QConvergeConsole® CLI

2600, 2700, 2800 Series Marvell® QLogic® Fibre Channel Adapters

User's Guide

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Preface

This guide describes QConvergeConsole® (QCC) CLI, a management tool that is used to configure and manage Marvell® QLogic® Fibre Channel Adapters®.

Intended Audience

This guide is for system administrators who are responsible for installing, configuring, and managing Marvell adapters using QConvergeConsole CLI.

What Is in This Guide

This guide contains the basic information you need to get started with the QConvergeConsole CLI tool.

This preface specifies the intended audience, summarizes the contents of this guide, explains the QConvergeConsole CLI help system, lists related documents, describes the typographic conventions used in this guide, and provides technical support and downloads information.

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

Part I General CLI Information

- Chapter 1 System Requirements lists the hardware, software, and operating system requirements needed for successful operation of the QCC CLI tool.
- Chapter 2 Installing and Uninstalling QConvergeConsole CLI describes how to download, install, and uninstall the QCC CLI tool.
- Chapter 3 Getting Started describes how to start the QCC CLI tool on Windows® and Linux® platforms. This chapter also describes how to view detailed information about command parameters and options.

Part II Noninteractive Commands

- Chapter 4 General Noninteractive Commands describes and shows examples of the general noninteractive commands that apply to protocols supported by the QCC CLI tool: NIC, Fibre Channel.
- Chapter 5 Fibre Channel Noninteractive Commands describes the noninteractive Fibre Channel command syntax and parameters.

Part III Interactive Commands

- Chapter 6 Fibre Channel Interactive Commands contains a description of the QCC CLI Fibre Channel interactive mode menus.

Part IV Appendices

- Appendix A USCM Virtual Lanes describes the virtual lane feature and how it is implemented.
- Appendix B USCM FPIN-LI/MPIO with FC-NVMe Storage provides information for USCM multipath switching based on marginal links.
- Appendix C Revision History contains a list of changes made to this guide since the last revision.

At the end of this guide is a glossary of terms to help you quickly locate the information you need.

What Is in the Help System

The QConvergeConsole CLI help system (`qaucli -h`) contains a condensed version of the NIC and Fibre Channel noninteractive commands that are described in

the Chapter 5 Fibre Channel Noninteractive Commands.

Related Materials

For information about downloading documentation from the Marvell Web site, see “Downloading Updates and Documentation” on page xvi. For additional help installing or using QConvergeConsole CLI, refer to *QConvergeConsole CLI Read Me* document.

Documentation Conventions

This guide uses the following documentation conventions:

- **NOTE** provides additional information.
- **CAUTION** without an alert symbol indicates the presence of a hazard that could cause damage to equipment or loss of data.
- Text in blue font indicates a hyperlink (jump) to a figure, table, or section in this guide, and links to Web sites are shown in underlined blue. For example:
  - Table 9-2 lists problems related to the user interface and remote agent.
  - See “Installation Checklist” on page 6.

- For more information, visit www.marvell.com.

- Text in **bold** font indicates user interface elements such as a menu items, buttons, check boxes, or column headings. For example:
  - Click the **Start** button, point to **Programs**, point to **Accessories**, and then click **Command Prompt**.
  - Under **Notification Options**, select the **Warning Alarms** check box.
- Text in `Courier` font indicates a file name, directory path, or screen output. For example:
  - To return to the root directory from anywhere in the file structure: Type **`cd/ root`** and press ENTER.

  Text in **`Courier bold`** font indicates a command. For example:
  - Issue the following command: **`sh ./install.bin`**.
- Key names and key strokes are indicated with UPPERCASE:
  - Press CTRL+P.
  - Press the UP ARROW key.
- Text in *italics* indicates terms, emphasis, variables, or document titles. For example:
  - For a complete listing of license agreements, refer to the applicable *Software End User License Agreement*.
  - What are *shortcut keys*?
  - To enter the date type *mm/dd/yyyy* (where *mm* is the month, *dd* is the day, and *yyyy* is the year).
- Topic titles between quotation marks identify related topics either within this manual or in the online help, which is also referred to as *the help system* throughout this document.

Command Line Interface Documentation Conventions

Command line interface (CLI) command syntax conventions include the following:

- Plain text indicates items that you must type as shown. For example:
  - `qaucli -pr nic -ei`
- `< >` (angle brackets) indicate a variable whose value you must specify. For example:
  - `<serial_number>`

  NOTE

  For CLI commands only, variable names are always indicated using angle brackets instead of *italics*.
- `[ ]` (square brackets) indicate an optional parameter. For example:
  - `[<file_name>]` means specify a file name, or omit it to select the default file name.
- `|` (vertical bar) indicates mutually exclusive options; select one option only. For example:
  - `on|off`
  - `1|2|3|4`
- `...` (ellipsis) indicates that the preceding item may be repeated. For example:
  - `x...` means *one* or more instances of `x`.
  - `[x...]` means *zero* or more instances of `x`.
- (vertical ellipsis) within command example output indicate where portions of repetitious output data have been intentionally omitted.
- `( )` (parentheses) and `{ }` (braces) are used to avoid logical ambiguity. For example:
  - `a|b c` is ambiguous
    `{(a|b) c}` means `a` or `b`, followed by `c`
    `{a|(b c)}` means either `a`, or `b c`

Conventions for Interactive Commands

Documentation conventions that are specific to the menu-driven CLI commands include the following:

- **Noninteractive command equivalents:** Some interactive commands have noninteractive command equivalents. For such commands, the corresponding noninteractive option is listed at the end of the section heading in parentheses. For example, the following heading for the interactive Fibre Channel command **FC Adapter Information** indicates that the noninteractive equivalent is the `-i` command line option, described in the corresponding (Fibre Channel) noninteractive mode chapter: **FC Adapter Information (-i)**
- **Breadcrumbs line**: Section headings for interactive commands include a *breadcrumbs* line that shows the sequence of menu options from the Main Menu to the current topic. For example, the following breadcrumbs line shows that you access the Flash Update option by selecting option 3 (on the Main Menu), option 1 (on the second menu), and option 1 (on the third menu):

3. Adapter Updates ▸ Flash Update

```
ConvergeConsoleCLI


CLI - Version 3.0.x (Build xx)


    Main


    1:  Adapter Information
    2:  Adapter Configuration
    3:  Adapter Updates
    4:  Adapter Diagnostics
    5:  Monitoring
    6:  Universal SAN Congestion Mitigation (USCM)
    7:  Refresh
    8:  Help
    9:  Exit
```

```
            Please Enter Selection: 3


    QConvergeConsoleCLI

    CLI - Version 3.0.x (Build xx)

        FC Adapter Update

        1:  Flash Update
        2:  Driver Update
        3:  Parameters Update
        4:  Parameters (OEMs)
        5:  Firmware Preload Update
        6:  FC Board Config Update
        7:  PEP Board Config Update


            (p or 0: Previous Menu; m or 98: Main Menu; x or 99:
Quit)
            Please Enter Selection:
```

Technical Support

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

Downloading Updates and Documentation

The Marvell Web site provides periodic updates to product firmware, software, and documentation.

To download Marvell firmware, software, and documentation:

1. Go to www.marvell.com.
2. Click **Support,** and then under **Tools & Resources**, click **Driver Downloads**.

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

NOTE

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

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

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

Part I

General CLI Information

Part I of this guide provides general information about QConvergeConsole CLI in the following chapters:

- Chapter 1 System Requirements
- Chapter 2 Installing and Uninstalling QConvergeConsole CLI
- Chapter 3 Getting Started

1 System Requirements

QConvergeConsole CLI is a management tool that centralizes management and configuration of QLogic adapters within the entire network (LAN and SAN). For optimum performance, QConvergeConsole CLI requires the hardware, software, and operating systems listed in this chapter:

Hardware Requirements

NOTE

For the latest information on supported hardware, refer to the QConvergeConsole CLI *Read Me* and *Release Notes*.

QConvergeConsole CLI requires the following minimum hardware for the workstation server:

- **Server.** Single-processor or multiprocessor server or workstation. See "Operating System Requirements" on page 3 for a list of operating systems.
- **Processor.** Intel® Core™ or AMD64 processor.
- **Memory.** 256MB of physical RAM to run QConvergeConsole CLI.
- **Hard disk space.** About 110MB disk space.

The minimum hardware requirements for the adapter are as follows:

- **Adapters.** One or more of the Marvell adapters listed under "Supported Marvell Adapters" on page 3.

The minimum requirements for a SAN environment are as follows:

- **Storage.** Fibre Channel devices, such as disks and RAID subsystems. QConvergeConsole CLI supports most Fibre Channel devices.

NOTE

Tape devices and backup protection software must support persistent binding.

Software Requirements

NOTE

For the latest information on supported software, refer to the QConvergeConsole CLI *Read Me* and *Release Notes* documents.

QConvergeConsole CLI requires the following software for the server on which your adapter is physically installed:

- Administrative privileges to perform management functions
- Marvell adapter drivers for your operating system

NOTE

To download Marvell adapter drivers and agents, go to the Marvell Web site, www.marvell.com (see "Downloading Updates and Documentation" on page xvi).

Operating System Requirements

QConvergeConsole CLI runs on the following platforms:

- Microsoft® Windows Server®
- Red Hat® Linux® Advance Server/Enterprise Server
- SUSE® Linux Enterprise Server (SLES®)
- Oracle® Linux Unbreakable Enterprise Kernel (UEK)
- Citrix® XenServer®
- Ubuntu®

NOTE

For an up-to-date list of supported operating system versions, refer to the QConvergeConsole CLI *Read Me* and *Release Notes*, which can be downloaded from the Marvell Web site, www.marvell.com (see "Downloading Updates and Documentation" on page xvi).

Supported Marvell Adapters

QConvergeConsole CLI supports the following Marvell-branded adapters:

- Fibre Channel Adapters

- ❑ 2600, 2700, and 2800 Series Fibre Channel Adapters

NOTE

For information about Marvell adapters, refer to the Marvell Web site, Products page:

https://www.marvell.com/products/

To determine support for OEM-branded adapters, please contact your OEM.

2 Installing and Uninstalling QConvergeConsole CLI

This chapter describes how to download, install, and uninstall QConvergeConsole CLI.

NOTE

QConvergeConsole CLI configures Marvell adapters on the local system (where it is installed) only. It cannot configure adapters on remote systems.

Downloading QConvergeConsole CLI

Follow this procedure to download the QConvergeConsole CLI package file from the Marvell Web site to your computer.

To download QConvergeConsole CLI from the Marvell Web site:

1. Go to www.marvell.com.
2. Point to **Support**, and then under **Tools and Resources**, click **Driver Downloads**.
3. Under **Marvell Drivers**, click **NICs and HBA drivers**.
4. On the Downloads and Documentation page, click **Adapters**.
5. Click the corresponding button to search **by Model** or **by Operating System**.
6. To define a search, click an item in each selection column, and then click **Go**.
7. In the search results list, locate and select the QConvergeConsole CLI version for your operating system.

8. View the product details Web page to ensure that you have the correct QConvergeConsole CLI.
9. (Optional) For additional information, click the **Read Me** and **Release Notes** under **Support Files**.
10. Click **Download Now**.
11. Save the file to your computer.

Installing QConvergeConsole CLI

The installation procedures differ depending on the operating system:

- Installing QConvergeConsole CLI in a Windows Environment
- Installing QConvergeConsole CLI in a Linux Environment

Installing QConvergeConsole CLI in a Windows Environment

You can install QConvergeConsole CLI from the command prompt using the Microsoft® Windows Installer (MSI). Use one of the following methods:

- Standard Windows Interactive (CLI) Installation
- Quiet or Silent Windows Installation
- Passive Windows Installation

NOTE

You can also configure the installation using MSI commands. To see a summary of MSI commands, type `msiexec` at the command prompt.

To obtain more information about MSI, visit the Microsoft Web site.

Standard Windows Interactive (CLI) Installation

To begin a standard installation of QConvergeConsole CLI on a Microsoft Windows operating system, unzip the file that you saved in Step 11 of “Downloading QConvergeConsole CLI” on page 5. Then, issue one of the following commands on a command line:

`QConvergeConsoleCLI-<version>_win_x64.msi`

where `<version>` is the version number of the QConvergeConsole CLI.

The default directory for the QConvergeConsole CLI tool is:

`Program Files\QLogic Corporation\QConvergeConsoleCLI`

If you want to install QConvergeConsole CLI in a different directory, enter it in the command line. For example:

QConvergeConsoleCLI-<version**>_win.msi installdir=<**directory**>**

or

QConvergeConsoleCLI-<version**>_win_x64.msi installdir=<**directory**>**

where <directory> is the full path name of the installation directory.

Quiet or Silent Windows Installation

A quiet or silent installation installs using defaults. This mode requires no user intervention. Issue the following command for a quiet (silent) installation:

Windows 64-bit:

```
msiexec.exe /qn /package QConvergeConsoleCLI-<version>-win_x64.msi
```

Windows 32-bit:

```
msiexec.exe /qn /package QConvergeConsoleCLI-<version>-win.msi
```

Passive Windows Installation

A passive installation installs using default settings and displays a progress indication only. This is an unattended mode installation. Issue the following command for a passive installation:

Windows 64-bit:

```
msiexec.exe /passive /package QConvergeConsoleCLI-<version>-win_x64.msi
```

Windows 32-bit:

```
msiexec.exe /passive /package QConvergeConsoleCLI-<version>-win.msi
```

Installing QConvergeConsole CLI in a Linux Environment

To install QConvergeConsole CLI on a Linux platform, issue the following commands from the command line:

Linux 64-bit (x64):

```
# rpm -ivh QConvergeConsoleCLI-<version>.x86_64.rpm
```

The default installation directory on Linux is:

```
/opt/QLogic_Corporation/QConvergeConsoleCLI
```

Red Hat and SUSE Linux also create a soft link from the /usr/local/bin directory to the executable, qaucli.

By default, the `/usr/local/bin` directory is in the execution path; you need not add it.

NOTE

- QConvergeConsole CLI is available for PowerPC® (PPC), both PPC64 and PPC64le.
- `qaucli` is already installed on Citrix 6.5 and later. To update QConvergeConsole CLI to the latest version, issue the following command:

  `# rpm -Uhv QConvergeConsoleCLI-Citrix-<version>.rpm`

Ubuntu (aarch64):

```
root@ubuntu:~# dpkg -i qconvergeconsolecli_3.0.00-xx_arm64.deb
Selecting previously unselected package qconvergeconsolecli.
(Reading database ... 117412 files and directories currently
installed.)
Preparing to unpack qconvergeconsolecli_3.0.00-xx_amd64.deb ...
Unpacking qconvergeconsolecli (3.0.00-xx) ...
Setting up qconvergeconsolecli (3.0.00-xx) ...
Package installed in user-defined location: /opt
Library 2.2  already installed at
/usr/lib/x86_64-linux-gnu/libHBAAPI.so.
Processing triggers for libc-bin (2.23-0ubuntu11) ...
```

Uninstalling QConvergeConsole CLI

To remove QConvergeConsole CLI from your system, follow the instructions for your operating system:

- Uninstalling QConvergeConsole CLI in a Windows Environment
- Uninstalling QConvergeConsole CLI in a Linux Environment

Uninstalling QConvergeConsole CLI in a Windows Environment

The Windows operating system (OS) offers the following methods of uninstalling QConvergeConsole CLI:

- Start Menu Uninstall
- Control Panel Uninstall
- Command Line Uninstall

Start Menu Uninstall

To uninstall from the Windows Start menu:

1. Go to **Start**.
2. Point to **All Programs**, point to **QLogic Management Suite**, and then click **Uninstall QConvergeConsole CLI**.

Control Panel Uninstall

NOTE

The following instructions uninstall both QConvergeConsole CLI and the associated drivers.

To uninstall from the Windows Control Panel:

1. Go to **Start**, and then click **Control Panel**.
2. Double-click **Add/Remove Programs**.
3. Select **QLogic Driver and Management Super Installer (x64)**.
4. Click **Change/Remove**.

Command Line Uninstall

You can uninstall QConvergeConsole CLI from the command line in interactive, passive, or silent (quiet) mode.

To uninstall interactively from the command line:

Issue one of the following commands from a command prompt:

```
QConvergeConsoleCLI-<version>-win_x64.msi
```

or

To uninstall in unattended mode from the command line:

Issue the following command from a command prompt:

```
msiexec /passive /x  QConvergeConsoleCLI-<version>-win_x64.msi
```

or

```
msiexec /passive /x  QConvergeConsoleCLI-<version>-win.msi
```

To uninstall in silent mode from the command line:

Issue the following command from a command prompt:

```
msiexec /q /x QConvergeConsoleCLI-<version>-win_x64.msi
```

or

msiexec /q /x QConvergeConsoleCLI-<version>-win.msi

Uninstalling QConvergeConsole CLI in a Linux Environment

To uninstall QConvergeConsole CLI on a Red Hat or SUSE Linux operating system, issue the following command:

```
# rpm -e QConvergeConsoleCLI
```

To uninstall QConvergeConsole CLI on an Ubuntu system, issue the following command:

```
root@ubuntu:~# dpkg -r qconvergeconsolecli
(Reading database ... 73791 files and directories currently
installed.)
Removing qconvergeconsolecli (2.2.00-xx) ...
```

3 Getting Started

QConvergeConsole CLI manages Fibre Channel functions on Marvell Fibre Channel Adapters. This chapter describes how to start the QConvergeConsole CLI using the noninteractive mode (command line interface) and the interactive mode (menu-driven interface), as well as how to get help.

Using Noninteractive Mode

Noninteractive mode is a command line interface that executes a command and its parameters, and then terminates. Use the noninteractive mode to run QConvergeConsole CLI from a script file or when you want to perform a single operation. This guide describes the noninteractive mode commands by function in the Chapter 5 Fibre Channel Noninteractive Commands.

To start the noninteractive QConvergeConsole CLI in Windows[1] or Linux, open an operating system shell, and then type a command with one or more command line switches. For specific command formats, refer to the chapter for the corresponding adapter function. For example, to discover a Fibre Channel adapter, issue the following command:

```
qaucli -pr fc -g
```

QConvergeConsole CLI is case-sensitive. In addition, file names in some operating systems are case-sensitive; in this case, QConvergeConsole CLI is case-sensitive for that specific file.

Using Interactive Mode

Interactive mode is a menu-driven interface that manages Marvell Fibre Channel Adapters. The interface for the Fibre Channel Adapters is described in Chapter 6.

[1] For Windows 2008 or later, use administrator mode.

Starting QConvergeConsole CLI

Start the CLI using the method specified for your operating system: Windows, Linux.

Starting QConvergeConsole CLI in Windows

To start QConvergeConsole CLI in interactive mode in Windows, do one of the following:

- Double-click the QConvergeConsole CLI icon on the desktop.

- Click **Start**, point to **All Programs**, point to **QLogic Management Suite**, and then click **QConvergeConsole CLI**.
- Open a command prompt in the installation directory (the default is `C:\Program Files\QLogic Corporation\QConvergeConsoleCLI`), and then issue the following command:

```
qaucli.exe
```

or

```
qaucli.exe -pr fc
```

Starting QConvergeConsole CLI in Linux

To start QConvergeConsole CLI in interactive mode in Linux, issue the following command:

```
qaucli
```

or

```
qaucli -pr fc
```

Main Menu

When you start QConvergeConsole CLI in interactive mode, the Main Menu appears as follows:

```
Main Menu

1:  Adapter Information
2:  Adapter Configuration
3:  Adapter Updates
4:  Adapter Diagnostics
```

```
5:  Monitoring
6:  Universal SAN Congestion Mitigation (USCM)
7:  Refresh
8:  Help
9:  Exit

        Please Enter Selection:
```

Menu Navigation

From any menu, type:

- **p** or **0** (zero) to return to the previous menu
- **m** or **98** to return to the Main Menu
- **ex** or **99** to end the QConvergeConsole CLI session

Getting Help

To view help in interactive mode:

Select the **Help** option.

To view help in noninteractive mode:

Use the `-h` switch. For example, to list all of the available command line parameters, issue the following command:

```
qaucli -h
```

To list available online switches, issue the following commands for their respective adapter types:

Fibre Channel: `qaucli -pr fc -h`

The following shows an example of noninteractive help output for Fibre Channel adapters:

```
Using config file: C:\QConvergeConsoleCLI-3.0.00-04_win_PE_x64\qaucli.cfg
QConvergeConsoleCLI
Version 3.0.x (Build xx)
Copyright (C) 2009-2023 Marvell Semiconductor Inc.
Build Type:  Release
Build Date:  Oct 12 2023 15:03:16

Usage: qaucli [options]
```

The following shows an example of noninteractive help output in debug mode:

```
"When the following command is executed: qaucli.exe -pr all -h, the help is
printed below
localhost:~ # qaucli -pr all -h
Using config file: C:\QConvergeConsoleCLI-3.0.00-04_win_PE_x64\qaucli.cfg
QConvergeConsoleCLI
Version 3.0.x (Build xx)
Copyright (C) 2009-2023 Marvell Semiconductor Inc.
Build Type:  Release
Build Date:  Oct 12 2023 15:03:16


Usage: qaucli [options]
```

Part II
Noninteractive Commands

Part II of this guide provides details about the noninteractive commands of QConvergeConsole CLI in the following chapters:

- Chapter 4 General Noninteractive Commands
- Chapter 5 Fibre Channel Noninteractive Commands

To run QConvergeConsole CLI:

Windows

Open a command prompt in the installation directory (the default is `C:\Program Files\QLogic Corporation\QConvergeConsoleCLI`), and then issue the desired non-interactive command. For example:

```
qaucli.exe <non-interactive options>
```

Linux

Open an operating system shell from any terminal window, and then issue the desired noninteractive command. For example:

```
qaucli <noninteractive options>
```

The examples in the following sections are shown with different OSs; be sure to use the format for your system's OS.

4 General Noninteractive Commands

This chapter describes and shows examples of the general noninteractive commands that apply to all QConvergeConsole CLI supported protocols: NIC, Fibre Channel. The general commands include the `all` switch. Use the general noninteractive commands for Viewing General Help.

Viewing General Help

To view the general help for all protocols, issue the `-pr fc -h` command as follows:

```
localhost:~ # qaucli -pr fc -h

Using config file: C:\QConvergeConsoleCLI-3.0.00-04_win_PE_x64\qaucli.cfg
QConvergeConsoleCLI
Version 3.0.x (Build xx)
Copyright (C) 2009-2023 Marvell Semiconductor Inc.
Build Type:  Release
Build Date:  Oct 12 2023 15:03:16


Usage: qaucli [options]
Legends:

   <hba instance>    - Instance number of an HBA port.
   <hba wwpn>        - World Wide Port Name of an HBA port.
                       (xx:xx:xx:xx:xx:xx:xx:xx or xxxxxxxxxxxxxx).
   <all>             - All adapters
   <target wwnn>     - World Wide Node Name of a target device.
                       (xx:xx:xx:xx:xx:xx:xx:xx or xxxxxxxxxxxxxx).
   <target wwpn>     - World Wide Port Name of a target device.
                       (xx:xx:xx:xx:xx:xx:xx:xx or xxxxxxxxxxxxxx).
```

```
   <target portid>   - Port ID of a target device.
                       (xx:xx:xx or xxxxxx).
   <target id>       - ID of a target device.
   <lun id>          - Logical Unit Number of a LUN.
   <lunname>         - The udev persistent device name to be assigned to
                       a designated LUN (Linux only).

Options:

   [int]             - Interactive mode (Menu driven).

   -i [<all>] vpd    - Views the general or vpd information of all HBAs.
   -i <hba instance>|<hba wwpn> vpd
                     - Displays general/VPD information of an HBA port.


   -c  [<all>]       - Displays current HBA Parameter settings of all HBAs.
   -c <hba instance>|<hba wwpn>
                     - Displays current HBA Parameters settings of an HBA
                       port.

   -n <hba instance>|<hba wwpn> {<param name>|<param alias> <param value>}
                     - Modifies current HBA parameter settings of an HBA
                       port.
   -n <hba instance>|<hba wwpn>|<all> default
                     - Restores factory default HBA parameter settings of
                       an HBA port
                       Note: This option is not supported with 2Gb HBAs.
   -n <hba instance>|<hba wwpn>|<all> <OEM name>
                     - Updates current HBA parameter settings of an HBA port
                       using a pre-defined OEM default templates.
```

```
      Options:
         <param name>     See supported parameter name (Table 1).
         <param alias>    See supported parameter alias (Table 1).
         <param value>    See supported parameter value (Table 1).

   -t [<all>]        - Displays information of devices (Disks or
                                  or Tapes) attached to all HBAs.
   -t <hba instance>|<hba wwpn>
                     - Displays information of devices (Disks or Tapes)
                       attached to an HBA port.
   -t <hba instance>|<hba wwpn> <target wwpn>|<target portid>
                     - Displays information of devices (Disks or Tapes)
                       attached to an HBA port.

l <hba instance>|<hba wwpn>
                     - Displays LUNs information of devices attached to an
                       HBA port.
                     - Displays LUNs information of devices attached to an
                       HBA port.
   -l <hba instance>|<hba wwpn> <target wwpn>|<target portid>
                     - Displays LUNs information of devices attached
                       to an HBA port.
   -l <hba instance>|<hba wwpn> <target wwpn>|<target portid> <lun id>
                     - Displays specific LUN information of a device
                       attached to an HBA port.
```

Also see Noninteractive Commands.

5 Fibre Channel Noninteractive Commands

This chapter describes the noninteractive Fibre Channel command format and parameters of QConvergeConsole CLI. For a quick reference to informative commands, see Displaying System Information (Command Line Options -g, -z) on this page.

NOTE

To view help, issue the `-h` command.

Displaying System Information (Command Line Options -g, -z)

When you select one of these options, general information appears in various formats. For example:

- **`qaucli -pr fc -g`** shows the host information (see "Host Information (Command Line Option -g)" on page 19).
- **`qaucli -pr fc -z`** shows the host configuration (see "Host Configuration (Command Line Option -z)" on page 20

Host Information (Command Line Option -g)

The command format to show host information is:

```
qaucli -pr fc -g
```

Issue the `-g` command to view the following information about the local machine:

- Host name
- OS type
- OS version (patches where applicable)
- SAN device management (SDM) API version

- List of adapters: adapter model, port number, worldwide port name (WWPN), serial number (SN), adapter number (adapter 0–*n*), and status (online or offline). Depending on the model, adapter information may also include the instance number, link status (up or down), diagnostic mode (D_Port), and SFP detection (installed or not).
- Total number of Marvell QLogic Fibre Channel Adapters detected

NOTE

The failover and SAN device management APIs are Marvell-specific libraries required for QConvergeConsole CLI. The versions of these libraries are useful for debugging purposes.

Host Configuration
(Command Line Option -z)

The command line option `-z` provides a summary for the selected adapter in a single command. The command format is [[start here]]:

```
qaucli -pr fc -z
```

QConvergeConsole CLI shows the information in “Host Information (Command Line Option -g)” on page 19, as well as the following additional information:

- Adapter general information
- Adapter Flash component version
- Adapter vital product data (VPD)
- Adapter parameter settings
- Driver settings information:
  - Group: persistent
  - Group: binding
- Target persistent binding (Windows only)
- USCM profile management configuration
- USCM Status
  - Initiator
  - Target (slow-drain devices)
- Device and LUN information
- Selective LUNs information
  - Boot device settings
- SFP information

To show the information for a single adapter, issue the following command:

```
qaucli -pr fc -z  <hba instance>|<hba wwpn>
```

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)
`<hba wwpn>` = World wide port name of the adapter

To show the information for all adapters, issue the following command:

```
qaucli -pr fc -z all
```

Host Port Configuration

Use these options to show the information for one or all of the adapter ports in the system. The `-z` option shows the combination of the commands listed in Table 5-1. The commands are listed in alphabetical order.

Table 5-1. Options Shown by -z

CLI	Description	See User's Guide Section
`-c`	Show adapter settings	"-c (Display HBA Parameters)" on page 29
`-dm`	Show general or detailed digital diagnostic monitoring	"-dm (Transceiver Diagnostics Monitoring Interface [DMI])" on page 31
`-e`	Configure boot device	"-e (Configure Boot Devices)" on page 42
`-fg`	View driver settings	"-fg (Display Driver Persistent Binding Settings)" on page 58
`-gs`	Show adapter statistics	"-gs (Configure Parameters [Monitoring])" on page 62
`-i`	Show adapter information	"-i (FC Adapter Information; FC VPD Information; FC Hyper-V VFC Information)" on page 64
`-l`	Show LUN list	"-l (FC Target/LUN Information)" on page 75
`-m`	Configure selective LUNs	"-m (Selective LUN Mapping)" on page 77
`-p`	Configure target persistent binding	"-p (Target Persistent Bindings)" on page 84
`-t`	Show target list	"-t (FC Storage Device Information)" on page 101

Command Format

The command format for noninteractive mode is:

```
qaucli -pr fc -<command> <hba instance>|<hba wwpn> view|info
```

Where:

`<command>` = One of the commands listed in "Command Summary" on page 23

`<hba instance>` = Adapter port instance (use the `-g` command to find)

`<hba wwpn>` = Adapter world wide port name

You *cannot* combine the `-f`, `-o`, and `-s` commands with any other options:

- `-f` = Input parameter options from a text file (see "-f" on page 54). For example:

  `qaucli -pr fc -f command.txt`

- `-o` = Output the results to a file (see "-o (Redirect Standard Output To a File)" on page 84). For example:

  `qaucli -pr fc -l all -o output.txt`

- `-s` = Silent mode (see "-s (Suppress Output [Silent Mode])" on page 97). For example:

  `qaucli -pr fc -i all -s`

You can combine the `-x` command with other options. However, it *must* be at the beginning or at the end of the command line. Use the command as follows:

- `-x` = Outputs the results in XML format (see "-x (XML Output [Legacy])" on page 108). For example:

  `qaucli -pr fc -i all -x -o output.xml`

In addition, the following general rules for commands apply:

- Only *one* command line option per input file is valid.
- You can use either the hyphen (`-`) character or the forward slash (`/`) character. For example, both of these commands are valid:

  `qaucli -pr fc -g`
  `qaucli -pr fc /g`

Table 5-2 defines the command variables.

Table 5-2. Command Variables

Variable	Definition	Format
`<hba instance>`	Adapter number [a]	—
`<hba wwpn>`	Adapter world wide port name	*xx*:*xx*:*xx*:*xx*:*xx*:*xx*:*xx*:*xx* or *xxxxxxxxxxxxxx*
`<alias>`	Adapter alias	Symbolic adapter [b] name

Table 5-2. Command Variables (Continued)

Variable	Definition	Format
`<target wwnn>`	Target world wide node name	*xx*:*xx*:*xx*:*xx*:*xx*:*xx*:*xx*:*xx* or *xxxxxxxxxxxxxx*
`<target wwpn>`	Target world wide port name	*xx*:*xx*:*xx*:*xx*:*xx*:*xx*:*xx*:*xx* or *xxxxxxxxxxxxxx*
`<target port id>`	Target port ID	*xx-xx-xx* or *xxxxxx*
`<target id>`	Target ID	—
`<lun id>`	Logical unit number	(0–255)
`<address>`	IP address	*xxx.xxx.xxx.xxx*
`<iidma speed>`	Target link speed	1.2, 4, or 8GHz

[a] You can use the `-g` command to find adapter numbers.

[b] You assign the symbolic name. It is limited to 100 characters in length.

Command Summary

This section lists and describes all Fibre Channel noninteractive commands in alphabetical order.

NOTE

A parenthetical phrase after a command indicates the equivalent *interactive* menu option. For example, **-c (Display HBA Parameters)** indicates that the `-c` command has an equivalent **Display HBA Parameters** menu option described in Chapter 6 Fibre Channel Interactive Commands.

Not all noninteractive commands have equivalent interactive menu options.

The Fibre Channel noninteractive commands include the following:

- -a (Port Beacon)
- -b (Flash Update; Save Flash)
- -bbcr (Buffer-to-Buffer Credits (BBC))
- -c (Display HBA Parameters)
- -ctp (CT Ping Test)
- -ctp (CT Ping Test)
- -d (Driver Update)
- -dm (Transceiver Diagnostics Monitoring Interface [DMI])
- -dport (Diagnostics Port)
- -e (Configure Boot Devices)
- -ei

- -f
- -fcep (Diagnostics FC Ping [ELS Echo Ping])
- -fec (Forward Error Correction (FEC))
- -fg (Display Driver Persistent Binding Settings)
- -ftr (CT FTR Test)
- -fs (Driver Parameters)
- -fwdump (Save Adapter RISC Firmware Dump)
- -g
- -gs (Configure Parameters [Monitoring])
- -h (Help)
- -ha (HBA Alias [FCoE Configuration])
- -i (FC Adapter Information; FC VPD Information; FC Hyper-V VFC Information)
- -kl (Loopback Test)
- -kr (Read Write Buffer Test)
- -l (FC Target/LUN Information)
- -ls (Display Parameters [HBA Statistics]; Link Status)
- -m (Selective LUN Mapping)
- -mbiv (Flash/MBI Information)
- -mpidump (Save Adapter MPI FW Dump)
- -n (HBA Parameter (NVRAM) Settings)
- -o (Redirect Standard Output To a File)
- -p (Target Persistent Bindings)
- -pa (HBA Port Alias [FCoE Configuration])
- -pc (Adapter Personality Change)
- -pl (Persistent Names [udev] – Linux only)
- -q (Target Link Speed [iiDMA])
- -qos (NPIV Quality of Service [QoS])
- -r (Parameters Update; Save HBA Parameters)
- -rdp (Read Diagnostics Parameter)
- -s (Suppress Output [Silent Mode])
- -scm | -uscm (Congestion Management)
- -sfpdump (Display SFP raw data to standard out put or save the SFP raw data in binary or text format to a file)
- -sp (Save Adapter FC Board Config)
- -t (FC Storage Device Information)
- -tb (Target Beacon)
- -tm (HBA Temperature)
- -tp (Topology)
- -trace (FCE Trace)
- -u (Firmware Preload Table Update)
- -v (QCC CLI Version Information)
- -vp (N_Port ID Virtualization [NPIV])
- -x (XML Output [Legacy])

- -x2 (XML Output)
- -z (All Information)

-a (Port Beacon)

Use the `-a` command to view or change the state (`ON` or `OFF`) of an LED beacon.

NOTE

- The adapter must not be in silent mode. See "-s (Suppress Output [Silent Mode])" on page 97 to issue a response to this command.
- Due to a hardware and firmware limitation, the `-a` option is not supported on Marvell 8200 Series Adapters.

To view the adapter port's LED beacon state, issue the following command:

```
qaucli -pr fc -a  <hba instance>|<hba wwpn>  view|info
```

The following message appears:

```
HBA Port x - LED Flashing is <state>.
```

Where `<state>` is `ON` if the LED is flashing, or `OFF` if the LED is not flashing.

To cause an adapter's LED beacon to start or stop flashing, issue the following command:

```
qaucli -pr fc -a  <hba instance>|<hba wwpn>
```

QConvergeConsole CLI toggles the LED's state. If the LED is flashing, the flashing stops. If the LED is not flashing, the flashing begins.

If QConvergeConsole CLI is not in silent mode (see "-s (Suppress Output [Silent Mode])" on page 97), one of the following messages appears to indicate the LED's current state:

```
The LED Flashing for <hba instance> <hba wwpn> has been turned ON
The LED Flashing for <hba instance> <hba wwpn> has been turned OFF
```

-b (Flash Update; Save Flash)

Use the `-b` command to:

- Update the BIOS from a file.
- Save the BIOS to a file.

To update the Flash of one or all adapters with new BIOS, issue the following command:

`qaucli -b <all>|<hba instance>|<hba wwpn> [-rg <all>] <image file> [<model type>] [--ports]`

Where:

`all` = All adapters of the same type in the system are updated with the new BIOS

`<hba instance>` = Adapter number (use the `-g` command to find)

`<hba wwpn>` = World wide port name

`all` = Update all regions (BIOS or extensible firmware interface (EFI)) depending on the Flash image

`<image file>` = Name or path of file containing update BIOS

`<model type>` = Optional. Update only adapters that match the specified adapter family type:

- `--26xx` 2600 Fibre Channel adapter model type
- `--268x` 26800 Fibre Channel adapter model type
- `--27xx` 2700 Fibre Channel adapter model type
- `--28xx` 2800 Fibre Channel adapter model type

--ports = Optional. Repeat Flash update to all other ports.

To update a single Host Bus Adapter or all Host Bus Adapters using a Flash update configuration template file:

`qaucli -b <all>|<hba instance>|<hba wwpn> <-op> <update mode> -src <template file>] [--ports]`

Where:

`all` = All adapters of the same type in the system are updated with the new BIOS

`<hba instance>` = Adapter number (use the `-g` command to find)

`<hba wwpn>` = World wide port name

`-op` = Flash update mode type when using a template configuration file.

`<update mode>` = Mode of update:

- `0` Force an update to boot code or firmware across multiple Host Bus Adapters (Override mode).
- `1` Force an update to boot code/firmware across multiple Host Bus Adapters that are currently at or below a known revision. Adapters that are currently up revision are ignored.
- `2` Force a downgrade to boot code or firmware across multiple Host Bus Adapters that are currently up a revision. Force to update boot code/firmware across multiple adapters that are currently down a revision. Adapters that are currently at revision are ignored.

`-src` = Specifies a different template file than the default file.

`<template file>` = User-defined configuration template file name. See the sample template file included for complete file syntax and format. If the `<-src>` option is omitted, the QConvergeConsole CLI tries to use the default template file, `flashcfg.properties`.

--ports = Optional. Repeat Flash update to all other ports.

Following is example output of a failed Flash update:

```
PS C:\> qaucli -b 0 .\mh010018.bin
Validating Flash Image File... Success
Updating Flash on HBA port(s) - QLE2774. Please wait...
Updating Adapter FC Boot Code... Success
EFI version: 07.01.00
Updating Adapter PEP softROM version 03.00.10... Success
Updating Adapter PEP FW version 03.00.12... Success
Updating Adapter PEP Board Configs version 03.00.00... Success
Updating Adapter Fw Preload Area version 3.0.7... Success
Updating Adapter MPI Fw version 135.03.04...
** failed checksum checksum check
Flash update failed with HBA (Instance 0 - QLE2774) with error
511)!
```

NOTE

For the 2770 Series, error 511 may indicate non-authentic firmware. See `fcscli-exitcodes.txt` for error code details.

-bbcr (Buffer-to-Buffer Credits (BBC))

Buffer-to-buffer credits (BBC) enables two FC peer ports (N_Port, F_Port, or E_Port) to periodically send and receive the quantity of receiver ready (R_RDY) signals transmitted. The BBC feature allows the peer port to recover from possible R_RDY signals lost over a lossy link. BBC enables two FC ports logged in with each other to recover lost buffer-to-buffer credits. These lost credits can impact throughput, cause link resets, and disrupt traffic flow.

To display current BBC status of a specific HBA port, issue the following command:

qaucli -bbcr <hba instance>|<hba wwpn>|<all> --info

To enable a BB credit of `5` to a specific HBA port of the HBA, issue the following command:

qaucli -bbcr <hba instance>|<hba wwpn>|<all> --enable 5

To disable the BB credit option on a specific HBA port of the HBA, issue the following command:

qaucli -bbcr <hba instance>|<hba wwpn>|<all> --disable 0

To display BB credit statistics on a specific HBA port of the HBA, issue the following command:

qaucli -bbcr <hba instance>|<hba wwpn>|<all> --stats

(To stop running BB credit statistics, press the ENTER key.)

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)

`<hba wwpn>` = World wide port name of the adapter

`<all>` = All discovered adapters

`<option>` = One of the following options:

- `--info`
- `--enable`
- `--disable`
  Disables BB credit on a specific HBA port or all ports
- `--stats`
  Displays BB credit statistics on a specific HBA port of an HBA

`<bbcr_val>` = Quantity of credits (0–15)

-C (Display HBA Parameters)

To show the parameter settings for all adapters in the system, issue the `-c` command as follows:

```
qaucli -pr fc -c [all]
```

To show the parameter settings for a specific adapter, issue the command as follows:

```
qaucli -pr fc -c  <hba instance>|<hba wwpn>
```

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)

`<hba wwpn>` = World wide port name of the adapter

-ctp (CT Ping Test)

NOTE

The `-ctp` command is supported on all Brocade switches and some Cisco switches. In the Cisco switches, the common transport (CT) feature must be enabled by the user (it is disabled by default). See the Cisco switch documentation for more information.

Use the `-ctp` command to issue a common transport (CT) ping command to one or all discovered targets.

To run a CT ping test using the default parameters, issue the following command:

```
qaucli -ctp <hba instance>|<hba wwpn>
```

To run a CT ping test with custom parameters, issue the following command:

```
qaucli -ctp  <hba instance>|<hba wwpn>|[-ex -exclude
<target wwpn>][<param name>|<param alias>) <param value>]
```

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)

`<hba wwpn>` = World wide port name of the adapter

`<target wwpn>` = World wide port name of the target

`<param name>` = One of the following parameter names:

- TestCount
- TestIncrement
- OnError

`<param alias>` = One of the following parameter aliases:

- TC
- TI
- OE

`<param value>` = Value of parameter or alias (see Table 5-3)

Table 5-3. Ping Diagnostics Parameters

Parameter Name	Parameter Alias	Parameter Values	Description
TestCount	TC	0–10,000	0 specifies that the `-fcp` command (see -fcp (Ping Test) continues until the user interrupts it. 1 to 10,000 specifies that the `-fcp` command (see -fcp (Ping Test) stops after sending count pings.
TestIncrement	TI	1–10,000	Specifies the quantity of the test increment, which must be less than the quantity of the test count.
OnError	OE	0–2 = Ignore on error 1 = Stop on error 2 = Loop on error	Specifies how errors are handled during any specific pass: ■ **Ignore on error** indicates that errors are ignored and the test sequence continues ■ **Stop on error** indicates that the test sequence halts when an error is encountered ■ **Loop on error** indicates that the test uses the same data pattern and test when errors are encountered

-d (Driver Update)

The Windows driver package is in a `.zip` file. Before running the `-d` command, extract the `.zip` file to a folder.

Issue the `-d` command to update the driver for Windows. For example:

```
qaucli -pr fc -d <driver file>
```

Where `<driver file>` is the full path to the `.inf` file extracted from the `.zip` file.

-dm (Transceiver Diagnostics Monitoring Interface [DMI])

The `-dm` option allows you to show general or detailed digital diagnostic monitoring interface for optical transceivers. You can also copy the plug-in SFP/SFF+ module EEPROM raw data to a file.

To show transceiver monitoring *general* information, issue the following command:

qaucli -dm <hba instance>|<hba wwpn>|all gen|--gen|/gen --refresh|/refresh

To show transceiver monitoring *detailed* information, issue the following command:

qaucli -pr fc -dm <hba instance>|<hba wwpn>|all det|--raw|/raw

To save the plug-in SFP/SFF+ module EEPROM raw data to a file, issue the following command:

qaucli -dm <hba instance>|<hba wwpn> save|--save|/save <filename>

Where:

- `<hba instance>` = Adapter number (use the `-g` command to find)
- `<hba wwpn>` = World wide port name of the adapter
- `all` = All adapters in the system
- `<filename>` = SFP/SFF+ module EEPROM raw data binary file

The following examples retrieve transceiver monitoring general information.

```
-------------------------------------------------------------------
HBA Instance 4: QLE2770 Port 1 WWPN 21:00:34:80:0d:3b:89:23
PortID 02:0f:00
Link: Online (FEC)
-------------------------------------------------------------------
-------------------------------------------------------------------------------
Media Information
-------------------------------------------------------------------------------
                        Vendor: FINISAR CORP.
                     Connector: LC (Lucent Connector)
                    Media Type: 3200-M5-SN-S
                   Part Number: FTLF8532P4BCV-QL
                         Speed: 3200 MBytes/Sec 1600 MBytes/Sec 800 MBytes/Sec
                      Revision: A
                 Serial Number: UU20U6T
                    Identifier: SFP/SFP+/SFP28 and later
     Extended Compliance Codes: Unspecified
```

```
               Rate Identifier: FC-PI-6 (32/16/8G Independent Rx, Tx
Rate_Select)
          QLogic SFP Installed: Yes
-------------------------------------------------------------------------------
-
                 Temperature   Voltage     Tx Bias    Tx Power    Rx Power
                     (C)         (V)         (mA)        (mW)        (mW)
               -------------   -------     -------    --------    --------
        Value      59.15        3.33       7.77        0.7449     0.5929
       Status     Normal       Normal      Normal      Normal      Normal
   High Alarm      75.00         3.60       12.00      1.9953      1.9953
 High Warning      70.00         3.50       11.50      1.5849      1.5849
  Low Warning       0.00         3.10        2.00      0.1585      0.0158
    Low Alarm      -5.00         3.00        1.00      0.1259      0.0100
```

The following examples retrieve transceiver monitoring detailed/raw data information.

