFW_Delayed_Ack               : off
AFW_AutoConnect               : on
*** Displaying Device Settings inst=0 ***
Large_Frames                  : off
DevType                       : 0 (*)
ExeThrottle                   : 0
FirstBurstLen                 : 32
KeepAliveTO                   : 30
DefaultTime2Retain            : 20 (*)
DefaultTime2Wait              : 2 (*)
MaxBurstLen                   : 512
MaxOutstandingR2T             : 1
MaxRxDataSegmentLen           : 128 (*)
Port                           : 3260 (*)
IPv4TOS                       : 0
IPv4TTL                       : 64
*** Displaying Basic Settings inst=0 ***
iSCSI_Discovery_Logout        : on
iSCSI_Strict_Login            : off
TCP_DHCP                      : off
TCP_Nagle                     : off
iSCSI_Alias                    :
IP_Address                    : 192.168.105.208
IP_Subnet_Mask                 : 255.255.255.0
IP_Gateway                    : 192.168.105.178
Secondary_DNS                  : (*)
Secondary_IP_Address           : (*)
Task_Management_Timeout        : 10

```

```
ENABLE_IPV4                : on
ENABLE_IPV6                : off
LOC_LINK_AUTO              : off
ROUTABLE_AUTO              : off
LDROUTER_AUTO              : off
IPv6_Addr_Local_link       : fe80::
ENABLE_4022IPV4            : on
*** Displaying Advanced Settings inst=0 ***
FW_Marker                   : on (*)
FW_Stat_Alarm               : off (*)
FW_Accept_AEN               : off (*)
FW_Access_Control          : off (*)
FW_Session_Mode             : on (*)
FW_Initiator_Mode           : on (*)
FW_Target_Mode              : off (*)
FW_Fast_Posting             : off (*)
FW_Sense_Buffer_Desc       : off (*)
FW_ZIO_Enable_Mode         : off
AFW_Device_Timeouts        : on
AFW_Delayed_Ack             : off
AFW_AutoConnect             : on
DevType                     : 0 (*)
ExeThrottle                 : 0
FirstBurstLen               : 32
IP_Fragmentation           : on (*)
IP_ARP_Redirect             : off
VLAN_Enable                 : off
VLAN_User_Priority          : 0
VLAN_ID                     : 0
IPv4_TOS_ENABLE             : off
Force_Negotiate_Main_iSCSI_Keys : off
iSCSI_Send_Markers         : off (*)
iSCSI_Header_Digests       : off
iSCSI_Data_Digests         : off
iSCSI_Immediate_Data       : on
iSCSI_Initial_R2T          : off
iSCSI_Data_Seq_In_Order    : on (*)
iSCSI_Data_PDU_In_Order    : on (*)
iSCSI_CHAP_Auth             : off (*)
iSCSI_Bidi_CHAP_Auth       : off (*)
iSCSI_Error_Recovery_Level : 0 (*)
KeepAliveTO                 : 30
DefaultTime2Retain         : 20 (*)
DefaultTime2Wait           : 2 (*)
MaxBurstLen                 : 512
MaxOutstandingR2T          : 1
MaxRxDataSegmentLen        : 128 (*)
Port                        : 3260 (*)
TCP_Timer_Scale             : 0 (*)
```

```

TCP_Time_Stamp           : on
TCP_Window_Scale         : 0
iSCSI_Name               :
iqn.2000-04.com.qlogic:isp8214.000e1e031685.5
ZIO                      : 0
IPv4TOS                  : 0
IPv4TTL                  : 64
IPV6_TCP_Timer_Scale     : 3(*)
IPV6_TCP_Time_Stamp      : on
IPV6_TCP_Window_Scale    : 0
IPV6_VLAN_ID            : 0
IPV6_VLAN_User_Priority  : 0
IPV6_VLAN_Enable         : off
IPV6_Traffic_Class       : 0
IPV6_Hop_Limit           : 64
IPV6_ND_Reachable_Timer  : 100
IPV6_ND_Retransmit_Timer : 100
IPV6_ND_Stale_Timeout    : 100
IPV6_DAD_Count           : 1
IPV6_Router_Advertised_MTU : 0(*)
IPv4_Address_State       : Valid(*)
IPV6_Link_Loc_Address_State : Invalid(*)
IPV6_Address0_State      : Invalid(*)
IPV6_Address1_State      : Invalid(*)
IPV6_Default_Router_State : No router(*)
IPV6_MCast_Listnr_Disco_Enable : off
ACB_Version              : 2(*)
AFW_Serl2_Task_Mngmt     : off
Large_Frames             : off
*** Displaying IPv6 Settings inst=0 ***
IPV6_Addr_Local_link     : fe80::
IPV6_Addr_Routable0      : ::
IPV6_Addr_Routable1      : ::
Default_IPv6_Router      : ::
IPV6_Port                 : 3260
IPV6_Gratuitious_Neighbor_Ad_Enable : off
IPV6_Redirect_Enable     : off
*** Displaying IPv6 TCP Settings inst=0 ***
IPV6_Nagle                : off
IPV6_TCP_Timer_Scale     : 3(*)
IPV6_TCP_Time_Stamp      : on
*** Displaying Remaining parameters inst=0 ***
ACB_Supported             : on(*)
Values noted with (*) are read only.

```

## Modifying Port-Level iSCSI Parameters

Use the `-n` command to modify port-level iSCSI parameters.

Command line options:

```
-n <hba_port_inst> <config_name|config_alias> <value>
<config_name|config_alias> <value>
```

Example:

In the following example, the HBA port instance = 0 and the parameter change is to turn on iSCSI header digests.

```
$qaucli -pr iscsi -n 0 iSCSI_Header_Digests on
```

Or:

```
$qaucli -iscsi -n 0 iSCSI_Header_Digests on
```

Port Parameters:

The following table lists the parameters that may be configured using the `-n` option in non-interactive mode.

Full Parameter Name	Alias Name	Allowable Values
AFW_Device_Timeouts	AFWDT	on or off
AFW_Delayed_Ack	AFDACK	on or off
AFW_AutoConnect	AFWC	on or off
AFW_Serlz_Task_Mngmt	AFWSTM	on or off
ExeThrottle	ET	0 to 32767
FirstBurstLen	FB	0 to 32767
Force_Negotiate_Main_iSCSI_Keys	FNMIK	on or off
IP_ARP_Redirect	IPARP	on or off
IPv6_MCast_Listnr_Disco_Enable	IPV6MLDEN	on or off
iSCSI_Alias	IALS	Character string
iSCSI_Header_Digests	IHD	on or off
iSCSI_Data_Digests	IDD	on or off
iSCSI_Immediate_Data	IID	on or off
iSCSI_Initial_R2T	IIR2T	on or off
iSCSI_Snack	ISNACK	on or off
iSCSI_Discovery_Logout	ID	on or off
iSCSI_Strict_Login	IS	on or off
KeepAliveTO	KATO	0 to ?
Large_Frames (not for 4010s)	LRGFRM	on or off
MaxBurstLen	MBL	0 to ?
MaxOutstandingR2T	MOR2T	0 to ?
TCP_DHCP	TCPDHCP	on or off
TCP_Nagle	TCPN	on or off
TCP_Time_Stamp	TCPTMS	on or off
TCP_Window_Scale	WINSCALE	0 to 14
VLAN_Enable	VLAN	on or off
VLAN_User_Priority	VLANUPRIOR	0 to 7

VLAN_ID	VLANID	0 to 4095
IP_Address	IPAD	IPv4 address format
IP_Subnet_Mask	IPSM	IPv4 address format
IP_Gateway	IPGW	IPv4 address format
ZIO	ZIO	2 to 16
FW_ZIO_Enable_Mode	ZIOE	on or off
Task_Management_Timeout	TMTO	0 to 65535
ENABLE_IPV4	EIPV4	on or off
ENABLE_4022IPV4	E4022IPV4	on or off
ENABLE_IPV6	EIPV6	on or off
LOC_LINK_AUTO	LOCLA	on or off
ROUTABLE_AUTO	RAUTO	on or off
LDROUTER_AUTO	LDRA	on or off
IPv6_Addr_Local_link	IPLL	IPv6 address format
IPv6_Addr_Routable0	IPR0	IPv6 address format
IPv6_Addr_Routable1	IPR1	IPv6 address format
Default_IPv6_Router	IPRR	IPv6 address format
IPv4TOS	IPV4TOS	0 255
IPv4_TOS_ENABLE	TOS_ENABLE	on or off
IPv4TTL	IPV4TTL	0 255
IPv6_Port	IPV6PORT	0 65535
IPv6_Gratuitious_Neighbor_Ad_Enable	IPV6GNAE	on or off
IPv6_Redirect_Enable	IPV6RDE	on or off
IPv6_Nagle	TCPV6ND	on or off
IPv6_TCP_Timer_Scale	TCPV6TS	0 to 7
IPv6_TCP_Time_Stamp	TCPV6TST	on or off
IPv6_TCP_Window_Scale	IPV6TCPWS	0 to 14
IPv6_VLAN_ID	IPV6VLANID	0 to 4095
IPv6_VLAN_User_Priority	IPV6VLANUP	0 to 7
IPv6_VLAN_Enable	IPV6VLANEN	on or off
IPv6_Traffic_Class	IPV6TC	0 to 255
IPv6_Hop_Limit	IPV6HL	0 to 255
(router may override)		
IPv6_ND_Retransmit_Timer	IPV6NDRET	0 to 4294967295
(router may override)		
IPv6_ND_Stale_Timeout	IPV6STO	0 to 4294967295
(router may override)		
IPv6_ND_Reachable_Timer	IPV6NDRT	0 to 4294967295
(router may override)		
IPv6_DAD_Count	IPV6DAD	0 to 255

## Summary of Target Sessions

Use the `-ts` command to display summary information for both persistent and non-persistent targets. Both `[hba_port_inst]` and `[target_id]` are optional parameters. If neither of the parameters is present, the information is displayed for all adapters and all targets. When `hba_port_inst` is entered, target information for all targets on the specified adapter is displayed. If the optional `target_id` keyword is entered, only information on the specified target is displayed.

Command line options:

```
-ts [hba_port_inst] [target_id]
```

Example:

```
$qauccli -pr iscsi -ts
```

Or:

```
$qauccli -iscsi -ts
Target ID: 2 hba_no: 0 IP: 192.168.105.247 Port: 3260 TGT
Instance #: 2
ISCSI Name:
Alias:
State: No Connection
Target ID: 3 hba_no: 0 IP: 192.168.105.247 Port: 3260 TGT
Instance #: 3
ISCSI Name:
iqn.2003-05.com.stringbeansoftware:apptester-starblazer248-target
Alias:
State: Session Active
Target ID: 2 hba_no: 1 IP: 192.168.105.247 Port: 3260 TGT
Instance #: 2
ISCSI Name:
iqn.2003-05.com.stringbeansoftware:apptester-appstorm245-target
Alias:
State: Session Active
Target ID: 3 hba_no: 1 IP: 192.168.105.247 Port: 3260 TGT
Instance #: 3
ISCSI Name:
iqn.2003-05.com.stringbeansoftware:apptester-starblazer248-target
Alias:
State: Session Active
```

## Target Session-Level iSCSI Negotiated Parameters

Use the `-t` command to display information for targets. The positional parameter is `<hba_port_inst>`. The optional parameter is `[target_id]`. If only the `hba_port_inst` is entered, target information for all targets on the specified adapter is displayed. If the optional `target_id` is entered, only information on the specified target is displayed.

Command line options:

```
-t <hba_port_inst> [target_id]
```

Example:

In the following examples, the HBA port instance = 0 and the target ID = 3.

```
$qaucli -pr iscsi -t 0 3
```

Or:

```
$qaucli -iscsi -t 0 3
Target ID: 3 hba_no: 0 IP: 192.168.105.247 Port: 3260 TGT
Instance #: 3
ISCSI Name:
iqn.2003-05.com.stringbeansoftware:apptester-starblazer248-target
Alias:
State: Session Active
TGT_iSCSI_Name :
iqn.2003-05.com.stringbeansoftware:apptester-starblazer248-target
TGT_Target_ID : 3(*)
TGT_Active : off(*)
TGT_Access_Granted : off(*)
TGT_Target_Entry : on(*)
TGT_Initiator_Entry : off(*)
TGT_RetryCount : 0(*)
TGT_RetryDelay : 0(*)
TGT_DevType : 0(*)
TGT_ExeThrottle : 0
TGT_FirstBurstLen : 32
TGTIPO_Fragmentation : on(*)
TGTISCSIO_Force_Neg_Main_Keys : off
TGTISCSIO_Send_Markers : off(*)
TGTISCSIO_Header_Digests : off
TGTISCSIO_Data_Digests : off
TGTISCSIO_Immediate_Data : on
TGTISCSIO_Initial_R2T : off
TGTISCSIO_Data_Sequence_In_Order : on(*)
TGTISCSIO_Data_PDU_In_Order : on(*)
TGTISCSIO_CHAP_Authentication : off
TGTISCSIO_Bidi_CHAP_Authentication : off
TGTISCSIO_Snack : off
```

```
TGTISCSIO_Discovery_Logout      : on
TGTISCSIO_Strict_Login          : off
TGTISCSIO_Error_Recovery_Level  : 0 (*)
TGT_KeepAliveTimeout           : 30
TGT_DefaultTimeout              : 2
TGT_DefaultTime2Retain         : 20 (*)
TGT_MaxBurstLen                 : 512
TGT_MaxOutstandingR2T          : 1
TGT_MaxRxDataSegmentLen        : 128 (*)
TGT_MaxTxDataSegmentLen        : 0 (*)
TGT_Port                         : 3260
TGTTCPO_Nagle                   : off
TGTTCPO_Timer_Scale            : 0 (*)
TGTTCPO_Timestamp              : on
TGT_TaskManagementTimeout      : 10
TGT_ExeCount                    : 0 (*)
TGT_TargetPortalGroupID        : 1 (*)
TGT_InitiatorSessID            : 0x000e1e031685
TGT_TargetSessID               : 9 (*)
TGT_TargetIPAddress            : 192.168.105.247
TGT_Window_Scale_Enable        : on
TGT_Rx_Window_Scale            : 0
TGT_Tx_Window_Scale            : 0 (*)
TGT_TimeStamp_Enable           : 64 (*)
TGT_DDB_IPv6                   : off
TGT_IPv6_Address                : c0a8:69f7::15:0:0
TGT_IPv6_iSCSIName             :
iqn.2003-05.com.stringbeansoftware:apptester-starblazer248-target
TGT_IPv6_Port                   : 3260
TGT_DIF_Enable                  : off
TGT_Max_Segment_Size           : 1448
TGT_Local_TCP_Port             : 29912 (*)
TGT_Type_of_Service            : 0
TGT_Traffic_Class               : 0 (*)
TGT_Local_IPv6_Address          : c0a8:69d0:: (*)
TGT_Perm_Redirect_Option       : off (*)
TGT_Temp_Redirect_Option       : off (*)
TGT_Redirect_IPAddr            : 88.2.60.0 (*)
TGT_Redirect_IPAddr_State      : Not Redirected (*)
TGT_IPv6_Flow_Label            :
TGT_4022_Deleyed_ACK           : off
TGT_IPv6_Source_Addr_Flg       : 0
TGT_IPv6_Source_Addr           : c0a8:69d0:: (*)
Values noted with (*) are read only.
```



## Target Session-Level Persistent iSCSI Parameters

This section shows the commands used to display and to modify target session-level persistent iSCSI parameters.

### Displaying Target Session-Level Persistent iSCSI Parameters

Use the `-tp` command to view target persistent parameter information (pre-negotiation, from Flash). The positional parameter is `<hba_port_inst>`. The optional parameter is `[target_id]`. If only the `hba_port_inst` is entered, target information for all targets on the specified adapter is shown. If the optional `target_id` is entered, only information on the specified target is shown.

Command line options:

```
-tp <hba_port_inst> [target_id]
```

Example:

In the following examples, the HBA port instance = 0 and the target ID = 3.

```
$qacucli -pr iscsi -tp 0 3
```

Or:

```
$qacucli -iscsi -TP 0 3
Target ID: 3 hba_no: 0 IP: 192.168.105.247 Port: 3260 TGT
Instance #: 3
ISCSI Name:
iqn.2003-05.com.stringbeansoftware:apptester-starblazer248-target
Alias:
State: Session Active
TGT_iscsi_Name :
iqn.2003-05.com.stringbeansoftware:apptester-starblazer248-target
TGT_Target_ID : 3(*)
TGTTO_Active : off(*)
TGTTO_Access_Granted : off(*)
TGTTO_Target_Entry : on(*)
TGTTO_Initiator_Entry : off(*)
TGT_RetryCount : 0(*)
TGT_RetryDelay : 0(*)
TGT_DevType : 0(*)
TGT_ExeThrottle : 0
TGT_FirstBurstLen : 32
TGTIPO_Fragmentation : on(*)
TGTISCSIO_Force_Neg_Main_Keys : off
TGTISCSIO_Send_Markers : off(*)
TGTISCSIO_Header_Digests : off
TGTISCSIO_Data_Digests : off
TGTISCSIO_Immediate_Data : on
TGTISCSIO_Initial_R2T : off
TGTISCSIO_Data_Sequence_In_Order : on(*)
```

```
TGTISCSIO_Data_PDU_In_Order      : on (*)
TGTISCSIO_CHAP_Authentication    : off
TGTISCSIO_Bidi_CHAP_Authentication : off
TGTISCSIO_Snack                  : off
TGTISCSIO_Discovery_Logout      : on
TGTISCSIO_Strict_Login          : off
TGTISCSIO_Error_Recovery_Level  : 0 (*)
TGT_KeepAliveTimeout            : 30
TGT_DefaultTimeout              : 2
TGT_DefaultTime2Retain          : 20 (*)
TGT_MaxBurstLen                  : 512
TGT_MaxOutstandingR2T           : 1
TGT_MaxRxDataSegmentLen         : 128 (*)
TGT_MaxTxDataSegmentLen         : 0 (*)
TGT_Port                          : 3260
TGTTCPO_Nagle                   : off
TGTTCPO_Timer_Scale             : 0 (*)
TGTTCPO_Timestamp               : on
TGT_TaskManagementTimeout       : 10
TGT_ExeCount                     : 0 (*)
TGT_TargetPortalGroupID         : 1 (*)
TGT_InitiatorSessID             : 0x000e1e031685
TGT_TargetSessID                : 9 (*)
TGT_TargetIPAddress             : 192.168.105.247
TGT_Window_Scale_Enable         : on
TGT_Rx_Window_Scale             : 0
TGT_Tx_Window_Scale             : 0 (*)
TGT_TimeStamp_Enable            : 64 (*)
TGT_DDB_IPv6                    : off
TGT_IPv6_Address                : c0a8:69f7::15:0:0
TGT_IPv6_iSCSIName              :
iqn.2003-05.com.stringbeansoftware:apptester-starblazer248-target
TGT_IPv6_Port                    : 3260
TGT_DIF_Enable                  : off
TGT_Max_Segment_Size            : 1448
TGT_Local_TCP_Port              : 29912 (*)
TGT_Type_of_Service             : 0
TGT_Traffic_Class                : 0 (*)
TGT_Local_IPv6_Address          : c0a8:69d0:: (*)
TGT_Perm_Redirect_Option        : off (*)
TGT_Temp_Redirect_Option        : off (*)
TGT_Redirect_IPAddr             : 40.2.45.1 (*)
TGT_Redirect_IPAddr_State       : Not Redirected (*)
TGT_IPv6_Flow_Label             :
TGT_4022_Deleyed_ACK            : off
TGT_IPv6_Source_Addr_Flg        : 0
TGT_IPv6_Source_Addr            : c0a8:69d0:: (*)
Values noted with (*) are read only.
```

## Modifying Target Session-Level iSCSI Parameters

Use the `-tc` command to modify target session-level iSCSI parameters. The positional parameters are `<hba_port_inst>`, `<target_id>`, and a series of one or more parameter name-value pairs.

Command line options:

```
-tc <hba_port_inst> <target_id> <config_name|config_alias> <value>
<config_name|config_alias> <value>]
```

Example:

In the following examples, the HBA port instance = 0, the target ID = 3, and the parameter change is to set the keep alive timeout value to 15 seconds.

```
$qauccli -pr iscsi -tc 0 3 TGT_KeepAliveTimeout 15
```

Or:

```
$qauccli -iscsi -tc 0 3 TGT_KeepAliveTimeout 15
```

Target Parameters:

The following table lists the parameters that may be configured using the `-tc` option in non-interactive mode.

Full Parameter Name	Alias Name	Allowable Values
-----	-----	-----
TGT_iSCSI_Name	TGTINAME	Character string
TGT_ExeThrottle	TGTET	0 to 32767
TGT_FirstBurstLen	TGTFB	0 to 32767
TGTISCSIO_Header_Digests	TGTIHD	on or off
TGTISCSIO_Data_Digests	TGTIDD	on or off
TGTISCSIO_Immediate_Data	TGTIID	on or off
TGTISCSIO_Initial_R2T	TGTIIR2T	on or off
TGTISCSIO_Snack	TGTISNACK	on or off
TGTISCSIO_Discovery_Logout	TGTLD	on or off
TGTISCSIO_Strict_Login	TGTIS	on or off
TGT_KeepAliveTimeout	TGKATO	0 to 32767
TGT_DefaultTimeout	TGTDTO	0 to 32767
TGT_MaxBurstLen	TGTMB	0 to 32767
TGT_MaxOutstandingR2T	TGTMOR2T	0 to 32767
TGT_Port	TGTPORT	0 to 65535
TGTTCPPO_Nagle	TGTTCPN	on or off
TGTTCPPO_Timestamp	TGTTMS	on or off
TGT_TaskManagementTimeout	TGTTMT	0 to 65535
TGT_InitiatorSessID	TGTISID	0x0 to 0xffffffffffff
TGT_TargetIPAddress	TGTIPADD	IPv4 address format
TGT_Window_Scale_Enable	TGTWINSCALEEN	on or off
TGT_Rx_Window_Scale	TGTRXWINSCALE	0 to 14
TGT_IPv6_Address	TGT_DDB_IPv6	IPv6

