MARVELL

QConvergeConsole® CLI

2500, 2600, 2700 Series Fibre Channel Adapters

User's Guide

DELL Technologies

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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 within SANs.

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®, Linux®, and Solaris® 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 the Fibre Channel protocol supported by the QCC CLI tool.
- Chapter 5 Fibre Channel Noninteractive Commands describes the noninteractive Fibre Channel command syntax and parameters.

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Part III Interactive Commands

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

Appendices

- Appendix A 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 and an index 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 Fibre Channel noninteractive commands that are described in Chapter 5.

Related Materials

For additional help installing or using QConvergeConsole CLI, refer to the following related documents:

- *QConvergeConsole CLI Read Me*

For information about the QConvergeConsole GUI tool, refer to the following document:

- *Installation Guide—QConvergeConsole GUI* (part number SN0054669-00)

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.

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- Text in **bold** font indicates user interface elements such as a menu items, buttons, check boxes, or column headings. For example:
  - Click the **Start** button, point to **Programs**, point to **Accessories**, and then click **Command Prompt**.
  - Under **Notification Options**, select the **Warning Alarms** check box.
- Text in `Courier` font indicates a file name, directory path, or command line text. For example:
  - To return to the root directory from anywhere in the file structure: Type **`cd/ root`** and press ENTER.
  - Issue the following command: **`sh ./install.bin`**.
- Key names and key strokes are indicated with UPPERCASE:
  - Press CTRL+P.
  - Press the UP ARROW key.
- Text in *italics* indicates terms, emphasis, variables, or document titles. For example:
  - For a complete listing of license agreements, refer to the 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 fc -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*.

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- `[ ]` (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:

- **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 ▸ 1. Converged Network Adapter ▸ 1. Flash Update

- **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)

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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

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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 4.

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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

Operating System Requirements

QConvergeConsole CLI runs on the following platforms:

- Microsoft® Windows Server®
- Red Hat® Linux® Advance Server/Enterprise Server
- Oracle® Linux Unbreakable Enterprise Kernel (UEK) R2 (2.6.39-400 kernel)
- Solaris® SPARC® and Solaris x86
- Citrix® XenServer®

NOTE

For an up-to-date list of supported operating system versions, refer to the QConvergeConsole CLI *Read Me*.

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Supported Marvell Adapters

QConvergeConsole CLI supports the 2500, 2600, and 2700 Series Fibre Channel Adapters.

NOTE

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

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

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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

The Marvell Web site provides periodic updates to the management utility, software, and documentation.

For Dell sourced adapters, use the applicable adapter Firmware Upgrade Utility and driver software packages found on the Dell support web site.

To download the management utility, software, and documentation:

1. Go to either the Dell Web site or www.marvell.com. Perform the following steps for the Marvell software download Web site.
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**.

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7. Locate the management utility, software, or document you need, and then click the item's name or icon to download or open the item.

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

To install QConvergeConsole CLI:

1. Launch the installer (Figure 2-1).

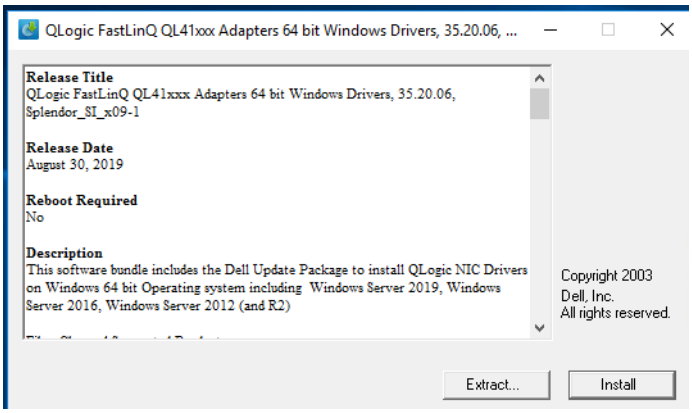

Figure 2-1. Installer—Start

2. Click **Install**. The Question window appears if you have not previously installed QConvergeConsole CLI (Figure 2-2).

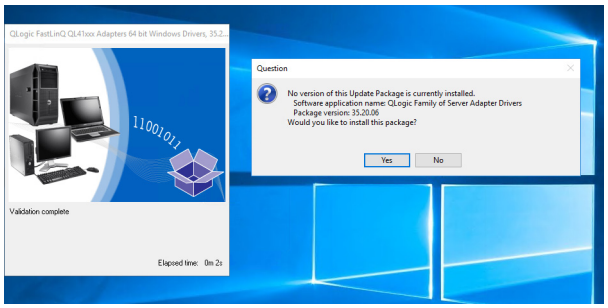

Figure 2-2. Update Package—No Previous Version

3. Click **Yes**.

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4. A message appears when the package has been installed successfully (Figure 2-3).

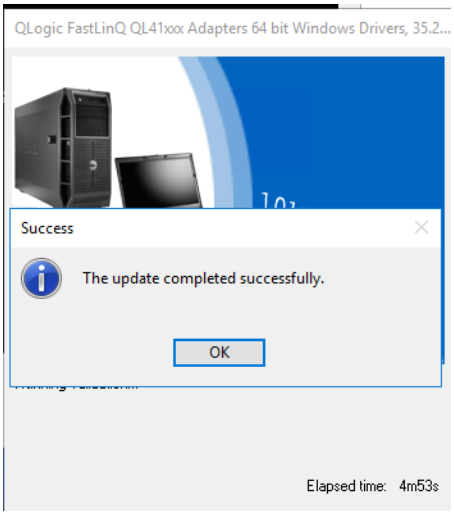

Figure 2-3. Update Package—Success

Installing QConvergeConsole CLI in a Linux Environment

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

Linux 32-bit (i386/i686):

```
# rpm -ivh QConvergeConsoleCLI-<version>.i386.rpm
```

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.

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NOTE

- QConvergeConsole CLI is available for PowerPC® (PPC), both PPC64 and PPC64le. Only FC protocol is supported with 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_2.2.00-xx_arm64.deb
Selecting previously unselected package qconvergeconsolecli.
(Reading database ... 73321 files and directories currently
installed.)
Preparing to unpack qconvergeconsolecli_2.2.00-xx_arm64.deb ...
Unpacking qconvergeconsolecli (2.2.00-13) ...
Setting up qconvergeconsolecli (2.2.00-13) ...
Library 2.2  already installed at
/lib/aarch64-linux-gnu/libHBAAPI.so.
Library 6.04 build17 already installed at
/lib/aarch64-linux-gnu/libqlsdm.so.
Processing triggers for libc-bin (2.23-0ubuntu5) ...
```

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

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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

To uninstall from the Windows Control Panel:

1. Go to **Start**, and then click **Control Panel**.
2. Double-click **Add/Remove Programs**.
3. Select **QConvergeConsole CLI**.
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

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

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
```


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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) ...
```


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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. The noninteractive Fibre Channel commands are described in Chapter 5.

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.

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

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Using Interactive Mode

Interactive mode is a menu-driven interface that manages MarvellFibre Channel Adapters, and all functions of Fibre Channel. The interface for the Fibre Channel Adapters is described in Chapter 6.

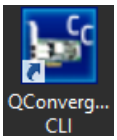
Starting QConvergeConsole CLI

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

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`

  To bypass iSCSI and Ethernet protocols, issue the following command:

  `qaucli -pr fc`

Starting QConvergeConsole CLI in Linux

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

`qaucli`

To bypass iSCSI and Ethernet protocols, issue the following command:

`qaucli -pr fc`

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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:  Refresh
7:  Help
8:  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:

iSCSI:	**`qaucli -pr iscsi -h`**
NIC:	**`qaucli -pr nic -h`**
Fibre Channel:	**`qaucli -pr fc -h`**

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The following shows an example of noninteractive help output for iSCSI, NIC, and Fibre Channel adapters:

```
Using config file: /opt/QLogic_Corporation/QConvergeConsoleCLI/qaucli.cfg
Installation directory: /opt/QLogic_Corporation/QConvergeConsoleCLI
Working dir: /root

QConvergeConsole
Version x.y.z (Build xx)
Copyright (C) 2020 Marvell Semiconductor, Inc.
Build Type:  Release
Build Date:  Nov  5 2020 10:56:35

NAME: qaucli

SYNOSYS:
   qaucli [ -pr <nic|iscsi|fc|fca> ] [options]
   qaucli [ -nic | -fc | -iscsi | -fca ] [options]

DESCRIPTION:
qaucli is a unified command line application, which can be
used to manage all QLogic adapter models.
The overall option (i.e.: -pr <protocol> allows user to start
the application with a specific protocol type (NIC/iSCSI/FC)
If no protocol is specified, then all protocols will be enabled
by default.

OPTIONS:
   Menu Mode
   qaucli                       - Start in interactive mode
   qaucli -pr nic [options]     - Launch application with NIC discovery only
   qaucli -pr iscsi [options]   - Launch application with iSCSI discovery only
   qaucli -pr fc [options]      - Launch application with FC discovery only
   qaucli -pr fca [options]- Launch application with FabricCache discovery only

   Command Line Mode
   qaucli [options]             - Execute command line options
   qaucli -npar [options]       - Execute NPAR command line options

   Legacy Modes (Command line mode only):
```


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```
   qaucli -nic [options]        - Use NIC legacy command line
   qaucli -iscsi [options]      - Use iSCSI legacy command line
   qaucli -fc [options]         - Use FC legacy command line
   qaucli -fca [options]        - Use FabricCache legacy command line

Additional options:
               -h               - Display built-in command line syntax

Help about commands, and command options available for each specific
protocol are available by specifying "-h" to the protocol of interest:

   qaucli -pr nic | -nic -h     - Display NIC protocol usage
   qaucli -pr fc | -fc -h       - Display FC/FCoE protocol usage
   qaucli -pr iscsi | -iscsi -h - Display iSCSI protocol usage
   qaucli -pr fca | -fca -h     - Display FabricCache protocol usage
   qaucli -pr all -h            - Display non-interactive command usage
                                  for all protocols
   qaucli -npar -h              - Display NPAR command usage
   qaucli -h                    - Display this usage

Miscellaneous options:
   qaucli -v                    - Display application version
   qaucli -beacon <all|port_num|mac|wwpn|wwnn|iSCSI name> <on|off|status>
                    - Enable/Disable/Status for Port Beacon
                    - Use qaucli -iport to view port_num
```

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: /opt/QLogic_Corporation/QConvergeConsoleCLI/qaucli.cfg
Installation directory: /opt/QLogic_Corporation/QConvergeConsoleCLI
Working dir: /root

QConvergeConsole
Version x.y.z (Build xx)
Copyright (C) 2020 Marvell Semiconductor, Inc.
Build Type:  Release
Build Date:  Nov  5 2020 10:56:35
```


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```
Usage: qaucli [options]


The following is a simplified help for extension
of non-interactive commands for all protocols (NIC/FC/iSCSI).


Non-interactive mode syntax:

   qaucli -pr all -switch  [options]

where switch is one of the following command line switches:

   -help     // Display help info

   -h        // Same as -help

   -?        // Same as -help

   ?         // Same as -help

   -ei       // List errors codes for -pr all switches

   -svmtool  [svm-options]          // SVM FW Update Tool
               where [svm-options] are:

           mode=[version|ver|inventory|update]
                 // mode of execution

           fwup=fw_file_name | fwup=list_of_fwup_files.txt

             output=[stdout|stderr|output_file_name]
                  // output in xml format; can be repeated

           mac=[11:22:33:44:55:66|11-22-33-44-55-66]
                  //limit update to device with physical mac
           NOTE: mac,wwnn and wwpn switches are exclusive

           wwpn=[11-22-33-44-55-66-77-88]
```


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```
        //limit update to device with WWN
  NOTE: mac,wwnn and wwpn switches are exclusive

  fwdump=fwdump_file_name   // NOT implemented yet

  comment=[on|true|yes|y|1]
         // inserts comments into xml output
         // on mac of the device
         // and other info if available


  discoverall=[on|true|yes|y|1]
         // discover all adapters; if not set,
         // only adapters specified in svmtool.cfg
         // will be discovered.
  NOTE: discoverall is applicable only for mode=inventory
        and mode=update

  -all  // same as discoverall=[on|true|yes|y|1]
  all   // same as discoverall=[on|true|yes|y|1]


-suppress_version_match // suppress match check
                        // for version of flash file
                        // and version in svmtool.cfg
-supvermatch   // same as -suppress_version_match

 Example 1 - Display vesion only

       qaucli -pr all -svmtool mode=version

 Example 2 - Update FW from file and produce xml
             output to stdout and to a  file;
             add comments to xml on mac of the device

     qaucli -pr all -svmtool  mode=update
             fwup=c:/fw/fw1.bin
             output=stdout output=c:/xmloutput/1.xml
             comment=on
```


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```
         Example 3 - Inventory

            qaucli -pr all -svmtool  mode=update output=stdout


-updimages_viewver <flash_file|list_of_fwup_files.txt> // Displays list of IDs
that
               // the flash file supports

-ffv  <flash_file|list_of_fwup_files.txt>  // verifies if input is FFV
supported file
           // Returns 0 upon support and non-zero otherwise
           // Input same as for -updimages_viewver

-updimages_matcher <flash_file|list_of_fwup_files.txt>  // Displays matches
between
             // flash file and discovered devices
             // example of the content of list_of_fwup_files.txt
             #
```


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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

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4 General Noninteractive Commands

This chapter describes and shows examples of the general noninteractive commands that apply to the Fibre Channel QConvergeConsole CLI supported protocol. The general commands include the `all` switch.

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

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

QConvergeConsole
Version x.y.z (Build xx)
Copyright (C) 2020 Marvell Semiconductor, Inc.
Build Type:  Release
Build Date:  Nov  5 2020 10:56:35


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.
```


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```
   <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>
```


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```
                    - 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.
-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.

-q <hba instance>|<hba wwpn>|<all> [-t|-targets]
                    - Displays current iiDMA settings of all attached
                      targets on an HBA port or all HBAs.
-q <hba instance>|<hba wwpn> <target wwpn>
                    - Displays current iiDMA settings of the specified
                      target on an HBA port.
-q <hba instance>|<hba wwpn>|<all> ) -t|-targets <iidma speed>
                    - Modifies iiDMA settings of all attached targets
                      on an HBA port or all HBAs.
-q <hba instance>|<hba wwpn> {<target wwpn> <iidma speed>}
                    - Modifies iiDMA settings of a specific targets
                      attached on an HBA port.
   Notes:
      This feature is not supported with devices attached to a 2Gb HBA
      or fibrelite HBA

-p <hba instance>|<hba wwpn>|<all> view|info
                    - Displays current persistent binding configuration of
                      all devices attached on an HBA port or all HBAs.

-p <hba instance>|<hba wwpn> {<target wwnn> <target wwpn> <target portid>
   <target id> }
                    - Binds the specified device(s) to an HBA port.

-p <hba instance>|<hba wwpn>|<all> bind all
                    - Binds all attached device(s) to an HBA port or
```


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```
                    all HBAs.

-p <hba instance>|<hba wwpn>|<all> remove all|unbind all
                  - Unbinds all attached device(s) to an HBA port or
                    all HBAs.

-p <hba instance>|<hba wwpn> remove|unbind <target wwnn>
                  - Unbinds the specified device of an HBA port.

-m <hba instance>|<hba wwpn> view|info
```


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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 24).
- **`qaucli -pr fc -z`** shows the host configuration (see "Host Configuration (Command Line Option -z)" on page 25

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

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- 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:

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

QConvergeConsole CLI shows the information in "Host Information (Command Line Option -g)" on page 24, 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
- 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

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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 34
`-dm`	Show general or detailed digital diagnostic monitoring	"-dm (Transceiver Diagnostics Monitoring Interface [DMI])" on page 36
`-e`	Configure boot device	"-e (Boot Devices Configuration)" on page 39
`-fg`	View driver settings	"-fg (Display Driver Persistent Binding Settings)" on page 47
`-gs`	Show adapter statistics	"-gs (Configure Parameters [Monitoring])" on page 51
`-i`	Show adapter information	"-i (FC Adapter Information; FC VPD Information; FC VFC Information)" on page 53
`-l`	Show LUN list	"-l (FC Target/LUN Information)" on page 65
`-m`	Configure selective LUNs	"-m (Selective LUNs)" on page 67
`-p`	Configure target persistent binding	"-p (Target Persistent Bindings)" on page 74
`-t`	Show target list	"-t (FC Target/LUN Information)" on page 89

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 28

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

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

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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 43). 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 73). For example:

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

- `-s` = Silent mode (see "-s (Suppress Output [Silent Mode])" on page 87). 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 96). 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
`<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)

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Table 5-2. Command Variables (Continued)

Variable	Definition	Format
<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
- -b (Flash Update; Save Flash)
- -bbcr (BB Credit Recovery)
- -c (Display HBA Parameters)
- -ctp (CT Ping Test)
- -d (Driver Update)
- -dm (Transceiver Diagnostics Monitoring Interface [DMI])
- -dp (Diagnostic Port Test)
- -dport (Diagnostics Port)
- -e (Boot Devices Configuration)
- -ei
- -f
- -fcep (Diagnostics FC Ping [ELS Echo Ping])
- -fec (FEC Enable/Disable)
- -fec (FEC Enable/Disable)
- -fg (Display Driver Persistent Binding Settings)
- -ftr (CT FTR Test)
- -fs (Driver Parameters)
- -fwdump (Firmware Dump)

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-a

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 87 to issue a response to this command.

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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.

In Solaris SPARC, include double quotes around the question mark (`?`) if the system is running with a *csh* or *tcsh* shell. For example:

qaucli -pr fc -a <hba instance> | <hba wwpn> "?"