The following output is for an Avago transceiver.

```
qaucli -pr fc -dm 1  gen --refresh
-------------------------------------------------------------------------------
HBA Instance 1: QLE2692 Port 1 WWPN 21:00:00:24:ff:8f:e3:96 PortID 01:08:00
Link: Online
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
Media Information
-------------------------------------------------------------------------------
                       Vendor: FINISAR CORP.
                    Connector: LC (Lucent Connector)
                   Media Type: 1600-M5-SN-S
                  Part Number: FTLF8529P3BCV-QL
                        Speed: 400 MBytes/Sec 1600 MBytes/Sec 800 MBytes/Sec
                     Revision: A
                Serial Number: USE0J7D
                   Identifier: SFP/SFP+/SFP28 and later
     Extended Compliance Codes: Unspecified
               Rate Identifier: FC-PI-5 (16/8/4G Independent Rx, Tx Rate_select
          QLogic SFP Installed: Yes
-------------------------------------------------------------------------------
                 Temperature   Voltage     Tx Bias    Tx Power    Rx Power
                     (C)         (V)         (mA)        (mW)        (mW)
```

	---	---	---	---	---
Value	38.50	3.39	8.22	0.5208	0.6927
Status	Normal	Normal	Normal	Normal	Normal
High Alarm	75.00	3.60	12.00	1.0000	1.2589
High Warning	70.00	3.50	11.50	0.7943	1.0000
Low Warning	0.00	3.10	2.00	0.1585	0.0158
Low Alarm	-5.00	3.00	1.00	0.1259	0.0100

qaucli -pr fc -dm 1 --det

```
------------------------------------------------------------------------------
HBA Instance 4: QLE2770 Port 1 WWPN 21:00:34:80:0d:3b:89:23 PortID 02:0f:00
Link: Online (FEC)
------------------------------------------------------------------------------
Optical Transceiver Digital Diagnostic Data:

Address A0
                    Identifier: SFP/SFP+/SFP28 and later
           Extended Identifier: GBIC/SFP defined by serial ID only
                     Connector: LC (Lucent Connector)
                Ethernet Speed:
                    Compliance: 0x00 0x00 0x00
                FC Link Length: Short Distance (S)
           FC Transmitter Tech: Shortwave Laser w/o OFC (SN)
         FC Transmission Media: Multi-mode 50m (M5)
                      FC Speed: 3200 MBytes/Sec 1600 MBytes/Sec 800 MBytes/Sec
                      Encoding: 64B/66B
                   BR, Nominal: 0xff
               Rate Identifier: FC-PI-6 (32/16/8G Independent Rx, Tx
Rate_Select)
             Length (9um) - km: 0x00
                  Length (9um): 0x00
             Length (50um,OM2): 0x03
            Length (62.5um,OM1): 0x00
      Length (50um,OM4,Copper): 0x0a
      Length (50um,OM3,Copper): 0x07
                   Vendor name: FINISAR CORP.
     Extended Compliance Codes: Unspecified
                   Vendor OUI: 0x00 0x90 0x65
                    Vendor PN: FTLF8532P4BCV-QL
                   Vendor Rev: A
```

```
                    Wave Length: 0x0352
                     FC Speed 2: 0x0
                        CC_BASE: 0x1f
 Optional Transceiver Signals:  -Linear Receiver Output Implemented: 0x0
                                -Power Level Declaration: 0x0
                                -Cooled Transceiver Declaration: 0x0
                                -Retimer or CDR indicator: 0x1
                                -Paging implemented indicator: 0x0
                                -High Power Level Declaration by bit 1: 0x0
                               -High Power Level Declaration by bits 1 and 5: 0x0
                                -Reserved: 0x0
                                -Signal Loss, as defined in SSFF-8419: 0x1
                                -Signal Loss, inverted from SFP MSA: 0x0
                                -TX_FAULT signal implemented: 0x1
                                -TX_DISABLE implemented & disables serial o/p:
0x1
                                -RATE_SELECT implemented: 0x1
                                -Tunable transmitter technology: 0x0
                                -Receiver decision threshold implemented: 0x0
            Signaling Rate Max: 0x70
            Signaling Rate Min: 0x00
                     Vendor SN: UU20U6T
                     Date code: 150729
         Diag Monitoring Type:  -Address change required: 0x0
                                -Power Measurement: 0x1
                                -Externally Calibrated: 0x0
                                -Internally Calibrated: 0x1
                                -Digital diag monitoring: 0x1
                                -Legacy diagnostic: 0x0
            Enhanced Options:  -Optional Soft Rate Select ctrl per SFF-8431:
0x1
                               -Optional Application Select ctrl per SFF-8079:
0x0
                               -Optional Soft RATE_SELECT ctrl & monitoring: 0x1
                                -Optional Soft RX_LOS monitoring: 0x1
                                -Optional Soft TX_FAULT monitoring: 0x1
                               -Optional Soft TX_DISABLE ctrl & monitoring: 0x1
                                -Optional Alarm/warning flags: 0x1
          SFF-8472 Compliance: Includes functionality described in Rev 12.4 of
SFF-8472
```

```
                      CC_EXT: 0xa0
              Vendor Specific: 0x51 0x4c 0x6f 0x67 0x69 0x63 0x00 0x00
                               0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
                               0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
                               0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
          SFP Firmware Version: 0x00 0x00
          MCU Firmware Version: 0x00 0x00
          DSP Firmware Version: 0x00 0x00 0x00

Address A2
               Temp High Alarm: 0x4b00
                Temp Low Alarm: 0xfb00
            Temp High Warning: 0x4600
             Temp Low Warning: 0x0000
           Voltage High Alarm: 0x8ca0
            Voltage Low Alarm: 0x7530
         Voltage High Warning: 0x88b8
          Voltage Low Warning: 0x7918
              Bias High Alarm: 0x1770
               Bias Low Alarm: 0x01f4
            Bias High Warning: 0x1676
             Bias Low Warning: 0x03e8
    TX Signal Power High Alarm: 0x4df1
     TX Signal Power Low Alarm: 0x04eb
  TX Signal Power High Warning: 0x3de9
   TX Signal Power Low Warning: 0x0631
    RX Signal Power High Alarm: 0x4df1
     RX Signal Power Low Alarm: 0x0064
  RX Signal Power High Warning: 0x3de9
-Paging implemented indicator: 0x0
                                -High Power Level Declaration by bit 1: 0x0
                             -High Power Level Declaration by bits 1 and 5: 0x0
                                -Reserved: 0x0
                                -Signal Loss, as defined in SSFF-8419: 0x1
                                -Signal Loss, inverted from SFP MSA: 0x0
                                -TX_FAULT signal implemented: 0x1
                               -TX_DISABLE implemented & disables serial o/p:
0x1
                                -RATE_SELECT implemented: 0x1
                                -Tunable transmitter technology: 0x0
```

```
                                -Receiver decision threshold implemented: 0x0
            Signaling Rate Max: 0x70
            Signaling Rate Min: 0x00
                     Vendor SN: UU20U6T
                     Date code: 150729
          Diag Monitoring Type:  -Address change required: 0x0
                                 -Power Measurement: 0x1
                                 -Externally Calibrated: 0x0
                                 -Internally Calibrated: 0x1
                                 -Digital diag monitoring: 0x1
                                 -Legacy diagnostic: 0x0
             Enhanced Options:  -Optional Soft Rate Select ctrl per SFF-8431:
0x1
                               -Optional Application Select ctrl per SFF-8079:
0x0
                              -Optional Soft RATE_SELECT ctrl & monitoring: 0x1
                                -Optional Soft RX_LOS monitoring: 0x1
                                -Optional Soft TX_FAULT monitoring: 0x1
                               -Optional Soft TX_DISABLE ctrl & monitoring: 0x1
                                -Optional Alarm/warning flags: 0x1
           SFF-8472 Compliance: Includes functionality described in Rev 12.4 of
SFF-8472
                       CC_EXT: 0xa0
                Vendor Specific: 0x51 0x4c 0x6f 0x67 0x69 0x63 0x00 0x00
                                 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
                                 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
                                 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
           SFP Firmware Version: 0x00 0x00
           MCU Firmware Version: 0x00 0x00
           DSP Firmware Version: 0x00 0x00 0x00

Address A2
                 Temp High Alarm: 0x4b00
                  Temp Low Alarm: 0xfb00
               Temp High Warning: 0x4600
                Temp Low Warning: 0x0000
              Voltage High Alarm: 0x8ca0
               Voltage Low Alarm: 0x7530
             Voltage High Warning: 0x88b8
              Voltage Low Warning: 0x7918
```

```
              Bias High Alarm: 0x1770
               Bias Low Alarm: 0x01f4
            Bias High Warning: 0x1676
             Bias Low Warning: 0x03e8
  TX Signal Power High Alarm: 0x4df1
   TX Signal Power Low Alarm: 0x04eb
TX Signal Power High Warning: 0x3de9
 TX Signal Power Low Warning: 0x0631
  RX Signal Power High Alarm: 0x4df1
   RX Signal Power Low Alarm: 0x0064
RX Signal Power High Warning: 0x3de9
 RX Signal Power Low Warning: 0x009e
                  Rx_PWR(4): 0x00000000
                  Rx_PWR(3): 0x00000000
                  Rx_PWR(2): 0x00000000
                  Rx_PWR(1): 0x3f800000
                  Rx_PWR(0): 0x00000000
                Tx_I(Slope): 0x0001
               Tx_I(Offset): 0x0000
              Tx_PWR(Slope): 0x0001
             Tx_PWR(Offset): 0x0000
                   T(Slope): 0x0001
                  T(Offset): 0x0000
                   V(Slope): 0x0001
                  V(Offset): 0x0000
                   Checksum: 0xd4
            Temperature MSB: 0x34
            Temperature LSB: 0x74
                    Vcc MSB: 0x81
                    Vcc LSB: 0xf1
                TX Bias MSB: 0x0f
                TX Bias LSB: 0x34
               TX Power MSB: 0x1c
               TX Power LSB: 0xec
               RX Power MSB: 0x1c
               RX Power LSB: 0xc9
               Reserved MSB: 0x00
               Reserved LSB: 0x00
               Reserved MSB: 0x00
```

```
                Reserved LSB: 0x00
      Status / Control Bits:  -Data_Ready_Bar: 0x0
                              -LOS: 0x0
                              -TX Fault: 0x0
                              -Soft RX Rate Select: 0x0
                              -RX Rate Select State: 0x1
                              -Soft TX Disable: 0x0
                              -TX Disable State: 0x0
                              -EWRAP Control Bit: 0x0
                              -EWRAP FORWARD Control Bit: 0x0
                              -OWRAP Control Bit: 0x0
                              -OWRAP FORWARD Control Bit: 0x0
                              -TX Signal Power Low Alarm: 0x0
                              -TX Signal Power High Alarm: 0x0
                              -TX Bias Low Alarm: 0x0
                              -TX Bias High Alarm: 0x0
                              -Vcc Low Alarm: 0x0
                              -Vcc High Alarm: 0x0
                              -Temp Low Alarm: 0x0
                              -Temp High Alarm: 0x0
                              -RX Signal Power Low Alarm: 0x0
                              -RX Signal Power High Alarm: 0x0
                              -TX Signal Power Low Warning: 0x0
                              -TX Signal Power High Warning: 0x0
                              -TX Bias Low Warning: 0x0
                              -TX Bias High Warning: 0x0
                              -Vcc Low Warning: 0x0
                              -Vcc High Warning: 0x0
                              -Temp Low Warning: 0x0
                              -Temp High Warning: 0x0
                              -Reserved Warning: 0x0
                              -Reserved Warning: 0x0
                              -Reserved Warning: 0x0
                              -Reserved Warning: 0x0
                              -Reserved Warning: 0x0
                              -Reserved Warning: 0x0
                              -RX Power Low Warning: 0x0
                              -RX Power High Warning: 0x0
Extended Module Control:      -Optional Power Level Select: 0x0
```

```
                                -Optional Power Level Operation State: 0x0
                                -Power Level 4 Enable: 0x0
                                -Soft RS(1) Select: 0x0
                                -Adaptive Input EQ Fail Flag: 0x0
                                -Reserved: 0x0
                                -Reserved: 0x0
                                -Reserved: 0x0
        Extended Status Bytes:  -Optional Tx CDR Unlocked: 0x0
                                -64GFC Mode: 0x0
                                -PAM4 Mode Rx Configured: 0x0
                                -PAM4 Mode Tx Configured: 0x0
                                -Reserved: 0x0
                                -Reserved: 0x0
                                -Reserved: 0x0
                Vendor Specific: 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x01
      TP1 to TP4 EWRAP Control  -EWRAP Disable: 0x0
                                -EWRAP Enable: 0x0
      TP3 to TP2 OWRAP Control  -OWRAP Disable: 0x0
                                -OWRAP Enable: 0x0
 Electrical Output Tx Tap Pre3: 0x00
 Electrical Output Tx Tap Pre2: 0x00
 Electrical Output Tx Tap Pre1: 0x00
 Electrical Output Tx Tap Main: 0x00
Electrical Output Tx Tap Post1: 0x00
     DSP Status Timing Control: 0x00
                   DSP Control: 0x00
            FC 64G Mode Control: 0x00
                   LSN Control  -Train 64G: 0x0
                                -Train 32G: 0x0
                                -Fixed Speed Switch to 64G: 0x0
                                -Reserved: 0x0
                                -Reserved: 0x0
                                -Reserved: 0x0
                                -Client Rx Adaptation Reset: 0x0
                                -LSN Mode: 0x0
          CDR Firmware Version: 0x00 0x00 0x00
                 Laser Version: 0x00
                   TIA Version: 0x00
                   CDR Version: 0x00
```

```
                HW Version: 0x00
               MCU Version: 0x00
             PLP API Version: 0x00
          Debug MCU Version: 0x00

Press <Enter> to continue:
          .
          .
```

-dport (Diagnostics Port)

Use the `-dport` command to identify and isolate link failures resulting from faulty modules (link, cable, or SFP).

NOTE

This feature is supported only with 16G/32G/64G Fibre Channel adapters and requires a supported Brocade or Cisco switch with the appropriate license.

To display current diagnostics port option, issue the following command:

qaucli.exe -dport <hba instance>|<hba wwpn> --info [<port_option>]

To enable the diagnostics port test, issue the following command.

qaucli.exe -dport <hba instance>|<hba wwpn> --enable [<port_option>]

To run diagnostics port test, issue the following command:

qaucli.exe -dport <hba instance>|<hba wwpn> --show [<port_option>]

To disable diagnostics port test, issue the following command:

qaucli.exe -dport <hba instance>|<hba wwpn> --disable [<port_option>]

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)
`<hba wwpn>` = World wide port name of the adapter
`<all>` = All discovered adapters.

`<option>` = One of the following options:

- `--info`
  Displays the current diagnostic port setting.
- `--enable`
  Enables a diagnostic port test.
- `--disable`
  Disables a diagnostic port test.
- `--show`
  Starts the diagnostic port test on the selected port of the adapter.

`[<port option>]` = Adapter port on which to run the diagnostics.

Marvell recommends running diagnostics port tests on multipath configured boot from SAN (BFS)/Fabric Assigned Boot LUN (FABootLUN). Using single path BFS/FABootLUN may cause issues with OS stability in true BFS environments.

Not all SFP vendors support the optical output (OWRAP) and electrical output (EWRAP) capability that is required for a D_Port configured on the switch or Diagnostics Port configured on the Marvell QLogic Fibre Channel Adapter.

Brocade features are not supported on all mezzanine cards.

When a switch port is enabled as a D_Port, the Marvell QLogic 2600, 2700, or 2800 Series Adapter automatically runs the basic diagnostic test at both ends of the link. The Brocade switch then runs the following additional tests:

- Electric loopback test
- Optical loopback test
- Measure link distance test
- Link traffic test

Example output of a Dport test result is as follows:

```
Using config file: M:\qaucli\qaucli.cfg
Installation directory: M:\qaucli
Working dir: M:\qaucli
Starting diagnostic port test of HBA 0 (QLE2772), please wait...
Start Time: Thu Oct 22 18:33:31 2020

End Time  : Thu Oct 22 18:33:53 2020

starting diagnostic port test of HBA 4 (QLE2772), please wait...
Start Time: Fri Nov  6 18:01:46 2020

End Time  : Fri Nov  6 18:03:17 2020
```

```
-------------------------------------------------------------------------------
HBA Instance 0: QLE2872 Port 2 WWPN 21:00:f4:e9:d4:54:ae:08 PortID 02:05:00
-------------------------------------------------------------------------------
           HBA Port Electrical Loopback    Optical Loopback       Link Traffic
           -------- ------------------    ----------------       ------------
  Value          01                0xD2                0xD3               0xD5
 Status        0x01                0x01                0x01               0x02
  Result     Passed              Passed              Passed            Skipped


Details (Mbx1): 0x41
Details (Mbx2): 0xe000
```

-e (Configure Boot Devices)

Use the `-e` command to:

- Show the current boot device selection for all adapters.
- Show the current boot device selection for a specific adapter.
- Set a target device as the boot device for an adapter.
- Boot the target using either legacy BIOS or UEFI.
- Selectable boot: the OS boots from the first target found.
- Delete the boot device from an adapter.
- Enable and disable a fabric-assigned boot LUN.

In commands for legacy BIOS boot, UEFI boot, and NVMe boot:

`<hba instance>` = Adapter number (use the `-g` command to find)

`<hba wwpn>` = World wide port name of the adapter

`<target wwnn>` = World wide node name of the target

`<target wwpn>` = World wide port name of the target

`<target id>` = ID to which the target is bound

`<storage wwnn>` = World wide name of an NVMe storage device

`<storage wwpn>` = Word wide port name of an NMVe storage device.

`<storage NQN>` = Identifies an NVMe storage subsystem. There can be multiple subsystems attached to an NVMe storage device WWPN. The storage NQN can be obtained from the NVMe storage device display information.

`<storage ctrlid>` = Identifies an controller attached to an NVMe subsystem. There can be multiple controllers attached to an NVME subsystem. In most cases, FFFFh is the correct value for this field. A value of FFFFh means any available controller.

`<storage nsid>` = Identifies a Namespace attached to an NVMe controller. There can be multiple Namespaces attached to an NVME controller. The Namespace ID can be obtained from the NVMe storage device display configuration.

`<storage flag>` = Enables or disables a specific NVMe storage device. When enabled (1h), the device is mapped by the UEFI FC driver When this parameter is 0h, the specified NVMe storage device is disabled.

`<lun id>` = ID of the LUN

`<boot mode>` = Legacy BIOS boot or UEFI boot. Valid values are:

- `--bios` or `/bios` = BIOS boot settings with FCP storage devices
- `--uefi` or `/uefi` = UEFI boot settings with FCP storage devices
- `--nvme` or `/nvme` = UEFI boot settings with NVMe storage devices

`<boot entry>` = Boot device database entry

`<prim>|<drive0>` = Primary or drive 0 WWN (BIOS and UEFI)

`<alt1>|<drive1>` = Alternate 1 or drive 1 WWPN (BIOS and UEFI)

`<alt2>|<drive2>` = Alternate 2 or drive 2 WWPN (BIOS and UEFI)

`<alt3>|<drive3>` = Alternate 3 or drive 3 WWPN (BIOS and UEFI)

`<alt4>|<drive4>` = Alternate 4 or drive 4 WWPN (UEFI)

`<alt5>|<drive5>` = Alternate 5 or drive 5 WWPN (UEFI)

`<alt6>|<drive6>` = Alternate 6 or drive 6 WWPN (UEFI)

`<alt7>|<drive7>` = Alternate 7 or drive 7 WWPN (UEFI)

`<boot parameter>` = Legacy BIOS boot parameters. Valid values are:

- `EnableBios` or `EB` = Enables or disables the ROM BIOS. To boot from a Fibre Channel disk, the BIOS parameter must be enabled.

  The default is `Enabled`.

- `EnableSelectableboot` or `ES` = Controls boot device selection in legacy BIOS mode. See the HBA BIOS documentation for more information.

  The default is `Disabled`.

- `EnableFabricassignbootLun` or `FB` = Fabric assign boot LUN discovery allows to eliminate the manual boot LUN configuration of each adapter from individual servers.

  The default is `Enabled`.

`<boot parameter>` = UEFI boot parameters. Valid values are:

`AdapterDriver` or `EB` = Enables or disables the UEFI driver. To boot from a storage device, the UEFI driver must be enabled.

The default is `Disabled`.

`EnableSelectivelogin` or `SL` = Login method that restricts device logins to the adapter port to those devices in the boot WWN database. When enabled, only the listed devices can login. Disables to allow any device to login.

The default `Disabled`.

`EnableSelectivelunlogin` or `LL` = Login method that restricts LUN logins to the adapter port to those LUNs associated with a device in the boot WWN database. Disables to allow any LUN associated with a device to login.

The default is `Disabled`.

`ForceWorldlogin` or `WL` = Login method that enables or disables forced world login. When enabled, this parameter allows all devices to log in to the adapter, overriding all other login methods. Enabling this parameter is typically done to troubleshoot FC link and target device issues, which can significantly increase the boot time.

The default is `Disabled`.

`<boot parameter>` = UEFI boot parameters (continued). Valid values are:

`EnableFabricAssignbootLun` or `FA` = Enabled Fabric assign boot LUN discovery allows to eliminate the manual boot LUN configuration of each adapter from individual servers.

The default is `Enabled`.

`NVMeEnable` or `NE` = Enables or disables the FC NVMe storage feature. When enabled, the driver searches for NVMe storage based on boot database entries.

The default is `Disabled`.

`SelectableBoot` or `ES` This parameter determines which LUN is mapped as the boot device. Valid values are:

`Disabled` (default). The first LUN found is mapped as the boot device.

`Enabled` (no specified boot port name or LUN database). LUN 0 is mapped as the boot device.

`Enabled` (boot port name or LUN database specified). The specified LUN is mapped as the boot device.

Viewing Boot Device Configuration (Legacy BIOS and UEFI)

To display current boot-from-SAN (BFS) parameters and drive mapping on all adapters:

`qaucli pr fc -e all view|info[<boot mode>]`

To display current BFS parameters and drive mapping on a specific adapter:

`qaucli pr fc -e <hba instance> | <hba wwpn> view | info [<boot mode>]`

In Windows and Linux, each adapter's currently selected boot device is shown in the following format:

`<hba instance> <hba wwpn> <target wwnn> <target wwpn> <lun id>`

Legacy BIOS Boot Mode

To view the boot device:

`qaucli.exe -pr fc -e 3 info --bios`

If the adapter does not have a ROM BIOS, the following message appears:

```
Command aborted. Current HBA 3 (QLE2872) does not have ROM BIOS
```

If the adapter has ROM BIOS, the following text appears:

```
-----------------------------------------------------------------
HBA Instance 4: QLE2872 Port 2 WWPN 21:00:34:80:0d:61:4b:11
PortID 01:0c:00
Link: Online
-----------------------------------------------------------------
Boot Settings:
----------------------------------
Adapter BIOS            : Enabled
Selectable Boot         : Disabled
Fabric Assigned Boot LUN: Disabled
----------------------------------
Drive 0 WWPN                LUN
-------------------------   ------
00:00:00:00:00:00:00:00       0
----------------------------------
Drive 1 WWPN                LUN
-------------------------   ------
00:00:00:00:00:00:00:00       0
----------------------------------
Drive 2 WWPN                LUN
-------------------------   ------
00:00:00:00:00:00:00:00       0
----------------------------------
Drive 3 WWPN                LUN
-------------------------   ------
00:00:00:00:00:00:00:00       0
----------------------------------
Drive 4 WWPN                LUN
-------------------------   ------
00:00:00:00:00:00:00:00       0

Drive 5 WWPN                LUN
-------------------------   ------
00:00:00:00:00:00:00:00       0

Drive 6 WWPN                LUN
-------------------------   ------
00:00:00:00:00:00:00:00       0
```

```
Drive 7 WWPN                  LUN
------------------------    ------
00:00:00:00:00:00:00:00         0
```

UEFI Boot Mode

To view the FCP storage device:

qaucli.exe -pr fc -e 3 info --uefi

```
-------------------------------------------------------------------
HBA instance 3: QLE2872 Port 1 WWPN 21:00:f4:e9:d4:54:ae:08
PortID 02:05:00

Link: Online
-------------------------------------------------------------------
Boot Settings:
----------------------------------
Selective Login         : Disabled
Selective LUN Login     : Disabled
World Login             : Disabled
Adapter Driver          : Disabled
Fabric Assigned Boot LUN: Enabled
----------------------------------
-------------------------------------------------------------------
HBA Instance 3: QLE2872 Port 2 WWPN 21:00:34:80:0d:61:4b:11
PortID 01:0c:00
Link: Online
-------------------------------------------------------------------
--------------
Boot Settings:
----------------------------------
----------------------------------
Drive 0 WWPN                  LUN
------------------------    ------
00:00:00:00:00:00:00:00         0
----------------------------------
Drive 1 WWPN                  LUN
------------------------    ------
00:00:00:00:00:00:00:00         0
----------------------------------
```

```
Drive 2 WWPN                 LUN
-------------------------    ------
00:00:00:00:00:00:00:00        0
-----------------------------------
Drive 3 WWPN                 LUN
-------------------------    ------
00:00:00:00:00:00:00:00        0
-----------------------------------
Drive 3 WWPN                 LUN
-------------------------    ------
00:00:00:00:00:00:00:00        0
-----------------------------------
Drive 4 WWPN                 LUN
-------------------------    ------
00:00:00:00:00:00:00:00        0
-----------------------------------
Drive 5 WWPN                 LUN
-------------------------    ------
00:00:00:00:00:00:00:00        0
-----------------------------------
Drive 6 WWPN                 LUN
-------------------------    ------
00:00:00:00:00:00:00:00        0
-----------------------------------
Drive 7 WWPN                 LUN
-------------------------    ------
00:00:00:00:00:00:00:00        0
```

To view an NVMe storage device:

qaucli.exe -pr fc -e 3 info --uefi --nvme

```
-------------------------------------------------------------------
HBA Instance 3: QLE2872 Port 2 WWPN 21:00:34:80:0d:61:4b:11
PortID 01:0c:00
Link: Link Down
-------------------------------------------------------------------
Boot Settings:
-----------------------------------
Selective Login         : Disabled
Selective LUN Login     : Disabled
```

```
World Login             : Disabled
Adapter Driver          : Disabled
Fabric Assigned Boot LUN: Enabled
---------------------------------
```

If the adapter does not have any boot-from SAN configuration, the following message appears:

```
No boot configuration found on HBA 3 (QLE2872)!
```

Following is an example of the boot device option when viewing the boot device for a single adapter in legacy BIOS boot mode. In this example, no boot device is configured (selectable boot is disabled; the boot port name is all zeros).

```
-------------------------------------------------------------------------------
HBA Instance 0: QLE2872 Port 2 WWPN 21:00:34:80:0d:61:4b:11 PortID 01:0c:00
Link: Online
-------------------------------------------------------------------------------
Boot Device Settings:
--------------------------------------
Selectable Boot: Disabled
Enable Fabric Assigned LUN: Disabled
--------------------------------------
(Primary    ) Boot Port Name        LUN
---------------------------     ------
00:00:00:00:00:00:00:00               0
---------------------------     ------
(Alternate 1) Boot Port Name        LUN
---------------------------     ------
00:00:00:00:00:00:00:00               0
---------------------------     ------
(Alternate 2) Boot Port Name        LUN
---------------------------     ------
00:00:00:00:00:00:00:00               0
---------------------------     ------
(Alternate 3) Boot Port Name        LUN
---------------------------     ------
00:00:00:00:00:00:00:00               0
```

The following example displays the UEFI boot settings information with an FCP storage device.

```
-------------------------------------------------------------------
```

```
HBA Instance 2: QLE2872 Port 1 WWPN 21:00:f4:e9:d4:54:ae:08
PortID 02:05:00

Link: Online (FEC)
-------------------------------------------------------------------------
Boot Settings:
-----------------------------------
-----------------------------------
Drive 0 WWPN                  LUN
------------------------    ------
00:00:00:00:00:00:00:00         0
-----------------------------------
Drive 1 WWPN                  LUN
------------------------    ------
00:00:00:00:00:00:00:00         0
-----------------------------------
Drive 2 WWPN                  LUN
------------------------    ------
00:00:00:00:00:00:00:00         0
-----------------------------------
Drive 3 WWPN                  LUN
------------------------    ------
00:00:00:00:00:00:00:00         0
-----------------------------------
Drive 3 WWPN                  LUN
------------------------    ------
00:00:00:00:00:00:00:00         0
-----------------------------------
Drive 4 WWPN                  LUN
------------------------    ------
00:00:00:00:00:00:00:00         0
-----------------------------------
Drive 5 WWPN                  LUN
------------------------    ------
00:00:00:00:00:00:00:00         0
-----------------------------------
Drive 6 WWPN                  LUN
------------------------    ------
00:00:00:00:00:00:00:00         0
-----------------------------------
```

```
Drive 7 WWPN                  LUN
------------------------      ------
00:00:00:00:00:00:00:00         0
```

Legacy BIOS Boot Commands

NOTE

Up to four FCP storage devices can be mapped as boot devices in legacy BIOS boot configuration.

Legacy BIOS boot configuration with NVMe storage devices is not supported.

The following commands are for booting in legacy BIOS mode. For commands for booting in UEFI mode, see “UEFI Boot Commands” on page 53.

To enable BIOS boot mode, issue the following command:

`qaucli -e [<hba instance>|<hba wwpn>|<all>] enable|disable`

Where:

`<hba instance>`	`LUN` N/A	=	Adapter number (use the `-g` command to find)
`<hba wwpn>`	`LUN` N/A	=	World wide port name of the adapter
`<all>`	`LUN` N/A	=	All discovered adapters.
`Disabled`	`LUN` X	=	The BIOS configures the first disk drive it finds as the boot device.
`Enabled`	None Specified	=	BIOS configures the first disk drive it finds that is also a LUN 0 as boot device.
`Enabled`	Specified	=	BIOS scans through the specified WWPN/LUN until it finds a disk configured as the boot device.

This command does one of the following:

- If a LUN is specified, the BIOS scans the specified WWPN/LUN until it finds a disk configured as the boot device.
- If no LUN is specified, the BIOS configures the first disk drive it finds that is LUN 0 as boot device.

To disable BIOS boot mode, issue one of the following commands:

`qaucli -e <hba instance>|<hba wwpn> disable`
Clears the boot device database entries

qaucli -e <hba instance>|<hba wwpn> disable all
Clears the boot device database entries, and disables the BIOS and selectable boot parameters.

To enable a BIOS boot parameter setting, issue the following command:

qaucli -e [<hba instance>|<hba wwpn>] enable <boot parameter> [<boot mode>]

To delete the current boot device entry in the WWN database entries, issue the following command:

qaucli -e <hba instance>|<hba wwpn> disable <boot entry>

To configure boot-from-SAN with an FCP storage device, issue the following command:

qaucli -e <hba instance>|<hba wwpn> <target wwnn> <target wwpn> <LUN ID> <boot entry>

QConvergeConsole CLI checks all parameters to verify that the adapter, targets, and LUNs are valid.

If you select an adapter with no target or a target with no LUN, QConvergeConsole CLI shows an error message and aborts.

For all operating systems, if the adapter already has boot devices defined and they are different from the ones in the command parameter or menu selection, you are prompted to confirm the boot device selection:

```
The HBA already has a boot device(s) selected. Do you want to
replace it with the new one?
```

For all operating systems, if the adapter already has boot devices selected and they are the same as the ones in the command parameter or menu selection, the following message appears:

```
The HBA already has that device selected as boot device.
```

To configure the OS to boot from the first disk drive it finds that is also a LUN 0 as boot device, select a boot port name of `000`, for example:

qaucli -e <hba instance>|<hba wwpn> 0 0 0

To enable or disable the BIOS boot parameter settings, issue the following command:

qaucli -e [<hba instance>|<hba wwpn>] enable | disable <boot parameter>

To disable (delete) the boot device for a specific adapter, issue the following command:

qaucli -pr fc -e <hba instance>|<hba wwpn> disable

To set boot parameters for fabric-assigned boot LUNs, issue the following commands:

```
qaucli -pr fc -e <hba instance>|<hba wwpn> <target wwnn> <target
wwpn> <lun id> [prim|alt1|alt2|alt3]
```

To clear the selected current boot device settings on an adapter port (primary or alternate boot port name), issue the following command:

```
qaucli -pr fc -e <hba instance>|<hba wwpn> disable
[prim|alt1|alt2|alt3]
```

To enable the fabric-assigned boot LUN setting, issue the following command:

```
qaucli -pr fc -e <hba instance>|<hba wwpn> enable
FabricAssignBootLUN | FA
```

To disable the fabric-assigned boot LUN setting, issue the following command:

```
qaucli -pr fc -e <hba instance>|<hba wwpn> disable
FabricAssignBootLUN | FA
```

UEFI Boot Commands

NOTE

UEFI boot configuration is supported only on 2700 Series Adapters, and 2800 Series Adapters and later.

Up to eight storage devices (FCP/NVMe) can be mapped as boot devices with UEFI boot configuration.

The following commands are for booting in UEFI mode. For commands for booting in legacy BIOS mode, see “Legacy BIOS Boot Commands” on page 51.

FCP Storage Devices

To configure UEFI boot parameter settings, issue the following command:

```
qaucli -e [<hba instance>|<hba wwpn>] enable | disable <boot
parameter> <boot mode>
```

To configure boot-from-SAN with FCP storage devices, issue the following command:

```
qaucli -e <hba instance>|<hba wwpn> <target wwnn> <target wwpn>
<lun id> <boot entry> <boot mode>
```

NVMe Storage Devices

To enable UEFI boot mode on the adapter, issue the following command, which automatically enables FC NVMe storage discovery.

qaucli -e [<hba instance>|<hba wwpn>all>] enable <boot mode>

To disable UEFI boot mode on the adapter, issue the following command, which automatically disables FC NVMe storage discovery.

qaucli -e <hba instance>|<hba wwpn> disable <boot mode>

To configure boot-from-SAN with NMVe storage devices, issue the following command:

qaucli -e <hba instance>|<hba wwpn> <storge WWNN> <storage WWPN> <storage nsid> <storage NQN> <storage ctrlid> <storage flag> <boot entry> <boot mode>

To disable boot-from-SAN in UEFI boot mode (which automatically disables FC/NVMe storage discovery, issue the following command:

qaucli -e <hba instance>|<hba wwpn> disable all <boot mode>

This command clears the current boot parameters and drive mapping (adapter driver, selective login, selective LUN login and FC NVMe parameters).

-ei

To view error and exit code information for noninteractive mode, issue the `-ei` command as follows:

qaucli -pr fc -ei

NOTE

Exit codes are also listed in the `fcscli-exitcodes.txt` file located here:

`C:\Program Files\QLogic Corporation\QConvergeConsoleCLI`

-f

NOTE

The `-f` option is valid only in noninteractive mode, and cannot be combined with any other options. Only one command line parameter per file is valid. This option is used when it is run as a script file.

To input parameter options to QConvergeConsole CLI through a text file, type `-f`, followed by the file name. For example:

`qaucli -pr fc -f <text file name>`

The text file must be formatted as follows:

- The file must contain a single line.
- The file must contain only parameters.
- The file cannot contain another `-f` option.

The following example shows how to set the connection option of an adapter to default (loop preferred, otherwise point-to-point) and the data rate to auto through a command file that is invoked by the `-f` option:

1. Create a text file (for example, `setadapter0.txt`) containing the following command:

   `-n 0 co 2 dr 2`

2. Save and close the file.
3. Issue the `qaucli -pr fc` command with the `-f` option as follows:

   `qaucli -pr fc -f setadapter0.txt`

4. QConvergeConsole CLI executes the command in file `setadapter0.txt`, which is equivalent to having issued the following command:

   `qaucli -pr fc -n 0 co 2 dr 2`

-fcep (Diagnostics FC Ping [ELS Echo Ping])

Issue the `-fcep` command to perform an FC ping (also known as an ELS echo ping) test. For example:

`qaucli -fcep <hba instance>| <hba wwpn> -wwn <wwpn> [<options>]`

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)

`<hba wwpn>` = World wide port name of the adapter

`<wwpn>` = World wide port name of the principal fabric WWN or a target WWPN

`[<options>]` = One of the following parameter names:

- `-P (--PayloadPattern)`
  One of the following predefined patterns:
  `RPAT, CRPAT, CSPAT, CJTPAT`

  The predefined patterns are as follows:

Hex	Binary
00	00000000
55	01010101
5A	01011010
A5	10100101
AA	10101010
FF	11111111

- `-L (--PayloadSize)`
  Valid values are `8, 16, 32, 64, 128, 256, 512, 1,024, 2,048` (bytes)
- `-C (--Count)`
  Determines the maximum number of echo ping commands to send to a destination. Valid values are:
  `0` = The echo ping command runs until interrupted by the user.
  `1–0000` = The echo ping command stops after sending the specified number of pings.
- `-I (--Interval)`
  Valid values are in the range `0–60`. The value determines the interval (in seconds) between each echo ping.
- `-E (--OnError)`
  Valid values are:
  `0` = Ignore on error (ignores the errors and continues to run)
  `1` = Stop on error (stops when an error occurs)
  `2` = Loop on error (keeps the same pattern when an error occurs)

-fcp (Ping Test)

Issue the `-fcp` command to perform a Fibre Channel ping test.

To run a Fibre Channel ping test using the default parameters, issue the following command:

`qaucli -fcp <hba instance>|<hba wwpn>`

To run a Fibre Channel ping test with custom parameters, issue the following command:

qaucli -fcp <hba instance>|<hba wwpn>|[-ex -exclude <target wwpn>][<param name>|<param alias>) <param value>]

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)

`<hba wwpn>` = World wide port name of the adapter

`<target wwpn>` = World wide port name of the target

`<param name>` = One of the following parameter names:

- TestCount
- TestIncrement
- OnError

`<param alias>` = One of the following parameter aliases:

- TC
- TI
- OE

`<param value>` = Value of parameter or alias (see Table 5-3 on page 30)

-fec (Forward Error Correction (FEC))

NOTE

The forward error correction (FEC) feature is supported only on Marvell QLogic 16/32/64Gb Fibre Channel adapters if the current adapter port is connected to a Brocade switch with FEC support. For 32Gb/64Gb adapters, FEC is enabled by default and cannot be disabled.

Issue the `-fec` command to enable or disable FEC. For example:

qaucli -fec <hba instance>|<hba wwpn>|<all> <options> [<--ports>]

Where:

`<hba instance>` = Host bus adapter instance number of a host bus adapter port.

`<hba wwpn>` = World wide port name of the adapter

`[<options>]` = Options include the following:

- `--info`
  Display the current FEC settings of a specific host bus adapter port or all ports.
- `--enable`
  Enable FEC on a specific host bus adapter port or all ports of a host bus adapter.
- `--disable`
  Disable FEC on a specific host bus adapter port or all ports of a host bus adapter.
- `--ports`
  Apply to all physical ports of the specified host bus adapter.

-fg (Display Driver Persistent Binding Settings)

NOTE

The `-fg` option is valid only in noninteractive mode.

The `-fg` option is not supported for Linux. The following error appears when issuing this command on a Linux system:
`Feature is unsupported with current driver!`

The `-fg` option displays the driver persistent binding settings. To change the settings, see “-fs (Driver Parameters)” on page 60.

To show the driver settings, issue the following command:

`qaucli -pr fc -fg <hba instance>|<hba wwpn> view|info`

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)

`<hba wwpn>` = World wide port name of the adapter

Example output is as follows:

```
Using config file: M:\qaucli\qaucli.cfg
Installation directory: M:\qaucli
Working dir: M:\qaucli
------------------------------------------------------------------
HBA Instance 0: QLE2872 Port 1 WWPN 21:00:f4:e9:d4:54:ae:08
PortID 02:05:00
Link: Online (FEC)
```

```
-------------------------------------------------------------------
Driver Settings - Group: Persistent
---------------------------------
```

-ftr (CT FTR Test)

QConvergeConsole CLI supports common transport (CT) Fibre Channel trace route (FTR) testing. The CT FTR test traces the route to each device attached to the port.

NOTE

The `-ftr` command is supported on all Brocade switches and some Cisco switches. In the Cisco switches, the common transport (CT) feature must be enabled by the user (it is disabled by default). See the Cisco switch documentation for more information.

NOTE

All inner-link switches between the initiator and the target must have the Brocade switch firmware 7.1.1 or later for the CT FTR test to work. For best results, Marvell highly recommends using HP P2000G3 or Promise® VTrak™ E610f as a target. To confirm if your target is supported, contact Marvell Support.

Issue the `-ftr` command to issue a CT FTR command to a single or all discovered targets. To run a CT FTR test using the default parameters, issue the following command:

`qaucli -ftr <hba instance>|<hba wwpn>`

To run a CT FTR test with custom parameters, issue the following command:

`qaucli -ftr <hba instance>|<hba wwpn>|[-ex -exclude <target wwpn>][<param name>|<param alias>) <param value>]`

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)

`<hba wwpn>` = World wide port name of the adapter

`<target wwpn>` = World Wide port name of the target

`<param name>` = One of the following parameter names:

- TestCount
- TestIncrement
- OnError

<param alias> = One of the following parameter aliases:
- TC
- TI
- OE

<param value> = Value of parameter or alias (see Table 5-3 on page 30)

-fs (Driver Parameters)

NOTE

The -fs option is not supported for Linux. The following error appears when issuing this command on a Linux system:
Feature is unsupported with current driver!

To configure the driver settings, issue the following command:

```
qaucli -pr fc -fs <hba instance>|<hba wwpn>
 (<param name>|<param alias> <param value>)...
```

Where:

<hba instance> = Adapter instance number of an adapter port (use the -g command to find)
<hba wwpn> = World wide port name of the adapter
<param name> = Name of the parameters
<param alias> = Alias of the parameters
<param value> = New value of the parameters

The pairs <param name> <param value> and <param alias> <param value> can be repeated to set multiple parameters in a single command.

Table 5-4 lists the driver configuration parameter names and aliases.

Table 5-4. Driver Settings Parameters

Description	Parameter Name <param name>	Alias <param alias>	Value [a] <param value>
Persistently bound target(s) only	PersistentOnly	PO	0, 1
Present persistently bound target(s) plus any new target(s) with driver default	PersistentPlusNew	PN	0, 1
Present targets with driver default	NewOnly [b]	NO	0, 1

Table 5-4. Driver Settings Parameters (Continued)

Description	Parameter Name <param name>	Alias <param alias>	Value [a] <param value>
Bind devices by WWPN	BindWWPN	BW	0, 1
Bind devices by port ID	BindPortID	BP	0, 1

[a] 0 = Disabled, 1 = Enabled

[b] Driver parameter NewOnly (NO) is supported only with the failover driver.

The following restriction apply:

- Under Linux, this feature is disabled if you are using the input/output control (IOCTL) driver.

-fwdump (Save Adapter RISC Firmware Dump)

NOTE

To force a firmware dump file that can be collected and saved, QConvergeConsole CLI requires a separate utility such as qlcna.exe., which is generally used for debugging purposes in the field by a Field Application Engineer (FAE). To obtain this utility please contact Marvell Technical Support (see "Technical Support" on page xvi).

To save the current adapter port firmware dump to a file, issue the following command:

qaucli -pr fc -fwdump <hba instance>|<hba wwpn> <file name>

Where:

<hba instance> = Adapter instance number of an adapter port (use the -g command to find)

<hba wwpn> = World wide port name of the adapter

<file name> = Name of the file where the compressed firmware dump will be saved.

-g

To display host and adapter information on a local system, issue the -g command. Example output is as follows:

```
-------------------------------------------------------------------------------
Host Name                       : WIN-EQ0S3D2FE5Q
```

```
OS Type                          : Microsoft Windows Server 2012
                                   Datacenter 64-bit  x64
OS Version                       : Build 9200
SDM API Version                  : 1.28.0.109 QLSDM.DLL
-------------------------------------------------------------------------------
HBA Model QLE2872 (SN AFE1223F04535):
  Port   1 WWPN 21:00:00:0e:1e:08:05:20 (HBA instance  0) Link Down
  Port   2 WWPN 21:00:00:0e:1e:08:05:21 (HBA instance  1) SFP Invalid
HBA Model QLE2872 (SN RFC0926L28501):
  Port   1 WWPN 21:00:00:c0:dd:10:e8:41 (HBA instance  2) SFP not installed
  Port   2 WWPN 21:00:00:c0:dd:10:e8:43 (HBA instance  3) SFP not installed
-------------------------------------------------------------------------------
            Total QLogic HBA(s) : 2
```

-gs (Configure Parameters [Monitoring])

To configure the adapter statistics, issue the `-gs` command as follows:

```
qaucli -pr fc -gs  <hba instance>|<hba wwpn>
 [<param name>|<param alias>) <param value>]
```

Where:

- `<hba instance>` = Adapter number (use the `-g` command to find)
- `<hba wwpn>` = World wide port name of the adapter
- `<param name>` = Name of the parameter
- `<param alias>` = Alias of the parameter
- `<param value>` = New value of the parameter

Table 5-5 lists the adapter statistics parameter names, aliases, and values.

Table 5-5. Adapter Statistics Parameters

Description	Name	Alias	Value
Sets how often statistics are retrieved	`AutoPoll`	`AP`	0–256 [a] cycles
Sets the polling interval when retrieving statistics	`PollRate`	`SR`	0 [b], 5–30 seconds
Saves the adapter's statistics to a CVS log file	`LogToFile`	`LF`	Log file name

[a] When the value is 0, statistics are retrieved automatically until you abort the operation. When the value is in the range 1–256, statistics are retrieved for the number of cycles specified.

[b] When the value is 0, the statistics are queried every second (no delay).

The following restriction applies:

- Under Linux, this feature is disabled if you are using the IOCTL driver.

To clear adapter driver statistic counters, issue the `-gs` command with the `-reset` option. For example:

qaucli -gs <hba instance>|<hba wwpn> --reset

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)
`<hba wwpn>` = World wide port name of the adapter

-h (Help)

To view the help file, issue the `-h` command as follows:

qaucli -pr fc -h

To view help information for an individual command, issue the following command:

qaucli -pr fc <command> -h

For example, typing **qaucli -pr fc -l -h** shows the following:

```
localhost:~ # qaucli  -pr fc -l -h
QConvergeConsoleCLI
Version 3.0.x (Build xx)
Copyright (C) 2003-2022 Marvell Semiconductor Inc.
Build Type:  Release
Build Date: Sept 13 2022 22:18:36
LUNs Information.
USAGE:
   Displays all discovered storage LUNs information.
   qaucli -l <hba instance>|<hba wwpn>
   Displays all storage LUNs information of a specified
   target device.
   qaucli -l <hba instance>|<hba wwpn> <target wwpn>|<target portid>
   Displays a single LUN information of a specified target device.
   qaucli -l <hba instance>|<hba wwpn> <target wwpn>|<target portid
             <lun id>
   Options
      <hba instance>   Adapter port instance number.
      <hba wwpn>       Adapter port World Wide Name.
      <target wwpn>    The World Wide Port Name of the target device.
      <target portid>  Port ID of the storage device.
```

```
<lun id>          Logical Unit Number of the storage device.
```

NOTE

To view the current version information for QConvergeConsole CLI, issue the `-v` command as described in "-v (QCC CLI Version Information)" on page 107.

-ha (HBA Alias [FCoE Configuration])

With this command you can view, set or delete the alias of a specific adapter.

To view the alias of a specified adapter, issue the following command:

`qaucli -pr fc -ha <hba instance>|<hba wwpn> view|info`

To set an alias for a specified adapter, issue the following command:

`qaucli -pr fc -ha <hba instance>|<hba wwpn> <alias>`

To delete an alias of a specified adapter, issue the following command:

`qaucli -pr fc -ha <hba instance>|<hba wwpn> delete`

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)
`<hba wwpn>` = World wide port name of the adapter
`<alias>` = Symbolic adapter name (100 characters, maximum)

-i (FC Adapter Information; FC VPD Information; FC Hyper-V VFC Information)

To show general adapter information (default), Hyper-V information, flash information, VPD information, or VFC information for a specific adapter or for all adapter ports in the system, issue the `-i` command as follows:

`qaucli -pr fc -i [all|<hba instance>|<hba wwpn>] [vpd|vfc|flash]`

Where:

`all` = All adapters in the system (default)
`<hba instance>` = Adapter number (use the `-g` command to find)
`<hba wwpn>` = World wide port name of the adapter
`<vpd |--vpd | /vpd>` = Show vital product data information
`<vfc | --vfc | /vfc>` = Show Virtual Fibre Channel information
`<flash | --flash | /flash>` = Flash component version

To show general information for all adapter ports in the system, issue the following command:

```
qaucli -pr fc -i all
```

To determine if the specified port is in D_Port diagnostic mode, issue the following command:

```
qaucli -pr fc -i 0
```

To determine if the specified port is enabled with forward error correction (FEC), issue the following command:

```
qaucli -pr fc -i 0
```

NOTE

The forward error correction (FEC) feature is supported only on Marvell QLogic 16/32/64Gb Fibre Channel adapters if the current adapter port is connected to a Brocade switch with FEC support. For 32Gb/64Gb adapters, FEC is enabled by default and cannot be disabled.

To show VPD for all adapter ports in the system, issue the following command:

```
qaucli -pr fc -i VPD
```

To show VFC information for all adapter ports in the system, issue the following command:

```
qaucli -pr fc -i VFC
```

NOTE

The `-vfc` option is available only on Windows 2012 or later.