```
address format
TGT_IPv6_iSCSIName          TGTINAME_IPv6    Character string
TGT_IPv6_Port              TGTPORT_IPv6    0 to 32767
TGT_DIF_Enable             TGTDIFEN_IPv6   on or off
TGT_Max_Segment_Size      TGTMSS          0 to 65535
TGT_IPv6_Source_Addr_Flg  TGTSRCADDR_IPv6 0 to 3
                        (0=Don't Care, 1=Link Local, 2=Address 0, 3=Address 1)
TGT_IPv6_Flow_Label        TGTFLWLBL       0x0 to 0xfffff
TGT_Force_Negotiate_Main_iSCSI_Keys TGTFNMIK        on or off
TGT_4022_Deleyed_ACK      TGT4022DACK     on or off (Only
                        405x cards)
TGT_Type_of_Service        TGTTOS          0 to 255
The maximize number of offload iSCSI connections is 512 connections
per port (total of two ports).
```

## Configuring iSCSI Initiators with QConvergeConsole

This section provides procedures on how to configure the following iSCSI initiators using QLogic's QConvergeConsole utility:

- [Configuring the Windows iSCSI Initiator](#)
- [Configuring the Linux iSCSI Initiator](#)
- [Configuring the ESX iSCSI Initiator](#)

---

### NOTE:

The current release does not support iSCSI IPv6. Support is expected in a future release.

---

---

### NOTE:

For an overview of the GUI version of QLogic's QConvergeConsole utility, see [Appendix C](#). Information on installing and starting the utility's GUI version is provided in the *QConvergeConsole User's Guide*. All procedural information for the utility is covered in the online help system.

---

## Configuring the Windows iSCSI Initiator

Use the QConvergeConsole CLI to configure the iSCSI initiator for Windows.

### To configure a Windows iSCSI initiator:

1. Access the QConvergeConsole CLI either by double-clicking the QCC CLI desktop icon or by entering `qauccli` in the CMD window.
2. On the QConvergeConsole CLI Main Menu, select **2, Adapter Configuration**.
3. On the Adapter Type Configuration Selection menu, select **1, CNA Configuration**.

4. On the Converged Network Adapter (CNA) Protocol Type Selection menu, select **1, CNA iSCSI Configuration**.
5. On the Converged Network Adapter (CNA) iSCSI Configuration menu, select **3, Port IP Settings**.
6. Select the Converged Network Port you want to configure.
7. Select **2, Configure IP Settings**.
8. Complete the interactive list of settings as follows:
  - a. Enable IPv4 [on]: Press ENTER to accept the default.
  - b. DHCP to obtain IPv4 Network Information: [off]: Press ENTER to accept the default.
  - c. IP\_Address [ ]: Type the IP address of the initiator system, and then press ENTER.
  - d. IP\_Subnet\_Mask [255.255.255.0]: Type the appropriate subnet mask, and then press ENTER.
  - e. IP\_Gateway [0.0.0.0]: Press ENTER to accept the default.
  - f. Enable IPv6 [off]: Press ENTER to accept the default.
9. On the options menu that appears, select **3, Save changes and reset HBA (if necessary)**.
10. At the prompt for both ports, type **Yes**.
11. To return to the Converged Network Adapter (CNA) iSCSI Configuration menu, type P and press ENTER, and then type P and press ENTER again.
12. On the Converged Network Adapter (CNA) iSCSI Configuration menu, select **4, Target Configuration**.
13. Select the same Converged Network Port you selected in [Step 6](#).
14. Select **6, Add a Target**.
15. Complete the interactive list of settings as follows:
  - a. IPv6 Target? [off]: Press ENTER to accept the default.
  - b. TGT\_iSCSI\_Name [ ]: Type the iSCSI Qualified Name (IQN) of the iSCSI target to connect to, and then press ENTER.
  - c. TGT\_Port [3260]: Press ENTER to accept the default.
  - d. TGT\_TargetIPAddress [0.0.0.0]: Type the IP address of the target, and then press ENTER.
16. On the options menu that appears, select **12, Save Target/CHAP Changes**.  
The iSCSI initiator is now configured to connect to the iSCSI target.

## Configuring the Linux iSCSI Initiator

Use the QConvergeConsole CLI to configure the iSCSI initiator for Linux.

### To configure a Linux iSCSI initiator:

1. Access the QConvergeConsole CLI by entering `qaucli` in a terminal window.
2. On the QConvergeConsole CLI Main Menu, select **2, Adapter Configuration**.
3. On the Adapter Type Configuration Selection menu, select **1, CNA Configuration**.
4. On the Converged Network Adapter (CNA) Protocol Type Selection menu, select **1, CNA iSCSI Configuration**.
5. On the Converged Network Adapter (CNA) iSCSI Configuration menu, select **3, Port IP Settings**.
6. Select the Converged Network Port you want to configure.
7. Select **2, Configure IP Settings**.
8. Complete the interactive list of settings as follows:
  - a. Enable IPv4 [on]: Press ENTER to accept the default.
  - b. DHCP to obtain IPv4 Network Information: [off]: Press ENTER to accept the default.
  - c. IP\_Address [ ]: Type the IP address of the initiator system, and then press ENTER.
  - d. IP\_Subnet\_Mask [255.255.255.0]: Type the appropriate subnet mask, and then press ENTER.
  - e. IP\_Gateway [0.0.0.0]: Press ENTER to accept the default.
  - f. Enable IPv6 [off]: Press ENTER to accept the default.
9. On the options menu that appears, select **3, Save changes and reset HBA (if necessary)**.
10. At the prompt for both ports, type **Yes**.
11. To return to the Converged Network Adapter (CNA) iSCSI Configuration menu, type **P** and press ENTER, and then type **P** and press ENTER again.
12. On the Converged Network Adapter (CNA) iSCSI Configuration menu, select **4, Target Configuration**.
13. Select the same Converged Network Port you selected in [Step 6](#).
14. Select **6, Add a Target**.

15. Complete the interactive list of settings as follows:
  - a. IPv6 Target? [off]: Press ENTER to accept the default.
  - b. TGT\_iSCSI\_Name [ ]: Type the iSCSI Qualified Name (IQN) of the iSCSI target to connect to, and then press ENTER.
  - c. TGT\_Port [3260]: Press ENTER to accept the default.
  - d. TGT\_TargetIPAddress [0.0.0.0]: Type the IP address of the target, and then press ENTER.
16. On the options menu that appears, select **12, Save Target/CHAP Changes**.  
The iSCSI initiator is now configured to connect to the iSCSI target.

### Configuring the ESX iSCSI Initiator

The software iSCSI initiator must be enabled for ESX/ESXi to be able to use it for accessing iSCSI storage.

#### To configure an ESX/ESXi initiator:

1. Log in to the vSphere Client.
2. In the inventory panel, select a server to which to connect.
3. Click the **Configuration** tab.
4. In the Hardware panel, click **Storage Adapters**.
5. From the list of available storage adapters, select the iSCSI initiator you want to configure, and then click **Properties**.
6. Click **Configure**.  
The **General Properties** dialog box shows the initiator's status, default name, and alias.
7. To enable the initiator, click **Enabled**.
8. (Optional) To change the default iSCSI name for your initiator, type a new name. The name you enter must be worldwide unique and properly formatted so that all storage devices can recognize the software iSCSI initiator.
9. To save your changes, click **OK**.

---

#### **NOTE:**

If you change the iSCSI name, it is used for new iSCSI sessions. Existing sessions do not use new settings until you log out and log in again.

---

## Enabling CHAP Authentication with QConvergeConsole

You can enable CHAP authentication with either the interactive mode or non-interactive mode of QConvergeConsole CLI. For details on the interactive mode, refer to the *QConvergeConsole CLI User's Guide*. For the non-interactive mode of the QConvergeConsole CLI, the following sections describes how to enable CHAP:

- [Configuring CHAP with QConvergeConsole CLI](#)
- [Linking to a CHAP Target](#)

---

### NOTE:

For an overview of the GUI version of QLogic's QConvergeConsole utility, see [Appendix C](#). Information on installing and starting the utility's GUI version is provided in the *QConvergeConsole User's Guide*. All procedural information for the utility is covered in the online help system.

---

## Configuring CHAP with QConvergeConsole CLI

### To configure CHAP with QConvergeConsole CLI:

1. To add a primary and local CHAP entry (name and secret), issue the `-addchap` command to add a CHAP entry to the persistent CHAP table. The positional parameters are `<hba_port_inst>`, `<CHAP name>`, and `<CHAP secret>`. The optional parameter is `[-BIDI]` indicating the CHAP entry is a bidirectional entry (default is local CHAP). The adapter is reset after this command is issued.

---

### NOTE:

The iSCSI RFC Specification recommends a minimum CHAP secret length of 12 bytes or characters. The maximum CHAP secret length for QLogic iSCSI cards (the firmware limit) is 100 bytes or characters.

---

### Command line options:

```
[-BIDI] -addchap <hba_port_inst> <CHAP name> <CHAP secret>
```

### Examples:

In the following examples, the HBA port instance = 0, the CHAP name = `chapdbserver1`, and the CHAP secret = `k9Q038iaZwlqPplq012`.

```
$qauccli -pr iscsi -addchap 0 chapdbserver1 k9Q038iaZwlqPplq012
```

Or:

```
$qauccli -iscsi -addchap 0 chapdbserver1 k9Q038iaZwlqPplq012
```



2. To add a peer and BIDI CHAP entry (name and secret), issue the `-addchap` command to add a CHAP entry to the persistent CHAP table. The positional parameters are `<hba_port_inst>`, `<CHAP name>`, and `<CHAP secret>`. The optional parameter is `[-BIDI]` indicating the CHAP entry is a BIDI entry (default is local CHAP). The adapter is reset after this command is issued.

Command line options:

```
[-BIDI] -addchap <hba_port_inst> <CHAP name>
<CHAP secret>
```

Example:

In the following examples, the HBA port instance = 2, the CHAP name = `chapbidistorage1`, and the CHAP secret = `Z9aujqklaZwlqPplq0827`.

```
$qaucli -pr iscsi -BIDI -addchap 2 chapbidistorage1
Z9aujqklaZwlqPplq0827
```

Or:

```
$qaucli -iscsi -BIDI -addchap 2 chapbidistorage1
Z9aujqklaZwlqPplq0827
```

3. To view the CHAP map table to determine the CHAP index to use later to link the CHAP entry to a target, issue the `-dspchap` command. The positional parameter for this command is `<hba_port_inst>`.

Command line options:

```
-dspchap <hba_port_inst>
```

In the following examples, the HBA port instance = 0.

```
$qaucli -pr iscsi -dspchap 0
```

Or:

```
$qaucli -iscsi -dspchap 0
CHAP TABLE
Entry: 1
Name: chapdbserver1
Secret: k9Q038iaZwlqPplq012
```

4. Add a persistent Send Target to discover, and log in with dynamic entries to discovered targets, by issuing the `-pa` command. The `-pa` command adds a persistent target. The positional parameters are `<hba_port_inst>` and `<ip address>`. The optional parameters are `[-PORT port_num]` and `[-INAME name]`. If the optional port number is not specified, it defaults to 3260. If the optional `INAME` (iSCSI name) is not specified, it defaults to an empty string.

Command line options:

```
-pa <hba_port_inst> <ip address> [-PORT port_num] [-INAME name]
```

Example:

In the following examples, the HBA port instance = 0 and the Send Target IP = 10.14.64.154.

```
$qaucli -pr iscsi -pa 0 10.14.64.154
```

Or:

```
$qaucli -iscsi -pa 0 10.14.64.154
```

5. To display a persistent Send Target entry, issue the `-ps` command (you should initially expect a failed connection because the target is not yet linked to CHAP). The `-ps` command lists persistent (bound) targets. The positional parameter is `[hba_port_inst [target_id]]`. If no `target_id` is specified, all targets for the specified `hba_port_inst` are shown. If neither the `hba_port_inst` nor `target_id` are specified, all `target_ids` for all adapters in the system are shown.

Command line options:

```
-ps <hba_port_inst> [target_id]
```

Example:

In the following examples, the HBA port instance = 0 and the Send Target IP = 10.14.64.154.

```
$qaucli -pr iscsi -ps 0
```

Or:

```
$qaucli -iscsi -ps 0
Target ID: 2 hba_no: 0 IP: 10.14.64.154 Port: 3260 TGT
Instance #: 2
ISCSI Name:
Alias:
State: Session Failed
```

6. Link the CHAP entry to the target by issuing the `-linkchap` command. The positional parameters are `<hba_port_inst>`, `<chap_no>` and `<target_id>`. The adapter is not reset after this command is issued.

Command line options:

```
-linkchap <hba_port_inst> <chap_no> <target_id> [<TGTBCA> <value>]
```

**Example:**

In the following examples, the HBA port instance = 0, the CHAP number = 1, and the Target ID = 2.

```
$qaucli -pr iscsi -linkchap 0 1 2
```

Or:

```
$qaucli -iscsi -linkchap 0 1 2
```

## Linking to a CHAP Target

You can link CHAP to a target with active bidirectional (BIDI) CHAP authentication. TGTBCA is an optional parameter to turn BIDI CHAP authentication on or off for this target connection.

To link a CHAP target:

1. Link CHAP to a target with BIDI enabled by issuing the `-linkchap` command.

Command line options:

```
iscli -linkchap <hba_port_inst> <chap_no> <target_id>  
[<TGTBCA> <on|off>]
```

**Example:**

In the following example, the HBA port instance = 2, the CHAP number = 9, and the Target ID = 10.

```
$qaucli -pr iscsi -linkchap 2 9 10 TGTBCA on
```

View persistent targets by issuing the `-ps` command. You should see only the Send Target.

**Example:**

In the following examples, the HBA port instance = 0.

```
$qaucli -pr iscsi -ps 0
```

Or:

```
$qaucli -iscsi -ps 0  
Target ID: 2 hba_no: 0 IP: 10.14.64.154 Port: 3260 TGT  
Instance #: 2  
ISCSI Name:  
Alias:  
State: No Connection
```

2. To view all targets linked to the CHAP, issue the `-chapmap` command. This command lists the mapping of targets to CHAP table entries. The positional parameter for this command is `<hba_port_inst>`.

Command line options:

```
-chapmap <hba_port_inst>
```

Example:

In the following example, the HBA port instance = 0.

```
$qaucli -pr iscsi -chapmap 0
```

Or:

```
$qaucli -iscsi -chapmap 0
Targets configured for CHAP:
Target ID: 2 IP: 10.14.64.154 Port: 3260
ISCSI Name:
Alias:
Name: chapdbserver1
Secret: k9Q038iaZwlqPplq012
Target ID: 64 IP: 10.14.64.154 Port: 3260
ISCSI Name: iqn.1987-05.com.cisco:00.ba6d7ea87bba.chap1
Alias: chap1
Name: chapdbserver1
Secret: k9Q038iaZwlqPplq012
Target ID: 65 IP: 10.14.64.154 Port: 3260
ISCSI Name: iqn.1987-05.com.cisco:00.00c80ea3857f.chap2
Alias: chap2
Name: chapdbserver1
Secret: k9Q038iaZwlqPplq012
Target ID: 66 IP: 10.14.64.154 Port: 3260
ISCSI Name: iqn.1987-05.com.cisco:00.0b597ef8adf8.chap3
Alias: chap3
Name: chapdbserver1
Secret: k9Q038iaZwlqPplq012
Target ID: 67 IP: 10.14.64.154 Port: 3260
ISCSI Name: iqn.1987-05.com.cisco:00.28182218624e.chap4
Alias: chap4
Name: chapdbserver1
Secret: k9Q038iaZwlqPplq012
```

## General Management with NIC Partitioning

Use the NIC Partitioning (NPAR) feature to manage the QME8242 as described in the following section.

### NIC Partitioning (NPAR)

This section provides the following information about the QLogic NIC Partitioning (NPAR) feature:

- [Overview](#)
- [Configuration and Operation](#)

#### Overview

The NPAR feature in QLogic adapters provides the ability to create multiple PCIe physical functions for each physical 10 GbE port on the adapter. Each of the PCIe functions appears as an independent interface to the host operating system or hypervisor.

Dual-port, 10 Gb adapters configured as Ethernet-only adapters contain eight Ethernet functions. QME8242 configurations can contain up to four Ethernet functions corresponding to each physical port.

#### Configuration and Operation

By default, NPAR functionality is disabled on the adapters. Only two Ethernet functions are enabled. Depending on the feature personality mapping supported on the adapter, you can enable additional Ethernet or storage functions. The PCI function number assignment is as follows:

- Functions 0 and 1 are always NIC functions.
- Functions 4 and 5 are iSCSI functions if iSCSI is enabled.
- Functions 6 and 7 are FCoE functions if FCoE is enabled.
- If iSCSI and FCoE functions are not enabled, they are available to be configured as NIC functions.
- Only one iSCSI function per physical port.
- Only one FCoE function per physical port.

The PCI function to port mapping is also fixed as follows:

- Functions 0, 2, 4, and 6 share one physical port.
- Functions 1, 3, 5, and 7 share the other physical port.

When performed, the following operations require a system reboot to take effect:

- Enabling or disabling NPAR mode
- Changing function type (iSCSI to NIC, FCoE to NIC, or NIC to FCoE)

Perform NPAR configuration using any of the following methods:

- OptROM
- Lifecycle controller
- Managements tools under various operating systems

After you have configured NPAR mode, you can modify the minimum and maximum bandwidth per NPAR. The changes take effect immediately; no reboot is required. The minimum and maximum bandwidths are specified as percentages of the link bandwidth, where:

- Minimum bandwidth is the minimum guaranteed bandwidth to a partition.
- Maximum bandwidth is the maximum value that a partition is permitted to use.

NPAR mode supports iSCSI Boot, FCoE Boot, and PXE Boot in their respective partitions.

---

**NOTE:**

For additional information on configuring NPAR in the QConvergeConsole utility, refer to the QConvergeConsole online help system.

---

## Windows Management Applications

Windows management applications for the QME8242 include the following:

- [Windows NIC Driver Management Applications](#)
- [Windows Teaming](#)
- [Windows VLAN Configuration](#)
- [User Diagnostics for Windows NIC Driver Management Applications](#)

## Windows NIC Driver Management Applications

### Overview

In the QConvergeConsole CLI (qaucli) utility, you can view VLAN and teaming overview information by issuing the `qaucli -nt -zvt` command. (The `qaucli` is an installation option available when you install the Windows drivers; see “[Windows Driver Installation and Configuration](#)” on page 2-2.)

### Viewing and Changing Adapter Properties

This section provides information on using the QConvergeConsole CLI for:

- [Viewing Adapter Properties](#)
- [Changing Adapter Properties](#)

## Viewing Adapter Properties

Issue the following commands to view the adapter properties.

To list all detected QME8242 ports:

```
qaucli -nic -i [cna_port_inst]
```

To view QME8242 information:

```
qaucli -nic -icna [cna_port_inst]
```

To view port Data Center Bridging Exchange (DCBX) protocol information:

```
qaucli -nic -idcbx [cna_port_inst]
```

To view configured port settings:

```
qaucli -nic -iset [cna_port_inst]
```

To view physical link status:

```
qaucli -nic -link [cna_port_inst]
```

To view port information:

```
qaucli -nic -pinfo [cna_port_inst]
```

## Changing Adapter Properties

---

### NOTE:

For an adapter that is teamed or an adapter with VLANS, do not directly modify the adapter properties. To ensure that the properties of all teamed adapters and adapters with VLANS remain synchronized with the team properties, make property changes only on the Team Management page (see [“Modifying a Team” on page 3-40](#)).

---

To configure the QME8242 port, issue the following command:

```
qaucli -nic -n [cna_port_inst] <config_name|config_alias>  
<value> [<config_name|config_alias> <value>]
```

You can set the following properties:

- Port\_Alias
- Port\_Physical\_MAC\_Alias
- Port\_LAA\_MAC\_Alias

You can change the variables listed in [Table 3-1](#); however, some variables cannot be changed on specific OSs or configuration states. To determine which ones can be changed, use the `-c` keyword.

**Table 3-1. Port Adapter Variables and Values**

Variable	Values
Checksum_Offload_Enable	on, off
IPv4_Checksum_Offload_Enable	off, Rx, Tx, RxTx
IPv4_TCP_Checksum_Offload_Enable	off, Rx, Tx, RxTx
IPv6_TCP_Checksum_Offload_Enable	off, Rx, Tx, RxTx
IPv4_UDP_Checksum_Offload_Enable	off, Rx, Tx, RxTx
IPv6_UDP_Checksum_Offload_Enable	off, Rx, Tx, RxTx
Large_Send_Offload_Enable	on, off
IPv4_Large_Send_Offload_v1_Enable	on, off
IPv4_Large_Send_Offload_v2_Enable	on, off
IPv6_Large_Send_Offload_v2_Enable	on, off
Receive_Side_Scaling_Enable	on, off
Header_Data_Split_Enable	on, off
Jumbo_Frames_MTU_9000_Enable	on, off
Jumbo_Frames_MTU_9000_Enable_Rx	on, off
Jumbo_Frames_MTU_9000_Enable_Tx	on, off
LOCAL_Administered_Address_MAC	xx:xx:xx:xx:xx:xx
Port_Wake_On_LAN_Option	0=Disabled, 1=Wake on Magic Frame
VLAN_ID	1..4094

To set the QME8242 configuration alias, issue the following command:

```
gauccli -nic -nh [cna_port_inst] <config_name|config_alias>
<value> [<config_name|config_alias> <value>]
```

## Windows Teaming

Windows Teaming: QLogic QME8242 Mezzanine Card User's Guide

- [Overview](#)
- [Teaming Modes](#)
- [Using the CLI for Teaming](#)
- [Using the Team Management GUI](#)
- [Teaming Configuration](#)
- [Viewing Teaming Statistics](#)



## Overview

You can group together multiple network adapters in a server to make a team. Individual adapters that are part of a team operate as a team rather than standalone adapters. A team provides traffic load balancing across the member adapters and fault tolerance when some, but not all, of the members lose connectivity.

To enable teaming functionality, install the teaming driver in addition to the basic NIC.

### Team MAC Address

At initialization, the teaming driver selects the team's MAC address to be the MAC of one of the teamed adapters. In general, the first adapter to come up is chosen to be the preferred primary adapter. The preferred primary's MAC address is assigned to the MAC address of the team. Alternately, you can choose any valid MAC address as the team's static MAC address, also called the Locally Administered Address (LAA). Make sure any provided LAA is unique for the local Ethernet network. This provision gives the system administrator more flexibility in configuring the MAC address for a team when necessary.

## Teaming Modes

Teaming is designed to improve reliability and fault tolerance of networks and to enhance performance by efficient load balancing.

The following NIC teaming modes are provided:

- **Failsafe Mode** ensures that an alternate standby or redundant adapter becomes active if the primary network connection fails.
- **Switch-Independent Load Balancing Mode** ensures distribution of transmit loads across the teamed adapters.
- **Link Aggregation Mode** (802.3ad static, 802.3ad dynamic [active and passive Link Aggregation Control Protocol (LACP)]) enables the use of multiple adapters together as a single, virtual adapter with the aggregated capacity of its individual adapters.

All team types—failsafe, switch-independent load balancing, and link aggregation—can be heterogeneous as well as homogeneous. Every team must have at least one QLogic adapter.

[Table 3-2](#) shows that Failsafe and Tx load-balancing modes are switch independent, which means they do not require switch configuration. LACP or 802.3ad requires switch ports configured for LACP.

**Table 3-2. Windows Teaming Modes**

Mode	Failover Capability	Switch Dependency	SFT (System Fault Tolerance)	Load Balancing	Number of Ports per Team (Range <sup>a</sup> )
Failsafe	Yes: Layer 2	No	Yes	No	2-16
Tx load balancing	Yes	No	Yes	Yes: Layers 3 or 4	2-16
Static 802.3ad	Yes	Yes	Yes	Yes	2-16
Dynamic 802.3ad	Yes	Yes	Yes	Yes	2-16

<sup>a</sup> 16×16 ports can be aggregated per system: 16 ports per team and 16 teams per system.

### Failsafe Mode

The failsafe mode provides Layer 2 fault tolerance. Failsafe provides high reliability through redundancy in the event of port failure. When the primary network connection is down, data traffic is automatically transferred to a secondary, standby connection. The preferred primary adapter can be specified either by the system administrator or by the teaming driver (if the admin does not select the preferred adapter). When the teaming driver needs to make the selection, it selects the best adapter in terms of bandwidth, health, and capability. The preferred primary must always be a QLogic adapter.

The administrator can also choose one of the following failback types to specify the behavior when connection to preferred primary is restored after a period of failure:

- *None*—When the preferred primary becomes operational again, the driver does not automatically switch back the primary to the active adapter.
- *Preferred Primary*—When the preferred primary becomes operational again, the driver automatically switches back the primary as the active adapter. The network traffic resumes to the primary adapter from the standby adapter. The traffic stays with the secondary adapter only as long as the primary adapter is down.
- *Auto Select*—Use this option to enable the teaming driver to automatically select the best adapter based on parameters such as bandwidth, link state, health, and so on.

In failsafe mode, the standby adapter could be dissimilar in the individual features supported and capacity, and may come from a different vendor.

All the adapters in the team share a common team MAC address. This is a locally administered MAC address or can be a default MAC address specified by the driver. Only one adapter at a time in the team is active for network traffic. No two same MAC addresses are exposed to the switch at the same time.

Failsafe mode is inherent in all other teaming modes and is switch agnostic.

## Switch-Independent Load Balancing Mode

Switch-independent load balancing mode provides a failsafe feature and supports transmit load balancing. For receive load balancing, use the 802.3ad modes.

In this mode, the outbound traffic is efficiently distributed across the member adapters to increase the transmit bandwidth. Traffic load balancing is connection-based to avoid out-of-order packet delivery. The administrator can select one of the following load distribution types:

- *Auto Select* indicates that the load is distributed based on the target IP address (IPv4 or IPv6) and port number. This option ensures a one-to-one correspondence between a traffic flow and a team adapter.
- *MAC address based* indicates that the load is distributed based on the target MAC address.

In switch-independent load balancing, a team receives the traffic on the preferred primary adapter. If the preferred primary adapter fails, the receive load switches to a secondary adapter (failover operation). If the preferred primary adapter becomes operational again, the receive load fails back to the preferred primary adapter (failback operation). Thus, a switch-independent load balancing team also behaves like a failsafe team. Each time the preferred primary changes due to failover or failback, other network elements are notified of the change in the primary adapter through team gratuitous ARPs.

## Link Aggregation Mode

Link aggregation provides increased bandwidth and high reliability by combining several NICs into a single, logical, network interface called a Link Aggregation Group (LAG). The link aggregation is scalable, meaning an adapter can be added or deleted either statically or dynamically from a team.

Traffic from all the team ports that form a LAG have the same MAC address, which is the MAC address of the team. If a new adapter joins the LAG, or an adapter forming the LAG fails, the LAG becomes operational again after a brief exchange of protocols between the switch and the server. QLogic adapters are rapidly aggregated, with a latency of one to two seconds.

Two options are available in the link aggregation mode:

- [Static Link Aggregation \(SLA\)](#)
- [Dynamic Link Aggregation \(DLA\)](#)

---

### NOTE:

The switch must support the IEEE 802.3ad standard for the preceding two link aggregation modes to work.

---

### Static Link Aggregation (SLA)

Static Link Aggregation (SLA, 802.3ad static protocols with generic trunking) is a switch-assisted teaming mode, where the switch must be 802.3ad compliant. The switch ports must be configured so that the switch perceives adapters from a LAG as a single, virtual adapter.

In SLA, the ports on the switch are active by default. There is no negotiation between the switch and the intermediate driver to decide on adapters participating in a LAG.

In SLA mode, the protocol stack responds to ARP requests with a single, advertised MAC address, and an IP address corresponding to the LAG. Each physical adapter in the team uses the same team MAC address during transmission. As the switch (at the other end of link) is aware of the trunking teaming mode, it appropriately modifies the forwarding table to indicate the trunk as a single virtual port. This modification ensures correct traffic routing on the receive side as well. In this mode, the switch also distributes receive traffic across the member adapters.

### Dynamic Link Aggregation (DLA)

Dynamic Link Aggregation (DLA) with LACP is similar to SLA except that LACP allows self configuration of LAG through handshaking between the switch and the intermediate driver. For the team to function, LACP must be enabled at both ends of the link: the server and the switch. LACP (802.3ad dynamic) allows switch ports to dynamically communicate with the intermediate driver, allowing controlled addition and removal of ports from the team.

Link aggregation mode has transmit load balancing and fail safety support. If a link connected through a participant port of a link-aggregated team goes down, LACP provides failover and load balancing across the remaining members of the team. In addition, if a new member port is added to the team or is removed from the team, the switch performs load rebalancing for the receive operation and the driver performs load balancing for the transmit operation, to accommodate the change in configuration.

Transmit load distribution in LACP provides the following options:

- *None* indicates no traffic distribution. Only a single "active" adapter is used for transmit. The driver selects the active adapter based on LACP state information.
- *Auto Select* indicates that the load is distributed based on the target IP address and port number. This option ensures a one-to-one correspondence between a traffic flow and a team adapter.
- *MAC address based* indicates that the load is distributed based on the target MAC address.

## Using the CLI for Teaming

You can view, create, configure, and delete teams using the QConvergeConsole utility.

To view a list of teams, issue the following command:

```
qaucli -nic -teamlist
```

To view team information, issue the following command:

```
qaucli -nic -teaminfo <team_inst|ALL>
```

To preview available ports before configuring a new team, issue the following command:

```
qaucli -nic -teamnew_portspreview
```

To configure a new team, issue the following command:

```
qaucli -nic -teamnew <team_type> <port_insts|ALL>
```

where `port_insts` are the ports indices separated by commas (for example, 1,2) and `team_type` is either 1=Fail Over or 2=Load Balanced.

To delete a team, issue the following command:

```
qaucli -nic -teamdel <team_inst|ALL>
```

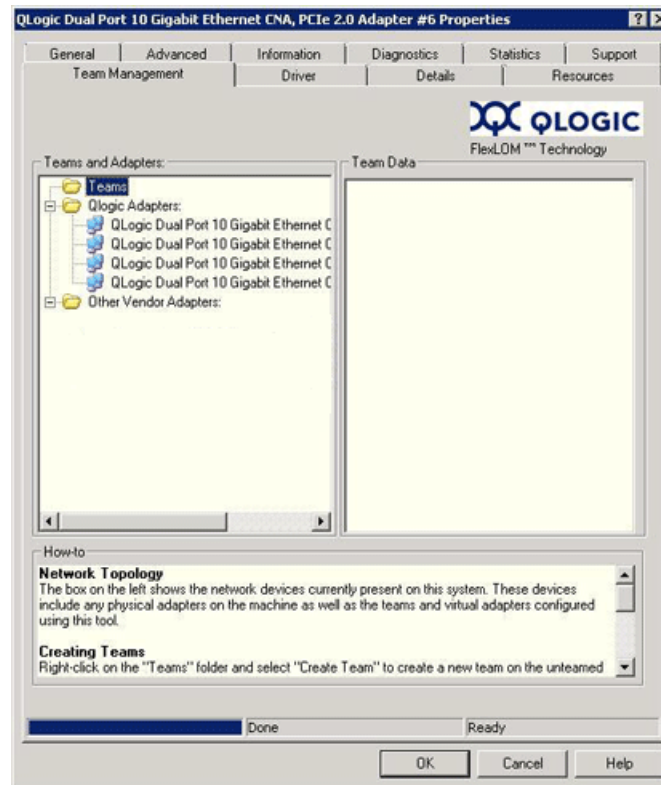
## Using the Team Management GUI

Use the Team Management property page to manage the following teaming-related activities:

- Viewing network topology
- Creating, modifying, and deleting teams
- Viewing and changing team properties
- Adding and deleting virtual adapters

**To launch the Team Management property page:**

1. In Windows, access the **Computer Management** dialog box, and then click **Device Manager** in the left pane.
2. Under **Network adapters**, right-click the **QLogic 10 Gigabit Ethernet adapter**, and then select **Properties**.
3. Click the **Team Management** tab to bring that page to the front (see [Figure 3-1](#)) and perform teaming-related management.



**Figure 3-1. Team Management Property Page**

On the **Team Management** page, the **Teams and Adapters** pane on the left lists the network devices currently present on this system, including:

- Teams and virtual adapters, as well as their member physical adapters
- QLogic and other vendor adapters.

Procedures for creating a team, adding virtual adapters, and more are provided in the How-to box on the bottom of the **Team Management** page.

## Teaming Configuration

Teaming configuration includes creating, modifying, and deleting teams, and viewing team statistics on the Team Management property page. To launch the Team Management property page, see [“Using the Team Management GUI” on page 3-33](#).

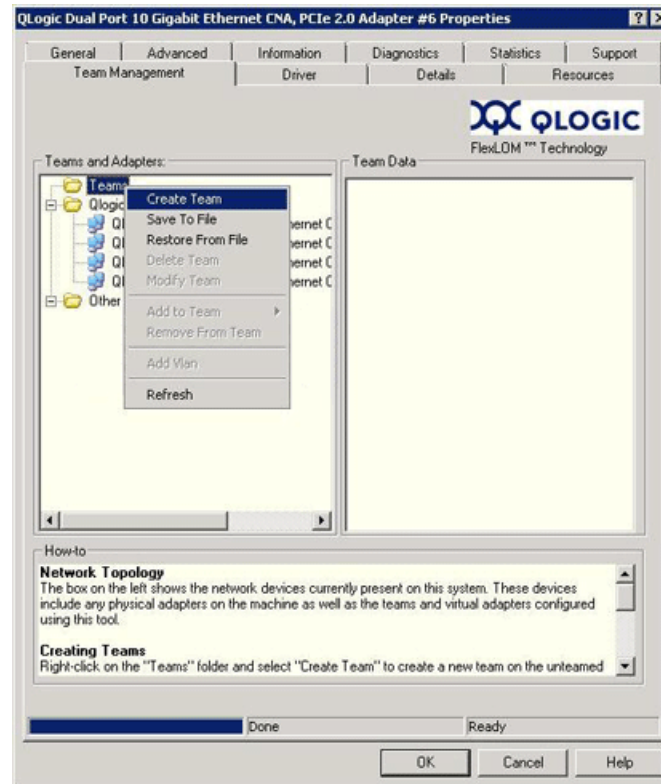
Information on teaming configuration includes the following:

- [Creating a Team](#)
- [Modifying a Team](#)
- [Deleting a Team](#)
- [Saving and Restoring Teaming Configuration](#)

## Creating a Team

To create a team:

1. Right-click the **Teams** folder icon, and then click **Create Team** (see [Figure 3-2](#)).



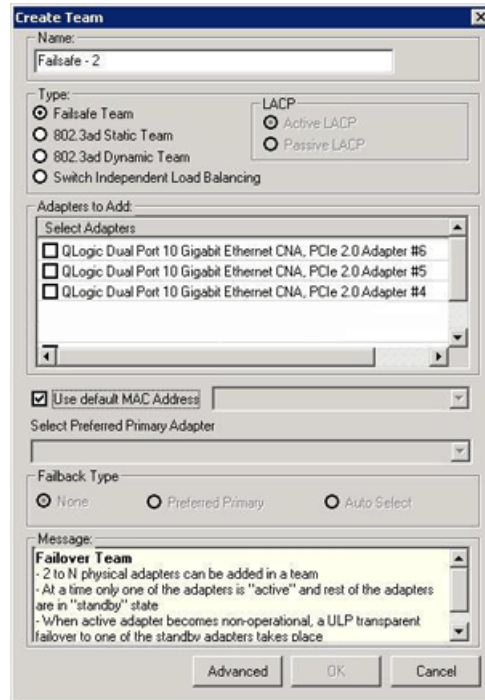
**Figure 3-2. Creating a Team**

2. The software automatically picks a unique team name, or you may choose to enter your own team name. Team names must be unique on a system.
3. On the **Create Team** dialog box, specify the following (see the message pane at the bottom of the dialog box for more details), and then click **OK** to return to the adapter properties:
  - **Name**—Type a name for the new team.
  - **Type**—Select the teaming mode by clicking either **Failsafe Team**, **802.3ad Static Team**, **802.3ad Dynamic Team**, or **Switch Independent Load Balancing**. If you select the 802.3ad dynamic option, you must also select one of the following options:

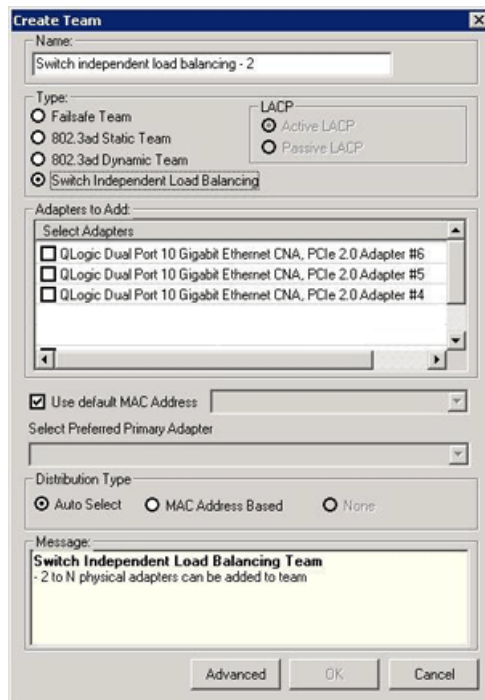
- Active LACP:** LACP is a Layer 2 protocol that is used control the teaming of physical ports into an aggregated set. LACP discovers if a host's ports are connected to a switch that supports aggregation on the connected ports and configures those ports into an aggregation bundle. For LACP to operate, one side has to be Active LACP. The Active LACP side of the protocol initiates the protocol.
- Passive LACP:** The Passive LACP side just responds to the active LACP requests.
- **Adapters to Add**—Select the check box next to each adapter that should form the team.
- **Use default MAC Address**—Select this check box to have the driver assign a MAC address, or clear the check box to select a locally-administered MAC address from the list.
- **Select Preferred Primary Adapter**—Choose a preferred primary adapter for the team from the list of teamed adapters, or **None** to allow the driver to assign the preferred primary adapter.
- **Failback Type**—If this is a Failsafe Team, select a failback type of either **None**, **Auto Select**, or **Preferred primary**.
- **Load Balancing Type**—If this is an 802.3ad Static Team or 802.3ad Dynamic Team, select the type of load balancing: **Auto**, **MAC Address Based**, or **None**.
- **Distribution Type**—If this is a Switch Independent Load Balancing team type, select a distribution type of either **Auto Select** or **MAC Address Based**.
- **Advanced**—Click this button to configure QLogic-specific team capabilities such as RSS, MTU, or various offloads. These properties are used to configure the member adapters to avoid any conflict after a team has been created. [Figure 3-7](#) shows the **Advanced Team Properties** dialog box.

The following figures show the configuration of various teaming modes.





**Figure 3-3. Creating a Failsafe Team**



**Figure 3-4. Creating a Switch-Independent Load Balancing Team**

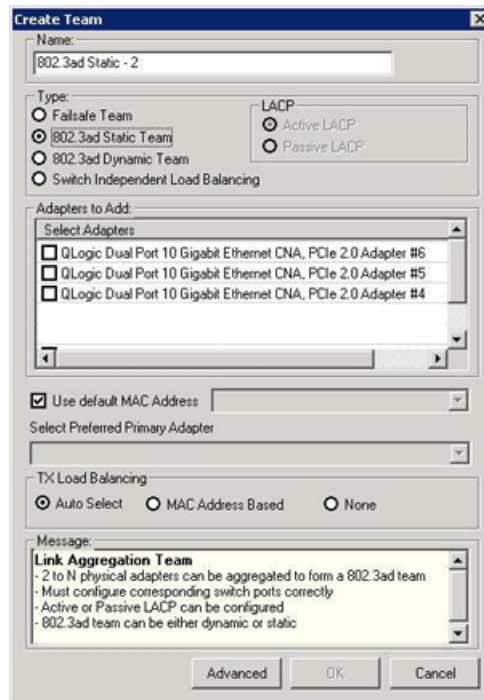


Figure 3-5. Creating an 802.3ad Static Team

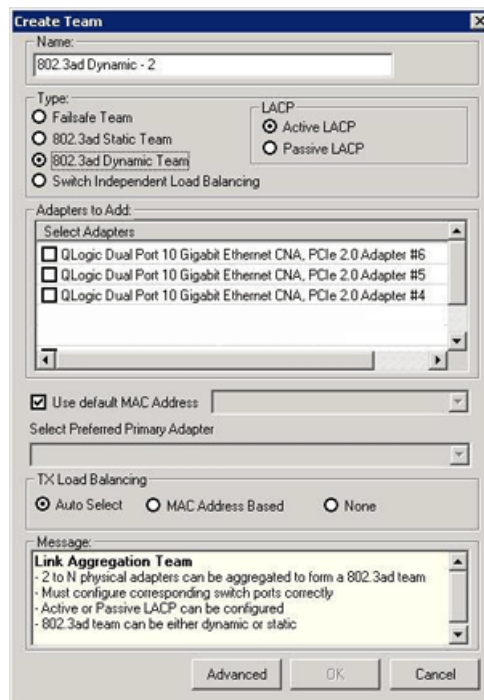
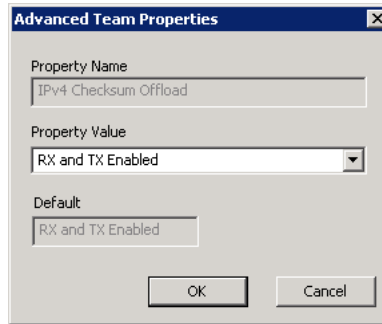


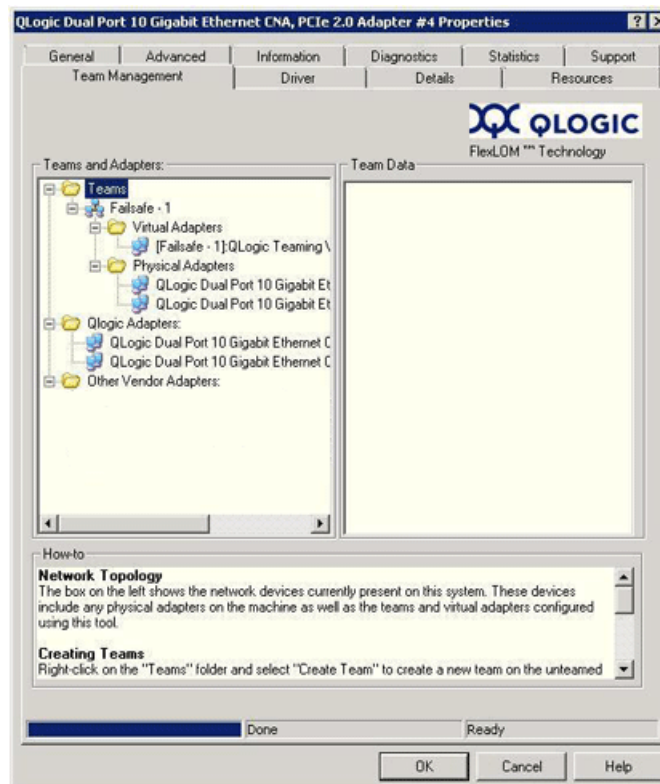
Figure 3-6. Creating an 802.3ad Dynamic Team



**Figure 3-7. Setting Advanced Team Properties**

- To confirm if a team has been successfully created, view the **Team and Adapters** pane on the **Team Management** page.

Figure 3-8 shows an example of a newly-formed team. The **Team Data** pane on the right shows the properties, information, and status of the team or adapter that is currently selected in the **Teams and Adapters** pane on the left.



**Figure 3-8. Confirming New Team Creation**

## Modifying a Team

A team can be modified by:

- Adding or removing one or more team members to a team.
- Modifying the team properties.

### To add team members:

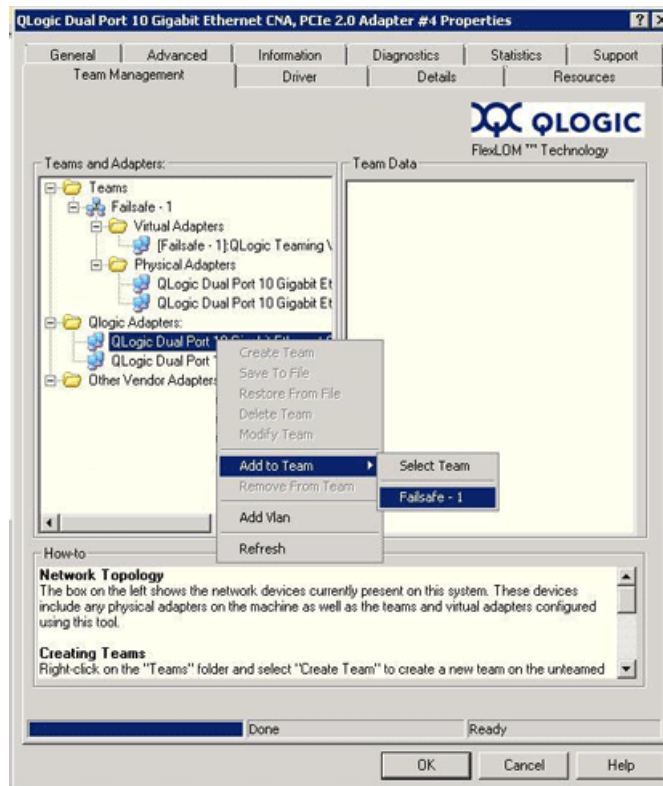
1. On the **Team Management** property page, right-click the unteamed adapter to add to a team.
2. On the shortcut menu, point to **Add to Team**, and then click the team to which you want to add the adapter (see [Figure 3-9](#)).

---

### NOTE:

You cannot add an adapter to a team that is already a member of another team. Teaming of teams is not supported.

---



**Figure 3-9. Adding a Team**

To remove an adapter from a team:

---

**NOTE:**

A team must include at least one QLogic adapter. A QLogic adapter is allowed to be deleted from a team only if it is not the last QLogic teamed adapter.

---

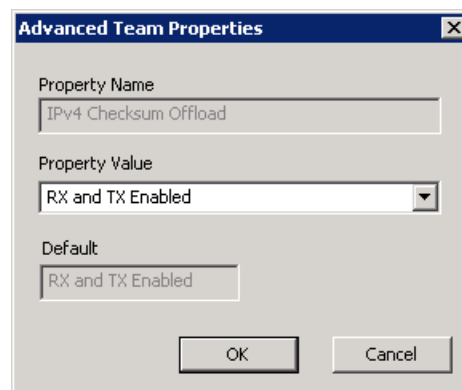
1. On the **Team Management** property page, right-click the adapter to be removed from the team.
2. On the shortcut menu, click **Remove from Team**.

At least two adapters must be present in a team. If an adapter is no longer required to be a member of a team, it can be removed from the team.

**To change a team property:**

For the VLAN and teaming solution to work correctly, the properties of all teamed adapters and adapters with multiple VLANs must remain synchronized with the team properties. Ensure that you change the properties of a team and an adapter with VLANs only on the **Team Management** page.

1. On the Team Management page, in the right pane under **Team Data**, expand the **Properties** list.
2. Double-click the team property you need to change.
3. In the **Advanced Team Properties** dialog box (see [Figure 3-10](#)), specify a new **Property Value**, and then click **OK**.



**Figure 3-10. Modifying Advanced Team Properties**

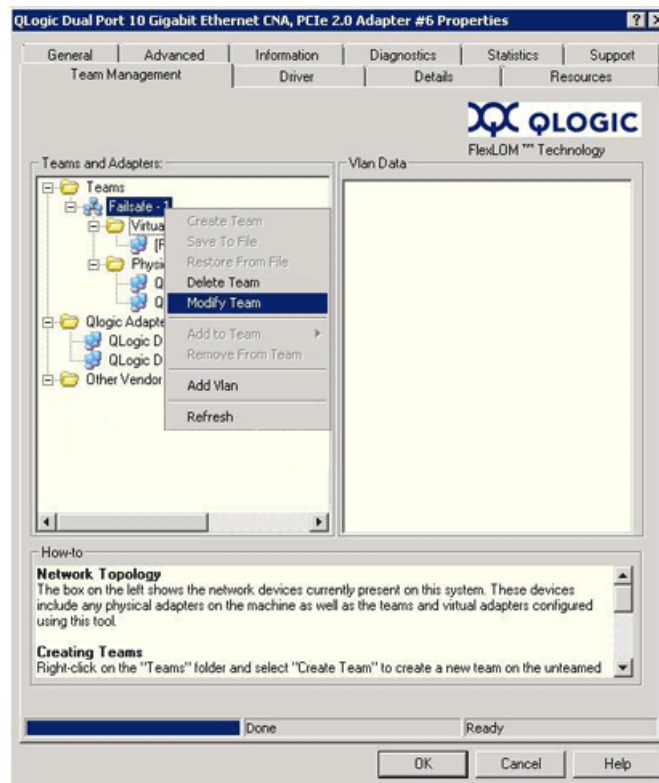
The team properties change takes effect immediately. Changing team properties causes the driver to reload, which could result in a momentary loss of connectivity.

**NOTE:**

To ensure that the properties of all teamed adapters and adapters with VLANs remain synchronized with the team properties, do not directly modify the adapter properties on the Advanced page. If an adapter property becomes out of sync with its team properties, change either the team or adapter property so that they are the same on each, and then reload the team. To reload a team: On the **Team Management** page, in the left pane under **Teams and Adapters**, right-click the team name, and then click **Reload Team**.

**To modify team composition:**

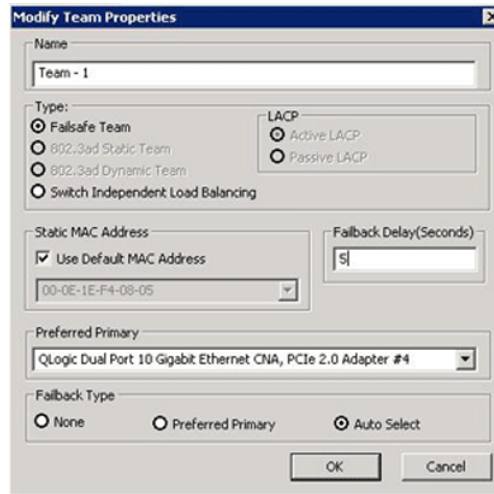
1. On the **Team Management** page, in the left pane under **Teams and Adapters**, right-click the team name whose properties are to be changed.
2. On the shortcut menu, click **Modify Team** (see [Figure 3-11](#)).



**Figure 3-11. Modifying Team Properties**

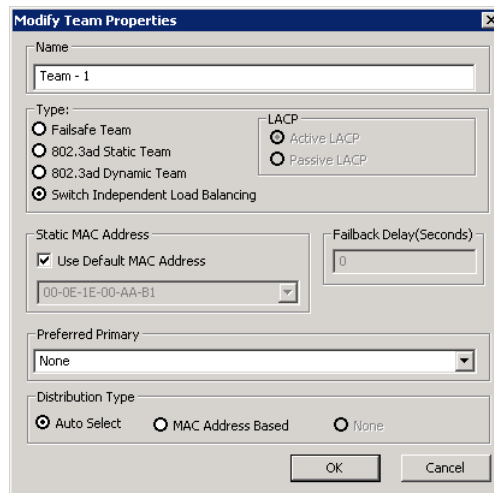
3. On the **Modify Team Properties** dialog box, change the team parameters as needed, and then click **OK**.

**Example 1:** For a failsafe team, you can change the team name, assigned team static MAC address, preferred primary adapter, and failback type, as shown in [Figure 3-12](#).



**Figure 3-12. Modifying Failsafe Team Properties**

**Example 2:** You can change the team type and the corresponding team attributes. For example, you can change from failsafe to switch-independent load balancing, or from 802.3ad static team to 802.3ad dynamic team. [Figure 3-13](#) shows a failsafe team modification, which shows the new team type and default values for team attributes. You can manually change attribute values.



**Figure 3-13. Modifying the Team Type**

## Deleting a Team

### To delete a team:

1. On the **Team Management** property page, in the left pane under **Teams and Adapters**, right-click the team name to be deleted.
2. On the shortcut menu, click **Delete team**.

## Saving and Restoring Teaming Configuration

It is recommended that you periodically save the configuration to prevent any accidental loss of network topology and settings. Current configuration including the teams, VLANs, and properties can be saved to a file. Restoring an earlier configuration results in the destruction of the current configuration.

### To save a configuration:

1. On the Team Management page under **Teams and Adapters**, right-click the **Teams** folder.
2. On the shortcut menu, click **Save to File**.
3. Enter a location to save the configuration.

### To restore a configuration:

1. On the Team Management page under **Teams and Adapters**, right-click the **Teams** folder.
2. On the shortcut menu, click **Restore From File**.
3. Select a previously saved configuration file.

## Viewing Teaming Statistics

You can view teaming and Ethernet statistics using the QConvergeConsole utility.

To view teaming statistics in the CLI, issue the following command:

```
qaucli -nic -statport
```

To reset the Ethernet statistics counter, issue the following command:

```
qaucli -nic -sreset [cna_port_inst]
```

To display Ethernet port statistics, issue the following command:

```
qaucli -nic -statport [cna_port_inst]
```

To undo the reset of Ethernet statistics counters, issue the following command:

```
qaucli -nic -sunreset [cna_port_inst]
```



## Windows VLAN Configuration

The term VLAN (Virtual Local Area Network) refers to a collection of devices that communicate as if they were on the same physical LAN. VLAN information covered in this section includes the following:

- [VLAN Properties](#)
- [Using the CLI for VLANs](#)
- [Using the GUI for VLANs](#)

### VLAN Properties

The VLAN protocol permits insertion of a tag into an Ethernet frame to identify the VLAN to which a frame belongs. If present, the four-byte VLAN tag is inserted into the Ethernet frame between the source MAC address and the length and type field. The first two bytes of the VLAN tag consist of the 802.1q tag type; the second two bytes include a user priority field and the VLAN identifier (VID).

For QLogic adapters, VLAN tagging is done according to the IEEE 802.1q protocol and the process is the same whether it is a single port or a team.

Multiple VLANs can be configured over a single port or a team of ports up to a maximum of 64 VLANs. Each VLAN is represented by a virtual network interface that is bound to the protocols.

### Using the CLI for VLANs

Use the QConvergeConsole CLI utility to view, add, and delete VLANs.

To display a list of VLANs, issue the following command:

```
qaucli -nic -vlanlist
```

To view VLAN information, issue the following command:

```
qaucli -nic -vlaninfo [vlan_inst|ALL]
```

To preview a VLAN before adding it to a port or team, issue the following command:

```
qaucli -nic -vlanadd_preview
```

To add a VLAN to a port or team, issue the following command:

```
qaucli -nic -vlanadd <list_insts> <vlan_id>
```

where `list_insts` are comma-separated port indices (for example, 1,2) and `vlan_id` is the comma-separated numeric value (for example, 1...4095 or 100,555). Use the `-vlanadd_preview` command to preview list indices.

To preview a VLAN before removing it from a port or team, issue the following command to list the indices to use in the `-vlandel` command:

```
qaucli -nic -vlandel_preview
```

To remove a VLAN from a port or team, issue the following command:

```
qaucli -nic -vlandel <list_insts|ALL> <vlan_id|ALL
```

where `list_insts` specifies the comma-separated port indices (for example, 1,2) and `vlan_id` specifies a comma-separated numeric value (for example, 1...4095 or 100,555). Use the `-vlandel_preview` command to preview list indices.

To view the content of VLAN and teaming state configuration, issue the following command:

```
qaucli -nic -vtcfgview [state_cfg_file]
```

To save the VLAN and teaming state configuration, issue the following command:

```
qaucli -nic -vtsave [state_cfg_file]
```

To restore VLAN and teaming state configuration, issue the following command:

```
qaucli -nic -vtrestore [state_cfg_file]
```

---

**NOTE:**

In the preceding commands, if the `state_cfg_file` option is not specified, the default file is `vtstate.cfg` in the installation directory.

---

## Using the GUI for VLANs

You can use the Team Management GUI to perform the following VLAN activities:

- [Adding and Configuring a VLAN](#)
- [Deleting a VLAN](#)
- [Viewing VLAN Statistics](#)

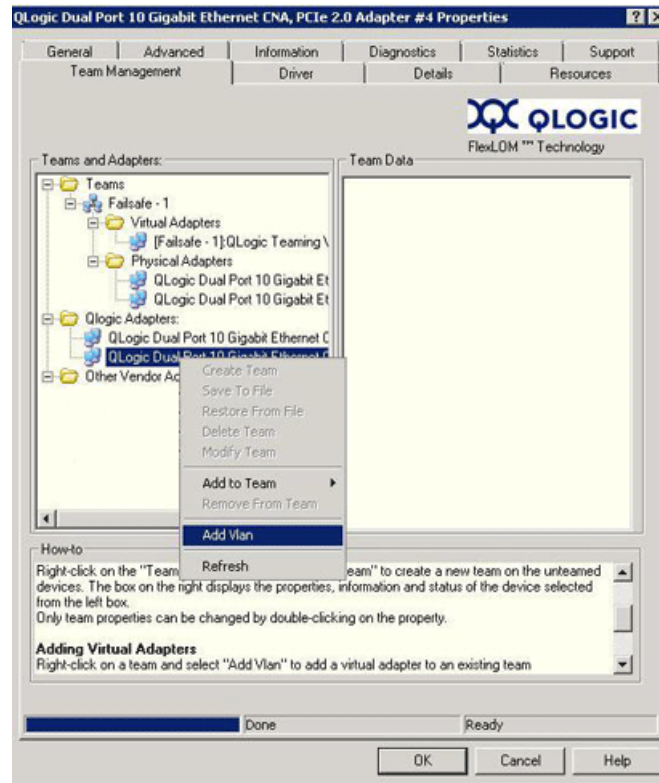
### Adding and Configuring a VLAN

Use the Team Management page to add VLAN on a team, either directly on an unteamed adapter, or on an unteamed adapter while configuring parameters for the adapter's NIC driver. Whenever a team is created a virtual adapter is implicitly created that becomes the default VLAN for the team. There can be only one untagged VLAN on a team.

Multiple virtual adapters can be created on top of the teamed adapter by creating different instances with different VLAN IDs assigned to each.

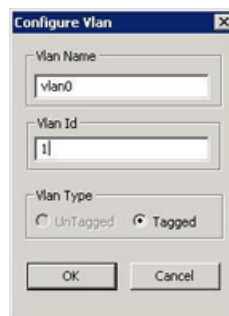
**To add and configure a VLAN:**

1. On the **Team Management** page under **Teams and Adapters**, right-click either a team or an unteamed adapter.
2. On the shortcut menu, click **Add VLAN** (see [Figure 3-14](#)).



**Figure 3-14. Adding a VLAN**

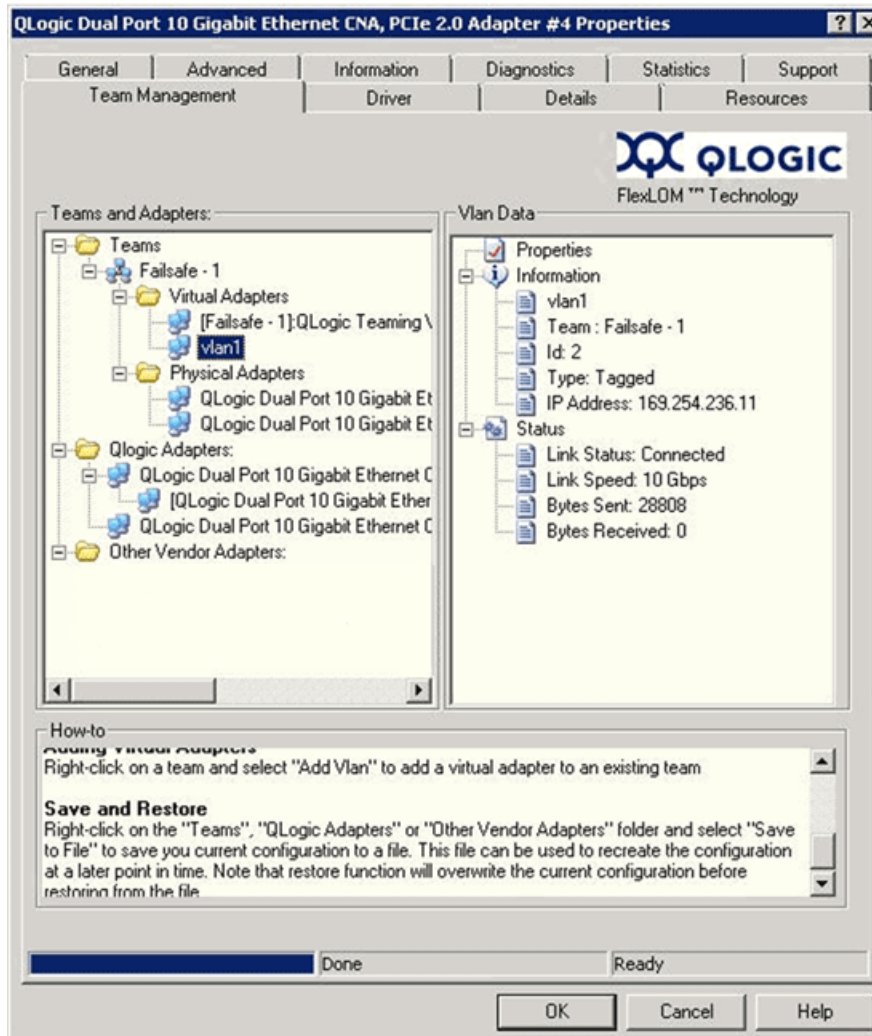
3. On the **Configure VLAN** dialog box (see [Figure 3-15](#)), type values in the **VLAN Name** and **VLAN ID** boxes, click an appropriate **VLAN Type**, and then click **OK**.



**Figure 3-15. Configuring a VLAN**

When the VLAN addition is complete, the added VLAN is visible as a **Virtual Adapter** on the **Team Management** page under **Teams and Adapters**.

4. Click the added virtual adapter to view all the properties, information, and status of the virtual adapter in the **VLAN Data** pane (see [Figure 3-16](#)).



**Figure 3-16. Viewing VLAN Data Properties**

### Deleting a VLAN

If VLAN is not needed on a team, you can delete it.

#### To delete a VLAN:

1. On the **Team Management** page, right-click the VLAN that you want to remove.
2. On the shortcut menu, click **Remove from Team**.

---

**NOTE:**

To allow VLAN deletion, there must be at least one VLAN on the team. Deleting the last VLAN on the team results in deletion of the entire team.

---

### Viewing VLAN Statistics

Follow these steps to view statistics for a selected VLAN.

**To view VLAN statistics:**

1. On the **Team Management** page, click a team name in the left pane under the **Teams** folder.
2. All the statistical data is listed in the **Team Data** pane on the right, including the VLAN type, VLAN ID, team IP, link status, link speed, and exchanged bytes.

## User Diagnostics for Windows NIC Driver Management Applications

This section covers the following information for user diagnostics for Windows NIC driver management applications:

- [Running Windows User Diagnostics](#)
- [Windows Diagnostic Test Descriptions](#)
- [Windows Diagnostic Test Messages](#)

---

**NOTE:**

The current release does not support external and internal loopback tests. Support is expected in a future release.

---

### Running Windows User Diagnostics

You can run user diagnostics using either the GUI or the CLI.

---

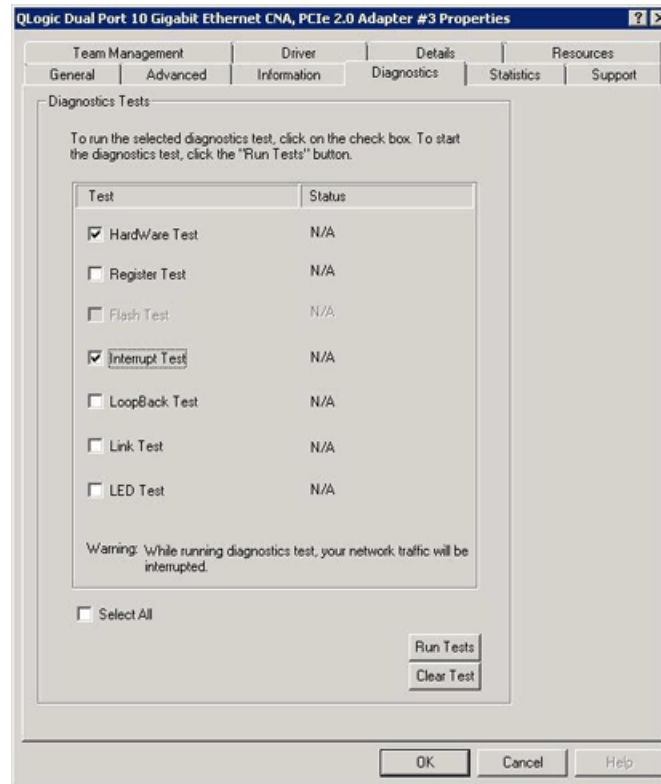
**NOTE:**

For an overview of the GUI version of QLogic's QConvergeConsole utility, see [Appendix C](#). Information on installing and starting the utility's GUI version is provided in the *QConvergeConsole User's Guide*. All procedural information for the utility is covered in the online help system.

---

**To run user diagnostics in the GUI:**

1. Access the Windows Control Panel, and then open the Device Manager.
2. In the Device Manager, right-click the QLogic 10 Gb Ethernet adapter, and then on the shortcut menu, click **Properties**.
3. On the adapter properties page, click the **Diagnostics** tab. [Figure 3-17](#) shows the Diagnostics page.



**Figure 3-17. Diagnostics Tests on Windows**

4. Under **Diagnostic Tests**, select one or more check boxes indicating the tests you want to run: **Hardware Test**, **Register Test**, **Interrupt Test**, **Loopback Test**, and **Link Test**. (“[Windows Diagnostic Test Descriptions](#)” on [page 3-54](#) describes each test type.)
5. Click **Run Tests**.

---

**NOTE:**

Only one test can run at a time. Multiple tests can run sequentially.

---

**To run user diagnostics in the CLI:**

Use QConvergeConsole CLI (qaucli), a unified command line utility, to manage all QLogic adapter models, including running user diagnostics.

The overall option (-pr <protocol>) allows you to start the utility with a specific protocol type, either NIC, iSCSI, or Fibre Channel. If you do not specify a protocol, all protocols are enabled by default. [Table 3-3](#) and [Table 3-4](#) list the QConvergeConsole commands for selecting a protocol.

**Table 3-3. Windows QConvergeConsole CLI—Selecting a Protocol in Menu Mode**

Command	Description
qaucli	Start QConvergeConsole CLI in interactive mode
qaucli -pr nic [options]	Issue NIC command line options
qaucli -pr iscsi [options]	Issue iSCSI command line options
qaucli -pr fc [options]	Issue Fibre Channel and FCoE command line options
qaucli -npar [options]	Issue NPAR command line options

**Table 3-4. Windows QConvergeConsole CLI—Selecting a Protocol in Legacy Mode**

Command	Description
qaucli -nic [options]	Use NIC legacy command line
netscli [options]	Use NIC legacy command line
qaucli iscsi [options]	Use iSCSI legacy command line
iscli [options]	Use iSCSI legacy command line
qaucli -fc [options]	Use Fibre Channel legacy command line
scli [options]	Use Fibre Channel legacy command line

Diagnostic help commands, and command options available for each specific protocol, are available by specifying -h to the protocol, as shown in [Table 3-5](#).

**Table 3-5. Windows QConvergeConsole CLI—Getting Help**

Command	Description
-h	Print usage of a specific adapter type, and then exit
qaucli -pr nic -h	Print NIC protocol usage, and then exit
qaucli -pr fc -h	Print Fibre Channel and FCoE protocol usage, and then exit
qaucli -pr iscsi -h	Print iSCSI protocol usage, and then exit
qaucli -npar -h	Print NPAR commands usage, and then exit

[Table 3-6](#) lists miscellaneous Windows diagnostics commands.

**Table 3-6. Windows QConvergeConsole CLI—Miscellaneous Commands**

Command	Description
qaucli -v	Print version number, and then exit
qaucli -h	Print usage, and then exit

[Table 3-7](#) lists the Windows CLI diagnostic test commands. Note that while running these tests, network traffic is interrupted.

**Table 3-7. Windows QConvergeConsole CLI—Diagnostic Test Commands**

Command	Description
-i --interface	Specifies the interface type (NX_NIC, NX_NIC1, and so on)
-a --all	Perform all test, regardless of default
-D --default	Perform only default test
-R --CRegs	Test all control registers (default)
-I --IRQS	Test interrupt mechanism (default)



**Table 3-7. Windows QConvergeConsole CLI—Diagnostic Test Commands (Continued)**

Command	Description
-L ---IntLB	Internal loopback test (default)
-H --Hw	Hardware test (default)
-S --LinkST	Link status test (default)
-nR --noCRegs	No control registers test (combine -D or -a)
-nI --noIRQS	No interrupt test (combine -D or -a)
-nL --noIntLP	No internal loopback test (combine -D or -a)
-nH --noHw	No hardware test (combine -D or -a)
-nS --noLinkSt	No link status test (combine -D or -a)
-h --help	View help text

For every test performed, the diagnostic utility shows the following data:

- Total number of attempts
- Number of successful completions
- Number of failures

You can either perform all tests in succession, or perform only specific tests specified by the preceding command-line parameters.

You can run additional diagnostics in the CLI as listed in the following table. To determine the `cna_port_inst`, issue the `qaucli -nic -i` command as shown in [Table 3-8](#).

**Table 3-8. Running Windows Diagnostic Tests in the CLI**

Test Type	Command
External Loopback	<pre>qaucli -nic -extloopback &lt;cna_port_inst&gt; &lt;tests_num&gt; &lt;on_error&gt;</pre> <p>where &lt;tests_num&gt; specifies the number of tests, 1–65535, and &lt;on_error&gt; is either 0=Ignore or 1=Abort.</p> <p><b>NOTE:</b> This test requires a pass-through module to be configured for both ports. Test runs between two ports. Single port loopback is not supported.</p>
Flash	<pre>qaucli -nic -testflash [cna_port_inst]</pre>
Hardware	<pre>qaucli -nic -testhw [cna_port_inst]</pre>
Internal Loopback	<pre>qaucli -nic -intloopback &lt;cna_port_inst&gt; &lt;tests_num&gt; &lt;on_error&gt;</pre> <p>where &lt;tests_num&gt; specifies the number of tests, 1–65535, and &lt;on_error&gt; is either 0=Ignore or 1=Abort.</p>
Interrupt	<pre>qaucli -nic -testinterrupt [cna_port_inst]</pre>
Link	<pre>qaucli -nic -testlink [cna_port_inst]</pre>
Ping (IPv4)	<pre>qaucli -nic -ping &lt;cna_port_inst&gt; &lt;hostname_or_IPv4&gt; [&lt;count&gt; &lt;pocket_size&gt; &lt;timeout_ms&gt; &lt;TTL&gt;]</pre> <p>where the default values are &lt;count&gt;=5, &lt;pocket_size&gt;=525, &lt;timeout_ms&gt;=1000, and &lt;TTL&gt;=30.</p>
Register	<pre>qaucli -nic -testregister [cna_port_inst]</pre>
Transceiver DMI Data	<pre>qaucli -nic -trans [cna_port_inst]</pre>

## Windows Diagnostic Test Descriptions

This section provides descriptions of the following Windows diagnostic tests.

### Hardware Test

The hardware test checks the status of various hardware blocks, including DMA Engines, Receive Engine, and on-board processor meta cores.

### Register Test

The register test performs device register read/write accesses.

### Interrupt Test

The interrupt test checks the ability of the hardware to create an interrupt and the ability of the driver to process the interrupt by forcing the generation of a predetermined number of interrupts. The test succeeds if the device generates the interrupts and the driver processes all interrupts expected.

### Loopback Test

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

### Link Test

The link test inspects the link status (up or down) by checking the physical communication channel between the host and the firmware.

## Windows Diagnostic Test Messages

If a test fails, an appropriate error code is generated and displayed, as shown in [Table 3-9](#). Note that this table does not list error messages for the Interrupt and Link tests.

**Table 3-9. Windows Diagnostic Test Messages**

Test	Error Message	Description
Loopback	LB_TEST_OK	Loopback test has passed
Loopback	LB_SEND_WAIT_QUEUE_ERR	Send queue blocked
Loopback	LB_NORCV_ERR	Receive packet not received
Loopback	LB_NOMEM_ERR	No memory error
Loopback	LB_TX_QUEUE_ERR	Transmit queue error
Loopback	LB_SHORT_DATA_ERR	Looped data short error
Loopback	LB_SEQUENCE_ERR	Looped data out of sequence
Loopback	LB_DATA_ERR	Looped data corrupted
Loopback	LB_ERR_CNT	Looped error count
Register	CR_TEST_OK	Control register test passed
Register	CR_NIU_MODE	Network interface unit (NIU) error
Register	CR_PHY	Physical layer (PHY) error
Register	CR_ERRCNT	Control register error count
Hardware	HW_TEST_OK	Hardware test has passed
Hardware	HW_DMA_BZ_0	DMA channel 0 is busy
Hardware	HW_DMA_BZ_1	DMA channel 1 is busy
Hardware	HW_DMA_BZ_2	DMA channel 2 is busy
Hardware	HW_DMA_BZ_3	DMA channel 3 is busy
Hardware	HW_SRE_PBI_HALT	Segmentation and Reassembly Engine currently halted

**Table 3-9. Windows Diagnostic Test Messages (Continued)**

Test	Error Message	Description
Hardware	HW_SRE_L1IPQ	Segmentation and Reassembly Engine currently paused due to L1 IPQ discard failure
Hardware	HW_SRE_L2IPQ	Segmentation and Reassembly Engine currently paused due to L2 IPQ discard failure
Hardware	HW_SRE_FREEBUF	Segmentation and Reassembly Engine free buffer list is
Hardware	HW_IPQ	IPQ is currently not empty
Hardware	HW_PQ_W_PAUSE	PQ write pause previously detected
Hardware	HW_PQ_W_FULL	PQ write full previously detected
Hardware	HW_IFQ_W_PAUSE	IFQ write pause previously detected
Hardware	HW_IFQ_W_FULL	IFQ write full previously detected
Hardware	HW_MEN_BP_TOUT	Memory backpressure timeout previously detected
Hardware	HW_DOWN_BP_TOUT	Downstream backpressure timeout previously detected
Hardware	HW_FBUFF_POOL_WM	Free buffer pool low watermark previously detected
Hardware	HW_PBUF_ERR	Packet buffer error previously detected
Hardware	HW_PBUF_ERR	Packet buffer error previously detected
Hardware	HW_FM_MSG_HD	FM message header error previously detected
Hardware	HW_FM_MSG	FM message error previously detected
Hardware	HW_EPG_CTRL_Q	Egress packet generator (EPG) control queue is backed up
Hardware	HW_EPG_MSG_BUF	EPG message buffer error
Hardware	HW_EPG_QREAD_TOUT	EPG read queue timeout
Hardware	HW_EPG_QWRITE_TOUT	EPG write queue timeout
Hardware	HW_EPG_CQ_W_FULL	EPG completion queue write full
Hardware	HW_EPG_MSG_CHKSM	Egress packet generator (EPG) message checksum error
Hardware	HW_EPG_MTLQ_TOUT	EPG MTL queue fetch timeout
Hardware	HW_PEG0	Peg 0 is not used
Hardware	HW_PEG1	Peg 1 is not used
Hardware	HW_PEG2	Peg 2 is not used
Hardware	HW_PEG3	Peg 3 is not used
Hardware	HW_ERRCNT	Hardware error count

For example:

```
gauccli -nic -testlink
=== Link Test for 1. CNA Port Index ===
Function is not supported by this hardware/driver/api stack
=== Link Test for 2. CNA Port Index ===
Function is not supported by this hardware/driver/api stack
=== Link Test for 3. CNA Port Index ===
Function is not supported by this hardware/driver/api stack
=== Link Test for 4. CNA Port Index ===
Function is not supported by this hardware/driver/api stack
=== Link Test for 5. CNA Port Index ===
Link Test Starts ...
Test Status:                Passed (Passed=1, Failed=0, ErrorCode=0)
Register Test Results:
    Status=Passed
    Passed=1, Failed=0, ErrorCode=0

=== Link Test for 6. CNA Port Index ===
Link Test Starts ...
Test Status:                Passed (Passed=1, Failed=0, ErrorCode=0)
Register Test Results:
    Status=Passed
    Passed=1, Failed=0, ErrorCode=0
```

## Linux Management Applications

Linux management applications for the QME8242 include the following:

- [Linux NIC Driver Management Applications](#)
- [User Diagnostics for Linux NIC Driver Management Applications](#)

## Linux NIC Driver Management Applications

The following sections describe how to configure and manage the driver and adapter using Linux management utilities.

### Overview

The following sections describe how to configure and manage the driver and adapter using Linux management utilities.

### Viewing and Changing Adapter Properties on Linux

Use the following Linux utilities to view and change adapter properties:

- [gauccli Utility](#)
- [ethtool Utility](#)
- [phantomcore Utility](#)

## qaucli Utility

Install QConvergeConsole CLI (qaucli) from the following packages supplied by QLogic:

- Package file  
`QConvergeConsoleCLI-<version>_linux_<arch>.install.tar.gz`
- RPM installer package file  
`QConvergeConsoleCLI-<version>_<arch>.rpm`

Example RPM package installation:

1. To determine if the QCC is installed and to find the full name of the installed QCC RPM package, issue the following command using the partial name “QConvergeConsoleCLI” as an argument to grep:

```
rpm -qa | grep QConvergeConsoleCLI
```

2. To check for an older version of the RPM package, issue the following command:

```
rpm -qa QConvergeConsoleCLI
```

3. If an older version is found, erase that version by issuing the following command:

```
rpm -e QConvergeConsoleCLI
```

4. To install the new version, issue the following command:

```
rpm -ihv QConvergeConsoleCLI-1.0.00-04.i386.rpm
```

The utility is installed in the  
`/opt/QLogic_Corporation/QConvergeConsoleCLI` directory.

Some software releases require firmware to be updated in the NIC’s Flash memory. See the release notes for your software package in order to see if this is necessary. If so, use the uCLI tool to flash the card.

The qaucli utility forces uCLI to use the NIC protocol interface to do a Flash update. For example:

```
.\qaucli -pr nic .updimages [cna_instance] image_file
```

To have uCLI automatically select a protocol interface to do Flash update, issue the following command:

```
.\qaucli -nic .updimages [cna_instance] image_file
```

## ethtool Utility

Use the ethtool utility to view adapter statistics and configure interface options. For additional details, refer to qlcnic driver man page and ethtool man page.

Examples:

To disable transmit segmentation offload, issue the following command, where [n] represents a numerical value for a specific instance:

```
ethtool -K eth[n] tso off
```

To list interface statistics, issue the following command, where [n] represents a numerical value for a specific instance:

```
ethtool -S eth[n]
```

### Sample Output 1:

```
ethtool -S eth8
NIC statistics:
xmit_called: 6
xmit_finished: 6
rx_dropped: 0
tx_dropped: 0
csummed: 0
rx_pkts: 0
lro_pkts: 0
rx_bytes: 0
tx_bytes: 468
lrobytes: 0
lso_frames: 0
xmit_on: 0
xmit_off: 0
skb_alloc_failure: 0
null_skb: 0
null_rxbuf: 0
rx_dma_map_error: 0
```

In the following example, ethtool eth[n] lists interface settings.

### Sample Output 2:

```
Ethtool eth8
Settings for eth8:
Supported ports: [ TP FIBRE ]
Supported link modes:
Supports auto-negotiation: No
Advertised link modes: 10000baseT/Full
Advertised auto-negotiation: No
Speed: 10000Mb/s
Duplex: Full
```

```
Port: FIBRE
PHYAD: 1
Transceiver: external
Auto-negotiation: off
Supports Wake-on: g
Wake-on: g
Current message level: 0x00000000 (0)
Link detected: yes
```

### phantomcore Utility

Use the phantomcore utility to collect a firmware dump that is useful for forwarding to QLogic Support.

To collect a firmware dump:

1. To turn off auto recovery in the driver, issue the following command:

```
insmod qlcnic.ko auto_fw_reset=0
```

2. To collect the firmware dump, issue the following command:

```
phantomcore -i <interface name>
```

The utility generates a core file that contains the firmware dump.

## User Diagnostics for Linux NIC Driver Management Applications

This section covers the following information for user diagnostics for Linux NIC driver management applications:

- [Running Linux User Diagnostics](#)
- [Linux Diagnostic Test Descriptions](#)
- [Linux Diagnostic Test Messages](#)

---

### NOTE:

The current release does not support external and internal loopback tests. Support is expected in a future release.

---

### Running Linux User Diagnostics

Linux user diagnostics include QConvergeConsole diagnostics and ethtool diagnostics.



---

## QConvergeConsole Diagnostics

---

### NOTE:

For an overview of the GUI version of QLogic's QConvergeConsole utility, see [Appendix C](#). Information on installing and starting the utility's GUI version is provided in the *QConvergeConsole User's Guide*. All procedural information for the utility is covered in the online help system.

---

QConvergeConsole CLI-based diagnostics include the following commands:

- To enable or disable the port beacon, issue the following command:

```
qaucli -pr nic -beacon [cna_port_inst] <on|off>
```

- To run an internal loopback test, issue the following command:

```
qaucli -pr nic -intloopback <cna_port_inst> <tests_num>  
<on_error>
```

where `tests_num` is the number of tests (1–65535) and `on_error` is either 0=Ignore or 1=Abort

- To perform a Flash test, issue the following command:

```
qaucli -pr nic testflash [cna_port_inst]
```

- To perform a hardware test, issue the following command:

```
qaucli -pr nic -testhw [cna_port_inst]
```

- To perform an interrupt test, issue the following command:

```
qaucli -pr nic -testinterrupt [cna_port_inst]
```

- To perform a link test, issue the following command:

```
qaucli -pr nic -testlink [cna_port_inst]
```

- To perform a register test, issue the following command:

```
qaucli -pr nic -testregister [cna_port_inst]
```

- To display transceiver DMI data, issue the following command:

```
qaucli -pr nic -trans [cna_port_inst]
```

### Ethtool Diagnostics

To perform an adapter self-test using ethtool-based diagnostics, issue the following command:

```
# ethtool -t eth<x> offline
```

The self-test includes the following:

- Loopback test
- Interrupt test
- Link test
- Register test

Examples:

```
# ethtool -t eth8 offline
The test result is PASS
The test extra info:
Register_Test_on_offline           0
Link_Test_on_offline               0
Interrupt_Test_offline             0
Loopback_Test_offline              0
```