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 87), 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 or FCode from a file.
- Save the BIOS or FCode to a file.

NOTE

The BIOS or FCode cannot be updated when the System Lockdown Mode feature is enabled. Use the command "-i (FC Adapter Information; FC VPD Information; FC VFC Information)" on page 53 command to view the System Lockdown Mode status. Use the Dell Management Console Dashboard to change the status. By default, the Firmware Update Lockdown feature is enabled.

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

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

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Where:

- `all` = All adapters of the same type in the system are updated with the new BIOS or FCode
- `<hba instance>` = Adapter number (use the `-g` command to find)
- `<hba wwpn>` = World wide port name
- `all` = Update all regions (BIOS, FCode, or extensible firmware interface (EFI) depending on the Flash image
- `<image file>` = Name or path of file containing update BIOS or FCode [a]
- `<model type>` = Optional. Update only adapters that match the specified adapter family type:
  - `--25xx` 25*xx* Fibre Channel adapter model type
  - `--26xx` 26*xx* Fibre Channel adapter model type
  - `--268x` 268*x* Fibre Channel adapter model type
  - `--27xx` 27*xx* Fibre Channel adapter model type
- --ports = Optional. Repeat Flash update to all other ports.

[a] The path and file name must *not* contain embedded spaces.

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 or FCode
- `<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.

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`-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.

To save the BIOS or FCode to a file (25*xx* Fibre Channel adapters only), issue the following command:

`qaucli -pr fc -b <hba instance>|<hba wwpn> SAVE <BIOS/FCode file name>`

Where:

`<hba instance>`	=	Adapter number (use the `-g` command to find)
`<hba wwpn>`	=	World wide port name of the adapter
`<BIOS/FCode file name>`	=	File name or a path to a file in which to save the BIOS or FCode [a]

[a] The path and file name must *not* contain embedded spaces.

Following is example output of a failed Flash update:

```
c:\Program Files\QLogic Corporation\QConvergeConsoleCLI>qaucli.exe
-b 0 C:\Users\Administrator\Downloads\mh030215.bin
Using config file: c:\Program Files\QLogic
Corporation\QConvergeConsole CI
Working dir: c:\Program Files\QLogic
Corporation\QConvergeConsoleCLI
FW lockdown is enabled. Flash update is restricted to HBA
instance 0 (QLE2772)!
```

If System Lockdown Mode is turned on, the flash update fails if the existing released driver/application is being run with the latest RISC/MPI firmware (that supports the firmware lockdown feature).

If a new driver/RISC/MPI firmware is being run with the existing application, the flash update fails with an error message that may be misleading, as the existing application is not aware of the lockdown feature.

If an existing MPI/RISC firmware, driver, and application are being run, System Lockdown Mode (on or off) has no effect. The flash update will be successful.

NOTE

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

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NOTE

On Solaris only:

- Reset is disabled if the system detects storage SR-IOV or VFs.
- The Flash update does not take effect until the system is restarted

-bbcr (BB Credit Recovery)

Buffer-to-buffer credit recovery (BB-CR) enables two FC peer ports (N_Port, F_Port, or E_Port) to periodically send and receive the quantity of receiver ready (R_RDY) signals transmitted. The BB-CR feature allows the peer port to recover from possible R_RDY signals lost over a lossy link. BB-CR 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 BB credit 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

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`<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 a Brocade® switch with Fabric OS version 7.1.1 and later.

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>]
```


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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

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-d (Driver Update)

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

qaucli -pr fc -d <driver file>

Where `<driver file>` is either a `.zip`, `.exe`, or `<oemdriver>.inf` file.

-dm (Transceiver Diagnostics Monitoring Interface [DMI])

The `-dm` option allows you to show general or detailed digital diagnostic monitoring interface for optical transceivers.

NOTE

Under Solaris, this option is disabled if you are using Linux inbox drivers (SLES 10.0 or RHEL 5.0 or later).

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

qaucli -pr fc -dm <hba instance>|<hba wwpn>|all general|gen

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

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

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

For example:

qaucli -dm 5 gen (where `5` is the HBA instance number)

```
-------------------------------------------------------------------------------
HBA Instance 5: QLE2764 Port 4 WWPN 50-02-7F-8F-18-D1-A0-01 PortID 01-02-00
Link: Online (FEC)
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
```


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```
Media Information
            ------------------------------------------------------------------
                        Vendor: FINISAR CORP.
                          Type: 800-M5-SN-S
                   Part Number: FTLF8532P4BCV-QL
                         Speed: 3200 MBytes/Sec 1600 MBytes/Sec 800 MBytes/Sec
                      Revision: A
                 Serial Number: UV41BT2
```

-dp (Diagnostic Port Test)

Information about this command will be provided in a future version of this guide.

-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 Fibre Channel adapters and requires supported Brocade switches 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.

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`<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 or 2700 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
```


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```
-------------------------------------------------------------------------------
HBA Instance 4: QLE2772 Port 1 WWPN 21-00-F4-E9-D4-54-AB-12 PortID 01-00-00
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 (Mbx1): 0x41
Details (Mbx2): 0xe000
```

-e (Boot Devices Configuration)

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.
- Selectable boot; the OS boots from the first target the BIOS finds.
- Delete the boot device from an adapter.
- Enable and disable a fabric-assigned boot LUN.

In 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
`<target id>` = ID to which the target is bound
`<lun id>` = ID of the LUN
`<prim>` = Primary boot port name
`<alt1>` = Alternate 1 boot port name
`<alt2>` = Alternate 2 boot port name
`<alt3>` = Alternate 3 boot port name
`<FabricAssignBootLUN>` = Enable or disable fabric-assigned boot LUN
`<fb>` = Enable or disable fabric-assigned boot LUN

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To view the current boot device selection on all adapters:

qaucli -pr fc -e all view|info

To view the current boot device selection for a specific adapter port:

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

In Solaris SPARC, if the system is running with a csh or tsch shell, include double quotes around the question mark (?). For example:

qaucli -pr fc -e <hba instance> | <hba wwpn> "?"

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>

Solaris shows each adapter's currently selected boot device in the following format:

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

If the system does not have an adapter with a boot device selected, the following message appears:

```
There is no boot device selected for any HBA in the system.
```

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

```
-------------------------------------------------------------------------------
HBA Instance 4: QLE2772 Port 1 WWPN 21-00-F4-E9-D4-54-AB-12 PortID 01-00-00
Link: Online (FEC)
-------------------------------------------------------------------------------
--
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
```


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```
---------------------------     ------
(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

        Press <Enter> to continue:
```

To cause the OS to boot from the first target it finds with a LUN, select a boot port name of `00-00-…00` (selectable boot); this applies only if the boot BIOS is enabled.

To set a specific target as the boot device for a specific adapter, issue the following command:

`qaucli -pr fc -e (<hba instance> | <hba wwpn>) <target wwnn> <target wwpn> <target id> <lun id>`

NOTE

Because x86 Solaris does not require the target ID, the Solaris command is:

```
qaucli -pr fc -e  <hba instance>|<hba wwpn>
<target wwnn> <target wwpn> <lun id>
```

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.

In Solaris SPARC, setting the target ID to the target of the boot-selected LUN is equivalent to persistently binding the target (see “-p (Target Persistent Bindings)” on page 74). Therefore, if the target is persistently bound, its boot device entry must have the same target ID.

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?
```


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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 use selectable boot (the OS boots from the first target the BIOS finds) set the `<target wwpn>`, `<target wwnn>`, and `<lun id>` inputs to all zeros. For example issue the following command:

```
qaucli -pr fc -e <hba instance>|<hba wwpn> (enable | 0 0 0)
```

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 configure the OS to boot from the first target that the BIOS finds (selectable boot), issue the following command:

```
qaucli -pr fc -e <hba instance>|<hba wwpn> enable|0 0 0
```

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 | FB
```

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

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


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-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
   ```


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-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

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- `-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

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

<param value> = Value of parameter or alias (see Table 5-3 on page 35)

-fec (FEC Enable/Disable)

NOTE

The forward error correction (FEC) feature is supported only on Marvell QLogic 16Gb and 32Gb Fibre Channel adapters if the current adapter port is connected to a Brocade switch with FEC support. For 32Gb 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.

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-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 49.

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: QLE2882 Port 1 WWPN 21-00-F4-E9-D4-54-AE-08 PortID
02-05-00
Link: Online (FEC)
------------------------------------------------------------------
Driver Settings - Group: Persistent
---------------------------------
```


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-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

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 35)

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-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
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.

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The following restrictions apply:

- Under Solaris, the driver configuration feature is disabled if you are using the driver from the OS installation CDs (QLC driver).
- Under Linux, this feature is disabled if you are using the input/output control (IOCTL) driver.
- Under Mac OS®, the `BindWWPN` and `BindPortID` parameters are not changeable; Mac OS supports only the `BindWWPN` parameter.

-fwdump (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.

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 to save the firmware dump to

-g

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

```
-------------------------------------------------------------------------------
Host Name                      : localhost
OS Type                        : Linux - SUSE Linux Enterprise Server 15 SP2
x86_64
OS Version                     : 5.3.18-22-default
FO API Version                 : 3.0.1 build9
SDM API Version                : v6.04 build65
-------------------------------------------------------------------------------
HBA Model QLE2772 (SN AFD1915Y07299):
  Port   1 WWPN 21-00-F4-E9-D4-54-AB-12 (HBA instance  4) Online (FEC)
```


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```
  Port   2 WWPN 21-00-F4-E9-D4-54-AB-14 (HBA instance  5) Online (FEC)
HBA Model QLE2562 (SN GFC0819H89417):
  Port   1 WWPN 21-00-00-1B-32-0C-A9-0B (HBA instance  2) SFP not present
  Port   2 WWPN 21-01-00-1B-32-2C-A9-0B (HBA instance  3) SFP not present
HBA Model QLE2672 (SN RFE1303H21665):
  Port   1 WWPN 21-00-00-0E-1E-11-60-D0 (HBA instance  0) Online
  Port   2 WWPN 21-00-00-0E-1E-11-60-D1 (HBA instance  1) SFP not present
-------------------------------------------------------------------------------
Total QLogic HBA(s) : 3
```

-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`	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.

The following restrictions apply:

- Under Solaris, this feature is disabled if you are using the driver from the OS installation CDs (QLC driver).
- Under Linux, this feature is disabled if you are using the IOCTL driver.

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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
QConvergeConsole FCAPI
Version x.y.z (Build xx)
Copyright (C) 2003-2020 Marvell Semiconductor Inc.
Build Type:  Release
Build Date:  Nov  5 2020 10:55:53
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.
```


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NOTE

To view the current version information for QConvergeConsole CLI, issue the `-v` command as described in "-v (QCC CLI Version Information)" on page 94.

-ha (Adapter 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 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.

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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 16Gb and 32Gb Fibre Channel adapters if the current adapter port is connected to a Brocade switch with FEC support. For 32Gb 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   : C0-03-FF-00-00-FF-FF-00
------------------------------------------------------------
```


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```
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
```


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```
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-RVBIHEFFUVI
HBA Instance                    : 0
HBA Model                       : QLE2694
HBA Description                 : QLE2694 Quad Port 16Gb FC to PCIe Gen3 x8
Adapter
HBA ID                          : 0-QLE2694
HBA Alias                       :
HBA Port                        : 1
Port Alias                      :
Node Name                       : 20-00-00-24-FF-7B-96-C4
Port Name                       : 21-00-00-24-FF-7B-96-C4
Port ID                         : 03-0F-00
Principal Fabric WWN            : 10-00-00-27-F8-F1-66-A0
Adjacent Fabric WWN             : 20-0F-00-27-F8-6B-26-B4
Adjacent Fabric WWN             : 20-0F-00-27-F8-6B-26-B4
Adjacent Fabric WWN             : Not connected
Serial Number                   : xxxxxxxxxxxxx
Driver Version                  : STOR Miniport  9.2.6.20 A2 DBG
BIOS Version                    : 3.54
Running Firmware Version        : 100.07.11
Running MPI Firmware Version    : Not Running
Running PEP Firmware Version    : 1.00.23
Flash BIOS Version              : 3.54
Flash FCode Version             : 4.11
Flash EFI Version               : 6.23
Flash Firmware Version          : 100.07.11
```


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```
Flash MPI Firmware Version     : 1.02.06
Flash PEP Firmware Version     : 1.00.23
Actual Connection Mode         : Point to Point
Actual Data Rate               : 16 Gbps
Supported Speed(s)             : 4 8 16 Gbps
Chip Model Name                : ISP2714-based 16/32Gb Fibre Channel to PCIe
Adapter
Chip Revision                  : 0x1(A0)
PortType (Topology)            : NPort
Target Count                   : 1
PCI Bus Number                 : 4
PCI Device Number              : 0
PCI Function Number            : 0
PCI Device ID                  : 0x2071
Subsystem Device ID            : 0x02a3
Subsystem Vendor ID            : 0x1077
PCIe Max Bus Width             : x16
PCIe Negotiated Width          : x8
PCIe Max Bus Speed             : 8.0 Gbps
PCIe Negotiated Speed          : 8.0 Gbps
HBA Temperature (C)            : 59
HBA Status                     : Online (FEC)
```

To view adapter information for the QLE2690, QLE2692, QLE2964, QLE2964L, QLE2740, QLE2742, QLE2764, QLE2770, QLE2772, and QLE2774 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
```


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```
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  9.3.1.20 DBG
BIOS Version                    : 3.62
Running Firmware Version        : 8.08.203
Running MPI Firmware Version    : 1.03.08
Running PEP Firmware Version    : 2.00.08
Flash BIOS Version              : 3.62
Flash FCode Version             : N/A
Flash EFI Version               : 6.28
Flash Firmware Version          : 8.08.203
Flash MPI Firmware Version      : 1.03.08
Flash PEP Firmware Version      : 2.00.08
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
Config Lockdown                 : Disabled
Firmware Update Lockdown        : Enabled
MPI Lockdown                    : Disabled
```


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```
HBA Status:                    : Online (FEC)
```

The following parameters are part of the System Lockdown Mode feature, which is set through the Dell Management Console Dashboard.

- Config Lockdown
  When this parameter is enabled, changes to the adapter configuration are not permitted; for example, boot devices, BB credit, NVRAM settings, and so on. The default is disabled (adapter configuration is allowed).
- Firmware Update Lockdown
  When this parameter is enabled (default), a flash update is not allowed. When this parameter is disabled, flash updates are allowed.
- MPI Lockdown
  When this parameter is enabled, MPI functionality (sideband management) is not allowed. The default is disabled (MPI functionality is enabled/in use).

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: QLE2772 Port 1 WWPN 21-00-F4-E9-D4-54-AB-12 PortID 01-00-00
Link: Online (FEC)
------------------------------------------------------------------------------
Flash Image Version            : 3.02.16
Family Firmware Version        : 15.20.06
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
```


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-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 64)

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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

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<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 64)

See “Running a Read/Write Buffer Test” on page 62 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
```


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

```
HBA 1: QEM2462 Port 1 WWPN xx-xx-xx-xx-xx-xx-xx-xx Port ID 02-0E-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

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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.

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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>
```


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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.

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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 and 32Gb adapters, you must update the adapter flash firmware to the latest version.

-m (Selective LUNs)

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.
- Under Solaris, if you use the driver from the OS installation CDs (QLC driver), this feature is disabled.
- Under Solaris, the QLA adapter driver supports a maximum of 256 LUNs.
- Under Solaris, the QLC adapter driver supports a maximum of 16K LUNs.

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

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<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

In Solaris SPARC, include double quotes around the question mark (?) if the system is running with a csh or tsch shell. For example:

qaucli -pr fc -m <hba instance> | <hba wwpn> "?"

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.

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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
```


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```
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: 2.04.00.13
Last Update Time  : 01:37:18 Oct. 27, 2020
```


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-n (Configure HBA Parameters)

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

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Table 5-9. Adapter Parameters (Continued)

Description	Name	Alias	Value
Data rate	DataRate [b]	DR	0 = 1Gbps 1 = 2Gbps 2 = Auto 3 = 4Gbps 4 = 8Gbps 5 = 16Gbps 6 = 32Gbps
Enable BIOS	EnableBIOS [c]	EB	1=Enable, 0=Disable
Enable fabric-assigned WWN	EnableFabricAssignWWN [d]	FN	1=Enable, 0=Disable
Enable Fibre Channel tape [e]	EnableFCTape	EF	1=Enable, 0=Disable
Enable HBA hard loop ID	EnableHardLoopID [f]	HL	1=Enable, 0=Disable
Enable long range	EnableLR [g]	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 SCM	EnableUSCM [h]	EC	1=Enable, 0=Disable
Enable target reset	EnableTargetReset	TR	1=Enable, 0=Disable
Execution throttle [i]	ExecutionThrottle	ET	1–65535
Frame size	FrameSize	FR	512, 1024, 2048
Hard loop ID	HardLoopID [f]	HD	0–125
Interrupt delay timer	InterruptDelayTimer [j]	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
Operation mode	OperationMode [k]	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

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Table 5-9. Adapter Parameters (Continued)

Description	Name	Alias	Value
Port down retry count	`PortDownRetryCount`	`PD`	0–255
Prefer FCP support	`PreferFCP` [l]	`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.

[a] `ConnectionOption` is read-only for 10GbE (Marvell 3200/8100/8200 Series Adapters).

[b] `DataRate` applies to QLE2562 and 8100/8200 Series Adapters. It is read-only for 8100/8200 Series Adapters.

[c] The NVRAM parameter `EnableBIOS` option is available only with Linux PPC64Le and Solaris x86.

