Emulex® OneCommand® CNA Manager Command Line Interface for OneConnect® Adapters

User Guide

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Chapter 1: Introduction

The OneCommand® CNA (converged network adapter) Manager command line interface (CLI) is a comprehensive management utility for Emulex® adapters. The CLI provides support for commonly used commands without requiring the installation of the OneCommand CNA Manager graphical user interface (GUI). The OneCommand CNA Manager CLI console application name is `Brcmhbacmd`. At the command line interface, a single operation is performed by entering `brcmhbacmd`, followed by a CLI client command and its possible parameters.

The OneCommand CNA Manager application can be installed on multiple operating systems: Windows, Linux, and Solaris. For VMware ESXi hosts, use the OneCommand CNA Manager application for VMware vCenter. For details, refer to the *Emulex OneCommand CNA Manager for VMware vCenter for OneConnect Adapters User Guide*. You can also manage adapters using the OneCommand CNA Manager CLI on Windows, but you must install and use the appropriate Emulex CIM Provider on those VMware hosts.

NOTE For VMware ESXi hosts, when advanced adapter management capabilities are required (for example, iSCSI Management and port disablement), use the OneCommand CNA Manager for VMware vCenter Server. For more details, refer to the *Emulex OneCommand CNA Manager for VMware vCenter for OneConnect Adapters User Guide*.

This product supports the following Emulex OneConnect converged network Adapters (CNAs):

- OCe11000-series adapters
- OCe14000-series adapters

For supported versions of operating systems and platforms, go to http://www.broadcom.com.

1.1 Abbreviations

API	application programming interface
ARI	alternative routing-ID interpretation
ARP	Address Resolution Protocol
ASIC	application-specific integrated circuit
BIOS	basic input-output system
CHAP	Challenge Handshake Authentication Protocol
CIMOM	CIM Model Object Manager
CIN	chassis internal network
CLI	command line interface
CNA	Converged Network Adapter
DAC	direct-attach copper
D_ID	destination identifier
DCB	Data Center Bridging
DCBX	Data Center Bridging Capabilities Exchange
DH	Diffie-Hellman
DHCHAP	Diffie-Hellman Challenge Handshake Authentication Protocol
ETO	extended timeout
FAT	file allocation table
FCF	Fibre Channel over Ethernet Forwarder

FCoE	Fibre Channel over Ethernet
FEC	forward error correction
FIP	FCoE Initialization Protocol
GUI	graphical user interface
HBA	host bus adapter
iBFT	iSCSI boot firmware table
ICMP	Internet Control Message Protocol
IP	internet protocol
ISID	initiator session identifier
iSCSI	Internet Small Computer Systems Interface
ISID	initiator session identifier
iSNS	Internet Storage Name Service
LDAP	Lightweight Directory Access Protocol
LLDP	Link Layer Discovery Protocol
LPVID	logical port VLAN ID
LUN	logical unit number
MAC	Media Access Control
MILI	Management Interface Library
MSI	message signaled interrupt
MTU	maximum transmission unit
NIC	network interface card
NPar	NIC partitioning
NPIV	N_Port_ID Virtualization
NVP	normal velocity of propagation
NVRAM	nonvolatile random access memory
OB	open boot
OS	operating system
PAM	pluggable authentication module
PCI	Peripheral Component Interconnect
PFC	priority flow control
PG	priority group
POST	power-on self-test
PXE	Pre-boot execution Environment
QCN	Quantized Congestion Notification
QoS	quality of service
RoCE	RDMA over Converged Ethernet
RHEL	Red Hat Enterprise Linux
Rx	receive
SAN	storage area network
SCSI	Small Computer Systems Interface
SFCB	Small Footprint CIM Broker
SFP	small form-factor pluggable
SLES	SUSE Linux Enterprise Server

SMB	Server Message Block
SR-IOV	single root I/O virtualization
TCP	Transmission Control Protocol
TDR	time-domain reflectometer
Tx	transmit
UEFI	Unified Extensible Firmware Interface
UFP	Unified Fabric Port
UMC	Universal Multichannel
VEPA	virtual Ethernet port aggregator
VLAN	virtual local area network
VLAN ID	VLAN identifier
VM	virtual machine
VPD	vital product data
vPort	virtual port
WWN	World Wide Name
WWNN	World Wide Node Name
WWPN	World Wide Port Name
XML	Extensible Markup Language

1.2 OneCommand CNA Manager Secure Management

OneCommand CNA Manager Secure Management gives system administrators the ability to further enhance the active management security of their networks. Using Secure Management, administrators can define each user's privileges for managing both local and remote adapters. When running in Secure Management mode, users must specify their user name and password to run the OneCommand CNA Manager CLI. When users are authenticated, only they can perform the functions allowed by the OneCommand CNA Manager user group to which they belong. If your systems are running in an LDAP or Active Directory domain, the OneCommand CNA Manager CLI will authenticate the user with those defined in that domain. For Linux and Solaris systems, this is accomplished using PAM.

NOTE OneCommand CNA Manager Secure Management is supported on Linux, Solaris, and Windows, but it is not supported on VMware hosts. For VMware hosts, the CIM credentials are used.

Administrators set up user accounts such that a user belongs to one of the OneCommand CNA Manager user groups. The user groups define the management capabilities for the user. Table 1 defines the OneCommand CNA Manager user groups and each group's management capabilities.

Table 1 Secure Management User Privileges

Group Name	OneCommand CNA Manager Capability
ocmadmin	Allows full active management of local and remote adapters
ocmlocaladmin	Permits full active management of local adapters only
ocmuser	Permits read-only access of local and remote adapters
ocmlocaluser	Permits read-only access of local adapters

On Linux or Solaris systems, the *unix getent group* utility can be run on the target host system's command shell to verify the correct configuration of the groups. The groups, and users within the groups, appear in the output of this command.

NOTE Although users can belong to the administrator group or be a root user, they will not have full privileges to run the OneCommand CNA Manager unless they are also a member of the ocmadmin group. Otherwise, when secure management is enabled, a root user or an administrator can only manage local adapters (similar to the ocmlocaladmin user).

Remote management operations between two machines is allowed or denied depending on the OneCommand CNA Manager secure management status of the machines, and the domains to which the machines belong. The following tables (Table 2, Table 3, and Table 4) list the expected behavior for each machine domain condition (assuming appropriate user credentials are used).

Table 2 Active Commands: Machines on Same Domain

	Remote Server (Secure)	Remote Server (Not Secure)
Client (Secure)	Allowed	Denied [a]
Client (Not Secure)	Denied	Allowed

a. Informs you of an unsecured server that you might want to secure.

Table 3 Active Commands: Machines on Different Domain

	Remote Server (Secure)	Remote Server (Not Secure)
Client (Secure)	Denied[a]	Denied [b]
Client (Not Secure)	Denied	Allowed

a. Allowed if the user name and password are the same on both domains.

b. Informs you of an unsecured server that you might want to secure.

Table 4 Passive Commands: Machines on Any Domain

	Remote Server (Secure)	Remote Server (Not Secure)
Client (Secure)	Allowed	Allowed
Client (Not Secure)	Allowed	Allowed

1.2.1 OneCommand CNA Manager Secure Management Configuration Requirements

For systems to run in the OneCommand CNA Manager secure management environment, they must be configured to provide the following two capabilities:

- Authentication – On Linux and Solaris, this is accomplished by using the PAM interface and must be configured as follows:
  - On Solaris, place the correct value in the auth section of the `/etc/pam.d/other` file, or its earlier equivalent, `/etc/pam.conf`.

    NOTE For Solaris systems, you must use `useradd -G groupname` for authentication to work. You cannot use a lowercase **g**.
  - On Linux, it is the `/etc/pam.d/passwd` file auth section, or the equivalent.
- User Group Membership – From the host machine, OneCommand CNA Manager Secure Management must be able to access the OneCommand CNA Manager group to which the user belongs. For Linux and Solaris systems, it uses the `getgrnam` and `getgrid` C-library API calls. The equivalent to the API calls can be obtained by typing `getent group` from the shell command line. If the four OneCommand CNA Manager group names are listed with their member users, the system is ready to use OneCommand CNA Manager secure management.

1.3 Secure Management Installation

The enabling or disabling of the Secure Management feature is specified at OneCommand CNA Manager installation time. This can be accomplished either interactively or by using dedicated installation switches on Windows, Linux, and Solaris. On Linux and Solaris, if the OneCommand CNA Manager groups described in the previous section (see Table 1) are not configured on the machine at the time of the OneCommand CNA Manager installation, the installation will fail when the secure management feature is selected.

NOTE Only a user with administrator or root privileges is allowed to enable or disable the secure management feature on a local host machine.

Management mode cannot be used if Secure Management is enabled.

1.3.1 Linux and Solaris

This section describes the Secure Management installation options for Linux and Solaris operating systems.

1.3.1.1 Interactive Installation

Enterprise OneCommand CNA Manager installations performed in interactive mode ask if OneCommand CNA Manager Secure Management mode should be enabled. If the answer is **yes**, the other management mode questions are skipped. If the answer is **no** to the OneCommand CNA Manager Secure Management mode question, then the management mode installation questions follow.

1.3.1.2 Unattended Installation with Install Script Switch Option Support

Enterprise OneCommand CNA Manager installations performed in unattended mode provide a switch option to enable OneCommand CNA Manager Secure Management. If the OneCommand CNA Manager Secure Management switch is not used with the installation, Secure Management is disabled.

1.3.2 Windows

During OneCommand CNA Manager installations performed in interactive mode, you are presented with a management mode window where you can select Secure Management as the management mode.

1.4 Setting Secure Management Mode for Linux and Solaris

To set the secure management mode for the Linux and Solaris operating systems:

1. Log on as root.
2. Set secure management:
   - To set Secure Management Mode for Linux, type the following command:
     ```
     # /usr/sbin/brcmocmanager/set_operating_mode
     ```
   - To set Secure Management Mode for Ubuntu 14, type the following command:
     ```
     # /opt/emulex/brcmocmanager/scripts/set_operating_mode.sh
     ```
   - To set Secure Management Mode for Solaris, type the following command:
     ```
     # /opt/brcmocm/brcmocmanager/set_operating_mode
     ```

   Example

   The following example text is displayed:

   ```
   Do you want to enable Secure Management feature for OneCommand? (s/u)
   The secure management feature requires OneCommand groups be configured on
   the LDAP network or the local host machine to provide for OneCommand
   operation.
   Enter 's' to select secure management. (LDAP/NIS OCM group configuration
   required)
   Enter 'u' to run without secure management (default.
   Enter the letter 's' or 'u': s
   ```

1.4.1 Using OneCommand CNA Manager with Secure Management Enabled

To run the OneCommand CNA Manager CLI when Secure Management is enabled, you must include your user name and password each time you type a command.

The syntax for entering your user name and password is the following:

```
brcmhbacmd <m=sec> <u=userid> <p=password> <command>
```

For example

```
>brcmhbacmd m=sec u=jsmith p=password download 00-12-34-56-78-9A
oc11-4.6.96.2.ufi
```

User names and passwords are used to authenticate the commands. After the credentials are authenticated, the OneCommand CNA Manager CLI will determine which one of the four user groups you belong to and will allow command usage as appropriate.

Chapter 2: Installing and Uninstalling the CLI

This chapter details prerequisites and procedures for installing and uninstalling the OneCommand CNA Manager CLI in the following operating systems: Linux, Solaris, and Windows. It also describes the Secure Management capability and the procedure for starting and stopping daemon processes.

2.1 Linux

The following instructions are for installing and uninstalling the OneCommand CNA Manager CLI on Linux operating systems. You can install Linux with or without an existing OneCommand CLI kit. Additionally, you can install the OneCommand CNA Manager CLI for Citrix-based operating systems.

2.1.1 Citrix

Citrix is based on CentOS Linux, however, for the OneCommand CNA Manager CLI, Citrix is more comparable to VMware –, a hypervisor-style server for managing virtual machines. Citrix XenServer 6.5 and 7.0 operating systems require the OneCommand CNA Manager CLI installation.

2.1.2 Installing in Linux without an Existing OneCommand CLI Kit

NOTE For Secure Management, prior to installation, OneCommand CNA Manager groups must be configured on the LDAP network or the local host machine for Secure Management operation. See Section 1.2.1, OneCommand CNA Manager Secure Management Configuration Requirements, for configuration instructions.

2.1.2.1 Linux OneCommand CNA Manager Requirements

For new systems, install the specific Linux driver rpm files before installing the OneCommand CNA Manager CLI.

2.1.2.1.1 Libnl Library

On RHEL 6.x and RHEL 7.x, the OneCommand CNA Manager Core rpm file requires the Libnl library. This library is not installed by default, but it can be obtained from the operating system distribution media.

- For i386 RHEL use the 32-bit libnl library.
- For x86_64 RHEL use the 64-bit libnl library.

2.1.2.1.2 libhbaapi Library

To install the OneCommand CNA Manager CLI in Linux without an existing OneCommand CNA Manager CLI:

1. Copy the applications kit tar file to a directory on the installation machine.
2. Change to the directory where you copied the tar file.
3. Untar the file:

   ```
   tar zxvf brcmocmcore-<supported_os>-<app_ver>-<rel>.tgz
   ```
4. Change to the core kit directory created in step 3.

   ```
   cd brcmocmcore-<supported_os>-<app_ver>-<rel>
   ```
5. Run the `install.sh` script.

   ```
   ./install.sh
   ```

The core kit consists of three or four rpm files for each supported architecture and each supported version of Linux. For example:

- `brcmocmlibhbaapi-*.rpm` (on 64-bit platforms that support 32-bit applications, there are two of these files)
- `brcmocmcore-*.rpm`
- `brcmocmcorelibs-*.rpm`

6. When you are prompted, choose whether to enable Secure Management for OneCommand:

```
Do you want to enable Secure Management feature for OneCommand? (s/u)
Enter 's' to select secure management. (LDAP/NIS OCM group configuration
required)
Enter 'u' to run without secure management (default).
Enter the letter 's' or 'u'.
```

If you enter **u**, an additional prompt is given for the management mode:

```
You selected: Secure Management Disabled
Select desired mode of operation for OneCommand CNA Manager:
Enter the number 1, 2, 3, or 4: 1
You selected: 'Local Only Mode'

1 Strictly Local Management:  Only manage the adapters on this host. Management of
                              adapters on this host from other hosts is not allowed.
2 Local Management Plus:      Only manage the adapters on this host. Management of
                              adapters on this host from other hosts is allowed.
3 Full Management:            Manage the adapters on this host and other hosts that
                              allow it. Management of the adapters on this host from
                              another host is allowed.
4 Management Host:            Manage the adapters on this host and other hosts that
                              allow it. Management of the adapters on this host from
                              another host is not allowed.
```

2.1.2.1.3 Unattended Installation

The `install.sh` script can be run in noninteractive (unattended or quiet) mode. Enter the following command to view the syntax:

```
./install.sh --help
```

To perform an unattended, silent installation, enter the following command:

```
#./install.sh –q2
```

NOTE The Management Mode default for unattended installation is Local Management Plus.

2.1.3 Installing in Linux with an Existing OneCommand CLI Kit

NOTE The OneCommand CNA Manager core kit cannot be installed if a previous version of the HBAnyware utility is installed.

There are two options for installing the OneCommand CNA Manager CLI on a Linux system with an existing OneCommand CLI kit:

- Updating an existing installation – Preserve existing settings
- Performing a clean install – Overwrite existing settings

2.1.3.1 Updating (Preserving Existing Settings)

To update the OneCommand CNA Manager CLI and preserve settings, you must install the current core kit as detailed in Section 2.1.2, Installing in Linux without an Existing OneCommand CLI Kit. The `.rpm` file handles the configuration file update. The install script executes an rpm file update (`rpm -U *.rpm`) to update the installed version of the core kit to the current version.

NOTE There is no update path from an HBAnyware 4.x or 3.x core kit to a OneCommand CNA Manager core kit. You must uninstall previous versions of the HBAnyware utility before installing a OneCommand CNA Manager core kit. For information on uninstalling older versions of HBAnyware, see Section 2.1.5, Uninstalling Older HBAnyware Kits in Linux.

2.1.3.2 Performing a Clean Install (Removing Existing Settings)

1. Uninstall the existing OneCommand CNA Manager CLI using the uninstall script included in the tar file or in the `/usr/sbin/brcmocmanager/scripts` directory. The configuration files are backed up by rpm with an `.rpmsave` extension.

   For Ubuntu 14, use the uninstall script in the following location:

   ```
   /opt/emulex/brcmocmanager/scripts/uninstall.sh
   ```

   NOTE If an HBAnyware CLI or enterprise kit is installed, follow the procedure in Section 2.1.5, Uninstalling Older HBAnyware Kits in Linux.

2. Install the specific rpm file for your driver for Linux version. For information on installing the rpm file, see Section 2.1.2, Installing in Linux without an Existing OneCommand CLI Kit.

2.1.4 Uninstalling in Linux

To uninstall the OneCommand CNA Manager CLI in Linux:

1. Log on as root.
2. Perform one of the following tasks:
   - Run the `uninstall_brcmocmanager.sh` script located in `/usr/sbin/brcmocmanager/scripts`.
   - Run the `uninstall.sh` script located in the installation tar file.
   - For Ubuntu 14, use the uninstall script in the following location:
     `/opt/broadcom/brcmocmanager/scripts/uninstall.sh`

2.1.5 Uninstalling Older HBAnyware Kits in Linux

2.1.5.1 Uninstalling an Older HBAnyware Core Kit

Run the following command to remove the core kit.

```
rpm -e elxlinuxcorekit
```

2.1.5.1.1 Uninstalling an Older HBAnyware Enterprise Kit

1. Perform one of the following tasks:
   - Run the uninstall script located in `/usr/sbin/hbanyware/scripts` to remove the enterprise kit.
   - Run the uninstall script located in the tar file to remove the enterprise kit.

   If the HBAnyware Security Configurator is installed, you must uninstall it before uninstalling the HBAnyware configuration utility. You must use the uninstall script that shipped with the version of OneCommand Security Configurator you want to remove and proceed to step 2. If the Security Configurator is not installed, proceed to step 3.
2. If the HBAnyware Security Configurator is installed, follow these steps:
   a. Log on as root.
   b. Change to the directory containing the tar file.
   c. Extract the tar file using the `tar -xvf` command.
   d. Change to the newly created directory.
   e. Type the following uninstall script with the ssc parameter specified:
      ```
      ./uninstall ssc
      ```
3. Uninstall the HBAnyware utility and the Application Helper module:
   a. Log on as root.
   b. Change to the directory containing the tar file.
   c. Extract the tar file using the `tar -xvf` command.
   d. Change to the newly created directory.
   e. Uninstall any previously installed versions. Type the following command:
      ```
      ./uninstall
      ```

2.2 Solaris

The following instructions are for installing and uninstalling the OneCommand CNA Manager CLI on Solaris operating systems.

2.2.1 Installing in Solaris

NOTE For Secure Management, prior to installation, OneCommand CNA Manager groups must be configured on the LDAP network or the local host machine for Secure Management operation. See Section 1.2.1, OneCommand CNA Manager Secure Management Configuration Requirements, for configuration instructions.

To install the OneCommand CNA Manager CLI in Solaris:

1. Copy the OneCommand CNA Manager core kit to a temporary directory on the system.
2. Untar the core kit by typing the following command:

   ```
   tar xvf brcmocmcore-solaris-<kit version>.tar
   ```

3. Change to the newly created `brcmocmcore-solaris-<kit version>` directory:

   ```
   cd ./brcmocmcore-solaris-<kit version>/
   ```

4. Run the `install` script and follow the instructions.

   ```
   ./install
   ```

   NOTE The `install` script can also be run in non-interactive (unattended, quiet) mode. Enter the following command to view the syntax:

   ```
   ./install --help
   ```

   If any of the following are already present on the system, the `install` script attempts to remove them first:
   - HBAnyware utility
   - OneCommand Manager or OneCommand CNA Manager core kit
   - OneCommand Manager or OneCommand CNA Manager enterprise kit
   - Solaris driver (FCSA) utilities
5. When you are prompted, choose whether or not to enable Secure Management for OneCommand:

   ```
   Do you want to enable Secure Management feature for OneCommand? (s/u)
   Enter 's' to select secure management. (LDAP/NIS OCM group configuration
   required)
   Enter 'u' to run without secure management (default).
   Enter the letter 's' or 'u'.
   ```

   If you enter **u** here, an additional prompt is given for the management mode:

   ```
   You selected: Secure Management Disabled
   Select desired mode of operation for OneCommand CNA Manager:
   Enter the number 1, 2, 3, or 4: 1
   You selected: 'Local Only Mode'

   1 Strictly Local Management: Only manage the adapters on this host. Management of
                                adapters on this host from other hosts is not allowed.
   2 Local Management Plus:     Only manage the adapters on this host. Management of
                                adapters on this host from other hosts is allowed.
   3 Full Management:           Manage the adapters on this host and other hosts that
                                allow it. Management of the adapters on this host from
                                another host is allowed.
   4 Management Host:           Manage the adapters on this host and other hosts that
                                allow it. Management of the adapters on this host from
                                another host is not allowed.
   ```

2.2.2 Uninstalling in Solaris

To uninstall the OneCommand CNA Manager CLI in Solaris:

1. Log on as root.
2. Perform one of the following tasks:
   - Run `/opt/brcmocm/scripts/uninstall`.

— Run the `uninstall` script located in the installation tar file.
— Enter the command `pkgrm brcmocmcore`.

NOTE The `uninstall` script can also be run in noninteractive (quiet) mode. Enter the following command to view the syntax:

```
./uninstall --help
```

2.3 VMware ESXi

The OneCommand CNA Manager CLI cannot be run on a VMware ESXi operating system. However, a VMware ESXi host can be accessed remotely from the Windows OneCommand CNA Manager CLI if the Emulex CIM provider is installed on the ESXi host. For instructions on installing Emulex CIM Provider on VMware ESXi operating systems, refer to the *Emulex CIM Provider Package for OneConnect Adapters Installation Guide*.

2.4 Windows

The following instructions are for installing and uninstalling the OneCommand CNA Manager CLI on Windows operating systems. There are two ways to install the OneCommand CNA Manager CLI in Windows:

- Attended installation – You are present during the installation. You are prompted for more information for the installation to continue.
- Unattended installation – You do not need to be present during the installation. Installation will complete on its own. Installation progress can be displayed as an option.

2.4.1 Installing in Windows by Attended Installation

To install the OneCommand CNA Manager CLI, run the `installation.exe` file for a core Windows driver kit that does not include the OneCommand CNA Manager GUI, and follow the installer directions.

Use the following syntax for the installation executable file:

```
brcmocmcore-windows-<arch>-<kit version>.exe
```

- *<arch>* is either x64 or x86.
- *<kit version>* represents the complete kit version.

For example, at the command prompt, type the following command:

```
brcmocmcore-windows-x64-5.0.2.14-1.exe
```

2.4.2 Installing in Windows by Unattended Installation

To install the OneCommand CNA Manager CLI in Windows unattended:

1. From http://www.broadcom.com, download the x64 or x86 OneCommand CNA Manager Core Kit installation file to your system.

2. Use the following syntax for the installation executable file:

   ```
   brcmocmcore-windows-<arch>-<kit version>.exe <option>
   ```

3. Activate the kit with switch `/q` or `/q2`.
   - The `/q` switch displays progress reports.
   - The `/q2` switch does not display progress reports.
4. Enable Secure Management Mode by adding the `sec=1` argument or disable it by adding `sec=0`. If the sec argument is not entered, Secure Management is disabled by default. See Section 1.2, OneCommand CNA Manager Secure Management, for more information.

   To enable Secure Management, at the command prompt, type the following command:

   ```
   brcmocm-windows-<arch>-kit version>.exe sec=1 /q2
   ```

   To disable Secure Management, at the command prompt, type the following command:

   ```
   brcmocm-windows-<arch>-kit version>.exe sec=0 /q2
   ```

   NOTE There are two management mode defaults for unattended installation:
   - `mmode=3` (Full Management Mode)
   - `achange=1`
5. Select a Management Mode by adding the `mmode` argument, and select the ability to change the Management Mode by adding the `achange` argument with selected values as in the following example.

   NOTE If you enabled Secure Management in step 4 and attempt to enter an `mmode` value, a `conflicting parameters` error can occur.

   For example, at the command prompt type the following command:

   ```
   brcmocm-windows-x64-5.01.00.10-4.exe mmode=3 achange=1 /q2
   ```

   The following are the possible `mmode` values:

   `1` – Local Only Management Mode

   `2` – Local Plus Management Mode

   `3` – Full Management Mode

   `4` – Local Plus Management Mode and Read Only

   `5` – Full Management Mode and Read Only

   `6` – Management host

   The following are the possible `achange` values:

   `0` – Do not allow Management Mode to change

   `1` – Allow Management Mode to change

   You can also set the following optional parameters:

   — `MHost` – This optional switch allows a non-management-host user to select a Management Host with which to register. If this switch is not specified, the default value of `0` is used, and the capability will be disabled. If the switch is specified, the value can be a host name or an IP address, which is validated by the installer. An error message appears if `mmode` is set as Local Only or Management Host.

   — `excl` – This optional switch allows the nonmanagement-host user to select whether the OneCommand CNA Manager application processes requests exclusively from the Management Host specified by the `MHost` switch. This option is only accepted if accompanied by a valid `MHost` value; otherwise, an error message appears. If this switch is not specified, the default value of `0` is used. If the switch is specified, the valid values are:

   `0` – Remotely managed by other hosts.

   `1` – Remotely managed by Management Host only.

— `Mtcp` – This optional switch allows you to enable or disable remote management and to specify the TCP/IP port number over which management occurs. If this switch is not specified, the default TCP/IP port number 23333 is used.

If the management host option is selected, you must select the default port number or enter a valid TCP/IP port number on the command line. A value of `0` will not be accepted.

If one of the nonmanagement host options is selected, you can enter the TCP/IP port number on the command line.

2.4.3 Uninstalling in Windows

You can uninstall the OneCommand CNA Manager CLI in Windows in one of two ways:

- Through the Control Panel
- Through the command line

2.4.3.1 Uninstalling through the Control Panel

To uninstall the OneCommand CNA Manager CLI in Windows through the Control Panel:

1. In the Control Panel, select **Programs and Features**.
2. If present, select **Emulex OC CNA Manager CLI** [*version*], and click **Uninstall/Change;** you are prompted to continue. Click **Yes**.

The OneCommand CNA Manager CLI components are removed from the system.

2.4.3.2 Uninstalling through the Command Line

To uninstall the OneCommand CNA Manager CLI in Windows through the command line:

1. Change to the appropriate uninstall directory:
   ```
   cd <Install Location>\broadcom\Util\Uninstall
   ```
2. Type the following command:
   ```
   uninstall_BrcmOCManager_Core.bat
   ```

2.5 Starting and Stopping Daemon Processes for Linux and Solaris Installations

On Linux and Solaris machines, you can stop and start the OneCommand CNA Manager daemon processes using the `stop_brcmocmanager` and `start_brcmocmanager` scripts, respectively. These are found in the following OneCommand CNA Manager installation directories:

- Linux – `/usr/sbin/brcmocmanager`
- Ubuntu 14 – `/opt/broadcom/brcmocmanager/scripts`:
  — `stop_brcmocmanger.sh`
  — `start_brcmocmanager.sh`
- Solaris – `/opt/brcmocm`

The `brcmhbamgrd` daemon process (included with OneCommand CNA Manager CLI) is affected by these scripts. It is a remote management daemon that services requests from OneCommand CNA Manager clients running on remote host machines.

The daemon processes start at system boot time.

Chapter 3: Updating to the OneCommand CNA Manager Application Enterprise Kit

NOTE The full-featured OneCommand CNA Manager application enterprise kit is not supported on Citrix XenServer 6.x, Citrix XenServer 7.x, or VMware ESXi server.