The following is an example of the output for the `vfc` option:

```
qaucli -pr fc -i 0 vfc

Computer Name: WIN-G181PBHIEV9
SAN Name     : fcp1
------------------------------------------------------------
VM Name      : vm1_gh
VM ID        : 36096d14:384c:4796:a893:16c29f1f05cc
WWPN Set A   : c0:03:ff:bd:f9:6e:00:02
WWNN Set A   : c0:03:ff:00:00:ff:ff:00
WWPN Set B   : c0:03:ff:bd:f9:6e:00:03
WWNN Set B   : 0:03:ff:00:00:ff:ff:00
------------------------------------------------------------
```

```
VM Name      : vm1_gh
VM ID        : 36096d14:384c:4796:a893:16c29f1f05cc
WWPN Set A   : c0:03:ff:bd:f9:6e:00:04
WWNN Set A   : c0:03:ff:00:00:ff:ff:00
WWPN Set B   : c0:03:ff:bd:f9:6e:00:05
WWNN Set B   : c0:03:ff:00:00:ff:ff:00
-------------------------------------------------------------
VM Name      : vm1_gh
VM ID        : 36096d14:384c:4796:a893:16c29f1f05cc
WWPN Set A   : c0:03:ff:bd:f9:6e:00:06
WWNN Set A   : c0:03:ff:00:00:ff:ff:00
WWPN Set B   : c0:03:ff:bd:f9:6e:00:07
WWNN Set B   : c0:03:ff:00:00:ff:ff:00
-------------------------------------------------------------
VM Name      : vm1_gh
VM ID        : 36096d14:384c:4796:a893:16c29f1f05cc
WWPN Set A   : c0:03:ff:bd:f9:6e:00:08
WWNN Set A   : c0:03:ff:00:00:ff:ff:00
WWPN Set B   : c0:03:ff:bd:f9:6e:00:09
WWNN Set B   : c0:03:ff:00:00:ff:ff:00
-------------------------------------------------------------
VM Name      : vm2
VM ID        : f19a6571:29b2:4b9a:acc5:4f36c8355c3e
WWPN Set A   : c0:03:ff:bd:f9:6e:00:09
WWNN Set A   : c0:03:ff:00:00:ff:ff:00
WWPN Set B   : c0:03:ff:bd:f9:6e:00:0a
WWNN Set B   : c0:03:ff:00:00:ff:ff:00
-------------------------------------------------------------
VM Name      : vm2
VM ID        : f19a6571:29b2:4b9a:acc5:4f36c8355c3e
WWPN Set A   : c0:03:ff:bd:f9:6e:00:0b
WWNN Set A   : c0:03:ff:00:00:ff:ff:00
WWPN Set B   : c0:03:ff:bd:f9:6e:00:0c
WWNN Set B   : c0:03:ff:00:00:ff:ff:00
-------------------------------------------------------------
VM Name      : vm2
VM ID        : f19a6571:29b2:4b9a:acc5:4f36c8355c3e
WWPN Set A   : c0:03:ff:bd:f9:6e:00:0d
WWNN Set A   : c0:03:ff:00:00:ff:ff:00
```

```
WWPN Set B   : c0:03:ff:bd:f9:6e:00:0e
WWNN Set B   : c0:03:ff:00:00:ff:ff:00
-------------------------------------------------------
VM Name      : vm2
VM ID        : f19a6571:29b2:4b9a:acc5:4f36c8355c3e
WWPN Set A   : c0:03:ff:bd:f9:6e:00:0f
WWNN Set A   : c0:03:ff:00:00:ff:ff:00
WWPN Set B   : c0:03:ff:bd:f9:6e:00:10
WWNN Set B   : c0:03:ff:00:00:ff:ff:00
-------------------------------------------------------
```

To determine if the adapter port is not online (for example, if the switch port is currently under D_Port Diagnostics Mode–loop down), see the `HBA Status` line in the output of the following FC Port Information example:

```
Host Name                     : WIN-RF9529KOTC9
Host NQN                      :
nqn.2014-08.org.nvmexpress:uuid:4c4c4544-0047-5110-8034-c7c04f514432
Host ID                       : 44454c4c470010518034c7c04f514432
HBA Instance                  : 4
HBA Model                     : QLE2770
HBA Description               : QLogic QLE2770 1x32Gb QLE2770 FC HBA
HBA ID                        : 4-QLE2770
HBA Alias                     :
HBA Port                      : 1
Port Alias                    :
Node Name                     : 20:00:34:80:0d:3b:89:23
Port Name                     : 21:00:34:80:0d:3b:89:23
Port ID                       : 02:0f:00
Principal Fabric WWN          : 10:00:00:27:f8:f1:66:a0
Adjacent Fabric WWN           : 20:0f:00:27:f8:f1:66:a0
Serial Number                 : AFD1911Y07032
Driver Version                : STOR Miniport  9.4.9.21
BIOS Version                  : 3.66
Running Firmware Version      : 9.12.00
Running MPI Firmware Version  : 3.03.07
Running PEP Firmware Version  : 3.01.39
Flash BIOS Version            : 3.66
Flash FCode Version           : N/A
Flash EFI Version             : 7.54
Flash Firmware Version        : 9.12.00
```

```
Flash MPI Firmware Version     : 3.03.07
Flash PEP Firmware Version     : 3.01.39
Actual Connection Mode         : Point to Point
Actual Data Rate               : 32 Gbps
Supported Speed(s)             : 8 16 32 Gbps
Chip Model Name                : ISP2812-based 64/32G Fibre Channel to PCIe
Controller
Chip Revision                  : 0x1(A0)
PortType (Topology)            : NPort
Target Count                   : 0
PCI Bus Number                 : 67
PCI Device Number              : 0
PCI Function Number            : 0
PCI Device ID                  : 0x2281
Subsystem Device ID            : 0x02f2
Subsystem Vendor ID            : 0x1077
PCIe Max Bus Width             : x8
PCIe Negotiated Width          : x8
PCIe Max Bus Speed             : 16.0 Gtps
PCIe Negotiated Speed          : 8.0 Gtps
HBA Temperature (C)            : 57
Congestion Current State       : Healthy
Congestion Severity            : None
Link Integrity Events          : No
Delivery Notification Events   : No
Seconds Since Last Event       : 1682620401
Fabric Connection Flags        : RDF Completed
Config Lockdown                : Disabled
Firmware Update Lockdown       : Disabled
MPI Lockdown                   : Disabled
HBA Status                     : Online (FEC)
-------------------------------------------------------------------------------
```

To view adapter information for the QLE2690, QLE2692, QLE2740, QLE2742, QLE2770, and QLE2772, and 2870 Series Adapters on which the port link is up, issue the following command. Command output for these specific models includes the host NVMe qualified name (NQN) for NVM Express® (NVMe™) over Fibre Channel (NVMe-oF).

qaucli -pr fc -i 0

```
Host Name                      : NX2-22A1-22A3
Host NQN                       : nqn.2018-08.com.marvell:nvme.host.sys.wwpn:21000024ff8fd7f4
```

```
HBA Instance                  : 1
HBA Model                     : QLE2742
HBA Description               : QLE2742 Dual Port 32Gb FC to PCIe Gen3 x8 Adapter
HBA ID                        : 1-QLE2742
HBA Alias                     :
HBA Port                      : 1
Port Alias                    :
Node Name                     : 20:00:00:24:ff:8f:d7:f4
Port Name                     : 21:00:00:24:ff:8f:d7:f4
Port ID                       : 02:0a:00
Principal Fabric WWN          : 10:00:00:27:f8:f1:66:a0
Adjacent Fabric WWN           : 20:0a:00:27:f8:f1:66:a0
Serial Number                 : AFD1536Y03381
Driver Version                : STOR Miniport  9.4.7.20
BIOS Version                  : 3.62
Running Firmware Version      : 9.10.11
Running MPI Firmware Version  : 3.03.06
Running PEP Firmware Version  : 2.01.30
Flash BIOS Version            : 3.62
Flash FCode Version           : 4.11
Flash EFI Version             : 7.22
Flash Firmware Version        : 9.10.11
Flash MPI Firmware Version    : 3.03.06
Flash PEP Firmware Version    : 2.01.30
Actual Connection Mode        : Point to Point
Actual Data Rate              : 32 Gbps
Supported Speed(s)            : 8 16 32 Gbps
Chip Model Name               : ISP2722-based 16/32Gb Fibre Channel to PCIe Adapter
Chip Revision                 : 0x1(A0)
PortType (Topology)           : NPort
Target Count                  : 1
PCI Bus Number                : 66
PCI Device Number             : 0
PCI Function Number           : 0
PCI Device ID                 : 0x2261
Subsystem Device ID           : 0x02ac
Subsystem Vendor ID           : 0x1077
PCIe Max Bus Width            : x8
PCIe Negotiated Width         : x8
PCIe Max Bus Speed            : 8.0 Gtps
```

```
PCIe Negotiated Speed          : 8.0 Gtps
HBA Temperature (C)            : 68
Congestion Current State       : Healthy
Congestion Severity            : None
Seconds Since Last Event       : 0 (sec)
Fabric Connection Flags        : RDF Completed
HBA Status:                    : Online (FEC)
```

To view information about the flash components, issue the following command:

```
localhost:~ # qaucli  -i 4 /flash
Using config file: /opt/QLogic_Corporation/QConvergeConsoleCLI/qaucli.cfg
Installation directory: /opt/QLogic_Corporation/QConvergeConsoleCLI
Working dir: /root
------------------------------------------------------------------------------
HBA Instance 4 : QLE2872 Port 2 WWPN 21:00:00:24:ff:8f:d7:f4  PortID 02:0a:00
Link: Online (FEC)
------------------------------------------------------------------------------
Flash Image Version            : 10.01.07
FC Bios Version                : 3.62.00
FC FCode Version               : 4.11.00
FC EFI Version                 : 7.22.00
FC Firmware Version            : 9.10.11
MPI Firmware Version           : 3.03.06
PEP Firmware Version           : 2.01.30
PEP SoftROM Version            : 2.00.11
PEP Brd Cfg Version            : 2.00.01
Firmware Preload Area Version  : 2.01.10
FC Brd Cfg Version             : 2.00.06
```

-kl (Loopback Test)

Use the `-kl` command to perform an external loopback test.

To perform a loopback test using the default parameters, issue the following command:

```
qaucli -pr fc -kl  <hba instance>|<hba wwpn>
```

To do an external loopback test with custom parameters, issue the following command:

```
# qaucli -pr fc -kl  <hba instance>|<hba wwpn>
[<param name>|<param alias>) <param value>]
```

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)

`<hba wwpn>` = World wide port name of the adapter

`<param name>` = One of the following parameter names:

- DataPattern
- DataSize
- TestCount
- TestIncrement
- OnError
- LoopbackType

`<param alias>` = One of the following parameter aliases:

- DP
- DS
- TC
- TI
- OE
- LT

`<param value>` = Value of parameter or alias (see Table 5-6 on page 74)

NOTE

To stop an active diagnostic test, press ENTER. To use a different key to stop tests, modify this line in the `sfcli.properties` configuration file:

Default:`node.app.diag.ascii.abortkey=CR`

Custom:`node.app.diag.ascii.abortkey=<stop key>`

Where `<stop key>` is **a**–**z** or **A**–**Z** (press SHIFT for uppercase).

Example of lowercase stop key:

`node.app.diag.ascii.abortkey=`**`s`** (Press S to stop test)

Example of uppercase stop key:

`node.app.diag.ascii.abortkey=`**`S`** (Press SHIFT+S to stop test)

-kr (Read Write Buffer Test)

Use the `-kr` command to run a read/write buffer test.

To run a read/write test using the default parameters, issue the following command:

```
# qaucli -pr fc -kr <hba instance>|<hba wwpn>
```

To run a read/write test with customized parameters, issue the following command:

```
# qaucli -pr fc -kr <hba instance>|<hba wwpn> [-ex|-exclude
<target wwpn>] <param name>|<param alias> <param value>
```

Where:

- `<hba instance>` = Adapter number (use the `-g` command to find)
- `<hba wwpn>` = World wide port name of the adapter
- `<target wwpn>` = World wide port name of the target device that is excluded from the read/write test
- `<param name>` = One of the following parameter names:
  - DataPattern
  - DataSize
  - TestCount
  - TestIncrement
  - OnError
- `<param alias>` = One of the following parameter aliases:
  - DP
  - DS
  - TC
  - TI
  - OE
- `<param value>` = Parameter or alias value (see Table 5-6 on page 74)

See “Running a Read/Write Buffer Test” on page 72 for command line examples and test results for a read/write buffer test.

Running a Read/Write Buffer Test

The read/write buffer test runs on all devices or on the devices you select on the adapter you select. This test sends the SCSI Write Buffer command to the target devices and uses the SCSI Read Buffer command to read the returned data and do a data comparison.

NOTE

All devices attached to the adapter must support the SCSI Read/Write Buffer commands.

To run a read/write buffer test using the current parameters, issue the following command:

```
qaucli -pr fc -kr  <hba instance>|<hba wwpn>
```

To exclude a device or devices on the selected adapter port, issue the following command:

qaucli -pr fc -kr <hba instance>|<hba wwpn> [-ex|-exclude <target wwpn>] [<param name>|<param alias> <param value>]

The following examples run 500 read/write buffer tests with a test increment of 10, a data pattern of FFh, and a data size of 8 bytes. The test stops if an error occurs.

qaucli -pr fc -kr <hba instance> DP FF DS 8 TC 500 TI 10 OE 1

qaucli -pr fc -kr <hba wwpn> DP FF DS 8 TC 500 TI 10 OE 1

To use the current value of a parameter, omit the parameter from the command line. For example, the following command sets the data pattern to FFh and uses the current values for the other parameters:

qaucli -pr fc -kr <hba instance> DP FF

The following example sets the data size to 16 bytes and has the test loop if an error occurs; the other parameters use the current values:

qaucli -pr fc -kr <hba wwpn**> DS 16 OE 2**

The following example shows a successful read/write buffer test:

```
HBA 1: QLE2872 Port 1 WWPN xx:xx:xx:xx:xx:xx:xx:xx Port ID 01:0c:00
------------------
Test Configuration
------------------
Data Pattern                 : Random
Data Size (Bytes)            : 512
Number of test(s) (0-65535)  : 500
Test Increment (1-65535)     : 1
On Error                     : Ignore
Test Continuous              : OFF
--------------------------------------------------------------------------------
```

Running an Adapter Diagnostics Read/Write Buffer Test

The `-ex|-exclude <target wwpn>` parameters specify a device to exclude from the read/write buffer test.

The system shows the following information after a read/write buffer test completes:

- Loop ID and status
- Data miscompare
- Link failure
- Loss of sync
- Loss of signal
- Invalid CRC

Table 5-6 lists the values for the `<param name>`, `<param alias>`, and `<param value>` options.

Table 5-6. Diagnostics Parameters

Name	Alias	Value	Description
DataPattern	DP	Test pattern in hex format [a] Customized (00–FF) Random pattern CRPAT [b] CJTPAT [c] CSPAT [d]	00, 55, 5A, A5, AA, FF (see Table 5-7) — — Loopback test only Loopback test only Loopback test only
DataSize [e]	DS	8, 16, 32, 64, 128, 256, 512, 1024, 2048	Actual data transferred during any specified pass of the test
TestCount [f]	TC	0–65,535 0–10,000	Loopback test only Read/write buffer test only
TestIncrement [g]	TI	1–65,535 1–10,000	Loopback test only Read/write buffer test only
OnError	OE	0–2	0 = ignore 1 = stop 2 = loop on error
LoopbackType [h]	LT	0–2	0 = 10-bit internal loopback [i] 1 = 1-bit serial loopback 2 = external loopback

[a] Valid two-character, case-insensitive hexadecimal patterns.

[b] Compliant random data pattern in a valid Fibre Channel frame, as defined by the ANSI document *Methodologies for Jitter and Signal Quality Specification—MJSQ Annex A—Test bit sequences.*

[c] Compliant jitter tolerance pattern in a Fibre Channel frame, as defined by the ASIC document listed above.

[d] Compliant supply noise test sequence in a valid Fibre Channel frame, as defined by the ASIC document listed above.

[e] For read/write buffer test, the maximum size is 128; this is also the default.

[f] 0=test continuously. 1–10,000 and 1–65535=total number of tests that will be executed.

[g] Must be less than the TestCount value.

[h] Loopback test only.

[i] Requires installation of a loopback plug in the port SFP.

Table 5-7. Data Pattern (DP) Test Patterns

Hex	Binary	Hex	Binary
00	00000000	A5	10100101
55	01010101	AA	10101010
5A	01011010	FF	11111111

If the read/write buffer test fails, the system shows the following information:

- **Loop or port ID** (the loop ID of the adapter when operating in loop mode).
- **Status**:
  - **Success**—The test passed.
  - **Error**—A data miscompare or link status firmware error occurred.
  - **Failed**—A link status error, SCSI write buffer error, or SCSI read buffer error occurred.
  - **Unknown**—The target was not present.
  - **Unsupported**—The device does not support this test.
- **Data Miscompare**—The possible values are:
  - 0 (no data miscompares)
  - Device not present
  - Get link status failed
  - Read buffer failed
  - R/W buffer not supported
  - Write buffer failed
- **Link Failure**—Number of link failures
- **Loss of sync**—Number of sync loss errors
- **Loss of signal**—Number of signal loss errors
- **Invalid CRC**—Number of invalid CRCs

-l (FC Target/LUN Information)

The `-l` command shows LUN information for:

- All adapters
- A specific target
- A specific LUN on a specific target

To show the LUN information for *all target* devices for a *specific adapter Instance*, issue the following command:

```
qaucli -pr fc -l  <hba instance>|<hba wwpn>
```

To show the LUN information for a specific device for a specific adapter port, issue the following command:

```
qaucli -pr fc -l  <hba instance>|<hba wwpn>
<target port id>|<target wwpn>
```

To show the LUN information for a specific LUN on a specific target device for a specific adapter port instance, issue the following command:

```
# qaucli -pr fc -l  <hba instance>|<hba wwpn>
<target port id>|<target wwpn>)  <lun id>
```

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)
`<hba wwpn>` = World wide port name of the adapter
`<target port id>` = Port ID of the target
`<target wwpn>` = World wide port name of the target
`<lun id>` = ID of the LUN

-ls (Display Parameters [HBA Statistics]; Link Status)

To view the link status, issue the following command:

```
# qaucli -pr fc -ls  <hba instance>|<hba wwpn>
[ <param name>|<param alias> <param value> ]
```

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)
`<hba wwpn>` = World wide port name of the adapter
`<param name>` = Name of the parameter (see Table 5-8)
`<param alias>` = Alias of the parameter (see Table 5-8)
`<param value>` = New value of the parameter (see Table 5-8)

Table 5-8 defines the link status parameter names, aliases, and values.

Table 5-8. Link Status Parameters

Description	Name	Alias	Value
Sets link-status retrieval period	`AutoPoll`	`AP`	0–256 [a] cycles
Sets link-status retrieval polling interval	`PollRate`	`SR`	5–30 seconds
Save link status to CSV log file	`LogToFile`	`LF`	Log file name

[a] When the value is 0, the link status is retrieved automatically until you abort the operation. When the value is in the range 1–256, the link status is retrieved for the number of cycles specified.

To reset adapter firmware link status counters, issue the `-ls` command with the `--reset` option as follows:

`qaucli -ls <hba instance>|<hba wwpn> --reset`

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)
`<hba wwpn>` = World wide port name of the adapter

For 4Gb and 8Gb adapters, the drivers include the latest firmware that support resetting adapter link status. For 16Gb/32Gb/64Gb adapters, you must update the adapter flash firmware to the latest version.

-m (Selective LUN Mapping)

NOTE

- If the current driver setting is Bind by Port ID, this option is not available.
- You must persistently bind the targets before configuring selective LUNs.
- Under Linux, this feature is disabled.

Use the `-m` command to:

- View all selective LUNs for all adapter ports
- View an adapter's selective LUN list
- View the current selective state of a LUN on a specific target
- Enable (select) a LUN on a specific target on a specific adapter
- Disable (deselect) a LUN on a specific target on a specific adapter
- Enable (select) all LUNs on a specific target on a specific adapter
- Disable (deselect) all LUNs on a specific target on a specific adapter
- Enable (select) all LUNs of all targets on a specific adapter
- Disable (deselect) all LUNs of all targets on a specific adapter

For these commands:

`<hba instance>` = Adapter number (use the `-g` command to find)
`<hba wwpn>` = World wide port name of the adapter
`<target wwnn>` = World wide node name of the target
`<target wwpn>` = World wide port name of the target
`<lun id>` = ID of the LUN

To view all selective LUNs for all adapter ports, issue the following command:

`qaucli -pr fc -m all view|info`

To view an adapter's selective LUN list, issue the following command:

qaucli -pr fc -m <hba instance>|<hba wwpn> view|info

QConvergeConsole CLI shows the adapter's enabled LUN list in the following format:

<target wwnn> <target wwpn> <lun id>

To view the current select state of a specific LUN, issue the following command:

qaucli -pr fc -m <hba instance>|<hba wwpn> (<target wwnn> <target wwpn> <lun id>) view|info

If the input represents a valid LUN, QConvergeConsole CLI shows that LUN's current state as selected or deselected for that adapter.

To enable (select) a LUN on a specific target on a specific adapter, issue the following command:

qaucli -pr fc -m <hba instance>|<hba wwpn> (<target wwnn> <target wwpn> <lun id> 1|enable|select)...

NOTE

To select multiple LUNs in a single command, repeat the sequence <target wwnn> <target wwpn> <lun id> 1.

To disable (deselect) a LUN on a specific target on a specific adapter, issue the following command:

qaucli -pr fc -m <hba instance>|<hba wwpn> (<target wwnn> <target wwpn> <lun id> 0|disable|deselect)...

NOTE

To select multiple LUNs in a single command, repeat the sequence <target wwnn> <target wwpn> <lun id> 0.

To enable (select) all LUNs for a specific target on a specific adapter, issue the following command:

qaucli -pr fc -m <hba instance>|<hba wwpn> select|enable <target wwnn> <target wwpn>

To disable (deselect) all LUNs for a specific target on a specific adapter, issue the following command:

qaucli -pr fc -m <hba instance>|<hba wwpn> deselect|disable <target wwnn> <target wwpn>

To enable (select) all LUNs of all targets on a specific adapter:

qaucli -pr fc -m <hba instance>|<hba wwpn> select all

To disable (deselect) all LUNs of all targets on a specific adapter:

qaucli -pr fc -m <hba instance>|<hba wwpn> deselect all

-mbiv (Flash/MBI Information)

To display the adapter's current multi-flash version, issue the `-mbiv` command as follows:

qaucli -mbiv <hba instance>|<hba wwpn> [<option>]

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)

`<hba wwpn>` = World wide port name of the adapter

`[<option>]` = One of the following options:

- `--mbi`
  Displays the multiboot interface (MBI) version.
- `--ffv`
  Shows the family firmware version (FFV) version (if it is valid).
- `--info`
  Activates the primary/second firmware/NVRAM.
- `--rec`
  Shows the flash memory block (FMB) information of the current adapter.
- `--crbinit`
  Shows the CRBinit version of the current adapter.
- `--chk`
  Checks the multiboot image file (compatibility test).

For example:

```
localhost:~ # qaucli  -mbiv 4 --mbi
Using config file: /opt/QLogic_Corporation/QConvergeConsoleCLI/qaucli.cfg
Installation directory: /opt/QLogic_Corporation/QConvergeConsoleCLI
Working dir: /root
--------------------------
QLE2772 (SN AFD1915Y07299)
Port 1 Instance 4
--------------------------
MBI Version       : 3.02.16
```

To display the adapter's current family firmware version (If applicable), issue the `--ffv` command as follows:

qaucli -mbiv <hba instance>|<hba wwpn> --ffv

For example:

```
localhost:~ # qaucli  -mbiv 4 --ffv
Using config file: /opt/QLogic_Corporation/QConvergeConsoleCLI/qaucli.cfg
Installation directory: /opt/QLogic_Corporation/QConvergeConsoleCLI
Working dir: /root
---------------------------
QLE2772 (SN AFD1915Y07299)
Port 1 Instance 4
---------------------------
Family FW Version : 15.20.06
```

To display the adapter flash information from the last update, issue the `-mbiv` command as follows:

```
localhost:~ # qaucli  -mbiv 4 --rec
Using config file: /opt/QLogic_Corporation/QConvergeConsoleCLI/qaucli.cfg
Installation directory: /opt/QLogic_Corporation/QConvergeConsoleCLI
Working dir: /root
---------------------------
QLE2772 (SN AFD1915Y07299)
Port 1 Instance 4
---------------------------
Family FW Version    : 15.20.06
MBI Version          : 3.02.16
MBI Build Date       : Oct. 20, 2020
Flash Tool ID        : QConvergeConsole CLI
Flash Tool Version   : 2.06.00.13
Last Update Time     : 01:37:18 Oct. 27, 2022
```

-mpidump (Save Adapter MPI FW Dump)

NOTE

This command is supported only on 2600, 2700, and 2800 Series Adapters. The driver registry setting must be enabled for this command to work.

To save the current MPI firmware dump for all ports to a file, issue the following command:

qaucli -mpidump <hba instance>|<hba wwpn> --save <file>]

To save the current MPI firmware dump for a specific file, issue the following command:

qaucli -mpidump <hba instance>|<hba wwpn> --trigger <file>]

Where:

<hba instance> = Adapter number (use the -g command to find)
<hba wwpn> = World wide port name of the adapter
<file> = Name of the compressed file that will contain the MPI firmware dump.

-n (HBA Parameter (NVRAM) Settings)

To set a specific parameter on a specific adapter port, issue the following command:

qaucli -n <hba instance>|<hba wwpn> <param name> <param value>

To restore the factory default adapter parameters, issue the following command:

qaucli -n <hba instance>|<hba wwpn> <param alias> <param value>

To update the adapter port parameters using a predefined OEM default template, issue the following command:

qaucli -n <hba instance>|<hba wwpn>|all <default>

Where:

<hba instance> = Adapter number (use the -g command to find)
<hba wwpn> = World wide port name of the adapter
<param name> = Name of the parameters
<param alias> = Alias of the parameters
<param value> = New value of the parameters
<default> = One of the following OEM names:
EMC = EMC-specific settings
HP = HP-specific settings
IBM = IBM®-specific settings
QLGC = Marvell-specific settings
SUN = Sun® or Oracle-specific settings

The pairs <param name> <param value> and <param alias> <param value> can be repeated to set multiple parameters with a single command.

Table 5-9 lists the adapter parameter names and aliases, alphabetized by name.

Table 5-9. Adapter Parameters

Description	Name	Alias	Value
Connection options	ConnectionOption [a]	CO	0 = Loop only 1 = Point-to-point only 2 = Loop preferred, otherwise point-to-point 3 = Point-to-point preferred, otherwise loop
Data rate	DataRate	DR	0 = 1Gbps 1 = 2Gbps 2 = Auto 3 = 4Gbps 4 = 8Gbps 5 = 16Gbps 6 = 32Gbps 7 = 64Gbps
Enable BIOS	EnableBIOS [b]	EB	1=Enable, 0=Disable
Enable distance support [c]	EnableDistanceSupport	ED	1=Enable, 0=Disable
Enable fabric-assigned WWN	EnableFabricAssignWWN	FN	1=Enable, 0=Disable
Enable Fibre Channel tape [d]	EnableFCTape	EF	1=Enable, 0=Disable
Enable HBA hard loop ID	EnableHardLoopID [e]	HL	1=Enable, 0=Disable
Enable long range	EnableLR [f]	EE	1=Enable, 0=Disable
Enable LIP full login	EnableLIPFullLogin	FL	1=Enable, 0=Disable
Enable LIP reset	EnableLipReset	LP	1=Enable, 0=Disable
Enable target reset	EnableTargetReset	TR	1=Enable, 0=Disable
Execution throttle [g]	ExecutionThrottle	ET	1–65535
Frame size	FrameSize	FR	512, 1024, 2048
Hard loop ID	HardLoopID[e]	HD	0–125
Interrupt delay timer	InterruptDelayTimer	ID	0–255
Link down time-out	LinkDownTimeOut	LT	0–240
Login retry count	LoginRetryCount	LR	0–255
Maximum LUNs per target	MaximumLUNsPerTarget	ML	0, 8, 16, 32, 64, 128, 256

Table 5-9. Adapter Parameters (Continued)

Description	Name	Alias	Value
Operation mode	`OperationMode`	`OM`	0 = Interrupt for every I/O completion 5 = Interrupt when interrupt delay timer expires 6 = Interrupt when interrupt delay timer expires or no active I/O
Port down retry count	`PortDownRetryCount`	`PD`	0–255
Prefer FCP support	`PreferFCP` [h]	`FP`	0 = Login to NVMe LUNs and ignore FCP LUNs behind the same target port. 1 = Login to FCP LUNs and ignore NVMe LUNs behind the same target port.
Enable Universal SAN Congestion Mitigation feature	`EnableUSCM` [i]	`EC`	0=Enable, 1=Disable
Virtual lane	`VirtualLane` [j]	`VL`	1=Enable, 0=Disable

[a] `ConnectionOption` is read-only for 10GbE.

[b] The NVRAM parameter `EnableBIOS` option is available only with Linux PPC64Le.

[c] The `EnableDistanceSupport` option is available only for Marvell QLogic 269*x*, 2700, and 2800 Series Adapters

[d] Tape devices and Backup Protection Software must support persistent binding.

[e] The `HardLoopID` option is *not* available for Marvell 8200 Series Adapters.

[f] The `Enable LR` option enables long range (LR) cable distances in kilometers. For 2690, 2700, and 2800 Series Adapters, select either 5Km or 10Km. For 2660 you can only select 10Km. The `Enable LR` option is not available on 8200 Series Adapters.

[g] The `ExecutionThrottle` option is read-only for all adapters.

[h] The `PreferFCP` option is available only for Marvell QLogic 2600, 2700, and 2800 Series Adapters. This option is for storage that offers both FCP and NVMe LUNs.

[i] The `EnableUSCM` option is supported only on 2690, 2770, and 2800 Series Adapters.

[j] The VirtualLane option is available only for Marvell QLogic 2770 and 2800 Series Adapters.

-o (Redirect Standard Output To a File)

NOTE

- The `-o` option is valid only in noninteractive mode.
- This option can be used with all noninteractive mode options that have a corresponding interactive mode option (see Table 5-1). The option must be the first or last command in the command line.
- If the file already exists, new data are appended to the current file.

To output result and status messages into a file, type `-o`, followed by the file name. For example, to save LUN information to a file named `systemLUNinfo`, issue the following command:

```
# qaucli -pr fc -l -o systemLUNinfo
```

Where the file name is `systemLUNinfo`, all messages are located in the directory indicated for the system platform:

Windows: `syslog.log` in the current directory

Linux: `/var/log/messages`

-p (Target Persistent Bindings)

Use the `-p` command to:

- Show binding information for one or all adapters.
- Bind a specific target to a selected adapter.
- Bind all targets on a specific adapter or on all adapters.
- Unbind a specific target.
- Unbind all targets on a specific adapter or on all adapters.

NOTE

- Under Linux, these features are disabled.

To show target persistent binding information for a specific adapter port, issue the `-p` command as follows:

```
qaucli -pr fc -p  <hba instance>|<hba wwpn>  view|info
```

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)

`<hba wwpn>` = World wide port name of the adapter

To show persistent binding information for all adapters, issue the following command:

qaucli -pr fc -p all view|info

The following example is a typical QConvergeConsole CLI output showing all targets currently bound to an adapter:

```
-------------------------------------------------------------------------
HBA 0: QLE2872 Port 1 WWPN xx:xx:xx:xx:xx:xx:xx:xx Port ID 01:0c:00
-------------------------------------------------------------------------
Bind  Type  Device Node Name         Device Port Name         Port ID   ID
----  ----  ----------------        ----------------         -------   --
No    Disk  xx:xx:xx:xx:xx:xx:xx:xx  xx:xx:xx:xx:xx:xx:xx:xx  10:02:e1
Yes   Disk  xx:xx:xx:xx:xx:xx:xx:xx  xx:xx:xx:xx:xx:xx:xx:xx  10:02:e2   0
Yes   Disk  xx:xx:xx:xx:xx:xx:xx:xx  xx:xx:xx:xx:xx:xx:xx:xx  10:02:e4   1
Yes   Disk  xx:xx:xx:xx:xx:xx:xx:xx  xx:xx:xx:xx:xx:xx:xx:xx  10:02:e8   2
    Press <Enter> to continue:
```

To bind a selected target to a specific adapter, issue the following command:

qaucli -pr fc -p <hba instance>|<hba wwpn> (<target wwnn> <target wwpn> <target port id> <target id>)

Where:

- <hba instance> = Adapter number (use the -g command to find)
- <hba wwpn> = World wide port name of the adapter
- <target wwnn> = World wide node name of the target
- <target wwpn> = World wide port name of the target
- <target port id> = Port ID of the target
- <target id> = ID to which the target is bound

To bind multiple targets with a single command, repeat the following group:

<target wwnn> <target wwpn> <target port id> <target id>

To bind all targets on a specific adapter or to bind all targets on all adapters, issue the following command:

qaucli -pr fc -p <hba instance>|<hba wwpn>|all bind all

Where:

- <hba instance> = Adapter number (use the -g command to find)
- <hba wwpn> = World wide port name of the adapter

To unbind a specific target, issue the following command:

qaucli -pr fc -p <hba instance>|<hba wwpn> remove|unbind <target wwnn>

Where:

<hba instance> = Adapter number (use the -g command to find)
<hba wwpn> = World wide port name of the adapter
<target wwnn> = World wide node name of the target

To unbind all targets on a specific adapter port or on all adapter ports, issue the following command:

qaucli -pr fc -p <hba instance>|<hba wwpn>|all remove|unbind all

Where:

<hba instance> = Adapter number (use the -g command to find)
<hba wwpn> = World wide port name of the adapter

-pa (HBA Port Alias [FCoE Configuration])

Use the -pa command to:

- Define the port alias for a specific adapter port
- Delete the port alias from a specific adapter port
- View the port alias for a specific adapter port

To define a port alias for the specified adapter, issue the following command:

qaucli -pr fc -pa <hba instance>|<hba wwpn> <alias>

Where:

<hba instance> = Adapter number (use the -g command to find)
<hba wwpn> = World wide port name of the adapter
<alias> = Symbolic name you assign to the adapter port

To delete a port alias for the specified adapter port, issue the following command:

qaucli -pr fc -pa <hba instance>|<hba wwpn> delete

To view a port alias for the specified adapter port, issue the following command:

qaucli -pr fc -pa <hba instance>|<hba wwpn> view|info

-pc (Adapter Personality Change)

NOTE

The adapter personality feature is supported only on Marvell 2600 Series adapters. This feature lets you set the adapter's personality to Fibre Channel only.

Use the `-pc` command to change an adapter's personality between Fibre Channel only (FC only).

To display the adapter's current personality, issue the `-pc` command as follows:

```
qaucli -pr fc -pc  <hba instance>|<hba wwpn>|all  --info
```

To change the adapter's personality, issue the `-pc` command as follows:

```
qaucli -pr fc -pc  <hba instance>|<hba wwpn>|all  --type <mode>
```

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)
`<hba wwpn>` = World wide port name of an adapter port
`all` = All adapter ports
`<mode>` = Adapter personality—specify one of the following:
- **`fc`** or **`fco`** or **`0`**: Fibre Channel

-pl (Persistent Names [udev] – Linux only)

To display udev persistent device names of a specific LUN or all LUNs, issue the following command:

```
qaucli -pr fc -pl  <hba instance>|<hba wwpn>  --info [<target id>
<lun id>]
```

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)
`<hba wwpn>` = World wide port name of the adapter
`<target id>` = Name of the firmware preload table DAT file.
`<lun id>` = ID of the LUN

If both `<target id>` and `<lun id>` are omitted, the `-pl` command lists all udev names that are currently assigned to all devices attached to a physical port on the adapter.

To remove a udev persistent device name from a LUN, issue the following command:

```
qaucli -pr fc -pl <hba instance>|<hba wwpn>  --del (<target ID>
<lun ID> <lun name>)...
```

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)
`<hba wwpn>` = World wide port name of the adapter
`<target id>` = Name of the firmware preload table DAT file.
`<lun id>` = ID of the LUN
`<lun name>` = Name of the LUN

NOTE

The parameter group `<target ID> <lun ID> <lun_name>` can be specified more than once. For example:

`...targetID1 lunID1 lun_name1 targetID2 lunID2 lun_name2`

To add a udev persistent device name to a LUN, issue the following command:

```
qaucli -pr fc -pl  <hba instance>|<hba wwpn>  --set (<target ID>
<lun ID> <lun name>)
```

-q (Target Link Speed [iiDMA])

To view the link speed (iiDMA) settings of all targets attached to a specific adapter or all adapter ports, issue the `-q` command as follows:

```
qaucli -pr fc -q  <hba instance>|<hba wwpn>|all  [-targets|-t]
```

To view the iiDMA settings of a specific target attached to a specific adapter port, issue the following command:

```
qaucli -pr fc -q  <hba instance>|<hba wwpn>|<target wwpn>
```

To set the iiDMA speed of all targets attached to a specific adapter port or all adapter ports, issue the following command:

```
qaucli -pr fc -q  <hba instance>|<hba wwpn>|all  -targets|-t
<iidma speed>
```

To set iiDMA speed of selected target(s) attached to a specific adapter port, issue the following command:

qaucli -pr fc -q <hba instance>|<hba wwpn>|all <target wwpn> <iidma speed>

Where:

- `<hba instance>` = Adapter number (use the `-g` command to find)
- `<hba wwpn>` = World wide port name of the adapter
- `all` = All adapter ports
- `<target wwpn>` = World wide port name of the target
- `<iidma speed>` = 1, 2, 4, 8, 10, 16, 32, 64Gbps.
- `-t|-targets` = The specified targets affected

-qos (NPIV Quality of Service [QoS])

NOTE

The `-qos` option is supported on Marvell 16G/32G/64G Fibre Channel Adapters on Windows Server 2019, Windows Server 2022, and Windows Server 2025 operating systems.

To view the current QoS settings of all virtual ports on a physical adapter port, issue the `-qos` command as follows:

qaucli -pr fc -qos <hba instance>|<hba wwpn> info --vp all [--per|--spd]

Where:

- `<hba instance>` = Adapter number (use the `-g` command to find)
- `<hba wwpn>` = World wide port name of the adapter
- `all` = Reports QoS settings for all virtual ports on the adapter port
- `--per` = Display bandwidth percentage-related QoS settings only
- `--spd` = Display bandwidth speed-related QoS settings only

To view the current QoS settings of a specific virtual port on a physical adapter port, issue the `-qos` command as follows:

qaucli -pr fc -qos <hba instance>|<hba wwpn> info --vp <vport wwpn> [--per|--spd]

Where:

<hba instance> = Adapter number (use the -g command to find)
<hba wwpn> = World wide port name of the adapter
<vport wwpn> = World wide port name of the virtual port
--per = Display bandwidth percentage-related QoS settings only
--spd = Display bandwidth speed-related QoS settings only

To change the QoS settings of a specific virtual port, issue the -qos command as follows:

qaucli -pr fc -qos <hba instance>|<hba wwpn> --vp <vport wwpn> [<option>]

Where:

<hba instance> = Adapter number (use the -g command to find)
<hba wwpn> = World wide port name of the adapter
<vport wwpn> = World wide port name of the virtual port
<option> = One of the following options:
--pri <priority>
--bwspd <speed> [Gbps|Mbps]
--bwper <percent>
--lock <lock op>
--enable <enable op>

--pri option:

To set the QoS on a virtual port by priority, issue the following command:

qaucli -pr fc -qos <hba instance>|<hba wwpn> --vp <vport wwpn> --pri <priority>

Where <priority> is **1** (low), **3** (medium), or **5** (high).

--bwspd option:

To set the QoS on a virtual port by bandwidth speed, issue the following command:

qaucli -pr fc -qos <hba instance>|<hba wwpn> --vp <vport wwpn> --bwspd <speed> [Gbps|Mbps]

Where <speed> is the required bandwidth speed in Gbps or Mbps.

--bwper option:

To set the QoS on a virtual port by bandwidth percentage, issue the following command:

```
qaucli -pr fc -qos  <hba instance>|<hba wwpn>
--vp <vport wwpn>  --bwper <percent>
```

Where <percent> is the required percentage in the range 0–100.

--lock option:

To change the QoS setting lock properties on a virtual port, issue the following command:

```
qaucli -pr fc -qos  <hba instance>|<hba wwpn>
--vp <vport wwpn>  --lock <lock op>
```

Where <lock op> is **1** (lock) or **0** (unlock).

--enable option:

To set the QoS setting enable option on a virtual port, issue the following command:

```
qaucli -pr fc -qos <hba instance>|<hba wwpn>
--vp <vport wwpn> --enable <enable op>
```

Where <enable op> is **1** (enable) or **0** (disable).

-r (Parameters Update; Save HBA Parameters)

To update the adapter parameters from a file, issue the -r command as follows:

```
qaucli -pr fc -r  <hba instance>|<hba wwpn>|all  <file name>
```

Where:

<hba instance> = Adapter number (use the -g command to find)
<hba wwpn> = World wide port name of the adapter port
all = All adapter ports in the system
<file name> = File name or a path to a file that contains the updated adapter parameters

To save the adapter parameters to a file, issue the following command:

```
qaucli -pr fc -r  <hba instance>|<hba wwpn>  save <file name>
```

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)
`<hba wwpn>` = World wide port name of the adapter
`<file name>` = File name or a path to a file to save the adapter parameters

-rdp (Read Diagnostics Parameter)

To run a read diagnostics parameter test from the adapter port, issue the following command:

`qaucli -rdp <hba instance>|<hba wwpn> --info`

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)
`<hba wwpn>` = World wide port name of the adapter

For example, typing **`qaucli.exe -rdp 1 --info`** shows the following:

```
Using config file: M:\qaucli\qaucli.cfg
Installation directory: M:\qaucli
Working dir: M:\qaucli
------------------------------------------------------------------
HBA instance 1: QLE2772 Port 2 WWPN 21:00:34:80:0d:61:4b:11 PortID
01:0c:00
Link: Online (FEC)
------------------------------------------------------------------
Diagnostics Parameters Descriptor List Length: 332 Bytes
--------------------------------
Diagnostics Parameters Descriptor
--------------------------------
Descriptor Tag: Link Service Request Information
Descriptor Len: 4 Bytes
Descriptor Value: 0x18000000



--------------------------------
Port Speed Descriptor
--------------------------------
Descriptor Tag: Port Speed
Descriptor Length: 4 Bytes
Port Speed Capabilities: 16 8 4 2 Gbps
Port Operating Speed: 8 Gbps
```

```
--------------------------------
Link Error Status Block Descriptor
--------------------------------
Descriptor Tag: Link Error Status Block
Descriptor Length: 28 Bytes
Link Failure Count: 46
Loss Of Sync Count: 1
Loss Of Signal Count: 354
Primary Sequence Error Count: 0
Invalid Transmit Word Count: 0
Invalid CRC Count: 0
PN Port Physical Type: 0x40000000
        The sending VN_Port uses an FC-FS-3 PN_Port or PF Port


--------------------------------
Port Name Descriptor
--------------------------------
Descriptor Tag: Port Name
Descriptor Length: 16 Bytes
Node WWN: 10:00:00:05:33:7e:5f:a3
Port WWN: 20:09:00:05:33:7e:5f:a3


--------------------------------
Port Name Descriptor
--------------------------------
Descriptor Tag: Port Name
Descriptor Length: 16 Bytes
Node WWN: 20:00:34:80:0d:3b:89:b0
Port WWN: 21:00:34:80:0d:3b:89:b0


--------------------------------
SFP Diagnostics Param Descriptor
--------------------------------
Descriptor Tag: SFP Diagnostics
```

```
Descriptor Length: 12 Bytes
Temperature: 0x3100 49 (C)
Vcc: 0x7F6C 3.26 V
Tx Bias: 0x0E73  7.3980 mA
Tx Power: 0x130B 0.4875 mW
Rx Power: 0x1D26 0.7462 mW
SFP Flag: 0x0051
        Port Tx Type: Short Wave Laser
        Connector Type: SFP+
        Optical Port: On
        SFP Diagnostics Parameters not valid: Off
        Connector Type: SFP+
        FEC Active: Off


--------------------------------
FEC Status Descriptor
--------------------------------
Descriptor Tag: FEC Status
Descriptor Length: 8 Bytes
Correctable Blocks: 1
UnCorreatable Blocks: 503


--------------------------------
Buffer Credits Status Descriptor
--------------------------------
Descriptor Tag: Buffer Credit
Descriptor Length: 12 Bytes
FC Port Buffer To Buffer Credits: 8
Attached FC Port Buffer To Buffer Credits: 372
Nominal FC Port RTT: 0 ns


--------------------------------
Optical Product Data Descriptor
--------------------------------
Descriptor Tag: Optical Product Data
Descriptor Length: 60 Bytes
```

```
Vendor Name: BROCADE
Part Number: 57-0000088-01
Serial Number: HAA11126100P8L2
Revision:
Date: 110628


--------------------------------
Optical Element Data Descriptor
--------------------------------
Descriptor Tag: Optical Element Data
Descriptor Length: 12 Bytes
Temperature High Alarm: 0x55
Temperature High Alarm: 85.00
Temperature Low Alarm: 0xfffb
Temperature Low Alarm: -5.00
Temperature High Warning: 0x4b
Temperature High Warning: 75.00
Temperature Low Warning: 0x00
Temperature Low Warning: 0.00


--------------------------------
Optical Element Data Descriptor
--------------------------------
Descriptor Tag: Optical Element Data
Descriptor Length: 12 Bytes
Voltage High Alarm: 0x8ca0
Voltage High Alarm: 3.60
Voltage Low Alarm: 0x7530
Voltage Low Alarm: 3.00
Voltage High Warning: 0x8728
Voltage High Warning: 3.46
Voltage Low Warning: 0x7a44
Voltage Low Warning: 3.13


--------------------------------
Optical Element Data Descriptor
```

```
---------------------------------
Descriptor Tag: Optical Element Data
Descriptor Length: 12 Bytes
Tx Bias High Alarm: 0x1770
Tx Bias High Alarm: 12.00
Tx Bias Low Alarm: 0x4e2
Tx Bias Low Alarm: 2.50
Tx Bias High Warning: 0x1676
Tx Bias High Warning: 11.50
Tx Bias Low Warning: 0x3e8
Tx Bias Low Warning: 2.00


---------------------------------
Optical Element Data Descriptor
---------------------------------
Descriptor Tag: Optical Element Data
Descriptor Length: 12 Bytes
Tx Power High Alarm: 0x312d
Tx Power High Alarm: 1.26
Tx Power Low Alarm: 0x4ec
Tx Power Low Alarm: 0.13
Tx Power High Warning: 0x1f04
Tx Power High Warning: 0.79
Tx Power Low Warning: 0x9ce
Tx Power Low Warning: 0.25


---------------------------------
Optical Element Data Descriptor
---------------------------------
Descriptor Tag: Optical Element Data
Descriptor Length: 12 Bytes
Rx Power High Alarm: 0x312d
Rx Power High Alarm: 1.26
Rx Power Low Alar
```

-S (Suppress Output [Silent Mode])

NOTE

- The `-s` option is valid only in noninteractive mode.
- You can use this option with noninteractive mode options that have a corresponding interactive mode option (see Table 5-1 on page 21). You cannot combine this option with the `-o` option. The `-s` option must be the first or last command in the command line.