[d] The `EnableFabricAssignWWN` option applies to Marvell 2600 and 8300 Series Adapters.

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

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

[g] The `Enable LR` option enables long range (LR) cable distances in kilometers. For 2690 and 2700 Series Adapters, select either 5Km or 10Km. For 2660 and 2500 Series Adapters, you can only select 10Km. The `Enable LR` option is not available on 8200 Series Adapters.

[h] The `EnableUSCM` option is supported only on 2770 Series Adapters and QLE269*x* Adapters.

[i] The `ExecutionThrottle` option does *not* apply to 2600 and 8300 Series Adapters. Execution throttle is read-only for 10GbE adapters.

[j] The `InterruptDelayTimer` option is *not* available on Solaris.

[k] The `OperationMode` option is *not* available on Solaris.

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

-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.

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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`

Solaris: `/var/adm/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 Solaris, if you use the driver from the OS installation CDs (QLC driver), these features are disabled.
- 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

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

qaucli -pr fc -p all view|info

NOTE

In Solaris SPARC using a csh or tsch shell, include double quotes around the question mark (?). For example:

qaucli -pr fc -p <hba instance> | <hba wwpn> "?"

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

```
-------------------------------------------------------------------------
HBA 0: QLA2772 Port 1 WWPN xx-xx-xx-xx-xx-xx-xx-xx Port ID 11-06-EF
-------------------------------------------------------------------------
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

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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 (Adapter 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`

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-pc (Adapter Personality Change)

NOTE

The adapter personality feature is supported only on Marvell 2600 and 8300 Series adapters. This feature lets you set the adapter's personality to Fibre Channel only or Converged Network Adapter.

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

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
- **`cna`** or **`1`**: Converged Network Adapter

-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

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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])

NOTE

The -q option is supported only on 4Gb adapters.

To view the link speed of all targets attached to one adapter or all adapters, issue the -q command as follows:

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

Where:

<hba instance> = Adapter number (use the -g command to find)
<hba wwpn> = World wide port name of the adapter
all = Reports link speed for all targets on all adapters in the system
-targets or -t = All targets

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To view the link speed of a specific target attached to an adapter, issue the following command:

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

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

To set the link speed of all targets attached to one adapter or all adapters to the designated speed, issue the following command:

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

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)
`<hba wwpn>` = World wide port name of the adapter
`all` = Reports link speed for all targets on all adapters in the system
`-targets or -t` = All targets
`<speed>` = Link speed

To set the link speed of selected target(s) attached to one adapter to the designated speed, issue the following command:

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

Where:

`<hba instance>` = Adapter number (use the `-g` command to find)
`<hba wwpn>` = World wide port name of the adapter
`all` = Reports link speed for all targets on all adapters in the system
`<target wwpn>` = World wide port name of the target
`<speed>` = Link speed

-qos (Quality of Service [QoS])

NOTE

The `-qos` option is supported on Marvell 8Gb, 16Gb, and 32Gb Fibre Channel Adapters and Converged Network Adapters, and on Windows Server 2008, Windows Server 2008 R2, Windows Server 2012, and Windows Server 2012 R2 operating systems.

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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>`

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--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>
```


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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: QLE2770 Port 1 WWPN 21-00-34-80-0D-3B-89-B0 PortID
01-09-00
Link: Online
------------------------------------------------------------------
Diagnostics Parameters Descriptor List Length: 332 Bytes
--------------------------------
Diagnostics Parameters Descriptor
--------------------------------
Descriptor Tag: Link Service Request Information
Descriptor Len: 4 Bytes
Descriptor Value: 0x18000000
```


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


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```
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
```


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```
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
```


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```
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
```


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```
--------------------------------
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 26). 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 (Congestion Management)

NOTE

- Universal SAN Congestion Mitigation (USCM) is supported only on 2770 Series Adapters and QLE269*x* Adapters.
- See Table 6-1 on page 196 for USCM congestion parameter definitions.

To enable or disable the USCM feature on an adapter, list slow drain devices, or monitor congestion status in your SAN configuration, issue the following command:

`qaucli -scm <hba instance>|<hba wwpn> <options>`

Where:

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

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<hba wwpn> = World wide port name of the adapter
<options> = One of the following options:
--config
--enable
--disable
--chk
--clear
--hba
--stats [<params>], where **params =**
AutoPoll or **ap**
SetRate or **sr**

--config option:

To view the current USCM configuration on the adapter port, issue the following command:

```
qaucli -pr fc -scm <hba wwpn> --config
```

--enable option:

To enable USCM on the current adapter, issue the following command:

```
qaucli -pr fc -scm <hba wwpn> --enable
```

--disable option:

To disable USCM on the current adapter, issue the following command:

```
qaucli -pr fc -scm <hba wwpn> --disable
```

--chk option:

To view slow-drain devices, issue the following command:

```
qaucli -pr fc -scm <hba wwpn> --chk
```

--clear option:

To clear the adapter congestion statistics counters, issue the following command:

```
qaucli -pr fc -scm <hba wwpn> --clear
```

--hba option:

To show the current adapter congestion status, issue the following command:

```
qaucli -pr fc -scm <hba wwpn> --hba
```

--stats option:

To view the USCM statistics, issue the following command:

```
qaucli -pr fc -scm <hba wwpn> --stats ap|sr <number of passes>
```


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Where:

`AutoPoll` or `ap` = The number of iterations (count base) that the USCM statistics will run. If `AutoPoll i`s 0, the statistics runs continuously; stop the process by pressing ENTER.

`SetRate` or `sr` = The delay time between each iteration.

For example, the following command polls the first HBA instance/port once:

```
qaucli -pr fc -scm 0 --stats ap 1
```

-sp (FC Board Config Update)

To update the adapter firmware serializer/deserializer (SerDes) table from a file, 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.

This feature is supported with 8Gb and 16Gb mezzanine and blade adapters. It is not needed with the standard QLE2562 adapters.

-t (FC Target/LUN 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>
```


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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: QLE2772 Port 1 WWPN 21-00-F4-E9-D4-54-AB-12 PortID 01-00-00
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
Current State       : Congested (congestion)
Status              : Online
------------------------------------------------------------------------------
Path                : 0
Target              : 0
```


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```
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
Current State       : Healthy (no congestion)
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 option>` = 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 (Temperature Monitor)

NOTE

This command is supported only on 2600 and 2700 Series Adapters.

Issue the `-tm` command to view the temperature (in °C) of a single adapter or all the adapters in a host:

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```
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	Set to automatically read the temperature of all adapters.
		1–256	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.

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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.

-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.

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-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 support on the Marvell QLogic 2770/2800 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 2003-2009 QLogic Corp.
All rights reserved.
Command Line QLogic FC Host Bus Adapters.
```


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```
Build Type: Release
Build Date: xx/xx/xxxx xx:xx:xx AM
```

-vp (Virtual Ports [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>

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-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 26). 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 73) 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 26). 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 73) 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 25 covers this command.

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Part III

Interactive Commands

Part III of this guide provides details about the Fibre Channel interactive commands of QConvergeConsole CLI.

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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 99)
2:  Adapter Configuration (see page 110)
3:  Adapter Updates (see page 150)
4:  Adapter Diagnostics (see page 158)
5:  Monitoring (see page 188)
6:  FabricCache CLI
7:  Refresh (see page 202)
8:  Help (see page 203)
9:  Exit (see page 203)

    Please Enter Selection:
```


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Adapter Information

1. Adapter Information ▸ 2. Fibre Channel Adapter

From the main menu, select the **Adapter Information** option. If prompted, select **2** (**Fibre Channel Adapter**) as the **Adapter Type**. The `Adapter Type Selection` option shown below is not available in all QConvergeConsole CLI versions.

```
Adapter Type Selection

1:  Converged Network Adapter
2:  Fibre Channel Adapter

    (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
    Please Enter Selection: 2
```

The FC Adapter Information menu provides options to view information about Fibre Channel adapters, ports, VPD, targets, LUNs, VFC, and flash. For example:

```
FC Adapter Information

1:  FC Adapter Information
2:  FC Port Information
3:  FC VPD Information
4:  FC Target/LUN Information
5:  FC VFC Information
6:  FC Flash Information
```

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.

2600/2700 Series Fibre Channel Adapters:

```
QConvergeConsole

        CLI - Version x.y.z (Build xx)

    Adapter Information

     1: HBA Model: QLE2772 SN: AFD1915Y07299
          Port   1 WWPN: 21-00-F4-E9-D4-54-AB-12 Online (FEC)
```


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```
          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-1E-11-60-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                       :
PCI Location                   : PCI bus 130 device 0 function 1
Host NQN                       :
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
Family Firmware Version        : 15.20.06
Firmware Update Lockdown       : Disabled
```


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

        Hit <Enter> to continue:
```

2770 Series Fibre Channel Adapters:

```
QConvergeConsole

        CLI - Version x.y.z (Build xx)

    Adapter Information

    HBA Model QLE2772 SN: AFD1915Y07299
      1: Port   1: WWPN: 21-00-F4-E9-D4-54-AB-12 Online (FEC)
      2: Port   2: WWPN: 21-00-F4-E9-D4-54-AB-14 Online (FEC)
    HBA Model QLE2562 SN: GFC0819H89417
      3: Port   1: WWPN: 21-00-00-1B-32-0C-A9-0B SFP not present
      4: Port   2: WWPN: 21-01-00-1B-32-2C-A9-0B SFP not present
    HBA Model QLE2672 SN: RFE1303H21665
      5: Port   1: WWPN: 21-00-00-0E-1E-11-60-D0 Online
      6: Port   2: WWPN: 21-00-00-0E-1E-11-60-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
Host NQN[1] :
HBA Instance                  : 4
HBA Model                     : QLE2772
HBA Description               : QLogic QLE2772 2x32Gb QLE2772 FC HBA
HBA ID                        : 4-QLE2772
HBA Alias                     :
HBA Port                      : 1
Port Alias                    :
Node Name                     : 20-00-F4-E9-D4-54-AB-12
Port Name                     : 21-00-F4-E9-D4-54-AB-12
```

[1] `Host NQN` appears only for 2600 Series Adapter models QLE2690, QLE2692, QLE2964, QLE2964L, and 2700 Series Adapter models QLE2740, QLE2742, QLE2764, QLE2770, QLE2772, QLE2774 on which the port link is up. It shows the host NVMe qualified name (NQN) for NVM Express (NVMe) over Fibre Channel (NVMe-oF)

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```
Port ID                         : 01-00-00
Principal Fabric WWN            : 10-00-D8-1F-CC-06-6A-DD
Adjacent Fabric WWN             : 20-00-D8-1F-CC-06-6A-DD
Serial Number                   : AFD1915Y07299
Driver Version                  : 10.02.02.00.a12-k
BIOS Version                    : 3.66
Running Firmware Version        : 9.06.02 (d0d5)
Running MPI Firmware Version    : 3.01.02
Running PEP Firmware Version    : 3.00.29
Flash BIOS Version              : 3.66
Flash FCode Version             : 0.00
Flash EFI Version               : 7.33
Flash Firmware Version          : 9.06.02
Flash MPI Firmware Version      : 3.01.02
Flash PEP Firmware Version      : 3.00.29
Actual Connection Mode          : Point to Point
Actual Data Rate                : 32 Gbps
Supported Speed(s)              : 8 16 32 Gbps
Chip Model Name                 : ISP2812-based Dual Port 64Gb Fibre Channel to PCIe Adapter
Chip Revision                   : 0x2(A1)
PortType (Topology)             : NPort
Target Count                    : 2
PCI Bus Number                  : 130
PCI Device Number               : 0
PCI Function Number             : 0
PCI Device ID                   : 0x2281
Subsystem Device ID             : 0x02f3
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)             : 39
Congestion Current State        : Healthy
Congestion Severity             : Warning
Seconds Since Last Event        : 1604705971 (sec)
Fabric Conection Flags          : RDF Completed
Config Lockdown                 : Disabled
```


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```
Firmware Update Lockdown       : Disabled
MPI Lockdown                   : Disabled
HBA Status                     : Online (FEC)
-------------------------------------------------------------------------------

        Hit <Enter> to continue:
```

The following parameters are part of the System Lockdown Mode feature, which is set through the Dell Management Console Dashboard.

- Config Lockdown
  When this parameter is enabled, changes to the adapter configuration are not permitted; for example, boot devices, BB credit, NVRAM settings, and so on. The default is disabled (adapter configuration is allowed).
- Firmware Update Lockdown
  When this parameter is enabled (default), a flash update is not allowed. When this parameter is disabled, flash updates are allowed.
- MPI Lockdown
  When this parameter is enabled, MPI functionality (sideband management) is not allowed. The default is disabled (MPI functionality is enabled/in use).

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.

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

    Adapter Information

    HBA Model QLE2770 SN: AFD1923Y07510
      1: Port   1: WWPN: 21-00-34-80-0D-3B-89-B0 Online
    HBA Model QLE2692 SN: RFD1610K18231
      2: Port   1: WWPN: 21-00-00-24-FF-75-2B-9C Online (FEC)
      3: 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
-------------------------------------------------------------------------------
Host Name                      : WIN-HQS1LTLMGPD
```


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```
Host NQN[1] : nqn.2014-08.org.nvmexpress:uuid:4c4c4544-0038-4310-8050-c3c04f5a5631
HBA Instance                    : 0
HBA Model                       : QLE2770
HBA Description                 : QLogic QLE2770 1x32Gb QLE2770 FC HBA
HBA ID                          : 0-QLE2770
HBA Alias                       :
HBA Port                        : 1
Port Alias                      :
Node Name                       : 20-00-34-80-0D-3B-89-B0
Port Name                       : 21-00-34-80-0D-3B-89-B0
Port ID                         : 01-0A-00
Principal Fabric WWN[2]         : 10-00-00-05-33-7E-5F-A3
Adjacent Fabric WWN[3]          : 20-0A-00-05-33-7E-5F-A3
Serial Number                   : AFD1923Y07510
Driver Version                  : STOR Miniport  9.4.2.20 A6 DBG
BIOS Version                    : 3.65
Running Firmware Version[4]     : 9.06.00
Running MPI Firmware Version    : 3.01.00
Running PEP Firmware Version[5] : 3.00.29
Flash BIOS Version              : 3.65
Flash FCode Version             : N/A
Flash EFI Version               : 7.29
Flash Firmware Version          : 9.06.00
Flash MPI Firmware Version      : 3.01.00
Flash PEP Firmware Version      : 3.00.29
Actual Connection Mode          : Point to Point
Actual Data Rate                : 16 Gbps
Supported Speed(s)              : 8 16 32 Gbps
Chip Model Name                 : ISP2812-based Dual Port 64Gb Fibre Channel to PCIe Adapter
```

[1] `Host NQN` appears only for 2600 Series Adapter models QLE2690, QLE2692, QLE2964, QLE2964L, and 2700 Series Adapter models QLE2740, QLE2742, QLE2764, QLE2770, QLE2772, QLE2774 on which the port link is up. It shows the host NVMe qualified name (NQN) for NVM Express (NVMe) over Fibre Channel (NVMe-oF) `Principal Fabric WWN` of the principal switch in the fabric.

[2] `Principal Fabric WWN` is the WWN of the principal switch in the fabric.

[3] `Adjacent Fabric WWN` is the WWN of the switch to which the adapter port is directly connecting.

[4] 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.

[5] In this example, the `Running PEP Firmware Version` description is available because the PCIe processor (PEP) firmware is currently being loaded.

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```
Chip Revision                  : 0x2(A1)
PortType (Topology)            : NPort
Target Count                   : 0
PCI Bus Number                 : 4
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)            : 37
Congestion Current State      : Healthy
Congestion Severity            : None
Seconds Since Last Event       : 0 (sec)
Config Lockdown                : Disabled
Firmware Update Lockdown       : Disabled
MPI Lockdown                   : Disabled
HBA Status                     : Online
Config Lockdown                : Disabled
Firmware Update Lockdown       : Disabled
MPI Lockdown                   : Disabled
HBA Status                     : Online
--------------------------------------------------------------------------------
```


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NOTE

- For a QLE8362 Fibre Channel or Converged Network Adapter, the port information also includes the `HBA Temperature` in degrees Celsius.
- For adapters other than QLE2562 and QLE2764 adapters, the port information's `Running Firmware Version` is labeled `Driver Firmware Version`.
- For Marvell QLogic 16Gb and 32Gb Fibre Channel adapters (QLE26*xx*, QLE27*xx*, and QLE83*xx*), 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 "FEC (-fec)" on page 149.) The FEC feature is supported only on Marvell QLogic 16Gb and 32Gb Fibre Channel adapters if the current adapter port is connected to a Brocade switch with FEC support.
- For QLE27*xx*, if the adapter is connecting and linking up as 32Gb, 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 Information menu, select an adapter port for which to view VPD information. For example:

```
QConvergeConsole

        CLI - Version x.y.z (Build xx)

    Adapter Information

    HBA Model QLE2770 SN: AFD1923Y07510
      1: Port   1: WWPN: 21-00-34-80-0D-3B-89-B0 Online
    HBA Model QLE2692 SN: RFD1610K18231
      2: Port   1: WWPN: 21-00-00-24-FF-75-2B-9C Online (FEC)
      3: 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
-------------------------------------------------------------------
HBA           : 1 Port 1
```


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```
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
Link          : Online
-----------------------------------------------------------------
HBA Instance 1: QLE2770 Port 1 WWPN 21-00-34-80-0D-3B-89-B0
                PortID 01-0A-00
Link: Online
-----------------------------------------------------------------
Product Identifier             :  QLogic 1x32Gb QLE2770 FC HBA
Part Number                    :  QLE2770
Serial Number                  : AFD1923Y07510
Engineering Date Code          : MA2810401-21 03
```

FC Target/LUN Information (-t)

1. Adapter Information ▸ 4. FC Target/LUN Information

From the FC Adapter Information menu, select the **FC Target/LUN Information** option. From the port menu, select a port to open the Target List Menu with options to select a target device or all targets. For example:

```
QConvergeConsole
CLI - Version x.y.z (Build xx)

    Target List Menu

=====================================================
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
Config Lockdown: Disable
Link           : Online (FEC)
=====================================================
```


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```
1:  Disk  (Online,Healthy)
       Vendor                        : SANBlaze
       Product ID                    : VLUN P2T5L0
       Product Rev                   : V7.4
       Serial Number                 : 2000000000002005-05-0000
       Node Name                     : 20-00-00-00-00-00-20-05
       Port Name                     : 21-00-00-00-00-00-20-05
       Port ID                       : 01-29-05
       Remote Type                   : Unknown
       Session State                 : N/A
       Secure Mode                   : Disabled
       Rekey Count                   : 0x0

2:  Disk  (Online,Healthy)
       Vendor                        : SANBlaze
       Product ID                    : VLUN P2T4L0
       Product Rev                   : V7.4
       Serial Number                 : 2000000000002004-04-0000
       Node Name                     : 20-00-00-00-00-00-20-04
       Port Name                     : 21-00-00-00-00-00-20-04
       Port ID                       : 01-29-04
       Remote Type                   : Unknown
       Session State                 : N/A
       Secure Mode                   : Disabled
       Rekey Count                   : 0x0

3:  All Target(s)
```

FC VFC Information (-i)

1. Adapter Information ▸ 5. FC VFC Information

From the FC Adapter Information menu, select the **FC VFC Information** option. From the port menu, select a virtual port to view information on that virtual port. For example:

```
Adapter Information

HBA Model QLE2772 SN: AFE1226F05904
   1: Port   1: WWPN: 21-00-00-0E-1E-08-B7-C0 Online
   2: vPort  0: WWPN: 21-04-00-0E-1E-08-B7-C0
   3: vPort  1: WWPN: 21-05-00-0E-1E-08-B7-C0
```


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```
   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                 : Hilda_vFC_P1
-------------------------------------------------------------
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:
```

FC Flash Information

1. Adapter Information ▸ 6. FC Flash Information

From the FC Adapter Information menu, select **FC Flash Information** to view the record (MBI version and tool) of the last update performed on the adapter.

This feature is supported on QLE266*x*, QLE269*x*, QLE274*x,* QLE276x, QLE277*x*, adapters.