This chapter details procedures for updating the OneCommand CNA Manager CLI to the OneCommand CNA Manager application enterprise kit in Linux, Solaris, and Windows operating systems. An update can be performed only if the version of the OneCommand CNA Manager application enterprise kit is the same or later than the OneCommand CNA Manager CLI version.

NOTE You cannot update a OneCommand CNA Manager CLI with a previous version of the OneCommand CNA Manager application enterprise kit.

3.1 Linux

To update from the OneCommand CNA Manager CLI to the full-featured OneCommand CNA Manager enterprise kit in Linux, run the `install.sh` script of the OneCommand CNA Manager application enterprise kit.

The install script executes an rpm file update (`rpm -U *.rpm`) to update the installed core kit to an enterprise kit.

3.2 Solaris

To update from the OneCommand CNA Manager CLI to the full-featured OneCommand CNA Manager enterprise kit in Solaris:

1. Download the OneCommand CNA Manager enterprise kit to a temporary directory on your system.
2. Untar the OneCommand CNA Manager enterprise kit tar file:

   ```
   tar xvf brcmocm-solaris-<kit version>.tar
   ```
3. Change to the newly created `brcmocm-<kit version>` directory:

   ```
   cd ./brcmocm-solaris-<kit version>/
   ```
4. Run the `install` script and follow the instructions:

   ```
   ./install
   ```

The `install` script can also be run in noninteractive (quiet) mode. To view the syntax, type the following command:

```
/install --help
```

3.3 Windows

To update from the OneCommand CNA Manager CLI to the full-featured OneCommand CNA Manager enterprise kit in Windows:

From the desktop, run the `brcmocm-windows-<kit version>.exe` file that contains the full application kit. Running this executable file removes the OneCommand CNA Manager CLI and installs a full-featured version of the OneCommand CNA Manager application that includes the CLI and the GUI.

Chapter 4: CLI Client Command Usage

The CLI Client component of the OneCommand CNA Manager application provides access to the capabilities of the Remote Management library or the CIM interface from a console command prompt to get the management information.

4.1 Overview

The CLI Client is intended for use in command shells or scripted operations from within shell scripts or batch files. The CLI Client is a console application named `BrmcHbaCmd`. A single operation is performed by typing `brcmhbacmd` at the command line, followed by a CLI client command and its possible parameters. For example:

```
brcmhbacmd [cli options]<command> [parameters]
```

The CLI options are specified for running the CLI commands to remote hosts or with Secure Management.

When the specified operation is completed, the command prompt is displayed. For a majority of commands, the first parameter following the command is the WWPN or MAC address of the port that the command is to act upon.

4.1.1 CLI in Read-Only Mode

The CLI does not allow the execution of some commands if it is configured for read-only mode. The following error message is returned if such a command is attempted:

```
Error: Read-only management mode is currently set on this host. The
requested command is not permitted in this mode.
```

4.2 BrcmHbaCmd Syntax Usage

The following syntax rules and usage apply to the BrcmHbaCmd application:

- Parameters denoted within angle brackets < > are required.
- Parameters denoted within square brackets [ ] are optional.
- For Linux and Solaris, (which are case-sensitive), program names must be in lowercase letters. Therefore, the command line must begin with brcmhbacmd (rather than BrcmHbaCmd). Windows is not case-sensitive, so the program name is not required to be in all lowercase letters.
- To run the command on a remote host, an IP address or host name must be specified using the h option with the following syntax:

  ```
  brcmhbacmd [h=IP_Address[:port] | Hostname[:port]] <command> [parameters]
  ```

  — If the h option is omitted, the command is run on the local host.

  — If the h option is specified, the command is sent to the specified remote host (assuming it is specified correctly, the remote host is up, and the remote host is running the OneCommand CNA Manager remote management agent.

  — The *`:port`* option is optional. If it is omitted, the OneCommand CNA Manager remote management protocol uses the default TCP port. If it is specified, the OneCommand CNA Manager remote management protocol uses the user-specified TCP port.

  — **Examples**

  Using the IP address:

  ```
  brcmhbacmd h=138.239.91.121 ListHBAs
  ```

Using the host name:

```
brcmhbacmd h=cp-hp5670 ListHBAs
```

— The h option is available for all commands except for the AddHost, RemoveHost, and the Version commands.

- For FCoE functions, the WWPN of the adapter must be specified. Where the WWPN is specified, each pair of numbers within the WWPN is separated by colons (:) or spaces ( ). If space separators are used, the entire WWPN must be enclosed in quotation marks (“ ”).

  For example, the following command displays the port attributes for the adapter with the specified WWPN:

  ```
  brcmhbacmd PortAttributes 10:00:00:00:c9:20:20:20
  ```

- For iSCSI and NIC functions, the MAC address must be specified. Where a MAC address is specified, each pair of numbers within the MAC address is separated by a dash (-).

  For example, the following command sets the target properties for the iSCSI port with the specified MAC address with an extended timeout value of 1:

  ```
  brcmhbacmd SetTargetProperties 00-11-22-33-44-55 iscsiTarget 1
  ```

- For NIC functions, only the permanent MAC address is supported for the port address parameter on a BrcmHbaCmd command line.

  Normally, for a NIC function, the functions's permanent MAC address and current MAC address parameters are equal. However, it is possible to set a user-specified (current) MAC address that is different from the permanent MAC address. Also, for some implementations, it is possible to have multiple NIC functions with the same current MAC addresses, but with unique permanent MAC addresses. Therefore, to be sure that the OneCommand CNA Manager application can access the correct function, only the permanent MAC address is supported.

NOTE Both the permanent MAC address and the current MAC address are displayed by using the `ListHBAs` command. See Section 5.13.9, ListHBAs.

4.3 Secure Management CLI Interface

The Secure Management CLI interface is supported by the Linux, Solaris, and Windows operating systems.

NOTE Users with root or Administrator privileges on the local machine will retain full OneCommand CNA Manager CLI configuration capability without the use of credentials (local machine only).

4.3.1 Device Management Using the Secure Management Interface

To run the BrcmHbaCmd CLI client application when the Secure Management feature is enabled, each invocation must include a user name and password. The user name and password options are added to the existing BrcmHbaCmd command in the same way as they are for CIM commands, except the <m=CIM> option is replaced by the <m=sec> option (to distinguish it from a CIM command). For example:

Without Secure Management (or if running as root or administrator):

```
brcmhbacmd  <cmd>
```

With Secure Management (as non-root or non-administrator user):

```
brcmhbacmd  <m=sec> <u=userid> <p=password> <cmd>
```

4.3.2 Syntax Rules for the Secure Management Interface

For the secure management interface, all of the syntax rules in Section 4.2, BrcmHbaCmd Syntax Usage, apply.

Example

In Windows, to download firmware on an adapter managed on a remote host at IP address 192.168.1.122 using the Secure Management interface, run the following command:

```
brcmhbacmd h=192.168.1.122 m=sec u=jsmith p=password download 00-12-34-56-78-9A
oc14-11.2.123.45.ufi
```

4.4 CIM Client Interface

NOTE In Linux and Solaris, you cannot use `brcmHbaCmd` as a CIM client.

4.4.1 Device Management Using the CIM Interface

VMware on the hypervisor-based ESXi platforms use the CIM as the only standard management mechanism for device management.

For VMware ESXi hosts, you can manage adapters using the OneCommand CNA Manager CLI on Windows, but you must install and use the appropriate Emulex CIM Provider on the VMware ESXi host. For installation, refer to the *Emulex CIM Provider Package for OneConnect Adapters Installation Guide*.

NOTE For VMware ESXi hosts, if advanced adapter management capabilities are required (such as iSCSI management), use the OneCommand CNA Manager for VMware vCenter Server. For more details, refer to the *Emulex OneCommand CNA Manager for VMware vCenter for OneConnect Adapters User Guide*.

4.4.2 Syntax Rules for the CIM Interface

For the CIM interface, all the syntax rules in section Section 4.2, BrcmHbaCmd Syntax Usage, apply, except that the h option is required. Additionally, the `m=cim` parameter is required in the command line for getting the data from the ESXi host. For example:

```
brcmhbacmd h=192.168.1.110 m=cim u=root p=password n=root/brcmccx listhbas
```

4.4.2.1 Syntax Options and Setting CIM Credentials

For issuing CIM-based commands, two main syntax options are available.

Option A

```
brcmhbacmd <h=IP_Address[:port]> m=cim [u=userid] [p=password]
[n=root/brcmccx] <command> <WWPN>
```

Option B

```
brcmhbacmd <h=IP_Address[:port]> <m=cim> <command>
```

Before using the option B syntax, you must set the CIM credentials. Perform one of the following tasks:

- Set the default CIM credentials using the `SetCimCred` command (see Section 5.13.13, SetCimCred). This command sets only the CIM credentials. After you have set them, subsequent `BrcmHbaCmd` commands do not require you to specify the CIM credentials on the command line.

  Command syntax:

  ```
  brcmhbacmd SetCimCred <username> <password> <namespace> <portnum>
  ```

- Add the host IP address with CIM credentials using the `AddHost` command.

  Command syntax:

  ```
  brcmhbacmd <m=cim> [u=userid] [p=password] [n=namespace] AddHost
  <IP_Address>
  ```

4.4.2.1.1 Default CIM Credentials

If you specify the command with the CIM method `m=cim` without specifying the CIM credentials (*`userid`*, *`password`*, or *`namespace`*), the default value for the missing CIM credential is obtained in the following order:

1. The information entered using the `addhost` command is looked up.
2. If no values exist, the information entered using the `setcimcred` command is used.
3. If no values exist, the following defaults are used:

   ```
   username=root
   password=root
   namespace=root/brcmccx
   portnum=5988
   ```

4.4.2.2 Example of Using the CIM Interface to Display Adapters

In Windows, to display a list of adapters managed for a specified host using the CIM interface, run the following command:

```
brcmhbacmd h=10.192.113.128 m=cim u=root p=root n=root/brcmccx listhbas
```

For a list of BrcmHbaCmd commands supported through the CIM interface, see Table 6, CLI Client Command Reference.

Chapter 5: CLI Client Command Descriptions

CLI Client commands are organized by command groups. Two tables are presented for your convenience; a table organized by command group and another by alphabetically listing CLI client commands.

The following table shows each command group with a short description and the commands in each group. After you determine the command group of interest, click on the command link and go directly to the command you selected.

Table 5 CLI Client Command Reference Functional Groups

Command Group	Description	Commands
Adapter License Management Commands	This group manages the adapter licensing. You can use these commands to install license keys to enable functionality and list current licensed functionality.	InstallAdapterLicense ShowAdapterLicenseFeatures ShowLicenseAdapterID
Attributes Commands	This group manages the display of adapter, port, server attributes, and port statistics for each adapter specified. You can also set the port speed on OCe11100-series and OCe14000-series adapters.	HbaAttributes ServerAttributes SetPhyPortSpeed SetPortEnabled
Boot Commands	This group manages the commands that enable or disable the network boot for NIC ports or the boot code for FCoE adapter ports. You can also show and change FCoE boot parameters.	EnableBootCode GetBootParams SetBootParam
Channel Management Commands	These commands enable and disable channel management and set channel properties for CNAs. The OCe14000-series adapters support NPar, a form of channel management.	CMGetParams CMMode CMSetBW CMSetLPVID
DCB Commands	These commands display and set the DCB and LLDP parameters for iSCSI, FCoE, and NIC adapter ports.	GetDCBParams GetPGInfo SetCnaPGBW SetDCBParam SetDCBPriority
Diagnostic Commands	This group provides commands that enable you to detect cabling problems, to examine transceiver data, and to flash memory load lists. Additionally, you can run specific diagnostic tests, such as the Loopback test and the POST test.	GetBeacon GetXcvrData LoopBackTest PciData SetBeacon SetCableNVP TDRTest
Driver Parameter Commands	Use the driver parameter commands to show, set, and save the driver parameter values. You can also change the parameters back to factory default values. Driver Parameter commands are supported only for FCoE ports.	DriverConfig GetDriverParams GetDriverParamsGlobal SaveConfig SetDriverParam SetDriverParamDefaults

Table 5 CLI Client Command Reference Functional Groups (Continued)

Command Group	Description	Commands
Dump Commands	Use the diagnostic dump feature to create a dump file for a selected adapter. Dump files contain information such as firmware version, driver version, and operating system information. This information is useful for troubleshooting an adapter, but it is unavailable in read-only mode.	DeleteDumpFiles Dump GetDumpDirectory GetDumpFile GetDumpFileNames GetRetentionCount SetDumpDirectory SetRetentionCount
FCoE Commands	This group of commands manages the FIP parameters and displays the FCF for an adapter in the FCoE mode.	GetFCFInfo GetFIPParams SetFIPParam

Table 5 CLI Client Command Reference Functional Groups (Continued)

Command Group	Description	Commands
iSCSI Commands	The commands in this section support the iSCSI interface. iSCSI commands are supported only on OneConnect iSCSI ports.	AddARPTableEntry AddiSNSServer AddRouteTableEntry AddTarget AddTargetPortal CleariSNSServer DelARPTableEntry DeleteiSNSServer DelRouteTableEntry DiscoveriSNSServer EraseiSCSIConfig ExportiSCSI GetInitiatorProperties GetiSCSILuns GetiSCSIPortStats GetNetworkConfiguration GetSessionInfo ImportiSCSI iSCSIPing ListSessions RemoveTarget RemoveTargetPortal SetBootTargetSession SetInitiatorProperties SetiSCSIBoot SetNetworkConfiguration SetTargetLoginProperties SetTargetProperties SetTPLoginProperties ShowARPTable ShowiSNSServer ShowRouteTable ShowTarget ShowTargetPortal TargetLogin TargetLogout UpdateiSNSServer
LUN Masking Commands	The commands in this group manage LUN masking activities. LUN masking is supported only for FCoE ports.	GetLunList GetLunUnMaskByHBA GetLunUnMaskByTarget RescanLuns SetLunMask

Table 5 CLI Client Command Reference Functional Groups (Continued)

Command Group	Description	Commands
Miscellaneous Commands	This group contains commands that do not belong in other groups.	AddHost CnaClearEventLog CnaGetEventLog Download ExportSANInfo GetCimCred GetQoSInfo GetVPD ListHBAs ListVFuncs Reset SetCimCred SRIOVEnable TargetMapping VEPAEnable Version
Persistent Binding Commands	This group of commands facilitates persistent binding operations. These commands are supported only for FCoE ports.	AllNodeInfo BindingCapabilities BindingSupport PersistentBinding RemoveAllPersistentBinding RemovePersistentBinding SetBindingSupport SetPersistentBinding
Personality Change Commands	This group of commands changes the personality or protocol running on OneConnect adapters.	ChangePersonality ShowPersonalities
Profile Management Commands	This group of commands manages profile configuration for OCe14000-series adapters. You can display active and reboot port configurations for an adapter, list available profile IDs, and configure the function protocol for all ports on OCe14000-series adapters.	GetAdapterPortConfig GetLinkConfig ListProfiles SetAdapterPortConfig (for OCe14000-Series Adapters) SetLinkConfig

Table 5 CLI Client Command Reference Functional Groups (Continued)

Command Group	Description	Commands
UMC Commands	UMC commands allow viewing of the UMC configuration, enabling and disabling of the UMC at the adapter level, and the modification of some of the channel properties. The UMC commands cannot be used to manage other channel management types.	UmcEnable UmcGetParams UmcSetBW UmcSetLPVID
vPort Commands	vPort commands manage virtual ports and functions only on FCoE adapters. In Linux, VPorts do not persist across system reboots.	CreateVPort DeleteVPort ListVPorts VPortTargets
WWN Management Commands	WWN management validates WWNs to avoid WWPN duplication; however, WWNN duplication is acceptable. You might see error and warning messages if a name duplication is detected. Make sure that the activation requirement is fulfilled after each WWN is changed or restored. If pending changes exist, some diagnostic and maintenance features are not available. WWN management commands are available only on FCoE adapters.	ChangeWWN GetWWNCap ReadWWN RestoreWWN

Table 6 lists each command alphabetically and shows the operating system and CIM Interface support for each command. A linked page number for each command is provided for your convenience. A check mark (✓) designates a supported command for a particular operating system and CIM interface.

NOTE For VMware ESXi, two options supprt the CLI:

- Using the OneCommand CNA Manager CLI on Windows with the appropriate Emulex CIM Provider installed on a VMware host. These commands are covered in this section. iSCSI management commands are not supported by this option.
- Using the OneCommand CNA Manager for VMware vCenter command line interface (`brcmvcpcmd`). Although the available commands are listed in Table 6 for your convenience, see the *Emulex OneCommand CNA Manager for VMware vCenter for OneConnect Adapters User Guide* for specific information.

Table 6 CLI Client Command Reference

Command	Linux		Solaris	Windows	CIM Interface Support	brcmvcpcmd	Page
	RHEL, SLES, Ubuntu, and Oracle	Citrix					
`AddARPTableEntry`	✓			✓		✓	66
`AddHost`	✓	✓	✓	✓	✓		87
`AddiSNSServer`	✓	✓		✓		✓	67
`AddRouteTableEntry`	✓	✓		✓		✓	67
`AddTarget`	✓	✓		✓		✓	67
`AddTargetPortal`	✓	✓		✓		✓	69
`AllNodeInfo`	✓	✓	✓	✓	✓	✓	96
`BindingCapabilities`			✓	✓			96
`BindingSupport`			✓	✓			96
`ChangePersonality`	✓	✓	✓	✓	✓	✓	99

Table 6 CLI Client Command Reference (Continued)

Command	Linux		Solaris	Windows	CIM Interface Support	brcmvcpcmd	Page
	RHEL, SLES, Ubuntu, and Oracle	Citrix					
ChangeWWN	✓	✓	✓	✓	✓	✓	136
ClearSNSServer	✓	✓		✓		✓	70
CMGetParams	✓	✓	✓	✓	✓	✓	44
CMMode	✓	✓	✓	✓	✓	✓	47
CMSetBW	✓	✓	✓	✓	✓	✓	48
CMSetLPVID	✓	✓	✓	✓	✓	✓	48
CnaClearEventLog	✓	✓		✓		✓	87
CnaGetEventLog	✓	✓		✓		✓	88
CreateVPort	✓		✓	✓			135
DelARPTableEntry	✓	✓		✓		✓	70
DelRouteTableEntry	✓	✓		✓		✓	71
DeleteDumpFiles	✓	✓	✓	✓	✓	✓	61
DeleteiSNSServer	✓	✓		✓		✓	70
DeleteVPort	✓		✓	✓			135
DiscoveriSNSServer	✓	✓		✓		✓	71
Download	✓	✓	✓	✓	✓	✓	88
DriverConfig	✓	✓		✓		✓	58
Dump	✓	✓	✓	✓	✓	✓	61
EnableBootCode	✓	✓	✓	✓	✓	✓	42
EraseiSCSIConfig	✓	✓	✓	✓			71
ExportSANInfo	✓	✓	✓	✓			89
ExportiSCSI				✓			72
GetBeacon	✓	✓	✓	✓	✓	✓	54
GetAdapterPortConfig	✓	✓	✓	✓	✓	✓	100
GetBootParams	✓	✓	✓	✓		✓	43
GetCimCred				✓			89
GetDCBParams	✓	✓	✓	✓	✓	✓	50
GetDriverParams	✓	✓	✓	✓	✓	✓	59
GetDriverParamsGlobal	✓	✓	✓	✓	✓	✓	59
GetDumpDirectory	✓	✓	✓	✓	✓	✓	61
GetDumpFile	✓	✓	✓	✓	✓	✓	62
GetDumpFileNames	✓	✓	✓	✓	✓	✓	62
GetFCFInfo	✓	✓	✓	✓	✓	✓	64
GetFIPParams	✓	✓	✓	✓	✓	✓	65
GetInitiatorProperties	✓	✓		✓		✓	72
GetiSCSILuns	✓	✓		✓		✓	72
GetiSCSIPortStats	✓	✓		✓		✓	73
GetLinkConfig	✓	✓	✓	✓	✓	✓	109

Table 6 CLI Client Command Reference (Continued)

Command	Linux		Solaris	Windows	CIM Interface Support	brcmvcpcmd	Page
	RHEL, SLES, Ubuntu, and Oracle	Citrix					
GetLunList	✓		✓	✓	✓	✓	85
GetLunUnMaskByHBA				✓			85
GetLunUnMaskByTarget				✓			86
GetNetworkConfiguration	✓	✓		✓		✓	73
GetPGInfo	✓	✓	✓	✓	✓	✓	50
GetQosInfo	✓	✓	✓	✓	✓	✓	89
GetRetentionCount	✓	✓	✓	✓	✓	✓	63
GetSessionInfo	✓	✓		✓		✓	73
GetVPD	✓	✓	✓	✓	✓	✓	90
GetWWNCap	✓	✓	✓	✓	✓	✓	137
GetXcvrData	✓	✓	✓	✓	✓	✓	54
HbaAttributes	✓	✓	✓	✓	✓	✓	37
Help	✓	✓	✓	✓	N/A	✓	35
ImportiSCSI				✓			74
InstallAdapterLicense	✓	✓	✓	✓	✓	✓	36
iSCSIPing	✓	✓		✓		✓	75
ListHBAs	✓	✓	✓	✓	✓	✓	90
ListProfiles	✓	✓	✓	✓	✓	✓	109
ListSessions	✓	✓		✓		✓	75
ListVFuncs	✓	✓	✓	✓	✓	✓	135
ListVPorts	✓	✓	✓	✓	✓		135
LoopBackTest	✓	✓	✓	✓	✓	✓	55
PciData	✓	✓	✓	✓	✓		56
PersistentBinding		✓	✓	✓		✓	96
PortAttributes	✓	✓	✓	✓	✓		38
PortStatistics	✓	✓	✓	✓	✓	✓	39
ReadWWN	✓	✓	✓	✓	✓	✓	137
RemoveAllPersistentBinding			✓	✓		✓	97
RemovePersistentBinding			✓	✓			97
RemoveHost	✓	✓	✓	✓	✓		91
RemoveTarget	✓	✓		✓			75
RemoveTargetPortal	✓	✓		✓		✓	75
RescanLuns	✓		✓	✓		✓	86
Reset	✓	✓	✓	✓	✓		92
RestoreWWN	✓	✓	✓	✓	✓	✓	138
SaveConfig	✓	✓	✓	✓		✓	59
ServerAttributes	✓	✓	✓	✓	✓	✓	40
SetAdapterPortConfig	✓	✓	✓	✓	✓	✓	110

Table 6 CLI Client Command Reference (Continued)

Command	Linux		Solaris	Windows	CIM Interface Support	brcmvcpcmd	Page
	RHEL, SLES, Ubuntu, and Oracle	Citrix					
SetBeacon	✓	✓	✓	✓	✓		54
SetBindingSupport			✓	✓		✓	97
SetBootParam	✓	✓	✓	✓			43
SetBootTargetSession	✓	✓		✓		✓	76
SetCableNVP	✓	✓	✓	✓		✓	56
SetCnaPGBW	✓	✓	✓	✓	✓	✓	51
SetCimCred				✓		✓	92
SetDCBParam	✓	✓	✓	✓	✓		51
SetDCBPriority	✓	✓	✓	✓	✓	✓	53
SetDriverParam	✓	✓	✓	✓	✓	✓	60
SetDriverParamDefaults	✓	✓	✓	✓		✓	60
SetDumpDirectory					✓	✓	63
SetFIPParam	✓	✓	✓	✓	✓	✓	65
SetInitiatorProperties	✓	✓		✓		✓	76
SetiSCSIBoot	✓	✓		✓		✓	77
SetLinkConfig	✓	✓	✓	✓	✓	✓	130
SetLunMask				✓		✓	86
SetNetworkConfiguration	✓	✓		✓			78
SetPersistentBinding			✓	✓			98
SetPhyPortSpeed	✓	✓	✓	✓	✓	✓	40
SetPortEnabled	✓	✓	✓	✓	✓	✓	41
SetRetentionCount	✓	✓	✓	✓	✓	✓	64
SetTargetLoginProperties	✓	✓		✓		✓	79
SetTargetProperties	✓	✓		✓		✓	80
SetTPLoginProperties	✓	✓		✓		✓	80
ShowAdapterLicenseFeatures	✓	✓	✓	✓	✓	✓	36
ShowARPTable	✓	✓		✓		✓	81
ShowiSNSServer	✓	✓		✓		✓	81
ShowLicenseAdapterID	✓	✓	✓	✓	✓	✓	37
ShowPersonalities	✓	✓	✓	✓	✓	✓	100
ShowRouteTable	✓	✓		✓		✓	82
ShowTarget	✓	✓		✓		✓	82
ShowTargetPortal	✓	✓		✓		✓	82
SRIOVEnable	✓	✓	✓	✓	✓	✓	93
TargetLogin	✓	✓		✓		✓	83
TargetLogout	✓	✓		✓		✓	84
TargetMapping	✓	✓	✓	✓	✓	✓	94
TDRTest	✓	✓	✓	✓		✓	57

Table 6 CLI Client Command Reference (Continued)

Command	Linux		Solaris	Windows	CIM Interface Support	brcmvcpcmd	Page
	RHEL, SLES, Ubuntu, and Oracle	Citrix					
UmcEnable	✓	✓	✓	✓	✓	✓	131
UmcGetParams	✓	✓	✓	✓	✓	✓	131
UmcSetBw	✓	✓	✓	✓	✓	✓	133
UmcSetLPVID	✓	✓	✓	✓	✓	✓	133
UpdateiSNSServer	✓	✓		✓		✓	84
VEPAEnable	✓	✓	✓	✓	✓	✓	94
Version	✓	✓	✓	✓	✓	✓	95
VPortTargets	✓	✓	✓	✓	✓	✓	136

5.1 Help

This command displays command information for the BrcmHbaCmd application. Without using its optional parameters, the Help command lists all the commands in their respective groups. Using the optional parameter GroupName, it lists the commands in a group. Using the optional parameter CmdName, it shows the details for a specific command.

Supported By

Linux, Solaris, and Windows

Syntax

```
Help [GroupName] [CmdName]
```

Parameters

GroupName This optional parameter lists the commands in a particular group.

CmdName This optional parameter shows the details for a particular CLI command.

Examples

This Help command example lists all the commands in their respective groups:

```
brcmhbacmd help
```

This Help command example shows the details for the SetDCBParam command:

```
brcmhbacmd help setdcbparam
```

5.2 Adapter License Management Commands

The Adapter License Management Group manages adapter licensing. Use these commands to install license keys to enable functionality and to list current licensed functionality.

For these commands, the *WWPN* or *MAC* address argument specifies the adapter the command is acting upon. The `BrcmHbaCmd` application uses the WWPN or MAC address to identify the adapter, but this does not mean that the command works successfully on the specified port.

These commands are supported on ESXi systems only if the CIM provider is used on a remote system.

NOTE Adapter License Management commands are supported only on some OCe11100-series adapters. They are not available on OCe11101-EM/EX, OCe11102-EM/EX, or OCe14000-series adapters. If license management commands are attempted with unsupported adapters, the following error message is returned:

```
There are no license features for this adapter
```

5.2.1 InstallAdapterLicense

This command installs the license keys from a license file to enable specific features on the adapter.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
InstallAdapterLicense <WWPN|MAC> <LicenseFile>
```

Parameters

WWPN	The WWPN of an FCoE port.
MAC	The MAC address of a NIC or iSCSI port.
License File	The path to the license key file containing the license keys obtained from the License area of http://www.broadcom.com.

Examples

For non-VMware ESXi hosts:

```
brcmhbacmd InstallAdapterLicense 00-12-34-56-78-9A K:\lf1324.lic
```

For VMware ESXi hosts:

```
brcmhbacmd h=<IP_Address> m=cim u=root p=<password> n=<namespace>
InstallAdapterLicense 00-12-34-56-78-9A K:\lf1324.lic
```

5.2.2 ShowAdapterLicenseFeatures

This command displays the licensed and licensable features and the features that are already licensed. The output is a list of features with an indication of whether the feature has been licensed.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
ShowAdapterLicenseFeatures <WWPN|MAC>
```

Parameters

WWPN	The WWPN of an FCoE port.