In noninteractive mode, the system shows result and status messages generated by QConvergeConsole CLI (by default) unless suppressed by silent mode.

-scm | -uscm (Congestion Management)

NOTE

USCM is not supported on all adapters.

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

Universal SAN Congestion Mitigation (USCM) is Marvell's IP, and describes Marvell's capabilities that encompass SCM and additional functionalities to further assist users.

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

- USCM statistics are not gathered for other initiators in the configured zones.
- USCM is supported only on 2690, 2770, and 2800 Series Adapters.
- USCM statistics track the following types of Fabric Performance Impact Notification (FPIN) Extended Link Services (ELSs) to provide SAN congestion awareness:

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

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

You can view the USCM congestion mitigation status and statistics; the statistics can also be reset. See “Universal SAN Congestion Mitigation (-scm | -uscm)” on page 242 for more information.

By default, USCM is enabled on all adapter ports. To enable or disable the USCM feature on an adapter port, query adapter and target congestion status, report slow-drain devices in your SAN configuration, or monitor congestion statistics in a host, issue one of the following commands:

```
qaucli -scm <hba instance>|<hba wwpn> <options>  [--ports]

qaucli -uscm <hba instance>|<hba wwpn> <options> [--ports]
```

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)

`<hba wwpn>` = World wide port name of the adapter

`<options>` = One of the following options:

```
--config
--enable
--disable
--chk
--clear
--hba
--stats [<params>]
--tgtstats [params]
--profile {<params>}
```

`--config` option:

To view the current SCM settings for the USCM feature on an adapter port, issue the following command:

```
qaucli -pr fc -scm <hba wwpn> --config
```

`--enable` option:

To enable SCM for the USCM feature on an adapter port, issue the following command:

```
qaucli -pr fc -scm <hba wwpn> --enable
```

`--disable` option:

To disable SCM for the USCM feature on an adapter port, issue the following command:

```
qaucli -pr fc -scm <hba wwpn> --disable
```

`--hba` option:

To query the current adapter congestion status on an adapter port, issue the following command:

```
qaucli -pr fc -scm <hba wwpn> --hba
```

`--chk` option:

To query target congestion status and report slow-drain devices on an adapter port, issue the following command:

```
qaucli -pr fc -scm <hba wwpn> --chk
```

`--stats` option:

To monitor the adapter and target congestion statistics on an adapter port, issue the following command:

```
qaucli -pr fc -scm <hba wwpn> --stats ap <number of passes> |
sr <delay time between each iteration> |lf <csv file>
```

Where:

`AutoPoll` or `ap` = The number of iterations (count base) that the adapter and target congestion statistics will run. Valid values are in the range of 0–256.

If `AutoPoll` is `0`, the congestion statistics run indefinitely. Stop the process by pressing the ENTER key.

`SetRate` or `sr` = The delay time between each iteration.

`LogToFile` or `lf` `<CSV file>` = Save USCM statistics data to a command separated value (CSV) file.

For example, the following command polls the first HBA instance/port once:

```
qaucli -pr fc -scm 0 --stats ap 1
```

`--clear` option:

To clear adapter and target congestion statistics counters on an adapter port, issue the following command:

```
qaucli -pr fc -scm <hba wwpn> --clear
```

`--tgtstats` option:

To monitor the congestion statistics of the connected targets, issue the following command:

```
qaucli -pr fc -scm <hba wwpn> --tgtstats ap <number of passes>
| sr <delay time between each iteration> |lf <csv file>
```

Where:

`AutoPoll` or `ap` = The number of iterations (count base) that connected target congestion statistics will run.

If `AutoPoll` is `0`, the congestion statistics run indefinitely. Stop the process by pressing the ENTER key.

`SetRate` or `sr` = The delay time between each iteration.

`LogToFile` or `lf` = Save USCM target statistics data to a comma-separated value (CSV) file.

For example, the following command shows the congestion statistics of all the connected targets:

```
qaucli -pr fc -scm 0 --tgtstats
```

`--profile` option:

To configure the USCM profile settings of the adapter port, issue the following command:

```
qaucli -pr fc -scm <hba instance | hba wwpn> --profile RD | AC <0-3>
```

Where:

`RevertToDrv` or `RD` = Reverts to driver settings, clearing the current NVRAM USCM profile settings of the adapter port.

`Activation` or `AC` = Configures the USCM profile activation type of the adapter port. Valid values are:

- 0 = Monitor only (Default)
- 1 = Conservative
- 2 = Moderate
- 3 = Aggressive

For example, the following command changes the current active profile to Conservative:

```
qaucli -pr fc -scm 0 --profile ac 2
```

NOTE

The `--profile` option is not supported on 2670 Series Adapters.

-sfpdump (Display SFP raw data to standard out put or save the SFP raw data in binary or text format to a file)

To display sfp raw binary dump to standard output

-sfpdump <hba instance>|<hba wwpn> --stdout|/stdout

To save sfp dump raw data to a hexadecimal binary file

-sfpdump <hba instance>|<hba wwpn> <file name> [--raw|/raw]

To save sfp dump raw data to a hexadecimal text file

-sfpdump <hba instance>|<hba wwpn> <file name> --txt|/txt

-sp (Save Adapter FC Board Config)

To update the FC board configuration from a file (including the firmware serializer/deserializer (SerDes) tables), issue the following command:

qaucli -pr fc -sp <hba instance>|<hba wwpn> <file name>

To save the adapter firmware SerDes table to a file, issue the following command:

qaucli -pr fc -sp <hba instance>|<hba wwpn> save <file name>

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)
`<hba wwpn>` = World wide port name of the adapter
`<file name>` = Name of the firmware preload table DAT file.

-t (FC Storage Device Information)

To show the target information for *all* adapters in the system, issue the -t command as follows:

qaucli -pr fc -t [all]

To show the target information for a *specific* adapter, issue the following command:

qaucli -pr fc -t <hba instance>|<hba wwpn>

To show specific target information for a *specific target* on an adapter, issue the following command:

qaucli -pr fc -t <hba instance>|<hba wwpn>
<target wwpn>|<target port id>

Where:

<hba instance> = Adapter number (use the -g command to find)
<hba wwpn> = World wide port name of the adapter
<target wwpn> = World wide port name of the target
<target port id> = Port ID of the target

To show the target information on all adapters, issue the following command:

-t [all]

To show the target information on a specific adapter, issue the following command:

-t <hba instance>|<hba wwpn>

To show the target information for a specific target on a specific adapter, issue the following command:

-t <hba instance>|<hba wwpn> <target wwpn>|<target port id>

iiDMA (intelligent interleaved direct memory access) settings include:

- —targets | -t applies to all targets.
- <speed> indicates the supported intelligent interleave factor: 1, 2, 4, or 8Gbps.

Following is a sample output of the -t command.

```
HBA Instance 4: QLE2872 Port 2 WWPN 21:00:34:80:0d:61:4b:11 PortID 01:0c:00
Link: Online (FEC)
--------------------------------------------------------------------------------
Path                : 0
Target              : 0
Device ID           : 0x82
Product Vendor      : SANBlaze
Product ID          : VLUN P2T2L0
Product Revision    : V7.5
Serial Number       : 200000000000-2002-02-0000
Node Name           : 20:00:00:00:00:00:20:02
Port Name           : 21:00:00:00:00:00:20:02
Port ID             : 01:29:02
Product Type        : FCP Disk
LUN Count(s)        : 1
Remote Type         : Target
Session State:      : Auth Complete
Secure Mode:        : Enabled
```

```
Congestion Current State  : Healthy (no congestion)
Link Integrity Events     : No
Seconds Since Last Event  : 0
I/O Throttling            : Disabled
Virtual Lane              : Non-Operational (2770 and 2800 Series Adapters)
Status                    : Online
-------------------------------------------------------------------------------
Path                      : 0
Target                    : 0
Device ID                 : 0x83
Product Vendor            : SANBlaze
Product ID                : VLUN P2T3L0
Product Revision          : V7.5
Serial Number             : 200000000000-2003-03-0000
Node Name                 : 20:00:00:00:00:00:20:03
Port Name                 : 21:00:00:00:00:00:20:03
Port ID                   : 01:29:03
Product Type              : FCP Disk
LUN Count(s)              : 1
Remote Type               : Target
Session State:            : Auth Complete
Secure Mode:              : Enabled
Congestion Current State  : Healthy (no congestion)
Link Integrity Events     : No
Seconds Since Last Event  : 0
I/O Throttling            : Disabled
Virtual Lane              : Non-Operational (2770 and 2800 Series Adapters)
Status                    : Online
```

-tb (Target Beacon)

To start or stop flashing a target's LED, issue the `-tb` command as follows:

`qaucli -pr fc -tb  <hba instance>|<hba wwpn> {<disk device wwpn>} <beacon mode>`

Where:

<hba instance> = Adapter number (use the -g command to find)

<hba wwpn> = World wide port name of the adapter

<disk device wwpn> = Target device world wide port name

<beacon mode> = One of the following options:

- 0|On
  Turns on the beacon of the attached devices.
- 1|Preset
  Turns on the beacon of the attached devices (flashes the LED 12 times). This feature is supported only on JBOD ("just a bunch of disk") devices.

-tm (HBA Temperature)

Issue the -tm command to view the temperature (in °C) of a single adapter or all the adapters in a host:

```
qaucli -tm  <hba instance> | <hba wwpn> | <all>
      {<param name>|<param alias>
      <param value>}
```

Where:

<hba instance> = Adapter number (use the -g command to find)

<hba wwpn> = World wide port name of the adapter

<all> = All discovered adapters

<param name> = One of the following parameter names:

- AutoPoll
- SetRate
- LoAlarm
- HiAlarm
- LogToFile

<param alias> = One of the following parameter aliases:

- AP
- SR
- LO
- HI
- LF

<param value> = Value of parameter or alias (see Table 5-10)

Table 5-10. Temperature Monitor Parameters

Parameter Name	Parameter Alias	Value	Description
AutoPoll	AP	0 1–256	Set to automatically read the temperature of all adapters. Set to manually read the temperature of all adapters updated at the given iteration.
SetRate	SR	5–300	Set the polling interval during automatic update (in seconds).
LoAlarm	LO	0–5	Alert when the temperature is below this threshold value.
HiAlarm	HI	1–100	Alert when the temperature exceeds this threshold value.
LogToFile	LF	File name	Export temperature monitored data to a CSV file.

The identifying information displays:

```
HBA         :       HBA instance.
HBA Model   :       HBA model.
HBA Port    :       HBA Port number.
Port Name   :       HBA World Wide Port Name.
Port ID     :       HBA Port ID.
```

The thermal temperature reading information displays:

```
Time              : Current time
HBA Model         :
HBA Serial Number:
Temp (C)          : Current reading temperature
Threshold (C)     : Hi Alarm threshold
Status            : Current status based on Low/High alarm
                    trigger settings
To end the current session, press the <ENTER> key to stop.
```

-tp (Topology)

Use the `-tp` option to show the topology configuration of the host:

`qaucli -pr fc -tp|-topology`

Under Linux, this feature is enabled only if you are using the 32-bit version.

The fabric scanning option must be enabled to issue the `-tp` command. Fabric scanning is disabled by default. To enable fabric scanning, edit the `sfcli.properties` configuration file in the QConvergeConsoleCLI install directory as follows:

```
node.agent.fabric.scanning.enable=1
```

-trace (FCE Trace)

To save an FCE trace of the current adapter port to a text file:

```
qaucli -pr fc -trace  <hba instance>|<hba wwpn>  <file name>
```

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)
`<hba wwpn>` = World wide port name of the adapter
`<file name>` = Name of the firmware preload table DAT file.

NOTE

After the trace file has been saved, send it to Marvell Technical Support (see "Technical Support" on page xvi).

-u (Firmware Preload Table Update)

Use the `-u` option to update the firmware preload area of the adapter from a DAT file or to save the current firmware preload area of the adapter to a DAT file.

NOTE

The `-u` option is available only for the Marvell QLogic 8Gb, 16Gb, and 32Gb Fibre Channel adapters. It is not supported on the Marvell QLogic 2770 Series Adapters.

To update the adapter firmware preload table, issue the following command:

```
qaucli -pr fc -u  <hba instance>|<hba wwpn>  <file name>
```

To save the current adapter firmware preload table to a DAT file, issue the following command:

```
qaucli -pr fc -u <hba instance>|<hba wwpn> save <file name>
```

To display the adapter's firmware preload table version, issue the following command:

```
qaucli -pr fc -u <hba instance>|<hba wwpn> /version
```

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)
`<hba wwpn>` = World wide port name of an adapter port
`<file name>` = Name of the firmware preload table DAT file.

-v (QCC CLI Version Information)

NOTE

The `-v` option is valid only in noninteractive mode.

To show the version number of the QConvergeConsole CLI tool, issue the `-v` command as follows:

qaucli -pr fc -v

The system shows the following information:

```
QConvergeConsole CLI
v1.x.x Build x
Copyright 2003-2022 QLogic Corp.
All rights reserved.
Command Line QLogic FC Host Bus Adapters.
Build Type: Release
Build Date: xx/xx/xxxx xx:xx:xx AM
```

-vp (N_Port ID Virtualization [NPIV])

NOTE

A maximum of 31 virtual ports is supported on 8200 Series adapters.

To list, create, and delete virtual ports on a physical adapter port, issue the `-vp` command as follows:

qaucli -pr fc -vp <hba instance>|<hba wwpn> list|create|delete <vport wwpn>|<vport hex>|all [<num_of_vport>]

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)
`<hba wwpn>` = World wide port name of the adapter port
`<vport wwpn>` = World wide port name of the virtual port

<vport hex> = World wide port name of the virtual port with the two hexadecimal digits in byte three supplied by the user

<num_of_vport> = Number of virtual ports to be created. If the keyword max is specified, the maximum number of virtual ports will be automatically created.

To list a specific virtual port on a physical adapter port, issue the following command:

qaucli -pr fc -vp <hba instance>|<hba wwpn> list <vport wwpn>

To create a virtual port with an automatic WWPN, issue the following command:

qaucli -pr fc -vp <hba instance>|<hba wwpn> create auto [<num_of_vport>]

To create a virtual port with a specific WWPN, issue the following command:

qaucli -pr fc -vp <hba instance>|<hba wwpn> create <vport hex>

When prompted, type two hexadecimal digits. The system checks these digits to be sure they are unique and, if they are, puts them into byte 1 of the WWPN.

To delete all virtual ports on a physical adapter port, issue the following command:

qaucli -pr fc -vp <hba instance>|<hba wwpn> delete all

To delete a specific virtual port on a physical adapter port, issue this command:

qaucli -pr fc -vp <hba instance>|<hba wwpn> delete <vport wwpn>

-X (XML Output [Legacy])

NOTE

The -x option is valid only in noninteractive mode.

You can use the -x option with all noninteractive mode options that have a corresponding interactive mode option (see Table 5-1 on page 21). This option must be the first or last command in the command line.

When you use this option, the system shows all result and status messages in XML format 1, a legacy format. This option is usually combined with the -o option (see “-o (Redirect Standard Output To a File)” on page 84) to create a text file with XML output so that it can be parsed by an XML-compliant utility. For example to show adapter general information and output it to an XML file named output.xml:

qaucli -pr fc -i all -x -o output.xml

-x2 (XML Output)

NOTE

The `-x2` option is valid only in noninteractive mode.

You can use the `-x2` option with all noninteractive mode options that have a corresponding interactive mode option (see Table 5-1 on page 21). This option must be the first or last command in the command line.

When you use this option, the system shows all result and status messages in XML format 2, the standard XML format. This option is usually combined with the `-o` option (see "-o (Redirect Standard Output To a File)" on page 84) to create a text file with XML output so that it can be parsed by an XML-compliant utility. For example, to show adapter general information and output it to an XML file named `output.xml`:

```
qaucli -pr fc -i all -x2 -o output.xml
```

-z (All Information)

To show all information for one specific adapter or for all adapters in the system, issue the `-z` command as follows:

```
qaucli -pr fc -z  <hba instance>|<hba wwpn>|all
```

"Host Configuration (Command Line Option -z)" on page 20 covers this command.

Part III

Interactive Commands

Part III of this guide provides details about the interactive commands of QConvergeConsole CLI.

6 Fibre Channel Interactive Commands

This chapter describes the interactive mode command line options for Fibre Channel Adapters. The interactive mode uses a series of menus from which you select the option you want by typing the number for that option.

For information about noninteractive mode operation—in which you simply type a short code to perform operations on the adapter—refer to Chapter 5 Fibre Channel Noninteractive Commands.

For information on documentation conventions specific to interactive commands, refer to “Conventions for Interactive Commands” on page xv.

The Main Menu contains the following options:

```
Main Menu

1:  Adapter Information (see page 111)
2:  Adapter Configuration (see page 127)
3:  Adapter Updates (see page 182)
4:  Adapter Diagnostics (see page 191)
5:  Monitoring (see page 234)
6:  Universal SAN Congestion Mitigation (USCM)(see page 242)
7:  Refresh (see page 257)
8:  Help (see page 258)
9:  Exit (see page 258)

    Please Enter Selection:
```

Adapter Information

1. Adapter Information ▸ 2. Fibre Channel Adapter

From the main menu, select the **Adapter Information** option.

```
QConvergeConsoleCLI
```

```
CLI - Version 3.0.x (Build xx)

    FC Adapter Information

    1:  FC Adapter Information
    2:  FC Port Information
    3:  FC VPD Information
    4:  FC Storage Device Information
    5:  FC Hyper-V VFC Information
    6:  FC Adapter FMB Information

        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection:
```

FC Adapter Information (-i)

1. Adapter Information ▸ 1. FC Adapter Information

From the Adapter Information menu, select the **FC Adapter Information** option. From the FC Adapter Information menu, select the adapter for which to view adapter information.

NOTE

In FC Adapter Information output, the `Host NQN` parameter appears only for 2600 Series Adapter models QLE2690, QLE2692; 2700 Series Adapter models QLE2740, QLE2742, QLE2770, QLE2772; and 2800 Series Adapters on which the port link is up. It shows the host NVMe qualified name (NQN) for NVM Express (NVMe) over Fibre Channel (NVMe-oF).

2870 Series Fibre Channel Adapters

```
Host Name                    : WINFC-A13
Host NQN                     : nqn.2014-08.org.nvmexpress:uuid:
                               4c4c4544-0034-4410-8033-c6c04f4c4d33
Host ID                      : 44454c4c340010448033c6c04f4c4d33
HBA Instance                 : 2
HBA Model                    : QLE2872
HBA Description              : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
HBA ID                       : 0-QLE2872
HBA Alias                    :
HBA Port                     : 1
Port Alias                   :
Node Name                    : 20:00:f4:c7:aa:01:bc:3b
```

```
Port Name                     : 21:00:f4:c7:aa:01:bc:3b
Port ID                       : 7d:00:c0
Principal Fabric WWN          : 20:01:00:3a:9c:ed:77:71
Adjacent Fabric WWN           : 20:07:00:3a:9c:ed:77:70
Serial Number                 : RFD2126T10669
Driver Version                : STOR Miniport  9.4.7.20 FCD-2244_Dbg1 DBG
BIOS Version                  : N/A
Running Firmware Version      : 9.10.10
Running MPI Firmware Version  : 3.03.04
Running PEP Firmware Version  : 3.01.39
Flash BIOS Version            : N/A
Flash FCode Version           : N/A
Flash EFI Version             : 7.29
Flash Firmware Version        : 9.10.10
Flash MPI Firmware Version    : 3.03.04
Flash PEP Firmware Version    : 3.01.39
Actual Connection Mode        : Point to Point
Actual Data Rate              : 32 Gbps
Supported Speed(s)            : 16 32 64 Gbps
Chip Model Name               : ISP2812-based 64/32G Fibre Channel to PCIe Controller
Chip Revision                 : 0x2(A1)
PortType (Topology)           : NPort
Target Count                  : 1
PCI Bus Number                : 23
PCI Device Number             : 0
PCI Function Number           : 1
PCI Device ID                 : 0x2281
Subsystem Device ID           : 0x02e2
Subsystem Vendor ID           : 0x1077
PCIe Max Bus Width            : x8
PCIe Negotiated Width         : x8
PCIe Max Bus Speed            : 16.0 Gtps
PCIe Negotiated Speed         : 16.0 Gtps
HBA Temperature (C)           : 60
Congestion Current State      : Healthy
Congestion Severity           : None
Link Integrity Events         : No
Delivery Notification Events  : No
Seconds Since Last Event      : 0
Fabric Connection Flags       : RDF Completed (Cisco)
```

```
Config Lockdown                : Disabled
Firmware Update Lockdown       : Disabled
MPI Lockdown                   : Disabled
HBA Status                     : Online (FEC)
-------------------------------------------------------------------------------
```

2600/2700/2800 Series Fibre Channel Adapters

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    Adapter Information

     1: HBA Model: QLE2772 SN: AFD1915Y07299
          Port   1 WWPN: 21:00:f4:e9:d4:54:ab:12 Online (FEC)
          Port   2 WWPN: 21:00:f4:e9:d4:54:ab:14 Online (FEC)
     2: HBA Model: QLE2562 SN: GFC0819H89417
          Port   1 WWPN: 21:00:00:1b:32:0c:a9:0b SFP not present
          Port   2 WWPN: 21:01:00:1b:32:2c:a9:0b SFP not present
     3: HBA Model: QLE2672 SN: RFE1303H21665
          Port   1 WWPN: 21:00:00:0e:1e:11:60:d0 Online
          Port   2 WWPN: 21:00:00:0e:1ev11:60:d1 SFP not present


        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1
-------------------------------------------------------------------------------
Host Name                      : localhost
PCI Location                   : PCI bus 130 device 0 function 0
Host NQN                       :nqn.2014-08.org.nvmexpress:uuid:
                                4c4c4544-0038-4310-8050-c3c04f5a5631
Host ID                        : 44454c4c340010448033c6c04f4c4d33
PCI Location                   : PCI bus 130 device 0 function 1
HBA Model                      : QLE2772
Device ISP ID                  : ISP2281
Chip Revision                  : 0x2(A1)
HBA Description                : QLogic QLE2772 2x32Gb QLE2772 FC HBA
HBA Alias                      :
Serial Number                  : AFD1915Y07299
Driver Version                 : 10.02.02.00.a12-k
```

```
FC Bios Version                : 3.66.00
FC FCode Version               : N/A
FC EFI Version                 : 7.33.00
FC Firmware Version            : 9.06.02
MPI Firmware Version           : 3.01.02
MPI SoftROM Version            : 255.255.00
PEP Firmware Version           : 3.00.29
PEP SoftROM Version            : 3.00.13
PEP Brd Cfg Version            : 3.01.00
Preload Fw Area Version        : 4.01.11
FC Brd Cfg Version             : 3.09.00
PCIe Serdes Version            : 3.00.07
Flash Image Version            : 3.02.16
Firmware Update Lockdown       : Disabled
--------------------------------------------------------------------------------

        Hit <Enter> to continue:
```

FC Port Information

1. Adapter Information ▸ 2. FC Port Information

From the FC Adapter Information menu, select the **FC Port Information** option. From the Adapter Port Information menu, select a port for which to view port information.

NOTE

In FC Adapter Information output, the `Host NQN` parameter appears only for 2600 Series Adapter models QLE2690, QLE2692; 2700 Series Adapter models QLE2740, QLE2742, QLE2770, QLE2772; and 2800 Series Adapters on which the port link is up. It shows the host NVMe qualified name (NQN) for NVM Express (NVMe) over Fibre Channel (NVMe-oF).

```
Adapter Port Information
Host Name                      : WINFC-A13
Host NQN                       : nqn.2014-08.org.nvmexpress:
                                 uuid:4c4c4544-0034-4410-8033-c6c04f4c4d33
Host ID                        : 44454c4c340010448033c6c04f4c4d33
HBA Instance                   : 2
HBA Model                      : QLE2872
HBA Description                : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
```

```
HBA ID                          : 0-QLE2872
HBA Alias                       :
HBA Port                        : 1
Port Alias                      :
Node Name                       : 20:00:f4:c7:aa:01:bc:3a
Port Name                       : 21:00:f4:c7:aa:01:bc:3a
Port ID                         : 7d:00:c0
Principal Fabric WWN[1]         : 20:01:00:3a:9c:ed:77:71
Adjacent Fabric WWN[2]          : 20:07:00:3a:9c:ed:77:70
Serial Number                   : RFD2126T10669
Driver Version                  : STOR Miniport  9.4.7.20 FCD-2244_Dbg1 DBG
BIOS Version                    : N/A
Running Firmware Version        : 9.10.10
Running MPI Firmware Version[3] : 3.03.04
Running PEP Firmware Version[4] : 3.01.39
Flash BIOS Version              : N/A
Flash FCode Version             : N/A
Flash EFI Version               : 7.29
Flash Firmware Version          : 9.10.10
Flash MPI Firmware Version      : 3.03.04
Flash PEP Firmware Version      : 3.01.39
Actual Connection Mode          : Point to Point
Actual Data Rate                : 32 Gbps
Supported Speed(s)              : 16 32 64 Gbps
Chip Model Name                 : ISP2812-based 64/32G Fibre Channel to PCIe Controller
Chip Revision                   : 0x2(A1)
PortType (Topology)             : NPort
Target Count                    : 1
PCI Bus Number                  : 23
PCI Device Number               : 0
PCI Function Number             : 1
PCI Device ID                   : 0x2281
Subsystem Device ID             : 0x02e2
```

[1] `Principal Fabric WWN` is the WWN of the principal switch in the fabric.
[2] `Adjacent Fabric WWN` is the WWN of the switch to which the adapter port is directly connecting.
[3] If the `Running MPI Firmware Version` description is Not Running, the management port interface (MPI) firmware is not currently being loaded nor is it active.
[4] In this example, the `Running PEP Firmware Version` description is available because the PCIe processor (PEP) firmware is currently being loaded.

```
Subsystem Vendor ID            : 0x1077
PCIe Max Bus Width             : x8
PCIe Negotiated Width          : x8
PCIe Max Bus Speed             : 16.0 Gtps
PCIe Negotiated Speed          : 16.0 Gtps
HBA Temperature (C)            : 60
Congestion Current State       : Healthy
Congestion Severity            : None
Link Integrity Events          : No
Delivery Notification Events   : No
Seconds Since Last Event       : 0
Fabric Connection Flags        : RDF Completed (Cisco)
Config Lockdown                : Disabled
Firmware Update Lockdown       : Disabled
MPI Lockdown                   : Disabled
HBA Status                     : Online (FEC)
-------------------------------------------------------------------------------
```

Adapter Port Information

Note the following:

- For a QLE2672 Fibre Channel adapter, the port information also includes the `HBA Temperature` in degrees Celsius.
- For adapters other than QLE2764 adapters, the port information's `Running Firmware Version` is labeled `Driver Firmware Version`.
- For Marvell QLogic 16Gb, 32Gb, 64Gb Fibre Channel adapters (2600, 2700, and 2800 Series Adapters), the `HBA Status` indicates whether the forward error correction (FEC) option is enabled; for example, `Online (FEC)`. (FEC is disabled by default; to enable FEC, see "Forward Error Correction (FEC) (-fec)" on page 180.) The FEC feature is supported only on Marvell QLogic 16Gb, 32Gb, and 64Gb Fibre Channel adapters if the current adapter port is connected to a Brocade switch with FEC support.
- For 2700 and 2800 Series Adapters, if the adapter is connecting and linking up as 32Gb or 64Gb, the FEC feature is automatically always ENABLED, regardless of the setting of FEC as disabled or enabled.

FC VPD Information (-i)

1. Adapter Information ▸ 3. FC VPD Information

From the FC Adapter Information menu, select the **FC VPD Information** option. From the Adapter VPD Information menu, select an adapter port for which to view VPD information. For example:

```
------------------------------------------------------------------------
HBA           : 0 Port 1
SN            : RFD2126T10669
HBA Model     : QLE2872
HBA Desc.     : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version    : 9.10.10
WWPN          : 21:00:f4:c7:aa:01:bc:3a
WWNN          : 20:00:f4:c7:aa:01:bc:3a
Link          : Online (FEC)
------------------------------------------------------------------------
------------------------------------------------------------------------
HBA Instance 0: QLE2872 Port 2 WWPN 21:00:34:80:0d:61:4b:11 PortID 01:0c:00
Link: Online (FEC)
------------------------------------------------------------------------
Product Identifier            : QLogic QLE2872 Dual Port 64/32/16GFC
                                PCIe Gen4 x8 Adapter
Part Number                   : QLE2872
Serial Number                 : RFD2126T10669
Engineering Date Code         : MA2810401-14 06
```

FC Storage Device Information (-t)

1. Adapter Information ▸ 4. FC Storage Device Information

From the FC Adapter Information menu, select the **FC Storage Device Information** option. From the Storage Device Information menu, select an initiator port to list all the connected storage devices. Do one of the following:

- Select a specific storage device (FCP or NVMe) from the menu to view the storage device information
- Select **All Target (s)** to view all connected storage devices.

The following example selects the All Targets (s) option.

```
QConvergeConsoleCLI


CLI - Version 3.0.x (Build xx)
```

```
Storage Device List

=======================================================
HBA             : 2 Port: 1
SN              : RFD2134U04244
HBA Model       : QLE2872
HBA Desc.       : QLogic QLogic QLE2872 64Gb 2-Port Fibre Channel
                  Adapter
FW Version      : 9.09.00
WWPN            : 21:00:f4:c7:aa:01:bc:3a
WWNN            : 20:00:f4:c7:aa:01:bc:3a
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  f0389f38-1a4f-4ddd-9052-baedadf0a091
Host ID         : b16cbd6c69744b1b835cbd1bd6103ab0
Link            : Online (FEC)
=======================================================

    1:  FCP Disk  (Online)
           Vendor                       : SCST_BIO
           Product ID                   : loc2Ram_0
           Product Rev                  : 350
           Serial Number                : 295fa7db
           Node Name                    : 20:00:34:80:0d:63:83:31
           Port Name                    : 21:00:34:80:0d:63:83:31
           Port ID                      : 76:01:c0
           Remote Type                  : Target
           Session State                : Auth Complete
           Secure Mode                  : Enabled
           I/O Throttling               : None
           Virtual Lane                 : Non-Operational
    2:  NVMe Disk  (Online, Unknown)
           Vendor                       : Linux
           Product ID                   :
           Product Rev                  : 4.19.0
           Serial Number                : 92d4104d412ecd55
           Node Name                    : 20:00:34:80:0d:63:83:30
           Port Name                    : 21:00:34:80:0d:63:83:30
           Port ID                      : 00:00:00
           Remote Type                  : Unknown
```

```
           Session State                : N/A
           Secure Mode                  : Disabled
           I/O Throttling               : Active
           Virtual Lane                 : Non-Operational
    3:  All Target(s)



        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 3

-----------------------------------------------------------------
HBA Instance 1: QLE2872 Port 1 WWPN 21:00:f4:c7:aa:01:bc:3a
PortID 01:0c:00
Link: Online (FEC)
-----------------------------------------------------------------
Path                           : 0
Target                         : 0
Device ID                      : 0x87
Product Vendor                 : NetApp
Product ID                     : ONTAP Controller
Product Revision               : FFFFFFFF
Storage NQN                    : nqn.1992-08.com.netapp:sn.
                                 4cb81b47fbac11ebbceed039ea23c044:
                                 subsystem.cang_nvme_512b_subsystem
Storage Controller ID          : 0x1940
Serial Number                  : 81EYEFQPiuYBAAAAAAAB
Node Name                      : 20:91:d0:39:ea:23:c0:43
Port Name                      : 20:93:d0:39:ea:23:c0:43
Port ID                        : 01:0b:02
Product Type                   : NVMe Disk
Namespace Count(s)             : 8
Remote Type                    : Unknown
Session State                  : N/A
Secure Mode                    : Disabled
Congestion Current State       : Healthy
Link Integrity Events          : No
Seconds Since Last Event       : 0
I/O Throttling                 : Disabled
Virtual Lane                   : Non-Operational
```

```
Status                          : Online
-------------------------------------------------------------
Path                            : 0
Target                          : 1
Device ID                       : 0x85
Product Vendor                  : SANBlaze
Product ID                      : VLUN P0T0L0
Product Revision                : V7.4
Storage NQN                     : N/A
Storage Controller ID           : 0x0000
Serial Number                   : 2000000000002000-00-0000
Node Name                       : 20:00:00:00:00:00:20:00
Port Name                       : 21:00:00:00:00:00:20:00
Port ID                         : 01:29:00
Product Type                    : FCP Disk
LUN Count(s)                    : 1
Remote Type                     : Unknown
Session State                   : N/A
Secure Mode                     : Disabled
Congestion Current State        : Healthy
Link Integrity Events           : No
Seconds Since Last Event        : 0
I/O Throttling                  : Disabled
Virtual Lane                    : Non-Operational
Status                          : Online
```

NVMe Disk

1. Adapter Information ▸ 4. FC Storage Device Information ▸ 1. NVMe Disk

From the Storage Device List menu, select **NVMe Disk** followed by an adapter port to view information about the connected NVMe storage device. For example:

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

NVME Storage Device

    HBA Instance 0 (QLE2872 Port 1) : Online (FEC)

NVMe Disk
```

```
    Product Vendor: NetApp
    Product ID    : ONTAP Controller
    Product Rev   : FFFFFFFF
    Node Name     : 20:91:d0:39:ea:23:c0:43
    Port Name     : 20:93:d0:39:ea:23:c0:43
    Port ID       : 01:0b:02
    Controller ID : 23296
    IEEE OUI ID   : 98a000
    Target NQN    : nqn.1992-08.com.netapp:
                    sn.4cb81b47fbac11ebbceed039ea23c044:
                    subsystem.cang_nvme_512b_subsystem
    Remote Type   : Unknown
    Session State : N/A
    Secure Mode   : Disabled


1:  Namespace   1
       Vendor                       : NetApp
       Product ID                   : ONTAP Controller
       Port Name                    : 20:93:d0:39:ea:23:c0:43
       Port ID                      : 01:0b:02
2:  Namespace   2
       Vendor                       : NetApp
       Product ID                   : ONTAP Controller
       Port Name                    : 20:93:d0:39:ea:23:c0:43
       Port ID                      : 01:0b:02
3:  Namespace   3
       Vendor                       : NetApp
       Product ID                   : ONTAP Controller
       Port Name                    : 20:93:d0:39:ea:23:c0:43
       Port ID                      : 01:0b:02
4:  Namespace   4
       Vendor                       : NetApp
       Product ID                   : ONTAP Controller
       Port Name                    : 20:93:d0:39:ea:23:c0:43
       Port ID                      : 01:0b:02
5:  Namespace  5
       Vendor                       : NetApp
       Product ID                   : ONTAP Controller
       Port Name                    : 20:93:d0:39:ea:23:c0:43
```

```
        Port ID                         : 01:0b:02
    6:  Namespace   6
        Vendor                          : NetApp
        Product ID                      : ONTAP Controller
        Port Name                       : 20:93:d0:39:ea:23:c0:43
        Port ID                         : 01:0b:02
    7:  Namespace   7
        Vendor                          : NetApp
        Product ID                      : ONTAP Controller
        Port Name                       : 20:93:d0:39:ea:23:c0:43
        Port ID                         : 01:0b:02
    8:  Namespace   8
        Vendor                          : NetApp
        Product ID                      : ONTAP Controller
        Port Name                       : 20:93:d0:39:ea:23:c0:43
        Port ID                         : 01:0b:02
    9:  All
```

FCP Disk

1. Adapter Information ▸ 4. FC Storage Device Information ▸ 2. FCP Disk

From the Storage Device List menu, select **FCP Disk** to view information about the connected FCP storage device. For example:

```
Storage LUN List

    HBA Instance 0 (QLE2872 Port 1) : Online (FEC)

    FCP Disk
        Product Vendor: SANBlaze
        Product ID    : VLUN P0T0L0
        Product Rev   : V7.4
        Node Name     : 20:00:00:00:00:00:20:00
        Port Name     : 21:00:00:00:00:00:20:00
        Port ID       : 01:29:00
        Remote Type   : Unknown
        Session State : N/A
        Secure Mode   : Disabled


    1:  LUN   0
```

```
          Vendor                        : SANBlaze
          Product ID                    : VLUN P0T0L0
          Port Name                     : 21:00:00:00:00:00:20:00
          Port ID                       : 01:29:00
   2:  All LUN(s)
```

All Target(s)

1. Adapter Information ▸ 4. FC Storage Device Information ▸ 3. All Target(s)

From the Storage Device List menu, select **All Target(s)** to view information about all connected targets. The following partial example shows target information with USCM and virtual lane status, which is supported only on Marvell QLogic 2770 and 2800 Series Adapters.

```
-------------------------------------------------------------------------------
HBA Instance 0: QLE2872 Port 2 WWPN 21:00:34:80:0d:61:4b:11
PortID 01:0c:00
Link: Online (FEC)
-------------------------------------------------------------------------------
Path                            : 0
Target                          : 0
Device ID                       : 0x97
Product Vendor                  : NetApp
Product ID                      : ONTAP Controller
Product Revision                : FFFFFFFF
Storage NQN                     : nqn.1992-08.com.netapp:
                                  sn.4cb81b47fbac11ebbceed039ea23c044:
                                  subsystem.cang_nvme_512b_subsystem
Storage Controller ID           : 0x5b40
Serial Number                   : 81EYEFQPiuYBAAAAAAAB
Node Name                       : 20:91:d0:39:ea:23:c0:43
Port Name                       : 20:93:d0:39:ea:23:c0:43
Port ID                         : 01:0b:02
Product Type                    : NVMe Disk
LUN Count(s)                    : 8
Remote Type                     : Unknown
Session State                   : N/A
Secure Mode                     : Disabled
Congestion Current State        : Healthy
Link Integrity Events           : No
Seconds Since Last Event        : 0
```

```
I/O Throttling                  : None
Virtual Lane                    : Non-Operational
Status                          : Online
```

Virtual lanes are valid only on 2770 and 2800 Series Marvell QLogic Adapters. For more information, see Appendix A USCM Virtual Lanes.

FC Hyper-V VFC Information (-i)

1. Adapter Information ▸ 5. FC Hyper-V VFC Information

From the FC Adapter Information menu, select the **FC Hyper-V VFC Information** option followed by a virtual port to view information on that virtual port. For example:

```
Adapter Information

HBA Model QLE8362 SN: AFE1226F05904
   1: Port   1: WWPN: 21:00:00:0e:1e:08:b7:c0 Online
   2: vPort  0: WWPN: c0:03:ff:c8:95:db:00:10
   3: vPort  1: WWPN: c0:03:ff:c8:95:db:00:12
   4: Port   2: WWPN: 21:00:00:0e:1e:08:b7:c1 SFP not installed

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 2
-------------------------------------------------------------
Computer Name            : RPDL360GEN8
SAN Name                 :
-------------------------------------------------------------
Virtual Machine Name     : RPDL360GEN8
Virtual ID Name          : RPDL360GEN8
Synthetic WWPN Set A     : c0:03:ff:c8:95:db:00:10
Synthetic WWNN Set A     : c0:03:ff:00:00:ff:ff:00
Synthetic WWPN Set B     : c0:03:ff:c8:95:db:00:11
Synthetic WWNN Set B     : c0:03:ff:00:00:ff:ff:00
Synthetic FC Element Name: Fibre Channel Adapter
Synthetic FC Instance ID :
Microsoft:8CAEDDD7-D9FA-4E3E-9818-CE422939BA8D\726C74
CC-6C46-409A-889E-CA96C06400B1

        Hit <Enter> to continue:
```


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FC Adapter Flash Memory Block (FMB) Information

1. Adapter Information ▸ 6. FC Flash Information

From the FC Adapter Information menu, select the **FC Adapter FMB Information** option, and then select an adapter port from the Adapter FMB Information menu to view the record (flash memo block (FMB) version, MBI version, and flash tool) of the last update performed on the adapter.

This feature is supported on the 2600, 2700, and 2800 Series Adapters.

Following is a sample output.

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

Adapter FMB Information

HBA Model QLE2872 SN: AFD1915Y07266
1: Port 1: WWPN: 21:00:f4:c7:aa:01:bc:3a Online
2: Port 2: WWPN: 21:00:f4:c7:aa:01:bc:3b Online

Please Enter Selection: 1----------------------------
QLE2872 (SN RFD2126T10669)
Port 0 Instance 0
---------------------------
FMB Version       : 3
MBI Version       : 1.06.08
MBI Build Date    : Aug. 19, 2022
Flash Tool ID     : QConvergeConsole CLI
Flash Tool Version: 2.05.01.06
Last Update Time  : 08:30:45 Aug. 23, 2022
```

Adapter Configuration

2. Adapter Configuration ▸ 2. FC Adapter Configuration

From the main menu, select the **Adapter Configuration** option.

The FC Adapter Configuration menu presents options to configure adapter alias and parameters, configure persistent names, configure boot devices, configure target link speed, driver parameters (Windows only), selective LUN mapping (Windows only), export a configuration, and generate reports. For example:

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    FC Adapter Configuration

    1:  HBA Alias
    2:  HBA Port Alias
    3:  HBA Parameters
    4:  Target Persistent Binding
    5:  Configure Boot Devices
    6:  N_Port ID Virtualization (NPIV)
    7:  Target Link Speed (iiDMA)
    8:  Driver Parameters
    9:  Selective LUN Mapping
   10:  NPIV QoS
   11:  Export Configuration
   12:  Inventory Report
   13:  Forward Error Correction (FEC)
   14:  Buffer-to-Buffer Credits (BBC)

(p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection:
```

NOTE

The options supported and available on the FC Adapter Configuration menu depend on the drivers and operating system detected. You may not see all of the options listed above and described in this section of the guide.

HBA Alias (-ha)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 1. HBA Alias

From the FC Adapter Configuration menu, select the **HBA Alias** option. From the HBA Alias menu, select an HBA to view or change its alias.

The HBA's identifying information is displayed followed by a prompt identifying the current adapter alias in brackets. To change the HBA alias, enter the new value and press ENTER. (If you do not want to change the alias, press ENTER.)

```
HBA Alias

      1: HBA Model: QLE2740
          Port  1 WWPN: 21:00:00:24:ff:00:28:b3 Online (FEC)
      2: HBA Model: QLE2872
          Port  1 WWPN: 20:00:f4:c7:aa:01:bc:3b Online
          Port  2 WWPN: 21:00:f4:c7:aa:01:bc:3b Online
      3: HBA Model: QLE2662
          Port  1 WWPN: 20:01:00:0e:1e:12:32:b0 SFP not present
          Port  2 WWPN: 20:01:00:0e:1e:12:32:b1 Online


        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 3
=====================================================
HBA Model     : QLE2662
HBA Desc.     : QLE2662 QLogic 2-port 16Gb Fibre Channel Adapter
HBA SN        : RFE1305H31052
HBA Alias     :
=====================================================
HBA Alias [None]:
```

HBA Port Alias (-pa)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 2. HBA Port Alias

From the FC Adapter Configuration menu, select the **HBA Port Alias** option. From the HBA Port Alias menu, select a port to view or change its port alias.

The port's information is displayed followed by a prompt identifying the current port alias in brackets. To change the port alias, enter the new value and press ENTER. (If you do not want to change the alias, press ENTER.)

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    HBA Port Alias

    HBA Model QLE2740
      1: Port   1: WWPN: 21:00:00:24:ff:00:28:b3 Online (FEC)
    HBA Model QLE2872
      2: Port   1: WWPN: 21:00:f4:c7:aa:01:bc:3a Online
      3: vPort  1: WWPN: 21:04:f4:c7:aa:01:bc:3a Online
      4: vPort  2: WWPN: 21:05:f4:c7:aa:01:bc:3a Online
      5: Port   2: WWPN: 21:00:f4:c7:aa:01:bc:3b Online
    HBA Model QLE2662
      6: Port   1: WWPN: 20:01:00:0e:1e:12:32:b0 SFP not present
      7: Port   2: WWPN: 20:01:00:0e:1e:12:32:b1 Online
(p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 2
=====================================================
HBA           : 2
Physical Port : 1
Port Alias    : p
HBA SN        : AFD1915Y07266
HBA Model     : QLE2872
HBA Desc.     : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
WWPN          : 21:00:f4:c7:aa:01:bc:3a
WWNN          : 20:00:f4:c7:aa:01:bc:3a
Link          : Online
=====================================================
HBA Port Alias [p]:
```

HBA Parameters

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 3. HBA Parameters ▸ <port selection>

From the FC Adapter Configuration menu, select the **HBA Parameters** option followed by an adapter port to open the HBA Parameters menu with options to view adapter parameters, configure adapter parameters, and restore adapter defaults. For example:2772

```
 QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

HBA Parameters

HBA Model QLE2872 SN: AFD1915Y07266
1: Port 1: WWPN: 21:00:f4:c7:aa:01:bc:3a Online
2: Port 2: WWPN: 21:00:f4:c7:aa:01:bc:3b Online

=======================================================
HBA             : 3 Port: 2
SN              : AFD1915Y07266
HBA Model       : QLE2872
HBA Desc.       : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version      : 9.08.02
WWPN            : 21:00:f4:c7:aa:01:bc:3b
WWNN            : 20:00:f4:c7:aa:01:bc:3b
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online
=======================================================

    1:  Display Settings
    2:  Change Settings
    3:  Restore Default Settings


        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection:
```

Display Settings (-c)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 3. HBA Parameters ▸ <port selection> ▸ 1. Display Settings

From the HBA Parameters menu, select the **Display Settings** option to view adapter parameters. For example:

```
-------------------------------------------------------------------------------
HBA Instance 2: QLE2872 Port 1 WWPN 21:00:f4:c7:aa:01:bc:3a PortID 01:0c:00
Link: Online
-------------------------------------------------------------------------------
Connection Options             : 2 - Loop Preferred, Otherwise Point-to-Point
Data Rate                      : Auto
Frame Size                     : 2048
Hard Loop ID                   : 0
Loop Reset Delay (seconds)     : 5
Host Adapter BIOS              : Disabled
Enable Hard Loop ID            : Disabled
Enable FC Tape Support         : Enabled
Operation Mode                 : 6 - Interrupt when Interrupt Delay Timer
                                 expires or no active I/O
Interrupt Delay Timer (100us)  : 2
Execution Throttle             : 0
Login Retry Count              : 8
Port Down Retry Count          : 30
LIP Full Login                 : Enabled
Link Down Timeout (seconds)    : 30
Target Reset                   : Enabled
LUNs Per Target                : 128
LR Extended Credits            : Disabled
Fabric Assigned WWN            : Disabled
Prefer FCP Support             : 0 - Login to NCMe LUNs, ignore FCP LUNS
                                 behind the same storage
USCM Support                   : Enabled
Virtual Lane                   : Enabled
```

NOTE

`Execution Throttle` is read-only.

`USCM Support` is available only on 2690, 2770, and 2800 Series Adapters, and is enabled by default.

Change Settings (-n)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 3. HBA Parameters ▸ <port selection> ▸ 2. Change Settings

From the HBA Parameters menu, select the **Change Settings** option to open the Configure Parameters menu with options to configure connection options, data rate, frame size, hard loop ID, loop reset delay, BIOS, Fibre Channel tape support, operation mode, interrupt delay timer, execution throttle, login retry count, port down retry count, LIP full login, link down timeout, target reset, LUNS per target, LR extended credits, and fabric-assigned WWN. For detailed information about these parameters, see Table 5-9 on page 82.

Following is a sample output.