```
Adapter Flash Information


     1: HBA Model: QLE2770 SN: AFD1923Y07510
          Port 1 WWPN: 21-00-34-80-0D-3B-89-B0 Online
     2: HBA Model: QLE2692 SN: RFD1610K18231
          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: 2
--------------------------
QLE2692 (SN RFD1610K18231)
```


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```
Port 1 Instance 0
--------------------------
MBI Version       : 1.02.06
MBI Build Date    : Oct. 02, 2020
Flash Tool ID     : QConvergeConsole CLI
Flash Tool Version: 2.04.00.17
Last Update Time  : 10:57:50 Dec. 22, 2020
```

Adapter Configuration

2. Adapter Configuration ▸ 2. FC Adapter Configuration

From the main menu, select the **Adapter Configuration** option, and then select the adapter type (**Fibre Channel Adapter**). The FC Adapter Configuration menu presents options to configure adapter alias and parameters, configure persistent names, configure boot devices, configure target link speed, export a configuration, and generate reports. For example:

```
Adapter Type Selection

1:  Converged Network Adapter
2:  Fibre Channel Adapter

    (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
    Please Enter Selection: 2

FC Adapter Configuration

1:  Adapter Alias
2:  Adapter Port Alias
3:  HBA Parameters
4:  Target Persistent Binding (on Windows) or
4:  Persistent Names (udev) (on Linux)
5:  Boot Devices Configuration
6.  Virtual Port (NPIV)
7:  Target Link Speed (iiDMA) or (NPIV) (see NOTE following this menu)
8:  Driver Parameters (on Windows only)
9:  Selective LUNs (on Windows only)
10:  QoS (on Windows only)
11:  Export (Save) Configuration (#8 on Linux or Solaris)
12:  Generate Reports (#9 on Linux or Solaris)
13:  Personality (QLE267x Adapters only) (#10 on Linux or Solaris)
14:  FEC
```


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```
15:  BB Credit Recovery
```

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.

Adapter Alias (-ha)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 1. Adapter Alias

From the FC Adapter Configuration menu, select the **Adapter Alias** option. From the adapter menu, select an adapter to view or change its adapter alias. The adapter's identifying information is displayed followed by a prompt identifying the current adapter alias in brackets. To change the adapter alias, enter the new value and press ENTER. (If you do not want to change the alias, just press ENTER.) The following is an example of changing the adapter alias from 0 to 1:

```
     FC Adapter Configuration

     1: HBA Model: QLE2562 SN: GFC0819H89653
          Port   1 WWPN: 21-00-00-1B-32-0C-95-0C Link Down
          Port   2 WWPN: 21-01-00-1B-32-2C-95-0C Link Down

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1
=====================================================
HBA Model     : QLE2562
HBA Desc.     : QLE2562 PCI Express to 8Gb FC Dual Channel
HBA SN        : GFC0819H89653
HBA Alias     : 0
=====================================================
HBA Alias [0]: 1
Update completed. Changes have been saved to HBA WWNN
20-00-00-1B-32-0C-95-0C!

        Hit <Enter> to continue:
```


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Adapter Port Alias (-pa)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 2. Adapter Port Alias

From the FC Adapter Configuration menu, select the **Adapter Port Alias** option. From the port 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, just press ENTER.) The following is an example of changing the port alias from 0 to 1:

```
    FC Adapter Configuration

    HBA Model QLE2562 SN: GFC0819H89653
      1: Port   1: WWPN: 21-00-00-1B-32-0C-95-0C Link Down
      2: Port   2: WWPN: 21-01-00-1B-32-2C-95-0C Link Down

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1
=====================================================
HBA           : 0
Physical Port : 1
Port Alias    : 0
HBA SN        : GFC0819H89653
HBA Model     : QLE2562
HBA Desc.     : QLE2562 PCI Express to 8Gb FC Dual Channel
WWPN          : 21-00-00-1B-32-0C-95-0C
WWNN          : 20-00-00-1B-32-0C-95-0C
Link          : Link Down
=====================================================
Port Alias [0]: 1
Update completed. Changes have been saved to HBA WWPN
21-00-00-1B-32-0C-95-0C!
```

HBA Parameters

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 3. HBA Parameters

From the FC Adapter Configuration menu, select the **HBA Parameters** option. From the port menu, select a port to open the HBA Parameters Menu with options to view adapter parameters, configure adapter parameters, and restore adapter defaults. For example:

```
    FC Adapter Configuration

    HBA Model QLE2692 SN: AFD1536Y03145
```


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```
    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

      (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
      Please Enter Selection: 1

      QConvergeConsole
      CLI – Version x.y.z (Build xx)

  HBA Parameters Menu

=====================================================
HBA           : 0 Port: 1
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-D8-66
WWNN          : 20-00-00-24-FF-8F-D8-66
Link          : Online
=====================================================

  1:  Display HBA Parameters
  2:  Configure HBA Parameters
  3:  Restore Defaults
```

Display HBA Parameters (-c)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 3. HBA Parameters ▸ <port selection> ▸ 1. Display HBA Parameters

From the HBA Parameters Menu, select the **Display HBA Parameters** option to view adapter parameters. For example:

```
-------------------------------------------------------------------------------
HBA Instance 0: QLE2692 Port 1 WWPN 21-00-00-24-FF-8F-D8-66 PortID 01-0A-00
Link: Online
-------------------------------------------------------------------------------

Connection Options             : 2 - Loop Preferred, Otherwise Point-to-Point
```


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```
Data Rate                       : Auto
Frame Size                      : 2048
Hard Loop ID                    : 0
Loop Reset Delay (seconds)      : 5
Enable Host HBA 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
Enable LIP Full Login           : Enabled
Link Down Timeout (seconds)     : 30
Enable Target Reset             : Enabled
LUNs Per Target                 : 128
Out Of Order Frame Assembly     : Disabled
Enable LR Ext. Credits          : Disabled
Enable Fabric Assigned WWN      : Disabled
Prefer FCP Support              : 0 - Login to NCMe LUNs, ignore FCP LUNS
                                  behind the same storage
Enable USCM Support             : Enabled
```

NOTE

`Execution Throttle` does not apply to 2600 and 8300 Series Adapters and is read-only for 10GbE adapters.

`Enable USCM Support` is available only on 2770 Series Adapters and QLE269*x* Adapters, and is enabled by default.

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Configure HBA Parameters (-n)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 3. HBA Parameters ▸ <port selection> ▸ 2. Configure HBA Parameters

From the HBA Parameters Menu, select the **Configure HBA Parameters** 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, receive out-of-order frame, LR extended credits, fabric-assigned WWN, and Universal SAN Configuration Management. For detailed information about these parameters, see Table 5-9 on page 71. For example:

```
    Configure Parameters Menu
=========================================================
HBA             : 0 Port: 1
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-D8-66
WWNN            : 20-00-00-24-FF-8F-D8-66
Link            : Online
=========================================================
    1:  Connection Options
    2:  Data Rate
    3:  Frame Size
    4:  Enable HBA Hard Loop ID
    5:  Hard Loop ID
    6:  Loop Reset Delay (seconds)
    7:  Enable BIOS
    8:  Enable 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:  Enable LIP Full Login
   15:  Link Down Timeout (seconds)
   16:  Enable Target Reset
   17:  LUNs per Target
   18:  Enable Receive Out Of Order Frame
```


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```
19:  Enable LR Ext. Credits
20:  Enable Fabric Assign WWN
21:  Prefer FCP Support
22:  Enable USCM Support
23:  Commit Changes
24:  Abort Changes
```

NOTE

- `Execution Throttle` does not apply to 2600 and 8300 Series Adapters and is read-only for 10GbE adapters.
- `Enable LR Ext. Credits` provides options to enable either 10km or 5km (the 5km option is only available for 269*x*, 274*x*, 276*x*, 277*x* 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 HBA Parameters (-c) menu.
- `Enable Fabric Assign WWN` applies only to 2600 and 8300 Series Adapters.
- `Enable USCM Support` applies only to 2770 Series Adapters and QLE269*x* Adapters.

Restore Defaults

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 3. HBA Parameters ▸ <port selection> ▸ 3. Restore Defaults

From the HBA Parameters Menu, select the **Restore Defaults** 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
```


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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 120).

From the FC Adapter Configuration menu, select the **Target Persistent Binding** option. From the port menu, select a port to open the Target Persistent Binding Menu with options to display the configuration, bind targets, and unbind targets. For example:

```
    FC Adapter Configuration

    HBA Model QLE8362 SN: AFE1134C09753
      1: Port   1: WWPN: 21-00-00-0E-1E-08-09-10 Online
      2: Port   2: WWPN: 21-00-00-0E-1E-08-09-11 Loop Down

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1

    Target Persistent Binding Menu

=======================================================
HBA           : 0 Port: 1
SN            : AFE1134C09753
HBA Model     : QLE8362
HBA Desc.     : QLE8362 QLogic 2-port 16Gb FC Adapter or 10Gb CNA (FCoE)
FW Version    : 6.00.10
WWPN          : 21-00-00-0E-1E-08-09-10
WWNN          : 20-00-00-0E-1E-08-09-10
Link          : Online
=======================================================

    1:  Display Configuration
    2:  Bind Target(s)
    3.  Unbind Target(s)
```


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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 0: QLE2770 Port 1 WWPN 21-00-34-80-0D-3B-89-B0 PortID 01-0A-00
Link: Online
--------------------------------------------------------------------------------

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             : 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
Link            : Online
=====================================================
1:  SAF-TE
           Vendor                       : HP
           Product ID                   : P2000 G3 FC
```


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```
            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

QConvergeConsole

        CLI - Version x.y.z (Build xx)
    Target Persistent Binding - FC Port Configuration

    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
```


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```
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
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                    : 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; 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 117).

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From the FC Adapter Configuration menu, select the **Persistent Names (udev)** option. From the port menu, select a 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; ex or 99: Quit)
        Please Enter Selection: 2

        QConvergeConsole

        CLI – Version x.y.z (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
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.
```


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```
      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
```


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```
7:  All Target(s)


    (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
    Please Enter Selection: 1

    QConvergeConsole

    Version x.y.z (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
```


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```
    5:  All LUN(s)

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1

        QConvergeConsole

        Version x.y.z (Build xx)

    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
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
Link          : Online
=======================================================
```


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```
    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
Link          : Online
=======================================================

    1:  Information
    2:  Persistent Names

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
```


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```
        Please Enter Selection: 2

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        Version x.y.z (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
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:
```


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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

        QConvergeConsole

        Version x.y.z (Build xx)

    Persistent Names Menu

=========================================================
CNA           : 0 Port: 1
SN            : AFE1317F10351
ENode MacAddr : 00:0E:1E:11:85:13
CNA Model     : QLE8442
CNA Desc.     : QLE8442 QLogic 2-port 10Gb CNA Adapter (FCoE)
FW Version    : 6.02.12
WWPN          : 21-00-00-0E-1E-11-85-10
WWNN          : 20-00-00-0E-1E-11-85-10
Link          : Online
=========================================================
```


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```
    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.
```

Boot Devices Configuration

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 5. Boot Devices Configuration

From the FC Adapter Configuration menu, select the **Boot Devices Configuration** option. Select a port to open the Boot Device Settings Menu with options to view and configure boot devices. For example:

```
    FC Adapter Configuration

    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

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1

        QConvergeConsole
        Version x.y.z (Build xx)
Boot Device Settings Menu

=====================================================
```


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```
HBA           : 0 Port: 1
SN            : AFD1536Y03145
HBA Model     : QLE2692
HBA Desc.     : QLE2692 Dell Dual Port 16Gb FC to PCIe Gen3 x8
Adapter
FW Version    : 8.05.41
WWPN          : 21-00-00-24-FF-8F-D8-66
WWNN          : 20-00-00-24-FF-8F-D8-66
Link          : Online
=====================================================
    1:  Display Boot Device(s)
    2:  Configure Boot Device(s)
```

Display Boot Device(s) (-e)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ ▲ 5. Boot Devices Configuration ▸ <port selection> ▸ 1. Display Boot Device(s)

From the Boot Device Settings Menu, select the **Display Boot Device(s)** option to view boot devices. For example:

```
--------------------------------------------------------------------------------
HBA Instance 0: QLE2692 Port 1 WWPN 21-00-00-24-FF-8F-D8-66 PortID 01-0A-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
---------------------------     ------
```


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```
(Alternate 3) Boot Port Name        LUN
---------------------------     ------
00-00-00-00-00-00-00-00               0
```

Configure Boot Device(s) (-e)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 5. Boot Devices Configuration ▸ <port selection> ▸ 2. Configure Boot Device(s)

From the Boot Device Settings Menu, select the **Configure Boot Device(s)** option to open the Boot Device Settings submenu with options to configure the primary and alternate boot devices. For example:

```
QConvergeConsole

        CLI - Version x.y.z (Build xx)

    Fibre Channel Adapter Configuration

    HBA Model QLE2772 SN: AFD1915Y07299
      1: Port   1: WWPN: 21-00-F4-E9-D4-54-AB-12 Online (FEC)
      2: Port   2: WWPN: 21-00-F4-E9-D4-54-AB-14 Online (FEC)
    HBA Model QLE2562 SN: GFC0819H89417
      3: Port   1: WWPN: 21-00-00-1B-32-0C-A9-0B SFP not present
      4: Port   2: WWPN: 21-01-00-1B-32-2C-A9-0B SFP not present
    HBA Model QLE2672 SN: RFE1303H21665
      5: Port   1: WWPN: 21-00-00-0E-1E-11-60-D0 Online
      6: Port   2: WWPN: 21-00-00-0E-1E-11-60-D1 SFP not present


        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1

        QConvergeConsole

        CLI - Version x.y.z (Build 15)

    Boot Device Settings Menu

=======================================================
HBA             : 4 Port: 1
SN              : AFD1915Y07299
```


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```
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
Config Lockdown: Disable
Link           : Online (FEC)
=======================================================

    1:  Display Boot Device(s)
    2:  Configure Boot Device(s)


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

Primary Boot Device

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 5. Boot Devices Configuration ▸ <port selection> ▸ 2. Configure Boot Device(s) ▸ 1. Primary Boot Device

From the Boot Device Settings Menu, select the **Primary Boot Device** option to configure the primary boot device. For example:

```
Boot Device Settings Menu

=======================================================
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
Config Lockdown: Disable
Link           : Online (FEC)
=======================================================

    1:  Disk
          (Primary) Boot Port Name: 21-00-00-00-00-00-20-05
          LUN: 0
    2:  Disk
```


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```
          (Primary) Boot Port Name: 21-00-00-00-00-00-20-04
          LUN: 0
    3:  Device
          (Primary) Boot Port Name: 00-00-00-00-00-00-00-00
          LUN: 0

        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 1
```

Alternate 1 (2, 3) Boot Device

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 5. Boot Devices Configuration ▸ <port selection> ▸ 2. Configure Boot Device(s) ▸ 2 (3, 4). Alternate 1 (2, 3) Boot Device

From the Boot Device Settings Menu, select the **Alternate *n* Boot Device** (n = 1, 2, or 3) option to configure one of three alternate boot devices. For example:

```
    Boot Device Settings Menu

=======================================================
HBA           : 0 Port: 1
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-D8-66
WWNN          : 20-00-00-24-FF-8F-D8-66
Link          : Online
=======================================================
1:  Device
          (Alternate 1) Boot Port Name: 00-00-00-00-00-00-00-00
          LUN: 0
```

Selectable Boot

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 5. Boot Devices Configuration ▸ <port selection> ▸ 2. Configure Boot Device(s) ▸ 5. Selectable Boot

From the Boot Device Settings Menu, select the **Selectable Boot** option to enable or disable selectable boot (the current setting is indicated by "`(Current)`"). For example, to enable selectable boot when it is currently disabled:

```
Boot Device Settings Menu

=======================================================
```


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```
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
Config Lockdown: Disable
Link            : Online (FEC)
=======================================================

    1:  Primary Boot Device
    2:  Alternate 1 Boot Device
    3:  Alternate 2 Boot Device
    4:  Alternate 3 Boot Device
    5:  Selectable Boot
    6:  Enable Fabric Assigned Boot LUN
    7:  Commit Changes


        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 5

        QConvergeConsole

        CLI - Version x.y.z (Build xx)

    Selectable Boot

    1:  Enable
    2:  Disable (Current)


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


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Enable Fabric Assigned Boot LUN

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 5. Boot Devices Configuration ▸ <port selection> ▸ 2. Configure Boot Device(s) ▸ 6. Enable Fabric Assigned Boot LUN

From the Boot Device Settings Menu, select the **Enable Fabric Assigned Boot LUN** option to enable or disable a fabric-assigned boot LUN.