MAC The MAC address of a NIC or iSCSI port.

Examples

For non-VMware ESXi hosts:

```
brcmhbacmd ShowAdapterLicenseFeatures  00-12-34-56-78-9A
```

For VMware ESXi hosts:

```
brcmhbacmd h=<IP_Address> m=cim u=root p=<password> n=<namespace>
ShowAdapterLicenseFeatures  00-12-34-56-78-9A
```

5.2.3 ShowLicenseAdapterID

This command returns the adapter ID used for enabling licensed features. The adapter ID and the entitlement code are used to obtain license keys that enable various features on the adapter.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
ShowLicenseAdapterID <WWPN|MAC>
```

Parameters

WWPN The WWPN of an FCoE port.

MAC The MAC address of a NIC or iSCSI port.

Examples

For non-VMware ESXi hosts:

```
brcmhbacmd ShowLicenseAdapterID 00-12-34-56-78-9A
```

For VMware ESXi hosts:

```
brcmhbacmd h=<IP_Address> m=cim u=root p=<password> n=<namespace>
ShowLicenseAdapterID 00-12-34-56-78-9A
```

5.3 Attributes Commands

The Attributes Command group manages the display of adapter, port, function, server attributes, and port statistics for each adapter specified. It also enables you to set the port speed.

5.3.1 HbaAttributes

This command shows a list of all adapter attributes for the adapter. The type of information listed might vary according to the adapter model.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
HbaAttributes <WWPN|MAC>
```

Parameters

WWPN	The WWPN of an FCoE function.
MAC	The MAC address of a NIC function.

Example

```
HBA Attributes for 00-90-fa-30-90-29

Host Name                       : dhcp-10-192-81-61
Manufacturer                    : Emulex Corporation
Serial Number                   : US0CG7YT0000039N000MX03
Model                           : OCe14102-U1-D
Model Desc                      : Emulex OneConnect OCe14102-U1-D 2-port PCIe 10GbE
CNA
HW Version                      : E4 B0
FW Version                      : 11.2.123.456
Vendor Spec ID                  : 10DF
Number of Ports                 : 6
Driver Name                     : be2net.ko
Driver Version                  : 11.2.123.456
Device ID                       : 0720
Operational FW                  : 11.2.123.456
Network Boot                    : Not Available
Available Network Boot Methods: PXE
Boot Version                    : 11.2.123.456
Board Temperature               : Normal
Function Type                   : NIC
Sub Device ID                   : E820
Port Number                     : 2
PCI Bus Number                  : 5
PCI Func Number                 : 7
Sub Vendor ID                   : 10DF
Firmware Status                 : Working
IPL Filename                    : CS2FDEL3
NCSI Version                    : N/A
Start-up Boot Code Version      : 2.0.281.768
FCoE Universal Version          : N/A
FCoE x86 BIOS Version           : 11.2.123.456
FCoE EFI Version                : 11.2.123.456
FCoE FCODE Version              : 11.2.123.456
UEFI NIC Version                : 11.2.123.456
NIC FCODE Version               : 11.2.123.456
UEFI iSCSI Version              : 11.2.123.456
PCI Express Link Speed          : 5GT/s
PCI Express Bus Width           : x4
Flash Firmware Version          : 11.2.123.456
```

5.3.2 PortAttributes

This command shows a list of attributes for the adapter-specified function. The type of information listed might vary according to the adapter model and can include IPv4 and IPv6 addresses.

NOTE If VEPA is supported on your adapter, the VEPA state is displayed as enabled or disabled.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
PortAttributes <WWPN|MAC>
```

Parameters

WWPN	The WWPN of an FCoE function.
MAC	The MAC address of a NIC or iSCSI function.

NOTE For Dell adapters, this command displays virtual WWPNs and WWNNs for each FCoE function, and virtual MAC addresses for each NIC function.

Example

```
brcmhbacmd h=10.192.78.68 portattributes 00-9 0-fa-30-44-84
Port Attributes for 00-90-fa-30-44-84
Port MAC:                  00-90-fa-30-44-84
Permanent MAC:             00-90-fa-30-44-84
Port State:                Operational
Interface Type:            10GB SFP Plus
Auto-Neg Supported Speeds: Not Supported
Force Supported Speeds:    1Gb,10Gb
Configured Port Speed:     All Supported Speeds
Port Speed Mode:           Default
DAC Cable Length:          0 meters
Maximum MTU:               9000
Current MTU:               1500
Function Type:             NIC
Function Port State:       Up
Function Port Speed:       10 GBit/sec
Interface Name:            \Device\NTPNP_PCI0114
Minimum Bandwidth:         10 GBit/sec
Maximum Bandwidth:         10 GBit/sec
IPv4 Address:              196.1.8.1
Subnet Mask:               255.255.0.0
IPv4 Gateway Address:      0.0.0.0
IPv6 Address:              Not Available
IPv6 Gateway Address:      Not Available
IP Address Origin:         Static
SRIOV State:               Enabled
VEPA State:                Disabled
```

5.3.3 PortStatistics

This command shows all function statistics for the specified function. The type of information listed may vary according to the adapter model.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
PortStatistics <WWPN|MAC> [clear]
```

Parameters

WWPN	The WWPN of an FCoE function.
MAC	MAC address of NIC function (on 10GBase-T adapters only).
clear	Clear counters for a 10GBASE-T function.

5.3.4 ServerAttributes

This command shows a list of server attributes for the server where the specified function is running. The type of information listed may vary according to the adapter model.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
ServerAttributes <WWPN|MAC>
```

Parameters

WWPN	The WWPN of an FCoE function.
MAC	The MAC address of a NIC or iSCSI function.

5.3.5 SetPhyPortSpeed

This command sets the port speed.

OneConnect adapters have configurable physical port speeds. Depending on the port module or transceiver installed in the physical port, the speed settings can be forced to a specific value, for instance 1 Gb, or to a range of values for auto-negotiation with the switch; for example, 10 Gb/1 Gb/100 Mb. Three values can be configured: port speed mode, speed value(s), and the DAC cable length.

The configurable port speeds are based on the port module type and the mode defined by the port speed *Mode* parameter. For the default port speed Mode, the speed setting is not required.

NOTE 10GBASE-CX4, 10GBASE XFP, and SGMII port module types do not support port speed settings.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
SetPhyPortSpeed <WWPN|MAC> <Mode> [Speed [Length]]
```

Parameters

WWPN	The WWPN of an FCoE function.
MAC	The MAC address of a NIC or iSCSI function.

Mode	The Mode number: 0 = Default 1 = Auto-negotiate; requires the Speed parameter 2 = Force; requires the Speed and Length parameters If the adapter's port speed value and the switch's port speed value conflict, the link will not be brought up.
Speed	The speed string of the PHY port. Some valid string values include 100 Mb, 1 Gb, and 10 Gb. The `PortAttributes` command lists all the valid speeds in Auto-negotiate and Force modes. **Auto-negotiated Speeds** A comma-separated list of available auto-negotiated speeds is displayed by the `PortAttributes` command. For combinations of speeds, each speed is separated by a slash, for example, 10 Gb/1 Gb/100 Mb. If the port does not support auto-negotiated speeds, this property is displayed as `Not Supported`. **Forced Speeds** A comma-separated list of available forced speeds is displayed by the `PortAttributes` command. Combinations of speeds for forced speeds are not available. If the port does not support forced speeds, this property is displayed as `Not Supported`. If the Mode parameter is 1 or 2, the Speed parameter is required. If the Mode parameter is 0, the Speed parameter is ignored.
Length	The length of the DAC cable in meters. Valid values are 0 to 10. A length value of 0 indicates an optical cable. A Length value is required if you are using a 10 Gb SFP and QSFP transceiver interface type. If the Mode parameter is 0, Speed and Length parameters are ignored. If the Mode parameter is 1, the Length parameter is ignored. For an embedded mezzanine adapter linked to an embedded switch on the internal port, the Length value is ignored.

Examples

The following example configures the PHY port to a forced speed of 1 Gb/s with a cable length of 10 meters:

```
brcmhbacmd setphyportspeed 00-00-c9-ad-ad-ac 2 1Gb 10
```

The following example tries to configure the PHY port to a forced speed of 100 Mbps:

```
brcmhbacmd setphyportspeed 00-00-c9-a9-41-88 2 100Mb
```

If the command is successful, the following is displayed:

```
Successfully changed speed settings on port.
```

If the *Mode* parameter is 2, this command results in the following error because you must include a value for the *Length* parameter:

```
ERROR: <431>: Cable length required for force mode and interface type
```

5.3.6 SetPortEnabled

This command enables or disables a port. When a port is disabled, packets are not transmitted or received on the port.

NOTE Make sure that all I/O traffic on the port is stopped before disabling the port.

NOTE OneConnect adapters do not require a reset when the adapter port is enabled or disabled.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
SetPortEnabled <WWPN|MAC> <PortEnable>
```

Parameters

WWPN	The WWPN of an FCoE function on the port.
MAC	The MAC address of a NIC or iSCSI function on the port.
PortEnabled	The port-enabled state: 0 = Disabled 1 = Enabled

5.4 Boot Commands

The Boot Commands group manages the commands that enable or disable the network boot for NIC ports or the boot code for FCoE ports. You can also show and change FCoE boot parameters.

5.4.1 EnableBootCode

This command enables or disables network boot. If network boot is being enabled, it is necessary to select the specific network boot type. The supported network boot types are PXE and iBFT. iBFT is not supported on all NIC adapter types.

NOTE To enable or disable boot on an iSCSI target, see Section 5.11.25, SetiSCSIBoot.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
EnableBootCode <MAC> <Flag> <NetworkBootMethod>
```

Parameters

MAC	The MAC address of a NIC function.
Flag	D = Disable the boot code. E = Enable the boot code.
NetworkBootMethod	The network boot method to be used by the NIC (PXE or iBFT). The network boot types supported on the specific NIC can be found in the Available Network Boot Methods string displayed by the HbaAttributes command.

Examples

The following example enables iBFT:

```
brcmhbacmd EnableBootCode  00-00-c9-11-22-33 e iBFT
```

The following example disables network boot:

```
brcmhbacmd EnableBootCode  00-00-c9-11-22-33 d
```

5.4.2 GetBootParams

This command shows the FCoE boot parameters. If any arguments are missing or invalid, an error is reported. If all arguments are correct, the data is displayed in tabular form.

Supported By

Linux, Solaris, and Windows

Syntax

```
GetBootParams <WWPN> <Type>
```

Parameters

WWPN	The WWPN of an FCoE function.
Type	X86, OpenBoot, or UEFI.

5.4.3 SetBootParam

This command changes the FCoE boot parameters. You can change function parameters and boot device parameters for x86, OpenBoot, and EFI boot.

- If you change adapter parameters, omit the `BootDev` keyword and value; otherwise, an error is reported.
- If you change boot device parameters for OpenBoot, omit the `BootDev` keyword and value; otherwise, an error is reported.
- For boot device parameters for x86 or UEFI, you must provide the `BootDev` keyword and value.

Supported By

Linux, Solaris, and Windows

Syntax

```
SetBootParam <WWPN> <Type> <Param> <Value1> [BootDev <Value2>]
```

Parameters

WWPN	The WWPN of an FCoE port.
Type	{x86, EFI, OB}
Param	The parameter name.
Value1	The parameter value.
BootDev	The boot device.
Value2	The boot device entry number: {0 to 7}.

Adapter Parameters	Boot Type	Value
DefaultAlpa	All	{ Value }
EnableAdapterBoot	All	{ State } (0=Disable, 1=Enable)
EnableBootFromSan	All	{ State } (0=Disable, 1=Enable)
LinkSpeed	All	{ 0, 1, 2, 4, 8 }
PlogiRetryTimer	All	{ 0, 1, 2, 3 }
Topology	All	{ 0, 1, 2, 3 }
AutoScan	X86	{ 0, 1, 2, 3 }
AutoBootSectorEnable	X86	{ State } (0=Disable, 1=Enable)

EDD30Enable	X86	{ State } (0=Disable, 1=Enable)
EnvVarEnable	X86	{ State } (0=Disable, 1=Enable)
SpinupDelayEnable	X86	{ State } (0=Disable, 1=Enable)
StartUnitCommandEnable	X86	{ State } (0=Disable, 1=Enable)
BootTargetScan	EFI	{ 0, 1, 2 }
DevicePathSelection	EFI	{ 0, 1 }
MaxLunsPerTarget	EFI	{ Value }
ResetDelayTimer	EFI	{ Value }
SfsFlag	OB	{ State } (0=Disable, 1=Enable)
Boot Device Parameters		
D_ID	All	{ Value [BootDev <Value2>] }
LUN	All	{ Value [BootDev <Value2>] }
TargetWwpn	All	{ Value [BootDev <Value2>] }
TargetID	OB	{ Value }

5.5 Channel Management Commands

These commands enable and disable channel management and set channel properties for CNAs.

NOTE OneCommand CNA Manager CLI commands for UMC management are still available for backward compatibility with existing UMC scripts. They cannot be used to manage other channel management types. See Section 5.17, UMC Commands, for information on UMC management.

Each port on each adapter's physical port can be partitioned into isolated channels providing a converged conduit for network and storage traffic. Each channel has its own unique MAC address. Depending on the type of channel management in effect, each channel provides various traffic management and provisioning capabilities, such as enabling and disabling, minimum and maximum bandwidth, and VLAN ID (in UMC for untagged packets, also called the LPVID).

The OneCommand CNA Manager application allows you to enable or disable channel management. In the case of UMC or SIMode, you can set each channel's properties. For the vNIC1 and UFP channel management types, the OneCommand CNA Manager application displays the channel properties, but it does not allow modification, except for vNIC1 where the LPVID (inner VLAN ID) can be modified.

Additionally, OCe14000-series adapters support NPar. Use the `GetAdapterPortConfig` and `SetAdapterPortConfig` command to manage NPar for these adapters. See Section 5.16.1, GetAdapterPortConfig, and Section 5.16.4, SetAdapterPortConfig (for OCe14000-Series Adapters). For Lenovo System X adapters, UMC mode is referred to as SIMode.

NOTE SR-IOV is not supported with channel management.

5.5.1 CMGetParams

This command shows the current channel management configuration for an adapter's physical port.

5.5.1.1 Multichannel

If multichannel is used, this command displays the adapter's active (booted) multichannel state, the configured state, the configured channel management mode (`N/A` if the configured state is disabled), and the available channel management modes. This is followed by a table showing the specified port's channel properties. The `Type` column shows the protocol that is running on the channel. The output is different depending upon the multichannel type.

NOTE While `Flex` is displayed in the output for the `CMGetParams` command as the multichannel type for HP adapters currently running in Flex mode, you cannot specify `Flex` for the *`mctype`* parameter of the `SetAdapterPortConfig` command. The only *`mctype`* parameter that can be specified on HP UMC-capable adapters is UMC.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
CMGetParams <MAC | WWPN>
```

Parameters

MAC	MAC address of any NIC or iSCSI function on an adapter port.
WWPN	WWPN of an FCoE function on an adapter port.

Consideration

If you specify a MAC address that belongs to a newly disabled port, an error message indicates that the operation cannot be performed on this port.

For example, if you type the following command:

```
>brcmhbacmd cmgetparams 00-90-FA-41-22-F0
```

The following error message is displayed:

```
ERROR: This port is configured to be removed after reboot. Channel
Management properties are unavailable.
```

Examples

The following table provides locations of application examples.

Multichannel Disabled

```
>brcmhbacmd CMGetParams 00-00-c9-12-34-56
Active Mode:     None
Configured mode: None
Available modes: UMC
```

Multichannel Enabled – UMC, NIC-only

```
>brcmhbacmd CMGetParams 00-00-c9-12-34-56
Active Mode:     UMC
Configured mode: UMC
Available modes: UMC

Func# Type  MAC Address       LPVID Min BW Max BW
----- ----- ----------------- ----- ------ ------
0     NIC   00-00-c9-12-34-56  2      25     50
1     NIC   00-00-c9-12-34-57  3      25      50
2     NIC   00-00-c9-12-34-58  4      25     50
3     NIC   00-00-c9-12-34-59  5      50     75
```

Multichannel Enabled – UMC, with Storage

```
>brcmhbacmd CMGetParams 00-00-c9-12-34-56
Active Mode:     UMC
Configured mode: UMC
Available modes: UMC

Func# Type  MAC Address       LPVID Min BW Max BW
----- ----- ----------------- ----- ------ ------
0     NIC   00-00-c9-12-34-56  2      25     50
1     FCoE  n/a                n/a    40     100
2     NIC   00-00-c9-12-34-58  4      25     50
3     NIC   00-00-c9-12-34-59  5      10     20
```

Multichannel Disabled – Lenovo System X

```
>brcmhbacmd CMGetParams 00-00-c9-12-34-56
Active Mode:     None
Configured mode: None
Available modes: vNIC1, SIMode, UFP
```

Multichannel Enabled – Lenovo System X UFP

```
>brcmhbacmd CMGetParams 00-00-c9-12-34-56
Active Mode:     UFP
Configured mode: UFP
Available modes: vNIC1, SIMode, UFP

                                Outer
Func# Type  MAC Address       VLAN  Min BW Max BW
----- ----- ----------------- ----- ------ ------
0     NIC   00-00-c9-12-34-56  2      25     50
1     NIC   00-00-c9-12-34-57  3      25     50
2     NIC   00-00-c9-12-34-58  4      25     50
3     NIC   00-00-c9-12-34-59  5      25     75
```

Dell NPar Disabled

```
>brcmhbacmd CMGetParams 00-00-c9-12-34-56
Active Mode:     None
Configured mode: None
Available modes: NPAR
```

Dell NPar Enabled – 4 Functions per Port

NOTE Even though function 1 has a minimum bandwidth of 0, some traffic flows through.

This command lists permanent MAC addresses, not virtual addresses.

```
>brcmhbacmd CMGetParams 00-00-c9-12-34-56
Active Mode:     NPAR
Configured mode: NPAR
Available modes: NPAR

Func# Type  MAC Address       Min BW Max BW
----- ----- ----------------- ------ ------
0     NIC   00-00-c9-12-34-56   25     50
1     NIC   00-00-c9-12-34-57   0      50
2     NIC   00-00-c9-12-34-58   25     50
3     NIC   00-00-c9-12-34-59   50     75
```

5.5.2 CMMode

This command enables or disables channel management mode only on OCe11100-series adapters. For UMC configurations, the `UMCEnable` command can still be used to enable UMC.

This command also sets the channel management type at the adapter level. A system reboot is required for the change take effect.

For OCe14000-series adapters, you must set the *`mctype`* parameter in the `SetAdapterPortConfig` command to enable multichannel, including NPar. See Section 5.16.4, SetAdapterPortConfig (for OCe14000-Series Adapters), for more information. If you use the `CMMode` command on an OCe14000-series adapter, an error message indicates that the command is not supported by the firmware or hardware.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
CMMode <WWPN | MAC Address> <None | Type>
```

Parameters

WWPN	WWPN of an FCoE function on the physical port.
MAC	MAC address of any NIC function on the physical adapter port.
None	Specify None to disable channel management or a channel.
Type	Management type (see Section 5.5.1, CMGetParams) to enable channel management.

Example

```
>brcmhbacmd CMMode 00-00-c9-bb-cc-aa None
```

This example disables channel management on an adapter containing a NIC function with a MAC address of 00-00-c9-bb-cc-aa.

5.5.3 CMSetBW

This command sets the minimum and maximum bandwidths for each channel on the physical port. For UMC and SIMode configurations, this command can also disable a channel's logical link by setting both the minimum and maximum bandwidths to `0`. To enable the logical link, specify a nonzero value for the minimum and maximum bandwidth.

If you are using NPar, setting the minimum bandwidth to zero does not bring the logical link down on the NPar function or prevent the NPar function from receiving or transmitting a small amount of network traffic.

The number of channels, the number of channels that need to be specified, and the number of bandwidth combinations that need to be specified depend on the adapter model. See Section 5.5.1, CMGetParams, to determine how many bandwidths need to be specified for a port by looking at the number of functions indicated in the `Func #` column of the output.

The total of the minimum bandwidths for the enabled channels or partitions (NPar) must add up to 100. An exception to this rule is for UMC and SIMODE configurations, when the minimum and maximum bandwidths for all channels are 0, effectively bringing down the logical link on all channels. The maximum bandwidth must be greater than or equal to the minimum bandwidth for that channel or partition (NPar), up to a maximum value of 100.

NOTE This command fails with an error message if the configured multichannel mode is *`vNIC1`*, *`UFP`*, or *`None`*.

Considerations

- If too many or too few minimum and maximum bandwidth combinations are provided, an error is generated.
- For UMC, the `UMCSetBW` command can still be used instead of `CMSetBW`.
- A reboot is not required to change the channel bandwidths when multichannel is currently active (including NPar) on the adapter.

  For NPar, these bandwidths are only in effect when ETS priority group bandwidths are not available. ETS priority group bandwidths are set by the `SetCnaPGBW` command.
- If a channel's protocol is configured to `None`, the minium and maximum bandwidth must be `0`.
- If you specify a MAC address that belongs to a newly disabled port, an error message indicates that the operation cannot be performed on this port.

  For example, if you type the following command:

  ```
  >brcmhbacmd cmSetBW  00-90-FA-41-22-F0 25,100 25,100 25,100 25,100
  ```

  The following message is displayed:

  ```
  ERROR: This port is configured to be removed after reboot. Bandwidth values
  can only be set on ports that will be available after reboot.
  ```

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
CMSetBW <MAC | WWPN> <Min0,Max0> [Min1,Max1]  ...  [MinN,MaxN]
```

Parameters

WWPN	WWPN of an FCoE function on the physical adapter port.
MAC	MAC address of any NIC or iSCSI function on the physical adapter port.
Min0, Max0	Minimum and maximum bandwidths for channel 0.

Min1, Max1	Minimum and maximum bandwidths for channel 1.
MinN, MaxN	Minimum and maximum bandwidths for channel N.

Examples

Down Logical Link on the Third Channel of a 4-Channels-per-Port Adapter

```
>brcmhbacmd CMSetBW 00-00-c9-12-34-56 25,50 50,100 0,0 25,50

>brcmhbacmd CMGetParams 00-00-c9-12-34-56

Active mode:     UMC
Configured mode: UMC
Available modes: UMC

Func# Type      MAC Address       LPVID Min BW Max BW
----- -----     ----------------- ----- ------ ------
0     NIC       00-00-c9-12-34-56  2      25     50
2     iSCSI     00-00-c9-12-34-57  n/a    50     100
4     NIC       00-00-c9-12-34-58  3      0      0
6     NIC       00-00-c9-12-34-59  4      25     50
```

5.5.4 CMSetLPVID

This command sets the LPVID values for the UMC and SIMode NIC channels. Use the `CMGetParams` command to determine the number of LPVIDs required. See Section 5.5.1, CMGetParams, for more information. A reboot is not required for these changes to take effect if UMC is enabled.

NOTE If the current multichannel mode is not UMC or SIMode, the `CMSetLPVID` command fails.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
CMSetLPVID <WWPN|MAC> <LPVID0> <LPVID1> ... [LPVIDn]
```

Parameters

WWPN	WWPN of an FCoE function on the physical adapter port.
MAC	MAC address of any NIC or iSCSI function on the physical adapter port.
LPVID0	LPVID for channel 0.
LPVID1	LPVID for channel 1.
LPVIDn	LPVID for channel n.

Considerations

- LPVID values are in the range of 2 to 4094.
- Every NIC channel on a physical port must have a unique LPVID.
- For FCoE and iSCSI channels, `0` must be entered because LPVIDs can only be specified for NIC channels.
- LPVIDs specified for channels with protocols set to `None` are ignored.
- This command is not supported on 1 Gb ports.
- If channel management is disabled when this command is executed, an error message is displayed.
- If you specify a MAC address that belongs to a newly disabled port, an error message indicates that the operation cannot be performed on this port.

For example, if you type the following command:

```
>brcmhbacmd cmSetLPVID 00-90-FA-41-22-F0 2 3 4 5 6 7 8 9
```

The following message is displayed:

```
ERROR: This port is configured to be removed after reboot. LPVID values can
only be set on ports that will be available after reboot.
```

Examples

4 NIC Channels

```
>>brcmhbacmd CMSetLPVID 00-00-c9-12-34-56 1001 1002 1003 1004
```

8 Channels, Storage on Second Channel

```
>brcmhbacmd CMSetLPVID 00-00-c9-55-43-21 1001 0 1002 1003 1004 1005 1006 1007
```

5.6 DCB Commands

This command group shows the DCB and LLDP parameters for iSCSI, FCoE, and NIC adapter ports.

DCB commands are not available on OCe11101-EM/EX or OCe11102-EM/EX adapters. If a command is used on an unsupported adapter, the following error message is returned:

```
ERROR: <222>: DCB not available
```

5.6.1 GetDCBParams

This command shows the active and configured DCB and LLDP settings on a port of a OneConnect adapter. The active parameters show what the adapter port is currently running, and the configured parameters show the value to which the adapter port's DCB parameter is set.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
GetDCBParams <WWPN|MAC>
```

Parameters

WWPN	The WWPN of an FCoE function on the port.
MAC	The MAC address of a NIC or iSCSI function on the port.

Example

```
brcmhbacmd GetDCBParams 00-00-c9-93-2f-d8
```

5.6.2 GetPGInfo

This command shows the ETS priority group bandwidth percentages for the port of a OneConnect adapter. Additionally, this command displays the number of priority groups supported by an adapter.

NOTE On OCe14000-series adapters, if UFP multichannel is active and the PGs are enabled by the switch, the `GetPGInfo` command displays the active PG values.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
GetPGInfo <WWPN|MAC>
```

Parameters

WWPN	The WWPN address of an FCoE function on the port.
MAC	The MAC address of a NIC or iSCSI function on the port.

Example

```
brcmhbacmd getpginfo 00-00-c9-93-2f-d8
```

5.6.3 SetCnaPGBW

This command sets the ETS priority group bandwidth percentages on a port of a OneConnect adapter according to the following rules:

- Bandwidths (BW0–BW7) for priority groups 0 to 7 (PG0 to PG7) must total 100 (for 100%).
- Bandwidth can be assigned to a priority group that has priorities.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
SetCnaPGBW <WWPN|MAC> <BW0–BW7>
```

Parameters

WWPN	The WWPN of an FCoE function on the port.
MAC	The MAC address of a NIC or ISCI function on the port.
BW0–BW7	The bandwidths allocated for the priority groups 0 to 7.

Example

This command sets the bandwidth of PG0 to 50%, PG1 to 50%, and PG2 to PG7 to 0%.

```
brcmhbacmd SetCnaPGBW 10:00:00:00:c9:3c:f7:88 50 50 0 0 0 0 0 0
```

5.6.4 SetDCBParam

This command configures the DCB and LLDP settings on a OneConnect adapter port. Use the `GetDCBParams` command to obtain valid parameter names for use in this command.

NOTE You cannot set DCBX mode. If you attempt to specify a *dcbxmode* parameter, an error message is displayed.

NOTE RoCE is available only on OCe140000-series adapters. RoCE is available as Technical Preview only. Do not use RoCE in a production environment.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
SetDCBParam <WWPN|MAC> <Param> <Value>
```

Parameters

WWPN	The WWPN of an FCoE function on the port.
MAC	The MAC address of a NIC or iSCSI function on the port.
Param	The parameter name. See DCB Settings for <Param> and <Value> and LLDP Settings for <Param> and <Value>.
Value	The parameter value. See DCB Settings for <Param> and <Value> and LLDP Settings for <Param> and <Value>.