```
Configure Parameters

=====================================================
HBA             : 2 Port: 1
SN              : AFD1915Y07266
HBA Model       : QLE2872
HBA Desc.       : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version      : 9.09.00
WWPN            : 21:00:f4:c7:aa:01:bc:3a
WWNN            : 20:00:f4:c7:aa:01:bc:3a
Host NQN        : nqn.2014-08.org.nvmexpress:uuid: 37363836-3239-4d32-3233-
                  313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
=====================================================

    1:  Connection Options
    2:  Data Rate
    3:  Frame Size
    4:  HBA Hard Loop ID
    5:  Hard Loop ID
    6:  Loop Reset Delay (seconds)
    7:  Host Adapter BIOS
    8:  Fibre Channel Tape Support
    9:  Operation Mode
   10:  Interrupt Delay Timer (100 microseconds)
   11:  Execution Throttle
   12:  Login Retry Count
   13:  Port Down Retry Count
```

```
14:  LIP Full Login
15:  Link Down Timeout (seconds)
16:  Target Reset
17:  LUNs per Target
18:  LR Extended Credits
19:  Fabric Assign WWN
20:  Prefer FCP Support
21:  USCM Support
22:  Virtual Lane
23:  Commit Changes
24:  Abort Changes
```

NOTE

- `Execution Throttle` is read-only.
- `LR Extended Credits` provides options to enable either 10km or 5km (the 5km option is only available for 2690, 2740, 2760, 2770 adapters). After you enable either option and commit the changes, the Configure Parameters Menu shows the selected option, either `Enabled (10 km)` or `Enabled (5 km)`. You can verify the change on the Display Settings (-c) menu.
- `Fabric Assign WWN` applies only to 2600 Series Adapters.
- `USCM Support` applies only to 2770 Series Adapters, QLE2690 Adapters, and 2800 Series Adapters.

Restore Default Settings

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 3. HBA Parameters ▸ <port selection> ▸ 3. Restore Default Settings

From the HBA Parameters menu, select the **Restore Default Settings** option to reset the adapter parameters to their default values. For example:

```
Warning:

    Please update the HBA parameters with extreme care.
    Incorrectly updating the HBA parameters may render the HBA inoperable.
    If you currently have boot device information set up in the HBA
    parameters, updating the HBA Parameters from a file
    will preserve that information.

    Do you want to proceed with the operation?
```

```
1:  Yes
2:  No

(p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
Please Enter Selection: 1
```

Target Persistent Binding (-p)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 4. Target Persistent Binding (on Windows)

NOTE

The Target Persistent Binding option applies to Windows systems only. On Linux systems, the Persistent Names option is provided (for information, see “Persistent Names (-pl)” on page 138).

From the FC Adapter Configuration menu, select the **Target Persistent Binding** option followed by an adapter port to display the configuration, bind targets, and unbind targets. For example:

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

FC Adapter Diagnostics

HBA Model QLE2872 SN: AFD1915Y07266
1: Port 1: WWPN: 21:00:f4:c7:aa:01:bc:3a Online
2: Port 2: WWPN: 21:00:f4:c7:aa:01:bc:3b Online

Please Enter Selection: 1

QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

Target Persistent Binding

=====================================================
HBA           : 2 Port: 1
SN            : AFD1915Y07266
HBA Model     : QLE2872
```

```
HBA Desc.      : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version     : 9.09.00
WWPN           : 21:00:f4:c7:aa:01:bc:3a
WWNN           : 20:00:f4:c7:aa:01:bc:3a
Host NQN       : nqn.2014-08.org.nvmexpress:uuid: 37363836-3239-4d32-3233-
                 313430315759
Host ID        : 363836373932324d3233313430315759
Link           : Online (FEC)
=====================================================

    1:  Display Configuration
    2:  Bind Target(s)
    3.  Unbind Target(s)
```

Display Configuration

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 4. Target Persistent Binding ▸ <port selection> ▸ 1. Display Configuration

From the Target Persistent Binding Menu, select the **Display Configuration** option to view the target binding configuration. For example:

```
        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1
-------------------------------------------------------------------------------
HBA Instance 2: QLE2872 Port 1 WWPN 21:00:f4:c7:aa:01:bc:3a PortID 01:0c:00
Link: Online (FEC)
-------------------------------------------------------------------------------

Bind Type    Target Info             Port Name               Port ID  Target ID
---- ------- ----------------------- ----------------------- -------- --------
Yes   Disk  SANBlaze VLUN FC RAMDisk 2f:ff:00:06:2b:0e:b2:44 c5:07:00 0
Yes   Disk  SANBlaze VLUN FC RAMDisk 2f:df:00:06:2b:0e:b2:44 c5:08:00 1
Yes   Disk  SANBlaze VLUN FC RAMDisk 2f:ff:00:06:2b:0f:56:99 c5:09:00 2
Yes  Device SANBlaze VLUN FC RAMDisk 2f:df:00:06:2b:0f:56:99 c5:0a:00 3
```

Bind Target(s)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 4. Target Persistent Bindings ▸ <port selection> ▸ 2. Bind Target(s)

From the Target Persistent Binding Menu, select the **Bind Target(s)** option to bind a target to a port. Select a target and specify a target ID to open the Target Persistent Binding – FC Port Configuration menu with options to select more targets, save changes, or cancel the binding operation. For example:

```
Target Persistent Binding Menu
```

```
=====================================================
HBA : 2 Port: 1
SN : AFD1915Y07266
HBA Model : QLE2872
HBA Desc. : QLogic QLE2872 64Gb 2-port Fibre Channel
Adapter
FW Version : 9.09.00
WWPN : 21:00:f4:c7:aa:01:bc:3a
WWNN : 20:00:f4:c7:aa:01:bc:3a
Host NQN :
nqn.2014-08.org.nvmexpress:uuid:37363836-3239-4d32-3233-313430315759
Host ID : 363836373932324d3233313430315759
Link : Online (FEC)
=====================================================
1:  SAF-TE
           Vendor                       : HP
           Product ID                   : P2000 G3 FC
           Port Name                    : 21:70:00:c0:ff:11:40:ac
           Port ID                      : 01:04:00
           Bind                         : Yes
           Target ID                    : 0
    2:  Disk
           Vendor                       : SANBlaze
           Product ID                   : VLUN FC RAMDisk
           Port Name                    : 5b:5c:00:11:0d:0b:00:00
           Port ID                      : 01:15:00
           Bind                         : No
           Target ID                    :
    3:  All Target(s)
(p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1

Enter Target ID: 1

QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

Target Persistent Binding
```

```
    1:  Select More
    2:  Commit Changes
    3:  Cancel
(p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection:
```

Unbind Target(s)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 4. Target Persistent Bindings ▸ <port selection> ▸ 3. Unbind Target(s)

From the Target Persistent Binding Menu, select the **Unbind Target(s)** option to unbind a target. Select a target to open the Target Persistent Binding – FC Port Configuration menu with options to select more targets, save changes, or cancel the binding operation. For example:

```
Target Persistent Binding Menu

=======================================================
HBA             : 1 Port: 1
SN              : AFD1923Y07510
HBA Model       : QLE2770
HBA Desc.       : QLogic QLE2770 1x32Gb QLE2770 FC HBA
FW Version      : 9.06.00
WWPN            : 21:00:34:80:0d:3b:89:b0
WWNN            : 20:00:34:80:0d:3b:89:b0
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online
=======================================================

1:  SAF-TE
            Vendor                      : HP
            Product ID                  : P2000 G3 FC
            Port Name                   : 21:70:00:c0:ff:11:40:ac
            Port ID                     : 01:04:00
            Bind                        : No
            Target ID                   :
    2:  Disk
            Vendor                      : SANBlaze
            Product ID                  : VLUN FC RAMDisk
```

```
          Port Name                    : b:5c:00:11:0d:0b:00:00
          Port ID                      : 01:15:00
          Bind                         : No
          Target ID                    :
    3:  All Target(s)

        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection:
```

Persistent Names (-pl)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 4. Persistent Names (udev) (on Linux)

NOTE

The Persistent Names option applies to Linux systems only. On Windows systems, the Target Persistent Binding option is provided (for information, see “Target Persistent Binding (-p)” on page 134).

From the FC Adapter Configuration menu, select the **Persistent Names (udev)** option. From the port menu, select an adapter port to open the Target List Menu, and then select the target to display the LUN List Menu, with options to display LUN information or manage persistent names. For example:

```
FC Adapter Configuration

    HBA Model QLE2672 SN: AFE1224F05259
      1: Port   1: WWPN: 21:00:00:0e:1e:08:f2:00 Link Down
      2: Port   2: WWPN: 21:00:00:0e:1e:08:f2:01 Online



        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 2

QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)
```

```
    Target List Menu

=====================================================
HBA           : 1 Port: 2
SN            : AFE1224F05259
HBA Model     : QLE2672
HBA Desc.     : QLE8362 Sun Storage 16Gb FC PCIe Universal HBA
FW Version    : 6.06.00
WWPN          : 21:00:00:0e:1e:08:f2:01
WWNN          : 20:00:00:0e:1e:08:f2:01
Host NQN      : nqn.2014-08.org.nvmexpress:uuid:
                37363836-3239-4d32-3233-313430315759
Host ID       : 363836373932324d3233313430315759
Link          : Online
=====================================================

    1:  Disk  (Online)
           Vendor                       : SANBlaze
           Product ID                   : VLUN FC RAMDisk
           Product Rev                  : 3.1
           Serial Number                : 2fff00062b0eb24401000000
           Node Name                    : 2f:df:00:06:2b:0e:b2:44
           Port Name                    : 2f:df:00:06:2b:0e:b2:44
           Port ID                      : 01:06:01

    2:  Disk  (Online)
           Vendor                       : SANBlaze
           Product ID                   : VLUN FC RAMDisk
           Product Rev                  : 3.1.
           Serial Number                : 2fff00062b0f569901000000
           Node Name                    : 2f:df:00:06:2b:0f:56:99
           Port Name                    : 2f:df:00:06:2b:0f:56:99
           Port ID                      : 01:04:01

    3:  Disk  (Online)
           Vendor                       : SANBlaze
           Product ID                   : VLUN FC RAMDisk
           Product Rev                  : 3.1
           Serial Number                : 2fff00062b0eb24400000000
           Node Name                    : 2f:ff:00:06:2b:0e:b2:44
```

```
       Port Name                    : 2f:ff:00:06:2b:0e:b2:44
       Port ID                      : 01:06:00

4:  Disk  (Online)
       Vendor                       : SANBlaze
       Product ID                   : VLUN FC RAMDisk
       Product Rev                  : 3.1.
       Serial Number                : 2fff00062b0f569900000000
       Node Name                    : 2f:ff:00:06:2b:0f:56:99
       Port Name                    : 2f:ff:00:06:2b:0f:56:99
       Port ID                      : 01:04:00

5:  Device  (Offline)
       Vendor                       : N/A
       Product ID                   : N/A
       Product Rev                  : N/A
       Serial Number                :
       Node Name                    : 21:00:00:24:ff:6a:51:3c
       Port Name                    : 21:00:00:24:ff:6a:51:3c
       Port ID                      : 01:0a:00

6:  Device  (Offline)
       Vendor                       : N/A
       Product ID                   : N/A
       Product Rev                  : N/A
       Serial Number                :
       Node Name                    : 21:00:00:24:ff:6a:51:88
       Port Name                    : 21:00:00:24:ff:6a:51:88
       Port ID                      : 01:0b:00

7:  All Target(s)


    (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
    Please Enter Selection: 1

    QConvergeConsoleCLI

    Version 3.0.x (Build xx)

LUN List Menu

HBA Instance 1 (QLE2672 Port 2) : Online
```

```
    Device
        Product Vendor: SANBlaze
        Product ID    : VLUN FC RAMDisk
        Product Rev   : 3.1
        Node Name     : 2f:df:00:06:2b:0e:b2:44
        Port Name     : 2f:df:00:06:2b:0e:b2:44
        Port ID       : 01:06:01

    1:  LUN   0
           Vendor                       : SANBlaze
           Product ID                   : VLUN FC RAMDisk
           Port Name                    : 2f:df:00:06:2b:0e:b2:44
           Port ID                      : 01:06:01
    2:  LUN   1
           Vendor                       : SANBlaze
           Product ID                   : VLUN FC RAMDisk
           Port Name                    : 2f:df:00:06:2b:0e:b2:44
           Port ID                      : 01:06:01
    3:  LUN   2
           Vendor                       : SANBlaze
           Product ID                   : VLUN FC RAMDisk
           Port Name                    : 2f:df:00:06:2b:0e:b2:44
           Port ID                      : 01:06:01
    4:  LUN   3
           Vendor                       : SANBlaze
           Product ID                   : VLUN FC RAMDisk
           Port Name                    : 2f:df:00:06:2b:0e:b2:44
           Port ID                      : 01:06:01
    5:  All LUN(s)

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1

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    LUN List Menu

=======================================================
HBA           : 1 Port: 2
SN            : AFE1224F05259
```

```
HBA Model      : QLE2672
HBA Desc.      : QLE8362 Sun Storage 16Gb FC PCIe Universal HBA
FW Version     : 6.06.00
WWPN           : 21:00:00:0e:1e:08:f2:01
WWNN           : 20:00:00:0e:1e:08:f2:01
Host NQN       : nqn.2014-08.org.nvmexpress:uuid:
                 37363836-3239-4d32-3233-313430315759
Host ID        : 363836373932324d3233313430315759
Link           : Online
=======================================================

    1:  Information
    2:  Persistent Names
```

Information

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 4. Persistent Names ▸ <port selection> ▸ 1. Information

From the LUN List Menu, select the **Information** option to display information on persistent LUN names. For example:

```
LUN List Menu

=======================================================
HBA            : 1 Port: 2
SN             : AFE1224F05259
HBA Model      : QLE2672
HBA Desc.      : QLE8362 Sun Storage 16Gb FC PCIe Universal HBA
FW Version     : 6.06.00
WWPN           : 21:00:00:0e:1e:08:f2:01
WWNN           : 20:00:00:0e:1e:08:f2:01
Host NQN       : nqn.2014-08.org.nvmexpress:uuid:
                 37363836-3239-4d32-3233-313430315759
Host ID        : 363836373932324d3233313430315759
Link           : Online
=======================================================

    1:  Information
    2:  Persistent Names

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1
Product Vendor             : SANBlaze
Product ID                 : VLUN FC RAMDisk
```

```
Product Revision           : 3.1
LUN                        : 0
Size                       : 699.00 MB
Type                       : SBC-2 Direct access block device (e.g. magnetic
disk)
WWULN                      : 60:00:62:b0:00:0e:b2:44:00:00:00:01:00:00:00:00
OS LUN Name                : /dev/sdr;/dev/sg18;
Persistent LUN Name   0    : jk
------------------------------------------------------------

        Press <Enter> to continue:
```

Persistent Names

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 4. Persistent Names ▸ <port selection> ▸ 2. Persistent Names

From the LUN List Menu, select the **Persistent Names** option to display the Persistent Names Menu, with options to display persistent LUN names, add a persistent LUN name, or delete a persistent LUN name. For example:

```
LUN List Menu

============================================================
HBA           : 1 Port: 2
SN            : AFE1224F05259
HBA Model     : QLE2672
HBA Desc.     : QLE8362 Sun Storage 16Gb FC PCIe Universal HBA
FW Version    : 6.06.00
WWPN          : 21:00:00:0e:1e:08:f2:01
WWNN          : 20:00:00:0e:1e:08:f2:01
Host NQN      : nqn.2014-08.org.nvmexpress:uuid:
                37363836-3239-4d32-3233-313430315759
Host ID       : 363836373932324d3233313430315759
Link          : Online
============================================================

    1:  Information
    2:  Persistent Names

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 2

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        Version 3.0.x (Build xx)
```

```
    Persistent Names Menu

=====================================================
HBA           : 1 Port: 2
SN            : AFE1224F05259
HBA Model     : QLE2672
HBA Desc.     : QLE8362 Sun Storage 16Gb FC PCIe Universal HBA
FW Version    : 6.06.00
WWPN          : 21:00:00:0e:1e:08:f2:01
WWNN          : 20:00:00:0e:1e:08:f2:01
Host NQN      : nqn.2014-08.org.nvmexpress:uuid:
                37363836-3239-4d32-3233-313430315759
Host ID        : 363836373932324d3233313430315759
Link          : Online
=====================================================

    1:  Info
    2:  Add
    3:  Delete
```

Info

From the Persistent Names Menu, select the **Info** option to display persistent LUN names. For example:

```
        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1

Product Vendor              : SANBlaze
Product ID                  : VLUN FC RAMDisk
Product Revision            : 3.1
LUN                         : 0
WWULN                       : 60:00:62:b0:00:0e:b2:44:00:00:00:01:00:00:00:00
OS LUN Name                 : /dev/sdr;/dev/sg18;
Persistent LUN Name   0     : jk

        Press <Enter> to continue:
```

Add

From the Persistent Names Menu, select the **Add** option to create a new persistent LUN name. For example:

```
        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
```

```
        Please Enter Selection: 2
-------------------------------------------------------------
Product Vendor                  : SANBlaze
Product ID                      : VLUN FC RAMDisk
Product Revision                : 3.1
LUN                             : 0
WWULN                           : 60:00:62:b0:00:0e:b2:44:00:00:
                                  00:01:00:00:00:00
OS LUN Name                     : /dev/sdr;/dev/sg18;
-------------------------------------------------------------
Enter new persistent LUN name: @Lun0
Persistent LUN name @Lun0 has been added to target 0 LUN 0.

        Press <Enter> to continue:
```

Delete

From the Persistent Names Menu, select the **Delete** option to delete an existing persistent LUN name. For example:

```
        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 3

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    Persistent Names Menu

=========================================================
HBA : 2 Port: 1
SN : AFD1915Y07266
HBA Model : QLE2872
HBA Desc. : QLogic QLE2872 64Gb 2-port Fibre Channel
Adapter
FW Version : 9.09.00
WWPN : 21:00:f4:c7:aa:01:bc:3a
WWNN : 20:00:f4:c7:aa:01:bc:3a
Host NQN :
nqn.2014-08.org.nvmexpress:uuid:37363836-3239-4d32-3233-313430315759
Host ID : 363836373932324d3233313430315759
Link : Online (FEC)
```

```
=======================================================

    1:  lun21

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1
-------------------------------------------------------------
Product Vendor                : DGC
Product ID                    : RAID 5
Product Revision              : 0531
LUN                           : 20
WWULN                         : 60:06:01:60:ba:20:31:00:da:
                                d0:a3:47:98:06:e2:11
OS LUN Name                   : /dev/sdck;/dev/sg91;
-------------------------------------------------------------
Persistent LUN Name               : lun21
Persistent LUN name lun21 of target 0 LUN 20 has been successfully deleted.
```

Configure Boot Devices (-e)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 5. Configure Boot Devices ▸ <port selection>

From the FC Adapter Configuration menu, select the **Configure Boot Devices** option. Select an adapter port to open the Configure Boot Devices Menu with options to view and configure boot devices, such as boot-from-SAN and drive mapping parameters.

Depending on the selected adapter, you can configure the boot device with BIOS or UEFI, or only UEFI.

For adapters that allow configuring a boot device only with UEFI, the Boot from SAN UEFI Configuration menu appears. For example:

```
Boot from SAN UEFI Configuration

=======================================================
HBA            : 4 Port: 1
Host NQN       : nqn.2014-08.org.nvmexpress:uuid:
                 4c4c4544-0047-5110-8034-c7c04f514432
Host ID        : 44454c4c470010518034c7c04f514432
SN             : AFD1911Y07032
HBA Model      : QLE2770
HBA Desc.      : QLogic QLE2770 1x32Gb QLE2770 FC HBA
FW Version     : 9.00.01
```

```
WWPN           : 21:00:34:80:0d:3b:89:23
WWNN           : 20:00:34:80:0d:3b:89:23
Link           : Online (FEC)
=====================================================

    1:  Boot-from-SAN and Drive Mapping Parameters
    2:  Boot-from-SAN with FCP Storage Device
    3:  Boot-from-SAN with NVMe Storage Device
```

For adapters that allow configuring a boot device with either the BIOS or UEFI, the Configure Boot Devices menu appears.

```
Configure Boot Devices

    HBA Model QLE2740
      1: Port   1: WWPN: 21:00:00:24:ff:00:28:b3 Online (FEC)
    HBA Model QLE2772
      2: Port   1: WWPN: 21:00:f4:e9:d4:54:aa:9a Online
      3: Port   1: WWPN: 21:00:f4:e9:d4:54:aa:9a Online
      4: Port   2: WWPN: 21:00:f4:e9:d4:54:aa:9b Online
    HBA Model QLE2662
      5: Port   1: WWPN: 20:01:00:0e:1e:12:32:b0 SFP not present
      6: Port   2: WWPN: 20:01:00:0e:1e:12:32:b1 Online

        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 1

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    Configure Boot Devices

    1:  Legacy BIOS Boot Mode
    2:  UEFI Boot Mode
```

Configuring Boot Devices with BIOS and UEFI

When you select an adapter port that supports configuring a boot device through either the BIOS or UEFI boot mode, the following options appear:

```
1:  Legacy BIOS Boot Mode
2:  UEFI Boot Mode
```

The following sections describe how to configure a boot device through either the BIOS, UEFI, or NMVe.

Legacy BIOS Boot Mode

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 5. Configure Boot Devices ▸ <port selection> ▸ 1. Legacy BIOS Boot Mode

From the Configure Boot Devices menu, select the **Legacy BIOS Boot Mode** to configure a boot device through the BIOS. The Boot from SAN BIOS Configuration menu appears. For example:

```
Boot from SAN BIOS Configuration

=====================================================
HBA             : 4 Port: 1
SN              : AFD1536Y03195
HBA Model       : QLE2740
HBA Desc.       : QLogic QLE2740 Single Port 32Gb FC to PCIe
                  Gen3 x8 Adapter
FW Version      : 9.08.02
WWPN            : 21:00:00:24:ff:00:28:b3
WWNN            : 20:00:00:24:ff:00:28:b3
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
=====================================================

    1:  Boot-from-SAN and Drive Mapping Parameters
    2:  Boot-from-SAN with FCP Storage Device
```

Boot-from-SAN and Drive Mapping Parameters

Select **Boot-from-SAN and Drive Mapping Parameters** to view the Boot from SAN BIOS Parameters menu, where you can either display or configure the BIOS boot parameters. For example:

```
Boot from SAN BIOS Parameters

=====================================================
HBA             : 4 Port: 1
SN              : AFD1536Y03195
HBA Model       : QLE2740
```

```
HBA Desc.       : QLogic QLE2740 Single Port 32Gb FC to
                  PCIe Gen3 x8 Adapter
FW Version      : 9.08.02
WWPN            : 21:00:00:24:ff:00:28:b3
WWNN            : 20:00:00:24:ff:00:28:b3
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
=======================================================

    1:  Display BIOS Boot Parameters
    2:  Configure BIOS Boot Parameters
```

Following is an example of the options that appear when you select **Configure BIOS Boot Parameters**:

```
Boot from SAN BIOS Parameters

=======================================================
HBA             : 4 Port: 1
SN              : AFD1536Y03195
HBA Model       : QLE2740
HBA Desc.       : QLogic QLE2740 Single Port 32Gb FC to
                  PCIe Gen3 x8 Adapter
FW Version      : 9.08.02
WWPN            : 21:00:00:24:ff:00:28:b3
WWNN            : 20:00:00:24:ff:00:28:b3
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
=======================================================

    1:  Host Adapter BIOS
    2:  Selectable Boot
    3:  Fabric Assign Boot LUN
    4:  Save
```

Boot-from-SAN with FCP Storage Device

Select **Boot-from-SAN with FCP Storage Device** to view the Boot from SAN BIOS Parameters menu, where you can either display or configure the BIOS boot drive mapping. For example:

```
Boot from SAN BIOS Drive Mapping

=======================================================
HBA             : 4 Port: 1
SN              : AFD1536Y03195
HBA Model       : QLE2740
HBA Desc.       : QLogic QLE2740 Single Port 32Gb FC to
                  PCIe Gen3 x8 Adapter
FW Version      : 9.08.02
WWPN            : 21:00:00:24:ff:00:28:b3
WWNN            : 20:00:00:24:ff:00:28:b3
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
=======================================================

    1:  Display BIOS Boot Drive Mapping
    2:  Configure BIOS Boot Drive Mapping
```

Following is an example of the options that appear when you select **Configure BIOS Boot Drive Mapping**.

```
Configure BIOS Boot from SAN Drive Mapping

=======================================================
HBA             : 4 Port: 1
SN              : AFD1536Y03195
HBA Model       : QLE2740
HBA Desc.       : QLogic QLE2740 Single Port 32Gb FC to
                  PCIe Gen3 x8 Adapter
FW Version      : 9.08.02
WWPN            : 21:00:00:24:ff:00:28:b3
WWNN            : 20:00:00:24:ff:00:28:b3
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
```

```
Link           : Online (FEC)
=======================================================

    1:  Boot Drive 0
    2:  Boot Drive 1
    3:  Boot Drive 2
    4:  Boot Drive 3
    5:  Save
```

UEFI Boot Mode

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 5. Configure Boot Devices ▸ <port selection> ▸ 2. UEFI Boot Mode

From the Configure Boot Devices menu, select the **UEFI Boot Mode** option to configure a boot device through UEFI. The Boot from SAN UEFI Configuration menu appears. For example:

```
Boot from SAN UEFI Configuration

=======================================================
HBA            : 4 Port: 1
SN             : AFD1536Y03195
HBA Model      : QLE2740
HBA Desc.      : QLogic QLE2740 Single Port 32Gb FC to
                 PCIe Gen3 x8 Adapter
FW Version     : 9.08.02
WWPN           : 21:00:00:24:ff:00:28:b3
WWNN           : 20:00:00:24:ff:00:28:b3
Host NQN       : nqn.2014-08.org.nvmexpress:uuid:
                 37363836-3239-4d32-3233-313430315759
Host ID        : 363836373932324d3233313430315759
Link           : Online (FEC)
=======================================================

    1:  Boot-from-SAN and Drive Mapping Parameters
    2:  Boot-from-SAN with FCP Storage Device
```

Boot-from-SAN and Drive Mapping Parameters

From the Boot from SAN UEFI Configuration menu, select the **Boot-from-SAN and Drive Mapping Parameters** option to display or configure UEFI boot parameters. For example:

```
Boot from SAN UEFI Parameters
```

```
=====================================================
HBA             : 4 Port: 1
SN              : AFD1536Y03195
HBA Model       : QLE2740
HBA Desc.       : QLogic QLE2740 Single Port 32Gb FC to
                  PCIe Gen3 x8 Adapter
FW Version      : 9.08.02
WWPN            : 21:00:00:24:ff:00:28:b3
WWNN            : 20:00:00:24:ff:00:28:b3
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
=====================================================

    1:  Display UEFI Boot Parameters
    2:  Configure UEFI Boot Parameters
```

Following is an example output of option 2, **Configure UEFI Boot Parameters**.

```
Boot from SAN UEFI Parameters

=====================================================
HBA             : 4 Port: 1
SN              : AFD1536Y03195
HBA Model       : QLE2740
HBA Desc.       : QLogic QLE2740 Single Port 32Gb FC to
                  PCIe Gen3 x8 Adapter
FW Version      : 9.08.02
WWPN            : 21:00:00:24:ff:00:28:b3
WWNN            : 20:00:00:24:ff:00:28:b3
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
=====================================================

    1:  Selective Login
    2:  Selective LUN Login
    3:  World Login
```

```
    4:  Adapter Driver
    5:  Fabric Assign Boot LUN
    6:  Save
```

Boot-from-SAN with FCP Storage Device

From the Boot from SAN UEFI Configuration menu, select the **Boot-from-SAN with FCP Storage Device** to display or configure UEFI boot drive mapping. For example:

```
Boot from SAN UEFI FCP Drive Mapping

=======================================================
HBA             : 4 Port: 1
SN              : AFD1536Y03195
HBA Model       : QLE2740
HBA Desc.       : QLogic QLE2740 Single Port 32Gb FC to
                  PCIe Gen3 x8 Adapter
FW Version      : 9.08.02
WWPN            : 21:00:00:24:ff:00:28:b3
WWNN            : 20:00:00:24:ff:00:28:b3
Host NQN         : nqn.2014-08.org.nvmexpress:uuid:
                   37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
=======================================================

    1:  Display UEFI FCP Boot Drive Mapping
    2:  Configure UEFI FCP Boot Drive Mapping
```

Following is an example output of option 2, **Configure UEFI FCP Boot Drive Mapping**.

```
Configure UEFI Boot from SAN Drive Mapping

=======================================================
HBA             : 4 Port: 1
SN              : AFD1536Y03195
HBA Model       : QLE2740
HBA Desc.       : QLogic QLE2740 Single Port 32Gb FC to
                  PCIe Gen3 x8 Adapter
FW Version      : 9.08.02
WWPN            : 21:00:00:24:ff:00:28:b3
```

```
WWNN            : 20:00:00:24:ff:00:28:b3
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
=========================================================

    1:  Boot Drive 0
    2:  Boot Drive 1
    3:  Boot Drive 2
    4:  Boot Drive 3
    5:  Boot Drive 4
    6:  Boot Drive 5
    7:  Boot Drive 6
    8:  Boot Drive 7
    9:  Save
```

Configuring Boot Devices with UEFI

When you select an adapter port that supports configuring a boot device only through UEFI, the following options appear:

```
1:  Boot-from-SAN and Drive Mapping Parameters
2:  Boot-from-SAN with FCP Storage Device
3:  Boot-from-SAN with NVMe Storage Device
```

The following sections describe these options.

Boot-from-SAN and Drive Mapping Parameters

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 5. Configure Boot Devices ▸ <port selection> ▸ 1. Boot-from-SAN and Drive Mapping Parameters

After selecting the desired port, select **Boot-from-SAN and Drive Mapping Parameters** to either display or configure the BIOS boot parameters. For example:

```
=========================================================
HBA             : 4 Port: 1
SN              : AFD1536Y03195
HBA Model       : QLE2740
HBA Desc.       : QLogic QLE2740 Single Port 32Gb FC to PCIe Gen3 x8
                  Adapter
FW Version      : 9.09.00
WWPN            : 21:00:00:24:ff:00:28:b3
```

```
WWNN           : 20:00:00:24:ff:00:28:b3
Host NQN       : nqn.2014-08.org.nvmexpress:uuid:
                 37363836-3239-4d32-3233-313430315759
Host ID        : 363836373932324d3233313430315759
Link           : Online (FEC)
=========================================================

    1:  Display UEFI Boot Parameters
    2:  Configure UEFI Boot Parameters
```

Following is an example output of option 2, **Configure UEFI Boot Parameters**.

```
Boot from SAN UEFI Parameters
=================================================================
HBA            : 4 Port: 1
SN             : AFD1536Y03195
HBA Model      : QLE2740
HBA Desc.      : QLogic QLE2740 Single Port 32Gb FC to PCIe Gen3 x8
                 Adapter
FW Version     : 9.08.02
WWPN           : 21:00:00:24:ff:00:28:b3
WWNN           : 20:00:00:24:ff:00:28:b3
Host NQN       : nqn.2014-08.org.nvmexpress:uuid:
                 37363836-3239-4d32-3233-313430315759
Host ID        : 363836373932324d3233313430315759
Link           : Online (FEC)
=================================================================
    1: Selective Login
    2: Selective LUN Login
    3: World Login
    4: Adapter Driver
    5: Fabric Assign Boot LUN
    6: Save
```

Boot-from-SAN with FCP Storage Device

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 5. Configure Boot Devices ▸ <port selection> ▸ 2. Boot-from-SAN with FCP Storage Device

From the Boot from SAN UEFI Configuration menu, select **Boot-from-SAN with FCP Storage Device** to display or configure the UEFI FCP boot drive mapping. For example:

```
Boot from SAN UEFI FCP Drive Mapping


=====================================================
HBA             : 4 Port: 1
SN              : AFD1536Y03195
HBA Model       : QLE2740
HBA Desc.       : QLogic QLE2740 Single Port 32Gb FC to PCIe Gen3 x8
                  Adapter
FW Version      : 9.08.02
WWPN            : 21:00:00:24:ff:00:28:b3
WWNN            : 20:00:00:24:ff:00:28:b3
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
=====================================================

    1:  Display UEFI FCP Boot Drive Mapping
    2:  Configure UEFI FCP Boot Drive Mapping
```

Following is an example output from option 1, **Display UEFI FCP Boot Drive Mapping**.

```
HBA Instance 4: QLE2740 Port 1 WWPN 21:00:00:24:ff:00:28:b3
PortID 01:0c:00
Link: Online (FEC)
-------------------------------------------------------------------
Boot Settings:
-----------------------------------
-----------------------------------
Drive 0 WWPN                 LUN
-------------------------    ------
00:00:00:00:00:00:00:00        0
-----------------------------------
Drive 1 WWPN                 LUN
```

```
------------------------    ------
00:00:00:00:00:00:00:00       0
---------------------------------
Drive 2 WWPN                LUN
------------------------    ------
00:00:00:00:00:00:00:00       0
---------------------------------
Drive 3 WWPN                LUN
------------------------    ------
00:00:00:00:00:00:00:00       0
---------------------------------
Drive 3 WWPN                LUN
------------------------    ------
00:00:00:00:00:00:00:00       0
---------------------------------
Drive 4 WWPN                LUN
------------------------    ------
00:00:00:00:00:00:00:00       0
---------------------------------
Drive 5 WWPN                LUN
------------------------    ------
00:00:00:00:00:00:00:00       0
---------------------------------
Drive 6 WWPN                LUN
------------------------    ------
00:00:00:00:00:00:00:00       0
---------------------------------
Drive 7 WWPN                LUN
------------------------    ------
00:00:00:00:00:00:00:00       0
```

Following is an example output from option 2, **Configure UEFI FCP Boot Drive Mapping**.

```
Configure UEFI Boot from SAN Drive Mapping

=====================================================
HBA            : 1 Port: 1
SN             : AFD1915Y07266
HBA Model      : QLE2872
```

```
HBA Desc.       : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version      : 9.08.02
WWPN            : 21:00:f4:c7:aa:01:bc:3a
WWNN            : 20:00:f4:c7:aa:01:bc:3a
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online
=======================================================

    1:  Boot Drive 0
    2:  Boot Drive 1
    3:  Boot Drive 2
    4:  Boot Drive 3
    5:  Boot Drive 4
    6:  Boot Drive 5
    7:  Boot Drive 6
    8:  Boot Drive 7
    9:  Save
```

Boot-from-SAN with NVMe Storage Device

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 5. Configure Boot Devices ▸ <port selection> ▸ 3 Boot-from-SAN with NVMe Storage Device

From the Boot from SAN UEFI Configuration menu, select **Boot-from-SAN with NVMe Storage Device** to display or configure the UEFI NMVe boot drive mapping. For example:

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    Boot from SAN UEFI Configuration
=======================================================
HBA             : 2 Port: 1
SN              : AFD1915Y07266
HBA Model       : QLE2872
HBA Desc.       : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version      : 9.09.00
WWPN            : 21:00:f4:c7:aa:01:bc:3a
WWNN            : 20:00:f4:c7:aa:01:bc:3a
```

```
Host NQN       : nqn.2014-08.org.nvmexpress:uuid:
                 37363836-3239-4d32-3233-313430315759
Host ID        : 363836373932324d3233313430315759
Link           : Online (FEC)
=======================================================

    1:  Boot-from-SAN and Drive Mapping Parameters
    2:  Boot-from-SAN with FCP Storage Device
    3:  Boot-from-SAN with NVMe Storage Device


        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 3


QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    Boot from SAN UEFI NVMe Drive Mapping

=======================================================
HBA            : 2 Port: 1
SN             : AFD1915Y07266
HBA Model      : QLE2872
HBA Desc.      : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version     : 9.09.00
WWPN           : 21:00:f4:c7:aa:01:bc:3a
WWNN           : 20:00:f4:c7:aa:01:bc:3a
Host NQN       : nqn.2014-08.org.nvmexpress:uuid:
                 37363836-3239-4d32-3233-313430315759
Host ID        : 363836373932324d3233313430315759
Link           : Online (FEC)
=======================================================

    1:  Display UEFI NVME Boot Drive Mapping
    2:  Configure UEFI NVME Boot Drive Mapping


        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
```

```
        Please Enter Selection: 1
```

Following is an example of output from option 1, **Display UEFI NVME Boot Drive Mapping**.

```
FC NVME                 : Enabled
Host NQN                : nqn.2014-08.org.nvmexpress:
                          uuid:4c4c4544-0047-5110-8034-c7c04f514432
Host ID                 : 44454c4c470010518034c7c04f514432
-------------------------------------------------
Storage 0              : Enabled
Storage 0 WWPN         : 20:93:d0:39:ea:23:c0:43
Storage 0 WWNN         : 20:91:d0:39:ea:23:c0:43
Storage 0 NQN          : nqn.1992-08.com.netapp:sn.
                         4cb81b47fbac11ebbceed039ea23c044:
                         subsystem.nvme_512b_subsystem
Storage 0 Controller ID: 5c80
Storage 0 Namespace ID : 1
-------------------------------------------------
Storage 1              : Enabled
Storage 1 WWPN         : 23:56:00:a0:98:e4:2e:9b
Storage 1 WWNN         : 22:f3:00:a0:98:e4:2e:9b
Storage 1 NQN          : nqn.1992-08.com.netapp:
                         sn.eeade8ebeb7111eb9dd100a098e43f7b:
                         subsystem.LR_K3_Apollo290_subsystem_402
Storage 1 Controller ID: ffff
Storage 1 Namespace ID : 1
-------------------------------------------------
Storage 2              : Enabled
Storage 2 WWPN         : 20:93:d0:39:ea:23:c0:43
Storage 2 WWNN         : 20:91:d0:39:ea:23:c0:43
Storage 2 NQN          : nqn.1992-08.com.netapp:sn.
                         4cb81b47fbac11ebbceed039ea23c044:
                         subsystem.nvme_512b_subsystem
Storage 2 Controller ID: 5d80
Storage 2 Namespace ID : 4
-------------------------------------------------
…
```

Following is an example output from option 2, **Configure UEFI NVME Boot Drive Mapping**.

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    Boot from SAN UEFI NVMe Drive Mapping

=======================================================

HBA            : 1 Port: 1
SN             : AFD1915Y07266
HBA Model      : QLE2872
HBA Desc.      : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version     : 9.08.02
WWPN           : 21:00:f4:c7:aa:01:bc:3a
WWNN           : 20:00:f4:c7:aa:01:bc:3a
Host NQN       : nqn.2014-08.org.nvmexpress:uuid:
                 37363836-3239-4d32-3233-313430315759
Host ID        : 363836373932324d3233313430315759
Link           : Online (FEC)
=======================================================

    1:  FC NVMe
        Host NQN                : nqn.2014-08.org.nvmexpress:
                                  uuid:4c4c4544-0047-5110-8034-c7c04f514432
        Host ID                 : 44454c4c470010518034c7c04f514432
    2:  Storage 0               : Enabled
        Storage 0 WWPN          : 20:93:d0:39:ea:23:c0:43
        Storage 0 WWNN          : 20:91:d0:39:ea:23:c0:43
        Storage 0 NQN           : nqn.1992-08.com.netapp:
                                  sn.4cb81b47fbac11ebbceed039ea23c044:
                                  subsystem.nvme_512b_subsystem
        Storage 0 Controller ID: 5c80
        Storage 0 Namespace ID : 1

    3:  Storage 1               : Enabled
        Storage 1 WWPN          : 23:56:00:a0:98:e4:2e:9b
        Storage 1 WWNN          : 22:f3:00:a0:98:e4:2e:9b
        Storage 1 NQN           : nqn.1992-08.com.netapp:
                                  sn.eeade8ebeb7111eb9dd100a098e43f7b:
                                  subsystem.LR_K3_Apollo290_subsystem_402
        Storage 1 Controller ID: ffff
```

```
        Storage 1 Namespace ID : 1

    4:  Storage 2              : Enabled
        Storage 2 WWPN         : 20:93:d0:39:ea:23:c0:43
        Storage 2 WWNN         : 20:91:d0:39:ea:23:c0:43
        Storage 2 NQN          : nqn.1992-08.com.netapp:
                                 sn.4cb81b47fbac11ebbceed039ea23c044:
                                 subsystem.nvme_512b_subsystem
        Storage 2 Controller ID: 5d80
        Storage 2 Namespace ID : 4
....
     9: Storage 2 : Enabled
        Storage 2 WWPN : 20:93:d0:39:ea:23:c0:43
        Storage 2 WWNN : 20:91:d0:39:ea:23:c0:43
        Storage 2 NQN : nqn.1992-08.com.netapp:
                        sn.4cb81b47fbac11ebbceed039ea23c044:
                        subsystem.nvme_512b_subsystem
        Storage 2 Controller ID: 5d80
        Storage 2 Namespace ID : 8

     10: Save


        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 4



QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    Configure Boot Devices

=======================================================
HBA            : 2 Port: 1
SN             : AFD1915Y07266
HBA Model      : QLE2872
HBA Desc.      : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version     : 9.09.00
```

```
WWPN           : 21:00:f4:c7:aa:01:bc:3a
WWNN           : 20:00:f4:c7:aa:01:bc:3a
Host NQN       : nqn.2014-08.org.nvmexpress:uuid:
                 37363836-3239-4d32-3233-313430315759
Host ID        : 363836373932324d3233313430315759
Link           : Online
=======================================================

    1:  NVMe Disk
          Storage 2 WWPN         : 20:93:d0:39:ea:23:c0:43
          Storage 2 NQN          : nqn.1992-08.com.netapp:
                                   sn.4cb81b47fbac11ebbceed039ea23c044:
                                   subsystem.nvme_512b_subsystem
          Storage 2 Controller ID: 280
          Storage 2 WWPN         : 20:93:d0:39:ea:23:c0:43
    2:  Delete Boot Device
          Storage 2 WWPN         : 00:00:00:00:00:00:00:00
          Storage 2 NQN          :
          Storage 2 Controller ID: 0


        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 1

QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

Boot from SAN UEFI NVMe Drive Mapping

=======================================================
HBA            : 2 Port: 1
SN             : AFD1915Y07266
HBA Model      : QLE2872
HBA Desc.      : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version     : 9.09.00
WWPN           : 21:00:f4:c7:aa:01:bc:3a
WWNN           : 20:00:f4:c7:aa:01:bc:3a
Host NQN       : nqn.2014-08.org.nvmexpress:uuid:
                 37363836-3239-4d32-3233-313430315759
```

```
Host ID        : 363836373932324d3233313430315759
Link           : Online (FEC)
=========================================================

    1:  Namespace ID: 1
    2:  Namespace ID: 2
    3:  Namespace ID: 3
    4:  Namespace ID: 4 (Boot)
    5:  Namespace ID: 5
    6:  Namespace ID: 6
    7:  Namespace ID: 7
    8:  Namespace ID: 8


        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 3

QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)


        Enable this NVMe storage device so it can be mapped by
        the UEFI FC driver?

    1:  Yes
    2:  No


        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 1

QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

Boot from SAN UEFI NVMe Drive Mapping

=========================================================
HBA            : 1 Port: 1
```

```
SN              : AFD1915Y07266
HBA Model       : QLE2872
HBA Desc.       : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version      : 9.08.02
WWPN            : 21:00:f4:c7:aa:01:bc:3a
WWNN            : 20:00:f4:c7:aa:01:bc:3a
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
=======================================================

    1:  FC NVMe
        Host NQN               : nqn.2014-08.org.nvmexpress:uuid:
                                 4c4c4544-0047-5110-8034-c7c04f514432
        Host ID                : 44454c4c470010518034c7c04f514432
    2:  Storage 0              : Enabled
        Storage 0 WWPN         : 20:93:d0:39:ea:23:c0:43
        Storage 0 WWNN         : 20:91:d0:39:ea:23:c0:43
        Storage 0 NQN          : nqn.1992-08.com.netapp:
                                 sn.4cb81b47fbac11ebbceed039ea23c044:
                                 subsystem.cang_nvme_512b_subsystem
        Storage 0 Controller ID: 5c80
        Storage 0 Namespace ID : 1
…
10:  Save


        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 10
Boot device settings updated. Changes have been saved to HBA instance 0.
        Press <Enter> to continue:
```

N_Port ID Virtualization (NPIV) (-vp)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 6. N_Port ID Virtualization (NPIV) ▸ <port selection>

From the FC Adapter Configuration menu, select the **N_Port ID Virtualization (NPIV)** option followed by an adapter port to open the N_Port ID Virtualization (NPIV) menu with options to view, create, and delete virtual ports. For example:

```
N_Port ID Virtualization (NPIV)
```

```
=======================================================
HBA             : 4 Port: 1
SN              : AFD1536Y03195
HBA Model       : QLE2740
HBA Desc.       : QLogic QLE2740 Single Port 32Gb FC to
                  PCIe Gen3 x8 Adapter
FW Version      : 9.08.02
WWPN            : 21:00:00:24:ff:00:28:b3
WWNN            : 20:00:00:24:ff:00:28:b3
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
=======================================================
    1:  View vPorts Info
    2:  Create vPorts
    3:  Delete vPorts
```

Target Link Speed (iiDMA) (-q)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 7. Target Link Speed (iiDMA) ▸ <port selection>

From the FC Adapter Configuration menu, select the **Target Link Speed (iiDMA)** option followed by an adapter port to open the iiDMA Menu with options for basic and advanced configuration. For example:

```
Target Link Speed (iiDMA)

=======================================================
HBA             : 2 Port: 1
SN              : AFD1915Y07266
HBA Model       : QLE2872
HBA Desc.       : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version      : 9.09.00
WWPN            : 21:00:f4:c7:aa:01:bc:3a
WWNN            : 20:00:f4:c7:aa:01:bc:3a
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
=======================================================
```

```
    1:  iiDMA Basic Settings
    2:  iiDMA Advanced Settings
```

iiDMA Basic Settings

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 7. Target Link Speed (iiDMA) ▸ <port selection> ▸ 1. iiDMA Basic Settings

From the iiDMA Menu, select the **iiDMA Basic Settings** option to specify the link speed. For example:

```
iiDMA Basic Settings

=====================================================
HBA             : 2 Port: 1
SN              : AFD1915Y07266
HBA Model       : QLE2872
HBA Desc.       : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version      : 9.09.00
WWPN            : 21:00:f4:c7:aa:01:bc:3a
WWNN            : 20:00:f4:c7:aa:01:bc:3a
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
=====================================================

    1:  1  Gbps
    2:  2  Gbps
    3:  4  Gbps
    4:  8  Gbps
    5:  16 Gbps
    6:  32 Gbps
    7:  64 Gbps
```

iiDMA Advanced Settings

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 7. Target Link Speed (iiDMA) ▸ <port selection> ▸ 2. iiDMA Advanced Settings

From the iiDMA Menu, select the **iiDMA Advanced Settings** option to select a target device, specify the link speed, and apply the changes. For example:

```
Target Link Speed (iiDMA)
```

```
=======================================================
HBA            : 2 Port: 1
SN             : AFD1915Y07266
HBA Model      : QLE2872
HBA Desc.      : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version     : 9.09.00
WWPN           : 21:00:f4:c7:aa:01:bc:3a
WWNN           : 20:00:f4:c7:aa:01:bc:3a
Host NQN       : nqn.2014-08.org.nvmexpress:uuid:
                 37363836-3239-4d32-3233-313430315759
Host ID        : 363836373932324d3233313430315759
Link           : Online (FEC)
=======================================================

    1:  SAF-TE
           Vendor                       : HP
           Product ID                   : P2000 G3 FC
           Product Rev                  : T251
           Serial Number : 00c0ff11758e00000000040000000000
           Port Name                    : 20:70:00:c0:ff:11:40:ac
           Port ID                      : 03:13:00
           Intelligent Interleave Factor: 64 Gbps

    2:  FCP Disk
           Vendor                       : HP
           Product ID                   : P2000G3 FC/iSCSI
           Product Rev                  : T250
           Serial Number : 00c0ff193e4d00000000040000000000
           Port Name                    : 20:70:00:c0:ff:19:52:47
           Port ID                      : 03:09:00
           Intelligent Interleave Factor: 64 Gbps

    3:  Apply Changes to selected Target(s)
```

Driver Parameters (-fs)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 8. Driver Parameters

NOTE

This option applies to adapters on Windows systems only.