Commit Changes

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 5. Boot Devices Configuration ▸ <port selection> ▸ 2. Configure Boot Device(s) ▸ 7. Commit Changes

From the Boot Device Settings Menu, select the **Commit Changes** option to save your changes.

Virtual Ports (NPIV) (-vp)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 6. Virtual Ports (NPIV)

From the FC Adapter Configuration menu, select the **Virtual Ports (NPIV)** option. From the port menu, select a port to open the vPorts Menu with options to view, create and delete virtual ports. For example:

```
    FC Adapter Configuration

    HBA Model QLE2562 SN: GFC0819H89653
      1: Port   1: WWPN: 21-00-00-1B-32-0C-95-0C Link Down
      2: Port   2: WWPN: 21-01-00-1B-32-2C-95-0C Link Down

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1

        QConvergeConsole

        Version x.y.z (Build xx)

    vPorts Menu

=======================================================
HBA           : 0 Port: 1
SN            : GFC0819H89653
HBA Model     : QLE2562
HBA Desc.     : QLE2562 PCI Express to 8Gb FC Dual Channel
FW Version    : 4.03.02
WWPN          : 21-00-00-1B-32-0C-95-0C
WWNN          : 20-00-00-1B-32-0C-95-0C
Link          : Link Down
=======================================================
```


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```
    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)

From the FC Adapter Configuration menu, select the **Target Link Speed (iiDMA)** option. From the port menu, select a port to open the iiDMA Menu with options for basic and advanced configuration. For example:

```
iiDMA Menu

=======================================================
HBA             : 0 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
Link            : Online
=======================================================

    1:  Basic Configuration
    2:  Advance Configuration
```

Basic Configuration

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 7. Target Link Speed (iiDMA) ▸ 1. Basic Configuration

From the iiDMA Menu, select the **Basic Configuration** option to specify the link speed. For example:

```
iiDMA Menu (Basic)

=======================================================
HBA             : 0 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
```


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```
Link           : Online
=======================================================

    1:  1  Gbps
    2:  2  Gbps
    3:  4  Gbps
    4:  8  Gbps
    5:  16 Gbps
    6:  32 Gbps
```

Advanced Configuration

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 7. Target Link Speed (iiDMA) ▸ 2. Advanced Configuration

From the iiDMA Menu, select the **Advanced Configuration** option to select a target device, specify the link speed, and apply the changes. For example:

```
iiDMA Menu

=======================================================
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
Config Lockdown: Disable
Link           : Online (FEC)
=======================================================

    1:  Disk
           Vendor                        : SANBlaze
           Product ID                    : VLUN P2T5L0
           Product Rev                   : V7.4
           Serial Number                 : 2000000000002005-05-0000
           Port Name                     : 21-00-00-00-00-00-20-05
           Port ID                       : 01-29-05
           Intelligent Interleave Factor: 16 Gbps

    2:  Disk
           Vendor                        : SANBlaze
```


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```
            Product ID                    : VLUN P2T4L0
            Product Rev                   : V7.4
            Serial Number                 : 2000000000002004-04-0000
            Port Name                     : 21-00-00-00-00-00-20-04
            Port ID                       : 01-29-04
            Intelligent Interleave Factor: 16 Gbps

    3:  Apply Changes to selected Target(s)



        (p or 0: Previous Menu; m or 98: Main Menu; x or 99: Quit)
        Please Enter Selection: 1

        QConvergeConsole


        CLI - Version x.y.z (Build xx)
iiDMA Menu (Advanced)

=======================================================
HBA            : 4 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
Config Lockdown: Disable
Link           : Online (FEC)
=======================================================

    1:  1  Gbps
    2:  2  Gbps
    3:  4  Gbps
    4:  8  Gbps
    5:  16 Gbps
    6:  32 Gbps (Current)
```


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

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. From the port menu, select a port to open the Driver Settings Menu with options to configure the driver settings. For example:

```
FC Adapter Configuration

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

   (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
   Please Enter Selection: 1

   QConvergeConsole
   Version x.y.z (Build xx)

Driver Settings Menu
-----------------------
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
-----------------------
```


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```
3: Bind by World Wide Port Name (Current)
4: Bind by Port ID
5: Commit Changes
```

Selective LUNs (-m)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 9. Selective LUNs

NOTE

This option applies to adapters on Windows systems only.

From the FC Adapter Configuration menu, select an adapter port to open the **Selective LUNs** menu with options to display the LUN configuration information, manually configure LUNs, or automatically configure LUNs. For example:

```
Selective LUNs Menu

=====================================================
HBA             : 4 Port: 1
SN              : AFD1915Y07299
HBA Model       : QLE2770
HBA Desc.       : QLogic QLE2770 1x32Gb QLE2772 FC HBA
FW Version      : 9.06.02
WWPN            : 21-00-F4-E9-D3-F1-BB-45
WWNN            : 20-00-F4-E9-D3-F1-BB-45
Config Lockdown: Disable
Link            : Online (FEC)
=====================================================
    1:  Display LUN Configuration
    2:  Manual Configure LUNs
    3:  Auto Configure LUNs
```

Display LUN Configuration

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 9. Selective LUNs ▸ 1. Display LUN Configuration

From the Selective LUNs Menu, select the **Display LUN Configuration** option and follow the prompts to display the LUN configuration. For example:

```
1:  Display LUN Configuration
2:  Manual Configure LUNs
3:  Auto Configure LUNs

    (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
```


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```
        Please Enter Selection: 1

        QConvergeConsole

       CLI - Version x.y.z (Build xx)

    Selective LUN Menu (Display)

=======================================================
HBA            : 4 Port: 1
SN             : AFD1915Y07299
HBA Model      : QLE2770
HBA Desc.      : QLogic QLE2770 1x32Gb QLE2772 FC HBA
FW Version     : 9.06.02
WWPN           : 21-00-F4-E9-D3-F1-BB-45
WWNN           : 20-00-F4-E9-D3-F1-BB-45
Config Lockdown: Disable
Link           : Online (FEC)
=======================================================
    1:  Details View
    2:  General View

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1

        QConvergeConsole

       CLI - Version x.y.z (Build xx)

    Selective LUN Menu (Display)

=======================================================
HBA            : 4 Port: 1
SN             : AFD1915Y07299
HBA Model      : QLE2770
HBA Desc.      : QLogic QLE2770 1x32Gb QLE2772 FC HBA
FW Version     : 9.06.02
WWPN           : 21-00-F4-E9-D3-F1-BB-45
WWNN           : 20-00-F4-E9-D3-F1-BB-45
Config Lockdown: Disable
Link           : Online (FEC)
=======================================================
    1:  Disk
           Vendor                       : SANBlaze
```


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```
            Product ID                    : VLUN FC RAMDisk
            Port Name                     : 2F-FF-00-06-2B-0E-B2-44
            Port ID                       : C5-07-00
            Bind                          : Yes
            Target ID                     : 0
    2:  Disk
            Vendor                        : SANBlaze
            Product ID                    : VLUN FC RAMDisk
            Port Name                     : 2F-DF-00-06-2B-0E-B2-44
            Port ID                       : C5-08-00
            Bind                          : Yes
            Target ID                     : 1
    3:  Disk
            Vendor                        : SANBlaze
            Product ID                    : VLUN FC RAMDisk
            Port Name                     : 2F-FF-00-06-2B-0F-56-99
            Port ID                       : C5-09-00
            Bind                          : Yes
            Target ID                     : 2
    4:  Device
            Vendor                        : SANBlaze
            Product ID                    : VLUN FC RAMDisk
            Port Name                     : 2F-DF-00-06-2B-0F-56-99
            Port ID                       : C5-0A-00
            Bind                          : Yes
            Target ID                     : 3

(p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1

    QConvergeConsole
     CLI - Version x.y.z (Build xx)
    Selective LUN Menu (Display)
=======================================================
HBA             : 4 Port: 1
SN              : AFD1915Y07299
HBA Model       : QLE2770
HBA Desc.       : QLogic QLE2770 1x32Gb QLE2772 FC HBA
FW Version      : 9.06.02
WWPN            : 21-00-F4-E9-D3-F1-BB-45
```


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```
WWNN           : 20-00-F4-E9-D3-F1-BB-45
Config Lockdown: Disable
Link           : Online (FEC)
=======================================================
    1:  LUN   0
           Vendor                       : SANBlaze
           Product ID                   : VLUN FC RAMDisk
           Port Name                    : 2F-FF-00-06-2B-0E-B2-44
           Port ID                      : C5-07-00
    2:  All LUNs

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1

-------------------------------------------------------------------------------
HBA Instance 0: QLE8362 Port 1 WWPN 21-00-00-0E-1E-08-09-10 PortID C5-0D-A5
Link: Online
-------------------------------------------------------------------------------
Enable Type     Target/LUN Info         Port Name               LUN ID
------ -------- ---------------------- ---------------------- ------
  Yes    Disk SANBlaze VLUN FC RAMDisk  2F-FF-00-06-2B-0E-B2-44 0
       Press <Enter> to continue: 0
```

Manual Configure LUNs

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 9. Selective LUNs ▸ 2. Manual Configure LUNs

From the Selective LUNs Menu, select the **Manual Configure LUNs** option and follow the prompts to manually configure LUNs.

Auto Configure LUNs

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 9. Selective LUNs ▸ 3. Auto Configure 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.

Quality of Service (QoS) (-qos)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 10. QoS

NOTE

Quality of service applies to adapters on Windows systems only.

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From the FC Adapter Configuration menu, select the **QoS** option. From the port menu, select a port to open the QoS Type Menu with options to set QoS by priority or by bandwidth. For example:

```
FC Adapter Configuration

HBA Model QLE2562 SN: GFC0819H89653
  1: Port   1: WWPN: 21-00-00-1B-32-0C-95-0C Link Down
  2: Port   2: WWPN: 21-01-00-1B-32-2C-95-0C Link Down

    (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
    Please Enter Selection: 1

    QConvergeConsole
    CLI - Version x.y.z (Build xx)

QoS Type Menu

=====================================================
HBA             : 4 Port: 1
SN              : AFD1915Y07299
HBA Model       : QLE2770
HBA Desc.       : QLogic QLE2770 1x32Gb QLE2772 FC HBA
FW Version      : 9.06.02
WWPN            : 21-00-F4-E9-D3-F1-BB-45
WWNN            : 20-00-F4-E9-D3-F1-BB-45
Config Lockdown: Disable
Link            : Online (FEC)
=====================================================

1:  QoS Priority
2:  QoS Bandwidth (Current)
```

Export (Save) Configuration

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 11. Export (Save) Configuration

From the FC Adapter Configuration menu, select the **Export (Save) Configuration** option. From the port menu, select a port to open the Export (Save) Configuration menu with options to save Flash memory and adapter parameters. For example:

```
FC Adapter Configuration

HBA Model QLE2692 SN: AFD1536Y03145
  1: Port   1: WWPN: 21-00-00-24-FF-8F-D8-66 Online
```


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```
    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

      (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
      Please Enter Selection: 1

      QConvergeConsole
      Version x.y.z (Build xx)

  Export (Save) Configuration

=====================================================
BA           : 0 Port: 1
SN            : AFD1536Y03145
BA Model     : QLE2692
BA Desc.     : QLE2692 Dual Port 16Gb FC to PCIe Gen3 x8 Adapter
W Version    : 8.05.41
WPN          : 21-00-00-24-FF-8F-D8-66
WNN          : 20-00-00-24-FF-8F-D8-66
Link          : Online
=====================================================

  1:  Save HBA Parameters
  2:  Save Firmware Preload Table
  3:  Save Firmware Serdes Table
```

Save Flash (-b)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 11. Export (Save) Configuration ▸ <port selection> ▸ 1. Save Flash

From the Export (Save) Configuration menu, select the **Save Flash** option to save changes to the Flash memory to a file.

NOTE

On Solaris only:

- Reset is disabled if the system detects storage SR-IOV or VFs.
- The flash update does not take effect until the system is restarted.

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Save HBA Parameters (-r)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 11. Export (Save) Configuration ▸ <port selection> ▸ 2. Save HBA Parameters

From the Export (Save) Configuration menu, select the **Save HBA Parameters** option to save changes to the adapter parameters to a file.

Generate Reports

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 12. Generate Reports

From the FC Adapter Configuration menu, select the **Generate Reports** option. From the port menu, select a port to for which to generate a report. In the following example, the output is truncated due to length:

```
    FC Adapter Configuration

    HBA Model QLE2692 SN: GFC0718P57753
      1: Port   1: WWPN: 21-00-00-1B-32-17-F9-C4 Online
      2: Port   2: WWPN: 21-01-00-1B-32-37-F9-C4 Loop Down

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1
QLogic FCAPI (x64)
v2.1.0 Build 2
Copyright (C) 2003-2016 QLogic Corp.
All rights reserved.
QLogic FC/FCoE Common Library
Build Type:  Release
Build Date:  07/20/2016 4:31:20 PM
------------------------------------------------------------------
Host Name                      : WIN-F5JD7VK2CK4
OS Type                       : Microsoft Windows Server 2012 R2 Datacenter 64-
bit  x64
OS Version                     : Build 9600
SDM API Version                : 1.28.0.134 QLSDM.DLL
------------------------------------------------------------------
HBA Model QLE2692 (SN AFD1536Y03145):
  Port   1 WWPN 21-00-00-24-FF-8F-D8-66 (HBA instance  0) Online
  Port   2 WWPN 21-00-00-24-FF-8F-D8-67 (HBA instance  1) D-Port
HBA Model QLE2740 (SN AFD1536Y03312):
  Port   1 WWPN 21-00-00-24-FF-00-27-B3 (HBA instance  4) SFP not installed
HBA Model QLE2662 (SN AFE1227F06193):
  Port   1 WWPN 20-01-00-0E-1E-08-D9-A0 (HBA instance  7) SFP not installed
```


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```
  Port   2 WWPN 20-01-00-0E-1E-08-D9-A1 (HBA instance  8) SFP not installed
HBA Model QLE2562 (SN BFD1303F99139):
  Port   1 WWPN 21-00-00-24-FF-4C-DC-2C (HBA instance  2) SFP not installed
  Port   2 WWPN 21-00-00-24-FF-4C-DC-2D (HBA instance  3) SFP not installed
HBA Model QLE2462 (SN FFC0548D34814):
  Port   1 WWPN 21-00-00-E0-8B-85-DE-1B (HBA instance  5) Link Down
  Port   2 WWPN 21-01-00-E0-8B-A5-DE-1B (HBA instance  6) Link Down
-------------------------------------------------------------------------------

Total QLogic HBA(s) : 5

Time and date:                  Tue Nov 15 12:14:38 2016

-------------------------------------------------------------------------------
HBA General Information
-------------------------------------------------------------------------------

-------------------------------------------------------------------------------
Host Name                      : WIN-F5JD7VK2CK4
HBA Instance                   : 0
HBA Model                      : QLE2692
HBA Description                : QLE2692 Dell Dual Port 16Gb FC to PCIe Gen3 x8
Adapter
HBA ID                         : 0-QLE2692
HBA Alias                      :
HBA Port                       : 1
Port Alias                     :
Node Name                      : 20-00-00-24-FF-8F-D8-66
Port Name                      : 21-00-00-24-FF-8F-D8-66
Port ID                        : 01-0A-00
Serial Number                  : AFD1536Y03145
Driver Version                 : STOR Miniport  9.2.2.20 Alpha 2
BIOS Version                   : 3.43
Running Firmware Version       : 8.05.00
Running MPI Firmware Version   : Not Running
Running PEP Firmware Version   : 2.00.08
Flash BIOS Version             : 3.43
Flash FCode Version            : N/A
Flash EFI Version              : 6.20
Flash Firmware Version         : 8.05.41
Flash MPI Firmware Version     : 100.02.00
```


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```
Flash PEP Firmware Version     : 2.00.08
Actual Connection Mode         : Point to Point
Actual Data Rate               : 16 Gbps
Device ISP ID                  : ISP2261
Chip Revision                  : 0x1(A0)
PortType (Topology)            : NPort
Target Count                   : 0
PCI Bus Number                 : 5
PCI Device Number              : 0
PCI Function Number            : 0
PCI Device ID                  : 0x2261
Subsystem Device ID            : 0x02a8
Subsystem Vendor ID            : 0x1077
PCIe Max Bus Width             : x8
PCIe Negotiated Width          : x8
PCIe Max Bus Speed             : 8.0 Gbps
PCIe Negotiated Speed          : 8.0 Gbps
HBA Temperature (C)            : 56
HBA Status                     : Online
-------------------------------------------------------------------------------
HBA VPD Information
-------------------------------------------------------------------------------
.
.
.
```

Personality (-pc)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 13. Personality

NOTE

The personality feature is supported only on Marvell QLogic QLE267*x* and QLE836*x* 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.

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Example of changing Fibre Channel (FC) to Converged Network Adapter (CNA):

```
        QConvergeConsole
        CLI - Version x.y.z (Build xx)
    FC Adapter Configuration
     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; ex 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):

```
        QConvergeConsole
        CLI - Version Version x.y.z (Build xx)
        Converged Network Adapter (CNA) FCoE Configuration
      1: CNA Model: QLE8362 SN: AFE1141F01212
          Port   1 [Protocol(s): FCoE]
          Port   2 [Protocol(s): FCoE]
        (p or 0: Previous Menu; m or 98: Main Menu; ex 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:
```


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FEC (-fec)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 13. FEC

NOTE

The forward error correction (FEC) feature is supported only on Marvell QLogic 16Gb Fibre Channel adapters—including the QLE269*x*, QLE267*x*, and the QLE8362 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 adapters, FEC is enabled by default and cannot be disabled.