DCB Settings for <Param> and <Value>

<Param>	Description and <Value>
DCBXState	The DCBX protocol state. 0 = Disabled 1 = Enabled
PFCEnable	Flow control in both directions (transmit and receive). 0 = Disabled 1 = Enabled
FCoEPriority	This parameter is only applicable for ports running FCoE. A single priority must be specified. The range of valid values is 0 to 7. Only one priority can be specified for each invocation of this command and must be for a protocol running on the port. If more than one protocol priority can be set, they must be unique values.
iSCSIPriority	This parameter is applicable for ports running iSCSI only. A single priority must be specified. The range of valid values is 0 to 7. Only one priority can be specified for each invocation of this command and must be for a protocol running on the port. If more than one protocol priority can be set, they must be unique values.
RoCEPriority	This parameter is only applicable for ports running RoCE. A single priority must be specified. The range of valid values is 0 to 7. Only one priority can be specified for each invocation of this command and must be for a protocol running on the port. If more than one protocol priority can be set, they must be unique values.
PFCPriority	A list of comma-separated values where multiple PFC priorities are supported. The comma-separated list can contain up to seven values ranging from 0 to 7.
QCNEnable	This parameter is only applicable for ports on OCe14000-series adapters running NIC+RoCE, and only for RoCE traffic. 0 = Disabled 1 = Enabled
defaults	Use to set the DCB parameters (including priority groups) to their default values. For example: `brcmhbacmd SetDCBParam <WWPN|MAC> defaults`

LLDP Settings for <Param> and <Value>

<Param>	Description and <Value>
TxState	Transmit State: DCBX uses LLDP to exchange parameters between two link peers. For the DCBX protocol to operate correctly, both LLDP Rx and Tx must be enabled. If either Rx or Tx is disabled, DCBX is disabled. 0 = Disabled 1 = Enabled

RxState	Receive State: DCBX uses LLDP to exchange parameters between two link peers. For the DCBX protocol to operate correctly, both LLDP Rx and Tx must be enabled. If either Rx or Tx is disabled, DCBX is disabled. 0 = Disabled 1 = Enabled
TxPortDesc	Transmit Port Description: Provides a description of the port in an alphanumeric format. 0 = Disabled 1 = Enabled
TxSysDesc	Transmit System Description: Provides a description of the network entity in an alphanumeric format. 0 = Disabled 1 = Enabled
TxSysName	Transmit System Name: Provides the system's assigned name in an alphanumeric format. 0 = Disabled 1 = Enabled
TxSysCap	Transmit System Capabilities: 0 = Disabled 1 = Enabled

Example

```
brcmhbacmd SetDCBParam 00-00-c9-3c-f7-88 fcoepriority 3
```

5.6.5 SetDCBPriority

This command sets the PFC priorities and the ETS priority groups priorities. The values must be set according to the following rules:

- The priorities range from 0 to 7.
- A priority (0 to 7) must exist in only one priority group.
- All priorities must appear once in any of the eight (PG0 to PG7) priority groups or if available, PG15.

NOTE For OCe14000-series adapters, you can use the PG15 priority group for only RoCE priority.

- To not specify priorities for a priority group, use a dash (-).
- Any assigned PFC priority must be assigned as the single priority in a priority group (for example, no other priorities allowed in a group assigned the PFC priority).
- Any PG assigned one or more priorities must also be assigned a nonzero bandwidth value (see Section 5.6.3, SetCnaPGBW).

The following rules are specific to FCoE and iSCSI adapters:

— A maximum of two PFC priorities can be assigned.
— If FCoE is running on the port, one of the PFC priorities must match the FCoE priority.
— If iSCSI is running on the port, one of the PFC priorities must match the iSCSI priority.

The following rules are specific to NIC-only adapters:

— Only one PFC priority can be assigned.
— In NIC-Only mode, PFC is disabled by default. To enable PFC, NIC ETS must be enabled.

To enable NIC ETS:

- In Windows, enable `Enhanced Transmission Selection` in the driver properties (for example, in the Device Manager property page for the NIC driver).
- In Linux, load the NIC driver with the `tx_prio` driver parameter set to 1.

The following rules are specific to RoCE adapters:

- The RoCE priority must be assigned to the PFC priority and as the only priority to Priority Groups PG0 to PG7, or to PG15.
- All non-RoCE priorities must be assigned to only one priority group other than the RoCE priority group.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
SetDcbPriority <WWPN|MAC> <PFC> <PG0> <PG1> <PG2> <PG3> <PG4> <PG5> <PG6> <PG7>
[PG15]
```

Parameters

WWPN	The WWPN of an FCoE function on a port.
MAC	The MAC address of a NIC or iSCSI function on a port.
PFC	The PFC priority that is a comma-separated list of up to eight values, ranging from 0 to 7.
PG0-PG7	Priority group membership that is a comma-separated list of priorities ranging from 0 to 7. Each set of priorities for a group must be separated by a space. All priorities (0 to 7) must be assigned to a PGID.
PG15	PG15 group membership (only required on RoCE ports)

Example

```
brcmhbacmd h=10.192.203.151 m=cim SetDCBPriority 10:00:00:00:c9:3c:f7:88 3
0,1,2,4,5,6,7 3 0 0 0 0 0 0
```

5.7 Diagnostic Commands

The Diagnostic Commands group provides commands that enable you to detect cabling problems, to examine transceiver data, and to flash memory load lists. Additionally, you can run specific diagnostic tests, such as the Loopback test.

5.7.1 GetBeacon

This command shows the current beacon state (either on or off).

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

GetBeacon <WWPN|MAC>

Parameters

WWPN	The WWPN of an FCoE function on the port.
MAC	The MAC address of a NIC or iSCSI function on the port.

5.7.2 GetXcvrData

This command shows transceiver data for a port on an adapter.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
GetXcvrData <WWPN|MAC> [Type]
```

Parameters

WWPN	The WWPN of an FCoE function on a port.
MAC	The MAC address of a NIC or iSCSI function on a port.
Type	This optional parameter indicates the type of SFP data to display: 1 = Formatted SFS data (default) 2 = Raw SFS data (not supported by Windows + CIM Provider on a VMware host)

Example

```
brcmhbacmd GetXcvrData 00-00-c9-93-2f-d6
```

5.7.3 LoopBackTest

This command runs one of the loopback tests available on the adapter port specified by the WWPN or MAC address.

NOTE PHY diagnostics are not supported on mezzanine cards and blade network daughter cards because they do not contain PHYs.

NOTE The external loopback test is not supported for OCe11102-xT adapters and OCe14102-UT adapters.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
LoopBackTest <WWPN 1 MAC> <Type> <Count> <StopOnError> [Pattern]
```

Parameters

WWPN	The WWPN of an FCoE function on a port.
MAC	The MAC address of a NIC or iSCSI function on a port.
Type	The type of loopback test to run: — 2 = External loopback test (requires loopback plug) — 3 = DMA loopback test — 4 = PHY loopback test — 5 = MAC loopback test
Count	Number of times to run the test. Possible values are 1 to 99,999. To run the test infinitely, use 0.
StopOnError	Checks whether the test must be halted on error. 0 = No halt 1 = Halt
Pattern	An optional parameter that specifies 1–8 hexadecimal bytes to use for loopback data (for example, 1a2b3c4d).

Example

```
brcmhbacmd LoopBackTest 00-00-c9-93-2f 4 120 0
```

5.7.4 PciData

This command shows the PCI configuration data (if available).

The PCI registers displayed are specific to the function referenced in the OneCommand CNA Manager CLI. For example, if you specify the WWPN for the FCoE function, the PCI registers for that FCoE function are returned. If you specify the MAC address for the NIC function on that same physical port, the PCI registers for that NIC function are returned.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
PciData <WWPN|MAC>
```

Parameters

WWPN	The WWPN of an FCoE function.
MAC	The MAC address of a NIC or iSCSI function.

Example

```
brcmhbacmd PciData 00-00-c9-93-2f-d6
The example output:
Vendor ID:        0x19A2       Device ID:          0x0700
Command:          0x0406       Status:             0x0010
Revision ID:      0x02         Prog If:            0x00
Subclass:         0x00         Base Class:         0x02
Cache Line Size:  0x10         Latency Timer:      0x00
Header Type:      0x80         Built In Self Test: 0x00
Base Address 0:   0x00000000   Base Address 1:     0xDF478000
Base Address 2:   0xDF480004   Base Address 3:     0x00000000
Base Address 4:   0xDF4A0004   Base Address 5:     0x00000000
CIS:              0x00000000   SubVendor ID:       0x10DF
SubSystem ID:     0xE622       ROM Base Address:   0x00000000
Interrupt Line:   0x00         Interrupt Pin:      0x01
Minimum Grant:    0x00         Maximum Latency:    0x00
Capabilities Ptr: 0x40
```

5.7.5 SetBeacon

This command turns the beacon on or off on the adapter port.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
SetBeacon <WWPN | MAC> <BeaconState>
```

Parameters

WWPN	The WWPN of an FCoE function on the port.
MAC	The MAC address of a NIC or iSCSI function on the port.
BeaconState	Indicates the state of the beacon. 0 = Off 1 = On

5.7.6 SetCableNVP

This command sets the NVP, which is required for the `TDRTest` command, for the cable that connects to the physical port associated with the WWPN or MAC.

NOTE This command supports only OCe11100-series and OCe14000-series 10GBASE-T adapters.

Supported By

Linux, Solaris, and Windows

Syntax

```
SetCableNVP <WWPN|MAC> <NVP>
```

Parameters

WWPN	The WWPN of an FCoE function on the port.
MAC	The MAC address of a NIC or iSCSI function on the port.
NVP	A percentage value between 1 and 100. Consult your cable documentation to obtain the proper NVP value.

5.7.7 TDRTest

NOTE This command only supports OneConnect adapters that use coax copper cables, such as the 10GBASE-T adapter.

The TDR test attempts to determine whether any cable faults are compromising the integrity of the link. The test requires that the cable is free of disturbances, is down, and is quiet. It is best if the cable is not terminated; however, if it is terminated, the link partner must not be active during the test.

For each twisted pair cable (labeled A, B, C, or D):

- If a fault cannot be detected, the test output displays `OK` and an estimated cable length (in meters), if possible. If the length cannot be determined, the estimated length is displayed as invalid.
- If one of two faults (a short or an open connection) is detected, the test output displays the fault type (`Shorted` or `Open`) and the distance to the fault (in meters).

Supported By

Linux, Solaris, and Windows

Syntax

```
TDRTest <MAC_Address>
```

Parameters

MAC_Address	The MAC address of the NIC or iSCSI port.

Example

```
brcmhbacmd TDRTest 00-90-FA-27-A1-70
```

The example output:

```
Pair A: OK. Cable Length Estimation: 50m.
Pair B: OK. Cable Length Estimation: invalid.
Pair C: Open. Distance to Fault: 38m.
Pair D: Shorted. Distance to Fault: 36m.
```

5.8 Driver Parameter Commands

The Driver Parameter Commands group controls the driver parameter values. You can also change the parameters back to factory default values.

NOTE Driver Parameter commands are supported only for FCoE ports.
The `DriverConfig` and `SetDriverParamDefaults` commands are not supported for Solaris.

Considerations

- Driver parameters set to temporary or global values (using the T and G flags, respectively) must be read using the `GetDriverParams` command to view the current value of the parameter. The `GetDriverParamsGlobal` command returns only permanently set driver parameter values.

  Additionally, if temporary and global values are set for one or more driver parameters, the `SaveConfig` command must be run with the N flag (using the N flag is analogous to using the `GetDriverParams` command) to force the driver parameter values for the specified adapter to be saved. Inaccurate values can be saved if the G flag is used for this command.
- The list of available driver parameters that can be configured are different depending on the operating system.

5.8.1 DriverConfig

This command sets all driver parameters to the values in the `.dpv` file type. The `.dpv` file's driver type must match the driver type of the host operating system adapter.

Supported By

Linux and Windows

Syntax

```
DriverConfig <WWPN> <FileName> <Flag>
```

Parameters

WWPN	The WWPN of an FCoE function.
FileName	The name of the `.dpv` file, which is stored in the Emulex Repository directory. For Linux, this is `/opt/broadcom/brcmocmanager/RMRepository`. For Windows, this is `\Program Files\Broadcom\Util\EmulexRepository`.
Flag	G = Make the change global (all FCoE functions on this host). N = Make the change non-global (function-specific).

5.8.2 GetDriverParams

This command shows the name and values of each parameter.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
GetDriverParams <WWPN>
```

Parameters

WWPN	The WWPN of an FCoE function.

5.8.3 GetDriverParamsGlobal

This command shows the name and the global value of each driver parameter.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
GetDriverParamsGlobal <WWPN>
```

Parameters

WWPN	The WWPN of an FCoE function.

5.8.4 SaveConfig

This command saves the specified adapter's driver parameters to a file. The resulting file contains a list of driver parameter definitions in ASCII file format with definitions delimited by a comma. Each definition has the following syntax:

```
<parameter-name>=<parameter-value>
```

The command saves either the values of the global set, or those specific to the adapter in the Emulex Repository directory. For Linux, this is `/opt/broadcom/brcmocmanager/RMRepository`. For Windows, this is `\Program Files\Broadcom\Util\EmulexRepository`.

Supported By

Linux, Solaris, and Windows

Syntax

```
SaveConfig <WWPN> <FileName> <Flag>
```

Parameters

WWPN	The WWPN of an FCoE function.
FileName	Name of the file that contains the driver parameters list.
Flag	G = Save the global parameter set. N = Save the local (function-specific) parameter set.

5.8.5 SetDriverParam

This command changes a driver parameter and designates the scope of the change.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
SetDriverParam <WWPN> <Flag1> <Flag2> <Param> <Value>
```

Parameters

WWPN	The WWPN of an FCoE function.
Flag1	L = Make change local for only this function. G = Make change global (all FCoE functions on this host).
Flag2	P = Make change permanent (persists across reboot). For Linux, to make a permanent change that persists across reboots, you must set Flag1 to G (Global). T = Make change temporary.
Param	Name of the parameter to modify.
Value	New parameter value, decimal or hexadecimal (0xNNN).

Example

To enable dynamic target mode:

```
brcmhbacmd SetDriverParam 10:00:00:00:c9:ff:ff:ff L P
```

To disable dynamic target mode, set the flag to 0.

5.8.6 SetDriverParamDefaults

This command changes all values to the default for the adapter.

Supported By

Linux, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
SetDriverParamDefaults <WWPN> <Flag1> <Flag2>
```

Parameters

WWPN	The WWPN of an FCoE function.
Flag1	L = Make change local for only this function. G = Make change global (applies to all FCoE functions on this host).
Flag2	P = Make change permanent (the change persists across reboot). T = Make change temporary.

5.9 Dump Commands

The diagnostic dump feature enables you to create a dump file for a selected adapter. Dump files contain information such as firmware version, driver version, and operating system information. This information is useful when your are troubleshooting an adapter, but it is unavailable in read-only mode.

CAUTION Disruption of service can occur if a diagnostic dump is run during I/O activity.

The dump files created are text files (`.txt` extension) and binary files. The extension for binary files depends on the dump type:

- Enhanced FAT dump – `.edf` extension
- Core dump – `.core` extension

5.9.1 DeleteDumpFiles

This command deletes all diagnostic dump files for an adapter.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
DeleteDumpFiles <WWPN|MAC>
```

Parameters

WWPN	The WWPN of an FCoE function on the adapter.
MAC	The MAC address of a NIC or iSCSI port function on the adapter.

5.9.2 Dump

This command creates a diagnostic dump file in the `BrcmHbaCmd` dump file directory.

NOTE In some cases, a core dump can be performed on an inoperative adapter. To view inoperative adapters on the local host, use the `ListHBAs down` command. See Section 5.13.9, ListHBAs.

If the core optional parameter is not specified, an enhanced FAT dump is performed by default.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
Dump <WWPN|MAC> [core [Options]]
```

Parameters

WWPN	The WWPN of an FC or FCoE port.
MAC	The MAC address of a NIC or iSCSI port.
core	Perform a core dump on an adapter (local host only).
Options	For available core dump options, contact Broadcom® technical support.

5.9.3 GetDumpDirectory

This command shows the dump file directory for the adapters in the host.

NOTE The dump directory can be set only on VMware ESXi hosts.

The dump directory applies to all adapters in the server. A separate dump directory for each adapter does not exist.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
GetDumpDirectory [WWPN|MAC]
```

Parameters

WWPN	Obsolete; ignored if specified.
MAC	Obsolete; ignored if specified.

5.9.4 GetDumpFile

This command gets the dump file. This command gets the user-specified dump file to the local client's dump directory. The dump directory (local and remote) is named `Dump`. The dump files are copied from the dump directory of the remote host to the dump directory of the local host. Therefore, if the remote host option is not specified (h=*`IP_Address`*`[:port]`), this command returns an error because the source and destination directories are the same.

Dump directory:

- Windows – *`SystemDrive_Letter`*`:\Program Files\broadcom\Util\Dump`
- Linux – `/var/opt/broadcom/brcmocmanager/Dump`
- Solaris – `/opt/brcmocm/Dump`
- VMware ESXi – The dump directory set using the `SetDumpDirectory` command.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
GetDumpFile <h=IP_Address[:port]>[WWPN|MAC] <filename>
```

Parameters

WWPN	Obsolete; ignored if specified.
MAC	Obsolete; ignored if specified.
filename	The name of the dump file to be copied from the remote host.

Example

```
brcmhbacmd h=10.192.193.154  GetDumpFile
BG-HBANYWARE-15_10000000c97d1314_20100120-032820421.dmp
```

5.9.5 GetDumpFileNames

This command gets the names of the files in the host's dump directory.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
GetDumpFileNames [WWPN|MAC]
```

Parameters

WWPN	Obsolete; ignored if specified.
MAC	Obsolete; ignored if specified.

Example

```
brcmhbacmd GetDumpFileNames
```

5.9.6 GetRetentionCount

This command shows the maximum number of diagnostic dump files to keep.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
GetRetentionCount [WWPN|MAC]
```

Parameters

WWPN	Obsolete; ignored if specified.
MAC	Obsolete; ignored if specified.

5.9.7 SetDumpDirectory

This command sets the dump directory (valid only on VMware ESXi hosts).

Supported By

Windows + CIM Provider on a VMware host

To use the `SetDumpDirectory` command, you must have a directory (which must be a Storage partition) mapped under `/vmfs/volumes` where the files are dumped. This directory points to the internal hard disk or an external storage area and can also be mapped using the vSphere Client utility from VMware.

The application checks for the dump directory and creates the dump files in that location.

In a remote environment, you can use the `SetDumpDirectory` command from a host running any operating system (including Linux, Solaris, and Windows), but only to a remote host that is running VMware ESXi.

NOTE The dump directory applies to all adapters in the server. A separate dump directory for each adapter does not exist.

Syntax

```
SetDumpDirectory <DumpDirectoryName>
```

Parameters

`DumpDirectoryName`	The directory under `/vmfs/volumes` that you created to store the dump files.

Example

This example shows the dump directory set to `/vmfs/volumes/ocm-datastore`:

```
brcmhbacmd h=10.192.203.173 m=cim u=root p=Swamiji001 n=root/brcmccx
SetDumpDirectory 10:00:00:00:c9:61:f2:64 ocm-datastore
```

5.9.8 SetRetentionCount

This command specifies the maximum number of diagnostic dump files for the adapter. When the count reaches the limit, the next dump operation deletes the oldest file.

NOTE The retention count applies to all adapters in the server.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
SetRetentionCount [WWPN|MAC] <Value>
```

Parameters

WWPN	Obsolete; ignored if specified.
MAC	Obsolete; ignored if specified.
Value	The number of dump files to retain.

Example

```
brcmhbacmd SetRetentionCount 6
```

5.10 FCoE Commands

The FCoE Commands group manages the FIP parameters and displays the FCF for an FCoE function.

5.10.1 GetFCFInfo

This command shows the FCF information of the FCoE function.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
GetFCFInfo <WWPN>
```

Parameters

WWPN	The WWPN of an FCoE function.

Example

```
brcmhbacmd GetFCFInfo 10:00:00:00:c9:3c:f7:88
Number of FCFs:   1
Active FCFs:      1
Entry 0:
```

```
State:            1
Priority:         133
Fabric Name:      10:00:00:05:1E:0C:54:49
Switch Name:      10:00:00:05:1E:0C:54:49
MAC:              00:05:9B:71:3D:71
FC Map:           0x0EFC00
VLAN IDs:
LKA Period:       8
```

5.10.2 GetFIPParams

This command gets the FIP parameters of an FCoE function.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
GetFIPParams <WWPN>
```

Parameters

WWPN	The WWPN of an FCoE function.

Example

```
brcmhbacmd h=10.231.140.83 getfipparams 10:00:00:00:c9:bc:a9:31
Param Description       Param Name  Value
-----------------       ----------  -----
Primary Fabric Name     pfabric     FF:FF:FF:FF:FF:FF:FF:FF
Primary Switch Name     pswitch     FF:FF:FF:FF:FF:FF:FF:FF
DCB VLan ID             vlanid      Any VLAN ID is valid
```

5.10.3 SetFIPParam

This command sets the FIP parameters of an FCoE function.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
SetFIPParam <WWPN> <Param> <Value>
```

Parameters

WWPN	The WWPN of an FCoE function.
Param	The FIP parameter name: — pfabric — pswitch — vlanid — fcmap — cinvlanid

Value The value based on the FIP parameter name:

- pfabric: 8-byte fabric name (format XX:XX:XX:XX:XX:XX:XX:XX)
- pswitch: 8-byte switch name (format XX:XX:XX:XX:XX:XX:XX:XX)
- vlanid: 2-byte VLAN ID [0–4095] or *any* for any VLANID
- fcmap: 3-byte FC_map, 0x0EFCxx
- cinvlanid: 2-byte VLAN_ID [0–4095]

Example

```
brcmhbacmd SetFIPParam 10:00:00:00:c9:5b:3a:6d fcmap 0x0efc99
```

5.11 iSCSI Commands

The iSCSI Commands group supports the iSCSI interface in the CLI.

NOTE iSCSI commands are supported only on OneConnect iSCSI functions.
Only OCe14000-series adapters support IPv6 addresses.

The MAC address <MAC_Address> of the iSCSI port must be passed to each command as the first argument.

Some commands require values to be set in a format similar to `option_name=value`. Type the full option name or the abbreviated option name (shown in Table 7) and enter the value. The abbreviations are not case sensitive.

Table 7 Option Names

Option Name	Abbreviation	Example
Auth	au	au=1
DataDigest	dd	dd=1
DHCP	dh	dh=1
HeaderDigest	hd	hd=1
ImmediateData	id	id=1
Initiator_Alias	ia	ia=”initiator_alias”
Initiator_Name	in	in=”initiator_name”
Priority	pr	pr=1
VLAN_ENABLED	ve	ve=1
VLAN_ID	vi	vi=1

5.11.1 AddARPTableEntry

This command adds an ARP table entry.

Supported By

Linux and Windows

Syntax

```
AddARPTableEntry <MAC_Address> <Dest_MAC_Address> <Dest_IP_Address>
```

Parameters

MAC_Address	The MAC address of the iSCSI function.
Dest_MAC_Address	The destination MAC address to add to the ARP table.
Dest_IP_Address	The destination IP address to add to the ARP table.

5.11.2 AddiSNSServer

This command adds a new iSNS server to the existing set of iSNS servers. It accepts either an IPv4 or IPv6 server address.

NOTE For OCe11000-series adapters, only one iSNS server can be configured. For OCe14000-series adapters, up to four iSNS servers can be configured.

Supported By

Linux and Windows

Syntax

```
AddiSNSServer <MAC_Address> <Server_IP> <Port>
```

Parameters

MAC_Address	The MAC address of an iSCSI function.
Server_IP	IP address of the iSNS server to configure.
Port	Port number of the iSNS server to configure (value: 1024 to 65535). iSNS is not supported on iSCSI functions running the Open iSCSI driver. In this case, adding an iSNS server will not detect any iSCSI targets.

5.11.3 AddRouteTableEntry

This command adds a new route table entry to the route table of the specified function.

Supported By

Linux and Windows

Syntax

```
AddRouteTableEntry <MAC_Address> <Dest_IP_Address> <Subnet_Mask> <Gateway>
```

Parameters

MAC_Address	MAC address of an iSCSI function.
Dest_IP_Address	Destination IP address to add to the route table.
Subnet_Mask	Subnet mask to add to the route table.
Gateway	Gateway to add to the route table.

5.11.4 AddTarget

This command adds a target to the list of targets seen by the initiator and logs into the target after it has been successfully created. This command requires that you specify a valid IPv4 or IPv6 target IP <*Target_IP*>, port

number <*Port*>, and iSCSI name <*iscsi_target_name*>. If you do not specify the remaining options, these options are set to their default values.

If you set the authentication method <*Auth*> to a value other than 0, you must set additional parameters. Each string must be enclosed in quotation marks to avoid mishandling by the Windows, Linux, Solaris, or VMware shell's parser.

- If you set the authentication method to One-Way CHAP (<*Auth*>=1), you must also specify the *TargetCHAPName* and *TargetSecret*. For example:

```
brcmhbacmd AddTarget 00-11-22-33-44-55 192.168.1.1 8000 iscsitarget Auth=1
"TgtCHAPName" "TargetSecret1"
```

- If you set the authentication method to Mutual CHAP (<Auth>=2), you must specify all four values. For example:

```
brcmhbacmd AddTarget 00-11-22-33-44-55 192.168.1.1 8000 iscsitarget Auth=1
"TgtCHAPName" "TargtSecret1" "InitCHAPName" "InitialSecret1"
```

Supported By

Linux and Windows

Syntax

```
AddTarget <MAC_Address> <Target_IP> <Port> <iscsi_target_name>
[ImmediateData=<0|1>] [HeaderDigest=<0|1>] [DataDigest=<0|1>] [Boot=<0|1>]
[Login=<0|1>] [Auth=<0|1|2> "TgtCHAPName" "TgtSecret" "InitCHAPName"
"InitSecret"]
```

Parameters

MAC_Address	The MAC address of an iSCSI function.
Target_IP	IP address of the target portal. You can specify an IPv4 or IPv6 IP address.
Port	Port number of the target portal (value: 102 to 65535).
iscsi_target_name	Target's iSCSI name enclosed in quotation marks (string length: 11 to 255).
ImmediateData	0 = No 1 = Yes (default)
HeaderDigest	0 = None (default) 1 = CRC32C
DataDigest	0 = None (default) 1 = CRC32C
Boot	This optional parameter specifies if the added target is a boot device: 0 = Added target is not a boot device 1 = Added target is a boot device
Login	This optional parameter specifies whether to log in to the target after it has been added: 0 = Do not log in to the target 1 = Specify log in to the target If the Login parameter is omitted, the default is 1.
Auth	0 = None (default) 1 = One-Way CHAP 2 = Mutual CHAP
TgtCHAPNam	Target CHAP name enclosed in quotation marks (string length: 1 to 256). Required when Auth =1 or 2.
TgtSecret	Target Secret enclosed in quotation marks (string length: 12 to 16). Required when Auth =1 or 2.
InitCHAPName	Initiator CHAP name enclosed in quotation marks (string length: 1 to 256). Required when Auth =2.

InitSecret	Initiator Secret enclosed in quotation marks (string length: 12 to 16). Required when Auth =2.

5.11.5 AddTargetPortal

This command adds a new SendTarget Portal for the initiator and runs a target detection after the SendTarget Portal is created. This command requires that you specify a valid IPv4 or IPv6 portal IP address <*Target_IP*> and a valid port number <*Port*>. If you do not specify the remaining options, these options are set to their default values.

If you set the authentication method <*Auth*> to a value other than 0, you must set additional parameters. Each string must be enclosed in quotation marks to avoid mishandling by the Windows, Linux, Solaris, or VMware shell's parser.

- If you set the authentication method to One-Way CHAP (<*Auth*>=1), you must also specify the Target CHAP Name and Target Secret. For example:

  ```
  brcmhbacmd AddTargetPortal 00-11-22-33-44-55 10.0.0.1 8000 Auth=1
  "TgtCHAPName" "TargetSecret1"
  ```

- If you set the authentication method to Mutual CHAP (<*Auth*>=2), you must specify all four values.

  For example:

  ```
  brcmhbacmd AddTargetPortal 00-11-22-33-44-55 10.0.0.1 8000 Auth=2
  "TgtChapName" "TargetSecret1" "InitCHAPName" "InitialSecret1"
  ```

You must specify either the TSIH value or the ISID qualifier. If you specify the ISID qualifier, you must also specify the Target's ID address.

Supported By

Linux and Windows

Syntax

```
AddTargetPortal <MAC_Address> <Target_IP> <Port> [ImmediateData=<0|1>]
[HeaderDigest=<0|1>] [DataDigest=<0|1>] [Auth=<0|1|2> "TgtCHAPName" "TgtSecret"
"InitCHAPName" "InitSecret"]
```

Parameters

MAC_Address	The MAC address of an iSCSI function.
Target_IP	IP address of the target portal. You can specify an IPv4 or IPv6 IP address.
Port	Port number of the target portal (value: 1024 to 65535).
ImmediateData	0 = No 1 = Yes (default)
HeaderDigest	0 = None (default) 1 = CRC32C
DataDigest	0 = None (default) 1 = CRC32C
Auth	0 = None (default) 1 = One-Way CHAP 2 = Mutual CHAP
TgtCHAPNam	Target CHAP name enclosed in quotation marks (string length: 1 to 256). Required when Auth =1 or 2.
TgtSecret	Target Secret enclosed in quotation marks (string length: 12 to 16). Required when Auth =1 or 2.
InitCHAPName	Initiator CHAP name enclosed in quotation marks (string length: 1 to 256). Required when Auth =2.

InitSecret	Initiator Secret enclosed in quotation marks (string length: 12 to 16). Required when Auth =2.

5.11.6 CleariSNSServer

This command clears the configured iSNS server and disables iSNS target detection. If no iSNS server is currently configured, or if two or more iSNS servers are defined, any attempt to use this command returns an error.

NOTE This command works only if one iSNS server is defined.

Supported By

Linux and Windows

Syntax

```
CleariSNSServer <MAC_Address>
```

Parameters

MAC_Address	The MAC address of an iSCSI function.

5.11.7 DelARPTableEntry

This command removes an ARP table entry.

Supported By

Linux and Windows

Syntax

```
DelARPTableEntry <MAC_Address> <Dest_MAC_Address> <Dest_IP_Address>
```

Parameters

MAC_Address	The MAC address of an iSCSI function.
Dest_MAC_Address	The destination MAC address to remove from the ARP table.
Dest_IP_Address	The destination IP address to remove from the ARP table.

5.11.8 DeleteiSNSServer

This command deletes an iSNS server from the current iSNS server list.

Supported By

Linux and Windows

Syntax

```
DeleteiSNSServer <MAC_Address> <IP_Address>
```

Parameters

MAC_Address	The MAC address of an iSCSI function.
IP_Address	The IPv4 or IPv6 IP address of the iSNS server.

5.11.9 DelRouteTableEntry

This command removes a route table entry from the specified function.

Supported By

Linux and Windows

Syntax

```
DelRouteTableEntry <MAC_Address> <Dest_IP_Address> <Subnet_Mask> <Gateway>
```

Parameters

MAC_Address	MAC address of an iSCSI function.
Dest_IP_Address	Destination IP address to delete from the route table.
Subnet_Mask	Subnet Mask to delete from the route table.
Gateway	Gateway to delete from the route table.

5.11.10 DiscoveriSNSServer

This command detects an iSNS server address through DHCP. If the DHCP server returns an iSNS server address, it replaces all manually configured iSNS servers and can be viewed using the `ShowiSNSServer` command.

NOTE OCe11000-series adapters can detect one iSNS server, and OCe14000-series adapters can detect up to four iSNS servers.

Supported By

Linux and Windows

Syntax

```
DiscoveriSNSServer <MAC_Address>
```

Parameters

MAC_Address	The MAC address of an iSCSI function. iSNS is not supported on iSCSI functions running the Open iSCSI driver. In this case, adding an iSNS server will not detect any iSCSI targets.

5.11.11 EraseiSCSIConfig

This command resets the iSCSI function configuration for OneConnect adapters to factory defaults.

Supported By

Linux and Windows

Syntax

```
EraseiSCSIConfig <MAC address>
```

Parameters

MAC_Address	The MAC address of an iSCSI function for which the configuration is to be erased.

5.11.12 ExportiSCSI

This command outputs the iSCSI function and target information in XML format. The output can be redirected to a specified file, and the file can be used for the `ImportiSCSI` command. This command works only on the local host.

Supported By

Windows

Syntax

```
ExportiSCSI
```

Example

In this example, the command exports all the iSCSI targets of all the adapters on the host. The output is redirected to the file `targets.xml`.

```
brcmhbacmd ExportiSCSI > targets.xml
```

5.11.13 GetInitiatorProperties

This command shows all the initiator login options for the specified port.

These properties are set as the target portal's login properties to be used when detecting the targets on the target portal. The detected targets inherit these properties.

Supported By

Linux and Windows

Syntax

```
GetInitiatorProperties <MAC_Address>
```

Parameters

MAC_Address	The MAC address of an iSCSI function.

5.11.14 GetiSCSILuns

This command shows all the LUNs and their information for a specified target. The command gathers the information from the iSCSI target indicated by the *<iscsi_target_name>* parameter.

Supported By

Linux and Windows

Syntax

```
GetiSCSILuns <MAC_Address> <iscsi_target_name>
```

Parameters

MAC_Address	The MAC address of an iSCSI function.
iscsi_target_name	Target's iSCSI name enclosed in quotation marks (string length: 11 to 255)

5.11.15 GetiSCSIPortStats

This command shows all the iSCSI statistics for a specified function.

Supported By

Linux and Windows

Syntax

```
GetiSCSIPortStats <MAC_Address>
```

Parameters

MAC_Address The MAC address of an iSCSI function.

5.11.16 GetNetworkConfiguration

This command lists a port's TCP/IP information for IPv4 and IPv6 protocols for the iSCSI function.

Supported By

Linux and Windows

Syntax

```
GetNetworkConfiguration <MAC_Address>
```

Parameters

MAC_Address The MAC address of an iSCSI function.

Example

```
TCP/IP Configuration for 00-00-c9-ad-ad-b1:

VLAN Enabled:          No
VLAN ID:               0
Priority:              0

IPv4 Configuration:
DHCP Enabled:          Yes
IP Address:            10.192.81.204
Subnet Mask:           255.255.248.0
Gateway:               10.192.87.254
IPv6 Configuration:
Automatic Assignment:  No
Link Local Address:    fe80::a1d3:f062:f44a:7577
IP Address 1:          fd01::16
IP Address 2:          fd02::16
Gateway:               fd00::1
```

5.11.17 GetSessionInfo

This command lists all session information for a specified session.

You must specify the <*iscsi_target_name*> and either the <*TSIH*> of the session or the session's ISID Qualifier <*ISID_Qual*> and the target's IPv4 or IPv6 IP address <*Target_IP*>. These parameters tell the command to

gather the information from the specified target and session. You can find the TSIH and ISID qualifier by running the `ListSessions` command.

Supported By

Linux and Windows

Syntax

```
GetSessionInfo <MAC_Address> <iscsi_target_name> <TSIH | <ISID_Qual Target_IP>>
```

Parameters

MAC_Address	The MAC address of an iSCSI function.
iscsi_target_name	Target's iSCSI name enclosed in quotation marks (string length: 11 to 255).
TSIH	TSIH value of the session (value: 1 to 65535).
ISID_Qual	ISID qualifier of the session (value: 0 to 65535).
Target_IP	The Target's IP address. You can specify an IPv4 or IPv6 IP address.

5.11.18 ImportiSCSI

This command imports iSCSI function configuration and targets from an XML file to the iSCSI functions on the local host. The XML file is created by the `ExportiSCSI` command.

Supported By

Windows

Syntax

```
ImportiSCSI <Import_File> [clean]
```

Parameters

Import_File	The name of the XML file containing import information that was generated by the ExportiSCSI command (see Section 5.11.12, ExportiSCSI).
clean	Erases entire iSCSI configuration on all iSCSI ports before importing targets.

NOTE This command fails if the system is booted from an iSCSI target.

Example

In this example, the command imports the iSCSI targets found in the targets.xml file to the iSCSI ports found on the host, and erases the iSCSI configuration (including targets) of all iSCSI ports on these host before importing the targets.

```
brcmhbacmd ImportiSCSI targets.xml clean
```

The example output:

```
All existing targets have been removed.
Added target iqn.2006-01.com.openfiler:target121-000.on.port.00-00-c9-be-1a-24
Added target iqn.2006-01.com.openfiler:target121-001.on.port.00-00-c9-be-1a-24
Added target iqn.2006-01.com.openfiler:target122-000.on.port.00-00-c9-2f-45-1b
Added target iqn.2006-01.com.openfiler:target122-001.on.port.00-00-c9-2f-45-1b
```

5.11.19 iSCSIPing

This command issues ICMP echo requests to an iSCSI target.

Supported By

Linux and Windows

Syntax

```
iSCSIPing <MAC_Address> <IP_Address>
```

Parameters

MAC_Address	The MAC address of an iSCSI function.
IP_Address	IP address of target to send ICMP echo request. You can specify an IPv4 or IPv6 IP address.

5.11.20 ListSessions

This command lists all the sessions on a specified target. The command gathers the information from the iSCSI target indicated by the <*iscsi_target_name*> parameter.

Supported By

Linux and Windows

Syntax

```
ListSessions <MAC_Address> <iscsi_target_name>
```

Parameters

MAC_Address	The MAC address of the an iSCSI function.
iscsi_target_name	Target's iSCSI name enclosed in quotation marks. The string length is 11 to 255.

5.11.21 RemoveTarget

This command removes the target with the specified iSCSI target name <*iscsi_target_name*>.

Supported By

Linux and Windows

Syntax

```
RemoveTarget <MAC_Address> <iscsi_target_name>
```

Parameters

MAC_Address	The MAC address of an iSCSI function.
iscsi_target_name	Target's iSCSI name enclosed in quotation marks. The string length is 11 to 255.

5.11.22 RemoveTargetPortal

This command removes the Target Portal containing the IPv4 or IPv6 target IP <*Target_IP*> and the port <*Port*> from the list of target portals for the specified initiator.

Supported By

Linux and Windows

Syntax

```
RemoveTargetPortal <MAC_Address> <Target_IP> <Port>
```

Parameters

MAC_Address	The MAC address of an iSCSI function.
Target_IP	The target portal's IP address. You can specify an IPv4 or IPv6 target IP address.
Port	The port number of the target portal. The possible values are 1024 to 65535.

5.11.23 SetBootTargetSession

This command enables and disables a iSCSI target's session as a boot session. If a session is enabled as a boot session and the system reboots, it attempts to boot from that target.

Depending on whether the target is logged in, there are two different ways to specify the session. If the target is logged in, use the <*TSIH*> parameter. If the target is not logged in, use the <*ISID_Qual Target_IP*> parameter. You can specify an IPv4 or IPv6 target IP address.

Supported By

Linux and Windows

Syntax

```
SetBootTargetSession <MAC Address> <Target> <TSIH | <ISID_Qual Target_IP>> <0|1>
```

Parameters

MAC_Address	The MAC address of an iSCSI function.
Target	Specifies the iSCSI name of the desired iSCSI target.
TSIH	TSIH value of the session. The possible values are 1 to 65535.
ISID_Qual Target_IP	ISID qualifier of the session. The possible values are 0 to 65535. You can specify an IPv4 or IPv6 Target IP address that the target is using depending on the adapter type.
0|1	Specifies the state of the BootProperty for the target: 0 = Disabled 1 = Enabled

5.11.24 SetInitiatorProperties

This command sets the initiator properties for the specified iSCSI function. It allows you to specify an initiator name <*Initiator_Name*> and an initiator alias <*Initiator_Alias*>. If you opt not to specify these fields, a default iSCSI name is assigned.

Except for the <*Initiator_Name*> and <*Initiator_Alias*> properties, these properties are set as the target portal's login properties to be used when detecting the targets on the target portal. The targets inherit the target portal's properties when they are detected. The detected target's login properties can be changed using the `SetTargetProperties` command.

If you set the authentication method <*Auth*> to a value other than `0`, you must set additional parameters. Each string must be enclosed in quotation marks to avoid mishandling by the Windows, Linux, Solaris, or VMware shell's parser. Additionally, these properties are used for iSNS target detection to set the detected target's login properties.

- If you set the authentication method to One-Way CHAP (<*Auth*>=1), you must also specify the *TgtCHAPName* and *TgtSecret*, which are used by the target to authenticate the initiator. For example:

  ```
  brcmhbacmd SetInitiatorProperties 00-11-22-33-44-55 Auth=1 "TgtChapName"
  "TargetSecret1"
  ```

- If you set the authentication method to Mutual CHAP (<*Auth*>=2), you need to specify the *TgtCHAPName* and *TgtSecret* and the *InitCHAPName* and *InitSecret*. The *InitCHAPName* and *InitSecret* are used for the initiator to authenticate the target. For example:

  ```
  brcmhbacmd SetInitiatorProperties 00-11-22-33-44-55 Auth=2 "TgtChapName"
  "TargetSecret1" "InitCHAPName" "InitialSecret1"
  ```

Supported By

Linux and Windows

Syntax

```
SetInitiatorProperties <MAC_Address> [Initiator_Name="initiator_name"]
[Initiator_Alias="initiator_alias"] [ImmediateData=<0|1>] [HeaderDigest=<0|1>]
[DataDigest=<0|1>] [Auth=<0|1|2> "TgtCHAPName" "TgtSecret" "InitCHAPName"
"InitSecret"]
```

Parameters

MAC_Address	The MAC address of an iSCSI function.
Initiator_Name	Initiator iSCSI name enclosed in quotation marks (string length: 1 to 224).
Initiator_Alias	Initiator iSCSI alias enclosed in quotation marks (string length: 0 to 32).
ImmediateData	0 = No 1 = Yes (default)
HeaderDigest	0 = None (default) 1 = CRC32C
DataDigest	0 = None (default) 1 = CRC32C
Auth	0 = None (default) 1 = One-Way CHAP 2 = Mutual CHAP
TgtCHAPNam	Target CHAP name enclosed in quotation marks (string length: 1 to 256). Required when Auth =1 or 2.
TgtSecret	Target Secret enclosed in quotation marks (string length: 12 to 16). Required when Auth =1 or 2.
InitCHAPName	Initiator CHAP name enclosed in quotation marks (string length: 1 to 256). Required when Auth =2.
InitSecret	Initiator Secret enclosed in quotation marks (string length: 12 to 16). Required when Auth =2.

5.11.25 SetiSCSIBoot

This command defines whether a specific iSCSI function's boot ROM is active.

Supported By

Linux and Windows

Syntax

```
SetiSCSIBoot <MAC_Address> <0|1>
```

Parameters

MAC_Address	The MAC address of an iSCSI function.
0|1	Specifies the iSCSI boot ROM state: 0 = Disabled 1 = Enabled

5.11.26 SetNetworkConfiguration

This command sets the TCP/IP configuration on a specified port. The required fields for this command depend on the values set for <*DHCP*> and <*VLAN_Enabled*>.

Supported By

Linux and Windows

Syntax

```
SetNetworkConfiguration <MAC address> VLAN_Enabled=<0|1>[VLAN_ID=<0-4094>
Priority=<0-7>]DHCP=<0|1> [<IPv4_Address> <Subnet> [IPv4_Gateway]] [AA=<0|1>
[<LL=IPv6_Address> [RA1=IPv6_Address RA2=IPv6_Address] [GW6=IPv6_Address]]]
```

Parameters

MAC_Address	The MAC address of an iSCSI function.
VLAN_Enabled	0 = Disabled 1 = Enabled
VLAN_ID	VLAN ID of the interface. The possible values are 0 to 4095. This value is specified only if VLAN is enabled.
Priority	VLAN priority of the interface. The possible values are 0 to 7. This value is specified only if VLAN is enabled.
DHCP	Dynamic Host Configuration Protocol for automatic IPv4 address assignment. 0 = Disabled 1 = Enabled If the DHCP parameter is disabled, you must specify its parameters. For example: IPv4_Address, Subnet, and IPv4_Gateway.
IPv4_Address	IPv4 address of initiator port. For example: 10.192.1.1. IPv4_Address is required if DHCP is disabled.
Subnet	Subnet mask of initiator port. For example: 255.255.255.0. Subnet is required if DHCP is disabled.
IPv4_Gateway	IPv4 gateway of initiator port. For example: 10.192.1.1. IPv4_Gateway is optional if DHCP is disabled.
AA	Automatic IPv6 address assignment. 0 = Disabled 1 = Enabled If the AA (automatic assignment) parameter is disabled, you must specify its parameters. For example, LL: RA1, RA2 and GW6.
LL	Link local IPv6 address. LL is required if AA is disabled, and it is ignored if AA is enabled.
RA1	Routable IPv6 address 1. RA1 is ignored if AA is enabled.

RA2	Routable IPv6 address 2. RA2 is ignored if AA is enabled.
GW6	IPv6 gateway address. GW6 is ignored if AA is enabled.

Considerations

- *VLAN_ID* and *Priority* are required only if *VLAN_Enabled* is enabled; otherwise, these values must be omitted.
- *IPv4_Address* and *Subnet* are required only if *DHCP* is disabled; otherwise these values must be omitted.
- At a minimum, the *DHCP* or *AA* parameter must be specified, and if required, their associated parameters as well. If either the *DHCP* or *AA* parameter is not specified, an error results.
- The *AA*, *LL*, *RA1*, *RA2*, and *GW6* parameters are valid only on OCe14000-series adapters.

5.11.27 SetTargetLoginProperties

This command sets the login and authentication properties associated with a specific target. This command requires that you specify a valid iSCSI target name <*iscsi_target_name*>. If you do not specify some of the remaining properties, these options are set to their default values. However, if no properties are changed, an error is generated. You must change at least one property for this command to be returned successfully.

If you set the authentication method <*Auth*> to a value other than 0, you must set additional parameters. Each string must be enclosed in quotation marks to avoid mishandling by the Windows, Linux, Solaris, or VMware shell's parser.

- If you set the authentication method to One-Way CHAP (<*Auth*>=1), you must also specify the *TgtCHAPName* and *TgtSecret*, which is used by the target to authenticate the initiator. For example:

  ```
  brcmhbacmd SetTargetLoginProperties 00-11-22-33-44-55 iscsitarget Auth=1
  "TgtCHAPName" "TargetSecret1"
  ```

- If you set the authentication method to Mutual CHAP (<*Auth*>=2), you must specify the *TgtCHAPName* and *TgtSecret*, and the *InitCHAPName* and *InitSecret*. The *InitCHAPName* and *InitSecret* are used for the initiator to authenticate the target.

  For example:

  ```
  brcmhbacmd SetTargetLoginProperties 00-11-22-33-44-55 iscsitarget Auth=2
  "TgtChapName" "TargetSecret1" "InitCHAPName" "InitialSecret1"
  ```

Supported By

Linux and Windows

Syntax

```
SetTargetLoginProperties <MAC_Address> <iscsi_target_name> [ImmediateData=<0|1>]
[HeaderDigest=<0|1>] [DataDigest=<0|1>] [Auth=<0|1|2> "TgtCHAPName" "TgtSecret"
"InitCHAPName" "InitSecret"]
```

Parameters

MAC_Address	The MAC address of an iSCSI port.
iscsi_target_name	Target's iSCSI name enclosed in quotation marks (string length: 11 to 255).
ImmediateData	0 = No 1 = Yes (default)
HeaderDigest	0 = None (default) 1 = CRC32C
DataDigest	0 = None (default) 1 = CRC32C

Auth	0 = None (default) 1 = One-Way CHAP 2 = Mutual CHAP
TgtCHAPNam	Target CHAP name enclosed in quotation marks (string length: 1 to 256). Required if Auth =1 or 2.
TgtSecret	Target Secret enclosed in quotation marks (string length: 12 to 16). Required if Auth =1 or 2.
InitCHAPName	Initiator CHAP name enclosed in quotation marks (string length: 1 to 256). Required if Auth =2.
InitSecret	Initiator Secret enclosed in quotation marks (string length: 12 to 16). Required if Auth =2.

5.11.28 SetTargetProperties

This command sets the ETO value of an iSCSI target.

Supported By

Linux and Windows

Syntax

```
SetTargetProperties <MAC_Address> <iscsi_target_name> <ETO>
```

Parameters

MAC_Address	The MAC address of an iSCSI function.
iscsi_target_name	Target's iSCSI name enclosed in quotation marks (string length: 11 to 255).
ETO	The extended time out option for the target: — For Windows, valid values are 0 to 3600 — For Linux and Solaris, valid values are 0 to 30

5.11.29 SetTPLoginProperties

This command sets a target portal's login properties. This command requires that you specify a valid IPv4 or IPv6 Target IP <*Target_IP*> and Port <*Port*>. However, if you specify no options other than the *Target_IP* and *Port*, no changes are made. You must change at least one of the optional parameters for this command to make any changes to the target portal's login properties.

These properties are used when detecting the targets on the target portal. The targets inherit the target portal's properties when they are detected. Targets already detected do not inherit the updated properties, only newly detected targets inherit the properties.

If you set the authentication method <*Auth*> to a value other than 0, you must set additional parameters. Each string must be enclosed in quotation marks to avoid mishandling by the Windows, Linux, Solaris, or VMware shell's parser.

- If you set the authentication method to One-Way CHAP (<*Auth*>=1), you must also specify the *TgtCHAPName* and *TgtSecret*. For example:

  ```
  brcmhbacmd SetTPLoginProperties 00-11-22-33-44-55 10.192.1.1 5050 Auth=1
  "TgtChapName" "TargetSecret1"
  ```

- If you set the authentication method to Mutual CHAP (<*Auth*>=2), you need to specify the *TgtCHAPName* and *TgtSecret*, and the *InitCHAPName* and *InitSecret*. The *InitCHAPName* and *InitSecret* are used for the initiator to authenticate the target. For example:

  ```
  brcmhbacmd SetTPLoginProperties 00-11-22-33-44-55 10.192.1.1 5050 Auth=2
  "TgtChapName" "TargetSecret1" "InitCHAPName" "InitialSecret1"
  ```

Supported By

Linux and Windows

Syntax

```
SetTPLoginProperties <MAC_Address> <Target_IP> <Port> [ImmediateData=<0|1>]
[HeaderDigest=<0|1>] [DataDigest=<0|1>] [Auth=<0|1|2> TgtCHAPName TgtSecret
InitCHAPName InitSecret]
```

Parameters

MAC_Address	The MAC address of an iSCSI port.
Target_IP	The IP address of the target portal. You can specify an IPv4 or IPv6 Target IP address.
Port	The port number of the target portal (value: 1024 to 65535).
ImmediateData	0 = No 1 = Yes (default)
HeaderDigest	0 = None (default) 1 = CRC32C
DataDigest	0 = None (default) 1 = CRC32C
Auth	0 = None (default) 1 = One-Way CHAP 2 = Mutual CHAP
TgtCHAPNam	The Target CHAP name enclosed in quotation marks (string length: 1 to 256). Required if Auth =1 or 2.
TgtSecret	The Target Secret enclosed in quotation marks (string length: 12 to 16). Required if Auth =1 or 2.
InitCHAPName	The Initiator CHAP name enclosed in quotation marks (string length: 1 to 256). Required if Auth =2.
InitSecret	The Initiator Secret enclosed in quotation marks (string length: 12 to 16). Required if Auth =2.

5.11.30 ShowARPTable

This command shows the current ARP table for the specified iSCSI function.

Supported By

Linux and Windows

Syntax

```
ShowARPTable <MAC_Address>
```

Parameters

MAC_Address	The MAC address of an iSCSI function.

5.11.31 ShowiSNSServer

This command shows the currently configured Internet Storage Name Server. OCe11000-series adapters support only one iSNS server. OCe14000-series adapters support up to four iSNS servers, and they include IPv6 addresses in addition to IPv4 addresses.

Supported By

Linux and Windows

Syntax

```
ShowiSNSServer <MAC_Address>
```

Parameters

MAC_Address	The MAC address of an iSCSI function.

5.11.32 ShowRouteTable

This command shows the route table for an iSCSI function.

Supported By

Linux and Windows

Syntax

```
ShowRouteTable <MAC_Address>
```

Parameters

MAC_Address	The MAC address of an iSCSI function.

Example

```
brcmhbacmd ShowRouteTable 00-00-c9-a0-ce-77
```

5.11.33 ShowTarget

This command shows the properties for a specified target or all targets for an iSCSI function. If you do not specify the iSCSI target name, all targets and their associated properties are returned.

Supported By

Linux and Windows

Syntax

```
ShowTarget <MAC_Address> [iscsi_target_name | refreshtargets]
```

NOTE Only a single command option can be specified with this command. That is, you can specify only *iscsi_target_name* or *refreshtargets*.

Parameters

MAC_Address	The MAC address of an iSCSI function.
iscsi_target_name	iSCSI target name of a specific target. If not specified, all targets for the iSCSI function are displayed.
refreshtargets	Refresh all targets before displaying the information.

5.11.34 ShowTargetPortal

This command shows the properties for a specified Target Portal. If the <Target_IP> and <Port> are not specified, all Target Portals and their associated properties return.

Supported By

Linux and Windows

Syntax

```
ShowTargetPortal <MAC_Address> [<Target_IP> <Port>]
```

Parameters

MAC_Address	The MAC address of an iSCSI port.
Target_IP	IP address of the target portal. You can specify an IPv4 or IPv 6 address.
Port	Port number of the target portal.

5.11.35 TargetLogin

This command logs in to a target. The iSCSI target name <*iscsi_target_name*> is the only mandatory option. The <*target_portal*> and <*port*> information are optional, and if they are not provided, a default target portal is used. If you do not specify the remaining options, these options are set to their default values.

If you set the authentication method <*Auth*> to a value other than 0, you must set additional parameters. Each string must be enclosed in quotation marks to avoid mishandling by the Windows, Linux, Solaris, or VMware shell's parser.

- If you set the authentication method to One-Way CHAP (<*Auth*>=1), you must also specify the *TgtCHAPName* and *TgtSecret*, which is used by the target t authenticate the initiator. For example:

  ```
  brcmhbacmd TargetLogin 00-11-22-33-44-55 iscsitarget Auth=1 "TgtChapName"
  "TargetSecret1"
  ```

- If you set the authentication method to Mutual CHAP (<*Auth*>=2), you need to specify the *TgtCHAPName* and *TgtSecret*, and the *InitCHAPName* and *InitSecret*. The *InitCHAPName* and *InitSecret* are used for the initiator to authenticate the target. For example:

  ```
  brcmhbacmd TargetLogin 00-11-22-33-44-55 iscsitarget Auth=2 "TgtChapName"
  "TargetSecret1" "InitCHAPName" "InitialSecret1"
  ```

Supported By

Linux and Windows

Syntax

```
TargetLogin <MAC address> <Target Name> [<Target IP> <Port>]
[HeaderDigest=<0|1>][ImmediateData=<0|1>][DataDigest=<0|1>][Auth=<0|1|2>
["TgtCHAPName"] ["TgtSecret"] ["InitCHAPName"] ["InitSecret"]]
```

Parameters

MAC_Address	The MAC address of an iSCSI function.
target_name	The target's iSCSI name enclosed in quotation marks (string length: 11 to 255 characters).
Target IP	Target IP Address. You can specify an IPv4 or IPv6 Target IP address.
Port	The port number of the target portal. The possible values are 1024 to 65535.
HeaderDigest	0 = None (default) 1 = Uses CRC32C checksum
ImmediateData	0 = No 1 = Yes (default) for appending solicited data to a command.
DataDigest	0 = None (default) 1 = CRC32C checksum

Auth	0 = None (default) 1 = One-Way CHAP 2 = Mutual CHAP
TgtCHAPName	The Target CHAP name enclosed in quotation marks (string length: 1 to 255 characters). The Target CHAP name is required it you set Auth to 1 or 2.
TgtSecret	The Target Secret enclosed in quotation marks (string length: 12 to 16 characters). The Target CHAP name is required it you set Auth to 1 or 2.
InitCHAPName	The Initiator CHAP name enclosed in quotation marks (string length: 1 to 255 characters). The Target CHAP name is required it you set Auth to 2.
InitSecret	The Initiator Secret enclosed in quotation marks (string length: 12 to 16 characters). The Target CHAP name is required it you set Auth to 2.

5.11.36 TargetLogout

This command logs out of an iSCSI target session.

You must specify the iSCSI target name <*iscsi_target_name*> and either the TSIH <*TSIH*> of the session, or the session's ISID Qualifier <*ISID_Qual*> and the target's IP address <*Target_IP*>.

Supported By

Linux and Windows

Syntax

```
TargetLogout <MAC_Address> <iscsi_target_name> <TSIH | <ISID_Qual Target_IP>>
```

Parameters

MAC_Address	The MAC address of an iSCSI function.
iscsi_target_name	The target's iSCSI name enclosed in quotation marks (string length: 11 to 255).
TSIH	The TSIH value of the session. The possible values are 1 to 65535.
ISID_Qual	The ISID qualifier of the session. The possible values are 0 to 65535.
Target_IP	The target's IP address.

5.11.37 UpdateiSNSServer

This command updates a configured iSNS server and accepts IPv4 or IPv6 iSNS server addresses. This command requires the server IP <*Server_IP*> and port number <*Port*> of the iSNS server to be available to respond to the iSNS requests. If a single iSNS server is configured, this command replaces the single iSNS server IP address with a new IP address. If no iSNS server is configured, this command adds a new iSNS server.

NOTE If two or more iSNS servers are already configured, any attempt to use this command results in an error.

Supported By

Linux and Windows

Syntax

```
UpdateiSNSServer <MAC_Address> <Server_IP> <Port>
```

Parameters

MAC_Address	The MAC address of an iSCSI function.

Server_IP	IP address of the iSNS server to configure. You can specify an IPv4 or IPv6 server IP address.
Port	Port number of the iSNS server to configure (value: 1024 to 65535).

5.12 LUN Masking Commands

The LUN Masking Commands group manage LUN masking activities. LUN Masking commands are supported only for FCoE functions.

NOTE Linux does not support LUN masking commands.

NOTE Solaris and Windows + CIM Provider on a VMware host do not support the following commands:

- `GetLunUnMaskbyHBA`
- `GetLunUnMaskbyTarget`
- `RescanLuns`
- `SetLunMask`

5.12.1 GetLunList

This command queries for the presence of any masked LUNs.

Supported By

Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
GetLunList <HBA WWPN> <Target WWPN> <Option>
```

Parameters

HBA WWPN	The WWPN of an FCoE function on the adapter.
Target WWPN	The WWPN of the target.
Option	0 = Get information from the driver 1 = Get information from the configuration

5.12.2 GetLunUnMaskByHBA

This command queries for the presence of any unmasked LUNs by FCoE functions.