From the FC Adapter Configuration menu, select the **Driver Parameters** option followed by an adapter port to open the Driver Settings Menu with options to configure the driver settings. For example:

```
Driver Parameters

    HBA Model QLE2740
      1: Port   1: WWPN: 21:00:00:24:ff:00:28:b3 Online (FEC)
    HBA Model QLE2772
      2: Port   1: WWPN: 21:00:f4:e9:d4:54:aa:9a Online
      3: Port   1: WWPN: 21:00:f4:e9:d4:54:aa:9a Online
      4: Port   2: WWPN: 21:00:f4:e9:d4:54:aa:9b Online
    HBA Model QLE2662
      5: Port   1: WWPN: 20:01:00:0e:1e:12:32:b0 SFP not present
      6: Port   2: WWPN: 20:01:00:0e:1e:12:32:b1 Online


        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 1

QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    Driver Parameters

    ----------------------
    Target: Display Options
    ----------------------
    1: Present persistently bound target(s) plus
       any new target(s) with driver default (Current)
    2: Present persistently bound target(s) Only
    ----------------------
    Target: Binding Options
```

```
----------------------
3: Bind by World Wide Port Name (Current)
4: Bind by Port ID
5: Commit Changes
```

Selective LUN Mapping (-m)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 9. Selective LUN Mapping ▸ <port selection>

NOTE

This option applies to adapters on Windows systems only.

From the FC Adapter Configuration menu, select an adapter port to open the **Selective LUN Mapping** menu with options to display the LUN configuration information, manually configure LUNs, or automatically configure LUNs. For example:

```
Selective LUN Mapping

=======================================================
Host NQN      :  nqn.2014-08.org.nvmexpress:uuid:
                 37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
HBA             : 0 Port: 1
SN              : AFD1915Y07266
HBA Model       : QLE2872
HBA Desc.       : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version      : 9.08.02
WWPN            : 21:00:f4:c7:aa:01:bc:3a
WWNN            : 20:00:f4:c7:aa:01:bc:3a
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
=======================================================

    1:  Display Selective LUN Mapping
    2:  Configure a specific LUN
    3:  Auto Configure all LUNs
```

Display Selective LUN Mapping

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 9. Selective LUN Mapping ▸ 1. Display Selective LUN Mapping

From the Selective LUNs Menu, select the **Display Selective LUN Mapping** option and follow the prompts to display the LUN configuration. For example:

```
    QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    Selective LUNs Mapping

=======================================================
HBA             : 2 Port: 1
SN              : AFD1915Y07266
HBA Model       : QLE2872
HBA Desc.       : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version      : 9.09.00
WWPN            : 21:00:f4:c7:aa:01:bc:3a
WWNN            : 20:00:f4:c7:aa:01:bc:3a
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online
=======================================================

    1:  Display Selective LUN Mapping
    2:  Configure a specific LUN
    3:  Configure all LUNs


        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 1

QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    Selective LUN Mapping

=======================================================
```

```
HBA             : 2 Port: 1
SN              : AFD1915Y07266
HBA Model       : QLE2872
HBA Desc.       : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version      : 9.09.00
WWPN            : 21:00:f4:c7:aa:01:bc:3a
WWNN            : 20:00:f4:c7:aa:01:bc:3a
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
=======================================================

    1:  Display current setting of a specific LUN
    2:  Display current setting of all LUNs


        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 1


QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

Selective LUN Mapping

=======================================================
HBA             : 2 Port: 1
SN              : AFD1915Y07266
HBA Model       : QLE2872
HBA Desc.       : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version      : 9.09.00
WWPN            : 21:00:f4:c7:aa:01:bc:3a
WWNN            : 20:00:f4:c7:aa:01:bc:3a
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
=======================================================
```

```
    1:  SAF-TE
           Vendor                       : HP
           Product ID                   : P2000 G3 FC
           Port Name                    : 20:70:00:c0:ff:11:40:ac
           Port ID                      : 03:13:00
           Bind                         : Yes
           Target ID                    : 0
    2:  FCP Disk
           Vendor                       : HP
           Product ID                   : P2000G3
           Port ID                      : 03:09:00
           Bind                         : Yes
           Target ID                    : 1


        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 2

QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    Selective LUN Mapping

=====================================================
HBA             : 2 Port: 1
SN              : AFD1915Y07266
HBA Model       : QLE2872
HBA Desc.       : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version      : 9.09.00
WWPN            : 21:00:f4:c7:aa:01:bc:3a
WWNN            : 20:00:f4:c7:aa:01:bc:3a
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
=====================================================

    1:  LUN   0
```

```
           Vendor                        : HP
           Product ID                    : P2000G3 FC/iSCSI
           Port Name                     : 20:70:00:c0:ff:19:52:47
           Port ID                       : 03:09:00
    2:  LUN   1
           Vendor                        : HP
           Product ID                    : P2000G3 FC/iSCSI
           Port Name                     : 20:70:00:c0:ff:19:52:47
           Port ID                       : 03:09:00
    3:  LUN   2
           Vendor                        : HP
           Product ID                    : P2000G3 FC/iSCSI
           Port Name                     : 20:70:00:c0:ff:19:52:47
           Port ID                       : 03:09:00
    4:  LUN   3
           Vendor                        : HP
           Product ID                    : P2000G3 FC/iSCSI
           Port Name                     : 20:70:00:c0:ff:19:52:47
           Port ID                       : 03:09:00
    5:  LUN   4
           Vendor                        : HP
           Product ID                    : P2000G3 FC/iSCSI
           Port Name                     : 20:70:00:c0:ff:19:52:47
           Port ID                       : 03:09:00
    6:  All LUNs

        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 6
--------------------------------------------------------------------------------
HBA Instance 2: QLE2772 Port 1 WWPN 21:00:f4:c7:aa:01:bc:3a PortID 01:0c:00
Link: Online
--------------------------------------------------------------------------------
Enable Type        Target/LUN Info         Port Name               LUN ID
------ ----------- ----------------------- ----------------------- ------
Yes    FCP Disk    P2000G3 FC/iSCSI        20:70:00:c0:ff:19:52:47   0
--------------------------------------------------------------------------------
Yes    FCP Disk    P2000G3 FC/iSCSI        20:70:00:c0:ff:19:52:47   1
--------------------------------------------------------------------------------
Yes    FCP Disk    P2000G3 FC/iSCSI        20:70:00:c0:ff:19:52:47   2
```

```
-------------------------------------------------------------------------------
Yes    FCP Disk    P2000G3 FC/iSCSI        20:70:00:c0:ff:19:52:47   3
-------------------------------------------------------------------------------
Yes    FCP Disk    P2000G3 FC/iSCSI        20:70:00:c0:ff:19:52:47   4
-------------------------------------------------------------------------------

        Press <Enter> to continue:
```

Configure a specific LUN

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 9. Selective LUN Mapping ▸ 2. Configure a specific LUN

From the Selective LUNs Menu, select the **Configure a specific LUN** option and follow the prompts to manually configure a LUN.

Auto Configure all LUNs

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 9. Selective LUN Mapping ▸ 3. Auto Configure all LUNs

From the Selective LUNs Menu, select the **Auto Configure LUNs** option and select either **1** to enable or **2** to disable automatic configuration of LUNs.

NPIV Quality of Service (QoS) (-qos)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 10. NPIV QoS

NOTE

Quality of service applies to adapters on Windows systems only.

From the FC Adapter Configuration menu, select the **NPIV QoS** option. From the port menu, select a port to open the NPIV QoS menu with options to set QoS by priority or by bandwidth. For example:

```
    NPIV QoS

    HBA Model QLE2872 SN: AFD1915Y07266
      1: Port   1: WWPN: 21:00:f4:c7:aa:01:bc:3a Online
      2: Port   2: WWPN: 21:00:f4:c7:aa:01:bc:3b Online

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1

QConvergeConsoleCLI
CLI - Version 3.0.x (Build xx)
```

```
    NPIV QoS

=====================================================HBA
HBA           : 2 Port: 1
SN            : AFD1915Y07266
HBA Model     : QLE2872
HBA Desc.     : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version    : 9.08.02
WWPN          : 21:00:f4:c7:aa:01:bc:3a
WWNN          : 20:00:f4:c7:aa:01:bc:3a
Host NQN      : nqn.2014-08.org.nvmexpress:uuid:
                37363836-3239-4d32-3233-313430315759
Host ID       : 363836373932324d3233313430315759
Link          : Online (FEC)
=====================================================

    1:  QoS Priority
    2:  QoS Bandwidth (Current)
```

Export Configuration

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 11. Export Configuration

From the FC Adapter Configuration menu, select the **Export Configuration** option followed by an adapter port to open the Export (Save) Configuration menu with options to save Flash memory and adapter parameters. For example:

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

Export Configuration
=====================================================
Host NQN       : nqn.2014-08.org.nvmexpress:uuid:
                 37363836-3239-4d32-3233-313430315759
Host ID        : 363836373932324d3233313430315759
HBA            : 0 Port: 1
SN             : AFD1915Y07266
HBA Model      : QLE2872
HBA Desc.      : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version     : 9.08.02
WWPN           : 21:00:f4:c7:aa:01:bc:3a
```

```
WWNN            : 20:00:f4:c7:aa:01:bc:3a
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
=======================================================

    1:  Save HBA Parameters
    2:  Save Adapter FW Preload
    3:  Save Adapter FC Board Config
    4:  Save Adapter RISC FW Dump
    5:  Save Adapter MPI FW Dump
```

Save HBA Parameters (-r)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 11. Export Configuration ▸ <port selection> ▸ 1. Save HBA Parameters

From the Export Configuration menu, select the **Save HBA Parameters** option to save changes to the adapter parameters to a file.

Save Adapter FW Preload

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 11. Export Configuration ▸ <port selection> ▸ 2. Save Adapter FW Preload

From the Export Configuration menu, select the **Save Adapter FW Preload** option to save the firmware preload information to a file.

Save Adapter FC Board Config (-sp)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 11. Export Configuration ▸ <port selection> ▸ 3. Save Adapter FC Board Config

From the Export Configuration menu, select the **Save Adapter FC Board Config** option to save the Fibre Channel adapter configuration to a file.

Save Adapter RISC FW Dump (-fwdump)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 11. Export Configuration ▸ <port selection> ▸ 4. Save Adapter RISC FW Dump

From the Export Configuration menu, select the **Save Adapter RISC FW Dump** option to save the current adapter RISC firmware dump to a file. For example:

```
FC Dump

     1: HBA Model: QLE2692 SN: AFD1536Y03145
          Port   1 WWPN: 21:00:00:24:ff:8f:d8:66 Online
          Port   2 WWPN: 21:00:00:24:ff:8f:d8:67 D-Port
```

```
     2: HBA Model: QLE2740 SN: AFD1536Y03312
          Port   1 WWPN: 21:00:00:24:ff:00:27:b3 SFP not installed
     3: HBA Model: QLE2662 SN: AFE1227F06193
          Port   1 WWPN: 20:01:00:0e:1e:08:d9:a0 SFP not installed
          Port   2 WWPN: 20:01:00:0e:1e:08:d9:a1 SFP not installed

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 2
Enter a file name or Hit <RETURN> to abort: fc_dump
```

Save Adapter MPI FW Dump (-mpidump)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 11. Export Configuration ▸ <port selection> ▸ 5. Save Adapter MPI FW Dump

From the Export Configuration menu, select the **Save Adapter MPI FW Dump** option to save the current adapter MPI firmware dump to a file.

Inventory Report (-z)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 12. Inventory Report

From the FC Adapter Configuration menu, select the **Inventory Report** option followed by an adapter port for which to generate a report. For example:

```
QConvergeConsoleCLI

Version 3.0.x (Build xx)

Inventory Report

    HBA Model QLE2770
      1: Port   1: WWPN: 21:00:34:80:0d:3b:89:23 Online (FEC)
    HBA Model QLE2874
      2: Port   1: WWPN: 21:00:34:80:0d:61:4b:10 Online (FEC)
      3: Port   2: WWPN: 21:00:34:80:0d:61:4b:11 Online (FEC)
      4: Port   3: WWPN: 21:00:34:80:0d:61:4b:12 Online (FEC)
      5: vPort  1: WWPN: 21:04:34:80:0d:61:4b:12 Online (FEC)
      6: vPort  2: WWPN: 21:05:34:80:0d:61:4b:12 Online (FEC)
      7: Port   4: WWPN: 21:00:34:80:0d:61:4b:13 Link Down
.
.
.
```

Personality (-pc)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 13. Personality

NOTE

The personality feature is supported only on Marvell QLogic QLE2670 Series Adapters. This feature lets you set the adapter's personality to Fibre Channel only or Converged Network Adapter.

From the FC Adapter Configuration menu, select the **Personality** option to set the adapter personality to Fibre Channel only or Converged Network Adapter. From the adapter menu, select the adapter whose personality is to be changed, and then confirm your selection, as shown in the following examples.

Following is an example of changing Fibre Channel (FC) to Converged Network Adapter (CNA):

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

HBA Personality

1: HBA Model: QLE8362 SN: 040210A+1238107609
Port 1 WWPN: 21:00:00:0e:1e:10:65:20 Online
Port 2 WWPN: 21:00:00:0e:1e:10:65:21 Online

 (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 1

Change personality to CNA? (y/n): y
Personality type of HBA instance 0 (QLE8362) has been changed successfully.
Please reboot machine. Make sure to change the SFP module to a compatible one
(CNA) before reboot.

        Hit <Enter> to continue:
```

Example of changing Converged Network Adapter (CNA) to Fibre Channel (FC):

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)
```

```
HBA Personality

1: HBA Model: QLE8362 SN: 040210A+1238107609
Port 1 WWPN: 21:00:00:0e:1e:10:65:20 Online
Port 2 WWPN: 21:00:00:0e:1e:10:65:21 Online

 (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 1

Change personality to FC? (y/n): y
Personality type of HBA instance 1 (QLE8362) has been changed successfully.
Please reboot machine. Make sure to change the SFP module to a compatible one
(FC) before reboot.
        Hit <Enter> to continue:
```

Forward Error Correction (FEC) (-fec)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 13. Forward Error Correction (FEC)

NOTE

The forward error correction (FEC) feature is supported only on Marvell QLogic 16Gb Fibre Channel adapters—including the QLE2670 and QLE2690 in FC mode—if the current adapter port is connected to a Brocade switch with FEC support. For information on how to enable FEC on the switch side, refer to documentation from Brocade.

For 32Gb/64Gb adapters, FEC is enabled by default and cannot be disabled.

From the FC Adapter Configuration menu, select the **Forward Error Correction (FEC)** option, and then select an adapter port. The following menu options allow you to view, enable, or disable support for FEC on the selected adapter port:

```
FEC Configuration Menu
```

1: Status (shows the FEC status as either Enabled or Disabled)

2: Enable (enables FEC; requires a reboot to take effect)

3: Disable (disables FEC; requires a reboot to take effect)

4: Info (shows the quantity of received correctable and uncorrectable FEC errors)

5: Reset FEC Counters (resets the counters for all FEC correctable and uncorrectable errors from the reported FEC information)

To enable FEC for the selected adapter port:

1. From the FEC Configuration Menu, select the **Enable** option.

   QConvergeConsole CLI prompts you to confirm that you want to `Enable FEC on all ports of the selected HBA?`
2. Respond by either typing **`1`** for Yes or **`2`** for No.
3. To confirm that FEC is now enabled, select the **Status** menu option and view the change.
4. For the FEC change to take effect, you must reboot the server.

Buffer-to-Buffer Credits (BBC) (-bbcr)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 14. Buffer-to-Buffer Credits (BBC)

Buffer-to-buffer credits (BBC) enables two FC peer ports (N_Port, F_Port, or E_Port) to periodically send and receive the quantity of receiver ready (R_RDY) signals transmitted. The BBC feature allows the peer port to recover from possible R_RDY signals lost over a lossy link. BBC enables two FC ports logged in with each other to recover lost buffer-to-buffer credits. These lost credits can impact throughput, cause link resets, and disrupt traffic flow.

During the login process, the peer ports exchange a nonzero BB_SC_N value. During frame transmission/reception, one port maintains counters to track the R_RDY and frames received. Based on a periodic exchange of BB_SC_N values, the receiving port determines how many R_RDYs should have been received. BB-CR compares this value with the actual counters maintained at the receiving port, from which the receiver can compute the actual quantity of credits lost, and thus recover without incurring a link reset.

By default, BB-CR functionality is enabled on Marvell QLogic 2600 and 2770 Series Adapters that are operating at 16Gbps or higher, and that integrate with Brocade Fabric OS Manager and Brocade Network Advisor.

From the FC Adapter Configuration menu, select the **Buffer-to-Buffer Credits (BBC)** option followed by an adapter port. The menu options allow you to view, enable, or disable support for BBC on the selected adapter port. For example:

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    Buffer-to-Buffer Credits (BBC)

=====================================================
HBA                : 2 Port: 1
SN                 : AFD1915Y07266
```

```
HBA Model          : QLE2872
HBA Desc.          : QLogic QLE2872 64Gb 2-port Fibre Channel
                     Adapter
FW Version         : 9.09.00
WWPN               : 21:00:f4:c7:aa:01:bc:3a
WWNN               : 20:00:f4:c7:aa:01:bc:3a
Host NQN           : nqn.2014-08.org.nvmexpress:uuid:
                     37363836-3239-4d32-3233-313430315759
Host ID            : 363836373932324d3233313430315759
Link               : Online (FEC)
=====================================================

    1:  Display Settings (shows the BBC as Enabled or Disabled)
    2:  Enable (Enables BBC; requires a reboot to take effect)
    3:  Disable (Disables BBC; requires a reboot to take effect)
```

Adapter Updates

From the Main menu, select **Adapter Updates** to view the FC Adapter Update menu. For example:

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    Main

    1:  Adapter Information
    2:  Adapter Configuration
    3:  Adapter Updates
    4:  Adapter Diagnostics
    5:  Monitoring
    6:  Universal SAN Congestion Mitigation (USCM)
    7:  Refresh
    8:  Help
    9:  Exit


        Please Enter Selection: 3
```

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    FC Adapter Update

    1:  Flash Update
    2:  Driver Update
    3:  Parameters Update

(p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection:
```

Flash Update (-b)

3. Adapter Updates ▸ 1. Flash Update

From the FC Adapter Update menu, select the **Flash Update** option. From the Flash Update menu, select the adapter port, and then the Multiboot image file (MBI) file name.

2600/2700/2800 Series Fibre Channel Adapter Selection:

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    Flash Update

      1: HBA Model: QLE2740
          Port  1 WWPN: 21:00:00:24:ff:00:28:b3 Online (FEC)
      2: HBA Model: QLE2872
          Port  1 WWPN: 21:00:f4:c7:aa:01:bc:3a Online
          Port  2 WWPN: 20:00:f4:c7:aa:01:bc:3b Online
      3: HBA Model: QLE2662
          Port  1 WWPN: 20:01:00:0e:1e:12:32:b0 SFP not present
          Port  2 WWPN: 20:01:00:0e:1e:12:32:b1 Online

        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 2
```

```
Enter file name or Hit <Enter> to abort: mh010604.bin
```

For 2600/2700/2800 Series non-CNSA Fibre Channel Adapters, following example output will be seen for successful flash update

```
Validating Flash Image File... Success
Updating Flash on HBA port(s) - QLE2772. Please wait...
Updating Adapter FC Boot Code... Success
EFI version: 07.27.00
Verifying Adadpter FC Boot Code... Success
Updating Adapter PEP softROM version 03.00.13... Success
Verifying Adapter PEP softROM... Success
Updating Adapter PEP Fw version 03.01.36... Success
Verifying Adapter PEP FW... Success
Updating Adapter PEP Board Configs version 3.1.0... Success
Verifying Adapter PEP Board Config... Success
Updating Adapter Fw Preload Area version 4.1.10... Success
Verifying Adapter Fw Preload Area... Success
Updating Adapter MPI Fw version 03.03.03... Success
Verifying Adapter MPI Fw... Success
Updating Adapter PCIe Serdes version 03.00.07... Success
Verifying Adapter PCIe Serdes... Success
Updating Adapter FC Board Configs version 3.0.2... Success
Verifying Adapter FC Board Config... Success
Updating Adapter FC RISC Fw version 09.09.00... Success
Verifying Adapter FC RISC Firmware... Success
Updating Adapter Flash Memo Block... Success
Verifying Flash Memo Block data... Success
Updating Adapter Primary Image Status... Success
Verifying Primary Image Status data... Success
Updating Adapter Secondary Image Status... Success
Verifying Secondary Image Status data... Success
Updating Adapter Primary Aux Image Status... Success
Verifying Primary Aux Image Status data... Success
Updating Adapter Secondary Aux Image Status... Success
Verifying Secondary Aux Image Status data... Success
Flash update complete. You must reboot in order for the changes to become
effective.
```

Following is example output of a failed flash update:

```
PS C:\> qaucli -b 0 .\mh010018.bin
Validating Flash Image File... Success
Updating Flash on HBA port(s) - QLE2772. Please wait...
Updating Adapter FC Boot Code... Success
EFI version: 07.01.00
Updating Adapter PEP softROM version 03.00.10... Success
Updating Adapter PEP FW version 03.00.12... Success
Updating Adapter PEP Board Configs version 03.00.00... Success
Updating Adapter Fw Preload Area version 3.0.7... Success
Updating Adapter MPI Fw version 135.03.04...
** failed checksum checksum check
Flash update failed with HBA (Instance 0 - QLE2772) with error 511)!
```

NOTE

For the 2770 Series, error 511 may indicate non-authentic firmware. See `fcscli-exitcodes.txt` for error code details.

Driver Update (-d)

3. Adapter Updates ▸ 2. Driver Update

NOTE

Interactive driver update applies to Windows systems only.

From the FC Adapter Update menu, select the **Driver Update** option. From the Driver Update menu, select the adapter port, and the full path of the Marvell Fibre Channel driver that includes the driver inf file (ql2x00.inf):

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    Driver Update

1: HBA Model: QLE2740
Port 1 WWPN: 21:00:00:24:ff:00:28:b3 Online (FEC)
```

```
2: HBA Model: QLE2872
Port 1 WWPN: 21:00:f4:c7:aa:01:bc:3a Online
Port 2 WWPN: 20:00:f4:c7:aa:01:bc:3b Online
3: HBA Model: QLE2662
Port 1 WWPN: 20:01:00:0e:1e:12:32:b0 SFP not present
Port 2 WWPN: 20:01:00:0e:1e:12:32:b1 Online
(p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
Please Enter Selection: 1

        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 1
Enter file name or Hit <Enter> to abort:
C:\Drivers\Marvell\q23wx64W16Storv9.4.9.21_WHQL_115292150569694969l\ql2x00.inf


        This option will install version: STOR Miniport 9.4.6.20
        The current version is: STOR Miniport 9.4.9.21
        Do you want to perform the operation?

        1: Yes
        2: No

                Enter Selection:
```

Parameters Update (-r)

3. Adapter Updates ▸ 3. Parameters Update

From the FC Adapter Update menu, select the **Parameters Update** option. From the port menu, select an adapter port for which to specify the parameter update, and then type the file name. For example:

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

Parameters Update

1: HBA Model: QLE2740
Port 1 WWPN: 21:00:00:24:ff:00:28:b3 Online (FEC)
2: HBA Model: QLE2872
```

```
Port 1 WWPN: 21:00:f4:c7:aa:01:bc:3a Online
Port 2 WWPN: 20:00:f4:c7:aa:01:bc:3b Online
3: HBA Model: QLE2662
Port 1 WWPN: 20:01:00:0e:1e:12:32:b0 SFP not present
Port 2 WWPN: 20:01:00:0e:1e:12:32:b1 Online
(p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
Please Enter Selection: 2

Warning:

  Please update the HBA parameters with extreme care.
  Incorrectly updating the HBA parameters may render the HBA   inoperable.
  If you currently have boot device information set up in the
  HBA parameters, updating the HBA Parameters from a file
  will preserve that information.

        Do you want to proceed with the operation?

    1:  Yes
    2:  No

Please Enter Selection:1
Enter a file name or Hit <RETURN> to abort:QLE27NVR.dat
```

If the adapter does not support the parameter update option, a notification message appears. For example:

```
Option not supported with selected HBA (Instance 0 - QLE2xxx)!
```

Parameters Template Update

3. Adapter Updates ▸ 3. Parameters Template Update

This option appears only when an 8Gb FC adapter is selected. From the FC Adapter Update menu, select the **Parameters Template Update** option. From the port menu, select a port to open the HBA Parameters Templates Menu with options for various adapter vendors. For example:

```
Parameters Template Update

HBA Model QLE2692 SN: AFD1536Y03145
  1: Port   1: WWPN: 21:00:00:24:ff:8f:d8:66 Online
  2: Port   2: WWPN: 21:00:00:24:ff:8f:d8:67 D-Port
```

```
    HBA Model QLE2740 SN: AFD1536Y03312
      3: Port   1: WWPN: 21:00:00:24:ff:00:27:b3 SFP not installed
    HBA Model QLE2662 SN: AFE1227F06193
      4: Port   1: WWPN: 20:01:00:0e:1e:08:d9:a0 SFP not installed
      5: Port   2: WWPN: 20:01:00:0e:1e:08:d9:a1 SFP not installed
    HBA Model QLE2562 SN: BFD1303F99139
      6: Port   1: WWPN: 221:00:00:24:ff:4c:dc:2c SFP not installed
     7: Port   2: WWPN: 21:00:00:24:ff:4c:dc:2d SFP not installed

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 6

        QConvergeConsoleCLI
        Version 3.0.x (Build xx)

    HBA Parameters Templates Menu

=======================================================
HBA           : 2 Port: 1
SN            : BFD1303F99139
HBA Model     : QLE2562
HBA Desc.     : QLE2562 PCI Express to 8Gb FC Dual Channel
FW Version    : 8.01.02
WWPN          : 21:00:00:24:ff:4c:dc:2c
WWNN          : 20:00:00:24:ff:4c:dc:2c
Link          : SFP not installed
=======================================================

    1:  HP
    2:  IBM
    3:  NETAPP
    4:  QLGC
    5:  SUN

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 4
Updating HBA Parameters on HBA instance 2 -  QLE2562. Please wait...
HBA Parameters update complete. Changes have been saved to HBA instance 2.
```

If the adapter does not support the parameter template update option, a notification message appears. For example:

```
    Parameters Template Update

    HBA Model QLE8362 SN: AFE1223F04535
      1: Port   1: WWPN: 21:00:00:0e:1e:08:05:20 Online
      2: Port   2: WWPN: 21:00:00:0e:1e:08:05:21 Online

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1
Option not supported with selected HBA (Instance 0 - QLE8362)!
```

Firmware Preload Update (-u)

3. Adapter Updates ▸ 4. Firmware Preload Update

NOTE

This option is only for blades and mezzanine adapters.

From the FC Adapter Update menu, select the **Firmware Preload Update** option to update the adapter firmware preload table. From the Preload Table Update menu, select the adapter port to be updated, and then enter a firmware preload table file name (`.dat`).

For example:

```
    Firmware Preload Update

     1: HBA Model: QLE2692 SN: AFD1536Y03145
          Port   1 WWPN: 21:00:00:24:ff:8f:d8:66 Online
          Port   2 WWPN: 21:00:00:24:ff:8f:d8:67 D-Port
     2: HBA Model: QLE2740 SN: AFD1536Y03312
          Port   1 WWPN: 21:00:00:24:ff:00:27:b3 SFP not installed
     3: HBA Model: QLE2662 SN: AFE1227F06193
          Port   1 WWPN: 20:01:00:0e:1e:08:d9:a0 SFP not installed
          Port   2 WWPN: 21:00:00:0e:1e:08:05:20 SFP not installed
     4: HBA Model: QLE2562 SN: BFD1303F99139
          Port   1 WWPN: 21:00:00:24:ff:4c:dc:2c SFP not installed
          Port   2 WWPN: 21:00:00:24:ff:4c:dc:2d SFP not installed

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
```

```
        Please Enter Selection: 1

Warning:

  Please update the HBA FW Table with extreme care.
  Incorrectly updating the HBA FW Table may render the HBA   inoperable.

  Do you want to proceed with the operation?

    1:  Yes
    2:  No


        Please Enter Selection:1

Enter a file name or Hit <RETURN> to abort: fwpreload.dat
```

FC Board Config Update (-sp)

3. Adapter Updates ▸ 5. FC Board Config Update

From the FC Adapter Update menu, select the **FC Board Config Update** option to update the adapter firmware SerDes table. From the FC Board Config Update menu, select the adapter port to be updated and then enter a firmware SerDes table file name (`.dat`). For example:

```
    FC Board Config Update

     1: HBA Model: QLE2692 SN: AFD1536Y03145
          Port   1 WWPN: 21:00:00:24:ff:8f:d8:66 Online
          Port   2 WWPN: 21:00:00:24:ff:8f:d8:67 D-Port
     2: HBA Model: QLE2740 SN: AFD1536Y03312
          Port   1 WWPN: 21:00:00:24:ff:00:27:b3 SFP not installed

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1

Warning:

  Please update the HBA Serdes Table with extreme care.
  Incorrectly updating the HBA Serdes Table may render the HBA
  inoperable.
```

```
  Do you want to proceed with the operation?

    1:  Yes
    2:  No


        Please Enter Selection: 1


Enter file name or Hit <RETURN> to abort: fwserdes.dat
```

Adapter Diagnostics

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter

From the main menu, select the **Adapter Diagnostics** option. The FC Adapter Diagnostics menu allows user to perform different diagnostics commands as listed. Options include diagnostics loopback test, read/write buffer test, transceiver diagnostics test, port beacon, FCE trace, device ping test, CT ping test, CT fabric trace route test, link status, diagnostics port test, fc ping test, and read diagnostics parameters test. For example:

```
    FC Adapter Diagnostics

    1:  Loopback Test
    2:  Read Write Buffer Test
    3:  Transceiver Diagnostics Monitoring Interface (DMI)
    4:  Port Beacon
    5:  FCE Trace
    6:  Device Ping Test
    7:  CT Ping Test
    8:  CT FTR Test
    9:  Link Status
   10:  Diagnostics Port Test
   11:  FC Ping Test
   12:  (Read Diagnostics Parameters (RDP) Test
```

Loopback Test (-kl)

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 1. Loopback Test

From the FC Adapter Diagnostics menu, select the **Loopback Test** option. From the Loopback Test menu, select an adapter port to view test parameters, reset test parameters, configure test parameters, and run the external loopback test. For example:

```
HBA : 2 Port: 1
SN : AFD1915Y07266
HBA Model : QLE2772
HBA Desc. : QLE2772 2x32Gb QLE2772 FC HBA
Adapter
FW Version : 9.09.00
WWPN : 21:00:f4:c7:aa:01:bc:3a
WWNN : 20:00:f4:c7:aa:01:bc:3a
Host NQN : nqn.2014-08.org.nvmexpress:uuid:
37363836-3239-4d32-3233-313430315759
Host ID : 363836373932324d3233313430315759
Link : Online (FEC)
================================================
    1:  Display Settings
    2:  Restore Default Settings
    3:  Change Settings
    4:  Start
```

Display Settings

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 1. Loopback Test ▸ <port selection> ▸ 1. Display Settings

From the Loopback Test menu, select the **Display Settings** option to view the external loopback test parameters. For example:

```
----------------------------------------------------------------


HBA Instance 0: QLE2872 Port 2 WWPN 21:00:34:80:0d:61:4b:11
PortID 01:0c:00
Link: Online
----------------------------------------------------------------


Diagnostics Settings
--------------------
Diagnostic Mode          : Loopback
```

```
Data Pattern              : Random
Data Size (Bytes)         : 8
Number of tests (1-65535): 10
Test Increment(1-65535)   : 1
Abort On Error            : Ignore
Test Continuous           : OFF
Loopback Type             : External Loopback
-----------------------------------------------------------------
```

Restore Default Settings

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 1. Loopback Test ▸ <port selection> ▸ 2. Restore Default Settings

From the Loopback Test menu, select the **Restore Default Settings** option to reset the external loopback test parameters to their default values.

Change Settings

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 1. Loopback Test ▸ <port selection> ▸ 3. Change Settings

From the Loopback Test menu, select the **Change Settings** option to open the Loopback Test menu with options to configure the data pattern, data size, number of tests, test increment, test option, and loopback type. For detailed information about these parameters, see Table 5-6 on page 74.

Following is an example output.

```
Loopback Test

=======================================================
HBA : 2 Port: 1
SN : AFD1915Y07266
HBA Model : QLE2772
HBA Desc. : QLE2772 2x32Gb QLE2772 FC HBA
FW Version : 9.09.00
WWPN : 21:00:f4:c7:aa:01:bc:3a
WWNN : 20:00:f4:c7:aa:01:bc:3a
Host NQN : nqn.2014-08.org.nvmexpress:uuid:
37363836-3239-4d32-3233-313430315759
Host ID : 363836373932324d3233313430315759
Link : Online
=======================================================
    1:  Data Patterns
    2:  Data Size
    3:  Maximum Number Of Tests
```

```
    4:  Test Increments
    5:  Test Option
    6:  Loopback Type
```

Start

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 1. Loopback Test ▸ <port selection> ▸ 4. Start

From the Loopback Test menu, select the **Start** option to run the external loopback test. For example:

```
-------------------------------------------------------------------------------
HBA Instance 2: QLE2872 Port 1 WWPN 21:00:f4:c7:aa:01:bc:3a PortID 01:0c:00
Link: Online
-------------------------------------------------------------------------------

--------------------
Diagnostics Settings
--------------------
Diagnostic Mode          : Loopback
Data Pattern             : Random
Data Size (Bytes)        : 8
Number of tests (1-65535): 10
Test Increment(1-65535)  : 1
Abort On Error           : Ignore
Test Continuous          : OFF
Loopback Type            : External Loopback
-------------------------------------------------------------------------------

---------------------------------
Diagnostics - Loopback Test Result
---------------------------------
Press <Enter> to abort
-----------------------------------------
HBA Test Data Pattern        Status      CRC       Disparity FrameLength
--- -----------------------  ----------- --------- --------- -----------
 0  2B-12-30-2F-5C-35-44-01      Success         0         0           0

Finished 10 iterations in 0 second(s)...
```

Read Write Buffer Test (-kr)

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 2. Read Write Buffer Test

From the FC Adapter Diagnostics menu, select the **Read Write Buffer Test** option. From the port menu, select an adapter port to open the Read Write Buffer Test menu with options to view test parameters, reset test parameters, configure test parameters, and run the test. For example:

```
    FC Adapter Diagnostics

    HBA Model QLE2692 SN: AFD1536Y03145
      1: Port   1: WWPN: 21:00:00:24:ff:8f:d8:66 Online
      2: Port   2: WWPN: 21:00:00:24:ff:8f:d8:67 Online
    HBA Model QLE2740 SN: AFD1536Y03312
      3: Port   1: WWPN: 21:00:00:24:ff:00:27:b3 SFP not installed
    HBA Model QLE2662 SN: AFE1227F06193
      4: Port   1: WWPN: 20:01:00:0e:1e:08:d9:a0 SFP not installed
      5: Port   2: WWPN: 20:01:00:0e:1e:08:d9:a1 SFP not installed

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1

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    Read Write Buffer Test

=====================================================
HBA           : 1 Port: 2
SN            : AFD1536Y03145
HBA Model     : QLE2692
HBA Desc.     : QLE2692 Dual Port 16Gb FC to PCIe Gen3 x8 Adapter
FW Version    : 8.05.41
WWPN          : 21:00:00:24:ff:8f:d8:67
WWNN          : 20:00:00:24:ff:8f:d8:67
Host NQN      : nqn.2014-08.org.nvmexpress:uuid:
                37363836-3239-4d32-3233-313430315759
Host ID       : 363836373932324d3233313430315759
Link          : Online
=====================================================
    1:  Display Settings
```

```
    2:  Restore Default Settings
    3:  Change Settings
    4:  Start
```

Display Settings (-kr)

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 2. Read Writer Buffer Test ▸ <port selection> ▸ 1. Display Settings

From the Read Write Buffer Test menu, select the **Display Settings** option to view the read write buffer test parameters. For example:

```
-----------------------------------------------------------------

HBA Instance 1: QLE2872 Port 2 WWPN 21:00:34:80:0d:61:4b:11
PortID 01:0c:00
Link: D-Port
-----------------------------------------------------------------

--------------------
Diagnostics Settings
--------------------
Diagnostic Mode          : R/W Buffer
Data Pattern             : Random
Data Size (Bytes)        : 8
Number of tests (1-10000): 10
Test Increment(1-10000)  : 1
Abort On Error           : Ignore
Test Continuous          : OFF
-----------------------------------------------------------------
```

Restore Default Settings

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 2. Read Write Buffer Test ▸ <port selection> ▸ 2. Restore Default Settings

From the Read Write Buffer Test menu, select the **Restore Default Settings** option to reset the read write buffer test parameters to their default values.

Change Settings (-kr)

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 2. Read Write Buffer Test ▸ <port selection> ▸ 3. Change Settings

From the Read Write Buffer Test menu, select the **Change Settings** option to open the Read Write Buffer Test submenu with options to configure the data pattern, data size, number of tests, test increment, error handling, and devices. For detailed information about these parameters, see Table 5-6 on page 74.

Following is an example output.

```
   Read Write Buffer Test

=======================================================
HBA           : 1 Port: 2
SN            : AFD1536Y03145
HBA Model     : QLE2692
HBA Desc.     : QLE2692 Dual Port 16Gb FC to PCIe Gen3 x8 Adapter
FW Version    : 8.05.41
Host NQN      : nqn.2014-08.org.nvmexpress:uuid:
                37363836-3239-4d32-3233-313430315759
Host ID       : 363836373932324d3233313430315759
WWPN          : 21:00:00:24:ff:8f:d8:67
WWNN          : 20:00:00:24:ff:8f:d8:67
Link          : D-Port
=======================================================
    1:  Data Patterns
    2:  Data Size
    3:  Number Of Tests
    4:  Test Increments
    5:  Test Option
    6:  Enable/Disable Device(s)
```

Start (-kr)

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 2. Read Write Buffer Test ▸ <port selection> ▸ 4. Start

From the Read Write Buffer Test menu, select the **Start** option to run the read write buffer test.

Transceiver Diagnostics Monitoring Interface (DMI)

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 3. Transceiver Diagnostics Monitoring Interface (DMI)

From the FC Adapter Diagnostics menu, select the **Transceiver Diagnostics Monitoring Interface (DMI)** option. From the port menu, select an adapter port to open the Transceiver Diagnostics Monitoring Interface (DMI) menu with options to view general and detailed transceiver information. For example:

```
QConvergeConsoleCLI

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Transceiver Diagnostics Monitoring Interface (DMI)
```

```
1: HBA Model: QLE2740
Port 1 WWPN: 21:00:00:24:ff:00:28:b3 Online (FEC)
2: HBA Model: QLE2872

Port 1 WWPN: 21:00:f4:c7:aa:01:bc:3a Online
Port 2 WWPN: 20:00:f4:c7:aa:01:bc:3b Online
3: HBA Model: QLE2662
Port 1 WWPN: 20:01:00:0e:1e:12:32:b0 SFP not present
Port 2 WWPN: 20:01:00:0e:1e:12:32:b1 Online
(p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
Please Enter Selection: 2
Update menu


QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    Transceiver Diagnostics Monitoring Interface (DMI)

=======================================================
            HBA : 4 Port: 1
            SN : AFD1911Y07032
            HBA Model : QLE2770
            HBA Desc. : QLogic QLE2770 1x32Gb QLE2770 FC HBA
            FW Version : 9.10.11
            WWPN : 21:00:34:80:0d:3b:89:23
            WWNN : 20:00:34:80:0d:3b:89:23
            Host NQN : nqn.2014-08.org.nvmexpress:uuid:
            4c4c4544-0047-5110-8034-c7c04f514432
            Host ID : 44454c4c470010518034c7c04f514432
            Link : Online (FEC)
=======================================================
    1:  SFP Module General
    2:  SFP Module Details
    3:  Raw Binary Dump to Screen
    4:  Raw Binary Dump to a File
    5:  Raw Text Dump to a File
```

```
        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection:


        Please Enter Selection: 1

    Transceiver Diagnostics Monitoring Interface (DMI)

=======================================================
HBA            : 2 Port: 1
SN             : AFD1915Y07266
HBA Model      : QLE2872
HBA Desc.      : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version     : 9.09.00
WWPN           : 21:00:f4:c7:aa:01:bc:3a
WWNN           : 20:00:f4:c7:aa:01:bc:3a
Host NQN       : nqn.2014-08.org.nvmexpress:uuid:
                 37363836-3239-4d32-3233-313430315759
Host ID        : 363836373932324d3233313430315759
Link           : Online (FEC)
=======================================================
            1:  SFP Module General
            2:  SFP Module Details
            3:  Raw Binary Dump to Screen
            4:  Raw Binary Dump to a File
            5:  Raw Text Dump to a File

QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    Transceiver Diagnostics Monitoring Interface (DMI)

            =======================================================
            HBA               : 4 Port: 1
            SN                : AFD1911Y07032
            HBA Model         : QLE2770
            HBA Desc.         : QLogic QLE2770 1x32Gb QLE2770 FC HBA
```

```
            FW Version        : 9.10.11
            WWPN              : 21:00:34:80:0d:3b:89:23
            WWNN              : 20:00:34:80:0d:3b:89:23
            Host NQN          : nqn.2014-08.org.nvmexpress:uuid:
                                4c4c4544-0047-5110-8034-c7c04f514432
            Host ID           : 44454c4c470010518034c7c04f514432
            Link              : Online (FEC)

=======================================================

    1:  SFP Module General
    2:  SFP Module Details
    3:  Raw Binary Dump to Screen
    4:  Raw Binary Dump to a File
    5:  Raw Text Dump to a File


        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 3

          00 01 02 03 04 05 06 07 08 09 0a 0b 0c 0d 0e 0f
00000000  03 04 07 00 00 00 00 40 40 04 2a 08 ff 10 00 00  .......@@.*.....
00000010  00 00 0a 07 57 54 44 20 20 20 20 20 20 20 20 20  ....WTD
00000020  20 20 20 20 00 00 1c ad 52 54 58 4d 35 32 30 2d      ....RTXM520-
00000030  35 37 31 2d 43 2d 51 4d 31 2e 30 20 03 52 01 28  571-C-QM1.0 .R.(
00000040  0a 3a 73 38 4d 48 32 32 35 33 30 30 31 32 30 34  .:s8MH2253001204
00000050  37 34 20 20 32 33 30 31 30 34 20 20 68 fa 09 f7  74  230104  h...
00000060  51 4c 6f 67 69 63 00 00 00 00 00 00 00 00 00 00  QLogic..........
00000070  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ................
00000080  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ................
00000090  00 00 00 00 00 00 0b 00 00 00 00 00 00 00 00 00  ................
000000a0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ................
000000b0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ................
000000c0  00 00 00 00 00 00 08 00 00 00 00 00 00 00 00 00  ................
000000d0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ................
000000e0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ................
000000f0  00 00 00 00 00 00 00 00 00 00 0b 5a 63 48 00 00  ...........ZcH..
00000100  4b 00 fb 00 46 00 00 00 8d cc 74 04 87 5a 7a 76  K...F.....t..Zzv
00000110  17 70 05 dc 15 e0 07 08 7b 87 02 5b 62 20 05 ea  .p......{..[b ..
00000120  7b 87 01 2e 3d e9 02 f7 00 00 00 00 00 00 00 00  {...=...........
```

```
00000130  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ................
00000140  00 00 00 00 3f 80 00 00 00 00 00 00 01 00 00 00  ....?...........
00000150  01 00 00 00 01 00 00 00 01 00 00 00 00 00 00 7d  ...............}
00000160  3b fd 81 4e 0a 8c 1f 1d 17 29 00 00 00 00 00 00  ;..N.....)......
00000170  00 00 00 00 00 00 01 00 00 00 00 00 00 00 00 00  ................
00000180  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ................
00000190  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ................
000001a0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ................
000001b0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ................
000001c0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ................
000001d0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ................
000001e0  00 00 fc 28 00 00 00 00 00 00 00 00 00 00 00 00  ...(............
000001f0  30 00 00 00 ab 00 00 00 00 00 00 00 00 00 00 00  0...............
000200

        Press <Enter> to continue:


QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    Transceiver Diagnostics Monitoring Interface (DMI)

            ========================================================
            HBA               : 4 Port: 1
            SN                : AFD1911Y07032
            HBA Model         : QLE2770
            HBA Desc.         : QLogic QLE2770 1x32Gb QLE2770 FC HBA
            FW Version        : 9.10.11
            WWPN              : 21:00:34:80:0d:3b:89:23
            WWNN              : 20:00:34:80:0d:3b:89:23
            Host NQN          : nqn.2014-08.org.nvmexpress:uuid:
                                4c4c4544-0047-5110-8034-c7c04f514432
            Host ID           : 44454c4c470010518034c7c04f514432
            Link              : Online (FEC)
========================================================

    1:  SFP Module General
    2:  SFP Module Details
    3:  Raw Binary Dump to Screen
```

```
    4:  Raw Binary Dump to a File
    5:  Raw Text Dump to a File


        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 4

Enter file name or Hit <Enter> to abort: sfpdata.bin


QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    Transceiver Diagnostics Monitoring Interface (DMI)