From the FC Adapter Configuration menu, select the **FEC** option. 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` (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.

BB Credit Recovery (-bbcr)

2. Adapter Configuration ▸ 2. FC Adapter Configuration ▸ 14. BB Credit Recovery

Buffer-to-buffer credit recovery (BB-CR) enables two FC peer ports (N_Port, F_Port, or E_Port) to periodically send and receive the quantity of receiver ready (R_RDY) signals transmitted. The BB-CR feature allows the peer port to recover from possible R_RDY signals lost over a lossy link. BB-CR 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.

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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 **BB Credit Recovery** option. The following menu options allow you to view, enable, or disable support for BB-CR on the selected adapter port:

```
BB Credit Config Menu
1:  Info (shows the BB Credit Status as Enabled or Disabled)
2:  Enable (enables BB-CR; requires a reboot to take effect)
3:  Disable (disables BB-CR; requires a reboot to take effect)
```

Adapter Updates

3. Adapter Updates ▸ 2. Fibre Channel Adapter

From the main menu, select the **Adapter Updates** option and then select **2** (**Fibre Channel Adapter**). The Fibre Channel Adapter Update menu provides options to update Flash memory, drivers, adapter parameters, the parameter template, and the firmware preload and Fibre Channel SerDes tables, and to perform a Fibre Channel firmware dump. For example:

```
Adapter Type Selection

1:  Converged Network Adapter
2:  Fibre Channel Adapter

    (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
    Please Enter Selection: 2

FC Adapter Update

1:  Flash Update
2:  Driver Update
3:  Parameters Update
4:  Parameters Template Update (available only for 8Gb adapters)
5:  Firmware Preload Update
```


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```
6:  FC Board Config Update
7:  FC Firmware Dump
```

Flash Update (-b)

3. Adapter Updates ▸ 2. Fibre Channel Adapter ▸ 1. Flash Update

NOTE

The BIOS or FCode cannot be updated when the System Lockdown Mode feature is enabled. Use “FC Adapter Information (-i)” on page 99 to view the System Lockdown Mode status. Use the Dell Management Console Dashboard to change the status. By default, the System Lockdown Mode feature is enabled.

From the FC Adapter Update menu, select the **Flash Update** option. From the adapter menu, select the adapter, and then type the Flash update file name.

2600/2700 Series Fibre Channel Adapter Selection:

```
Flash 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: 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
Enter a file name or Hit <RETURN> to abort: bkxxxxxx.bin
```

2770 Series Fibre Channel Adapter Flash Update Example:

Following is example output for a 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: 07.06.00
Updating Adapter PEP softROM version 03.00.13... Success
Updating Adapter PEP FW version 03.00.22... Success
Updating Adapter PEP Board Configs version 03.01.00... Success
```


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```
Updating Adapter Fw Preload Area version 4.0.10... Success
Updating Adapter PCIe Serdes version 03.00.04... Success
Updating Adapter FC Board Configs version 03.00.01... Success
Updating Adapter FC RISC Fw version 9.2.3... Success
Updating Adapter Flash Memo Block... Success
Updating Adapter Primary Image Status... Success
Updating Adapter Secondary Image Status... Success
Updating Adapter Primary Aux Image Status... Success
Updating Adapter Secondary Aux Image Status... Success
Flash update complete. You must reboot in order for the changes to
become effective.
```

Following is example output of a failed flash update:

```
c:\Program Files\QLogic Corporation\QConvergeConsoleCLI>qaucli.exe
-b 0 C:\Users\Administrator\Downloads\mh030215.bin
Using config file: c:\Program Files\QLogic
Corporation\QConvergeConsole CI
Working dir: c:\Program Files\QLogic
Corporation\QConvergeConsoleCLI
FW lockdown is enabled. Flash update is restricted to HBA
instance 0 (QLE2772)!
```

If System Lockdown Mode is turned on, the flash update fails if the existing released driver/application is being run with the latest RISC/MPI firmware (that supports the firmware lockdown feature).

If a new driver/RISC/MPI firmware is being run with the existing application, the flash update fails with an error message that may be misleading, as the existing application is not aware of the lockdown feature.

If an existing MPI/RISC firmware, driver, and application are being run, System Lockdown Mode (on or off) has no effect. The flash update will be successful.

NOTE

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

NOTE

On Solaris only:

- Reset is disabled if the system detects storage SR-IOV or VFs.
- The flash update does not take effect until the system is restarted.

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Driver Update (-d)

3. Adapter Updates ▸ 2. Fibre Channel Adapter ▸ 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 adapter menu, select the adapter, and then type the driver update file name. The driver update file can be either an `.inf` file or a compressed driver file (`.zip` or `.exe` file). For example, to use an `.inf` driver file:

```
Driver Update

    HBA Model QLE8362 SN: 040210A+1238107609
      1: Port   1: WWPN: 21-00-00-0E-1E-10-65-20 Online
      2: Port   2: WWPN: 21-00-00-0E-1E-10-65-21 Online

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1
Enter a file name or Hit <RETURN> to abort:
C:\Drivers\q23wx64Storv911028_whql-1548570-12052012\ql2x00.inf
```

The following is an example of using a compressed driver file (`.zip` in this case):

```
Driver Update

    HBA Model QLE8362 SN: 040210A+1238107609
      1: Port   1: WWPN: 21-00-00-0E-1E-10-65-20 Online
      2: Port   2: WWPN: 21-00-00-0E-1E-10-65-21 Online

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1

Enter a file name or Hit <RETURN> to abort:
C:\Drivers\q23wx64Storv911028_whql-1548570-12052012.zip

        This option will install version: STOR Miniport 9.1.10.28
        The current version is: STOR Miniport 9.1.11.20 Alpha 4
        Do you want to perform the operation?

        1: Yes
        2: No
                Enter Selection:
```


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Parameters Update (-r)

3. Adapter Updates ▸ 2. Fibre Channel Adapter ▸ 3. Parameters Update

From the FC Adapter Update menu, select the **Parameters Update** option. From the port menu, select a port for which to specify the parameter update, and then type the file name. For example:

```
    Parameters 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

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1
Enter a file name or Hit <RETURN> to abort:parameters_update
```

If the adapter does not support the parameter update option, a notification message appears. For example:

```
        (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)!
```

Parameters Template Update

3. Adapter Updates ▸ 2. Fibre Channel Adapter ▸ 4. 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
```


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```
      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: 21-00-00-24-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

        QConvergeConsole
        Version x.y.z (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
```


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```
        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 ▸ 2. Fibre Channel Adapter ▸ 5. 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 HBA selection menu, select the adapter 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: 20-01-00-0E-1E-08-D9-A1 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

        Firmware Preload Table
        Current version: v2.1.3

Enter a file name or Hit <RETURN> to abort: fwpreload.dat
```


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FC Board Config Update (-sp)

3. Adapter Updates ▸ 2. Fibre Channel Adapter ▸ 6. 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 HBA selection menu, select the adapter 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

        Firmware Serdes Table
        Current version: v2.1.2

Enter a file name or Hit <RETURN> to abort: fwserdes.dat
```

FC Firmware Dump (-fwdump)

3. Adapter Updates ▸ 2. Fibre Channel Adapter ▸ 7. FC Firmware Dump

From the FC Adapter Update or CNA Update menu, select the **FC Firmware Dump** option. From the adapter menu, select the adapter, and then enter the name of the firmware dump file to be created. 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
```


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Adapter Diagnostics

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter

From the main menu, select the **Adapter Diagnostics** option and then select **2** (**Fibre Channel Adapter**). The FC Adapter Diagnostics menu includes options to perform a loopback test, test the read write buffer, and view the transceiver diagnostics information. For example:

```
Adapter Type Selection

1:  Converged Network Adapter
2:  Fibre Channel Adapter

    (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
    Please Enter Selection: 2

FC Adapter Diagnostics

1:  Loopback Test
2:  Read Write Buffer Test
3:  Transceiver Diagnostics Monitoring Interface (DMI)
4:  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:  (RDP) Read Diagnostics Parameters
```

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 port menu, select a port to open the FC/FCoE Loopback Test menu with options to view test parameters, reset test parameters, configure test parameters, and run the external loopback 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 D-Port
```


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```
    HBA Model QLE2740 SN: AFD1536Y03312
      3: 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: 3

       QConvergeConsole
       CLI - Version x.y.z (Build xx)

    FC/FCoE Loopback Test

=======================================================
HBA           : 4 Port: 1
SN            : AFD1536Y03312
HBA Model     : QLE2740
HBA Desc.     : QLE2740 Dell Single Port 32Gb FC to PCIe Gen3 x8
Adapter
FW Version    : 8.03.06
WWPN          : 21-00-00-24-FF-00-27-B3
WWNN          : 20-00-00-24-FF-00-27-B3
Link          : SFP not installed
=======================================================
    1:  Display Test Parameters
    2:  Reset Test Parameters
    3:  Configure Test Parameters
    4:  Start Diagnostics Test
```

Display Test Parameters

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 1. Loopback Test ▸ <port selection> ▸ 1. Display Test Parameters

From the Loopback Test menu, select the **Display Test Parameters** option to view the external loopback test parameters. For example:

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

HBA Instance 0: QLE2692 Port 1 WWPN 21-00-00-24-FF-8F-D8-66 PortID
01-0A-00
Link: Online
-----------------------------------------------------------------

--------------------
Diagnostics Settings
--------------------
Diagnostic Mode          : Loopback
```


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

Reset Test Parameters

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 1. Loopback Test ▸ <port selection> ▸ 2. Reset Test Parameters

From the Loopback Test menu, select the **Reset Test Parameters** option to reset the external loopback test parameters to their default values.

Configure Test Parameters

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 1. Loopback Test ▸ <port selection> ▸ 3. Configure Test Parameters

From the Loopback Test menu, select the **Configure Test Parameters** option to open the Loopback Test menu with options to configure the data pattern, data size, number of tests, test increment, error handling, and loopback type. For detailed information about these parameters, see Table 5-6 on page 64.

For example:

```
    FC/FCoE Loopback Test

=======================================================
HBA           : 0 Port: 1
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-D8-66
WWNN          : 20-00-00-24-FF-8F-D8-66
Link          : Online
=======================================================
    1:  Data Patterns
    2:  Data Size
    3:  Number Of Test(s)
    4:  Test Increment(s)
    5:  Abort On Error
    6:  Loopback Type
```


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Start Diagnostics Test

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 1. Loopback Test ▸ <port selection> ▸ 4. Start Diagnostics Test

From the Loopback Test menu, select the **Start Diagnostics Test** option to run the external loopback test. For example:

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

HBA Instance 0: QLE2692 Port 1 WWPN 21-00-00-24-FF-8F-D8-66 PortID 01-0A-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)...
```


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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 a 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 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

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 2

        QConvergeConsole
        CLI - Version x.y.z (Build xx)

    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
Link          : D-Port
=========================================================
    1:  Display Test Parameters
    2:  Reset Test Parameters
    3:  Configure Test Parameters
    4:  Start Diagnostics Test
```


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Display Test Parameters (-kr)

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 2. Read Writer Buffer Test ▸ <port selection> ▸ 1. Display Test Parameters

From the Read Write Buffer Test menu, select the **Display Test Parameters** option to view the read write buffer test parameters. For example:

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

HBA Instance 1: QLE2692 Port 2 WWPN 21-00-00-24-FF-8F-D8-67 PortID
00-00-00
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
-----------------------------------------------------------------
```

Reset Test Parameters

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 2. Read Write Buffer Test ▸ <port selection> ▸ 2. Reset Test Parameters

From the Read Write Buffer Test menu, select the **Reset Test Parameters** option to reset the read write buffer test parameters to their default values.

Configure Test Parameters (-kr)

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 2. Read Write Buffer Test ▸ <port selection> ▸ 3. Configure Test Parameters

From the Read Write Buffer Test menu, select the **Configure Test Parameters** 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 64.

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For example:

```
    FC/FCoE 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
Link          : D-Port
==================================================

    1:  Data Patterns
    2:  Data Size
    3:  Number Of Test(s)
    4:  Test Increment(s)
    5:  Abort On Error
    6:  Enable/Disable Device(s)
```

Start Diagnostics Test (-kr)

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 2. Read Write Buffer Test ▸ <port selection> ▸ 4. Start Diagnostics Test

From the Read Write Buffer Test menu, select the **Start Diagnostics Test** 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 a port to open the Transceiver Diagnostics Monitoring Interface (DMI) menu with options to view general and detailed transceiver information. For example:

```
    FC Adapter Diagnostics

    HBA Model QLE2692 SN: GFC0718P57753
      1: Port   1: WWPN: 21-00-00-1B-32-17-F9-C4 Online
      2: Port   2: WWPN: 21-01-00-1B-32-37-F9-C4 Loop Down

        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1
```


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```
Transceiver Diagnostics Monitoring Interface (DMI)

1:  General
2:  Details
```

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. For example:

```
-------------------------------------------------------------------------------
HBA Instance 0: QLE2692 Port 1 WWPN 21-00-00-24-FF-8F-D8-66 PortID 01-0A-00
Link: Online
-------------------------------------------------------------------------------

-------------------------------------------------------------------------------
Media Information
-------------------------------------------------------------------------------
              Vendor: FINISAR CORP.
                Type: 800-M5-SN-S
         Part Number: FTLF8529P3BCV-QL
               Speed: 400 MBytes/Sec 1600 MBytes/Sec 800 MBytes/Sec
            Revision: A
       Serial Number: UL40TFY
QLogic SFP Installed: Yes
-------------------------------------------------------------------------------

                 Temperature   Voltage     Tx Bias    Tx Power    Rx Power
                     (C)         (V)         (mA)       (mW)        (mW)
              -------------   -------     -------    --------    --------
       Value      37.36         3.37        8.43      0.4921      0.5224
      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

       Hit <Enter> to continue:
```


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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 0: QLE2692 Port 1 WWPN 21-00-00-24-FF-8F-D8-66 PortID 01-0A-00
Link: Online
-------------------------------------------------------------------------------

Optical Transceiver Digital Diagnostic Data:

Address A0
           Identifier: SFP
      Ext. Identifier: GBIC/SFP defined by serial ID only
            Connector: LC
       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: 400 MBytes/Sec 1600 MBytes/Sec 800 MBytes/Sec
              Encoding: Reserved
          BR, Nominal: 0x8c
    Length (9um) - km: 0x00
         Length (9um): 0x00
        Length (50um): 0x03
      Length (62.5um): 0x00
      Length (Copper): 0x00
          Vendor name: FINISAR CORP.
           Vendor OUI: 0x00 0x90 0x65
            Vendor PN: FTLF8529P3BCV-QL
           Vendor Rev: A
          Wave Length: 0x0352
              CC_BASE: 0xb0
              Options:-Signal Loss, as defined in SFP MSA: 0x1
                      -Signal Loss, inverted from SFP MSA: 0x0
                      -TX_FAULT signal implemented: 0x1
                      -TX_DISABLE implemented & disables serial o/p: 0x1
```


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```
          -RATE_SELECT implemented: 0x1
  BR, max: 0x00
  BR, min: 0x00
Vendor SN: UL40TFY
Date code: 110727
.
.
.
```

Beacon (-a)

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 4. Beacon

From the FC Adapter Diagnostics menu, select the **Beacon** option. From the port menu, select a port to open the Beacon Test menu with options to <turn beacon LED on> and <turn beacon LED off>.

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 a port. At the prompt, type a file name with which to save the trace information. For example:

```
    QConvergeConsole

    CLI - Version x.y.z (Build xx)

FC Diagnostics

HBA Model QLE2772 SN: AFD1915Y07299
  1: Port   1: WWPN: 21-00-F4-E9-D4-54-AB-12 Online (FEC)
  2: Port   2: WWPN: 21-00-F4-E9-D4-54-AB-14 Online (FEC)
HBA Model QLE2562 SN: GFC0819H89417
  3: Port   1: WWPN: 21-00-00-1B-32-0C-A9-0B SFP not present
  4: Port   2: WWPN: 21-01-00-1B-32-2C-A9-0B SFP not present
HBA Model QLE2672 SN: RFE1303H21665
  5: Port   1: WWPN: 21-00-00-0E-1E-11-60-D0 Online
```


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```
        6: Port   2: WWPN: 21-00-00-0E-1E-11-60-D1 SFP not present


          (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
          Please Enter Selection: 1
Enter File Name to Save: FCE_Trace.log
FCE trace of HBA instance 4 (QLE2772) has been saved successfully
as FCE_Trace.log
```

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 a port. The FC Ping Test menu opens and lists options to view, reset, and configure ping test parameters, and to start the ping test.