```
# ethtool -t eth4
The test result is PASS
The test extra info:
Register_Test_on_offline           0
Link_Test_on_offline               0
Interrupt_Test_offline             0
Loopback_Test_offline              0
```

## Linux Diagnostic Test Descriptions

- *Internal Loopback Test* performs internal packet loopback.
- *Flash Test* verifies the Flash read and write.
- *Hardware Test* verifies that the hardware is running.
- *Interrupt Test* enables and disables the interrupt and functional verification tests.
- *Link Test* verifies that the port is linked, meaning that the port has a good cable attached to the port and that other end of the cable is connected to an operational Ethernet port, either another NIC port or a network device, such as a switch.
- *Register Test* verifies the NIC register read and write.

## Linux Diagnostic Test Messages

Test information and PASS or FAIL messages are displayed for each of the tests listed in [“Linux Diagnostic Test Descriptions” on page 3-62](#).

## VMware Management Applications

VMware management applications for the QME8242 include the following:

- [VMware NIC Driver Management Applications](#)
- [User Diagnostics for VMware NIC Driver Management Applications](#)

### VMware NIC Driver Management Applications

This section provides the following information about the VMware NIC driver management applications.

#### Overview

VMware® vSphere™ provides a Common Information Model (CIM) monitoring framework for both classic ESX and ESXi. Use this framework to configure and manage Ethernet interfaces. On an ESX Server™, you can configure and manage Ethernet interfaces using a command line interface. On an ESXi Server, use the remote Command Line Interfaces (remote CLIs).

#### Using NPAR Under ESX

All NPAR Ethernet functions are enumerated by the hypervisor, controlled by the driver running in the hypervisor, and configured similar to other Ethernet interfaces. For more details, see [“NIC Partitioning \(NPAR\)” on page 3-25](#).

You would typically create a virtual switch (vSwitch) for each NPAR interface. You can configure Virtual Machines (VMs) to use the standard virtual network devices, such as VMXNET 3 adapters. On each interface, you can configure features such as NetQueue. Although it is possible to configure all standard aggregation and failover configurations supported by ESX using NPAR interfaces as uplinks, it is not useful to have multiple uplinks with NPARs belonging to the same physical port.

The vSwitch switches the packets when VMs are assigned to share the same NPAR. The embedded switch (eSwitch) on the adapter switches packets when packets are sent by a VM on an NPAR destined to another VM that is connected to a vSwitch on a different NPAR belonging to the same physical port. If the two NPARs are associated with different physical ports, the external switch forwards packets between them.

Perform vSwitch configuration using either standard service console commands or RCLI commands. For specific command options, refer to the VMware documentation.

---

#### **NOTE:**

The QME8242 adapter has eSwitches. Because all of the interfaces are assigned to the hypervisor, eSwitch operation is transparent, and the system administrator is not required to perform any additional configuration.

---

## User Diagnostics for VMware NIC Driver Management Applications

This section covers the following information for user diagnostics for VMware.

### Ethtool

Use the ethtool utility to view adapter statistics and configure interface options.

Supported options include the display of device information, protocol offload options, driver information, adapter statistics, and more. For details, refer to the ethtool man page.

To view driver and firmware versions, issue the following command:

```
ethtool -i vmnic[n]
```

Example:

```
# ethtool -i vmnic7
driver: qlcnic
version: 4.0.614
firmware-version: 4.3.2
bus-info: 0000:10:00.3
```

To view interface statistics, issue the following command:

```
ethtool -S vmnic[n]
```

Example:

```
# ethtool -S vmnic7
NIC statistics:
  bad_skblen: 0
  rcvd_badskb: 0
  xmit_called: 617618
  xmit_finished: 617618
  rx_dropped: 0
  tx_dropped: 0
  csummed: 777792
  rx_pkts: 897558
  lro_pkts: 0
  rx_bytes: 78433279
  tx_bytes: 60526284
```

### EFI

This section provides user notes regarding the Unified Extensible Firmware Interface (UEFI) driver contained in the 10 Gb multi-boot image. It includes the following sections:

- [UEFI Package Contents](#)
- [Supported Features](#)
- [Fibre Channel Adapter Configuration](#)
- [Updating the UEFI \(EfiUtilx64\)](#)

## UEFI Package Contents

Files in the UEFI driver package include the following:

- `p3pxxxxxx.bin` is a combined binary file, which includes the binaries for BIOS, FCode, UEFI driver, and RISC firmware.
- `EfiUtil.EFI` or `EfiUtilx64.EFI` is the UEFI Utility to update the UEFI driver, firmware, and NVRAM.
- `QL8XXX.DRV` is the auxiliary driver file used for updating the adapter.
- `UPDATE.NSH` is the UEFI script file used to update the adapter on a UEFI system.
- `EFICFG.PDF` is the Adapter Configuration and Diagnostic PDF.
- `EFIUTIL.PDF` is the Adapter EfiUtil Utility PDF.

The preceding PDF files are included in the boot code release package, EFI directory.

---

### NOTE:

All `bin`, `uefi`, and `nsh` files are required to update the adapter on a UEFI system.

---

## Supported Features

The UEFI driver supports the following features:

- UEFI specification 1.10, 2.1
- UEFI protocols: Extended SCSI Pass Thru, Block IO, SCSI IO, Driver Diagnostics, Driver Configuration, and Component Name
- 382 targets
- 2,047 LUNs per target
- Fabric topology
- Boot from SAN
- Compatible with RHEL 5.5 and SLES 11 SP 1 x64, and Windows Server 2008 x64 on UEFI Intel x64 based systems EFI Specification 1.10 and 2.1

## Fibre Channel Adapter Configuration

To configure the adapter parameters, refer to the `EFICFG.PDF` file included in the boot code release package, EFI directory.

## Updating the UEFI (EfiUtilx64)

For systems that do not include a built-in UEFI Shell, obtain the UEFI Shell program from an open source site, such as <https://www.tianocore.org/>.

The EfiUtilx64 is a QLogic Flash programming utility for UEFI. To run the utility, boot the UEFI shell. Do not run this utility from a drive connected to a Converged Network Adapter.

Make sure `update.nsh`, `efiutilx64.efi`, `ql8xxx.drv`, and `p3pxxxxxx.bin` source files are in the same directory.

To update the UEFI driver and RISC firmware on all adapters:

1. Unzip and copy the update kit files to the root level of a USB storage device.

---

**NOTE:**

Do not change or rearrange the kit directories or files that were unzipped and copied to the USB storage device.

---

2. Connect the USB device to the UEFI-based system with the 8xxx adapters.
3. At the system's UEFI shell prompt, issue the `map -r` command to map the USB device file system. You can check the mapping as follows:

```
map -b
```

4. Locate the USB device and change to that device. For example, if the USB device is mapped to `fs9` after the `map -r`:

```
fs9: <ENTER>
```

The UEFI shell prompt should change as follows:

```
fs9:\>
```

5. To update the UEFI driver and RISC firmware, run the `update.nsh` script. For example:

```
fs9:> update.nsh
```

`Update.nsh` calls `efiutilx64.efi` to update all of the adapters.

6. For the changes to take effect, power the system off, and then back on.

To update NVRAM or perform other manual EfiUtilx64 flash functions, refer to the information in the file, `efiutil.pdf`.

To write, read, or verify the multi-boot image on the adapter, use `EfiUtilx64`.

---

**NOTE:**

To perform other manual EfiUtilx64 flash functions, refer to `efiutil.pdf`.

---

# 4 Boot Configuration

This section provides the following information about boot configuration for the QLogic QME8242:

- [Boot from SAN](#)
- [PXE Boot Setup](#)
- [iSCSI Configuration Using Fast!UTIL](#)
- [iBFT Boot Setup \(iSCSI\)](#)
- [DHCP Boot Setup \(iSCSI\)](#)

## Boot from SAN

Booting servers from Storage Area Networks (SANs) can provide significant benefits in today's complex data center environments. One of the driving forces behind SANs is the need to deliver mission-critical data quickly, at any time, without interruptions or delays.

This section provides the following information on boot from SAN:

- [General Boot from SAN](#)
- [Windows Boot from SAN](#)
- [Linux Boot from SAN](#)
- [ESX Boot from SAN](#)

### General Boot from SAN

The following high-level boot from SAN instructions apply to all OSs: Linux, Windows, and ESX:

1. Set up the boot order to disable boot from local disk or disconnect internal hard drives.
2. Configure a single path to the storage array when installing Microsoft Windows. For multiple QME8242 port configurations (for redundancy), only one QME8242 port should be connected to the SAN during installation. The same recommendation applies to the storage controller ports.
3. Enable the QME8242 port BIOS.
4. Specify a boot LUN from the QLogic QME8242 *Fast!UTIL* BIOS configuration utility.

### Windows Boot from SAN

This section provides the following procedures:

- [Creating a Driver Disk](#)
- [Windows 2003 Boot from SAN](#)
- [Windows 2008 Boot From SAN](#)

#### Creating a Driver Disk

Before you begin boot from SAN for Windows, create a driver disk as follows:

1. Go to the QLogic Web site:  
<http://driverdownloads.qlogic.com>
2. Under the Downloads banner, click **QLogic Products**.



3. In the selection list, do the following:
  - a. In the first box, click **Converged Network Adapters** or **iSCSI Adapters**.
  - b. In the second box, click your adapter model number.
  - c. In the third box, click your Windows platform.
  - d. Click the **Go** button.
4. Under **Drivers**, click the download link for the appropriate driver.
5. Read the license agreement, and then click **Agree**.
6. When prompted, select to save the driver to a temporary location on the hard drive.
7. For a Boot from SAN installation, save the driver on the appropriate media (floppy disk or USB flash drive, for example).
8. Run the self-extracting file you just downloaded and enter a temporary directory in the **Unzip to folder** box. (If the final driver package is not saved in an .EXE format, this step is not required.)
9. Right-click the driver to extract the driver files to the temporary location.

## Windows 2003 Boot from SAN

---

### **NOTE:**

The following procedure requires a driver disk; see [“Creating a Driver Disk” on page 4-2](#).

---

For Windows 2003, follow these steps to perform an initial OS installation with the QLogic QME8242 adapter as boot or as add-on.

1. Start the Windows installation procedure using the setup CD.
2. Press F6 when the following message appears:  
**Press F6 if you want to install a third-party SCSI or RAID driver....  
After all the standard devices have been loaded, press S to Specify Additional Device.**
3. Insert the QLogic driver diskette and press ENTER.
4. Select the QLogic FCoE Adapter or iSCSI Adapter, and then press ENTER.
5. For Windows Server 2003, press S to use the driver on the floppy drive.

The following message appears:

**Setup will load support for the following mass storage devices.  
QLogic FCoE Adapter. [or iSCSI Adapter]  
Press Enter=Continue.**

6. Press ENTER.
7. Continue with the standard installation procedure.

## Windows 2008 Boot From SAN

For Windows 2008, follow these steps to perform an initial OS installation with the QLogic QME8242 adapter as boot or as add-on.

---

### NOTE:

The following procedure requires a USB flash drive; see [“Creating a Driver Disk” on page 4-2](#).

---

To perform the Windows 2008 boot from SAN, follow these steps.

1. Start the Windows installation procedure using the setup CD.
2. When the following message appears, click **Custom (Advanced)**:  
**Which type of installation do you want?**
3. When the following message appears, click **Load Driver**:  
**Where do you want to install Windows?**
4. At the **Load Driver** window, insert the USB flash drive in a USB port, and then click **OK**.
5. To continue with the standard installation procedure, click **Next**.

## Linux Boot from SAN

This section provides the following procedures:

- [Red Hat Enterprise Linux Boot from SAN](#)
- [SUSE Linux Enterprise Server \(Novell\) Boot from SAN](#)

### Red Hat Enterprise Linux Boot from SAN

Follow these steps to install boot from SAN for Red Hat Enterprise Linux, all supported versions:

1. Insert the current Linux Red Hat product CD #1 in the CD drive, and then boot the system.  
The system boots from the CD and stops at the boot prompt.
2. At the boot prompt, type `Linux dd`, and then press ENTER.  
The Driver Disk message box displays the following prompt:  
**Do you have a driver disk?**
3. Click **YES**, then press ENTER.

4. In the **Driver Disk Source** window, select the driver source:
  - If the driver file is on a disk, select **fd0**, then press ENTER.
  - If the driver file is on a CD, select **hdx** (where x = CD drive letter), and then press ENTER.

The **Insert Driver Disk** window opens.

5. Insert the iso-dd-kit disk into either the disk drive or the CD drive, depending on the option selected in step 4.

6. Click **OK**, and then press ENTER.

The SCSI driver is loaded automatically.

The **Disk Driver** window opens and prompts you to install more drivers.

7. Click **NO**, and then press ENTER.
8. Insert the current Linux Red Hat product CD #1 in the CD drive (remove the iso-dd-kit CD first, if necessary), and then press ENTER.
9. Follow the on-screen instructions to complete the installation.

### SUSE Linux Enterprise Server (Novell) Boot from SAN

Follow these steps to install boot from SAN for SUSE Linux Enterprise Server (Novell), all supported versions:

1. Insert the SLES CD #1 in the CD drive, and then boot the system.
2. On the main installation window, press one of the following keys:
  - Press F5 for SLES 10 SP3
  - Press F6 for SLES 11 and SLES 11 SP1

The system prompts you to select either **Yes**, **No**, or **File**.

3. Select **Yes**.
4. Select the installation option, and then press ENTER.

The system prompts you to choose a driver update medium.

5. Ensure that the dd-kit is inserted in the appropriate drive, either the CD-ROM or floppy drive, and then select the drive (for dd-kit ISO images, select the CD-ROM), and then press ENTER.

The driver update is loaded to the system.

If the driver update was successful, the **Driver Update OK** message appears.

6. Press ENTER.

7. If the system prompts you to update another **drive**, click **BACK**, and then press ENTER.

The following message appears:

**Make sure that CD number 1 is in your drive.**

8. Insert the SLES CD #1 in the drive, and then click **OK**.
9. Follow the on-screen instructions to complete the installation.

## ESX Boot from SAN

For VMware ESX only (does not apply to ESXi 4.x), follow these steps to install the driver for devices as part of a new ESX installation.

---

### **NOTE:**

You will need the ESX installation DVD to begin.

---

1. Place the ESX installation DVD in the host DVD drive.
2. Restart the host.
3. Read and accept the terms of the license agreement.
4. Select a keyboard type.
5. When prompted for custom drivers, select **Yes** to install custom drivers.
6. To eject the ESX installation DVD, click **Add**.
7. Place the driver CD in the ESX host DVD drive.
8. Select the driver module from which to import drivers to the ESX host, and then click **Next**.
9. On the **Load the system drivers?** message box, click **Yes**.
10. After loading the driver module, continue installing ESX.
11. After the driver is installed, you are prompted to swap the driver CD with the ESX installation DVD.

## PXE Boot Setup

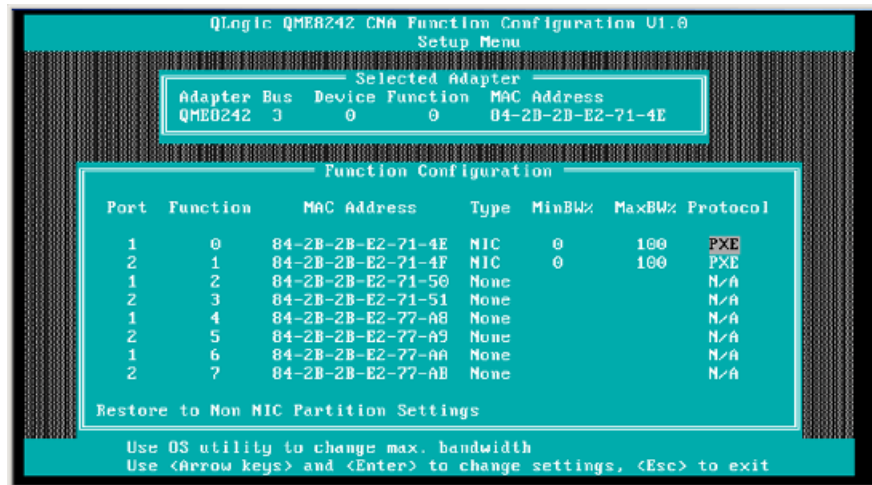
The Pre-boot eXecution Environment (PXE) allows a workstation to boot from a server on a network prior to booting the operating system on the local hard drive.

### Configuring PXE Boot

This section provides procedures for configuring the QME8242 to perform PXE boot.

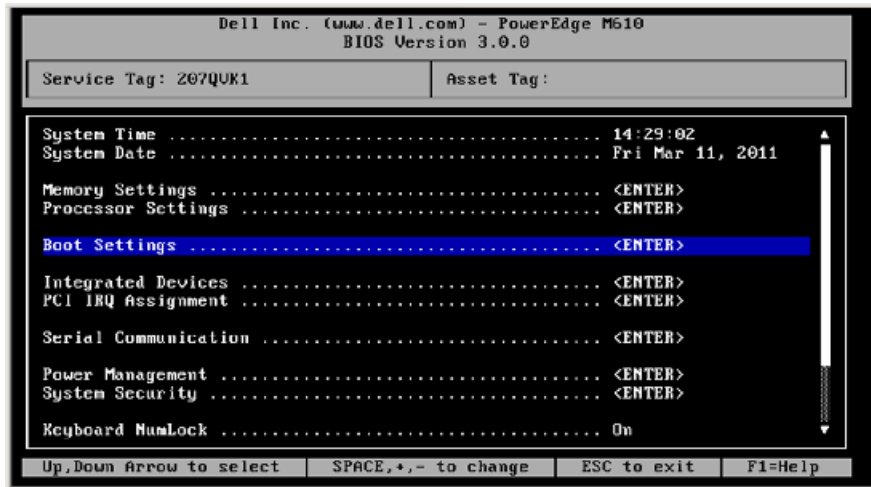
#### To configure PXE boot:

1. During POST, press CTRL+Q to enter the **QLogic QME8242 CNA Function Configuration** window.
2. On the Function Configuration main window, ensure that the **Protocol** is set to **PXE**, as shown in [Figure 4-1](#).



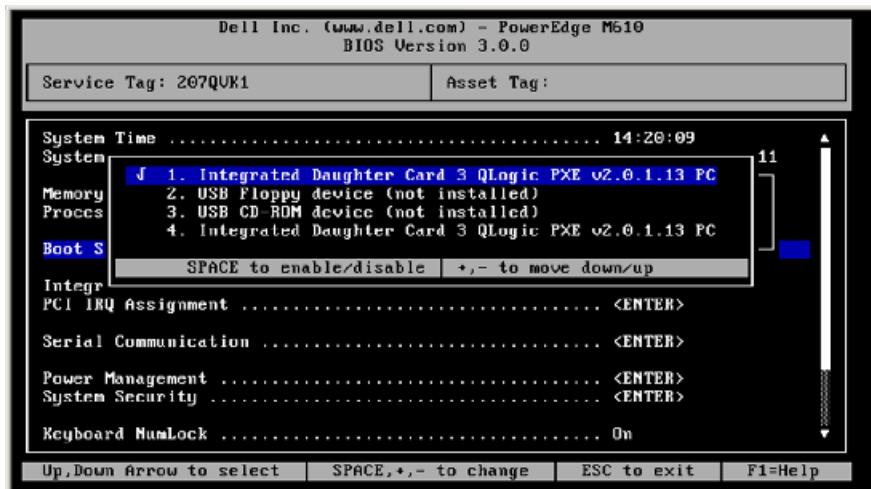
**Figure 4-1. QLogic QME8242 CNA Function Configuration**

3. Press ESC to exit.
4. Select **Save changes** to save your edits, exit, and reboot the system.
5. During POST, press F2 to enter the Dell BIOS system.
6. Select **Boot Settings**, and then press ENTER, as shown in [Figure 4-2](#).



**Figure 4-2. Dell BIOS: Boot Settings**

7. Select the **Boot Sequence** option, and then press ENTER.
8. Select the **Integrated Daughter Card 3 QLogic PXE...** entry, and then press UP ARROW to move this entry to the first position, as shown in [Figure 4-3](#).



**Figure 4-3. Dell BIOS: Integrated Daughter Card 3 QLogic PXE**

9. Press ESC, and then select **Save changes and exit**.  
The system reboots.
10. After the system reboot, follow the screen prompt for PXE boot server for the installation of OS of your choice.

## iSCSI Configuration Using *Fast!UTIL*

*Fast!UTIL* is the QLogic iSCSI BIOS Configuration utility used to configure the iSCSI TCP/IP Offload Engine (TOE).

- [Accessing Fast!UTIL](#)
- [Configuring Host Adapter Settings](#)
- [Configuring iSCSI Boot Settings](#)

In addition, you can use *Fast!UTIL* for [Configuring DHCP iSCSI Boot for IPv4](#).

### Accessing *Fast!UTIL*

To access *Fast!UTIL* for PXE, iSCSI, and FCoE, respectively, press CTRL+Q during the QME8242 adapter BIOS initialization PXE, iSCSI, or FCoE QLogic banner display.

It may take a few seconds for the *Fast!UTIL* menu to appear. The *Fast!UTIL* Options menu for iSCSI contains the following selections:

- Configuration Settings
- Scan iSCSI Devices
- iSCSI Disk Utility
- Ping Utility
- Loopback Test
- Reinit Adapter
- Select Host Adapter
- Exit Fast!UTIL

*Fast!UTIL* prompts you to select the adapter you want to configure. After changing the settings, exit and reboot your system to load the new *Fast!UTIL* parameters.

### Configuring Host Adapter Settings

On the *Fast!UTIL* Options menu, select **Configuration Settings**, and then select **Host Adapter Settings** to configure the following:

- **Spin Up Delay**

When this bit is set, access to the devices is delayed. The default setting is **Disabled**. When Spin Up Delay is **Enabled**, press CTRL+S to bypass Spin Up Delay during BIOS initialization.
- **Initiator IPv4 and IPv6 Address Through DHCP**

When set to **Yes**, the QME8242 adapter uses the dynamic host configuration protocol (DHCP) to obtain its IP address, subnet mask, and gateway IP address. Press ESC three times to save the changes.

---

**NOTE:**

These values are not populated when you save the settings for the IP address, Subnet Mask, Gateway, IPv6 Routable Address 1, and IPv6 Routable Address 2.

---

■ **Initiator IPv4/IPv6 Address**

When DHCP is set to **No**, this field must contain a valid IP address.

■ **Subnet Mask**

When DHCP is set to **No**, this field must contain a valid subnet mask.

■ **Gateway IP Address**

When DHCP is set to **No**, this field must contain a valid gateway IP address; otherwise, the system under configuration can communicate only with other nodes on its LAN.

■ **Initiator iSCSI Name**

Press ENTER to configure the iSCSI name of the initiator. Specifying the Initiator iSCSI Name is optional; however, if not specified, the iSCSI function uses the default iSCSI qualified name (IQN) that is programmed during manufacture. Use this option to specify an IQN other than the default.

■ **Initiator CHAP Name**

Press ENTER to configure the bidirectional (BIDI) challenge handshake authentication protocol (CHAP) name.

■ **Initiator CHAP Secret**

Press ENTER to configure the BIDI CHAP secret.

## Configuring iSCSI Boot Settings

On the *Fast!UTIL* Options menu, select **Configuration Settings** to access the **iSCSI Boot Settings** and specify the drive you want to boot from. Press C to clear the boot device information from the primary and alternate boot locations.

---

**NOTE:**

For an alternate method of iSCSI boot from SAN, use the fields in the iSCSI Boot Firmware Table (iBFT). For details, see [“iBFT Boot Setup \(iSCSI\)” on page 4-19](#).

---



iSCSI boot setup information includes the following:

- [Boot Device Primary and Alternate](#)
- [Adapter Boot Mode](#)
- [Primary and Alternate Boot Device Settings](#)
- [Configuring the iSCSI Boot Parameters](#)
- [Configuring the iSCSI Boot Settings](#)
- [Preparing the Image on the Local Hard Drive](#)
- [Transferring the OS Image to the iSCSI Target](#)
- [Booting](#)

### Boot Device Primary and Alternate

After configuring a device (through **Primary/Alternate Boot Device Settings**), press ENTER on these locations to view a list of available devices. To select an iSCSI boot device, highlight the device, and then press ENTER.

### Adapter Boot Mode

- *Disable*—Select this option to disable the ROM BIOS on the QME8242 adapter, freeing space in upper memory.
- *Manual*—Select this option to manually configure the parameters for the iSCSI boot device in the **Primary/Alternate Boot Device Settings** area. Manual parameters include the following:
  - Initiator IPv4/IPv6 Address via DHCP*—When set to **Yes**, the QME8242 adapter uses DHCP to obtain its IP address, subnet mask, and gateway IP address. Press ESC three times to save the changes. These values are not populated when you save the settings for the IP address, subnet mask, gateway, IPv6 routable addresses, and initiator IPv4 or IPv6 address. When DHCP is set to **No**, this field must contain a valid IP address.
  - Subnet Mask*—When DHCP is set to **No**, this field must contain a valid subnet mask.
  - Gateway IP Address*—When DHCP is set to **No**, this field must contain a valid gateway IP address.
  - Initiator iSCSI Name*—Press ENTER to configure the iSCSI name of the initiator. By default, the iSCSI name (containing two parts, the standard product model and serial number) is used. If you change the iSCSI name, you need to flash the adapter to make the name change permanent.
  - Initiator CHAP Name*—Press ENTER to configure the bidirectional CHAP name.

- Initiator CHAP Secret*—Press ENTER to configure bidirectional CHAP secret. You can access the iSCSI Boot Settings area from the **Configuration Settings** menu. Use these options to specify the drive from which you want to boot. Press C to clear the boot device information from the primary and alternate boot locations.
- *DHCP*—Select this option to have the initiator acquire its IP address from a DHCP server. The initiator also acquires all boot parameters for an iSCSI target if the boot parameters are specified on the DHCP server. This setting requires advanced users to manually input vendor-specific information on the DHCP server and in the **Vendor ID** field of the DHCP Boot Settings area.

### Primary and Alternate Boot Device Settings

- *Security Settings*—Press ENTER to access Primary Boot Security Settings. Press ENTER to enable or disable CHAP and bidirectional CHAP, and to configure the CHAP Name and CHAP Secret. (Depending on your configuration, it may not be necessary to configure this option.)
- *Target IP*—When the Adapter Boot Mode is set to **Manual**, you must use this field to specify the IP address of the intended iSCSI boot target.
- *Target Port*—Enter the port used by the target. (By default, iSCSI uses port 3260. Do not modify this unless it is necessary.)
- *Boot LUN*—Enter the logical unit number (LUN) of the boot device. (Depending on your configuration, it may not be necessary to change this option.)
- *iSCSI Name*—Enter the iSCSI name of an intended boot target. (Depending on your configuration, it may not be necessary to configure this option.)
- *DHCP Dynamic iSCSI Boot Configuration*—Select this option to have the initiator acquire its IP address from a DHCP server. The initiator also acquires all boot parameters for an iSCSI target if the boot parameters are specified on the DHCP server. This setting requires advanced users to manually input vendor-specific information on the DHCP server and in the **Vendor ID** field of the DHCP Boot Settings area.
  - Vendor ID* is the identification string sent to DHCP server.
  - Alternate Client ID* provides an alternative for DHCP clients to use instead of the **dhcp-client-identifier** option. The alternate client ID is a unique identifier string sent to the DHCP server. It provides an additional filtering option to set device-specific boot parameters. If this field is not set, a default identifier string consisting of the devices MAC address is used.
  - Configure Parameters* for the secondary adapter.
  - Select Host Adapter* if you have multiple QME8242 adapters in your system, select, view, and configure the settings of a specific QME8242 adapter.

---

**NOTE:**

These options apply only to disk devices; they do not apply to tape drives and other non-disk devices.

---

## Configuring the iSCSI Boot Parameters

This section discusses how to configure a QLogic iSCSI adapter for booting from a SAN. On a system set up to boot from a SAN, the system BIOS must designate the iSCSI adapter as the boot controller. To locate the target boot LUN, you must enable the QLogic BIOS on the iSCSI adapter.

### To enable the QLogic iSCSI adapter to boot from a SAN:

1. During server POST, press CTRL+Q to enter the QLogic iSCSI *Fast!UTIL* BIOS.
2. Select the I/O port to configure. By default, the **Adapter Boot** mode is set to **Disable**.

## Configuring the iSCSI Boot Settings

1. From the *Fast!UTIL* Options menu, select **Configuration Settings**, and then select **iSCSI Boot Settings**.
2. Before you can set **SendTargets**, set the **Adapter Boot** mode to **Manual**.
3. Select **Primary Boot Device Settings**.
4. Enter the discovery **Target IP** and **Target Port**.
5. You can leave the **Boot LUN** and **iSCSI Name** fields blank only if one iSCSI target and one LUN are at the specified address from which to boot. Otherwise, you must specify these fields to ensure that you do not boot from a volume for some other system. After the target storage system is reached, these fields are populated after a rescan.
6. Save your changes.
7. From the **iSCSI Boot Settings** menu, select the primary boot device. An auto rescan of the host bus adapter finds new target LUNs.
8. Select the iSCSI target.

---

**NOTE:**

If more than one LUN exists within the target, you can choose a specific LUN ID by pressing ENTER after you locate the iSCSI device. Return to the **Primary Boot Device Setting** menu. After the rescan, the **Boot LUN** and **iSCSI Name** fields are populated.

---

9. Change the value of **Boot LUN** to the LUN ID you want.

10. Save your changes and restart the system.

For additional details and the most current information about QLogic host adapter configuration settings, see the QLogic host adapter readme file on the QLogic Web site.

For information on configuring iSCSI boot parameters, refer to sections [“Adapter Boot Mode” on page 4-11](#) and [“Primary and Alternate Boot Device Settings” on page 4-12](#).

## Boot Protocol Configuration

Boot protocol primary and alternate boot device settings include the following:

- *Security Settings*—Press ENTER to access Primary Boot Security Settings. Press ENTER to enable or disable CHAP and bidirectional CHAP, and to configure the CHAP Name and CHAP Secret. (Depending on your configuration, it may not be necessary to configure this option.)
- *Target IP*—When the Adapter Boot Mode is set to **Manual**, you must use this field to specify the IP address of the intended iSCSI boot target.
- *Target Port*—Enter the port used by the target. (By default, iSCSI uses port 3260. Do not modify this unless it is necessary.)
- *Boot LUN*—Enter the LUN of the boot device. (Depending on your configuration, it may not be necessary to change this option.)
- *iSCSI Name*—Enter the iSCSI name of an intended boot target. (Depending on your configuration, it may not be necessary to configure this option.)

## Static iSCSI Boot Configuration

Use the QLogic iSCSI *Fast!UTIL* BIOS to configure static iSCSI boot parameters. Refer to [“Configuring the iSCSI Boot Parameters” on page 4-13](#).

## Dynamic iSCSI Boot Configuration

Dynamic iSCSI boot configuration primary and alternate boot device settings include the following:

- *Security Settings*—Press ENTER to access Primary Boot Security Settings. Press ENTER to enable or disable CHAP and bidirectional CHAP, and to configure the CHAP Name and CHAP Secret. (Depending on your configuration, it may not be necessary to configure this option.)
- *DHCP Dynamic iSCSI Boot Configuration*—Select this option to have the initiator acquire its IP address from a DHCP server. The initiator also acquires all boot parameters for an iSCSI target if the boot parameters are specified on the DHCP. This setting requires advanced users to manually input vendor-specific information the DHCP server and in the **Vendor ID** field of the DHCP Boot Settings area.
- *Vendor ID* specifies the identification string sent to DHCP server.

- *Alternate Client ID* is the additional filtering option to set the boot device.
- *Configure Parameters* for the secondary adapter.
- *Select Host Adapter* if you have multiple adapters in your system, select, view, and configure the settings of a specific adapter.

### Configuring Parameters for a Secondary Adapter

If login to the primary boot target fails, the BIOS should attempt to log in to the secondary target using the same technique. BIOS attempts to log in to boot targets configured on different ports, depending on their configuration. iSCSI ports can reside on physical interfaces and may exist on separate adapters.

When adapters of the same model number are present in a system, *Fast!UTIL* lists all of the iSCSI interface ports. Select a specific port of a secondary adapter to configure its parameters.

### Preparing the Image on the Local Hard Drive

QLogic iSCSI boot does not require preparing the image on the local hard drive. However, if you choose to do so, follow these steps.

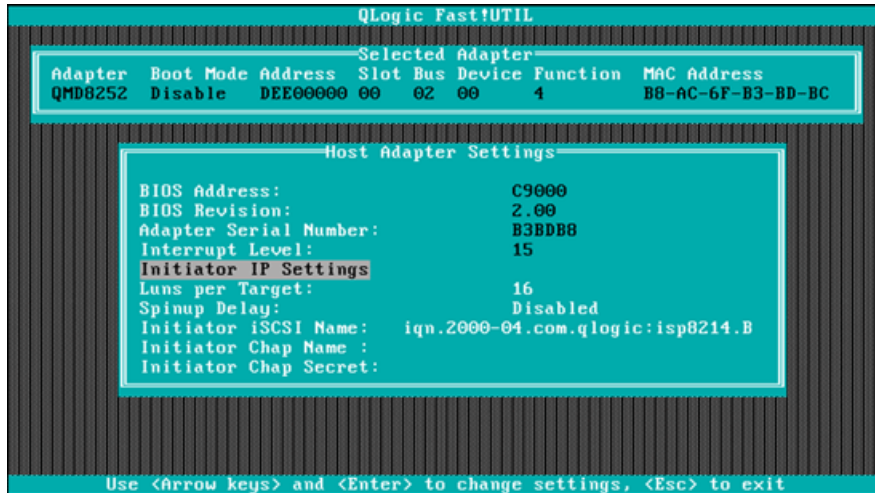
To configure QLogic iSCSI boot:

1. During POST, press CTRL+Q to enter the QLogic iSCSI BIOS *Fast!UTIL* utility. [Figure 4-4](#) shows the main Options menu.



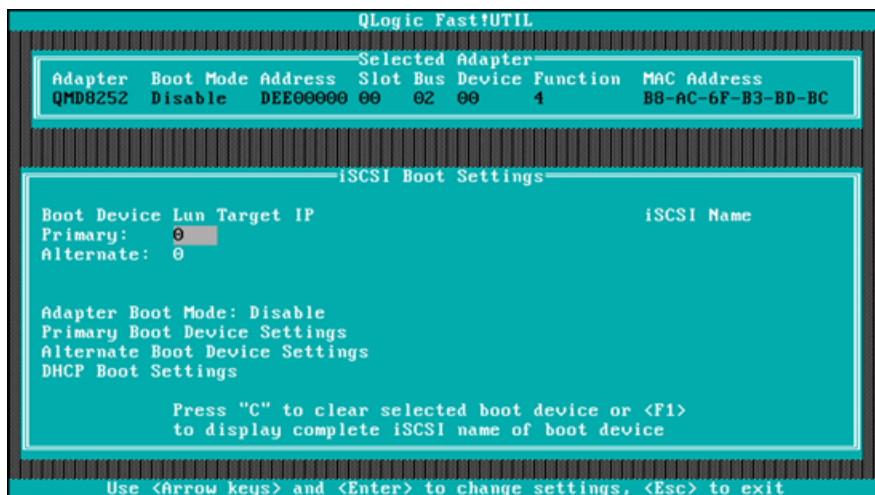
**Figure 4-4. Fast!UTIL: Options Menu**

2. On the Options menu, select **Configuration Settings**.
3. On the Configuration Settings menu, select **Host Adapter Settings**.  
The **Host Adapter Settings** window opens as shown in [Figure 4-5](#).



**Figure 4-5. Fast!UTIL: Host Adapter Settings Window**

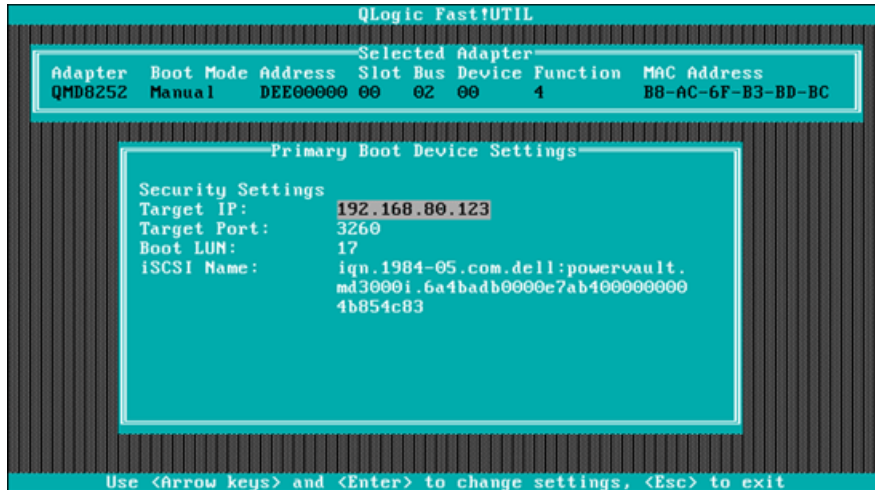
- a. Select **Initiator IP Settings**, and then specify the initiator IP address, subnet, and gateway as needed.
  - b. (Optional) Specify the **Initiator iSCSI Name** (IQN). This option is not dependent upon DHCP.
4. On the Configuration Settings menu, select **iSCSI Boot Settings** to configure the target settings shown in [Figure 4-6](#).



**Figure 4-6. Fast!UTIL: iSCSI Boot Settings Window**

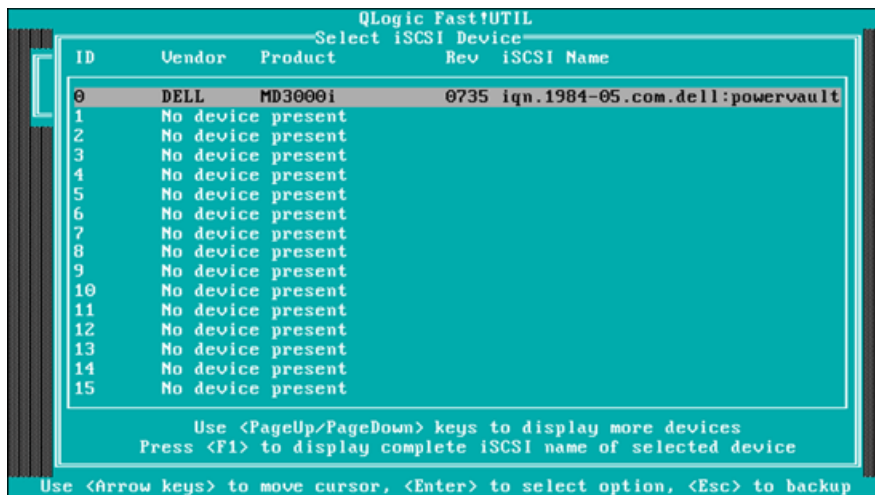
- a. On the **iSCSI Boot Settings** window, select **Adapter Boot Mode** and set it to **Manual**.
- b. On the **iSCSI Boot Settings** window, select **Primary Boot Device Settings**.

5. On the **Primary Boot Device Settings** window (Figure 4-7), specify the target parameters.



**Figure 4-7. Fast!UTIL: Primary Boot Device Settings Window**

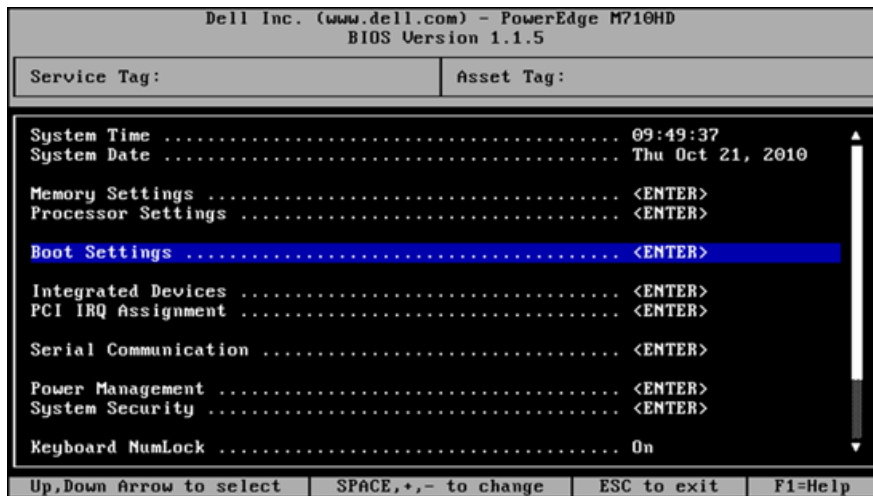
- a. To scan for the specified target, highlight the primary LUN **Target IP**, and then press ENTER.
- b. Select the target from the list of discovered targets on the **Select iSCSI Device** window, as shown in Figure 4-8.



**Figure 4-8. Fast!UTIL: Select iSCSI Device Window**

- c. On the **Select LUN** window, select the LUN to set the target as the primary iSCSI boot device.
6. Press ESC, and then select **Save changes**.

7. Press ESC again, and then select **Reboot System**.  
After rebooting, the iSCSI BIOS loads for the target configured previously in the QLogic iSCSI *Fast!UTIL* BIOS utility.
8. During POST, press F2 to enter the Dell system BIOS as shown in [Figure 4-9](#).



**Figure 4-9. Dell System BIOS**

- a. Select **Boot Settings**.
  - b. Select **Hard-Disk Drive Sequence**, and then move the iSCSI target to the first position.
  - c. Select **Boot Sequence**, and then move the iSCSI target to the first position.
9. Select **Save changes and exit**.
  10. Follow the manufacturer’s OS installation instructions.

## Transferring the OS Image to the iSCSI Target

QLogic iSCSI boot does not require transferring the OS image to the iSCSI target.

## Booting

The iSCSI *Fast!UTIL* BIOS includes an **iSCSI Boot Settings** option, which is accessed from the **Configuration Settings** menu. When you enable this option, you can specify the drive from which you want to boot. After this is enabled, the option forces the system to boot from the selected iSCSI drive. When you disable this option, the system looks for a boot device (as selected in the system BIOS).



## iBFT Boot Setup (iSCSI)

For an alternate method of iSCSI boot from SAN, use the fields in the iSCSI Boot Firmware Table (iBFT). iBFT is a component of the Advanced Configuration and Power Interface Specification (ACPI) 3.0b standard that provides operating systems a standard way to boot from software-initiated iSCSI protocol. To view the iBFT specification, visit the following URL:

<http://www.microsoft.com/whdc/system/platform/firmware/ibft.msp>

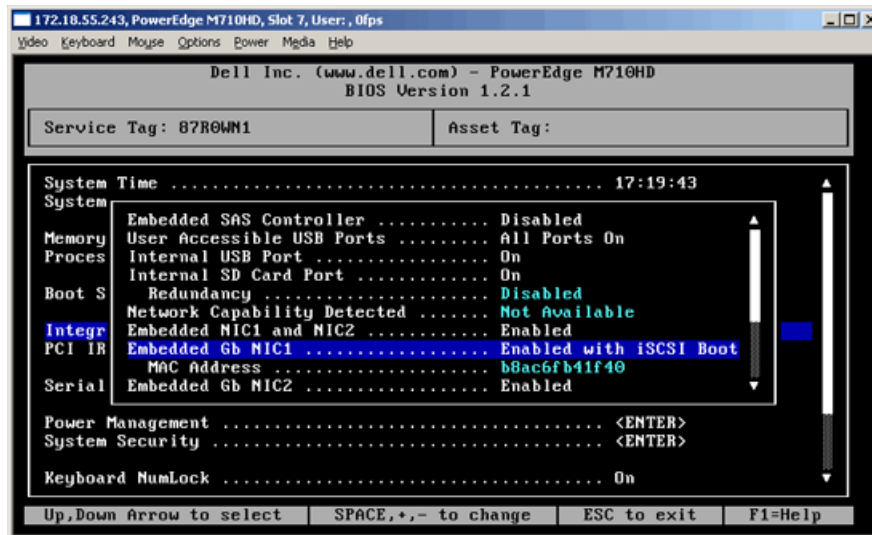
This section provides details for setting up the QME8242 adapter using iBFT, including:

- [Enabling iBFT Boot](#)
- [Setting Up iBFT on IPv4](#)
- [Setting Up iBFT on IPv6](#)
- [Booting to a Target Disk](#)

### Enabling iBFT Boot

Follow these steps to enable iBFT boot in the Dell BIOS system.

1. Boot the server, and then follow Dell's instructions to access the Dell system BIOS.
2. In the Dell system BIOS, select **Integrated Devices**, and then press ENTER.
3. Select the **Embedded Gb NIC 1 ... Enabled with iSCSI Boot** line, as shown in [Figure 4-10](#), and then press ENTER.



**Figure 4-10. Enabling iSCSI Boot**

4. Press ESC to save your settings and exit the Dell BIOS.
5. Reboot the system.

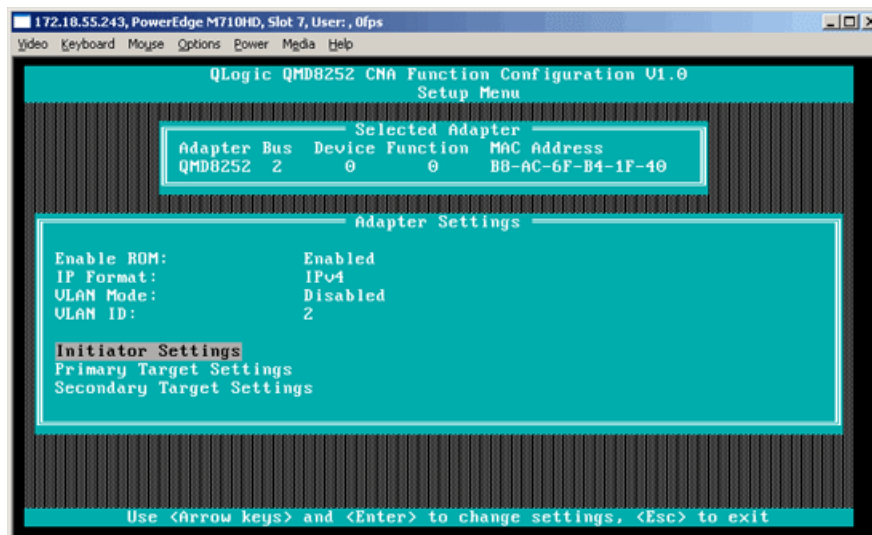
## Setting Up iBFT on IPv4

You can set up iBFT on IPv4 with either a static IP address (see [“Setting Up a Static IPv4 Address” on page 4-20](#)) or a dynamic IP address (see [“Setting Up a Dynamic IPv4 Address” on page 4-22](#)).

### Setting Up a Static IPv4 Address

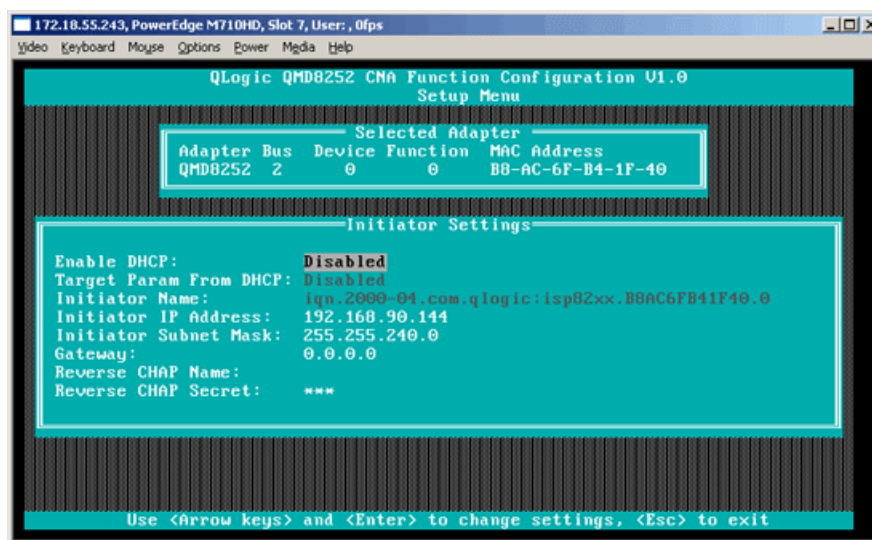
To set up a static IP address on IPv4, follow these steps:

1. Start the server and when the NIC boot code banner appears, press CTRL+Q. The QLogic CNA Function Configuration utility opens to the Select Adapter menu.
2. Select the adapter to configure, and then press ENTER. The QLogic CNA Function Configuration utility opens to the Setup menu for the selected adapter.
3. Under Function Configuration, select the iBFT function to configure, and then press ENTER.
4. Under Adapter Settings, configure the following, as shown in [Figure 4-11](#):
  - a. Set Enable ROM to **Enabled**.
  - b. Set IP Format to **IPv4**.
  - c. Set the VLAN Mode to one of the following:
    - Disabled** if the VLAN is not used in the network
    - Enabled** to specify a valid VLAN ID
  - d. If VLAN is enabled, specify a valid VLAN ID in the range of 2 to 4095.



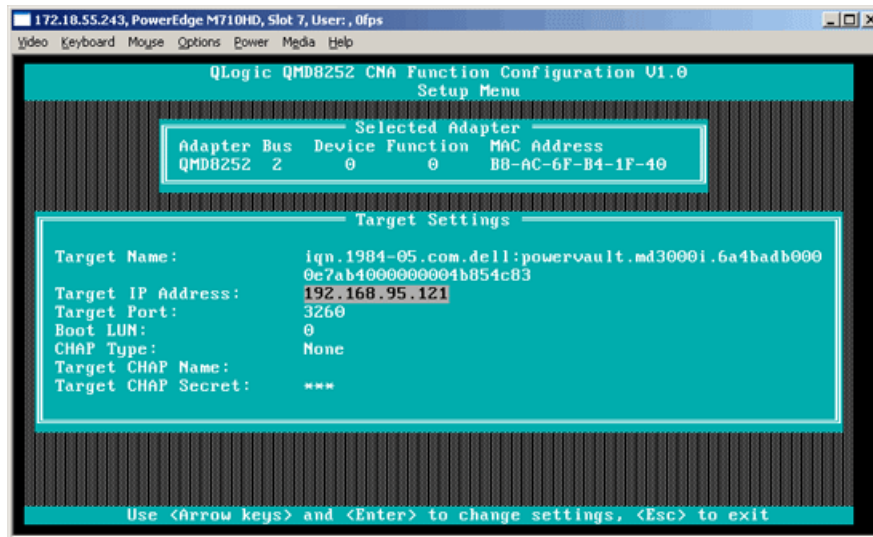
**Figure 4-11. Configuring Adapter Settings for IPv4 (Static)**

5. Under Adapter Settings, select Initiator Settings, and then press ENTER.
6. Under Initiator Settings, configure the following, as shown in [Figure 4-12](#):
  - a. Set **Enable DHCP** to **Disabled**; the **Target Param From DHCP** is automatically set to **Disabled**.
  - b. The **Initiator Name** is set automatically; set the **Initiator IP Address**, **Initiator Subnet Mask**, and **Gateway** according to the network setup.
  - c. (Optional) Configure the **Reverse CHAP Name** and **Reverse CHAP Secret** as needed.
  - d. Press ENTER to save these settings.



**Figure 4-12. Configuring Initiator Settings for IPv4 (Static)**

7. Press ESC to return to the **Adapter Settings** menu.
8. On the **Adapter Settings** menu, select **Primary Target Settings**, and then press ENTER.
9. Under **Target Settings**, configure the following, as shown in [Figure 4-13](#):
  - a. Set the **Target Name**, **Target IP Address**, **Target Port**, and **Boot LUN** to the appropriate settings for the target setup.
  - b. (Optional) Specify the **CHAP Type** as one of the following:
    - **None** to disable CHAP
    - **One-Way** for a target-authenticating initiator
    - **Mutual** to enable both the target and initiator to authenticate each other
  - c. (Optional) Configure the **Target CHAP Name** and **Target CHAP Secret** as needed.



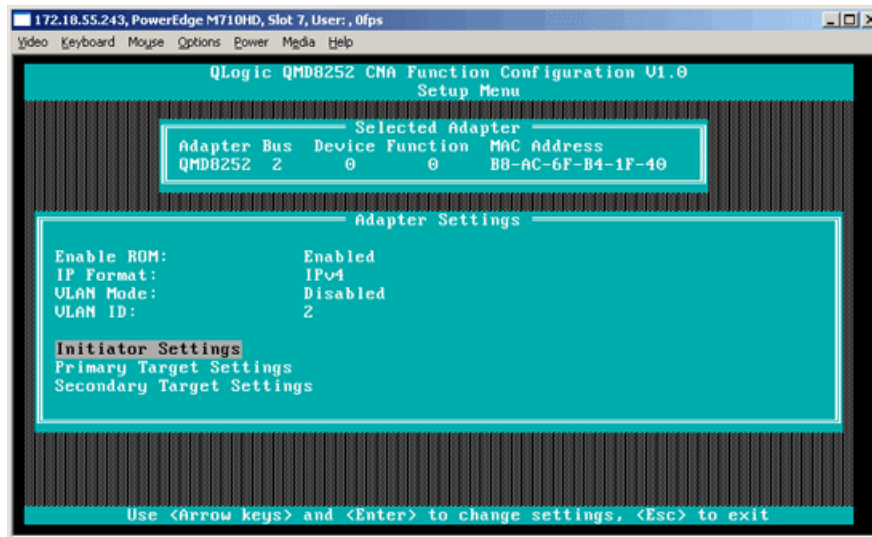
**Figure 4-13. Configuring Target Settings for IPv4 (Static)**

10. Press ESC and save the settings.
11. Reboot the system.

### Setting Up a Dynamic IPv4 Address

To set up a dynamic IP address on IPv4, follow these steps:

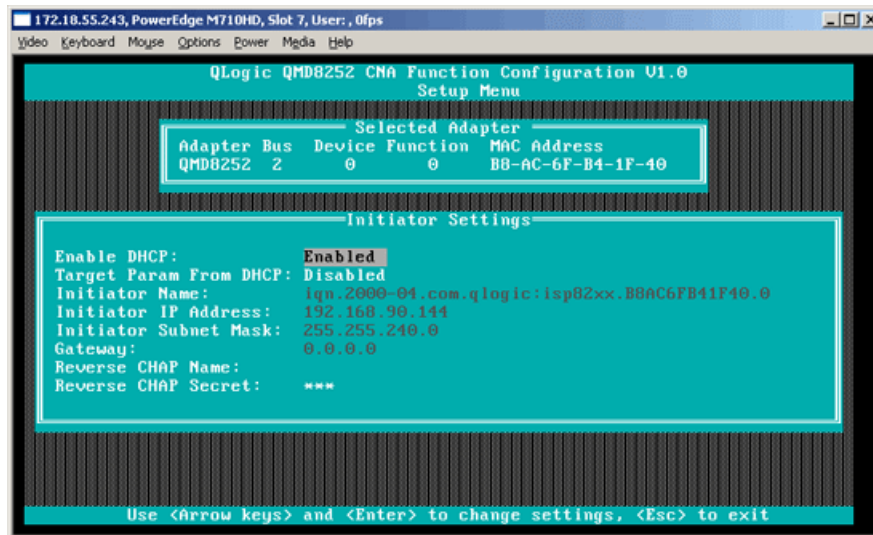
1. Start the server and when the NIC boot code banner appears, press CTRL+Q.  
The QLogic CNA Function Configuration utility opens to the Select Adapter menu.
2. Select the adapter to configure, and then press ENTER.  
The QLogic CNA Function Configuration utility opens to the Setup menu for the selected adapter.
3. Under Function Configuration, select the iBFT function to configure, and then press ENTER.
4. Under **Adapter Settings**, configure the following, as shown in [Figure 4-14](#):
  - a. Set Enable ROM to **Enabled**.
  - b. Set IP Format to **IPv4**.
  - c. Set the VLAN Mode to one of the following:
    - **Disabled** if the VLAN is not used in the network
    - **Enabled** to specify a valid VLAN ID
  - d. If VLAN is enabled, specify a valid VLAN ID in the range of 2 to 4095.



**Figure 4-14. Configuring Adapter Settings for IPv4 (Dynamic)**

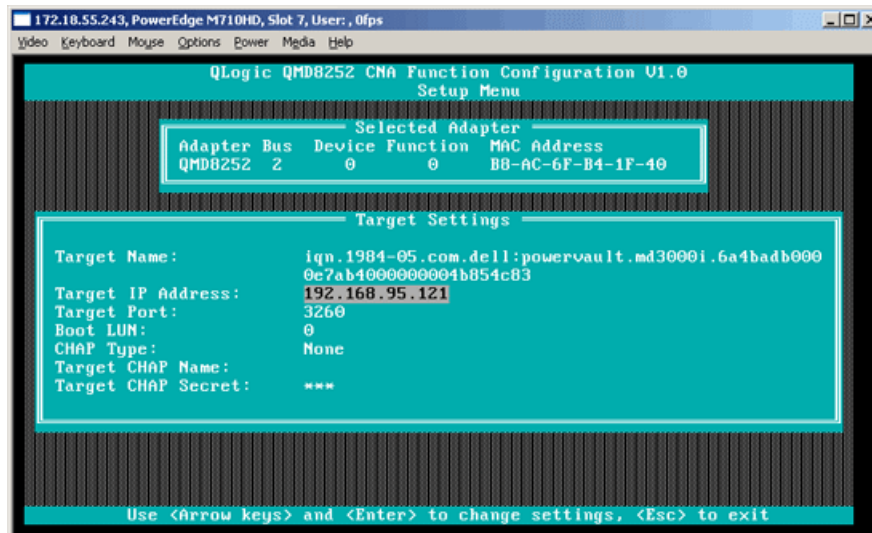
5. Under **Adapter Settings**, select **Initiator Settings**, and then press ENTER.
6. Under **Initiator Settings**, configure the following, as shown in [Figure 4-15](#):
  - a. Set **Enable DHCP** to **Enabled**.
  - b. Set **Target Param to DHCP** to one of the following:
    - **Disabled** to manually configure the target settings (see [Step 9](#)).
    - **Enabled** to automatically obtain the target settings from the DHCP server, which must provide the RootPath Option (option 17) to its client. The option field string should have the following format:
 