Supported By

Windows

Syntax

```
GetLunUnMaskByHBA <HBA WWPN> <Option>
```

Parameters

HBA WWPN	The WWPN of an FCoE port.
Option	0 = Get information from the driver 1 = Get information from the configuration

5.12.3 GetLunUnMaskByTarget

This command queries for any unmasked LUNs by target.

Supported By

Windows

Syntax

```
GetLunUnMaskByTarget <HBA WWPN> <Target WWPN> <Option>
```

Parameters

HBA WWPN	The WWPN of an FCoE function.
Target WWPN	The WWPN of the target.
Option	0 = Get information from the driver 1 = Get information from the configuration

5.12.4 RescanLuns

This command rescans LUNs to find any new LUNs.

Supported By

Windows

Syntax

```
RescanLuns <HBA WWPN> <Target WWPN>
```

Parameters

HBA WWPN	The WWPN of an FCoE function.
Target WWPN	The WWPN of the target.

5.12.5 SetLunMask

This command masks the specified LUNs.

Supported By

Windows

Syntax

```
SetLunMask <HBA WWPN> <Target WWPN> <Option> <Lun> <LunCount> <MaskOp>
```

Parameters

HBA WWPN	The WWPN of an FCoE function.
Target WWPN	The WWPN of the target.
Option	0 = Get information from the driver 1 = Get information from the configuration (make persistent) 2 = Send information to both
Lun	The starting LUN number.
LunCount	The number of LUNs.

MaskOp	A = Mask LUN B = Clear unmask target level C = Clear unmask HBA level D = Unmask LUN E = Unmask target level F = Unmask HBA level

5.13 Miscellaneous Commands

Commands in the Miscellaneous Command group do not fit in other groups. See specific commands for adapter limitations.

5.13.1 AddHost

This command adds a host to the hosts file for remote TCP/IP management in the OneCommand CNA Manager application. The adapters for these hosts are also presented by the `ListHBAs` command (see Section 5.13.9, ListHBAs).

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

To add non-VMware ESXi hosts:

```
AddHost <hostname|IP_address>[:Port_Number]
HostName:          Name of host to add to hosts file
IP_address:        IP address (IPv4 or IPv6) of host to add to hosts file
                   Example IPv4: 10.192.80.102
                   Example IPv6: fe80::6445:80e9:9878:a527
Port_Number:       Optional IP port number to access remote host
                   Example: 10.192.80.102:9876
                   Note: When specifying IPv6 address with Port_Number, it must be
                   enclosed in [].
                   Example: [fe80::6445:80e9:9878:a527]:9876
```

- An attempt is made to contact the host to confirm remote access before adding it to the host list. If the attempt fails, the host is not added.
- The h option (for specifying an optional IP address or host name) after `brcmhbacmd` is not available for the `AddHost` command.

To add VMware ESXi hosts to Windows using the OneCommand CNA Manager application:

```
m=cim [u=<username>] [p=<password>] [n=<namespace>] AddHost  <IP_Address>
```

If the *username*, *password*, and *namespace* are not specified, see Section 4.4.2.1.1, Default CIM Credentials.

Parameters

host_address	The IP address (using the IPv4 or IPv6 format) or the host name.

5.13.2 CnaClearEventLog

This command clears the event log for the adapter specified by the WWPN or MAC address

Supported By

Linux and Windows

Syntax

```
CnaClearEventLog <WWPN|MAC>
```

Parameters

WWPN	The WWPN of an FCoE function on the adapter.
MAC	The MAC address of a NIC or iSCSI function on the adapter.

5.13.3 CnaGetEventLog

This command shows the adapter event log for the adapter specified by the WWPN or MAC address.

NOTE This command is supported only for OneConnect adapters.

Supported By

Linux and Windows

Syntax

```
CnaGetEventLog <WWPN|MAC>
```

Parameters

WWPN	The WWPN of an FCoE function on the adapter.
MAC	The MAC address of a NIC or iSCSI function on the adapter.

5.13.4 Download

This command downloads a firmware image to the port function or adapter specified by the WWPN or MAC address.

Considerations

- If a secure version of firmware (version 11.0 or later) is installed on an OCe14000B-series adapter and you want to update to an earlier unsecured version of firmware, you must remove the secure firmware jumper block before performing the update. Refer to the installation manual for the adapter for more information.
- If you attempt to update unauthenticated firmware for a secure OCe14000B-series, adapter, the following error message is displayed:

```
ERROR: Download Failed due to invalid firmware digital signature. Please
contact customer support for additional help.
ERROR: <203>: Failed validating firmware digital signature
```

- If you attempt to update unsecured firmware for a secure OCe14000B-series adapter, the following error message is displayed:

```
ERROR: Download Failed due to missing digital signature in firmware file.
Please contact customer support for additional help.
ERROR: <209>: Firmware digital signature missing
```

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
Download <WWPN|MAC> <FileName>
```

Parameters

WWPN	The WWPN of an FCoE function on the adapter.
MAC	The MAC address of a NIC or iSCSI function on the adapter.
FileName	The name and location of the firmware image (any file accessible to the CLI client).

5.13.5 ExportSANInfo

For reporting purposes, this command captures the SAN information in `.xml` for XML-formatted files and `.csv` for CSV-formatted files.

NOTE This command can take a long time on large SAN configurations because of the large amount of information that must be obtained and reported. The output can also be redirected to a file if required.

Supported By

Linux, Solaris, and Windows

Syntax

```
ExportSANInfo [format]
```

NOTE The h option (for specifying an optional IP address or host name) after `brcmhbacmd` is not available for the `ExportSANInfo` command.

Parameters

format — An optional parameter that specifies the format of the adapter information:
- csv
- xml

Leaving the format blank shows the data in xml format (default).

5.13.6 GetCimCred

This command shows the default credentials set for the CIM client.

NOTE The password is encrypted.

Supported By

Windows

Syntax

```
GetCimCred
```

Parameters

None.

5.13.7 GetQoSInfo

This command shows the QoS information for a specified NIC function if multichannel support is enabled for the port on which the NIC function exists.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
GetQoSInfo <MAC_Address>
```

Parameters

MAC The MAC address of a NIC function.

Example

```
brcmhbacmd GetQoSInfo 00-00-c9-93-20f-d6
```

5.13.8 GetVPD

This command shows the port's VPD.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
GetVPD <WWPN | MAC>
```

Parameters

WWPN The WWPN of an FCoE function.

MAC The MAC address of a NIC or iSCSI function.

5.13.9 ListHBAs

This command shows a list of the manageable Broadcom Emulex adapters found by local discovery. For a NIC-only or iSCSI adapter, the MAC address is displayed rather than the port WWN. The node WWN and fabric WWN are not displayed. The type of information listed may vary according to the adapter model.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
ListHBAs [local] [m=model] [pt=type] [down]
```

Parameters

local	Displays only local adapters. For Dell adapters, this parameter displays virtual WWPNs and WWNNs for each FCoE function and virtual MAC addresses for each NIC function. It does not display permanent settings.
m=model	Model filter. Append * to the end of the model name for a wildcard match. For example: OCe14*
pt=type	The port type filter. Valid types are NIC, RoCE, iSCSI, and FCoE.
down	Displays only the NIC functions of adapters on the local system in which the adapter's ARM processor has stopped. This parameter detects adapters that need to have a core dump collected in addition to adapters that might not respond to commands from the OneCommand CNA Manager CLI or application.

5.13.10 ListVFuncs

This command lists the virtual functions (SR-IOV) on a specified NIC function.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
ListVFuncs <MAC>
```

Parameters

MAC The MAC address of a NIC function.

Example

```
brcmhbacmd ListVFuncs 00-00-c9-12-34-56
```

The example output:

```
Virtual Functions for 00-00-c9-12-34-56:

MAC Address    : 00-00-c9-12-34-ab
VLADID         : 10
Transmit Rate  : 100 Mbit/sec.

MAC Address    : 00-00-c9-12-34-cd
VLADID         : 10
Transmit Rate  : 100 Mbit/sec.

MAC Address    : 00-00-c9-12-34-ef
VLADID         : 10
Transmit Rate  : 1 bbit/sec.

MAC Address    : 00-00-c9-13-34-01
VLADID         : 20
Transmit Rate  : 1 Gbit/sec.
```

5.13.11 RemoveHost

This command removes a host from the hosts file use for TCP/IP management in the OneCommand CNA Manager application GUI. The <*host_address*> can be an IP address that uses the IPv4 or IPv6 format, or it can be a host name.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

For the remote management interface:

```
RemoveHost host_address
```

For VMware ESXi using the CIM interface:

```
m=cim RemoveHost <IP_Address>
```

NOTE The h option (for specifying an optional IP address or host name) after `brcmhbacmd` is not available for the `RemoveHost` command.

Parameters

host_address	The host to remove.
IP_Address	The IP address of the host to remove.

5.13.12 Reset

This command resets the FCoE function. A reset can require several seconds to complete, especially for remote devices. When the reset is completed, the system command prompt is displayed.

NOTE This command applies only to FCoE functions.
This command only resets the driver to update changed driver parameters that require a driver reset. It does not cause a hardware reset of the FCoE function.

Supported By

Linux, Solaris, Windows, and VMware ESXi from a Windows remote host

Syntax

```
Reset <WWPN>
```

Parameters

WWPN	The WWPN of an FCoE function.

5.13.13 SetCimCred

This command sets the default CIM credentials. You must specify all four credentials: *`username`*, *`password`*, *`namespace`*, and *`portnum`*. Default credentials are used if any credential is not in the `brcmhbacmd` command argument. After the default credentials for a host are set, any other command can be issued by specifying `m=cim`.

Supported By

Windows

Syntax

```
SetCimCred <username> <password> <namespace> <portnum>
```

NOTE Use this command to set only the CIM credentials. After this is finished, subsequent `brcmhbacmd` commands do not require you to specify the CIM credentials in the command line.

Parameters

username	The login user ID of the VMware ESXi.
password	The login password of the VMware ESXi.
namespace	The namespace where the Emulex CIM provider is registered in the SFCB CIMOM of VMware ESXi, specifically `root/brcmccx`.
portnum	The port number of the SFCB that CIMOM is listening to, that is, 5988 (HTTP) or 5989 (HTTPS).

5.13.14 SRIOVEnable

For OCe11000-series adapters, this command enables/disables SR-IOV only on the specified NIC function. For OCe14000-series adapters, this command enables or disables SR-IOV on all NIC functions on the adapter. This command can be used to enable or disable SR-IOV with the `NPar` or `NParEP` mode enabled.

This command is not available on OCe11101-EM/EX or OCe11102-EM/EX adapters. The following error is returned:

```
ERROR: <251>: Hardware or firmware does not support command.
```

`SRIOVEnable` returns an error if channel management is enabled.

For OCe14000-series adapters, it is preferable to use the `SetAdapterPortConfig` command (see Section 5.16.4, SetAdapterPortConfig (for OCe14000-Series Adapters)) to enable or disable SR-IOV.

NOTE SR-IOV is not supported with RoCE configurations.

Supported By

Linux, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
SRIOVEnable <MAC> <0|1>
```

Parameters

MAC	The MAC address of a NIC function.
0|1	0 = Disables SR-IOV 1 = Enables SR-IOV

Examples

The following command enables SR-IOV on a NIC function with MAC address 00-00-c9-12-34-56:

```
brcmhbacmd SRIOVEnable 00-00-c9-12-34-56 1
```

The following command enables or disables SR-IOV with `NPar` or `NParEP` mode enabled:

```
>brcmhbacmd SriovEnable 00-90-fa-41-22-f0 1

SR-IOV successfully enabled in all ports. A system reboot is required.
```

NOTE You can use the `GetAdapterPortConfig` command to display the SR-IOV state.

```
brcmhbacmd getAdapterPortConfig 00-90-fa-41-22-f0

Number of Ports             : 2
Maximum FCoE Functions      : 1
Maximum iSCSI Functions     : 1
Mixed Mode I/O Allowed      : Yes
Concurrent Mode I/O Allowed : Yes
ROCE Functions Allowed      : Yes
RebootRequired              : Yes

Active Configuration
  Profile ID  : 16
  MC Type     : None
  SR-IOV State: Disabled
```

```
  Port Assignments:
    Port 1: NIC
    Port 2: NIC

Reboot Configuration
  Profile ID  : 16
  MC Type     : NPar
  SR-IOV State: Enabled
  NParEP Mode : Disabled
  Port Assignments:
    Port 1 (p0): NIC, NIC, NIC, NIC
    Port 2 (p1): NIC, NIC, NIC, NIC

Note:  (pN) labels are the port parameter names to use in the SetAdapterPortConfig
command (e.g. p0=NIC,FCoE p1=NIC,iSCSI).
```

5.13.15 TargetMapping

This command shows a list of mapped targets and the LUNs for an FCoE function on a port.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

`TargetMapping <WWPN>`

Parameters

WWPN	The WWPN of an FCoE adapter.

5.13.16 VEPAEnable

This command enables or disables VEPA Management. VEPA Management is supported only for OCe14000-series NIC ports that have SR-IOV enabled. For all other board types and port types, this feature is undefined, and this command returns a `Hardware Does Not Support` error. In addition, when the next boot configuration does not have SR-IOV enabled or if multichannel is enabled, the following error message is displayed:

```
ERROR: <223>: VEPA is only settable on NIC ports when the reboot
configuration is non-multichannel and SR-IOV is enabled.
```

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

`VEPAEnable <MAC> <0|1>`

Parameters

MAC	The MAC address of the NIC function.
0|1	The VEPA state: 0 = Disabled 1 = Enabled The current VEPA state for the NIC function is displayed by the PortAttributes command. If the current or next boot configuration does not allow VEPA, the VEPA state is displayed as N/A.

NOTE If VEPA is currently enabled, when the system is rebooted with either SR-IOV disabled or multichannel enabled, VEPA is automatically disabled.

5.13.17 Version

This command shows the current version of the OneCommand CNA Manager CLI Client.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

For the remote management interface:

`Version`

NOTE The h option (for specifying an optional IP address or host name) after `brcmhbacmd` is not available for the `Version` command.

For VMware ESXi using the CIM interface:

`h=<IP address> m=cim Version`

Parameters

None

5.14 Persistent Binding Commands

The Persistent Binding Commands group facilitates persistent binding operations.

In a remote environment, you can perform persistent bindings operations from a host running any operating system (including Linux or VMware ESXi), but only to a remote host that is running Windows or Solaris.

For a binding to take effect immediately (that is, `SetPersistentBinding parameter`: `Scope` = `I` or B), the <*`SCSIBus`*> and <*`SCSITarget`*> parameters must match the SCSI bus and SCSI target to which the FCoE target is already automapped. If automapping is disabled, the binding takes effect immediately if the FCoE target is not already persistently bound, and the specified <*`SCSIBus`*> and <*`SCSITarget`*> parameters are available to be persistently bound. Also, the <*`BindType`*> parameter must match the currently active bind type. Otherwise, you are notified that you must reboot the system to cause the persistent binding to become active.

These commands are supported only on FCoE ports.

The following persistent binding commands are not supported on Linux or on Windows + CIM Provider on a VMware host:

- `BindingCapabilities`
- `BindingSupport`
- `PersistentBinding`
- `RemoveAllPersistentBinding`
- `RemovePersistentBinding`
- `SetPersistentBinding`
- `SetBindingSupport`

5.14.1 AllNodeInfo

This command shows target node information for each target accessible by the adapter.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
AllNodeInfo <WWPN>
```

Parameters

WWPN	The WWPN of an FCoE function.

5.14.2 BindingCapabilities

This command shows the binding capabilities of the adapter. If a binding is configured, it is maintained across reboots.

Supported By

Solaris and Windows

Syntax

```
BindingCapabilities <WWPN>
```

Parameters

WWPN	The WWPN of an FCoE function.

5.14.3 BindingSupport

This command shows the binding support for an FCoE function.

Supported By

Solaris and Windows

Syntax

```
BindingSupport <WWPN> <Source>
```

Parameters

WWPN	The WWPN of an FCoE function.
Source	C = Configuration support L = Live support

5.14.4 PersistentBinding

This command specifies the set of persistent binding information (configuration or live state) that is requested.

Supported By

Solaris and Windows

Syntax

```
PersistentBinding <WWPN> <Source>
```

Parameters

WWPN	The WWPN of an FCoE function.
Source	C = Configuration support L = Live support

5.14.5 RemoveAllPersistentBinding

This command removes all persisting bindings for an FCoE function.

Supported By

Solaris and Windows

Syntax

```
RemoveAllPersistentBinding <WWPN>
```

Parameters

WWPN	The WWPN of an FCoE function.

5.14.6 RemovePersistentBinding

This command removes persistent binding between an FCoE target and a SCSI bus and target. The binding to be removed can be to a target WWPN, a target WWNN, or a target D_ID.

Supported By

Solaris and Windows

Syntax

```
RemovePersistentBinding <WWPN> <BindType> <ID> <SCSIBus> <SCSITarget>
```

Parameters

WWPN	The WWPN of an FCoE function.
BindType	P = Remove binding by WWPN N = Remove binding by WWNN D = Remove binding by D_ID
ID	The type of ID based on <BindType>: — Target WWPN if <BindType> = P — Target WWNN if <BindType> = N Target D_ID if <BindType> = D
SCSIBus	The bus number of the SCSI device.
SCSITarget	The target number of the SCSI device.

5.14.7 SetBindingSupport

This command enables and sets the binding support for an FCoE function.

Supported By

Solaris and Windows

Syntax

```
SetBindingSupport <WWPN> <BindFlag>
```

Parameters

WWPN	The WWPN of an FCoE function.
BindFlag	The type of binding support for the adapter: D = Binding by D_ID (not available for Windows driver) P = Binding by WWPN N = Binding by WWNN (not available for Windows driver) A = Binding by automap (not available for Windows driver) DA = Binding by D_ID and automap PA = Binding by WWPN and automap NA = Binding by WWNN and automap

5.14.8 SetPersistentBinding

This command sets a persistent binding between an FCoE target and a SCSI bus target. The binding can be to a target WWPN, target WWNN, or target D_ID.

Supported By

Solaris and Windows

Syntax

```
SetPersistentBinding <WWPN> <Scope> <BindType> <TargetId> <SCSIBus> <SCSITarget>
```

Parameters

WWPN	The WWPN of an FCoE function.
Scope	P = Permanent binding (survives reboot) I = Immediate binding B = Binding is both permanent and immediate
BindType	P = Enable binding by WWPN N = Enable binding by WWNN D = Enable binding by D_ID
TargetId	If BindType = P, Target WWPN If BindType = N, Target WWNN If BindType = D, Target D_ID
SCSIBus	The bus number of the SCSI device.
SCSITarget	The target number of the SCSI device.

5.15 Personality Change Commands

The OneCommand CNA Manager application enables you to change the personality or protocol running on OneConnect adapters. If you change the personality of the adapter and reboot the host, the adapter starts running the new personality. The personalities that the OneConnect adapters currently run are NIC-only, NIC + FCoE, NIC + iSCSI, and NIC + RoCE for OCe14000-series adapters.

For RoCE-1, check the Knowledge Base on http://www.broadcom.com for any updated information on additional use cases for the RoCE-1 profile. Choose the RoCE-2 profile for Windows SMB Direct, or for Linux iSER, NFS, or VM Migration support.

NOTE It is possible to install one (or more) driver kits for the current personality profile, then change the personality profile and no longer have the drivers necessary to run the adapter. If you change personality profiles, you must install the appropriate drivers. The appropriate drivers are available at http://www.broadcom.com.

5.15.1 ChangePersonality

This command changes the personality on the adapter. It is the only way to change the personality of an OCe11000-series adapter. For an OCe14000-series adapter, `ChangePersonality` is an efficient way to set all ports on the adapter to run the same protocols.

However, the OCe14000-series adapter is capable of running different protocols on different ports. If you want to set different protocols on different ports, use the `SetAdapterPortConfig` command. See Section 5.16.4, SetAdapterPortConfig (for OCe14000-Series Adapters) for more information.

After a successful personality change, a system reboot is required.

NOTE RoCE is available only on OCe14000-series adapters.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
ChangePersonality <WWPN|MAC> <type> [Profile_ID]
```

Parameters

WWPN	The WWPN of an FCoE function on the adapter.
MAC	The MAC address of a NIC, NIC+RoCE, or iSCSI function on the adapter.
type	The personality type to which the adapter is being changed. The available values are shown when you are using the `ShowPersonalities` command. See Section 5.15.2, ShowPersonalities.
Profile_ID	Optionally specifies the profile ID number to used to identify the personality. This number can be obtained from Section 5.16.3, ListProfiles by looking at the Active Profile ID field. Profile_ID is only required in the following instances: — When specifying a NIC-only personality — When specifying a NIC+RoCE personality — When more than one NIC profile is available Selecting a profile that cannot be used with the specified personality results in an error.

Examples

Changing to FCoE personality:

```
brcmhbacmd ChangePersonality 00-12-34-56-78-9A fcoe
```

Changing to FCoE personality:

```
brcmhbacmd changepersonality 00-00-c9-12-34-56 fcoe
```

Changing to NIC + RoCE personality with Profile ID 21:

```
brcmhbacmd ChangePersonality 00-00-c9-12-34-56 nic+roce 21
brcmhbacmd ShowPersonalities 00-00-c9-12-34-56
Adapter Personalities:
NIC
NIC+RoCE (configured)
iSCSI
FCoE (active)
```

5.15.2 ShowPersonalities

This command displays the list of single personalities available on an adapter. The personality type is displayed as either NIC, NIC + RoCE, iSCSI, or FCoE.

NOTE If the active configuration is not a single personality (only on OCe14000-series), the active personality indicators are not displayed.

NOTE The available personalities are adapter dependent.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
ShowPersonalities <WWPN|MAC>
```

Parameters

WWPN	The WWPN of an FCoE function on the adapter.
MAC	The MAC address of a NIC, NIC + RoCE or iSCSI function on the adapter.

Example

```
>brcmhbacmd showpersonalities 00-00-c9-12-34-56
Adapter Personalities:
NIC
NIC+RoCE
iSCSI
FCoE (active) (configured)
```

5.16 Profile Management Commands

The Profile Management Commands group manages profile configuration for OCe14000-series adapters. You can display active and reboot port configurations for an adapter, list available profile IDs, and configure the function protocol for all ports on OCe14000-series adapters.

5.16.1 GetAdapterPortConfig

This command displays the active and reboot adapter port configurations of an OCe14000-series adapter. This includes the total number of ports, the maximum number of FCoE and iSCSI functions that can be defined, and whether mixed mode and concurrent mode storage are supported by the adapter.

NOTE All adapters support concurrent mode; therefore, up to two storage protocols can be configured on a port.

Additionally, it shows whether RoCE is supported on the adapter and whether a reboot is currently required to activate the new configuration.

The number of functions displayed per port depends on the current configuration of the adapter, such as custom mode, multichannel, or NPar.

In the information displayed for the reboot configuration, each of the ports displays the pN parameter name in parenthesis. The pN parameter is used in the `SetAdapterPortConfig` command to change the port's protocol assignments. This is useful when the physical port numbering on the adapter does not start at 0.

For multichannel and Dell NPar configurations, this command displays only the port protocol assignments. For the entire multichannel configuration, use the Section 5.5.1, CMGetParams.

NOTE If ARI is present on a host, this command may show more partitions per port than are actually running on the host.

If `Flex` is displayed in the output for the `GetAdapterPortConfig` command as the multichannel type for HP adapters currently running in Flex mode, you cannot specify `Flex` for the *`mctype`* parameter of the `SetAdapterPortConfig` command. The only *`mctype`* parameter that can be specified on HP UMC-capable adapters is UMC.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
GetAdapterPortConfig <MAC|WWPN>[table]
```

Parameters

MAC	MAC address of any iSCSI, or NIC, NIC + RoCE function on the adapter WWPN.
WWPN	WWPN of any FCoE function on the adapter.
table	The table option displays the output in tabular form, including all function and available protocols for each function.