            ========================================================
            HBA               : 4 Port: 1
            SN                : AFD1911Y07032
            HBA Model         : QLE2770
            HBA Desc.         : QLogic QLE2770 1x32Gb QLE2770 FC HBA
            FW Version        : 9.10.11
            WWPN              : 21:00:34:80:0d:3b:89:23
            WWNN              : 20:00:34:80:0d:3b:89:23
            Host NQN          : nqn.2014-08.org.nvmexpress:uuid:
                                4c4c4544-0047-5110-8034-c7c04f514432
            Host ID           : 44454c4c470010518034c7c04f514432
            Link              : Online (FEC)
========================================================

    1:  SFP Module General
    2:  SFP Module Details
    3:  Raw Binary Dump to Screen
    4:  Raw Binary Dump to a File
    5:  Raw Text Dump to a File


        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 5

Enter file name or Hit <Enter> to abort: sfpdata.txt
```

General (-dm)

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 3. Transceiver Diagnostics Monitoring Interface (DMI) ▸ <port selection> ▸ 1. General

From the Transceiver Diagnostics Monitoring Interface menu, select the **General** option to view general transceiver diagnostic information.

Following is an example output for an Avago® transceiver:

```
-------------------------------------------------------------------------------
HBA Instance 4: QLE2770 Port 1 WWPN 21:00:34:80:0d:3b:89:23 PortID 02:0f:00
Link: Online (FEC)
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
Media Information
-------------------------------------------------------------------------------
                      Vendor: FINISAR CORP.
                   Connector: LC (Lucent Connector)
                  Media Type: 3200-M5-SN-S
                 Part Number: FTLF8532P4BCV-QL
                       Speed: 3200 MBytes/Sec 1600 MBytes/Sec 800 MBytes/Sec
                    Revision: A
               Serial Number: UU20U6T
                  Identifier: SFP/SFP+/SFP28 and later
    Extended Compliance Codes: Unspecified
             Rate Identifier: FC-PI-6 (32/16/8G Independent Rx, Tx
Rate_Select)
         QLogic SFP Installed: Yes
-------------------------------------------------------------------------------
                Temperature   Voltage     Tx Bias    Tx Power    Rx Power
                    (C)         (V)         (mA)       (mW)        (mW)
             -------------   -------     -------    --------    --------
       Value      53.69         3.33        7.72      0.7397      0.7305
      Status     Normal       Normal      Normal      Normal      Normal
  High Alarm      75.00         3.60       12.00      1.9953      1.9953
High Warning      70.00         3.50       11.50      1.5849      1.5849
 Low Warning       0.00         3.10        2.00      0.1585      0.0158
   Low Alarm      -5.00         3.00        1.00      0.1259      0.0100
```

Following is an example output for an Accelink® WTD transceiver:

```
-------------------------------------------------------------------------------
HBA Instance 2: QLE2872 Port 1 WWPN 21:00:f4:c7:aa:01:bc:3a PortID 01:0c:00
Link: Online
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
                      Vendor: WTD
                   Connector: LC (Lucent Connector)
                  Media Type: 6400-M5-SN-S
                 Part Number: RTXM520-571-C-QM
                       Speed: 6400 MBytes/Sec 3200 MBytes/Sec
                              <Speed3200MBytesPerSec>1600 MBytes/Sec
                    Revision: 1.0
               Serial Number: RS224700310003
                  Identifier: SFP/SFP+/SFP28 and later
    Extended Compliance Codes: Unspecified
              Rate Identifier: FC-PI-7 (64/32/16G Independent Rx,
                               Tx Rate Select)
         QLogic SFP Installed: Yes
-------------------------------------------------------------------------------
                Temperature   Voltage     Tx Bias    Tx Power    Rx Power
                    (C)         (V)         (mA)       (mW)        (mW)
             --------------   -------     -------    --------    --------
        Value      59.84         3.31        6.80      0.8814      0.8015
       Status     Normal       Normal      Normal      Normal      Normal
   High Alarm      75.00         3.63       12.00      3.1623      3.1623
High Warning      70.00         3.46       11.20      2.5120      1.5849
  Low Warning       0.00         3.13        3.60      0.1514      0.0759
    Low Alarm      -5.00         2.97        3.00      0.0603      0.0302
```

Details (-dm)

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 3. Transceiver Diagnostics Monitoring Interface (DMI) ▸ <port selection> ▸ 2. Details

From the Transceiver Diagnostics Monitoring Interface menu, select the **Details** option to view general transceiver diagnostic information. In the following example, the output is truncated to save space:

```
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
HBA Instance 4: QLE2770 Port 1 WWPN 21:00:34:80:0d:3b:89:23 PortID 02:0f:00
Link: Online (FEC)
-------------------------------------------------------------------------------
--
Optical Transceiver Digital Diagnostic Data:

Address A0
                    Identifier: SFP/SFP+/SFP28 and later
          Extended Identifier: GBIC/SFP defined by serial ID only
                     Connector: LC (Lucent Connector)
                Ethernet Speed:
                    Compliance: 0x00 0x00 0x00
                FC Link Length: Short Distance (S)
            FC Transmitter Tech: Shortwave Laser w/o OFC (SN)
         FC Transmission Media: Multi-mode 50m (M5)
                      FC Speed: 3200 MBytes/Sec 1600 MBytes/Sec 800 MBytes/Sec
                      Encoding: 64B/66B
                   BR, Nominal: 0xff
               Rate Identifier: FC-PI-6 (32/16/8G Independent Rx, Tx
Rate_Select)
             Length (9um) - km: 0x00
                  Length (9um): 0x00
              Length (50um,OM2): 0x03
           Length (62.5um,OM1): 0x00
      Length (50um,OM4,Copper): 0x0a
      Length (50um,OM3,Copper): 0x07
                   Vendor name: FINISAR CORP.
     Extended Compliance Codes: Unspecified
                    Vendor OUI: 0x00 0x90 0x65
                     Vendor PN: FTLF8532P4BCV-QL
                    Vendor Rev: A
                   Wave Length: 0x0352
```

```
                    FC Speed 2: 0x0
                       CC_BASE: 0x1f
 Optional Transceiver Signals:  -Linear Receiver Output Implemented: 0x0
                                -Power Level Declaration: 0x0
                                -Cooled Transceiver Declaration: 0x0
                                -Retimer or CDR indicator: 0x1
                                -Paging implemented indicator: 0x0
                                -High Power Level Declaration by bit 1: 0x0
                               -High Power Level Declaration by bits 1 and 5: 0x0
                                -Reserved: 0x0
                                -Signal Loss, as defined in SSFF-8419: 0x1
                                -Signal Loss, inverted from SFP MSA: 0x0
                                -TX_FAULT signal implemented: 0x1
                                -TX_DISABLE implemented & disables serial o/p:
0x1
                                -RATE_SELECT implemented: 0x1
                                -Tunable transmitter technology: 0x0
                                -Receiver decision threshold implemented: 0x0
            Signaling Rate Max: 0x70
            Signaling Rate Min: 0x00
                     Vendor SN: UU20U6T
                     Date code: 150729
         Diag Monitoring Type:  -Address change required: 0x0
                                -Power Measurement: 0x1
                                -Externally Calibrated: 0x0
                                -Internally Calibrated: 0x1
                                -Digital diag monitoring: 0x1
                                -Legacy diagnostic: 0x0
             Enhanced Options:  -Optional Soft Rate Select ctrl per SFF-8431:
0x1
                               -Optional Application Select ctrl per SFF-8079:
0x0
                               -Optional Soft RATE_SELECT ctrl & monitoring: 0x1
                                -Optional Soft RX_LOS monitoring: 0x1
                                -Optional Soft TX_FAULT monitoring: 0x1
                               -Optional Soft TX_DISABLE ctrl & monitoring: 0x1
                                -Optional Alarm/warning flags: 0x1
          SFF-8472 Compliance: Includes functionality described in Rev 12.4 of
SFF-8472
                       CC_EXT: 0xa0
```

```
              Vendor Specific: 0x51 0x4c 0x6f 0x67 0x69 0x63 0x00 0x00
                               0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
                               0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
                               0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
          SFP Firmware Version: 0x00 0x00
          MCU Firmware Version: 0x00 0x00
          DSP Firmware Version: 0x00 0x00 0x00

Address A2
               Temp High Alarm: 0x4b00
                Temp Low Alarm: 0xfb00
              Temp High Warning: 0x4600
               Temp Low Warning: 0x0000
            Voltage High Alarm: 0x8ca0
             Voltage Low Alarm: 0x7530
          Voltage High Warning: 0x88b8
           Voltage Low Warning: 0x7918
              Bias High Alarm: 0x1770
               Bias Low Alarm: 0x01f4
            Bias High Warning: 0x1676
             Bias Low Warning: 0x03e8
    TX Signal Power High Alarm: 0x4df1
     TX Signal Power Low Alarm: 0x04eb
  TX Signal Power High Warning: 0x3de9
   TX Signal Power Low Warning: 0x0631
    RX Signal Power High Alarm: 0x4df1
     RX Signal Power Low Alarm: 0x0064
  RX Signal Power High Warning: 0x3de9
   RX Signal Power Low Warning: 0x009e
                    Rx_PWR(4): 0x00000000
                    Rx_PWR(3): 0x00000000
                    Rx_PWR(2): 0x00000000
                    Rx_PWR(1): 0x3f800000
                    Rx_PWR(0): 0x00000000
                  Tx_I(Slope): 0x0001
                 Tx_I(Offset): 0x0000
                Tx_PWR(Slope): 0x0001
               Tx_PWR(Offset): 0x0000
                     T(Slope): 0x0001
```

```
                T(Offset): 0x0000
                 V(Slope): 0x0001
                V(Offset): 0x0000
                 Checksum: 0xd4
          Temperature MSB: 0x34
          Temperature LSB: 0x74
                  Vcc MSB: 0x81
                  Vcc LSB: 0xf1
              TX Bias MSB: 0x0f
              TX Bias LSB: 0x34
             TX Power MSB: 0x1c
             TX Power LSB: 0xec
             RX Power MSB: 0x1c
             RX Power LSB: 0xc9
             Reserved MSB: 0x00
             Reserved LSB: 0x00
             Reserved MSB: 0x00
             Reserved LSB: 0x00
Status / Control Bits:  -Data_Ready_Bar: 0x0
                        -LOS: 0x0
                        -TX Fault: 0x0
                        -Soft RX Rate Select: 0x0
                        -RX Rate Select State: 0x1
                        -Soft TX Disable: 0x0
                        -TX Disable State: 0x0
                        -EWRAP Control Bit: 0x0
                        -EWRAP FORWARD Control Bit: 0x0
                        -OWRAP Control Bit: 0x0
                        -OWRAP FORWARD Control Bit: 0x0
                        -TX Signal Power Low Alarm: 0x0
                        -TX Signal Power High Alarm: 0x0
                        -TX Bias Low Alarm: 0x0
                        -TX Bias High Alarm: 0x0
                        -Vcc Low Alarm: 0x0
                        -Vcc High Alarm: 0x0
                        -Temp Low Alarm: 0x0
                        -Temp High Alarm: 0x0
                        -RX Signal Power Low Alarm: 0x0
                        -RX Signal Power High Alarm: 0x0
```

```
                                -TX Signal Power Low Warning: 0x0
                                -TX Signal Power High Warning: 0x0
                                -TX Bias Low Warning: 0x0
                                -TX Bias High Warning: 0x0
                                -Vcc Low Warning: 0x0
                                -Vcc High Warning: 0x0
                                -Temp Low Warning: 0x0
                                -Temp High Warning: 0x0
                                -Reserved Warning: 0x0
                                -Reserved Warning: 0x0
                                -Reserved Warning: 0x0
                                -Reserved Warning: 0x0
                                -Reserved Warning: 0x0
                                -Reserved Warning: 0x0
                                -RX Power Low Warning: 0x0
                                -RX Power High Warning: 0x0
      Extended Module Control:  -Optional Power Level Select: 0x0
                                -Optional Power Level Operation State: 0x0
                                -Power Level 4 Enable: 0x0
                                -Soft RS(1) Select: 0x0
                                -Adaptive Input EQ Fail Flag: 0x0
                                -Reserved: 0x0
                                -Reserved: 0x0
                                -Reserved: 0x0
        Extended Status Bytes:  -Optional Tx CDR Unlocked: 0x0
                                -64GFC Mode: 0x0
                                -PAM4 Mode Rx Configured: 0x0
                                -PAM4 Mode Tx Configured: 0x0
                                -Reserved: 0x0
                                -Reserved: 0x0
                                -Reserved: 0x0
                Vendor Specific: 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x01
      TP1 to TP4 EWRAP Control  -EWRAP Disable: 0x0
                                -EWRAP Enable: 0x0
      TP3 to TP2 OWRAP Control  -OWRAP Disable: 0x0
                                -OWRAP Enable: 0x0
 Electrical Output Tx Tap Pre3: 0x00
 Electrical Output Tx Tap Pre2: 0x00
 Electrical Output Tx Tap Pre1: 0x00
```

```
 Electrical Output Tx Tap Main: 0x00
Electrical Output Tx Tap Post1: 0x00
     DSP Status Timing Control: 0x00
                   DSP Control: 0x00
            FC 64G Mode Control: 0x00
                   LSN Control  -Train 64G: 0x0
                                -Train 32G: 0x0
                                -Fixed Speed Switch to 64G: 0x0
                                -Reserved: 0x0
                                -Reserved: 0x0
                                -Reserved: 0x0
                                -Client Rx Adaptation Reset: 0x0
                                -LSN Mode: 0x0
           CDR Firmware Version: 0x00 0x00 0x00
                  Laser Version: 0x00
                    TIA Version: 0x00
                    CDR Version: 0x00
                     HW Version: 0x00
                    MCU Version: 0x00
                PLP API Version: 0x00
              Debug MCU Version: 0x00
```

Following is an example output for an Avago® transceiver:

```
-------------------------------------------------------------------------------
HBA Instance 2: QLE2872 Port 1 WWPN 21:00:f4:c7:aa:01:bc:3a PortID 01:0c:00
Link: Online (FEC)
-------------------------------------------------------------------------------
Optical Transceiver Digital Diagnostic Data:

Address A0
                     Identifier: SFP/SFP+/SFP28 and later
             Extended Identifier: GBIC/SFP defined by serial ID only
                      Connector: LC (Lucent Connector)
                 Ethernet Speed:
                     Compliance: 0x00 0x00 0x00
                 FC Link Length: Intermediate Distance (I) Short Distance (S)
             FC Transmitter Tech: Shortwave Laser w/o OFC (SN)
```

```
          FC Transmission Media: Multi-mode 50m (M5)
                      FC Speed: 3200 MBytes/Sec 1600 MBytes/Sec
                      Encoding: PAM4
                    BR, Nominal: 0xff
                Rate Identifier: FC-PI-7 (64/32/16G Independent Rx,
                                 Tx Rate Select)
              Length (9um) - km: 0x00
                   Length (9um): 0x00
              Length (50um,OM2): 0x00
            Length (62.5um,OM1): 0x00
         Length (50um,OM4,Copper): 0x0a
         Length (50um,OM3,Copper): 0x07
                  Vendor name: AVAGO
       Extended Compliance Codes: 64GFC (FC-PI-7)
                   Vendor OUI: 0x00 0x17 0x6a
                    Vendor PN: AFBR-57H5MZ
                   Vendor Rev: 0
                  Wave Length: 0x0352
                   FC Speed 2: 0x0
                      CC_BASE: 0x20
Optional Transceiver Signals:  -Linear Receiver Output Implemented: 0x0
                               -Power Level Declaration: 0x0
                               -Cooled Transceiver Declaration: 0x0
                               -Retimer or CDR indicator: 0x1
                               -Paging implemented indicator: 0x0
                               -High Power Level Declaration by bit 1: 0x1
                             -High Power Level Declaration by bits 1 and 5: 0x0
                               -Reserved: 0x0
                               -Signal Loss, as defined in SSFF-8419: 0x1
                               -Signal Loss, inverted from SFP MSA: 0x0
                               -TX_FAULT signal implemented: 0x1
                               -TX_DISABLE implemented & disables serial
                                o/p: 0x1
                               -RATE_SELECT implemented: 0x1
                               -Tunable transmitter technology: 0x0
                               -Receiver decision threshold implemented: 0x0
             .
             .
             .
                     Laser Version: 0x01
```

```
                TIA Version: 0x01
                CDR Version: 0x01
                 HW Version: 0x02
                MCU Version: 0x16
            PLP API Version: 0x33
          Debug MCU Version: 0x16
```

Port Beacon (-a)

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 4. Port Beacon

From the FC Adapter Diagnostics menu, select the **Port Beacon** option. From the port menu, select an adapter port to open the Beacon Test menu with options to Check, Blink, and Unblink.

FCE Trace (-trace)

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 5. FCE Trace

NOTE

The FCE Trace command supports both Cisco and Brocade switches.

From the FC Adapter Diagnostics menu, select the **FCE Trace** option and then select an adapter port. At the prompt, type a file name with which to save the trace information. For example:

```
QConvergeConsoleCLI
CLI - Version 3.0.x (Build xx)

FCE Trace

1: HBA Model: QLE2740
Port 1 WWPN: 21:00:00:24:ff:00:28:b3 Online (FEC)
2: HBA Model: QLE2872
Port 1 WWPN: 21:00:f4:c7:aa:01:bc:3a Online
Port 2 WWPN: 20:00:f4:c7:aa:01:bc:3b Online
3: HBA Model: QLE2662
Port 1 WWPN: 20:01:00:0e:1e:12:32:b0 SFP not present
Port 2 WWPN: 20:01:00:0e:1e:12:32:b1 Online
(p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
Please Enter Selection: 2
```

```
Enter File Name to Save: FCE_Trace.log

Diagnostics - FCE Trace Result
----------------------------------------
FCE trace of HBA instance 1 (QLE2872) has been saved successfully
as FCE_Trace.log

Hit <Enter> to continue:
```

Device Ping Test (-fcp)

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 6. Device Ping Test

From the FC Adapter Diagnostics menu, select the **Device Ping Test** option, and then select an adapter port. The FC Ping Test menu opens and lists options to view, reset, and configure ping test parameters, and to start the ping test.

```
FC Adapter Diagnostics
HBA Model QLE2872 SN: AFD1915Y07266
1: Port 1: WWPN: 21:00:f4:c7:aa:01:bc:3a Online
2: Port 2: WWPN: 21:00:f4:c7:aa:01:bc:3b Online

FC Ping Test

=======================================================
HBA : 2 Port: 1
SN : AFD1915Y07266
HBA Model : QLE2872
HBA Desc. : QLogic QLE2872 64Gb 2-port Fibre Channel
Adapter
FW Version : 9.09.00
WWPN : 21:00:f4:c7:aa:01:bc:3a
WWNN : 20:00:f4:c7:aa:01:bc:3a
Host NQN :
nqn.2014-08.org.nvmexpress:uuid:37363836-3239-4d32-3233-313430315759
Host ID : 363836373932324d3233313430315759
Link : Online (FEC)
=======================================================
    1:  Display Settings
    2:  Restore Default Settings
    3:  Change Settings
```

```
    4:  Start
```

Display Settings

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 6. Device Ping Test ▸ <port selection> ▸ 1. Display Settings

From the Device Ping Test menu, select the **Display Settings** option to view the ping test parameters. For example:

```
-------------------------------------------------------------------------------
HBA Instance 1: QLE2872 Port 2 WWPN 21:00:34:80:0d:61:4b:11 PortID 01:0c:00
Link: Online
-------------------------------------------------------------------------------

--------------------
Diagnostics Settings
--------------------
Diagnostic Mode          : FC Ping
Number of tests (1-10000): 10
Test Increment(1-10000)  : 1
Abort On Error           : Ignore
Test Continuous          : OFF
```

Restore Default Settings

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 6. Device Ping Test ▸ <port selection> ▸ 2. Restore Default Settings

From the FC Ping Test menu, select the **Restore Default Settings** to reset the ping test parameters to their default values.

Change Settings

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 6. Device Ping Test ▸ <port selection> ▸ 3. Change Settings

From the FC Ping Test menu, select the **Change Settings** option to open the **FC Ping Test** menu. The FC Ping Test menu lists options to configure the quantity of tests and test increments, set abort on error, and enable or disable devices. For detailed information about these parameters, see Table 5-3 on page 30.

Following is an example output:

```
  Device Ping Test

=======================================================
HBA : 2 Port: 1
SN : AFD1915Y07266
HBA Model : QLE2772
HBA Desc. : QLE2772 2x32Gb QLE2772 FC HBA
```

```
FW Version : 9.09.00
WWPN : 21:00:f4:c7:aa:01:bc:3a
WWNN : 20:00:f4:c7:aa:01:bc:3a
Host NQN : nqn.2014-08.org.nvmexpress:uuid:
37363836-3239-4d32-3233-313430315759
Host ID : 363836373932324d3233313430315759
Link : Online
=======================================================
    1:  Maximum Number Of Test(s)
    2:  Number of Increments
    3:  Test Option
    4:  Enable/Disable Device(s)
```

Start

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 6. Device Ping Test ▸ <port selection> ▸ 4. Start

From the Device Ping Test menu, select the **Start** option to run the ping test. For example:

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    Device Ping Test

=======================================================
=======================================================
            HBA : 4 Port: 1
            SN : AFD1911Y07032
            HBA Model : QLE2770
            HBA Desc. : QLogic QLE2770 1x32Gb QLE2770 FC HBA
            FW Version : 9.10.11
            WWPN : 21:00:34:80:0d:3b:89:23
            WWNN : 20:00:34:80:0d:3b:89:23
            Host NQN : nqn.2014-08.org.nvmexpress:uuid:
            4c4c4544-0047-5110-8034-c7c04f514432
            Host ID : 44454c4c470010518034c7c04f514432
            Link : Online (FEC)
=======================================================
=======================================================
    1:  Display Settings
```

```
    2:  Restore Default Settings
    3:  Change Settings
    4:  Start


        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 4
-------------------------------------------------
Diagnostics Test Configuration
-------------------------------------------------
Diagnostic Mode          : FC Ping
Number of tests (1-10000): 10
Number of Pass           : 1
Test Increment(1-10000)  : 1
Abort On Error           : Ignore
Test Continuous          : OFF
-------------------------------------------------------------------------------
--
--------- ---------- ---------- ---------- ---------- ----------
---------------------
    ID    Data       Link       Sync       Signal     Invalid    Diagnostics
Port/Loop Miscompare Failure    Loss       Loss       CRC        Status
--------- ---------- ---------- ---------- ---------- ----------
---------------------
01-29-05          0          0          0          0          0 10 replies in 3 ms
01-29-04          0          0          0          0          0 10 replies in 3 ms
```

CT Ping Test (-ctp)

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 7. CT Ping Test

From the FC Adapter Diagnostics menu, select the **CT Ping Test** option, and then select an adapter port. The CT Ping Test menu opens and lists options to view, reset, and configure common transport (CT) ping test parameters, and to start the CT ping test.

NOTE

The CT Ping Test option is supported on all Brocade switches and some Cisco switches. In the Cisco switches, the common transport (CT) feature must be enabled by the user (it is disabled by default). See the Cisco switch documentation for more information.

For example:

```
FC Adapter Diagnostics

HBA Model QLE8362 SN: 1234A00-1234567891
1: Port   1: WWPN: 21:00:00:0e:1e:08:f3:10 SFP not installed
2: Port   2: WWPN: 21:00:00:0e:1e:08:f3:11 Online

(p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
Please Enter Selection: 2

CT Ping Test
=====================================================
            HBA : 4 Port: 1
            SN : AFD1911Y07032
            HBA Model : QLE2770
            HBA Desc. : QLogic QLE2770 1x32Gb QLE2770 FC HBA
            FW Version : 9.10.11
            WWPN : 21:00:34:80:0d:3b:89:23
            WWNN : 20:00:34:80:0d:3b:89:23
            Host NQN : nqn.2014-08.org.nvmexpress:uuid:
            4c4c4544-0047-5110-8034-c7c04f514432
            Host ID : 44454c4c470010518034c7c04f514432
            Link : Online (FEC)
=====================================================
    1:  Display Settings
    2:  Restore Default Settings
    3:  Change Settings
    4:  Start
```

Display Settings

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 7. CT Ping Test ▸ 1. Display Settings

From the CT Ping Test menu, select the **Display Settings** option to view the parameters for the CT ping test. For example:

```
-------------------------------------------------------------------------------
HBA Instance 1: QLE2872 Port 2 WWPN 21:00:34:80:0d:61:4b:11 PortID 01:0c:00
Link: Online
-------------------------------------------------------------------------------
Diagnostics Settings
```

```
----------------------------
Diagnostic Mode           : CT Ping
Number of tests (1-10000) : 10
Test Increment(1-10000)   : 1
Abort On Error            : Ignore
Test Continuous           : OFF
--------------------------------------------------------------------------------
```

Restore Default Settings

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 7. CT Ping Test ▸ 2. Restore Default Settings

From the CT Ping Test menu, select the **Restore Default Settings** option to reset the CT ping test parameters to the default values.

Change Settings

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 7. CT Ping Test ▸ 3. Change Settings

From the CT Ping Test menu, select the **Change Settings** option to open the CT Ping Test submenu. The CT Ping Test menu lists options to configure the quantity of tests and test increments, set abort on error, and enable or disable devices. For detailed information about these parameters, see Table 5-3 on page 30.

Following is an example output.

```
=====================================================
HBA : 2 Port: 1
SN : AFD1915Y07266
HBA Model : QLE2872
HBA Desc. : QLogic QLE2872 64Gb 2-port Fibre Channel
Adapter
FW Version : 9.09.00
WWPN : 21:00:f4:c7:aa:01:bc:3a
WWNN : 20:00:f4:c7:aa:01:bc:3a
Host NQN : nqn.2014-08.org.nvmexpress:uuid:
37363836-3239-4d32-3233-313430315759
Host ID : 363836373932324d3233313430315759
Link : Online (FEC)
            ======================================================


=====================================================
    1:  Maximum Number Of Tests
    2:  Number of Increments
    3:  Test Option
```

```
    4:  Enable/Disable Device(s)
```

Start

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 7. CT Ping Test ▸ 4. Start

From the CT Ping Test menu, select the **Start** option to run the CT ping test. For example:

```
-------------------------------------------------
Diagnostics Test Configuration
-------------------------------------------------
Diagnostic Mode          : CT Ping
Number of tests (1-10000): 10
Number of Pass           : 1
Test Increment(1-10000)  : 1
Abort On Error           : Ignore
Test Continuous          : OFF
-------------------------------------------------------------------------------
---------  ----------  ----------  ----------  ----------  ----------
 ---------------------
    ID     Data         Link       Sync        Signal      Invalid
    Diagnostics
Port/Loop  Miscompare  Failure     Loss        Loss        CRC         Status
---------  ----------  ----------  ----------  ----------  ----------
 ---------------------
07-28-00            0           0           0           0           0  Success
07-29-00            0           0           0           0           0  Success
07-2A-00            0           0           0           0           0  Success
07-2B-00            0           0           0           0           0  Success
```

CT FTR Test (-ftr)

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 8. CT FTR Test

QConvergeConsole CLI supports common transport (CT) Fibre Channel trace route (FTR) testing. The CT FTR test traces the route to each device attached to the port.

NOTE

All inner-link switches between the initiator and the target must have Brocade switch firmware version 7.1.1 or later for the CT FTR test to work. For best results, Marvell highly recommends using HP P2000G3 or Promise® VTrak E610f as a target. To confirm if your target is supported, contact Marvell Support.

From the FC Adapter Diagnostics menu, select the **CT FTR Test** option, and then select an adapter port. The CT FTR Test menu opens and lists options to view, reset, and configure CT FTR test parameters, and to start the CT FTR test. For example:

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    CT FTR Test
=======================================================
=======================================================
HBA           : 4 Port: 1
SN            : AFD1915Y07299
HBA Model     : QLE2772
HBA Desc.     : QLogic QLE2772 2x32Gb QLE2772 FC HBA
FW Version    : 9.06.02
WWPN          : 21:00:f4:e9:d4:54:ab:12
WWNN          : 20:00:f4:e9:d4:54:ab:12
Host NQN      : nqn.2014-08.org.nvmexpress:uuid:
                37363836-3239-4d32-3233-313430315759
Host ID       : 363836373932324d3233313430315759
Link          : Online (FEC)
=======================================================
    1:  Display Settings
    2:  Restore Default Settings
    3:  Change Settings
    4:  Start
```

Display Settings

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 8. CT FTR Test ▸ 1. Display Settings

From the CT FTR Test menu, select the **Display Settings** option to view the CT FTR test parameters. For example:

```
-------------------------------------------------------------------------------
HBA Instance 1: QLE2872 Port 2 WWPN 21:00:34:80:0d:61:4b:11 PortID 01:0c:00
Link: Online
-------------------------------------------------------------------------------
---------------------------
Diagnostics Settings
---------------------------
Diagnostic Mode          : CT FTR
Number of tests (1-10000): 10
Test Increment(1-10000)  : 1
Abort On Error           : Ignore
Test Continuous          : OFF
-------------------------------------------------------------------------------
```

Restore Default Settings

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 8. CT FTR Test ▸ 2. Restore Default Settings

From the CT FTR Test menu, select the **Restore Default Settings** option to reset the CT FTR test parameters to the default values.

Change Settings

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 8. CT FTR Test ▸ 3. Change Settings

From the CT FTR Test menu, select the **Change Settings** option to open the CT FTR Test submenu. The CT FTR Test menu lists options to configure the quantity of tests and test increments, set abort on error, and enable or disable devices. For detailed information about these parameters, see Table 5-3 on page 30.

Following is an example output.

```
=====================================================
HBA : 2 Port: 1
SN : AFD1915Y07266
HBA Model : QLE2872
HBA Desc. : QLogic QLE2872 64Gb 2-port Fibre Channel
Adapter
FW Version : 9.09.00
WWPN : 21:00:f4:c7:aa:01:bc:3a
WWNN : 20:00:f4:c7:aa:01:bc:3a
```

```
Host NQN :
nqn.2014-08.org.nvmexpress:uuid:37363836-3239-4d32-3233-313430315759
Host ID : 363836373932324d3233313430315759
Link : Online (FEC)
=====================================================
    1:  Maximum Number Of Tests
    2:  Number of Increments
    3:  Test Option
    4:  Enable/Disable Device(s)
```

Start

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 8. CT FTR Test ▸ 4. Start

From the CT FTR Test menu, select the **Start** option to run the CT FTR test. For example:

```
-------------------------------------------------
Diagnostics Test Configuration
-------------------------------------------------
Diagnostic Mode          : CT FTR
Number of tests (1-10000): 10
Number of Pass           : 1
Test Increment(1-10000)  : 1
Abort On Error           : Ignore
Test Continuous          : OFF
-------------------------------------------------------------------------------
--------- ---------- ---------- ---------- ---------- ---------- -------------
    ID    Data       Link       Sync       Signal     Invalid    Diagnostics
Port/Loop Miscompare Failure    Loss       Loss       CRC        Status
--------- ---------- ---------- ---------- ---------- ---------- -------------
01-29-05           0          0          0          0          0 Success
01-29-04           0          0          0          0          0 Success
```

Link Status (-ls)

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 9. Link Status

From the FC Adapter Diagnostics menu, select the **Link Status** option, and then select an adapter port. The Link Status Menu opens and lists options to view, configure, reset, and run port link status counters. For example:

```
Link Status

=======================================================
HBA             : 2 Port: 1
SN              : AFD1915Y07266
HBA Model       : QLE2872
HBA Desc.       : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version      : 9.08.02
WWPN            : 21:00:f4:c7:aa:01:bc:3a
WWNN            : 20:00:f4:c7:aa:01:bc:3a
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online
=======================================================

    1:  Display Settings
    2:  Change Settings
    3:  Reset Counters
    4:  Start
```

Display Settings

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 9. Link Status ▸ 1. Display Settings

From the FC Adapter Diagnostics menu, select the **Display Settings** option, select an adapter port, and then select **Info** to view the current values for the AutoPoll (AP), SetRate (SR), and LogToFile (LF) settings. For example:

```
---------------------------------
Link Status Settings
---------------------------------
AutoPoll (AP): 10
SetRate (SR): 5
LogToFile (LF): N/A
```

Change Settings

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 9. Link Status ▸ 2. Change Settings

From the FC Adapter Diagnostics menu, select the **Link Status** option, select an adapter port, and then select **Change Settings** to view the Link Config menu. For example:

```
Link Status

=======================================================
HBA             : 2 Port: 1
SN              : AFD1915Y07266
HBA Model       : QLE2872
HBA Desc.       : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version      : 9.09.00
WWPN            : 21:00:f4:c7:aa:01:bc:3a
WWNN            : 20:00:f4:c7:aa:01:bc:3a
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
=======================================================

    1:  Disable AutoPoll Mode
    2:  Polling Interval Rate
    3:  Save Result as a CSV File
    4:  Restore Default Settings
```

Disable Auto Poll Mode

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 9. Link Status ▸ 2. Change Settings ▸ 1. Disable Auto Poll Mode

From the Link Status Menu, select the **Disable Auto Poll** option, and then select either **Enable Auto Poll** or **Disable Auto Poll**. The currently selected mode is indicated by `(Current)`.

Polling Interval Rate

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 9. Link Status ▸ 2. Change Settings ▸ 2. Polling Interval Rate

From the Link Status menu, select the **Polling Interval Rate** option, and specify a polling time interval value between 5 and 300 seconds; the current value is shown in brackets.

Save Result as a CSV File

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 9. Link Status ▸ 2. Change Settings ▸ 3. Save Result as a CSV File

From the Link Status menu, select the **Save Results as a CSV File** option to specify the name of a log file in which to store link statistics for the selected adapter port.

Restore Default Settings

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 9. Link Status ▸ 2. Change Settings ▸ 4. Restore Default Settings

From the Link Status menu, select the **Restore Default Settings** option to restore the default settings for link statistics for the selected adapter port.

Reset Counters

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 9. Link Status ▸ 3. Reset Counters

From the Link Status menu, select the **Link Status** option, and then select **Reset Counters** to set of the counters to zero in the firmware private statistics data. When the command completes successfully, the following firmware counters are cleared:

- Link Failure
- Sync Loss
- Signal Loss
- Invalid CRC
- Seq Proto Error
- Invalid Trans Word

Start

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 9. Link Status ▸ ▸ 4. Start

From the Link Status menu, select the **Start** option, and then select **Run** to start running a link status. Press ENTER to stop running the link status.

```
---------------------------------------
Link Status Settings
---------------------------------------
AutoPoll (AP): 10
SetRate (SR): 5
LogToFile (LF): null.csv
-------------------------------------------------------------------------------
HBA Instance 1: QLE2872 Port 2 WWPN 21:00:34:80:0d:61:4b:11 PortID 01:0c:00
Link: SFP not installed
-------------------------------------------------------------------------------
Link Status
```

```
-----------------------------------------
General keyboard shortcuts:
      R     - Reset current
      C     - Refresh current
      T     - Refresh total
      ENTER - Cancel the current task
-----------------------------------------
Port Name               Link     Sync     Signal   Invalid  Seq Proto Invalid
                        Failure  Loss     Loss     CRC      Error     Trans Word
----------------------- -------- -------- -------- -------- --------- ----------
20:01:00:09:0c:00:ff:01        0        0        0        0         0          0
-------------------------------------------------------------------------------
```

Diagnostics Port Test (-dport)

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 10. Diagnostics Port Test

From the FC Adapter Diagnostics menu, select the **Diagnostics Port Test** option, and then select a port with a link speed of 16Gbps or 32Gbps or 64Gbps. The Diagnostics Port Test menu opens and lists options to configure and run port, electrical and optical loopback, and link traffic diagnostics on the selected port.

NOTE

Currently Cisco does *not* support running diagnostics from the host server; it only supports running the diagnostics test from the switch. For details, refer to the Cisco user's guide.

Change Settings

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 10. Diagnostics Port Test ▸ 1. Change Settings

From the Diagnostics Port Test menu, select one of the following options:

```
1. Disable Diagnostics Port Mode
2. Enable Diagnostics Port Mode (Current)
```

The currently selected mode (enabled or disabled) is indicated by `(Current)`.

Start

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 10. Diagnostics Port Test ▸ 2. Start

When you select **Start**, a warning message advises that running the Diagnostics Port Test will put the port in offline mode and asks if you want to proceed. To continue, select **1: Yes**.

NOTE

Do not run dport when the switch port is configured in dport mode.

Before running diagnostics, ensure that the adapter is online by issuing the following command:

```
#qaucli -g
HBA Model QLE2740 (SN AFD1533Y02970):
= Port   1 WWPN 21:00:00:24:ff:8f:c9:e0 (HBA instance 0)
Online (FEC)
```

The following example is a test output from a Brocade switch.

```
Starting diagnostic port test of HBA 0 (QLE2740), please wait...
Start Time: Tue Jul 25 09:20:59 2017

End Time  : Tue Jul 25 09:21:21 2017

------------------------------------------------------------------------------
HBA Instance 0: QLE2872 Port 2 WWPN 21:00:34:80:0d:61:4b:11 PortID 01:0c:00
Link: Link Down
------------------------------------------------------------------------------
           HBA Port Electrical Loopback    Optical Loopback       Link Traffic
           -------- -------------------    ----------------       ------------
  Value          01                0xD2               0xD3               0xD5
 Status        0x01                0x01               0x01               0x02
  Result     Passed              Passed             Passed            Skipped
Details: 0x0

Details: 0x0
```

FC Ping Test (-fcping)

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 11. FC Ping Test

From the FC Adapter Diagnostics menu, select the **FC Ping Test** option, and then select an adapter port. The FC Ping Test menu opens and lists options to display, restore, and change ping test parameters, and to run the FC ping test. For example:

```
FC Ping Test

=======================================================
HBA             : 2 Port: 1
SN              : AFD1915Y07266
```

```
HBA Model       : QLE2872
HBA Desc.       : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version      : 9.08.02
WWPN            : 21:00:f4:c7:aa:01:bc:3a
WWNN            : 20:00:f4:c7:aa:01:bc:3a
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
=====================================================

    1:  Display Settings
    2:  Restore Default Settings
    3:  Change Settings
    4:  Start
```

Display Settings

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 11. FC Ping Test ▸ 1. Display Settings

From the FC Ping Test menu, select **Display Settings** to view the current diagnostics settings. For example:

```
-------------------------------------------------------------------------------
HBA Instance 0: QLE2872 Port 2 WWPN 21:00:34:80:0d:61:4b:11 PortID 01:0c:00
Link: Online (FEC)
-------------------------------------------------------------------------------
--------------------
Diagnostics Settings
--------------------
Diagnostic Mode           : FC Ping ELS Echo
Destination WWN           : 10:00:00:27:f8:f1:66:a0
Data Pattern              : Random (RPAT)
Data Size (Bytes)         : 8
Number of Echo Request    : 1
Wait Interval (Seconds)   : 1
Abort On Error            : Ignore
-------------------------------------------------------------------------------
```

Restore Default Settings

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 11. FC Ping Test ▸ 2. Restore Default Settings

From the FC Ping Test menu, select **Restore Default Settings** to return the FC ping test parameters to their default values.

Change Settings

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 11. FC Ping Test ▸ 3. Change Settings

From the FC Ping Test menu, select **Change Settings** to select from the following options for the ping test:

```
1:  Display Settings
2:  Destination WWN
3:  Payload Patterns
4:  Payload Size
5:  Number Of Pings
6:  Intervals
```

Start

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 11. FC Ping Test ▸ 4. Start

From the FC Ping Test menu, select **Start** to execute the ping test. For example:

```
-------------------------------------------------------------------------------
HBA Instance 0: QLE2872 Port 2 WWPN 21:00:34:80:0d:61:4b:11 PortID 01:0c:00
Link: Online (FEC)
-------------------------------------------------------------------------------
--------------------
Diagnostics Settings
--------------------
Diagnostic Mode          : FC Ping ELS Echo
Destination WWN          : 10:00:00:27:f8:f1:66:a0
Data Pattern             : CRPAT (192B)
Data Size (Bytes)        : 8
Number of Echo Request   : N/A
Wait Interval (Seconds)  : 10
Abort On Error           : Ignore
-------------------------------------------------------------------------------
---------------------- ------ ------ -------- -------- --------- -------
Destination            Ping   Frame  Frame    Response Response  Echo
WWN                    Seq.   Sent   Received Length   Time      Status
---------------------- ------ ------ -------- -------- --------- -------
```

```
10:00:00:27:f8:f1:66:a0 1      1        1       12         0.00 ms Success
----------------------- ------ ------ --------- --------- --------- -------
Destination             Ping   Frame  Frame     Response Response  Echo
WWN                     Seq.   Sent   Received Length   Time      Status
----------------------- ------ ------ --------- --------- --------- -------
10:00:00:27:f8:f1:66:a0 1      1        1       12         0.00 ms Success
----------------------- ------ ------ --------- --------- --------- -------
Destination             Ping   Frame  Frame     Response Response  Echo
WWN                     Seq.   Sent   Received Length   Time      Status
----------------------- ------ ------ --------- --------- --------- -------
10:00:00:27:f8:f1:66:a0 1      1        1       12         0.00 ms Success
----------------------- ------ ------ --------- --------- --------- -------
Destination             Ping   Frame  Frame     Response Response  Echo
WWN                     Seq.   Sent   Received Length   Time      Status
----------------------- ------ ------ --------- --------- --------- -------
10:00:00:27:f8:f1:66:a0 1      1        1       12         0.00 ms Success
----------------------- ------ ------ --------- --------- --------- -------
Destination             Ping   Frame  Frame     Response Response  Echo
WWN                     Seq.   Sent   Received Length   Time      Status
----------------------- ------ ------ --------- --------- --------- -------
10:00:00:27:f8:f1:66:a0 1      1        1       12         0.00 ms Success
----------------------- ------ ------ --------- --------- --------- -------
```

Read Diagnostics Parameters (RDP) Test (-rdp)

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 12. Read Diagnostics Parameters (RDP) Test

NOTE

RDP is supported with Cisco and Brocade switches; the output is slightly different for the Cisco and Brocade switches.

From the FC Adapter Diagnostics menu, select the **Read Diagnostics Parameters (RDP) Test** option, and then select an adapter port. The following example shows the RDP information that appears.

```
------------------------------------------------------------------------------
HBA Instance 2: QLE2872 Port 1 WWPN 21:00:f4:c7:aa:01:bc:3a PortID 01:0c:00
Link: Online (FEC)
------------------------------------------------------------------------------
Diagnostics Parameters Descriptor List Length: 332 Bytes
---------------------------------
```

```
Diagnostics Parameters Descriptor
--------------------------------
Descriptor Tag: Link Service Request Information
Descriptor Length: 4 Bytes
Descriptor Value: 0x18000000

--------------------------------
Port Speed Descriptor
--------------------------------
Descriptor Tag: Port Speed
Descriptor Length: 4 Bytes
Port Speed Capabilities: 32 16 8 4 Gbps
Port Operating Speed: 32 Gbps

--------------------------------
Link Error Status Block Descriptor
--------------------------------
Descriptor Tag: Link Error Status Block
Descriptor Length: 28 Bytes
Link Failure Count: 0
Loss Of Sync Count: 0
Loss Of Signal Count: 0
Primary Sequence Error Count: 0
Invalid Transmit Word Count: 0
Invalid CRC Count: 0
PN Port Physical Type: 0x40000000
        The sending VN_Port uses an FC-FS-3 PN_Port or PF Port

--------------------------------
Port Name Descriptor
--------------------------------
Descriptor Tag: Port Name
Descriptor Length: 16 Bytes
Node WWN: 10:00:00:27:f8:f1:66:a0
Port WWN: 20:05:00:27:f8:f1:66:a0

--------------------------------
Port Name Descriptor
--------------------------------
Descriptor Tag: Port Name
Descriptor Length: 16 Bytes
```

```
Node WWN: 20:00:00:24:ff:00:27:d5
Port WWN: 21:00:00:24:ff:00:27:d5

--------------------------------
SFP Diagnostics Param Descriptor
--------------------------------
Descriptor Tag: SFP Diagnostics
Descriptor Length: 12 Bytes
Temperature: 0x3B00 59 (C)
Vcc: 0x813B 3.31 V
Tx Bias: 0x0EF2  7.6520 mA
Tx Power: 0x1B82 0.7042 mW
Rx Power: 0x1F81 0.8065 mW
SFP Flag: 0x0051
        Port Tx Type: Short Wave Laser
        Connector Type: SFP+
        Optical Port: On
        SFP Diagnostics Parameters not valid: Off
        Connector Type: SFP+
        FEC Active: Off

--------------------------------
FEC Status Descriptor
--------------------------------
Descriptor Tag: FEC Status
Descriptor Length: 8 Bytes
Correctable Blocks: 0
UnCorreatable Blocks: 0

--------------------------------
Buffer Credits Status Descriptor
--------------------------------
Descriptor Tag: Buffer Credit
Descriptor Length: 12 Bytes
FC Port Buffer To Buffer Credits: 20
Attached FC Port Buffer To Buffer Credits: 12
Nominal FC Port RTT: 0 ns

--------------------------------
Optical Product Data Descriptor
--------------------------------
```

```
Descriptor Tag: Optical Product Data
Descriptor Length: 60 Bytes
Vendor Name: BROCADE
Part Number: 57-1000333-01
Serial Number: JAF315410000FSU
Revision:
Date: 151007

--------------------------------
Optical Element Data Descriptor
--------------------------------
Descriptor Tag: Optical Element Data
Descriptor Length: 12 Bytes
Temperature High Alarm: 0x55
Temperature High Alarm: 85.00
Temperature Low Alarm: 0xfffb
Temperature Low Alarm: -5.00
Temperature High Warning: 0x4b
Temperature High Warning: 75.00
Temperature Low Warning: 0x00
Temperature Low Warning: 0.00

-------------------------------------------------------------------------------
Media Information
-------------------------------------------------------------------------------
                        Vendor: AVAGO
                     Connector: LC (Lucent Connector)
                    Media Type: 6400-M5-SN-S
                   Part Number: AFBR-57H5MZ
                         Speed: 6400 MBytes/Sec 3200 MBytes/Sec 1600 MBytes/Sec
                      Revision: 0
                 Serial Number: VC2120H00MX
                    Identifier: SFP/SFP+/SFP28 and later
     Extended Compliance Codes: 64GFC (FC-PI-7)
               Rate Identifier: FC-PI-7 (64/32/16G Independent Rx,
                                Tx Rate Select)
          QLogic SFP Installed: No
-------------------------------------------------------------------------------
                Temperature   Voltage     Tx Bias    Tx Power    Rx Power
                    (C)         (V)         (mA)        (mW)        (mW)
```

```
              --------------    -------     -------    --------    --------
       Value      57.02           3.31        7.33      0.6803      0.9420
      Status     Normal         Normal      Normal      Normal      Normal
  High Alarm      80.00           3.63       10.00      5.0118      5.0118
High Warning      75.00           3.46        8.50      2.5118      2.5118
 Low Warning       0.00           3.13        3.00      0.1659      0.0891
   Low Alarm      -5.00           2.97        2.00      0.0831      0.0446
.
.
.
```

Monitoring

5. Monitoring ▸ 2. Fibre Channel Adapter

From the main menu, select the **Monitoring** option, and then select the adapter type (Fibre Channel Adapter). The Monitoring menu contains options for monitoring statistics for Host Bus Adapters, HBA temperature, and buffer-to-buffer credits.

Following is an example of navigating the Monitoring menu. After selecting a monitor option, you are prompted to select an adapter port, and then the Monitoring menu appears.

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

Monitoring

1: HBA Statistics
2: HBA BBC Recovery Counters
3: HBA Termperature
```


Doc. No. SN0054667-00 Rev. ZN

HBA Statistics (-gs)

5. Monitoring ▸ 2. Fibre Channel Adapter ▸ 1. HBA Statistics

From the Monitoring menu, select the **HBA Statistics** option, and then select an adapter port. The **HBA Statistics Menu** provides options to display the current configuration, reset the default configuration, change the configuration, and run HBA statistics.