```
iscsi:<server ip address>:tcp:<port number>:<LUN>:<target name>
```
  - c. (Optional) Configure the **Reverse CHAP Name** and **Reverse CHAP Secret** as needed.
  - d. Press ENTER to save these settings.



**Figure 4-15. Configuring Initiator Settings for IPv4 (Dynamic)**

7. Press ESC to return to the **Adapter Settings** menu.
8. On the **Adapter Settings** menu, select **Primary Target Settings** and then press ENTER.
9. Under **Target Settings**, configure the following, as shown in [Figure 4-16](#):
  - a. If the **Target Param From DHCP** was disabled in [Step 6](#), set the **Target Name**, **Target IP Address**, **Target Port**, and **Boot LUN** to the appropriate settings for the target setup.
  - b. (Optional) Specify the **CHAP Type** as one of the following:
    - **None** to disable CHAP
    - **One-Way** for a target-authenticating initiator
    - **Mutual** to enable both the target and initiator to authenticate each other
  - c. (Optional) Configure the **Target CHAP Name** and **Target CHAP Secret** as needed.



**Figure 4-16. Configuring Target Settings for IPv4 (Dynamic)**

10. Press ESC and save the settings.
11. Reboot the system.

## Setting Up iBFT on IPv6

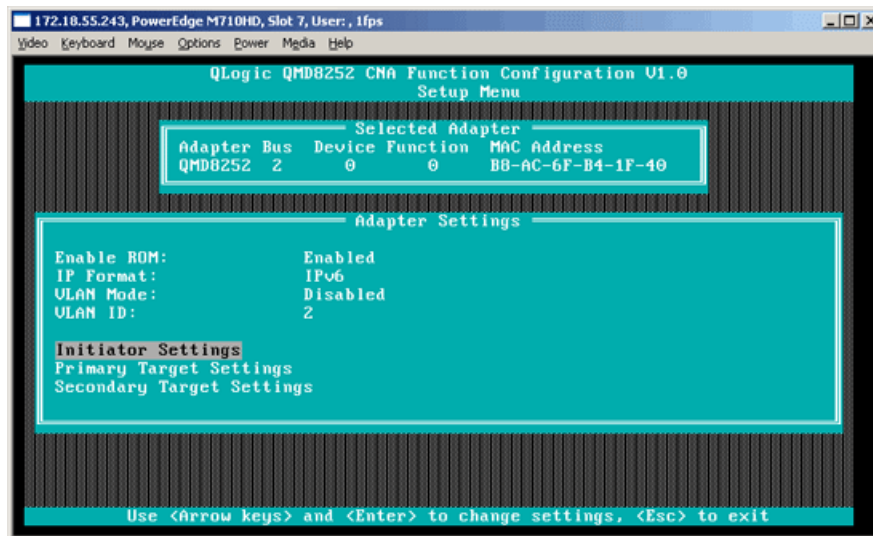
You can set up iBFT on IPv6 with either a static IP address (see [“Setting Up a Static IPv6 Address”](#) on page 4-25) or a dynamic IP address (see [“Setting Up a Dynamic IPv6 Address”](#) on page 4-28).

### Setting Up a Static IPv6 Address

To set up a static IP address on IPv6, follow these steps:

1. Start the server and when the NIC boot code banner appears, press CTRL+Q.  
The QLogic CNA Function Configuration utility opens to the Select Adapter menu.
2. Select the adapter to configure, and then press ENTER.  
The QLogic CNA Function Configuration utility opens to the Setup menu for the selected adapter.
3. Under Function Configuration, select the iBFT function to configure, and then press ENTER.
4. Under **Adapter Settings**, configure the following, as shown in [Figure 4-17](#):
  - a. Set **Enable ROM** to **Enabled**.
  - b. Set **IP Format** to **IPv6**.

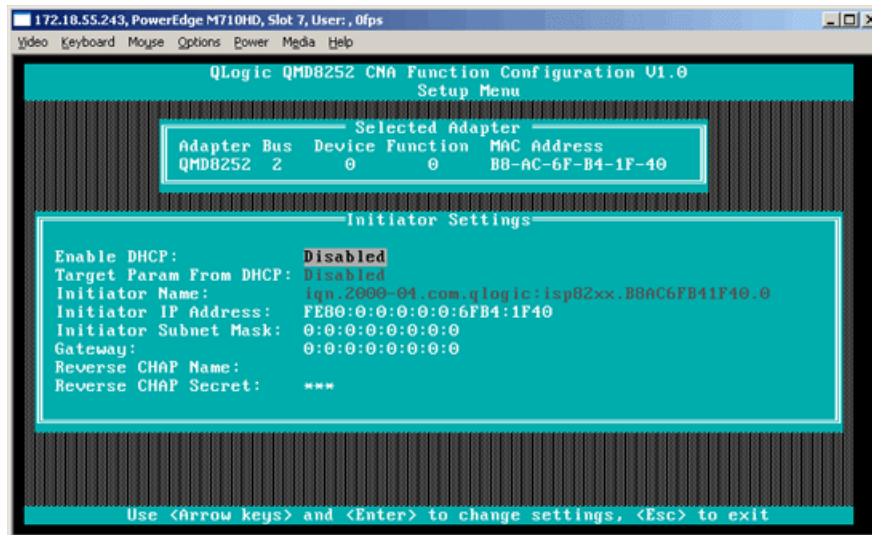
- c. Set the **VLAN Mode** to one of the following:
  - **Disabled** if the VLAN is not used in the network
  - **Enabled** to specify a valid VLAN ID
- d. If VLAN is enabled, specify a valid **VLAN ID** in the range of 2 to 4095.



**Figure 4-17. Configuring Adapter Settings for IPv6 (Static)**

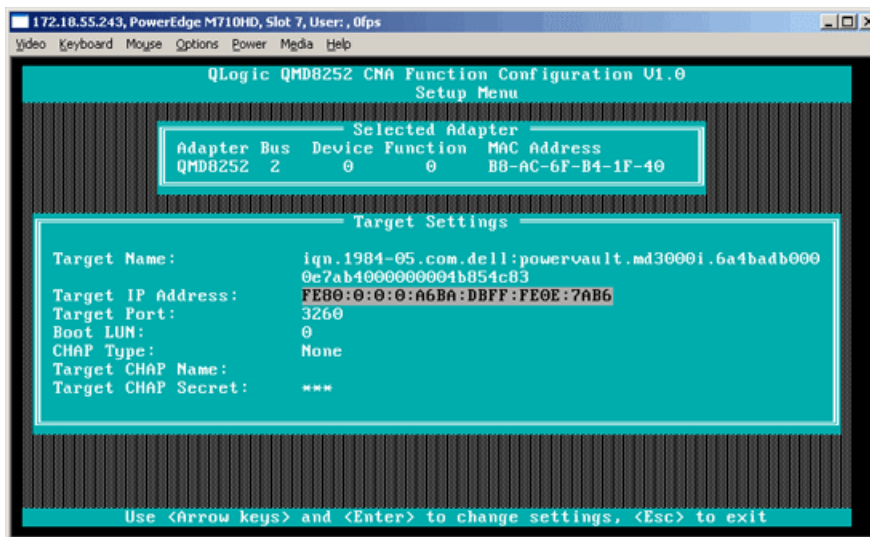
5. Under **Adapter Settings**, select **Initiator Settings**, and then press ENTER.
6. Under **Initiator Settings**, configure the following, as shown in [Figure 4-18](#):
  - a. Set **Enable DHCP** to **Disabled**; the **Target Param From DHCP** is automatically set to **Disabled**.
  - b. The **Initiator Name** is set automatically; set the **Initiator IP Address**, **Initiator Subnet Mask**, and **Gateway** according to the network setup.
  - c. (Optional) Configure the **Reverse CHAP Name** and **Reverse CHAP Secret** as needed.
  - d. Press ENTER to save these settings.





**Figure 4-18. Configuring Initiator Settings for IPv6 (Static)**

7. Press ESC to return to the Adapter Settings menu.
8. On the **Adapter Settings** menu, select **Primary Target Settings** and then press ENTER.
9. Under **Target Settings**, configure the following, as shown in [Figure 4-19](#):
  - a. Set the **Target Name**, **Target IP Address**, **Target Port**, and **Boot LUN** to the appropriate settings for the target setup.
  - b. (Optional) Specify the **CHAP Type** as one of the following:
    - **None** to disable CHAP
    - **One-Way** for a target-authenticating initiator
    - **Mutual** to enable both the target and initiator to authenticate each other
  - c. (Optional) Configure the **Target CHAP Name** and **Target CHAP Secret** as needed.



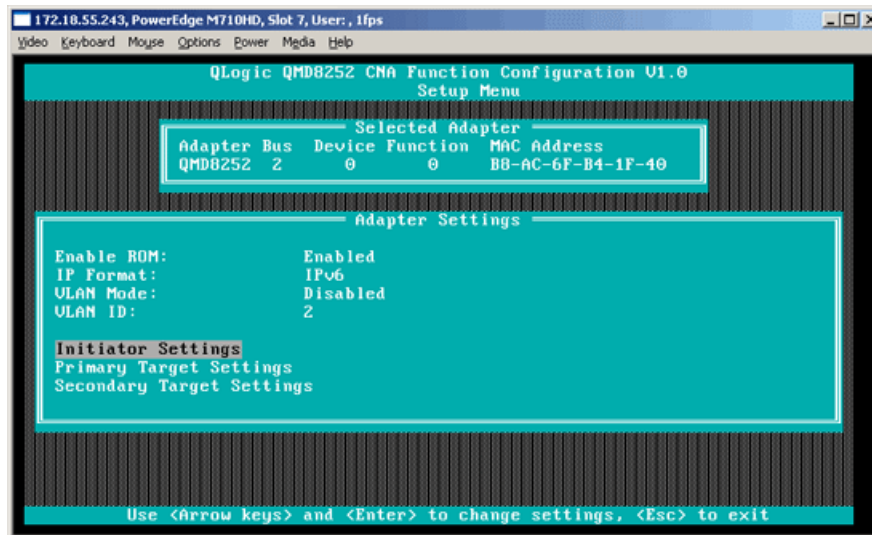
**Figure 4-19. Configuring Target Settings for IPv6 (Static)**

10. Press ESC and save the settings.
11. Reboot the system.

### Setting Up a Dynamic IPv6 Address

To set up a dynamic IP address on IPv6, follow these steps:

1. Start the server and when the NIC boot code banner appears, press CTRL+Q.  
The QLogic CNA Function Configuration utility opens to the Select Adapter menu.
2. Select the adapter to configure, and then press ENTER.  
The QLogic CNA Function Configuration utility opens to the Setup menu for the selected adapter.
3. Under Function Configuration, select the iBFT function to configure, and then press ENTER.
4. Under **Adapter Settings**, configure the following, as shown in [Figure 4-20](#):
  - a. Set **Enable ROM** to **Enabled**.
  - b. Set **IP Format** to **IPv6**.
  - c. Set the **VLAN Mode** to one of the following:
    - **Disabled** if the VLAN is not used in the network
    - **Enabled** to specify a valid VLAN ID
  - d. If VLAN is enabled, specify a valid **VLAN ID** in the range of 2 to 4095.



**Figure 4-20. Configuring Adapter Settings for IPv6 (Dynamic)**

5. Under **Adapter Settings**, select **Initiator Settings**, and then press ENTER.
6. Under **Initiator Settings**, configure the following, as shown in [Figure 4-21](#):
  - a. Set **Enable DHCP** to **Enabled** to obtain the address from IPv6 router or the DHCPv6 server in this order:
    - i. The iBFT initiator first requests the IP address from the IPv6 router.
    - ii. If the IPv6 router indicates that a DHCPv6 server is also available in the network, the initiator requests the IP address from the DHCPv6 server.
    - iii. If the IPv6 router is not available, the initiator obtains the address from the DHCPv6 server.
  - b. Set **Target Param From DHCP** to one of the following:
    - **Disabled** to manually configure the **Target Name**, **Target IP Address**, and **Target Port**, and **Boot LUN** (see [Step 9](#)).
    - **Enabled** to automatically obtain target setting from the DHCP server, which must provide the RootPath Option (option 17) to its client. The option field string should have the following format:
 

```
iscsi:<server ip address>:tcp:<port number>:<LUN>:
<target name>
```

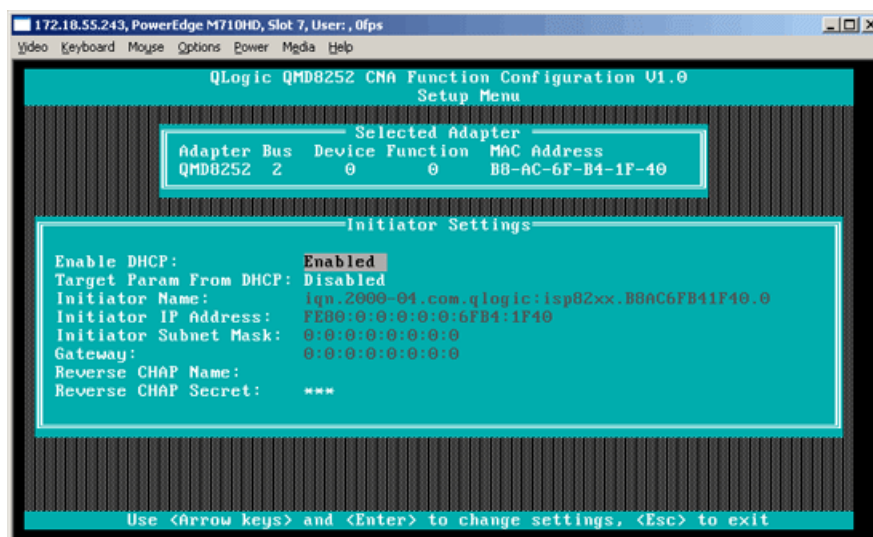
**NOTE:**

The IPv6 address must be enclosed in a pair of square brackets ("[" and "]"). For example:

```
iscsi: [2001:1234:5678:0000:0000:0000:abcd]:tcp:  
3260:0:iqn.2008-09.com.iscsi:storage.tape.sys.xyz
```

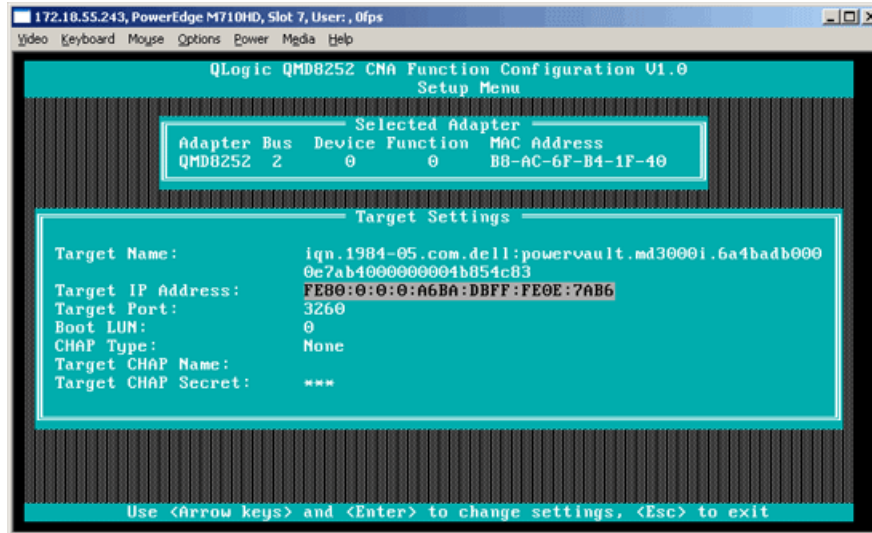
The DHCPv6 server must use the QLogic enterprise number 3873.

- c. (Optional) Configure the **Reverse CHAP Name** and **Reverse CHAP Secret** as needed.



**Figure 4-21. Configuring Initiator Settings for IPv6 (Dynamic)**

7. Press ESC to return to the **Adapter Settings** menu.
8. On the **Adapter Settings** menu, select **Primary Target Settings** and then press ENTER.
9. Under **Target Settings**, configure the following, as shown in [Figure 4-22](#):
  - a. If the **Target Param From DHCP** was disabled in [Step 6](#), set the **Target Name**, **Target IP Address**, **Target Port**, and **Boot LUN** to the appropriate settings for the target setup.
  - b. (Optional) Specify the **CHAP Type** as one of the following:
    - **None** to disable CHAP
    - **One-Way** for a target-authenticating initiator
    - **Mutual** to enable both target and initiator to authenticate each other
  - c. (Optional) Configure the **Target CHAP Name** and **Target CHAP Secret** as needed.



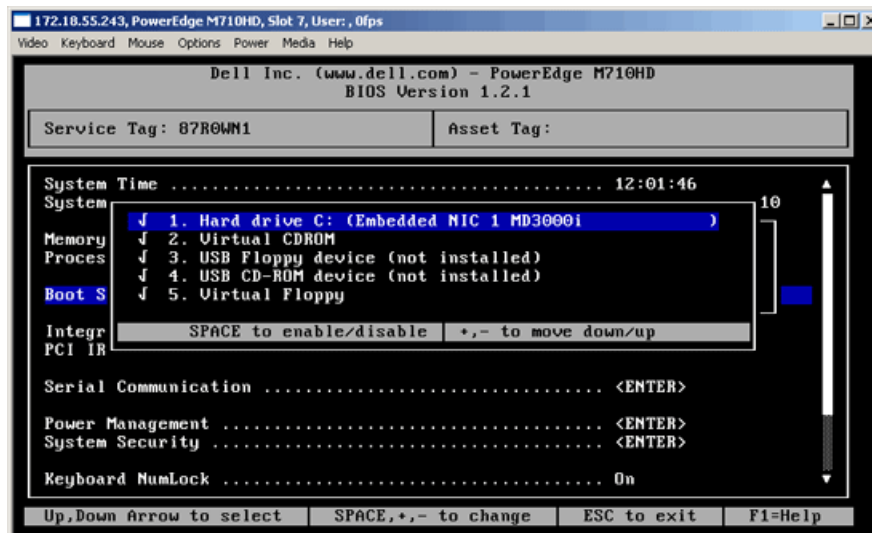
**Figure 4-22. Configuring Target Settings for IPv6 (Dynamic)**

10. Press ESC and save the settings.
11. Reboot the system.

## Booting to a Target Disk

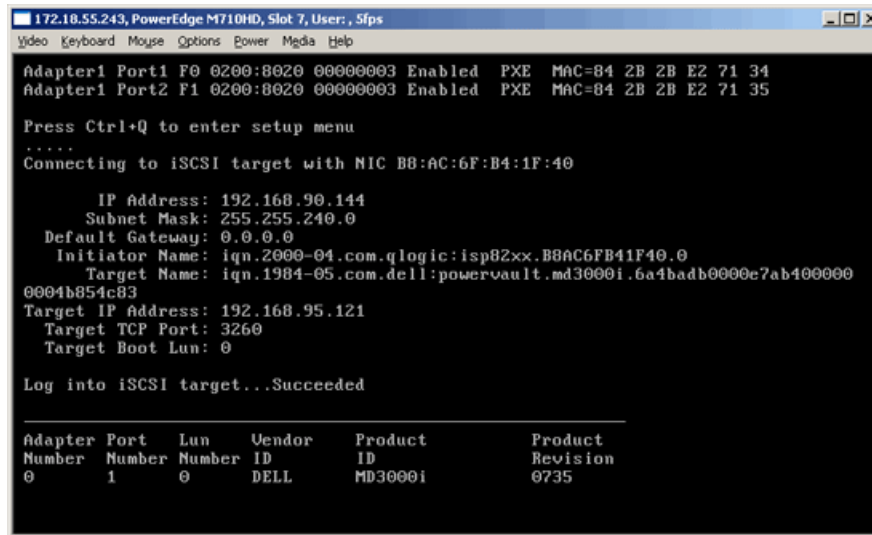
To boot to the target disk, you must first load to the target a valid image matching the system hardware. Target loading generally occurs by installing a fresh OS to the target disk.

1. In the BIOS boot order, set first the CD/DVD, and second the iSCSI target disk, as shown in [Figure 4-23](#).



**Figure 4-23. Setting the Boot Order**

2. Reboot the system.
3. The Option Rom shows the iSCSI target login information, as shown in [Figure 4-24](#).