Examples

The following table provides locations of application examples.

5.16.1.1 Tabular Output

The adapter configuration information is displayed in a table format when the table (tab or tabular) option is specified.

```
>brcmhbacmd getadapterportconfig 00-90-FA-41-22-F0 table

Number of Ports             : 2
Maximum FCoE Functions      : 1
Maximum iSCSI Functions     : 1
Mixed Mode I/O Allowed      : Yes
Concurrent Mode I/O Allowed : Yes
ROCE Functions Allowed      : Yes
RebootRequired              : Yes

Active Configuration
  Profile ID  : 16
  MC Type     : None
  SR-IOV State: Enabled

  Port#  Func#  Protocol
  -----  -----  --------
    1       0   NIC
    2       1   NIC

Reboot Configuration
  Profile ID  : 16
  MC Type     : UMC  (Available MC Types: UMC)
  SR-IOV State: Disabled


  Port#  Func#  Protocol  Available Protocols for Function
  -----  -----  --------  ---------------------------------
  1 (p0)    0   NIC       NIC, NIC+RoCE
            2   NIC       none, NIC, iSCSI, FCoE
            4   NIC       none, NIC, iSCSI, FCoE
            6   NIC       none, NIC, iSCSI, FCoE
            8   none      none, NIC
           10   none      none, NIC
           12   none      none, NIC
           14   none      none, NIC
  2 (p1)    1   NIC       none, NIC, NIC+RoCE
            3   NIC       none, NIC, iSCSI, FCoE
            5   NIC       none, NIC, iSCSI, FCoE
            7   NIC       none, NIC, iSCSI, FCoE
            9   none      none, NIC
           11   none      none, NIC
           13   none      none, NIC
           15   none      none, NIC

Note: (pN) labels are the port parameter names to use in the SetAdapterPortConfig
command (e.g. p0=NIC,FCoE p1=NIC,iSCSI).
```

5.16.1.2 2-port Adapter, with the Table Option

```
>brcmhbacmd getadapterportconfig 00-00-c9-12-34-56
Number of Ports             : 2
Maximum FCoE Functions      : 1
Maximum iSCSI Functions     : 1
Mixed Mode I/O Allowed      : Yes
Concurrent Mode I/O Allowed : Yes
ROCE Functions Allowed      : Yes
RebootRequired              : No

Active Configuration
  Profile ID  : 37
  MCType      : None
  SR-IOV State: disabled


  Port #  Func # Protocol
 ------  ------  --------
    0       0     NIC
            2     iSCSI
            4     FCoE
    1       1     NIC
            3     iSCSI
            5     FCoE

Reboot Configuration
  Profile ID  : 37
  MC Type     : None
  SR-IOV State: Disabled (Available Types: UMC)

  Port #  Func #  Protocol  Available Protocols for Function
  ------  ------  --------  ---------------------------------
  0 (p0)    0     NIC       NIC, NIC+RoCE
            2     iSCSI     NIC, iSCSI, FCoE
            4     FCoE      NIC, iSCSI, FCoE
            6     n/a       NIC
            8     n/a       NIC
            10    n/a       NIC
            12    n/a       NIC
            14    n/a       NIC
  1 (p1)    1     NIC       NIC, NIC+RoCE
            3     iSCSI     NIC, iSCSI, FCoE
            5     FCoE      NIC, iSCSI, FCoE
            7     n/a       NIC
            9     n/a       NIC
            11    n/a       NIC
            13    n/a       NIC
            15    n/a       NIC


Note: (pN) labels are the port parameter names to use in the SetAdapterPortConfig
command (e.g. p0=NIC, FCoE p1=NIC, iSCSI).
```

5.16.1.3 4-Port Adapter

```
>brcmhbacmd getadapterportconfig 00-00-c9-12-34-56
Number of Ports             : 4
Maximum FCoE Functions      : 4
Maximum iSCSI Functions     : 4
Mixed Mode I/O Allowed      : Yes
Concurrent Mode I/O Allowed : No
ROCE Functions Allowed      : Yes
RebootRequired              : No

Active Configuration
  Profile ID  : 37
  MCType      : None
  SR-IOV State: disabled
  Port Assignments:
    Port 0: NIC,iSCSI
    Port 1: NIC,iSCSI
    Port 2: NIC,FCoE
    Port 3: NIC,FCoE

Reboot Configuration
  Profile ID  : 37
  MCType      : None
  SR-IOV State: disabled
  Port Assignments:
    Port 0 (p0): NIC,iSCSI
    Port 1 (p1): NIC,iSCSI
    Port 2 (p2): NIC,FCoE
    Port 3 (P3): NIC,FCoE
```

Note: (pN) labels are the port parameter names to use in the SetAdapterPortConfig command (e.g. p0=NIC, FCoE p1=NIC, iSCSI).

5.16.1.4 2-Port Adapter, Port Number Starting at 1

```
>brcmhbacmd getadapterportconfig 00-00-c9-12-34-56
Number of Ports             : 2
Maximum FCoE Functions      : 4
Maximum iSCSI Functions     : 4
Mixed Mode I/O Allowed      : Yes
Concurrent Mode I/O Allowed : Yes
ROCE Functions Allowed      : Yes
RebootRequired              : Yes

Active Configuration
  Profile ID  : 37
  MCType      : None
  SR-IOV State: disabled
  Port Assignments:
    Port 1: NIC,iSCSI,FCoE
    Port 2: NIC,iSCSI,FCoE

Reboot Configuration
  Profile ID  : 23
```

```
  MCType      : None
  SR-IOV State: disabled
  Port Assignments:
    Port 1 (p0): NIC,FCoE,None
    Port 2 (p1): NIC,FCoE,None
```

Note: (pN) labels are the port parameter names to use in the SetAdapterPortConfig command (e.g. p0=NIC, FCoE p1=NIC, iSCSI).

5.16.1.5 UMC

```
>brcmhbacmd getadapterportconfig 00-00-c9-12-34-56
Number of Ports             : 4
Maximum FCoE Functions      : 4
Maximum iSCSI Functions     : 4
Mixed Mode I/O Allowed      : Yes
Concurrent Mode I/O Allowed : Yes
ROCE Functions Allowed      : Yes
RebootRequired              : No

Active Configuration
  Profile ID  : 37
  MC Type     : UMC
  SR-IOV State: disabled
  Port Assignments:
    Port 0: NIC,iSCSI,FCoE,NIC
    Port 1: NIC,iSCSI,FCoE,NIC
    Port 2: NIC,FCoE,NIC,NIC
    Port 3: NIC,iSCSI,NIC,NIC

Reboot Configuration
  Profile ID  : 37
  MC Type     : UMC
  SR-IOV State: disabled
  Port Assignments:
    Port 0 (p0): NIC,iSCSI,FCoE,NIC
    Port 1 (p1): NIC,iSCSI,FCoE,NIC
    Port 2 (p2): NIC,FCoE,NIC,NIC
    Port 3 (p3): NIC,iSCSI,NIC,NIC
```

Note: (pN) labels are the port parameter names to use in the SetAdapterPortConfig command (e.g. p0=NIC, FCoE p1=NIC, iSCSI).

5.16.1.6 NIC+RoCE

```
>brcmhbacmd getadapterportconfig 00-00-c9-12-34-56
Number of Ports             : 4
Maximum FCoE Functions      : 4
Maximum iSCSI Functions     : 4
Mixed Mode I/O Allowed      : Yes
Concurrent Mode I/O Allowed : Yes
ROCE Functions Allowed      : Yes
RebootRequired              : No

Active Configuration
  Profile ID  : 21
```

```
  MC Type     : None
  SR-IOV State: disabled
  Port Assignments:
    Port 0: NIC+RoCE,None,None
    Port 1: NIC,None,None
    Port 2: NIC+RoCE,None,None
    Port 3: NIC,None,None

Reboot Configuration
  Profile ID  : 21
  MC Type     : None
  SR-IOV State: disabled
  Port Assignments:
    Port 0 (p0): NIC+RoCE,None,None
    Port 1 (p1): NIC,None,None
    Port 2 (p2): NIC+RoCE,None,None
    Port 3 (p3): NIC,None,None

Note: (pN) labels are the port parameter names to use in the SetAdapterPortConfig
command (e.g. p0=NIC, FCoE p1=NIC, iSCSI).
```

5.16.1.7 Default Output Format with a Disabled Port

If you have removed a port, the `GetAdapterPortConfig` output no longer displays a port number or port name for the removed port, since this information becomes unavailable. The port number is replaced with the word `Removed` in the default output or `N/A` in the tabular output.

Example

```
Number of Ports             : 2
Maximum FCoE Functions      : 1
Maximum iSCSI Functions     : 1
Mixed Mode I/O Allowed      : Yes
Concurrent Mode I/O Allowed : Yes
ROCE Functions Allowed      : Yes
RebootRequired              : No

Active Configuration
  Profile ID  : 23
  MC Type     : None
  SR-IOV State: disabled
  Port Assignments:
    Port 1: NIC, FCoE, None
    Removed: (p1) : None, None, None

Reboot Configuration
  Profile ID  : 23
  MC Type     : None
  SR-IOV State: disabled
  Port Assignments:
    Port 1 (p0): NIC, FCoE, None
    Removed: None, None, None

Note: (pN) labels are the port parameter names to use in the SetAdapterPortConfig
command (e.g. p0=NIC, FCoE p1=NIC, iSCSI).
```

5.16.1.8 Tabular Output Format with a Disabled Port

```
>brcmhbacmd setadapterportconfig 00-90-FA-41-22-F0

Active Configuration
  Profile ID  : 23
  MC Type     : None
  SR-IOV State: disabled

Port#    Func#   Protocol
 ------  ------  --------
    1       0     NIC
            2     FCoE
            4     None
    N/A     1     None
            3     None
            5     None

Reboot Configuration
  Profile ID  : 23
  MC Type     : None  (Available MC Types: vNIC1, SIMode, UFP)
  SR-IOV State: Disabled

  Port #  Func #  Protocol  Available Protocols for Function
  ------  ------  --------  ---------------------------------
  1 (p0)    0     NIC       NIC, NIC+RoCE
            2     iSCSI     None, NIC, iSCSI, FCoE
            4     FCoE      None, NIC, iSCSI, FCoE
            6     None      None, NIC
            8     None      None, NIC
            10    None      None, NIC
            12    None      None, NIC
            14    None      None, NIC
  N/A (p1)   1    None      None, NIC, NIC+RoCE
```

5.16.1.9 Default Output with Port Added Back

```
>brcmhbacmd getadapterportconfig 00-90-FA-41-22-F0

Number of Ports             : 2
Maximum FCoE Functions      : 1
Maximum iSCSI Functions     : 1
Mixed Mode I/O Allowed      : Yes
Concurrent Mode I/O Allowed : Yes
ROCE Functions Allowed      : Yes
RebootRequired              : No

Active Configuration
  Profile ID  : 23
  MC Type     : None
  SR-IOV State: Disabled
  Port Assignments:
    Port 1  : NIC, FCoE, None
```

```
    Disabled: None, None, None

Reboot Configuration
  Profile ID  : 23
  MC Type     : None
  SR-IOV State: Disabled
  Port Assignments:
    Port 1 (p0): NIC, FCoE, None
    Added (p1) : NIC, FCoE, None

Note:  (pN) labels are the port parameter names to use in the SetAdapterPortConfig
command (e.g. p0=NIC,FCoE p1=NIC,iSCSI).
```

5.16.1.10 Tabular Output with Port Added Back

```
>brcmhbacmd setadapterportconfig 00-90-FA-41-22-F0

Active Configuration
  Profile ID  : 23
  MC Type     : None
  SR-IOV State: Disabled

  Port#     Func#  Protocol
  -------   -----  --------
    1          0   NIC
               2   FCoE
               4   None
   N/A         1   None
               3   None
               5   None

Reboot Configuration
  Profile ID  : 23
  MC Type     : None  (Available MC Types: vNIC1, SIMode, UFP)
  SR-IOV State: Disabled

  Port#     Func#  Protocol  Available Protocols for Function
  -------   -----  --------  ---------------------------------
  1 (p0)       0   NIC       NIC, NIC+RoCE
               2   FCoE      None, NIC, iSCSI, FCoE
               4   None      None, NIC, iSCSI, FCoE
               6   None      None, NIC
               8   None      None, NIC
              10   None      None, NIC
              12   None      None, NIC
              14   None      None, NIC
  N/A (p1)     1   None      None, NIC, NIC+RoCE

Note: the port number for re-enabled ports will be available after system reboot.
```

5.16.2 GetLinkConfig

This command displays the active and configured link configuration IDs and lists the available link configurations (descriptions).

NOTE The link reconfiguration feature is available on only some OCe14000-series adapters.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
GetLinkConfig <MAC|WWPN>
```

Parameters

WWPN	The WWPN of any FCoE function on the adapter.
MAC	The MAC address of any NIC+RoCE or iSCSI function on the adapter.

Example

```
OCM: brcmhbacmd GetLinkConfig 00-90-fa-41-28-f0

Active Link ID:     19
Configured Link ID: 19

Available Link Configurations

ID Description
-- --------------------------------
19   1x40Gbps QSFP+ OCe14401-UX CNA
20   4x10Gbps SFP+ OCe14401-UX CNA
```

5.16.3 ListProfiles

This command shows a list of the available profile IDs and their descriptions for an adapter, including the currently active and configured profile IDs. This information helps to determine the appropriate profile ID to specify to the `ChangePersonality` and `SetAdapterPortConfig` commands required for RoCE and NIC-only configurations. The specific profiles listed may vary according to the adapter model.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
ListProfiles <MAC|WWPN>
```

Parameters

MAC	MAC address of any NIC, NIC+RoCE or iSCSI function on the adapter.
WWPN	WWPN of any FCoE function on the adapter.

Example

NOTE Different adapter models will have a different set of profiles.

```
>brcmhbacmd ListProfiles 00-00-c9-12-34-56
Active Profile ID:      23
Configured Profile ID:  23

Available Profiles
ID     Description
--  ---------------------------------

16    NIC
17    ISCSI initiator, no DIF
19    FCOE initiator + Target, with DIF
20    RoCE-1
21    RoCE-2
23    FCOE initiator + Target, no DIF
36    Mixed Storage, 25% ISCSI initiator only, 75% FCOE, no DIF
37    Mixed Storage, 50% ISCSI initiator only, 50% FCOE, no DIF
38    Mixed Storage, 75% ISCSI initiator only, 25% FCOE, no DIF
```

5.16.4 SetAdapterPortConfig (for OCe14000-Series Adapters)

This command can do the following:

- Configure the function protocol assignments for all ports on an OCe14000-series adapter.
- Restore the adapter to its factory default profile and settings.
- Enable or disable SR-IOV on the entire adapter.
- Remove a port when all functions are set to None, even if multichannel is enabled.

NOTE This command fails under the following conditions:

- Three storage protocols on a port are specified.
- Two of the same storage protocols on a port are specified.

- The number of ports and function protocol assignments specified in this command depend on the available ports and the multichannel and NPar states. A reboot is required to activate the new port configuration.

To support up to 16 functions on an adapter, ARI must be available on the system and the following conditions must be met:

- The system hardware, such as the motherboard and BIOS, must support ARI.
- ARI must be enabled in the system BIOS.
- The operating system must support ARI, such as Windows Server 2012 and later.
- The management tools you use must support ARI, such as OneCommand CNA Manager.

If these conditions are not met, although you may configure all 16 functions, only eight functions will be present and discovered by the OneCommand CNA Manager application after a reboot.

NOTE SR-IOV is not supported with RoCE or with multichannel configurations. For a Linux or VMware operating system, SR-IOV must be enabled on the system BIOS when NParEP is used. See the documentation that accompanied your Dell server for more information.

You cannot specify `Flex` for the *`mctype`* parameter of the `SetAdapterPortConfig` command. The only *`mctype`* parameter that can be specified on HP UMC-capable adapters is UMC, even though `Flex` is displayed in the output for the `GetAdapterPortConfig` and the `CMGetParams` commands as the multichannel type for HP adapters currently running in `Flex` mode.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
SetAdapterPortConfig <MAC|WWPN> defaults
```

or

```
SetAdapterPortConfig <MAC | WWPN> p0=fcnCfg [p1=fcnCfg] [p2=fcnCfg] [p3=fcnCfg]
[pid=ProfileID] [mctype=Type] [NParEpMode=State][sriov=SriovState]
```

Parameters

MAC	MAC address of any iSCSI, NIC or NIC+RoCE function on the adapter.
WWPN	WWPN of any FCoE function on the adapter.
defaults	Sets the adapter port configuration back to its factory default configuration. No additional parameters should be specified with the default parameter. For Dell adapters, this command resets virtual addresses to their factory defaults. A system reboot is required to activate the new settings.
p0=fcnCfg	First port's function
p1=fcnCfg	Second port's function (required for 2- and 4-port adapters)
p2=fcnCfg	Third port's function (required for 4-port adapters)
p3=fcnCfg	Fourth port's function (required for 4-port adapters)
fcnCfg	:: f0[,f1[,...fM]] where: — f0 – First function protocol on port (must be NIC or NIC+RoCE). — f1 – Second function protocol on port (optional). — f*m* – *M*th function protocol on port (optional). The number of functions per port (the value of *M*) is specific to the model and multichannel type.
pid=ProfileID	This parameter is required in the following instances: — When specifying a NIC-only personality — When specifying a NIC+RoCE personality — When more than one NIC profile is available Otherwise, this parameter must be omitted.

mctype=Type — Optional multichannel type specification. This parameter is required to enable multichannel. Specify None to disable multichannel. If you do not specify an mctype, no change to the configured multichannel type is made. Multichannel types are listed as follows:

Restrictions	Options: Type =
None	None
None	UMC (this option is not available for Lenovo System X or Dell)
Lenovo System X	vNIC1
Lenovo System X	SIMode
Lenovo System X	UFP
Dell	NPar

NParEpMode=State — NParEP Mode state (Dell only). This parameter can only be specified when mctype=NPar. See Section 5.16.6.3, NParEP Mode for more information.

0 = Disable, 1 = Enable sriov = SriovState (0 = disabled, 1 = enabled)

SriovState — SR-IOV state (0 = disabled, 1 = enabled)

Considerations

- The protocols specified by the f0–fm parameters are the names displayed by the `ShowProperties` command.
- If you are using `SIMODE` or `UFP` with OCe-14000-series adapters, the maximum number of channels is eight per port for 2-port adapters and four channels per port for 4-port adapters. If you are using `vNIC1`, the maximum number of channels is four channels per port for 2-port and 4-port adapters.
- The following rules apply when using this command with non-NPar multichannel enabled:
  - Do not add spaces before or after the equal sign (=) and commas (,) in the port specification. For example,
    `p0 = nic, iscsi`
    would cause an error.
  - The only choice for f0 is NIC or NIC+RoCE. Choices for f1 through f*m* are `None`, `iSCSI`, `FCoE` or `NIC`. `NIC` for f1 through f*m* can be specified only for multichannel configurations. Except for `NPar`, `iSCSI` and `FCoE` are limited to f1 and f2.
  - NIC+RoCE can be specified only as the f0 parameter with no other f parameters specified, and it cannot be specified with multichannel configurations. If NIC+RoCE is specified for any of the port functions, all other port function specifications must be NIC or NIC+RoCE. For example, a single NIC or NIC+RoCE function per port is all that is allowed. Also, NIC+RoCE can only be specified when *`mctype`*=none.
  - The number of functions (f) specified depends on the adapter model and configuration type; for example, non-multichannel, multichannel, RoCE, and NPar. If an incorrect number of functions is specified, an error is generated.
  - The *`pid`*=`ProfileID` option is required for NIC+RoCE configurations. If it is specified and the profile does not work with the specified port functions, an error is generated. When using a NIC-only profile, if more than one NIC profile exists, you must specify it. To determine how many NIC-only profiles are available, use the `ListProfiles` command. See Section 5.16.3, ListProfiles for more information.
  - f0 must always be specified. However, if the rest of the functions on a port can be set to None, they do not have to be specified. For example, p0=NIC, iSCSI p1=NIC, None could be specified as `p0=NIC, iSCSI p1=NIC`.
  - Storage protocols can be configured on f1 or f2 or both.
  - If *`mctype`* is specified, it must be an available multichannel type, or it must be set to `None` to disable multichannel. If it is not specified, the currently configured multichannel type (including None) remains unchanged.
  - If the functions being set to None are the last functions on a port, they do not need to be specified. For example, p0=NIC, iSCSI, None can be shortened to `p0=nic,iscsi`.

— NParEP mode can be specified only if the *mctype* parameter is set to NPar or if the currently configured multichannel type is NPar.
— NParEP support is available only on Dell 13G or newer systems.
— When disabling NPar (*mctype*=none), NParEP mode is automatically disabled.

Examples

The following table provides the locations of application examples.

One Storage Protocol Plus SR-IOV

```
>brcmhbacmd SetAdapterPortConfig 00-00-c9-12-34-56 p0=nic,iscsi p1=nic,fcoe
p2=nic,fcoe p3=nic sriov=1

>brcmhbacmd GetAdapterPortConfig 00-00-c9-12-34-56
Number of Ports              : 4
Maximum FCoE Functions       : 4
Maximum iSCSI Functions      : 4
Mixed Mode I/O Allowed       : Yes
Concurrent Mode I/O Allowed  : No
ROCE Functions Allowed       : Yes
RebootRequired               : Yes

Active Configuration
 Profile ID  : 37
 MCType      : None
 SR-IOV State: Disabled
 Port Assignments:
   Port 0: NIC,iSCSI
   Port 1: NIC,FCoE
   Port 2: NIC,iSCSI
   Port 3: NIC,FCOE

Reboot Configuration
  Profile ID : 37
  MCType     : None SR-IOV State: Enabled
  Port Assignments:
    Port 0 (P0): NIC,iSCSI
    Port 1 (P1): NIC,FCoE
    Port 2 (P2): NIC,FCoE
    Port 3 (P3): NIC,None

Note: (pN) labels are the port parameter names to use in the SetAdapterPortConfig
command (e.g. p0=NIC, FCoE p1=NIC, iSCSI).
```

Two Storage Protocols – 2 Ports

```
>brcmhbacmd SetAdapterPortConfig 00-00-c9-12-34-56 p0=nic,iscsi,fcoe p1=nic,fcoe

>brcmhbacmd GetAdapterPortConfig 00-00-c9-12-34-56
Number of Ports             : 2
Maximum FCoE Functions      : 4
Maximum iSCSI Functions     : 4
Mixed Mode I/O Allowed      : Yes
Concurrent Mode I/O Allowed : Yes
ROCE Functions Allowed      : Yes
RebootRequired              : Yes

Active Configuration
  Profile ID  : 33
  MCType      : None
  SR-IOV State: Disabled
  Port Assignments:
    Port 1: NIC,iSCSI,FCoE
    Port 1: NIC,iSCSI,FCoE

Reboot Configuration
  Profile ID  : 33
  MCType      : None
  SR-IOV State: Disabled
  Port Assignments:
    Port 1 (p0): NIC,iSCSI,FCoE
    Port 2 (p1): NIC,FCoE,None
```

Note: (pN) labels are the port parameter names to use in the SetAdapterPortConfig command (e.g. p0=NIC, FCoE p1=NIC, iSCSI).

RoCE

```
>brcmhbacmd SetAdapterPortConfig 00-00-c9-12-34-56 p0=nic+roce p1=nic p2=nic
p3=nic+roce pid=21
>brcmhbacmd GetAdapterPortConfig 00-00-c9-12-34-56
Number of Ports             : 4
Maximum FCoE Functions      : 4
Maximum iSCSI Functions     : 4
Mixed Mode I/O Allowed      : Yes
Concurrent I/O Mode Allowed : Yes
ROCE Functions Allowed      : Yes
RebootRequired              : Yes
Active Configuration
  Profile ID  : 37
  MCType      : None
  SR-IOV State: Disabled
  Port Assignments:
    Port 0: NIC,iSCSI,FCoE
    Port 1: NIC,FCoE,None
    Port 2: NIC,iSCSI,None
    Port 3: NIC,None,None

Reboot Configuration
  Profile ID  : 21
```

```
  MCType      : None
  SR-IOV State: Disabled
  Port Assignments:
    Port 0 (p0): NIC+RoCE,None,None
    Port 1 (p1): NIC,None,None
    Port 2 (p2): NIC,None,None
    Port 3 (p3): NIC+RoCE,None,None
```

```
Note: (pN) labels are the port parameter names to use in the SetAdapterPortConfig
command (e.g. p0=NIC, FCoE p1=NIC, iSCSI).
```

Enabling NPar with SR-IOV

```
>brcmhbacmd setadapterportconfig 00-90-fa-26-14-2a p0=nic,iscsi,fcoe,nic p1=nic,
iscsi,none,nic p2=nic,iscsi,nic,fcoe p3=nic,nic,iscsi,none mctype=npar
nparepmode=1 sriov=1

Successfully changed port configuration. A reboot is required to complete changes.
```

NOTE You can use the `GetAdapterPortConfig` command to display the SR-IOV state.

5.16.4.1 Multichannel Configurations

For additional information about universal multichannel, refer to the *Emulex Universal Multichannel Reference Manual*.

ARI must be available to support sixteen functions on an adapter. OCe14000-series adapters automatically support ARI. However, the system's motherboard must support ARI, ARI must be enabled in the system BIOS, and the operating system must support ARI. If these conditions are not met, although you can configure all sixteen functions, only eight functions will be present and detected by the OneCommand CNA Manager application after a reboot.

5.16.4.1.1 Enabling and Disabling Multichannel

The *`mctype`* parameter in the `SetAdapterPortConfig` command enables or disables multichannel on an adapter. This parameter is required to enable multichannel.

Disable multichannel on an adapter by setting *`mctype`* to `None`. When multichannel is enabled, the additional function protocols must be specified for the extra channels that are not available when multichannel is disabled.

NOTE The `CMMode` command that enables or disables multichannel on OCe11100-series adapters cannot be used on OCe14000-series adapters. If it is used, an error message is generated. Use the `SetAdapterPortConfig` command instead.

Examples

Enable Multichannel for UMC:

```
>brcmhbacmd SetAdapterPortConfig 00-00-c9-12-34-56 p0=nic,iscsi,nic,nic
p1=nic,fcoe,nic,nic p2=nic,fcoe,nic,nic p3=nic,iscsi,nic,nic mctype=umc
```

Disable Multichannel:

```
>brcmhbacmd SetAdapterPortConfig 00-00-c9-12-34-56 p0=nic,iscsi p1=nic,fcoe
p2=nic,fcoe p3=nic,iscsi mctype=none
```

5.16.4.1.2 Showing Multichannel Configuration

The `CMGetParams` command shows the current multichannel configuration for an adapter's physical port. See Section 5.5.1, CMGetParams for more information.

5.16.4.1.3 Setting Channel Protocols using SetAdapterPortConfig

Use the `SetAdapterPortConfig` command to configure the protocols running on the channels or functions.

The following rules apply when using `SetAdapterPortConfig` with non-NPar multichannel enabled:

- The first function must always be NIC; other functions can be None.
- If NIC+RoCE is specified on any port, all other ports must be either NIC or NIC+RoCE.
- Storage functions cannot be specified on adapters running NIC+RoCE.
- RoCE cannot be specified for any multichannel configurations.
- This command fails under the following conditions:
  - Three storage protocols are specified on a port.
  - The f2 and f3 storage protocols are the same.
- The optional *`mctype`* parameter can specify the multichannel type, or it can be set to `None` to disable multichannel. If the *`mctype`* parameter is not specified, the currently configured multichannel type is not changed.

NOTE You must reboot your system after running this command to run the new protocols assigned to the channels.

Examples

The following table provides the locations of application examples.

Enable UMC on 4-Port, 4 Channels per Port

```
>brcmhbacmd SetAdapterPortConfig 00-00-c9-12-34-56 p0=nic,iscsi,nic,nic
p1=nic,fcoe,nic,nic p2=nic,fcoe,nic,nic p3=nic,iscsi,nic,nic mctype=umc


Successfully changed port configuration. A reboot is required to complete changes.