For example:

```
QConvergeConsole

        CLI - Version x.y.z (Build xx)

    FC Diagnostics

    HBA Model QLE2772 SN: AFD1915Y07299
      1: Port   1: WWPN: 21-00-F4-E9-D4-54-AB-12 Online (FEC)
      2: Port   2: WWPN: 21-00-F4-E9-D4-54-AB-14 Online (FEC)
    HBA Model QLE2562 SN: GFC0819H89417
      3: Port   1: WWPN: 21-00-00-1B-32-0C-A9-0B SFP not present
      4: Port   2: WWPN: 21-01-00-1B-32-2C-A9-0B SFP not present
    HBA Model QLE2672 SN: RFE1303H21665
      5: Port   1: WWPN: 21-00-00-0E-1E-11-60-D0 Online
      6: Port   2: WWPN: 21-00-00-0E-1E-11-60-D1 SFP not present


        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 1

        QConvergeConsole

        CLI - Version 2.4.0 (Build 15)
```


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```
    Device Ping 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
Link          : Online (FEC)
=======================================================
    1:  Display Test Parameters
    2:  Reset Test Parameters
    3:  Configure Test Parameters
    4:  Diagnostics Device Ping Test


        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 4
```

Display Test Parameters

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 6. Device Ping Test ▸ <port selection> ▸ 1. Display Test Parameters

From the FC Ping Test menu, select the **Display Test Parameters** option to view the ping test parameters. For example:

```
-------------------------------------------------------------------------------
HBA Instance 4: QLE2772 Port 1 WWPN 21-00-F4-E9-D4-54-AB-12 PortID 01-00-00
Link: Online (FEC)
-------------------------------------------------------------------------------
```


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```
--------------------
Diagnostics Settings
--------------------
Diagnostic Mode           : FC Ping
Number of tests (1-10000): 10
Test Increment(1-10000)   : 1
Abort On Error            : Ignore
Test Continuous           : OFF
-------------------------------------------------------------------------------
```

Reset Test Parameters

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 6. Device Ping Test ▸ <port selection> ▸ 2. Reset Test Parameters

From the FC Ping Test menu, select the **Reset Test Parameters** option to reset the ping test parameters to their default values.

Configure Test Parameters

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 6. Device Ping Test ▸ <port selection> ▸ 3. Configure Test Parameters

From the FC Ping Test menu, select the **Configure Test Parameters** 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 35.

For example:

```
QConvergeConsole

        CLI - Version x.y.z (Build xx)

    FC Ping 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
Link          : Online (FEC)
=======================================================
```


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```
    1:  Number Of Test(s)
    2:  Test Increment(s)
    3:  Test Option
    4:  Enable/Disable Device(s)


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

Start Diagnostics Test

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 6. Device Ping Test ▸ <port selection> ▸ 4. Start Diagnostic Test

From the Ping Test menu, select the **Start Diagnostics Test** option to run the ping test. For example:

```
QConvergeConsole

        CLI - Version x.y.z (Build xx)

    Device Ping 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
Link          : Online (FEC)
=========================================================
    1:  Display Test Parameters
    2:  Reset Test Parameters
    3:  Configure Test Parameters
    4:  Diagnostics Device Ping Test


        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 4
-------------------------------------------------
Diagnostics Test Configuration
```


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```
------------------------------------------------
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 a 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

Currently, only Brocade switches support the CT Ping Test.

For example:

```
QConvergeConsole

        CLI - Version x.y.z (Build xx)

    FC Diagnostics

    HBA Model QLE2772 SN: AFD1915Y07299
      1: Port   1: WWPN: 21-00-F4-E9-D4-54-AB-12 Online (FEC)
      2: Port   2: WWPN: 21-00-F4-E9-D4-54-AB-14 Online (FEC)
    HBA Model QLE2562 SN: GFC0819H89417
      3: Port   1: WWPN: 21-00-00-1B-32-0C-A9-0B SFP not present
      4: Port   2: WWPN: 21-01-00-1B-32-2C-A9-0B SFP not present
    HBA Model QLE2672 SN: RFE1303H21665
```


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```
    5: Port   1: WWPN: 21-00-00-0E-1E-11-60-D0 Online
    6: Port   2: WWPN: 21-00-00-0E-1E-11-60-D1 SFP not present


      (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
      Please Enter Selection: 1

      QConvergeConsole

      CLI - Version x.y.z (Build xx)

  CT Ping 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
Link          : Online (FEC)
=======================================================
    1:  Display Test Parameters
    2:  Reset Test Parameters
    3:  Configure Test Parameters
    4:  Diagnostics CT Ping Test


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

Display Test Parameters

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 7. CT Ping Test ▸ 1. Display Test Parameters

From the CT Ping Test menu, select the **Display Test Parameters** option to view the parameters for the CT ping test. For example:

```
-------------------------------------------------------------------------------
HBA Instance 4: QLE2772 Port 1 WWPN 21-00-F4-E9-D4-54-AB-12 PortID 01-00-00
Link: Online (FEC)
```


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```
-------------------------------------------------------------------------------
Diagnostics Settings
--------------------
Diagnostic Mode           : CT Ping
Number of tests (1-10000): 10
Test Increment(1-10000)   : 1
Abort On Error            : Ignore
Test Continuous           : OFF
-------------------------------------------------------------------------------
```

Reset Test Parameters

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 7. CT Ping Test ▸ 2. Reset Test Parameters

From the CT Ping Test menu, select the **Reset Test Parameters** option to reset the CT ping test parameters to the default values.

Configure Test Parameters

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 7. CT Ping Test ▸ 3. Configure Test Parameters

From the CT Ping Test menu, select the **Configure Test Parameters** 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 35.

For example:

```
=====================================================
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
Link           : Online (FEC)
=====================================================
    1:  Number Of Test(s)
    2:  Test Increment(s)
    3:  Test Option
    4:  Enable/Disable Device(s)
```


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

Start Diagnostics Test

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 7. CT Ping Test ▸ 4. Start Diagnostic Test

From the CT Ping Test menu, select the **Start Diagnostics Test** option to run the CT ping test. For example:

```
QConvergeConsole

        CLI - Version x.y.z (Build xx)

    CT Ping 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
Link          : Online (FEC)
=========================================================
    1:  Display Test Parameters
    2:  Reset Test Parameters
    3:  Configure Test Parameters
    4:  Diagnostics CT Ping Test


        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 4
-------------------------------------------------
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
```


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```
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
```

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 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.

From the FC Adapter Diagnostics menu, select the **CT FTR Test** option, and then select a 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:

```
QConvergeConsole

        CLI - Version x.y.z (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
```


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```
WWNN          : 20-00-F4-E9-D4-54-AB-12
Link          : Online (FEC)
=======================================================
    1:  Display Test Parameters
    2:  Reset Test Parameters
    3:  Configure Test Parameters
    4:  Diagnostics CT FTR Test
```

Display Test Parameters

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 8. CT FTR Test ▸ 1. Display Test Parameters

From the CT FTR Test menu, select the **Display Test Parameters** option to view the CT FTR test parameters. For example:

```
-------------------------------------------------------------------------------
HBA Instance 4: QLE2772 Port 1 WWPN 21-00-F4-E9-D4-54-AB-12 PortID 01-00-00
Link: Online (FEC)
-------------------------------------------------------------------------------
--------------------
Diagnostics Settings
--------------------
Diagnostic Mode          : CT FTR
Number of tests (1-10000): 10
Test Increment(1-10000)  : 1
Abort On Error           : Ignore
Test Continuous          : OFF
-------------------------------------------------------------------------------
```

Reset Test Parameters

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 8. CT FTR Test ▸ 2. Reset Test Parameters

From the CT FTR Ping Test menu, select the **Reset Test Parameters** option to reset the CT FTR test parameters to the default values.

Configure Test Parameters

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 8. CT FTR Test ▸ 3. Configure Test Parameters

From the CT FTR Test menu, select the **Configure Test Parameters** 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 35.

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For example:

```
=====================================================
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
Link          : Online (FEC)
=====================================================
    1:  Number Of Test(s)
    2:  Test Increment(s)
    3:  Test Option
    4:  Enable/Disable Device(s)


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

Start Diagnostics Test

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 8. CT FTR Test ▸ 4. Start Diagnostics Test

From the CT FTR Test menu, select the **Start Diagnostics Test** option to run the CT FTR test. For example:

```
QConvergeConsole

        CLI - Version x.y.z (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
Link          : Online (FEC)
```


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```
=======================================================
    1:  Display Test Parameters
    2:  Reset Test Parameters
    3:  Configure Test Parameters
    4:  Diagnostics CT FTR Test


        (p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 4
-------------------------------------------------
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 a port. The Link Status Menu opens and lists options to view, configure, reset, and run port link status counters.

Info

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 9. Link Status ▸ 1. Info

From the FC Adapter Diagnostics menu, select the **Link Status** option, and then select **Info** to view the current values for the AutoPoll (AP), SetRate (SR), and LogToFile (LF) settings.

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Configure

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 9. Link Status ▸ 2. Configure

From the FC Adapter Diagnostics menu, select the **Link Status** option, select **Configure**, to view the Link Status Config Menu with the following options:

```
Link Status Config Menu
  1:  Auto Poll
  2:  Set Rate
  3:  Enable Log
  4:  Default
```

Auto Poll

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 9. Link Status ▸ 2. Configure ▸ 1. Auto Poll

From the Link Status Config Menu, select the **Auto Poll** option, and then select either **Enable Auto Poll** or **Disable Auto Poll**.

Set Rate

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 9. Link Status ▸ 2. Configure ▸ 2. Set Rate

From the Link Status Config Menu, select the **Set Rate** option, and then for the `Sampling Rate (Seconds)` setting, type a value between 5 and 30; the current value is shown in brackets.

Enable Log

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 9. Link Status ▸ 2. Configure ▸ 3. Enable Log

From the Link Status Config Menu, select the **Enable Log** option to specify the name of a log file in which to store link statistics for the selected port.

Default

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 9. Link Status ▸ 2. Configure ▸ 4. Default

From the Link Status Config Menu, select the **Default** option to restore the default settings for link statistics for the selected port.

Hard Reset

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 9. Link Status ▸ 3. Hard Reset

From the FC Adapter Diagnostics menu, select the **Link Status** option, and then select **Hard Reset** to set to zero all of the counters 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

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- Seq Proto Error
- Invalid Trans Word

Run

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 9. Link Status ▸ ▸ 4. Run

From the FC Diagnostics menu, select the **Link Status** 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: QLE2662 Port 2 WWPN 20-01-00-09-0C-00-FF-01 PortID 00-00-00
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. The Diagnostics Port Menu opens and lists options to configure and run port, electrical and optical loopback, and link traffic diagnostics on the selected port. This option is not supported on the Oracle Solaris platform.

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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.

Configure

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 10. Diagnostics Port Test ▸ 1. Configure

From the Diagnostics Port Config Menu, select one of the following options:

```
1. Disable Diagnostics Port
2. Enable Diagnostics Port
```

The currently selected mode (enabled or disabled) is indicated by `(Current)`.

Run

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 10. Diagnostics Port Test ▸ 2. Run

When you select **Run**, 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 shows example 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: QLE2740 Port 1 WWPN 21-00-00-24-FF-00-27-D5 PortID 02-05-00
Link: Link Down
-------------------------------------------------------------------------------
           HBA Port Electrical Loopback    Optical Loopback       Link Traffic
```


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```
          -------- ------------------    ----------------       ------------
  Value           01                0xD2               0xD3              0xD5
 Status         0x01                0x01               0x01              0x02
  Result      Passed              Passed             Passed           Skipped
Details: 0x0

Details: 0x0
```

FC Ping Test

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 11. FC Ping Test

From the FC Adapter Diagnostics menu, select the **FC Ping Test** option. The FC Ping Test menu opens and lists options to display, reset, and configure ping test parameters, and to run the FC ping test.

Display Test Parameters

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 11. FC Ping Test ▸ 1. Display Test Parameters

From the FC Ping Test menu, select **Display Test Parameters** to view the current diagnostics settings. For example:

```
-------------------------------------------------------------------------------
HBA Instance 0: QLE2740 Port 1 WWPN 21-00-00-24-FF-00-27-D5 PortID 02-05-00
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
-------------------------------------------------------------------------------
```

Reset Test Parameters

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 11. FC Ping Test ▸ 2. Reset Test Parameters

From the FC Ping Test menu, select **Reset Test Parameters** to return the FC ping test parameters to their default values.

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Configure

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 11. FC Ping Test ▸ 3. Configure

From the FC Ping Test menu, select **Configure** 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 Ping(s)
6:  Interval(s)
```

Run

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 11. FC Ping Test ▸ 4. Run

From the FC Ping Test menu, select **Run** to execute the ping test. The following shows example output from the test:

```
-------------------------------------------------------------------------------
HBA Instance 0: QLE2740 Port 1 WWPN 21-00-00-24-FF-00-27-D5 PortID 02-05-00
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
```


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

(RDP) Read Diagnostics Parameters (-rdp)

4. Adapter Diagnostics ▸ 2. Fibre Channel Adapter ▸ 12. (RDP) Read Diagnostics Parameters

NOTE

RDP is supported with Cisco and Brocade switches; the output is slightly different for the Cisco and Brocade switches. This feature is *not* supported on the Oracle Solaris platform.

From the FC Adapter Diagnostics menu, select the **(RDP) Read Diagnostics Parameters** option, and then select a port. This feature is not supported on the Oracle Solaris platform.

The following example shows the RDP information that appears:

```
-----------------------------------------------------------------------------
HBA Instance 0: QLE2740 Port 1 WWPN 21-00-00-24-FF-00-27-D5 PortID 02-05-00
Link: Online (FEC)
-----------------------------------------------------------------------------
Diagnostics Parameters Descriptor List Length: 332 Bytes
---------------------------------
Diagnostics Parameters Descriptor
---------------------------------
```


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```
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: 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
```


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


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```
Part Number: 57-1000333-01
Serial Number: JAF315410000FSU
Revision:
Date: 151007

--------------------------------
Optical Element Data Descriptor
--------------------------------
Descriptor Tag: Optical Element Data
Descriptor Length: 12 Bytes
High Alarm: 75.00
Optical Element Function Flag [0x00] High Alarm: 0x4b
Optical Element Function Flag [0x00] Low Alarm: 0xfffb
Optical Element Function Flag [0x00] High Warning: 0x46
Optical Element Function Flag [0x00] Low Warning: 0x00
```

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, buffer-to-buffer credits, and congestion (UCSM).

HBA Statistics

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.

Info

5. Monitoring ▸ 2. Fibre Channel Adapter ▸ 1. HBA Statistics ▸ 1. Info

From the HBA Statistics Menu, select **Info** to view the current Monitor Settings for the selected port, including AutoPoll (AP), SetRate (SR), and LogToFile (LF).

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Default

5. Monitoring ▸ 2. Fibre Channel Adapter ▸ 1. HBA Statistics ▸ 2. Default

From the HBA Statistics Menu, select **Default** to restore all HBA statistics settings to their defaults.

Configure (-gs)

5. Monitoring ▸ 2. Fibre Channel Adapter ▸ 1. HBA Statistics ▸ 3. Configure

From the HBA Statistics Menu, select **Configure** to open the Monitoring Config Menu.

```
Monitoring Config Menu
  1.  Auto Poll
  2.  Set Rate
  3.  Enable Log
```

Auto Poll

5. Monitoring ▸ 2. Fibre Channel Adapter ▸ 1. HBA Statistics ▸ 3. Configure ▸ 1. Auto Poll

From the Monitoring Config Menu, select the **Auto Poll** option, and then select either **Enable Auto Poll** or **Disable Auto Poll**.

Set Rate

5. Monitoring ▸ 2. Fibre Channel Adapter ▸ 1. HBA Statistics ▸ 3. Configure ▸ 2. Set Rate

From the Monitoring Config Menu, select the **Set Rate** option, and then for the `Sampling Rate (Seconds)` setting, type a value between 5 and 30; the current value is shown in brackets.

Enable Log

5. Monitoring ▸ 2. Fibre Channel Adapter ▸ 1. HBA Statistics ▸ 3. Configure ▸ 3. Enable Log

From the Monitoring Config Menu, select the **Enable Log** option to specify the name of a log file in which to store HBA statistics for the selected port.

Run

5. Monitoring ▸ 2. Fibre Channel Adapter ▸ 1. HBA Statistics ▸ 4. Run

From the HBA Statistics Menu, select **Run** to monitor port statistics. The following shows example output:

```
-------------------------------------------------------------------------------
HBA Instance 0: QLE2692 Port 1 WWPN 50-00-53-37-A1-52-C0-06 PortID 05-15-00
Link: Online (FEC)
-------------------------------------------------------------------------------
Monitoring
---------------------------------------
```


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```
General keyboard shortcuts:
      R     - Reset all counters
      ENTER - Cancel the current task
----------------------------------------
HBA Port Errors Device Errors Reset  I/O Count  IOPS        BPS        Time
--- ----------- ------------- ----- ---------- ----- ---------- -----------
  0           1            19     0      96016     1     891289 11:50:43 AM
```

BB Credit Stats (-bbcr)

5. Monitoring ▸ 2. Fibre Channel Adapter ▸ 2. BB Credit Stats

Buffer-to-buffer credit recovery (BB-CR) enables two FC peer ports (N_Port, F_Port, or E_Port) to periodically send and receive the quantity of receiver ready (R_RDY) signals transmitted. The BB-CR feature allows the peer port to recover from possible R_RDY signals lost over a lossy link. BB-CR 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 **BB Credit Stats** option, and then select an adapter port. The BB Credit Stats Menu provides options to display the current configuration, change the configuration, and run BB-CR statistics.

```
BB Credit Stats Menu
1:  Info
2:  Configure
3:  Run
```

To reset all the driver statistics counters for the current session, press the R key during run time.