To reset all the driver statistics counters for the current session, press the R key during run time.

Following is an example of the HBA Statistics menu.

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    HBA Statistics

=====================================================
HBA : 2 Port: 1
SN : AFD1915Y07266
HBA Model : QLE2872
HBA Desc. : QLogic QLE2872 64Gb 2-port Fibre Channel
Adapter
FW Version : 9.09.00
WWPN : 21:00:f4:c7:aa:01:bc:3a
WWNN : 20:00:f4:c7:aa:01:bc:3a
Host NQN : nqn.2014-08.org.nvmexpress:uuid:
37363836-3239-4d32-3233-313430315759
Host ID : 363836373932324d3233313430315759
Link : Online (FEC)
=====================================================
    1:  Display Settings
    2:  Change Settings
    3:  Start
```

Display Settings

5. Monitoring ▸ 2. Fibre Channel Adapter ▸ 1. HBA Statistics ▸ 1. Display Settings

From the HBA Statistics Menu, select **Display Settings** to view the current Monitor Settings for the selected port, including AutoPoll (AP), SetRate (SR), and LogToFile (LF).

Change Settings

5. Monitoring ▸ 2. Fibre Channel Adapter ▸ 1. HBA Statistics ▸ 2. Change Settings

From the HBA Statistics Menu, select **Change Settings** to open the Monitoring Configuration Menu. For example.

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)



=========================================================
HBA             : 2 Port: 1
SN              : RFD2003G13727
HBA Model       : QLE2872
HBA Desc.       : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version      : 9.09.00
WWPN            : 21:00:f4:c7:aa:01:bc:3a
WWNN            : 20:00:f4:c7:aa:01:bc:3a
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
=========================================================

    1:  Number of Iterations
    2:  Polling Interval Rate
    3:  Save Result as a CSV File
    4:  Restore Default Settings
```

Start

5. Monitoring ▸ 2. Fibre Channel Adapter ▸ 1. HBA Statistics ▸ 3. Start

From the HBA Statistics Menu, select **Start** to monitor port statistics. For example:

```
-------------------------------------------------------------------------------
HBA Instance 2: QLE2872 Port 1 WWPN 21:00:f4:c7:aa:01:bc:3a PortID 01:0c:00
Link: Online (FEC)
-------------------------------------------------------------------------------
Monitoring
-----------------------------------------
General keyboard shortcuts:
```

```
      R     - Clear all counters next iteration in this session
      ENTER - Stop
---------------------------------------
HBA Port Errors Device Errors Reset  I/O Count  IOPS        BPS        Time
--- ----------- ------------- ----- ---------- ----- ---------- -----------
  0           1            19     0      96016     1     891289 11:50:43 AM
```

HBA BBC Recovery (-bbcr)

5. Monitoring ▸ 2. Fibre Channel Adapter ▸ 2. HBA BBC Recovery

Buffer-to-buffer credit (BBC) enables two FC peer ports (N_Port, F_Port, or E_Port) to periodically send and receive the quantity of receiver ready (R_RDY) signals transmitted. The BBC feature allows the peer port to recover from possible R_RDY signals lost over a lossy link. BBC enables two FC ports logged in with each other to recover lost buffer-to-buffer credits. These lost credits can impact throughput, cause link resets, and disrupt traffic flow.

From the Monitoring menu, select the **HBA BBC Recovery** option, and then select an adapter port. The HBA BBC Recovery menu provides options to display the current configuration, change the configuration, and run BBC statistics. For example:

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    HBA BBC Recovery

=====================================================
HBA             : 2 Port: 1
SN              : AFD1915Y07266
HBA Model       : QLE2872
HBA Desc.       : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version      : 9.09.00
WWPN            : 21:00:f4:c7:aa:01:bc:3a
WWNN            : 20:00:f4:c7:aa:01:bc:3a
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
=====================================================
```

```
1:  Display Settings
2:  Change Settings
3:  Start
```

To reset all the driver statistics counters for the current session, press the R key during run time.

Display Settings

5. Monitoring ▸ 2. Fibre Channel Adapter ▸ 2. HBA BBC Recovery ▸ 1. Display Settings

From the HBA BBC Recovery menu, select **Display Settings** to view the current HBA BBC statistics for the selected port, including AutoPoll (AP) and SetRate (SR). For example:

```
--------------------------------------
HBA BBC Stats
--------------------------------------
AutoPoll (AP): 10
SetRate (SR): 20
```

Change Settings

5. Monitoring ▸ 2. Fibre Channel Adapter ▸ 2. HBA BBC Recovery ▸ 2. Change Settings

From the HBA BBC Recovery menu, select **Change Settings** to select from the following options:

```
1. Number of Iterations
2. Polling Interval Rate
3. Restore Default Settings
```

Number of Iterations

5. Monitoring ▸ 2. Fibre Channel Adapter ▸ 2. HBA BBC Recovery ▸ 2. Change Settings ▸ 1. Number of Iterations

From the HBA BBC Recovery menu, select the **Number of Iterations** option, and then select either **Enable Auto Poll Mode** or **Disable Auto Poll Mode**. The currently selected mode is indicated by `(Current)`.

Polling Interval Rate

5. Monitoring ▸ 2. Fibre Channel Adapter ▸ 2. BBC Recovery Counters ▸ 2. Change Settings ▸ 2. Polling Interval Rate

From the HBA BBC Recovery menu, select the **Polling Interval Rate** option, and then type a value between 5 and 300; the current value is shown in brackets.

Restore Default Settings

5. Monitoring ▸ 2. Fibre Channel Adapter ▸ 2. HBA BBC Recovery ▸ 2. Change Settings ▸ 3. Restore Default Settings

From the HBA BBC Recovery menu, select **Restore Default Settings** to restore all BBC statistics settings to their defaults.

Start

5. Monitoring ▸ 2. Fibre Channel Adapter ▸ 2. HBA BBC Recovery ▸ 3. Start

From the HBA BBC Recovery menu, select **Start** to show BBC statistics for the selected port. For example:

```
HBA Instance 2: QLE2872 Port 1 WWPN 21:00:f4:c7:aa:01:bc:3a
PortID 01:0c:00
Link: Online
------------------------------------------------------------------


HBA BBC Recovery
----------------------------------------
General keyboard shortcuts:
        ENTER - Cancel the current task
----------------------------------------
HBA Port Transmitted  Received     Time
No  No   Credit Lost  Credit Lost
--- ---- ------------ ------------ -----------
  6    1            0            0 04:37:36 PM
```

HBA Temperature (-tm)

5. Monitoring ▸ 3. HBA Temperature

From the Monitoring menu, select **HBA Temperature** followed by an adapter port to view the temperature for the selected adapter port or for all adapter ports in the host. For example:

```
QConvergeConsoleCLI


CLI - Version 3.0.x (Build xx)


    HBA Temperature


     1: HBA Model: QLE2872
          Port   1 WWPN: 21:00:f4:c7:aa:01:bc:3a Online (FEC)
```

```
          Port   2 WWPN: 21:00:f4:c7:aa:01:bc:3b Online (FEC)
     2: HBA Model: QLE2692
          Port   1 WWPN: 21:00:00:24:ff:75:2b:9c Online (FEC)
          Port   2 WWPN: 21:00:00:24:ff:75:2b:9d Unsupported SFP Vendor

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1

QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    HBA Temperature

=======================================================
HBA             : 2 Port: 1
SN              : AFD1915Y07266
HBA Model       : QLE2872
HBA Desc.       : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version      : 9.09.00
WWPN            : 21:00:f4:c7:aa:01:bc:3a
WWNN            : 20:00:f4:c7:aa:01:bc:3a
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
=======================================================

    1:  Display Settings
    2:  Change Settings
    3:  Start
```

Display Settings

5. Monitoring ▸ 3. HBA Temperature ▸ 1. Display Settings

Following is an example of the **Display Settings** selection.

```
--------------------------------------
Monitor HBA Temperature
--------------------------------------
AutoPoll (AP): 10
```

```
SetRate (SR): 10
LogToFile (LF): N/A
LowAlarm (LO): 5
HiAlarm (HI): 100
```

Change Settings

5. Monitoring ▸ 3. HBA Temperature ▸ 2. Change Settings

From the HBA Temperature menu, select the **Change Settings** option to set the number of iterations, the polling interval rate, alarms, and so on. For example:

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    HBA Temperature

=======================================================
HBA             : 2 Port: 1
SN              : RFD2003G13727
HBA Model       : QLE2872
HBA Desc.       : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version      : 9.09.00
WWPN            : 21:00:f4:c7:aa:01:bc:3a
WWNN            : 20:00:f4:c7:aa:01:bc:3a
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
=======================================================

    1:  Number of Iterations
    2:  Polling Interval Rate
    3:  Set Low Alarm
    4:  Set High Alarm
    5:  Save Result as a CSV File
    6:  Restore Default Settings
```

Start

5. Monitoring ▸ 3. HBA Temperature ▸ 3. Start

From the HBA Temperature menu, select the **Start** option to view the current adapter temperature. For example:

```
----------------------------------------
HBA Board Thermal Temperature
----------------------------------------
General keyboard shortcuts:
      <Enter>    - Cancel the current task
----------------------------------------
Time        HBA Model Serial Number Temp(C) Threshold(C) Status
----------- --------- ------------- ------- ------------ --------------------
11:54:30 AM   QLE2770 AFD1923Y07510      38          100 Good

----------------------------------------
HBA Board Thermal Temperature
----------------------------------------
General keyboard shortcuts:
      <Enter>    - Cancel the current task
----------------------------------------
Time        HBA Model Serial Number Temp(C) Threshold(C) Status
----------- --------- ------------- ------- ------------ -------------------
11:54:30 AM   QLE2770 AFD1923Y07510      38          100 Good
```

Universal SAN Congestion Mitigation (-scm | -uscm)

6. Universal SAN Congestion Mitigation (USCM)

NOTE

USCM is not supported on all adapters.

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

Universal SAN Congestion Mitigation (USCM) is Marvell's IP, and describes Marvell's capabilities that encompass SCM and additional functionalities to further assist users.

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

- USCM statistics are not gathered for other initiators in the configured zones.
- USCM is supported only on 2690 Series Adapters, 2770 Series Adapter, and 2800 Series Adapters.
- USCM statistics track the following types of Fabric Performance Impact Notification (FPIN) Extended Link Services (ELSs) to provide SAN congestion awareness:

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

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

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

For more information about USCM, see the appropriate Marvell QLogic Fibre Channel adapter user's guide.

From the Main menu, select **Universal SAN Congestion Mitigation (USCM)** followed by an adapter port to view the Universal SAN Congestion Mitigation menu. For example:

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    Universal SAN Congestion Mitigation

=====================================================
HBA             : 0 Port: 1
SN              : RFD2003G13727
HBA Model       : QLE2874
```

```
HBA Desc.       : QLogic QLE2874 Quad Port 64Gb FC to PCIe Gen4 x16
                  Adapter
FW Version      : 9.09.00
WWPN            : 21:00:34:80:0d:61:4b:10
WWNN            : 20:00:34:80:0d:61:4b:10
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
=======================================================

    1:  USCM Status
    2:  USCM Profile
    3:  USCM Statistics
```

USCM Status

6. Universal SAN Congestion Mitigation (USCM) ▸ 1. USCM Status

From the Universal SAN Congestion Mitigation (USCM) menu, select **USCM Status**, the adapter port, and then either **1. Initiator** or **2. Target Devices**. For example:

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    USCM Status

=======================================================
HBA             : 2 Port: 1
SN              : AFD1915Y07266
HBA Model       : QLE2872
HBA Desc.       : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version      : 9.09.00
WWPN            : 21:00:f4:c7:aa:01:bc:3a
WWNN            : 20:00:f4:c7:aa:01:bc:3a
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  37363836-3239-4d32-3233-313430315759
Host ID         : 363836373932324d3233313430315759
Link            : Online (FEC)
```

```
=======================================================

    1:  Initiator
    2:  Target Devices
```

Initiator

6. Universal SAN Congestion Mitigation (USCM) ▸ 1. USCM Status ▸ 1. Initiator

USCM initiator port congestion status (Table 6-1) indicates the current status of the particular HBA port or virtual lane, based on congestion events (both extended link service (ELS) and signals) from the switch. At a given point in time, the HBA port is either `Congested` or `Healthy`. The other status indicates the severity of congestion and the time since the last congestion event.

Table 6-1. HBA (Initiator) USCM Status

Status	Description
`Congestion Current State`	`Healthy` `Congested`
`Congestion Severity`	`Warning`. Congestion is building and may have reached a severe level. `Alarm`. Congestion has reached a severe level. `None`. No congestion present. `Reserved`
`Link Integrity Events`	Value (h) — Description `00` Unknown `01` Link failure `02` Loss of synchronization `03` Loss of signal `04` Primitive sequence protocol error `05` Invalid transmission word `06` Invalid CRC `0F` Device specific

Table 6-1. HBA (Initiator) USCM Status (Continued)

Status	Description
Delivery Notification Events	Value (h) — Description 00 — Unknown 01 — Timeout 02 — Unable to route 0F — Device specific
Seconds Since Last Event	Time since the last congestion event (in seconds).
Fabric Connection Flags	RDF Rejected. The adapter is either not connected or does not support RDF; or the connected switch does not support USCM. RDF Completed. Either the connected Brocade or Cisco switch does not support virtual lanes or the virtual lane feature is disabled at the initiator port. RDF Completed (Cisco). The connected Cisco switch has virtual lanes up and running. ***NOTE:*** RDF stands for Registration Diagnostic Function.
Virtual Lane [a]	Disabled Non-operational Operational

[a] Virtual Lane is supported only on 2770 and 2800 Series Marvell QLogic Adapters. For more information, see "USCM Virtual Lanes" on page 260.

Target Devices

6. Universal SAN Congestion Mitigation (USCM) ▸ 1. USCM Status ▸ 2. Target Devices

The USCM target congestion status parameters (Table 6-2) display the current status of a particular target port based on the FPIN ELS from the switch. These parameters include link integrity, peer congestion, and delivery notifications, and provide details about each of these events for each active target port.

Table 6-2. Target Congestion Status

Status	Description
Congestion Current State	Healthy Congested

Table 6-2. Target Congestion Status (Continued)

Status	Description
Link Integrity Events	Unknown Link Failure Loss-of-Synchronization Loss-of-Signal Primitive Sequence Protocol Error Invalid Transmission Word Invalid CRC Device Specific Reserved
Seconds Since Last Event	See Seconds Since Last Event.
Virtual Lane [a]	Slow Normal Fast Non-operational NA

[a] Virtual Lane is supported only on 2770 and 2800 Series Marvell QLogic Adapters. For more information, see “USCM Virtual Lanes” on page 260.

USCM Profiles

6. Universal SAN Congestion Mitigation (USCM) ▸ 2. USCM Profile

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

From the **Universal SAN Congestion Mitigation (USCM)** menu, select an adapter port, and then **USCM Profile** to view the USCM Profile menu port. For example:

```
USCM Profile
=========================================================
HBA           : 0  Port: 1
SN            : AFD1915Y07299
HBA Model     : QLE2772
HBA Desc.     : QLogic QLE2772 32Gb 2-port Fibre Channel Adapter
FW Version    : 9.08.02
WWPN          : 21:00:f4:e9:d4:54:ab:12
WWNN          : 20:00:f4:e9:d4:54:ab:12
```

```
Host NQN      : nqn.2014-08.org.nvmexpress:uuid:
                37363836-3239-4d32-3233-313430315759
Host ID       : 363836373932324d3233313430315759
Link          : Online (FEC)
=======================================================
  1. Display
  2. Modify
```

NOTE

USCM profile is supported on 2690, 2770, and 2800 Series Marvell QLogic Adapters.

Display

6. Universal SAN Congestion Mitigation (USCM) ▸ 2. USCM Profile ▸ 1. Display

From the USCM Profile menu, select **Display** to view the current profile. For example:

```
-------------------------------------------------------
HBA Model                      : QLE2772
HBA Instance                   : 1
HBA Port                       : 1
Node Name                      : 20:00:f4:e9:d4:54:ab:18
Port Name                      : 21:00:f4:e9:d4:54:ab:18
Port ID                        : 01:1a:00
HBA Status                     : Online (FEC)
USCM Configuration Status      : Enable
USCM Profile Management        : Driver Settings
USCM Profile Activation        : Conservative
```

The USCM profile display parameters are described in Table 6-3.

Table 6-3. USCM Profile Display

Profile	Description

`USCM Configuration Status`	Indicates if the USCM feature of the specified adapter port is supported. Valid values are:
	`Enabled`
	`Disabled`

Table 6-3. USCM Profile Display (Continued)

Profile	Description
`USCM Profile Management`	Indicates the current active profile setting for congestion on the specified adapter port. Valid values are: `Driver Settings` (default). The USCM profile is set using either a Windows driver registry parameter; or a Linux or VMware ESXi driver module parameter. `NVRAM Settings`. The USCM profile is set in the adapter NVRAM.

`USCM Profile Activation`	Valid values are:
	`Monitor-Only` (default)
	`Conservative`
	`Moderate`
	`Aggressive`

Modify

6. Universal SAN Congestion Mitigation (USCM) ▸ 2. USCM Profile ▸ 2. Modify

From the USCM Profile menu, select **Modify** to change how the port handles congestion traffic. The profile in use is indicated by `(Current)` next to the option. For example:

```
USCM Profile

1: Monitor-Only (Current) (default)
2: Conservative
3: Moderate
4: Aggressive
5: Refresh  or
5: Revert to Driver Settings
```

The USCM profiles are described in Table 6-4.

Table 6-4. Adapter Port USCM Profiles

Profile	Description
`Monitor Only`	Records adapter performance and congestion history for review. No actions are taken to resolve congestion.

Table 6-4. Adapter Port USCM Profiles (Continued)

Profile	Description
`Conservative`	Maintains optimum throughput while gradually reducing congestion. Queue depth (outstanding I/Os) is reduced to half of the current value as part of the throttle down operation. Marvell recommends this setting for high-priority workloads.
`Moderate`	Queue depth (outstanding I/Os) is reduced to one-quarter of the current value as part of the throttle down operation.
`Aggressive`	Reduces congestion on priority while reducing throughput. Queue depth (outstanding I/Os) is reduced to one-eighth of the current value as part of the throttle down operation. Marvell recommends this setting for low-priority workloads.
`Revert to Driver Settings`	Reverts the current USCM profile settings by driver (driver module parameter or Windows registry settings). The command takes effect immediately; a system reboot or driver reload is not required.
`Refresh`	Reads the latest profile setting and updates this menu to show the current USCM profile.

USCM Statistics

6. Universal SAN Congestion Mitigation (USCM) ▸ 3. USCM Statistics

NOTE

QConvergeConsole CLI records USCM statistics for this adapter and targets in the configured zones with active sessions.

QConvergeConsole CLI does not record USCM statistics for other initiators in the configured zones.

USCM is supported only on 2690, 2770, and 2800 Series Adapters.

USCM statistics include four types of Fabric Performance Indication Notification (FPIN) Extended Link Services (ELSs) to provide SAN congestion awareness: Congestion, Link Integrity, Delivery, Peer Congestion.

From the Universal SAN Congestion Mitigation (USCM) menu, select an adapter port, and then **USCM Statistics** to view the USCM Statistics menu. For example:

```
USCM Statistics
=======================================================
HBA           : 2 Port: 1
SN            : AFD1915Y07266
HBA Model     : QLE2872
HBA Desc.     : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version    : 9.09.00
WWPN          : 21:00:f4:c7:aa:01:bc:3a
WWNN          : 20:00:f4:c7:aa:01:bc:3a
Host NQN      : nqn.2014-08.org.nvmexpress:uuid:
                37363836-3239-4d32-3233-313430315759
Host ID       : 363836373932324d3233313430315759
Link          : Online (FEC)
=======================================================
1:  Configure USCM Statistics
2:  Start USCM Statistics
3:  Clear USCM Statistics
```

Configure USCM Statistics

6. Universal SAN Congestion Mitigation ▸ 3. USCM Statistics ▸ 1. Configure USCM Statistics

From the USCM Statistics menu, select the **Configure USCM Statistics** option to modify the current statistics settings. For example:

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    USCM Statistics

=======================================================
HBA           : 2 Port: 1
SN            : AFD1915Y07266
HBA Model     : QLE2872
HBA Desc.     : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version    : 9.09.00
WWPN          : 21:00:f4:c7:aa:01:bc:3a
WWNN          : 20:00:f4:c7:aa:01:bc:3a
```

```
Host NQN       : nqn.2014-08.org.nvmexpress:uuid:
                 37363836-3239-4d32-3233-313430315759
Host ID        : 363836373932324d3233313430315759
Link           : Online (FEC)
=====================================================

    1:  Display Settings
    2:  Number of Iterations
    3:  Polling Interval Rate
    4:  Save Result as a CSV File
    5:  Restore Default Settings
```

Start USCM Statistics

6. Universal SAN Congestion Mitigation ▸ 3. USCM Statistics ▸ 2. Start USCM Statistics

From the USCM Statistics menu, select the **Start USCM Statistics** option to monitor USCM statistics. For example:

```
USCM Statistics

=====================================================
HBA            : 2 Port: 1
SN             : AFD1915Y07266
HBA Model      : QLE2872
HBA Desc.      : QLogic QLE2872 64Gb 2-port Fibre Channel Adapter
FW Version     : 9.09.00
WWPN           : 21:00:f4:c7:aa:01:bc:3a
WWNN           : 20:00:f4:c7:aa:01:bc:3a
Host NQN       : nqn.2014-08.org.nvmexpress:uuid:
                 37363836-3239-4d32-3233-313430315759
Host ID        : 363836373932324d3233313430315759
Link           : Online (FEC)
=====================================================

    1:  Initiator
    2:  Target Devices
```

Type **1** to review the initiator (HBA) statistics. Following is an example.

```
-------------------------------------
USCM Statistics Monitoring Settings
-------------------------------------
```

```
AutoPool (AP): 10
SetRate (SR): 10
LogToFile (LF): N/A
---------------------------------
HBA WWNN   : 20:00:f4:e9:d4:54:aa:9a
HBA WWPN   : 21:00:f4:e9:d4:54:aa:9a
HBA PID    : 03:11:00
HBA Status : Online
Time       : 05/03/2022 12:09:31
-----------------------------------------
Congestion Mitigation
-----------------------------------------
Congestion Alarm Count: 0
Congestion Warning Count: 0
Throttled Up Count: 0
Throttled Down Count: 0
Bottom Out Count: 0
Returned Busy Count: 0
-------------------------
Rx Fabric Performance Impact Notifications
-------------------------
Link Failure Count: 1
Link Unknown Event Count: 0
Loss Of Sync Count:
Loss Of Signal Count: 0
Link Device Specific Event: 0
Primitive Seq Protocol Error Count: 0
Invalid Transmission Word Count: 0
Invalid CRC Count: 0
Delivery Failure Unknown Count: 0
Delivery Timeout Count: 0
Delivery Unable To Route Count: 0
Delivery Failure Device Specific Count: 0
Congestion Clear Count: 0
Congestion Lost Credit Count: 0
Congestion Credit Stall Count:
Congestion Oversubscription Count: 0
Congestion Device Specific Count: 0
Link Uncorrectable FEC Count: 0
```

```
-----------------------------------------------
```

These statistics indicate how many times a congestion event has occurred since the counters were reset (see Table 6-5).

Table 6-5. HBA (Initiator) Congestion Statistics

Statistic	Description
`Congestion Alarm Count`	Counter for the number of alarm events in the Congestion Severity parameter.
`Congestion Warning Count`	Counter for the number of warning events in the Congestion Severity parameter.
`Congestion Clear Count`	Counter for the number of times the congestion event was cleared for this HBA.
`Throttled Up Count`	The number of times the driver incremented the throttling rate, which is pre-defined by the driver. The rate is incremented when the driver is throttling I/Os for the given HBA because of a prior congestion notification on the HBA port.
`Throttled Down Count`	The number of times the driver decremented the I/O throttle. This count is equal to the number of times the driver receives congestion notifications for which the driver took corrective action.
`Bottom Out Count`	The number of times the driver received a congestion event in spite of the driver throttling down requests to its lowest supported limit.
`Returned Busy Count`	The number of times the driver returned I/O status for the given HBA.

Type **2** to review the target (device) statistics. Following is an example.

```
-------------------------------------
USCM Statistics Monitoring Settings
-------------------------------------
AutoPool (AP): 1
SetRate (SR): 10
LogToFile (LF): N/A
---------------------------------
Target WWPN: 20:70:00:c0:ff:11:40:ac
Target WWNN: 20:80:00:c0:ff:11:40:ac
Target PID : 03:13:00
```

```
Time       : 05/03/2022 12:18:52
------------------------------------------
Congestion Mitigation
------------------------------------------
Cleared Congestion Count: 0
Throttled Up Count: 0
Throttled Down Count: 0
Bottom Out Count: 0
Returned Busy Count: 0
-------------------------
Rx Fabric Performance Impact Notifications
-------------------------
Link Failure Count: 1
Link Unknown Event Count: 0
Loss Of Sync Count: 0
Loss Of Signal Count: 0
Link Device Specific Event Count: 0
Primitive Seq Protocol Error Count: 0
Invalid Transmission Word Count: 0
Invalid CRC Count: 0
Congestion Clear Count: 0
Congestion Lost Credit Count: 0
Congestion Credit Stall Count:
Congestion Oversubscription Count: 0
Congestion Device Specific Count: 0
Link Uncorrectable FEC Count: 0
PUN Count: 0
------------------------------------------------
```

The target statistics are described in Table 6-6.

Table 6-6. Target (Device) Congestion Statistics

Statistic	Description
`Cleared Congestion Count`	Counter for the number of times the congestion event was cleared for this target.

Table 6-6. Target (Device) Congestion Statistics (Continued)

Statistic	Description
`Throttled Up Count`	The number of times the driver incremented the throttling rate, which is pre-defined by the driver. The rate is incremented when the driver is throttling I/Os for the given HBA/target port because of a prior congestion notification on the HBA/target port.
`Throttled Down Count`	See Throttled Down Count initiator description.
`Bottomed Out Count`	See Bottom Out Count initiator description.
`Returned Busy Count`	The number of times the driver returned I/O status for the given HBA.
`Link Failure Count`	Counter for number of link failure events.
`Link Unknown Event Count`	Counter for the number of unknown events.
`Loss of Sync Count`	Counter for the number of loss of sync events.
`Loss of Signal Count`	Counter for the number of loss of signal count events.
`Link Device Specific Event Count`	Counter for the number of device specific events.
`Primitive Seq Protocol Error Count`	Counter for the number of primitive sequence protocol errors.
`Invalid Transmission Word Count`	Counter for the number of transmission word errors.
`Invalid CRC Count`	Counter for the number of invalid CRC events.
`Congestion Clear Count`	Counter for the number of times the peer congestion event was cleared for this target.
`Congestion Lost Credit Count`	Counter for the number of lost credit events.

Table 6-6. Target (Device) Congestion Statistics (Continued)

Statistic	Description
Congestion Credit Stall Count	Counter for the number of credit stall events.
Congestion Over-subscription Count	Counter for the number of oversubscription events.
Congestion Device Specific Count	Counter for the number of device-specific events.
Link Uncorrect-able FEC Count	Counter for the number of uncorrectable FECs.
PUN Count	Number of priority update notifications received.

Clear USCM Statistics

6. Universal SAN Congestion Mitigation ▸ 3. USCM Statistics ▸ 3. Clear USCM Statistics

From the USCM Statistics menu, select **Clear USCM Statistics** to reset all USCM statistics counters to zero.

Refresh

7. Refresh

From the main menu, select the **Refresh** option to refresh (reload) the adapters and adapter port indexes. For example:

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    Main

    1:  Adapter Information
    2:  Adapter Configuration
    3:  Adapter Updates
    4:  Adapter Diagnostics
    5:  Monitoring
    6:  Universal SAN Congestion Mitigation (USCM)
```

```
    7:  Refresh
    8:  Help
    9:  Exit


        Please Enter Selection: 7

Refreshing...
Done.

        Press <Enter> to continue:
```

When you run QConvergeConsole CLI, the CLI collects all relevant information, including the number of available ports and the state of each one. Between the time you start QConvergeConsole CLI and the time you perform a specific action or request additional information, changes may have occurred to the port state, network state, or firmware parameters. To ensure that you are viewing the most current information, you should perform a **Refresh**. (In some cases, QConvergeConsole CLI automatically refreshes the information before or after specific commands.)

Help (-h)

8. Help

From the main menu, select the **Help** option to view the syntax and description for each noninteractive command line option. For more detailed information about each command, see the noninteractive chapter for the specific adapter type.

Exit

9. Exit

From the main menu, select the **Exit** option to close the QConvergeConsole CLI session.

Part IV
Appendices

Part IV of this guide consists of the following appendices:

- Appendix A USCM Virtual Lanes
- Appendix B USCM FPIN-LI/MPIO with FC-NVMe Storage
- Appendix C Revision History

A USCM Virtual Lanes

This appendix provides instructions for how to program the USCM virtual lanes feature on Marvell QLogic Adapters using QConvergeConsole CLI.

Prerequisites

When setting up virtual lanes, consider the following:

- This feature is available only when the adapter is connected to a supported Cisco switch running a fabric OS version that supports the equivalent feature on the fabric.
- USCM must be enabled to use the virtual lanes feature. See “-scm | -uscm (Congestion Management)” on page 97 for instructions on how to enable USCM.
- By default, the USCM virtual lanes feature is disabled.
- USCM virtual lanes feature can be enabled on both target and initiator ports.
- The USCM virtual lanes feature is available only on Fibre Channel 2770 Series Adapters.

Enabling USCM Virtual Lanes

There are two ways to enable this feature: using a driver module/registry parameter (see the appropriate Marvell QLogic Adapter user’s guide) or using QConvergeConsole CLI, as described in the following sections.

Noninteractive Mode

In QConvergeConsole CLI noninteractive mode, issue the `-n` command with the `VirtualLane` parameter to enable virtual lanes (see “-n (HBA Parameter (NVRAM) Settings)” on page 81).

Interactive Mode

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 3. HBA Parameters ▸ 2. Change Settings ▸ 23. Virtual Lane

In QConvergeConsole CLI interactive mode, from the Adapter Configuration menu, select **3. HBA Parameters ▸ 2. Change Settings ▸ 23. Virtual Lane**. The Virtual Lane parameter applies on per-port basis. Following is an example for an initiator port.

```
QConvergeConsoleCLI

CLI - Version 3.0.x (Build xx)

    HBA Parameters

=====================================================
HBA             : 2 Port: 3
SN              : RFD2134U04244
HBA Model       : QLE2874
HBA Desc.       : QLogic QLE2874 64Gb 4-port Fibre Channel Adapter
FW Version      : 9.09.00
WWPN            : 21:00:34:80:0d:63:83:26
WWNN            : 20:00:34:80:0d:63:83:26
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  f0389f38-1a4f-4ddd-9052-baedadf0a091
Host ID         : b16cbd6c69744b1b835cbd1bd6103ab0
Link            : Online (FEC)
=====================================================

    1:  Display Settings
    2:  Change Settings
    3:  Restore Default Settings


        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 2

        QConvergeConsoleCLI

        CLI - Version 3.0.x (Build xx)

    Configure Parameters
```

```
=====================================================
HBA             : 2 Port: 3
SN              : RFD2134U04244
HBA Model       : QLE2874
HBA Desc.       : QLogic QLE2874 64Gb 4-port Fibre Channel Adapter
FW Version      : 9.09.00
WWPN            : 21:00:34:80:0d:63:83:26
WWNN            : 20:00:34:80:0d:63:83:26
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  f0389f38-1a4f-4ddd-9052-baedadf0a091
Host ID         : b16cbd6c69744b1b835cbd1bd6103ab0
Link            : Online (FEC)
=====================================================

    1:  Connection Options
    2:  Data Rate
    3:  Frame Size
    4:  HBA Hard Loop ID
    5:  Hard Loop ID
    6:  Loop Reset Delay (seconds)
    7:  Host Adapter BIOS
    8:  Fibre Channel Tape Support
    9:  Operation Mode
   10:  Interrupt Delay Timer (100 microseconds)
   11:  Execution Throttle
   12:  Login Retry Count
   13:  Port Down Retry Count
   14:  LIP Full Login
   15:  Link Down Timeout (seconds)
   16:  Target Reset
   17:  LUNs per Target
   18:  LR Extended Credits
   19:  Fabric Assign WWN
   20:  Prefer FCP Support
   21:  USCM Support
   22:  Virtual Lane
   23:  Commit Changes
   24:  Abort Changes
```

```
            (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
            Please Enter Selection: 22

            QConvergeConsoleCLI

            CLI - Version 3.0.x (Build xx)

        Virtual Lane

        1:  Enable
        2:  Disable (Current)


            (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
            Please Enter Selection: 1

QConvergeConsoleCLI

            CLI - Version 3.0.x (Build xx)

        Configure Parameters

=========================================================
HBA             : 2 Port: 3
SN              : RFD2134U04244
HBA Model       : QLE2874
HBA Desc.       : QLogic QLE2874 64Gb 4-port Fibre Channel Adapter
FW Version      : 9.09.00
WWPN            : 21:00:34:80:0d:63:83:26
WWNN            : 20:00:34:80:0d:63:83:26
Host NQN        : nqn.2014-08.org.nvmexpress:uuid:
                  f0389f38-1a4f-4ddd-9052-baedadf0a091
Host ID         : b16cbd6c69744b1b835cbd1bd6103ab0
Link            : Online (FEC)
=========================================================

        1:  Connection Options
        2:  Data Rate
        3:  Frame Size
```

```
 4:  HBA Hard Loop ID
 5:  Hard Loop ID
 6:  Loop Reset Delay (seconds)
 7:  Host Adapter BIOS
 8:  Fibre Channel Tape Support
 9:  Operation Mode
10:  Interrupt Delay Timer (100 microseconds)
11:  Execution Throttle
12:  Login Retry Count
13:  Port Down Retry Count
14:  LIP Full Login
15:  Link Down Timeout (seconds)
16:  Target Reset
17:  LUNs per Target
18:  LR Extended Credits
19:  Fabric Assign WWN
20:  Prefer FCP Support
21:  USCM Support
22:  Virtual Lane
23:  Commit Changes
24:  Abort Changes


 (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
 Please Enter Selection: 23

 HBA Parameters Update Complete. Changes have been saved to
HBA instance 2.
```

Viewing USCM Virtual Lanes Status

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

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

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

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

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

Noninteractive Mode

To view the virtual lanes status, issue the `-t` command. See “-t (FC Storage Device Information)” on page 101.

Interactive Mode

To view the virtual lanes status, navigate to the one of the following selections:

6. Universal SAN Congestion Mitigation (USCM) ▸ 1. USCM Status ▸ 1. Initiator

6. Universal SAN Congestion Mitigation (USCM) ▸ 1. USCM Status ▸ 2. Target Devices

See “Initiator” on page 245 and “Target Devices” on page 246, respectively.

B USCM FPIN-LI/MPIO with FC-NVMe Storage

This appendix provides information for USCM multipath switching based on marginal links with integrity issues running on Marvell QLogic Adapters using QConvergeConsole CLI.

Prerequisites

When enabling and configuring FPIN-LI/MPIO, consider the following:

- This feature is available only with RHEL 9.4 or later hosts.
- USCM must be enabled to use the FPIN-LI/MPIO feature.
- This feature is available on 2600, 2700, and 2800 Series Adapters.

NOTE

RHEL 9.4 and later support FPIN marginal path groups for both FC-NVMe and FCP protocols. For more information, see Red Hat RHEL 9.4 Release Notes and documentation.

C Revision History

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Changes	Sections Affected
Added the following to the operating system list: ■ SUSE Linux Enterprise Server (SLES®) ■ Ubuntu®	"Operating System Requirements" on page 3
Removed Solaris® SPARC® and Solaris x86 from the operating system list.	
Removed topics referring to Oracle SPARC, Solaris x86, and FCode.	All sections

Glossary

adapter

The board that interfaces between the host system and the target devices. Adapter is synonymous with *host bus adapter (HBA)*, *host adapter*, and a*dapter board*.

adapter port

A port on the adapter board.

address resolution protocol

See ARP.

API

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

ARP

Address resolution protocol. An Internet protocol used for mapping an IP address to a physical address on an Ethernet LAN.

challenge-handshake authentication protocol

See CHAP.

CHAP

Challenge-handshake authentication protocol. Used for remote logon, usually between a client and server or a Web browser and Web server. A challenge/response is a security mechanism for verifying the identity of a person or process without revealing a secret password that is shared by the two entities. Also referred to as a “three-way handshake.”

CLI

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

comma separated values

See CSV.

command line interface

See CLI.

CSV

Comma separated values. A data file used for storage of data structured in a table form.Each line in the file corresponds to a row in the table. Within a line, fields are separated by commas, each field belonging to one table column.

data center bridging exchange protocol

See DCBX.

DCBX

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

device

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

DHCP

Dynamic host configuration protocol. Protocol used by networked devices (clients) to obtain various parameters necessary for the clients to operate in an IP network.

driver

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

dynamic host configuration protocol

See DHCP.

EFI

Extensible firmware interface. A specification that defines a software interface between an operating system and platform firmware. EFI is a replacement for the older BIOS firmware interface present in all IBM PC-compatible personal computers.

Enhanced Ethernet

Also called *Data Center Ethernet* or *Converged Enhanced Ethernet*. Refers to new enhancements to the existing Ethernet standard that eliminate Ethernet's inherently lossy nature and make 10Gb Ethernet a viable storage networking transport.

enhanced transition services

See ETS.

eSwitch

The eSwitch (embedded switch) functionality provides a basic Layer-2 switch for Ethernet frames. Each physical port has one instance of an eSwitch, which supports all NIC partitions on that physical port.

Ethernet

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

ETS

Enhanced transition services. Controls the actual bandwidth allocation at the network port.

extensible firmware interface

See EFI.

FC

See Fibre Channel.

FCoE

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

Fibre Channel

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

Fibre Channel over Ethernet

See FCoE.

frame

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

iiDMA

Intelligent interleaved direct memory access. A Marvell patent-pending feature that ensures maximum link efficiency.

initiator

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

input/output control

See IOCTL.

intelligent interleaved direct memory access

See iiDMA.

Internet Protocol

See IP.

Internet simple name service

See iSNS.

Internet small computer system interface

See iSCSI.

IOCTL

Input/output control. A system call in UNIX and Linux systems that allows an application to control or communicate with a device driver outside usual read/write operations.

IP

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

IPv4

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

iSCSI

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

iSNS

Internet simple name service. Allows automated discovery, management, and configuration of iSCSI and Fibre Channel devices (using iFCP gateways) on a TCP/IP network.

link layer discovery protocol

See LLDP.

LIP

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

LLDP

Link layer discovery protocol. A vendor-neutral Layer 2 protocol that allows a network device to advertise its identity and capabilities on the local network. This protocol supersedes proprietary protocols like Cisco Discovery Protocol, Extreme Discovery Protocol, and Nortel Discovery Protocol (also known as SONMP).

Information gathered with LLDP is stored in the device and can be queried using SNMP. The topology of a LLDP-enabled network can be discovered by crawling the hosts and querying this database.

logical unit number

See LUN.

loop initialization process

See LIP.

loopback test

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

LUN

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

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

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

management workstation

PC workstation used to manage routers remotely by connecting to the routers using QConvergeConsole CLI or CLI commands.

message passing interface

See MPI.

message signaled interrupts

See MSI.

MPI

Message passing interface. A standard used for writing parallel processing high performance computing (HPC) applications using the MPI message-passing API standard. The MPI API is used by many computational applications, and many other commercial and customer-developed applications.

The main advantages of a message-passing standard like MPI are portability and ease-of-use. In a distributed memory communication environment in which the higher level routines are built upon lower level message passing routines, the benefits of a standard are apparent. Additionally, a message passing standard provides vendors with a defined base set of routines that can be implemented efficiently, or in some cases provide hardware support for, thereby enhancing scalability.

MSI

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

N_Port

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

N_Port ID virtualization

See NPIV.

network time protocol

See NTP.

NIC

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

node port

See N_Port.

non-volatile random access memory

See NVRAM.

NPIV

N_Port ID virtualization. The ability for a single physical Fibre Channel end point (N_Port) to support multiple, uniquely addressable, logical end points. With NPIV, a host Fibre Channel Adapter is shared in such a way that each virtual adapter is assigned to a virtual server and is separately identifiable within the fabric. Connectivity and access privileges within the fabric are controlled by identification of each virtual adapter and, hence, the virtual server using each virtual adapter.

NTP

Network time protocol. NTP is used for distributing the Coordinated Universal Time (UTC) by means of synchronizing the clocks of computer systems over packet-switched, variable-latency data networks.

NVRAM

Non-volatile random access memory. A type of memory that retains data (configuration settings) even when power is removed. You can manually configure NVRAM settings or restore them from a file.

path

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

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

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

PCI

Peripheral component interconnect. First released in 1992, PCI has been rapidly evolving into a viable replacement for the ISA bus. It solves many of the problems with older architectures, while at the same time delivering a substantial increase in processing speed. PCI provides a new way of connecting peripherals to both the system memory and CPU, with the goal of alleviating many problems encountered when installing new cards in an ISA-based system (IRQ conflicts, address conflicts, and so on.).

However, unlike MicroChannel, PCI boards may be used in a system that also employs other types of devices. In fact, in many systems, a single slot can accommodate either an ISA or PCI board.

PCIe, PCI Express

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

peripheral component interface

See PCI.

personality

The term personality appears in different contexts:

- Adapter level

Adapter Personality
The term personality refers to the entire adapter where supported. When used in this context of an adapter, it includes all the I/O ports and its functions on that adapter. For example, a Marvell adapter can have dual personality—convert from Fibre Channel Adapter to Converged Network Adapter or vice versa. Therefore, all the I/O functions and all the I/O physical ports on the adapter change from Fibre Channel to Converged Network Adapter.

ping

A computer network tool used to test whether a specific host is reachable across an IP network. Ping is also used to self-test the network interface card of the computer, or as a speed test.

point-to-point

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

port

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

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

port instance

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

QoS

Quality of service. Refers to the bandwidth allocation assigned to each partition used to send and receive data between the adapter port and connected devices.

Each physical port on a Marvell adapter can send and receive data at up to 10Gbps in both directions at the same time. When the physical port is partitioned into four partitions, the port bandwidth is divided between each port partition according to traffic demands.

You can set QoS for each port partition by setting minimum and maximum percentages of the physical port's bandwidth for each partition. This feature helps guarantee a transmission rate for each partition that requires a specific bandwidth to run critical applications using port partitions. The setting for a specific QoS can resolve bottlenecks that exist when virtual machines (VMs) contend for port bandwidth.

quality of service

See QoS.

RAID

Redundant array of independent/inexpensive disks. RAID are fault-tolerant disks that look like either single or multiple volumes to the server.

RAM

Random-access memory. The most common computer memory that can be used by programs to perform necessary tasks while the computer is on; an integrated circuit memory chip. RAM allows information to be stored or accessed in any order (randomly), and all storage locations are equally accessible.

random-access memory

See RAM.

redundant array of independent/inexpensive disks

See RAID.

SAN

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

SCM

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

SCSI

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

secure sockets layer

See SSL.

self-monitoring, analysis and reporting technology

See SMART.

SerDes

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

serializer/deserializer

See SerDes.

SFP

Small form-factor pluggable. A compact, hot-pluggable transceiver used for both telecommunication and data communications applications. It interfaces a network device mother board (for a switch, router, media converter, or similar device) to a fiber optic or copper networking cable. It is a popular industry format supported by many network component vendors. SFP transceivers are designed to support SONET, Gigabit Ethernet, Fibre Channel, and other communications standards.

single root input/output virtualization

See SR-IOV.

small computer system interface

See SCSI.

small form-factor pluggable

See SFP.

SMART

Self-monitoring, analysis and reporting technology. A monitoring system for computer hard disk drives to detect and report various indicators of reliability that may indicate an impending disk failure. If SMART anticipates a failure, the user may choose to replace the disk drive to avoid unexpected outage and data loss.

SR-IOV

Single root input/output virtualization. A specification by the PCI SIG that enables a single PCIe device to appear as multiple, separate physical PCIe devices. SR-IOV permits isolation of PCIe resources for performance, interoperability, and manageability.

SSL

Secure sockets layer. A cryptographic protocol that provides communications security over the Internet.

storage area network

See SAN.

sysfs

A virtual file system provided by the 2.6 Linux kernel. Sysfs exports information about devices and drivers from the kernel device model to user space, and is also used for configuration.

target

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

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

TCP

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

TLV

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

These fields are used as follows:

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

type-length-value

See TLV.

UEFI

Unified extensible firmware interface. A specification detailing an interface that helps hand off control of the system for the preboot environment (that is, after the system is powered on, but before the operating system starts) to an operating system, such as Windows or Linux. UEFI provides a clean interface between operating systems and platform firmware at boot time, and supports an architecture-independent mechanism for initializing add-in cards.

unified extensible firmware interface

See UEFI.

USCM

SAN congestion management (SCM) is a common noun, and describes a standards-based Fibre Channel technology. Universal SAN Congestion Mitigation (USCM) is Marvell's IP, and describes Marvell's SCM feature set.

USCM Profiles

Settings to control the amount of I/O throttling by throttling outstanding requests to a target device either up or down.

virtual LAN

See VLAN.

Virtual Lanes (VLs)

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

virtual machine

See VM.

vital product data

See VPD.

VLAN

Virtual LAN. A group of hosts with a common set of requirements that communicate as if they were attached to the same wire, regardless of their physical location. Although a VLAN has the same attributes as a physical LAN, it allows for end stations to be grouped together even if they are not located on the same LAN segment. VLANs enable network reconfiguration through software, instead of physically relocating devices.

VM

Virtual machine. A software implementation of a machine (computer) that executes programs like a real machine.

VPD

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

wake on LAN

See WoL.

WoL

Wake on LAN. An Ethernet computer networking standard that allows a computer to be remotely switched on or awakened by a network message sent usually by a simple program executed on another computer on the network.

world wide name

See WWN.

world wide node name

See WWNN.

world wide port name

See WWPN.

world wide unique LUN name

See WWULN.

WWN

World wide name. A unique 64-bit address assigned to a device by the device manufacturer.

WWNN

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

WWPN

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

WWULN

World wide unique LUN name. Identifiers for SCSI devices are read from page 83 and page 80 of your SCSI block device as based on the SCSI standard.

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

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