```
172.10.55.243, PowerEdge M710HD, Slot 7, User: 5f5ps
Video Keyboard Mouse Options Power Media Help
Adapter1 Port1 F0 0200:8020 00000003 Enabled PXE MAC=84 2B 2B E2 71 34
Adapter1 Port2 F1 0200:8020 00000003 Enabled PXE MAC=84 2B 2B E2 71 35

Press Ctrl+Q to enter setup menu
.....
Connecting to iSCSI target with NIC BB:AC:6F:B4:1F:40
    IP Address: 192.168.90.144
    Subnet Mask: 255.255.240.0
    Default Gateway: 0.0.0.0
    Initiator Name: iqn.2000-04.com.qlogic:isp02xx.BBAC6FB41F40.0
    Target Name: iqn.1984-05.com.dell:powervault.md3000i.6a4badb000e7ab400000
0004b054c83
Target IP Address: 192.168.95.121
Target TCP Port: 3260
Target Boot Lun: 0

Log into iSCSI target...Succeeded

Adapter Port Lun Vendor Product Product
Number Number Number ID ID Revision
0 1 0 DELL MD3000i 0735
```

**Figure 4-24. Connecting to the iSCSI Target**

Continue with OS installation (refer to the OS documentation).

## DHCP Boot Setup (iSCSI)

DHCP boot provides a method for the iSCSI initiator to acquire target parameters from a DHCP server.

To configure the DHCP server to support iSCSI boot, first ensure that your DHCP server is set up, and then refer to the following procedure.

---

**NOTE:**

This release does not support DHCP iSCSI boot for IPv6. Refer to future Readme and Release Notes for IPv6 support notification

---

## Configuring DHCP iSCSI Boot for IPv4

---

### NOTE:

Although this section describes how to configure a Windows 2003 or Windows 2008 DHCP server and QLogic adapter to allow DHCP to work, additional steps are required. For example, you must also configure the IP addresses of the Ethernet interfaces on the DHCP server, configure the iSCSI storage box, and configure the network. These configuration steps are outside the scope of this guide.

---

To configure the QLogic adapter to obtain all of its IP and iSCSI initiator and target settings from the DHCP server:

1. Ensure that the latest BIOS and firmware are installed.
2. Reboot the server, and when the QLogic iSCSI BIOS screen appears, press CTRL+Q to enter the adapter BIOS utility, *Fast!UTIL*.
3. On the initial **Select Host Adapter** screen, select the adapter ports you want to configure for SAN boot. This will be the same MAC addresses for which you created reservations on the DHCP server.
4. Press ENTER.  
  
If both ports are to be configured, perform the following steps for the first port, complete its configuration, and then repeat the steps for the second port.
5. On the *Fast!UTIL* Options screen, select **Configuration Settings**, and then press ENTER.
6. On the Configuration Settings screen, select **iSCSI Boot Settings**, and then press ENTER.
7. On the iSCSI Boot Settings screen, select **Adapter Boot Mode**, and then press ENTER.
8. When presented with the various Boot Modes, select **DHCP using VendorID**, and then press ENTER.
9. Select the **DHCP Boot Settings**, and then press ENTER.
10. On the DHCP Boot Settings screen, select **Vendor ID**, and then press ENTER.
11. Enter the **Vendor ID** (class) that you defined earlier in the DHCP server configuration steps, and then press ENTER. Note that the vendor ID name is case-sensitive. For this example, use **QLOGIC\_ISAN** because it matches what was configured previously.
12. Press ESC until the **Configuration Settings Modified** screen is displayed.

13. Select **Save changes**, and then press ENTER.
14. If all components are configured correctly, you can either:
  - Reinitialize the adapter from the BIOS.
  - Reboot the server.

The adapter should now be able to obtain all of its IP and initiator and target information from the DHCP server.

### DHCP Option 17, Root Path

DHCP option 17 specifies the path name that contains the client's root disk. The path is formatted as a character string consisting of characters from the network virtual terminal (NVT) ASCII character set. The data is formatted as a string using the DHCP Root Path Option (Option 17):

```
"iscsi:"<servername | serveripaddress>":"<protocol>":"<port>":  
"<LUN>":"<targetname>"
```

### DHCP Option 43 (Adding Vendor Options)

Define a vendor class called "QLogic" as part of the "Default User Class," and then add the iSCSI specific information. Two of these options—201 and 202—contain iSCSI boot target information for primary and secondary targets, respectively. BIOS must parse the Vendor Specific Information buffer for the Primary Boot Target (Option 201). The third option, iSCSI Initiator (Option 203), contains the iSCSI initiator IQN information.

#### DHCP Vendor Class Option 201, Primary Boot Target IQN and Boot Parameters

Format the data as a string using the DHCP vendor-defined Primary Boot Target IQN and Boot Parameters Option (Option 201):

```
"iscsi:"<servername | serveripaddress>":"<protocol>":"<port>":  
"<LUN>":"<targetname>"
```

Example string value (no spaces):

```
iscsi:192.168.95.121:6:3260:7:iqn.1984-05.com.dell:powervault.md30  
00i.6a4badb0000e7ab4000000004b854c83
```

#### DHCP Vendor Class Option 202, Secondary Boot Target IQN and Boot Parameters

Format the data as a string using the DHCP vendor-defined Secondary Boot Target IQN and Boot Parameters Option (Option 202):

```
"iscsi:"<servername | serveripaddress>":"<protocol>":"<port>":  
"<LUN>":"<targetname>"
```



Example string value (no spaces):

```
iscsi:192.168.95.109:6:3260:9:iqn.1992-01.com.lsi:1535.600a0b80006  
7fe9a000000004b9fd854
```

### **DHCP Vendor Class Option 203, Initiator IQN**

Format the data as a string using the DHCP vendor-defined Initiator IQN Option (Option 203):

```
"<initiatorname>"
```

Example string value (no spaces):

```
iqn.2000-04.com.qlogic:isp8214.00e1e049e02.4
```



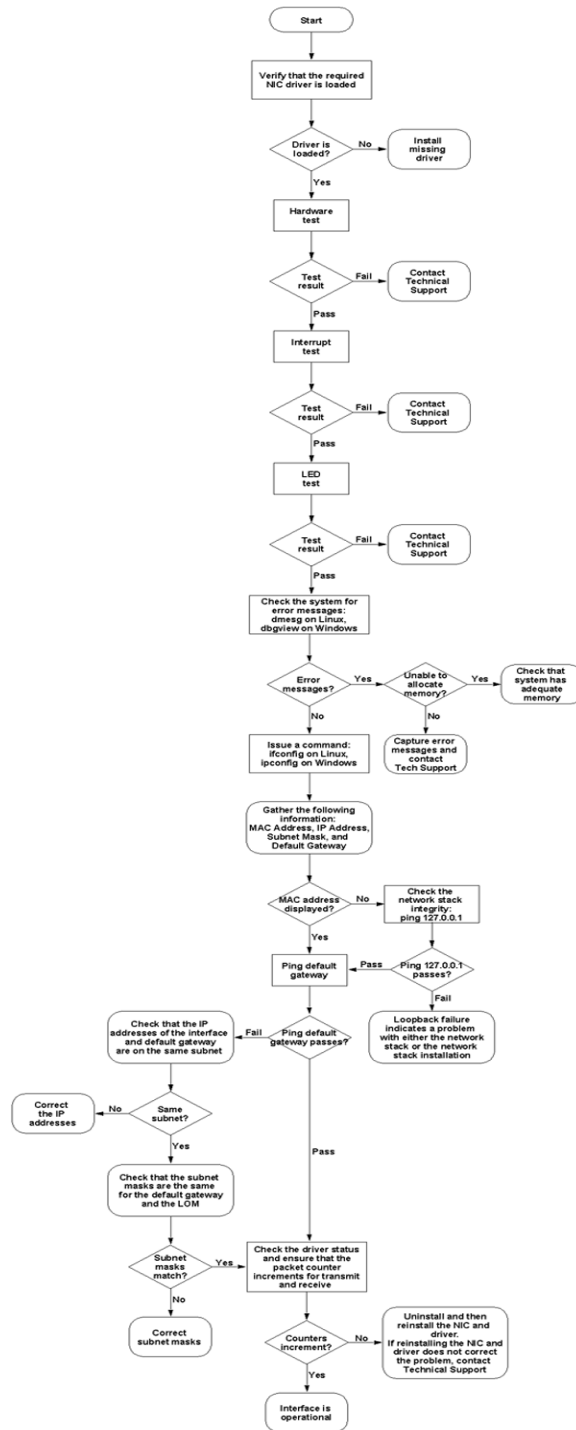
# A Troubleshooting

- [Diagnosing Problems](#)
- [NIC Troubleshooting](#)
- [iSCSI Troubleshooting](#)
- [FCoE Troubleshooting](#)
- [ESX Troubleshooting](#)

## Diagnosing Problems

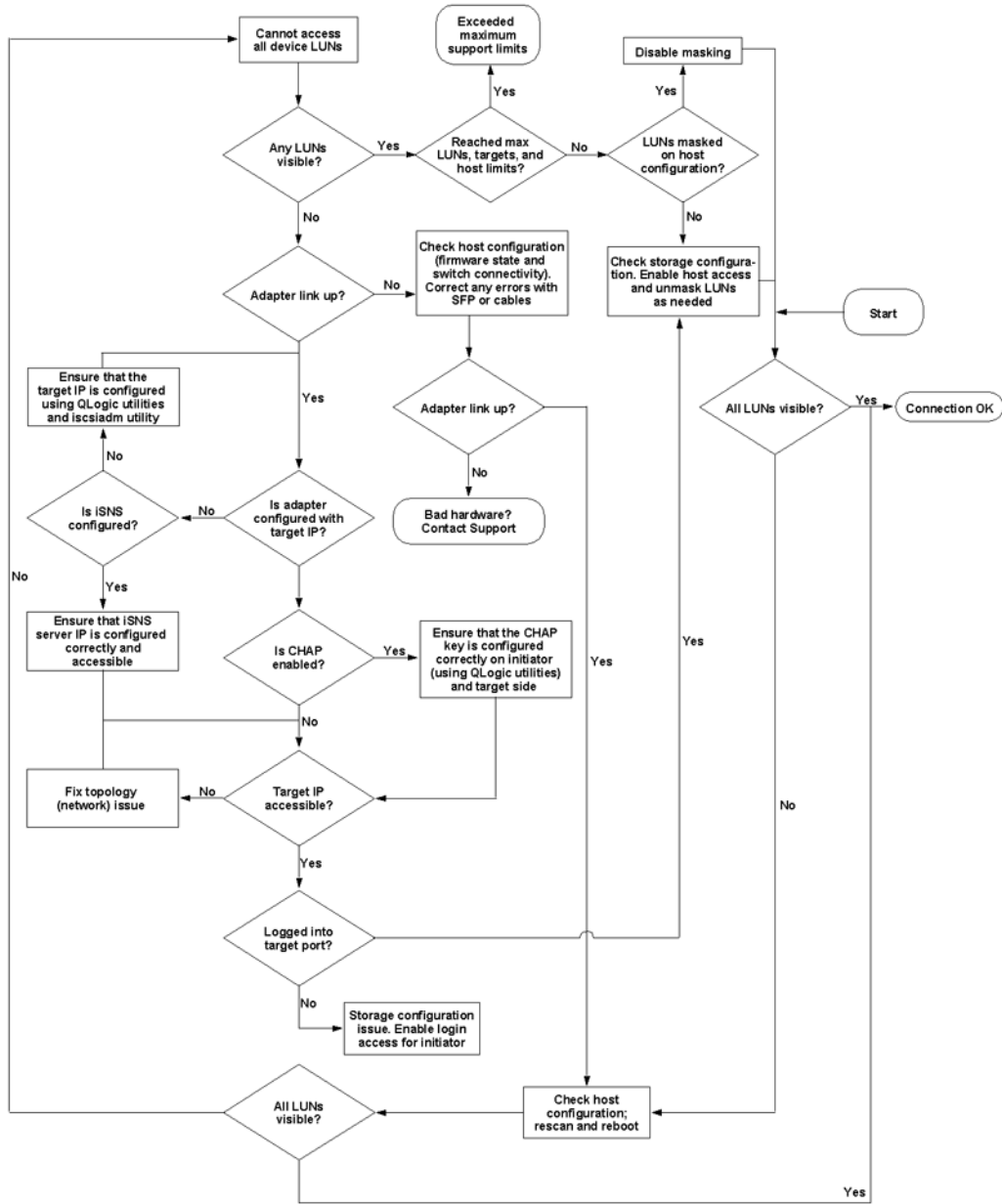
Network activity indicators and diagnostic utilities help you to verify that hardware and software are working properly. If the installed adapter cannot communicate over the network, the flowcharts shown in this section can help diagnose the problem with the adapter.

# NIC Troubleshooting



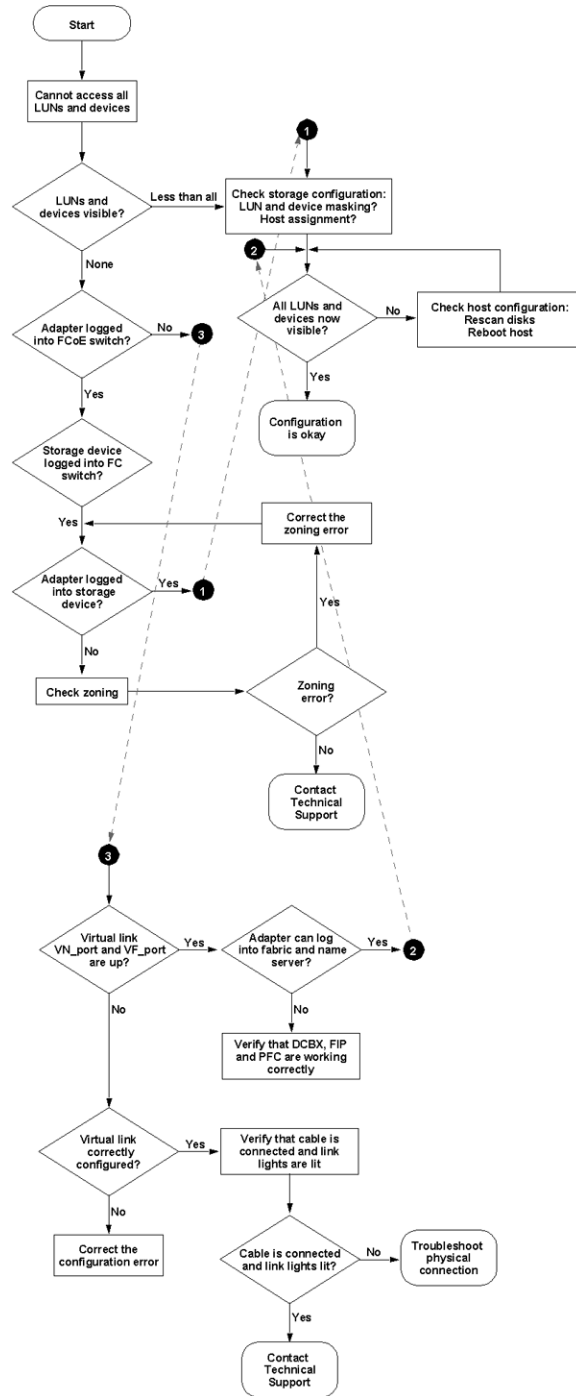
**Figure A-1. NIC Diagnostics Flowchart**

# iSCSI Troubleshooting



**Figure A-2. iSCSI Diagnostics Flowchart**

# FCoE Troubleshooting



**Figure A-3. FCoE Diagnostics Flowchart**

---

## ESX Troubleshooting

For debugging and troubleshooting networking issues on ESX, refer to the VMware document, *VI3 Networking: Advanced Troubleshooting*, located here:

[http://www.vmware.com/files/pdf/technology/vi\\_networking\\_adv\\_troubleshooting.pdf](http://www.vmware.com/files/pdf/technology/vi_networking_adv_troubleshooting.pdf)

If the troubleshooting procedures in this document do not resolve the problem, please contact Dell for technical assistance (refer to the “Getting Help” section in your Dell™ system documentation). For information about your Dell warranty, see your system documentation.





# B Specifications

## Physical Characteristics

*Table B-1. Physical Characteristics*

Adapter	Description
Type	Mezzanine card
Length	3.307 inches
Width	3.465 inches

## Power Requirements

*Table B-2. Power Requirements*

Voltage Rail	Voltage	Current
12 V	12 V	5 mA
12 V AUX	12 V	0.007 A
3.3 V	3.3 V	0 A
3.3 V AUX	3.3 V	1.77 A
Vcore LOM	0.956 V	11.5 A

## Standards Specifications

The QME8242 adapter supports the following standards specifications:

- IEEE: 802.3ae (10 Gb Ethernet)
- IEEE: 8021q (VLAN)
- IEEE: 802.3ad (Link Aggregation)
- IEEE: 802.1p (Priority Encoding)
- IEEE: 802.3x (Flow Control)
- IEEE: 802.1Qbb (Priority Based Flow Control)
- IEEE: 802.1Qaz (Enhanced Transmission Selection)
- IPv4 Specification (RFC791)
- IPv6 Specification (RFC2460)
- TCP/UDP Specification (RFC793/768)
- ARP Specification (RFC826)
- SCSI-3 Fibre Channel Protocol (SCSI-FCP)
- Fibre Channel Tape (FC-TAPE) Profile
- SCSI Fibre Channel Protocol-2 (FCP-2)
- Second Generation FC Generic Services (FC-GS-2)
- Third Generation FC Generic Services (FC-GS-3)

## Interface Specifications

**Table B-3. Interface Specifications**

Port Type	Media
10G-BASE-KR	Dell PE M1000e KR Midplane Revision 1.1

# Environmental Specifications

**Table B-4. Environmental Specifications**

Condition	Operating	Non-Operating
Temperature Ranges (for Altitude ≤900 m or 2952.75 ft)	10 °C to 35 °C (50 °F to 95 °F)	-40 °C to 65 °C (-40 °F to 149 °F)
Temperature Ranges (for Altitude >900 m or 2952.75 ft)	10 °C to Note <sup>a</sup> °C (50 °F to Note <sup>b</sup> °F)	-40 °C to 65 °C (-40 °F to 149 °F)
Temperature Gradient Maximum per 60 Min.	10 °C	20 °C
Humidity Percent Ranges— Noncondensing	20% to 80%* (Max Wet bulb temperature = 29 °C) <sup>c</sup>	5% to 95%+ (Max Wet bulb temperature = 38 °C) <sup>c</sup>
Humidity Gradient Maximum per 60 Min.	10%	10%
Altitude Ranges—Low Limits	-15.2 m (-50 ft)	-15.2 m (-50 ft)
Altitude Ranges—High Limits	3,048 m (10,000 ft)	10,668 m (35,000 ft)
Airborne Contaminants—ISA-71 Level	G1 <sup>c</sup>	G1 <sup>c</sup>

<sup>a</sup> Use the following formulas to calculate the maximum operating temperature (in °C) for a specific altitude. Use the first formula if the altitude is stated in meters and the second formula if the altitude is stated in feet.

$$35 - \frac{(\text{MaximumAltitude}_{\text{meters}} - 900)}{300} \text{ } ^\circ\text{C} \quad \text{or} \quad 35 - \frac{(\text{MaximumAltitude}_{\text{feet}} - 2952.75)}{984.25} \text{ } ^\circ\text{C}$$

<sup>b</sup> Use the following formulas to calculate the maximum operating temperature (in °F) for a specific altitude. Use the first formula if the altitude is stated in meters and the second formula if the altitude is stated in feet.

$$95 - \frac{(\text{MaximumAltitude}_{\text{meters}} - 900) \times 1.8}{300} \text{ } ^\circ\text{F} \quad \text{or} \quad 95 - \frac{(\text{MaximumAltitude}_{\text{feet}} - 2952.75) \times 1.8}{984.25} \text{ } ^\circ\text{F}$$

<sup>c</sup> Maximum corrosive contaminant levels measured at ≤50% relative humidity; see Table 3 in ISA-71.04-1985.

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## Notes

# C QConvergeConsole GUI

This appendix provides an overview of the QConvergeConsole web management interface:

- [Introduction to QConvergeConsole](#)
- [Downloading QConvergeConsole Documentation](#)
- [What's in the QConvergeConsole Help System](#)

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**NOTE:**

Information on installing and starting the GUI version of QLogic's QConvergeConsole utility is provided in the *QConvergeConsole User's Guide*. All procedural information for the utility is covered in the online help system.

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## Introduction to QConvergeConsole

QConvergeConsole is a unified adapter web management interface. This web-based client/server utility provides for centralized management and configuration of QLogic adapters within the entire network (LAN and SAN).

On the server side, QConvergeConsole runs as an Apache Tomcat server web utility. After the utility is launched on the web server, you can connect to the QConvergeConsole's graphical user interface (GUI) through a browser, either locally on the server or remotely from another computer. Your browser window becomes the client used to connect to servers that host the QLogic adapters and connected storage devices within the network.

The QConvergeConsole web management interface displays the main window used to connect to servers that host QLogic adapters. Each host server may include a combination of the following QLogic adapters:

- 4Gb and 8Gb Fibre Channel Adapters (QLx24xx and QLx25xx)
- Intelligent Ethernet Adapters (QLE324x)
- Converged Network Adapters (QLE81xx and QLE82xx)

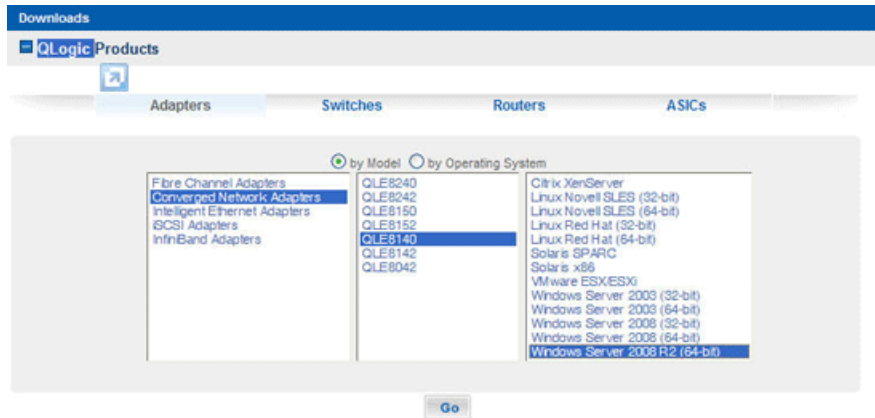
Note the following:

- The QConvergeConsole web utility works with the Windows XP Professional, Windows 2000, Windows Server 2003, Windows Vista, Windows Server 2008, Linux Red Hat Advanced Server, Linux SUSE SLES, Solaris SPARC, Solaris x86, Novell® NetWare®, and Macintosh OS X operating systems. Multiple operating system support allows control of heterogeneous environments.
- The QConvergeConsole web interface runs on the two most recent versions of commonly used web browsers, including Apple Safari, Mozilla Firefox, Google Chrome, and Microsoft Internet Explorer.
- The QConvergeConsole help system's Search and Index tools work best when running the help system using Internet Explorer or Firefox browsers. Although the help topics display correctly in Chrome or Safari browsers, they do not support the features required to display the Index and Search results.

## Downloading QConvergeConsole Documentation

Follow these steps to download QConvergeConsole documentation from the QLogic Web site:

1. On the QLogic home page (<http://www.qlogic.com>), click the **Downloads** tab.
2. On the Driver Downloads/Documentation page, click **QLogic Products**.
3. Complete the selection box ([Figure C-1](#)) as follows:
  - a. In the first column, click either **Fibre Channel Adapters**, **Intelligent Ethernet Adapters**, or **Converged Network Adapters**.
  - b. In the second column, click your adapter model number.
  - c. In the third column, click your operating system.
  - d. Click **Go**.



**Figure C-1. QLogic Products Download Selections (Example)**

4. On the downloads page for the selected adapter, scroll down to the **Management Tools** table, and then locate the **QConvergeConsole** row.
5. In the **Support Files** column, click the **Readme** and **Release Notes** links to open, view, and save those PDF documents.
6. Still on the downloads page, scroll down to the **Documentation** table, and then click the **QConvergeConsole User's Guide** link to open, view, and save that PDF document.

**NOTE:**

You can also download the Readme, Release Notes, and user's guide for the QLogic QConvergeConsole CLI utility from this same downloads page.

## What's in the QConvergeConsole Help System

To access the QConvergeConsole help system while the GUI utility is running, click the **Help** menu, and then click **Browse Contents**. The help system provides topics containing details of the following:

- **Introduction** summarizes the contents of the help system.
- **QConvergeConsole Overview** describes the purpose and scope of QConvergeConsole.
- **Getting Started** shows how to start using QConvergeConsole and the help system. It also describes how to initiate automatic e-mail notifications and set security on adapters installed for a selected host.
- **Managing Host Connections** describes how to connect to a host, create and use a host group, view host information, and disconnect from one or more host servers.

- **Displaying Host and Adapter Information** describes how to view general host and adapter information.
- **Displaying Device Information** shows you how to view information about a device (disk or tape).
- **Using Reports** describes the different types of reports and how to generate, view, and save them using the using QConvergeConsole's report facility.
- **Managing Fibre Channel and FCoE Adapter Ports** describes how to view and configure common parameters on Fibre Channel and FCoE ports, which reside on either Fibre Channel or Converged Network Adapters. It also describes how to use the advanced utilities, create and delete virtual ports, and perform diagnostics.
- **Managing the QLE8xxx FCoE Ports** describes how to view the parameters and statistics for FCoE ports that reside on QLE81xx and QLE82xx adapters.
- **Managing iSCSI Ports** shows and describes the parameters provided on the iSCSI port management pages for the QLE82xx Converged Network Adapters.
- **Managing Ethernet (NIC) Ports** shows and describes the parameters and configuration options provided on the NIC port management pages for QLE324x Intelligent Ethernet Adapters, as well as QLE81xx and QLE82xx Converged Network Adapters.
- **Troubleshooting** describes tools you can use to resolve the problems that can occur when installing and using QConvergeConsole. It also provides the procedures for tracing QConvergeConsole GUI and agent activity, if directed to do so by your authorized service provider.
- **Frequently Asked Questions** provides the answers to frequently asked questions about QConvergeConsole.
- **Technical Support** provides information about technical support availability and contact information. Customers should contact their authorized maintenance provider for technical support of their QLogic adapter products.
- **Contacting QLogic** describes how to contact technical support and how to obtain product information, the latest drivers, and links.







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