Info

5. Monitoring ▸ 2. Fibre Channel Adapter ▸ 2. BB Credit Stats ▸ 1. Info

From the BB Credit Stats Menu, select **Info** to view the current HBA BB-CR statistics for the selected port, including AutoPoll (AP) and SetRate (SR). For example:

```
--------------------------------------
HBA BBCR Stats
--------------------------------------
AutoPoll (AP): 10
SetRate (SR): 20
```


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Configure

5. Monitoring ▸ 2. Fibre Channel Adapter ▸ 2. BB Credit Stats ▸ 2. Configure

From the BB Credit Stats Menu, select **Configure** to open the Monitoring Config Menu.

```
BB Credit Stats Menu
1.  Auto Poll
2.  Set Rate
3.  Default
```

Auto Poll

5. Monitoring ▸ 2. Fibre Channel Adapter ▸ 2. BB Credit Stats ▸ 2. Configure ▸ 1. Auto Poll

From the BB Credit Stats Menu, select the **Auto Poll** option, and then select either **Enable Auto Poll** or **Disable Auto Poll**.

Set Rate

5. Monitoring ▸ 2. Fibre Channel Adapter ▸ 2. BB Credit Stats ▸ 2. Configure ▸ 2. Set Rate

From the Monitoring Config Menu, select the **Set Rate** option, and then for the **Sampling Rate (Seconds)** setting, type a value between 5 and 30; the current value is shown in brackets.

Default

5. Monitoring ▸ 2. Fibre Channel Adapter ▸ 2. BB Credit Stats ▸ 2. Configure ▸ 3. Default

From the Monitoring Config Menu, select **Default** to restore all BB-CR statistics settings to their defaults.

Run

5. Monitoring ▸ 2. Fibre Channel Adapter ▸ 2. BB Credit Stats ▸ 3. Run

From the BB Credit Stats Menu, select **Run** to show BB-CR statistics for the selected port. For example:

```
HBA Instance 6: QLE2692 Port 1 WWPN 21-00-00-24-FF-8F-D8-66 PortID
01-0A-00
Link: Online
------------------------------------------------------------------

HBA BBCR Stats
----------------------------------------
General keyboard shortcuts:
        ENTER - Cancel the current task
----------------------------------------
HBA Port Transmitted  Received     Time
```


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```
No  No   Credit Lost  Credit Lost
--- ---- ------------ ------------ -----------
  6    1            0            0 04:37:36 PM
```

Temperature (-tm)

5. Monitoring ▸ 3. HBA Temperature

From the Monitoring menu, select **HBA Temperature** to view the adapter temperature for the selected adapter or for all adapters in the host. For example:

```
QConvergeConsole

        CLI - Version x.y.z (Build xx)

    Monitoring

     1: HBA Model: QLE2770 SN: AFD1923Y07510
          Port   1 WWPN: 21-00-34-80-0D-3B-89-B0 Online
     2: HBA Model: QLE2692 SN: RFD1610K18231
          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

        QConvergeConsole

        CLI - Version x.y.z (Build xx)

    Monitor Temperature Menu

=====================================================
HBA           : 0 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
Link          : Online
=====================================================
```


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```
    1:  View Current Settings
    2:  Modify Settings
    3:  Monitor HBA Temperature

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

Following is an example of the **View Current Settings** selection.

```
1. Display Setting
Select 1 from the menu to view current settings for monitoring adapter temperature.

---------------------------------------
Temperature Monitoring Settings
---------------------------------------
AutoPoll (AP): 10
SetRate (SR): 10
LogToFile (LF): N/A
LowAlarm (LO): 5
HiAlarm (HI): 100
```

Following is an example of the **Modify Settings** selection.

```
2. Modify Settings

    1:  View Current Settings
    2:  Modify Settings
    3:  Monitor HBA Temperature

Select 2 from the menu to modify the default settings for monitoring adapter temperature.,

Monitor Temperature Menu

=====================================================
HBA           : 0 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
Link          : Online
```


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```
=====================================================
    1:  Set Count-based
    2:  Set Interval Rate
    3:  Set Low Alarm
    4:  Set High Alarm
    5:  Export to CSV File
    6:  Reset to Default Settings


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

Following is an example of the **Monitor HBA Temperature** selection.

```
3. Monitor HBA Temperature

    1:  View Current Settings
    2:  Modify Settings
    3:  Monitor HBA Temperature

Select 3 from the menu to start monitoring the ASIC temperature of selected adapter.

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


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```
11:54:30 AM   QLE2770 AFD1923Y07510      38          100 Good
```

Congestion Management

5. Monitoring ▸ 4. Congestion Management

Universal SAN congestion mitigation (USCM) is a feature that detects and handles potential and actual congestion conditions in the SAN. A Fibre Channel port can experience congestion due to various factors such as link instability, credit stall, and over subscription. Both the HBA and the Fabric must support USCM (and the feature must be turned on in the Fabric).

For all supported hardware, QConvergeConsole CLI displays state and statistics related information associated with USCM.

From the Monitoring menu, select **Congestion Management** to view the USCM Congestion Menu.

```
Congestion Menu

=======================================================
HBA           : 0  Port: 1
SN            : AFD1915Y07299
HBA Model     : QLE2772
HBA Desc.     : QLogic QLE2772 32Gb 2-port Fibre Channel Adapter
FW Version    : 9.06.02
WWPN          : 21-00-F4-E9-D4-54-AB-12
WWNN          : 20-00-F4-E9-D4-54-AB-12
Link          : Online (FEC)
=======================================================
    1:  HBA Congestion Status
    2:  Target Congestion Status
    3:  Congestion Statistics Settings
    4:  Monitor Congestion Statistics
    5:  Clear Congestion Statistics
```


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Table 6-1 defines some of the USCM congestion parameters that appear in the following sections.

Table 6-1. USCM Congestion Parameters

Parameter	Valid Values

`Link Event Type`
(Link Integrity Notification ELS)
	The port exceeded the error transmission threshold. Valid values are:
	`Unknown`
	`Link Failure`
	`Loss-of-Synchronization`
	`Loss-of-Signal`
	`Primitive Sequence Protocol Error`
	`Invalid Transmission Word`
	`Invalid CRC`
	`Device Specific`

`Delivery Notification`
(Delivery Notification ELS)
	The port discarded the frame because the delivery time threshold was exceeded. Valid values are:
	`Unknown`
	`Timeout`
	`Unable to route`
	`Device Specific`

`Congestion Notification`
(Congestion Notification ELS)
	The transmission resources have been consumed to a level low enough to cause the receiving device—this port—to behave as though it is congested. Valid values are:
	`Warning`
	Congestion is building.
	`Alarm`
	Congestion has reached a severe level.

`Peer Congestion Event Type`
(Peer Congestion Notification ELS)
	Another port in this zone is exhibiting behaviors associated with I/O congestion, which is impeding a free flow of frames through the Fabric. Valid values are:
	`Clear/None`
	`Lost Credit`
	`Credit Stall`
	`Oversubscription`
	`Device Specific`

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HBA Congestion Status

5. Monitoring ▸ 4. Congestion ▸ 1. HBA Congestion Status

From the Congestion menu, select **HBA Congestion Status** to see the current USCM statistics' settings. For example:

```
HBA Model                       : QLE2772
HBA Instance                    : 4
HBA Port                        : 1
Node Name                       : 20-00-F4-E9-D4-54-AB-12
Port Name                       : 21-00-F4-E9-D4-54-AB-12
Port ID                         : 01-00-00
HBA Status                      : Online (FEC)
Congestion Current State        : Healthy
Congestion Severity             : Warning
Seconds Since Last Event        : 1604708524 (sec)
```

Target Congestion Status

5. Monitoring ▸ 4. Congestion ▸ 2. Target Congestion Status

From the Congestion Management menu, select **Target Congestion Status** to see the target's traffic status.

In the following example, the target is congested.

```
Path                            : 0
Target                          : 0
Device ID                       : 0x82
Product Vendor                  : SANBlaze
Product ID                      : VLUN P2T2L0
Product Revision                : V7.5
Serial Number                   : 2000000000002002-02-0000
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
Port State                      : 1
Current State                   : Congested
Current Event                   : Peer Congestion
Seconds Since Last Event        : 19 (sec)
Link Integrity Event Type       : Unknown
Link Integrity Event Threshold  : 0 (ms)
```


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```
Delivery Reason Code            : Unknown

Peer Congestion Event Type      : Credit Stall
Peer Congestion Event Period    : 600000 (ms)
Status                          : Online
-------------------------------------------------
Path                            : 0
Target                          : 1
Device ID                       : 0x83
Product Vendor                  : SANBlaze
Product ID                      : VLUN P2T3L0
Product Revision                : V7.5
Serial Number                   : 2000000000002003-03-0000
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
Port State                      : 1
Current State                   : Congested
Current Event                   : Peer Congestion
Seconds Since Last Event        : 5(sec)
Link Integrity Event Type       : Unknown
Link Integrity Event Threshold  : 0 (ms)
Delivery Reason Code            : Unknown
Peer Congestion Event Type      : Oversubscription
Peer Congestion Event Period    : 600000 (ms)
Status                          : Online
```

In the following example, the target is not congested.

```
Congestion Menu
================================================

HBA        : 0 Port: 1
SN         : B5147852369987654951753
HBA Model  : QLE2772
HBA Desc.  : QLogic QLE2772 32Gb 2-Port PCIe Fibre Channel Adapter
FW Version : 9.03.00
WWPN       : 21-00-F4-E9-D4-54-AF-4A
WWNN       : 20-00-F4-E9-D4-54-AF-4A
```


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```
Link       : Online (FEC)
================================================
    1. HBA Congestion Status
    2. Target Congestion Status
    3. Congestion Statistics Settings
    4. Montior Congestion Statistics
    5. Clear Congestion Statistics

(p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 2
Congestion not detected with HBA 4(QLE2772)
```

Congestion Statistics Settings

5. Monitoring ▸ 4. Congestion ▸ 3. Congestion Statistics Settings

From the Congestion menu, select **Congestion Statistics Settings** to auto poll the adapter, manually poll the adapter, set count based, set internal rate, or export the settings to a CSV value. For example:

```
Congestion Config Menu
================================================

HBA        : 0 Port: 1
SN         : B5147852369987654951753
HBA Model  : QLE2772
HBA Desc.  : QLogic QLE2772 32Gb 2-Port PCIe Fibre Channel Adapter
FW Version : 9.03.00
WWPN       : 21-00-F4-E9-D4-54-AF-4A
WWNN       : 20-00-F4-E9-D4-54-AF-4A
Link       : Online
================================================
    1. View Current Settings
    2. Set Count-based
    3. Set Interval Rate
    4. Export to CSV file
    5. Reset to Default Settings
```

The Congestion Config menu allows you to:

1. View Current Settings

Displays the current statistics settings.

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2. Set Count-base

Sets the number of iterations or an infinite run.

3. Set Interval Rate

Set the internal rate between two iterations.

4. Export to CSV file

Saves the statistics data in CSV format. You are prompted to enter a name for the CSV file.

The congestion statistics data is saved to two separate files. The prefix `hba_` or `tgt_` is added to the initial file name depending on the statistics data (HBA port or targets). For example, if the initial file name is `scmstats.csv`, the new files will be `hba_scmstats.csv` and `tgt_scmstats.csv`.

5. Reset to Default Settings

Resets all the statistics settings to their default values.

Monitor Congestion Statistics

5. Monitoring ▸ 4. Congestion ▸ 4. Monitor Congestion Statistics

From the Congestion menu, select **Monitor Congestion Statistics** to view congestion details. For example:

```
-------------------------------
Congestion Monitor Settings
-------------------------------
AutoPoll (AP): 10
SetRate (SR): 10
LogToFile (LF): N/A
-----------------------------------------------------------------
HBA Instance     : 2 (QLE2772 Port 1)
Port Name        : 21-00-F4-E9-D4-54-AF-4A
PortID           : 06-1D-00
HBA Status       : Online (FEC)
Current State:   : Healthy
-----------------------------
Initiator: 21-00-F4-E9-D4-54-AF-4A
Time: 04:56:52 PM
---------------------------------------
Congestion Alarm: 0
Congestion Warning: 2
Cleared Congestion Count: 2
```


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```
Throttled Up Count: 0
Throttled Down Count: 0
Bottom Out Count: 0
Returned Busy Count: 0
-----------------------------------------
Device: 21-00-00-00-00-00-20-02
Time: 11:27:16 AM
-----------------------------------------------
Cleared Congestion Count: 4
Throttled Up Count: 0
Throttled Down Count: 0
Bottom Out Count: 0
Returned Busy Count: 0
Link Failture Count: 0
Link Unknown Event: 0
Loss of Sync Count: 0
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 Unabel to Route Count: 0
Delivery Failsure Device Specific Count: 0
Peer Congestion Clear Count: 0
Peer Congestion Lost Credit Count: 0
Peer Congestion Credit Stall Count: 2
Peer Congestion Oversubscription Count: 1
Peer Congestion Device Specific Count: 0
PUN Count: 0
PUN Clear Count: 0
```

There are four broad event categories that cause the fabric to notify an adapter port of an SCM event:

- Link integrity notification
- Delivery notification
- Congestion notification
- Peer congestion notification

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The details of these categories and the specific sub-event (noted as valid values) under each category is listed in Table 6-1.

When the fabric detects one of these events, or is notified (by one of its peers about the same), it broadcasts that information to all connected devices (hosts and target ports that support and have registered for SCM) for a given zone.

The link integrity and delivery notifications are stateless. The congestion and peer congestion notifications are stateful.

Clear Congestion Statistics

5. Monitoring ▸ 4. Congestion ▸ 5. Clear Congestion Statistics

From the Congestion menu, select **Clear Congestion Statistics** to clear the congestion statistics counters. For example:

```
Congestion Menu
================================================

HBA         : 0 Port: 1
SN          : B5147852369987654951753
HBA Model   : QLE2772
HBA Desc.   : QLogic QLE2772 32Gb 2-Port PCIe Fibre Channel Adapter
FW Version : 9.03.00
WWPN        : 21-00-F4-E9-D4-54-AF-4A
WWNN        : 20-00-F4-E9-D4-54-AF-4A
Link        : Online (FEC)
================================================
    1. HBA Congestion Status
    2. Target Congestion Status
    3. Congestion Statistics Settings
    4. Montior Congestion Statistics
    5. Clear Congestion Statistics

(p or 0: Previous Menu; m or 98: Main Menu; ex or 99: Quit)
        Please Enter Selection: 5
Congestion stats of HBA 0 (QLE2772) have been reset successfully.
```

Refresh

7. Refresh

From the main menu, select the **Refresh** option to refresh (reload) the adapters and adapter port indexes. For example:

```
Scanning for QLogic adapters, please wait...
```


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```
Using config file: C:\Program Files\...\iscli.cfg
Using config file: C:\Program Files\...\netscli.cfg
Loading: 1. CNA ... adapters, please wait...
Loading: 1. CNA Port index : 1 ...
Loading: 1. CNA Port index : 2 ...
Refreshing interfaces ... Please wait ......
Scanning for QLogic adapters, please wait...

        Hit <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.

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A Revision History

Document Revision History	
Revision 1, January 29, 2021	
Changes	**Sections Affected**
Initial release	All

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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.

Converged Network Adapter

Marvell Converged Network Adapters support both data networking (TCP/IP) and storage networking (Fibre Channel) traffic on a single I/O adapter using two new technologies: Enhanced Ethernet and Fibre Channel over Ethernet (FCoE).

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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. The bandwidth allocation under ETS is typically 50 percent for FCoE traffic and 50 percent for non-FCoE traffic (NIC + iSCSI). This means that NPAR QoS allocations among the NIC partitions for a specific port, allocate a percentage of the non-FCoE portion of the bandwidth.

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extensible firmware interface

See EFI.

FC

See Fibre Channel.

FCode

A type of boot code designed for use on Sun's SPARC or Macintosh hardware platforms.

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.

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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.

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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.

NIC partitioning

See NPAR.

node port

See N_Port.

non-volatile random access memory

See NVRAM.

NPAR

NIC partitioning. A feature in Marvell adapters that allows you to partition a single 10GbE NIC port into up to four individual partitions with user-configurable bandwidth and function type (or function protocol). The partitioning options are not limited to NIC as the name NPAR indicates; it extends to converged fabric partitioning by enabling you to assign iSCSI or FCoE protocols to specific partitions.

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.

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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
- Network partition (NPAR function) level

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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.

Network Partition Function Personality
The term personality refers to a specific I/O function type on the adapter's physical port where supported, not the entire adapter. When used in the context of a network partition function, the term is associated with an individual I/O function of a physical port. For example, a physical I/O port can be partitioned into multiple I/O functions, and an individual I/O function can be configured with a LAN (NIC) or a SAN (FCoE or iSCSI) personality.

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.

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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.

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.

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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.

virtual LAN

See VLAN.

virtual machine

See VM.

vital product data

See VPD.

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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.

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