>brcmhbacmd GetAdapterPortConfig 00-00-c9-12-34-56
Number of Ports             : 4
Maximum FCoE Functions      : 4
Maximum iSCSI Functions     : 4
Mixed Mode I/O Allowed      : Yes
Concurrent Mode I/O Allowed : No
ROCE Functions Allowed      : Yes
RebootRequired              : Yes

Active Configuration
  Profile ID  : 37
  MC Type     : UMC
  SR-IOV State: Disabled
  Port Assignments:
    Port 0: NIC,NIC,NIC,NIC
    Port 1: NIC,NIC,NIC,NIC
    Port 2: NIC,NIC,NIC,NIC
    Port 3: NIC,NIC,NIC,NIC
```

```
Reboot Configuration
  Profile ID  : 37
  MC Type     : UMC
  SR-IOV State: Disabled
  Port Assignments:
    Port 0 (p0): NIC,iSCSI,NIC,NIC
    Port 1 (p1): NIC,FCoE,NIC,NIC
    Port 2 (p2): NIC,FCoE,NIC,NIC
    Port 3 (p3): NIC,iSCSI,NIC,NIC


Note: (pN) labels are the port parameter names to use in the SetAdapterPortConfig
command (e.g. p0=NIC, FCoE p1=NIC, iSCSI).
```

Enable UMC on 2-Port, 8 Channels per Port

```
>brcmhbacmd SetAdapterPortConfig 00-00-c9-12-34-56
p0=nic,iscsi,fcoe,nic,nic,nic,nic,nic p

1= nic,fcoe,iscsi,nic,nic,nic,nic,nic mctype=UMC
Successfully changed port configuration. A reboot is required to complete changes.

>brcmhbacmd getadapterportconfig 00-00-c9-12-34-56
Number of Ports             : 4
Maximum FCoE Functions      : 4
Maximum iSCSI Functions     : 4
Mixed Mode I/O Allowed      : Yes
Concurrent Mode I/O Allowed : Yes
ROCE Functions Allowed      : Yes
RebootRequired              : Yes

Active Configuration
  Profile ID  : 37
  MC Type     : None
  SR-IOV State: Disabled
  Port Assignments:
    Port 0: NIC,iSCSI,FCoE
    Port 1: NIC,FCoE,iSCSI

Reboot Configuration
  Profile ID  : 37
  MC Type     : UMC
  SR-IOV State: Disabled
  Port Assignments:
    Port 0 (p0): NIC,iSCSI,FCoE,NIC,NIC,NIC,NIC,NIC
    Port 1 (p1): NIC,FCoE,iSCSI,NIC,NIC,NIC,NIC,NIC

Note: (pN) labels are the port parameter names to use in the SetAdapterPortConfig
command (e.g. p0=NIC, FCoE p1=NIC, iSCSI).
```

5.16.4.1.4 Setting Multichannel Bandwidths

See Section 5.5.3, CMSetBW for more information.

5.16.4.2 Removing a Port

NOTE Removed ports are not discovered by the `ListHba` command after a system reboot.

Channel management operations cannot be performed on a newly disabled port.

The following conditions generate error or warning messages (see Table 9 for a list of messages):

- Adding a port while enabling multichannel mode
- Attempting to remove a port on an unsupported adapter
- Setting the first function from the first port to none
- Setting the first function from a port other the first port to none

To remove a port on supported adapters, type the following command:

```
brcmhbacmd setAdapterPortConfig 00-90-fa-41-22-f0 p0=NIC p1=none pid=16
```

The following output is displayed:

```
Adapter configuration successfully set to new configuration.
System reboot required to activate it.
```

If you set the first function of a port other than the first port to `None`, you must either also set the rest of the functions from that port to `None`, or do not specify any other function (which will cause the remaining functions to be set to `None`). If you attempt to set any other function from this port to a protocol other than `None`, the attempt fails and the following error message is generated:

```
>brcmhbacmd setadapterportconfig 00-90-FA-41-22-F0 p0=nic,fcoe p1=none,fcoe

ERROR: If f0 is set to None, all functions on the port must be set to NONE.
ERROR: <4>: Invalid Argument
```

5.16.4.3 Adding a Port While Enabling Multichannel Mode

If you add a port back while also enabling multichannel mode, a warning message notifies you that multichannel properties can be set on this port only after a system reboot has been performed.

For example, if you type the following command:

```
brcmhbacmd setadapterportconfig 00-90-FA-41-22-F0 p0=nic,fcoe,nic,nic
p1=nic,fcoe,nic,nic mctype=umc
```

The following messages are displayed:

```
Adapter configuration successfully set to new configuration.
System reboot required to activate it.

The multichannel type has been changed. Be sure to use the additional
multichannel commands to set the other multichannel properties in order to
complete the configuration.

Multichannel properties can only be set on newly added ports after system
reboot.
```

5.16.4.4 Adding a Port While Operating in Multichannel Mode

If you add a port back while the adapter is currently running in `Multichannel` mode, a warning message notifies you that multichannel properties can be set on this port only after a system reboot has been performed.

For example, if you type the following command:

```
brcmhbacmd setadapterportconfig 00-90-FA-41-22-F0 p0=nic,fcoe,nic,nic
p1=nic,fcoe,nic,nic
```

The following messages are displayed:

```
Adapter configuration successfully set to new configuration.
System reboot required to activate it.

Multichannel properties can only be set on newly added ports after system
reboot.
```

5.16.5 Lenovo System X Multichannel for OCe14000-Series Adapters

For Lenovo System X multichannel configuration, three multichannel types are available: vNIC, SIMode, and UFP.

For vNIC, a maximum of four channels per port can be configured.

For SIMode and UFP, the maximum number of channels per port is shown in Table 8.

Table 8 SIMode and UFP Maximum number of functions per port

Number of Ports	Port Speed	Default Functions per Port	Maximum Functions per Port
1	10Gb/s	4	8
2	10Gb/s	4	8
4	10Gb/s	4	4
1	40Gb/s	4	16

5.16.6 Dell NPar Configurations

NOTE NParEP must be available to support sixteen functions on an adapter. OCe14000-series adapters automatically support NParEP. However, the system's motherboard must support NParEP, it must be enabled in the system BIOS, and the operating system must support NParEP. If these conditions are not met, although you are required to configure all sixteen functions, only eight functions will be present and detected by the OneCommand CNA Manager application after a reboot.

5.16.6.1 Enabling and Disabling NPar

Enable NPar by setting the *`mctype`* parameter in the `SetAdapterPortConfig` command to `NPar`. When you enable NPar, you must also specify the additional function protocols for the extra channels, or they will be set to `None`, meaning that there is no protocol running on the function.

Disable NPar by setting *`mctype`* to `None`.

NOTE The `CMMode` command that enables or disables multichannel on OCe11100-series adapters cannot be used to enable or disable NPar. Using the `CMMode` command to enable or disable NPar displays an

error message indicating that the command is not supported by the firmware or hardware.

When NPar is disabled, NParEP mode is automatically disabled as well. It is not necessary to specify the *nparepmode* parameter on the command line when disabling NPar (*mctype*=none), and an error is generated if this is attempted.

After enabling NPar with the SetAdapterPortConfig command, default bandwidths are automatically assigned to each partition with an assigned protocol. See Section 5.16.6.7, Default NPar Bandwidths for more information.

5.16.6.2 Showing NPar Configuration

The GetAdatperPortConfig command and the CMGetParams command show different aspects of the NPar configuration.

5.16.6.2.1 Showing NPar Configuration Using GetAdapterPortConfig

The GetAdatperPortConfig command displays all of the adapter's ports and the functions running on each port. It also shows the state of NParEP mode. See Section 5.16.1, GetAdapterPortConfig for more information.

Examples Using GetAdatperPortConfig

The following table provides the locations of application examples.

NPar Disabled – 2 Ports, NParEP Mode Disabled

```
>brcmhbacmd getadapterportconfig 00-00-c9-12-34-56
Number of Ports             : 4
Maximum FCoE Functions      : 4
Maximum iSCSI Functions     : 4
Mixed Mode I/O Allowed      : Yes
Concurrent Mode I/O Allowed : Yes
ROCE Functions Allowed      : Yes
RebootRequired              : No

Active Configuration
  Profile ID  : 16
  MC Type     : None
  SR-IOV State: Enabled
  Port Assignments:
    Port 1: NIC
    Port 2: NIC

Reboot Configuration
  Profile ID  : 16
  MC Type     : None
  SR-IOV State: Enabled
  Port Assignments:
    Port 1 (p0): NIC
    Port 2 (p1): NIC
```

```
Note: (pN) labels are the port parameter names to use in the SetAdapterPortConfig
command (e.g. p0=NIC, FCoE p1=NIC, iSCSI).
```

NPar Enabled – 2 Ports, NParEP Mode Enabled on Reboot

```
>brcmhbacmd getadapterportconfig 00-00-c9-12-34-56
Number of Ports             : 4
Maximum FCoE Functions      : 4
Maximum iSCSI Functions     : 4
Mixed Mode I/O Allowed      : Yes
Concurrent Mode I/O Allowed : Yes
ROCE Functions Allowed      : Yes
RebootRequired              : Yes

Active Configuration
  Profile ID  : 37
  MC Type     : NPAR
  SR-IOV State: Disabled
  Port Assignments:
    Port 1: NIC,iSCSI,FCoE,NIC
    Port 2: NIC,iSCSI,FCoE,NIC

Reboot Configuration
  Profile ID  : 37
  MC Type     : NPAR
  SR-IOV State: Disabled
  NParEP Mode : Enabled
  Port Assignments:
    Port 1 (p0): NIC,iSCSI,NIC,NIC,NIC,NIC,NIC,NIC
    Port 2 (p1): NIC,iSCSI,FCoE,NIC,NIC,NONE,NONE,NONE


Note: (pN) labels are the port parameter names to use in the SetAdapterPortConfig
command (e.g. p0=NIC, FCoE p1=NIC, iSCSI).
```

5.16.6.2.2 Showing NPar Configuration Using CMGetParams

The `CMGetParams` command shows the current NPar configuration for an adapter's physical port. When NPar is enabled, `CMGetParams` shows the function information such as the protocol and bandwidths. See Section 5.5.1, CMGetParams for more information.

When you are using NPar, this command displays the adapter's active (booted) mode as `NPar` or `None`, the configured mode as `NPar` or `None`, and the available management mode, which can only be `NPar`. This is followed by a table showing the specified port's functions and function properties. When `NPar` is active, the `Type` column shows the protocol that is running on each function.

Examples Using CMGetParams

The following table provides the locations of application examples.

NPar Disabled

```
>brcmhbacmd cmgetparams 00-00-c9-12-34-56
Active Mode:     None
Configured mode: None
Available modes: NPAR
```

NPar Enabled – 4 Partitions per Port

```
>brcmhbacmd cmgetparams 00-00-c9-12-34-56
Active Mode:     NPAR
Configured mode: NPAR
Available modes: NPAR

Func# Type  MAC Address       Min BW Max BW
----- ----- ----------------- ------ ------
0     NIC   00-00-c9-12-34-56   20     75
4     iSCSI 00-00-c9-12-34-57   60     100
8     FCoE  00-00-c9-12-34-58   40     100
12    NONE  00-00-c9-12-34-59   0      0
```

NPar Enabled – 8 Partitions per Port

```
>brcmhbacmd cmgetparams 00-00-c9-12-34-56
Active Mode:     NPAR
Configured mode: NPAR
Available modes: NPAR

Func# Type  MAC Address       Min BW Max BW
----- ----- ----------------- ------ ------
0     NIC   00-00-c9-12-34-56   10     50
2     iSCSI 00-00-c9-12-34-57   20     100
4     NIC   00-00-c9-12-34-58   10     50
6     FCoE  00-00-c9-12-34-59   30     100
8     NIC   00-00-c9-12-34-5A   10     50
10    NIC   00-00-c9-12-34-5B   10     50
12    NIC   00-00-c9-12-34-5C   10     50
14    NIC   00-00-c9-12-34-5C   0      50
```

5.16.6.3 NParEP Mode

For NPar adapters, you can change the total number of partitions displayed and configured on the adapter to 8 if NParEP mode is disabled, or to as many as16 if NParEP mode is enabled. Use the *nparepmode* parameter in the SetAdapterPortConfig command to enable or disable this property.

NOTE If NPar is disabled, NParEP mode is automatically disabled as well. It is not necessary to specify the nparepmode parameter on the command line when disabling NPar by setting the *mctype* parameter to None.

After enabling or disabling NParEP mode with the SetAdapterPortConfig command, default bandwidths are automatically assigned to each partition with an assigned protocol. See Section 5.16.6.7, Default NPar Bandwidths for more information.

Syntax

```
SetAdapterPortConfig <MAC | WWPN> p0=fcnCfg [p1=fcnCfg] [p2=fcnCfg] [p3=fcnCfg]
[pid=ProfileID] [mctype=Type] [NParEpMode=State][sriov=SriovState]
```

5.16.6.4 Parameters

MAC	MAC address of any iSCSI, NIC or NIC+RoCE function on the adapter.
WWPN	WWPN of any FCoE function on the adapter
defaults	Sets the adapter port configuration back its factory default configuration. No additional parameters should be specified with the defaults parameter.
p0=fcnCfg	First port's function
p1=fcnCfg	Second port's function (required for 2- and 4-port adapters)
p2=fcnCfg	Third port's function (required for 4-port adapters)
p3=fcnCfg	Fourth port's function (required for 4-port adapters)
fcnCfg	:: f0[,f1[,...f*M*]] where: — f0 – First function protocol on port (must be NIC or NIC+RoCE). — f1 – Second function protocol on port (optional). — f*m* – *M*th function protocol on port (optional). The number of functions per port (the value of *M*) are model and multichannel-type specific.
pid=ProfileID	This parameter is required when specifying a NIC-only or NIC+RoCE personality; otherwise, this parameter must be omitted.
mctype=Type	Optional multichannel type specification. This parameter is required to enable multichannel. Specify None to disable multichannel or NPar if you are using the NParEP mode. If you do not specify an mctype, no change to the configured multichannel type is made.
NParEpMode=State	NParEP Mode state (Dell only). This parameter can only be specified when mctype=NPar. See Section 5.16.6.3, NParEP Mode for more information. 1 = enables the NParEP Mode to display and configure 16 functions. 0 = disables the NParEP Mode to display and configure only 8 functions. sriov = SriovState (0 = disabled, 1= enabled

5.16.6.5 Setting NPar Function Protocols

When NPar is enabled, the protocols for additional functions on each port can be specified depending on the board model, the number of ports available on the adapter, and the NParEPMode setting. If protocols for additional functions are not specified, they are set to `None`. In other words, no protocol is running on the function. The `SetAdapterPortConfig` command configures the protocols running on each function.

After NPar mode is enabled with the `SetAdapterPortConfig` command, default bandwidths are automatically assigned to each partition with an assigned protocol. See Section 5.16.6.7, Default NPar Bandwidths for more information.

The following rules apply when using the `SetAdapterPortConfig` command with multichannel enabled to configure NPar:

- The first function on a port is always NIC. NIC+RoCE is not available when NPar is enabled.
- Storage can be configured only on the second, third, or fourth partitions. A total of two different storage protocols can be configured on a port.
- Any partition other than the first partition can be configured as `None`; that is, for no protocol.
- A reboot is required after executing this command to run the new protocols assigned to the functions.

Examples

The following table provides the locations of application examples.

4 Ports – NParEP Mode Disabled, 2 Functions per Port

```
>brcmhbacmd setadapterportconfig 00-00-c9-12-34-56 p0=nic,iscsi p1=nic,fcoe
p2=nic,fcoe p3=nic,iscsi mctype=npar nparepmode=0
Successfully changed port configuration. A reboot is required to complete changes.

>brcmhbacmd getadapterportconfig 00-00-c9-12-34-56
Number of Ports             : 4
Maximum FCoE Functions      : 4
Maximum iSCSI Functions     : 4
Mixed Mode I/O Allowed      : Yes
Concurrent Mode I/O Allowed : Yes
ROCE Functions Allowed      : Yes
RebootRequired              : Yes

Active Configuration
  Profile ID  : 16
  MC Type     : NPAR
  Port Assignments:
    Port 1: NIC,NIC
    Port 2: NIC,NIC
    Port 3: NIC,NIC
    Port 4: NIC,NIC

Reboot Configuration
  Profile ID  : 37
  MC Type     : NPAR
  NParEP Mode : Disabled
  Port Assignments:
    Port 1 (p0): NIC,iSCSI
    Port 2 (p1): NIC,FCoE
    Port 3 (p2): NIC,FCoE
    Port 4 (p3): NIC,iSCSI


Note: (pN) labels are the port parameter names to use in the SetAdapterPortConfig
command (e.g. p0=NIC, FCoE p1=NIC, iSCSI).
```

2 Ports – NParEP Mode-Disabled, 4 Functions per Port

```
>brcmhbacmd setadapterportconfig 00-00-c9-12-34-56 p0=nic,iscsi,nic,fcoe
p1=nic,fcoe,iscsi,nic mctype=npar nparepmode=0

Successfully changed port configuration. A reboot is required to complete changes.
```

```
>brcmhbacmd getadapterportconfig 00-00-c9-12-34-56
Number of Ports             : 2
Maximum FCoE Functions      : 2
Maximum iSCSI Functions     : 2
Mixed Mode I/O Allowed      : Yes
Concurrent Mode I/O Allowed : No
ROCE Functions Allowed      : Yes
RebootRequired              : Yes

Active Configuration
  Profile ID  : 16
  MC Type     : None
  Port Assignments:
    Port 1: NIC
    Port 2: NIC

Reboot Configuration
  Profile ID  : 33
  MC Type     : NPAR
  NParEP Mode : Disabled
  Port Assignments:
    Port 1 (p0): NIC,iSCSI,NIC,FCoE
    Port 2 (p1): NIC,FCoE,iSCSI,NIC
```

Note: (pN) labels are the port parameter names to use in the SetAdapterPortConfig command (e.g. p0=NIC, FCoE p1=NIC, iSCSI).

4 Ports – NParEPMode-Enabled, 4 Functions per Port

```
>brcmhbacmd setadapterportconfig 00-00-c9-12-34-56 p0=nic,iscsi,fcoe,nic
p1=nic,iscsi,none,nic p2=nic,iscsi,nic,fcoe p3=nic,nic,iscsi,none mctype=npar
nparepmode=1

Successfully changed port configuration. A reboot is required to complete changes.
>brcmhbacmd getadapterportconfig 00-00-c9-12-34-56
Number of Ports             : 4
Maximum FCoE Functions      : 4
Maximum iSCSI Functions     : 4
Mixed Mode I/O Allowed      : Yes
Concurrent Mode I/O Allowed : Yes
ROCE Functions Allowed      : Yes
RebootRequired              : Yes

Active Configuration
  Profile ID  : 33
  MC Type     : NPAR
  SR-IOV State: Disabled
  Port Assignments:
    Port 1: NIC,NIC,NIC,NIC
    Port 2: NIC,NIC,NIC,NIC
    Port 3: NIC,iSCSI,NIC,FCoE
    Port 4: NIC,iSCSI,FCoE,None

Reboot Configuration
```

```
Profile ID  : 33
MC Type     : NPAR
SR-IOV State: Disabled
NParEP Mode : Enabled
Port Assignments:
  Port 1 (p0): NIC,iSCSI,FCoE,NIC
  Port 2 (p1): NIC,iSCSI,None,NIC
  Port 3 (p2): NIC,iSCSI,NIC,FCoE
  Port 4 (p3): NIC,NIC,iSCSI,None
```

```
Note: (pN) labels are the port parameter names to use in the SetAdapterPortConfig
command (e.g. p0=NIC, FCoE p1=NIC, iSCSI).
```

5.16.6.6 Setting NPar Bandwidths

After enabling NPar with the `SetAdapterPortConfig` command, default bandwidths are set for each partition that is enabled. Use the `CMSetBW` command to configure new bandwidths if the default bandwidths are not acceptable. See Section 5.5.3, CMSetBW for more information.

NOTE A partition is referred to as a channel in the `CMSetBW` help.

The number of bandwidth combinations that need to be specified depend on the adapter model. See Section 5.16.1, GetAdapterPortConfig to determine how many bandwidths need to be specified for a port by looking at the number of functions indicated for each port number under `Reboot Configuration`. For example, if `Reboot Configuration` shows four functions for each port number, four sets of minimum and maximum bandwidths must be specified. If too many or too few minimum and maximum bandwidth combinations are provided, an error is generated.

The total of the minimum bandwidths for the enabled functions, such as partitions assigned protocols, must add up to 100.Although you can set the minimum bandwidths on some enabled functions to 0, you cannot set them all to 0.

The maximum bandwidth of a partition must be greater than or equal to the minimum bandwidth for that partition, up to a maximum of 100. The minimum and maximum bandwidths on disabled functions, those configured as `None`, must be 0.

NOTE A reboot is not required for bandwidth changes to take effect when channel management is enabled or when NPar is currently running on the adapter.

Setting the minimum and maximum bandwidths to zero does not bring the logical link down on the NPar function, or prevent receiving or transmitting packets on that function, because a small amount of network traffic still gets through.

5.16.6.7 Default NPar Bandwidths

After NParEP or NPar are enabled or disabled, the default bandwidths that are automatically assigned to each partition with an assigned protocol have minimum and maximum bandwidths. The default minimum bandwidths are set by dividing 100 by the number of partitions with assigned protocols to run on them. This can cause an uneven distribution if 100 is divided evenly by the number of partitions, meaning that the minimum bandwidth of some partitions may be one greater than others. The maximum bandwidth defaults to 100 for all partitions with assigned protocols.

NOTE If default bandwidths are not required, use the `CMSetBW` command to configure the minimum and maximum bandwidths. See Section 5.5.3, CMSetBW for more information.

Examples

The following table provides the locations of application examples.

4 Partitions per Port

```
>brcmhbacmd CMSetBW 00-00-c9-12-34-56 15,50 30,100 40,100 15,50
>brcmhbacmd CMGetParams 00-00-c9-12-34-56
Active mode:     NPAR
Configured mode: NPAR
Available modes: NPAR

Func# Type  MAC Address       Min BW Max BW
----- ----- ----------------- ------ ------
0     NIC   00-00-c9-12-34-56   15     50
1     iSCSI 00-00-c9-12-34-57   30     100
2     FCoE  00-00-c9-12-34-58   40     100
3     NIC   00-00-c9-12-34-59   15     50
```

4 Partitions per Port – Third and Fourth Partition Protocol = None

```
>brcmhbacmd CMSetBW 00-00-c9-12-34-56 50,100 60,100 0,0 0,0

>brcmhbacmd CMGetParams 00-00-c9-12-34-56
Active mode:     NPAR
Configured mode: NPAR
Available modes: NPAR

Func# Type  MAC Address       Min BW Max BW
----- ----- ----------------- ------ ------
0     NIC   00-00-c9-12-34-56   40     100
1     iSCSI 00-00-c9-12-34-57   60     100
2     None  00-00-c9-12-34-58   0      0
3     None  00-00-c9-12-34-59   0      0
```

8 Partitions per Port – 2 Port Adapter, NParEP Mode = Enabled, Last Channel MinBandwith = 0

```
>brcmhbacmd cmsetbw 00-00-c9-12-34-56 10,100, 30,100 10,100, 10,100, 10,100,
10,100, 10,100, 10,100

>brcmhbacmd cmgetparams 00-00-c9-12-34-56
Active mode:     NPAR
Configured mode: NPAR
Available modes: NPAR

Func# Type  MAC Address       Min BW Max BW
----- ----- ----------------- ------ ------
0     NIC   00-00-c9-12-34-56   10     100
```

```
1     iSCSI 00-00-c9-12-34-57   40     100
2     NIC   00-00-c9-12-34-58   10     100
3     NIC   00-00-c9-12-34-59   10     100
4     NIC   00-00-c9-12-34-5a   10     100
5     NIC   00-00-c9-12-34-5b   10     100
6     NIC   00-00-c9-12-34-5c   10     100
7     NIC   00-00-c9-12-34-5d   0      100
```

5.16.6.8 Configuring Ports When Disabling NPar

When NPar is being disabled, each of the ports can be configured to run with a single NIC or NIC+RoCE function. Use the `SetAdapterPortConfig` command to configure these ports. See Section 5.16.4, SetAdapterPortConfig (for OCe14000-Series Adapters) for more information.

Use the following syntax when disabling NPar:

```
SetAdapterPortConfig <MAC> <p0=NIC|NIC+RoCE> <p1=NIC|NIC+RoCE> [p2=NIC|NIC+RoCE]
[p3=NIC|NIC+RoCE] [pid=20|21]
```

where:

```
MAC               : MAC address of one of the NIC functions on the adapter
  p0=NIC|NIC+RoCE : Protocol to run on 1st port (NIC or NIC+RoCE)
  p1=NIC|NIC+RoCE : Protocol to run on 2nd port (NIC or NIC+RoCE)
  p2=NIC|NIC+RoCE : Protocol to run on 3rd port, if available (NIC or NIC+RoCE)
  p3=NIC|NIC+RoCE : Protocol to run on 2nd port, if available (NIC or NIC+RoCE)
  pid=20|21       : Required when setting any port to NIC+ROCE
                    (NIC+RoCE-1=20,NIC+RoCE-2=21)
```

NOTE When specifying any of the ports to run NIC+RoCE (for example, p1=RoCE), the RoCE Profile ID must be specified. It can be either 20 or 21 depending upon the preferred protocol. See Section 5.15.1, ChangePersonality for more information.

Examples

The following table provides the locations of application examples.

Disable NPar – 4 Ports, All NIC

```
>brcmhbacmd setadapterportconfig 00-00-c9-12-34-56 p0=nic p1=nic p2=nic p3=nic
mctype=none sriov=0

Successfully changed port configuration. A reboot is required to complete changes.
>brcmhbacmd getadapterportconfig 00-00-c9-12-34-56
Number of Ports             : 4
Maximum FCoE Functions      : 4
Maximum iSCSI Functions     : 4
Mixed Mode I/O Allowed      : Yes
Concurrent Mode I/O Allowed : Yes
ROCE Functions Allowed      : Yes
RebootRequired              : Yes
```

```
Active Configuration
  Profile ID  : 33
  MC Type     : NPAR
  SR-IOV State: Disabled
  Port Assignments:
    Port 1: NIC,iSCSI,FCoE,NIC
    Port 2: NIC,iSCSI,None,NIC
    Port 3: NIC,iSCSI,NIC,FCoE
    Port 4: NIC,iSCSI,FCoE

Reboot Configuration
  Profile ID  : 16
  MC Type     : None
  SR-IOV State: Disabled
  Port Assignments:
    Port 1 (p0): NIC
    Port 2 (p1): NIC
    Port 3 (p2): NIC
    Port 4 (p3): NIC

Note: (pN) labels are the port parameter names to use in the SetAdapterPortConfig
command (e.g. p0=NIC, FCoE p1=NIC, iSCSI).
```

2 Ports – Switching from All NIC to NIC+RoCE on First Port, RoCE Profile ID 21: RoCE-2

```
>brcmhbacmd setadapterportconfig 00-00-c9-12-34-56 p0=nic+roce p1=nic pid=21
mctype=none

Successfully changed port configuration. A reboot is required to complete changes.
>brcmhbacmd getadapterportconfig 00-00-c9-12-34-56
Number of Ports             : 2
Maximum FCoE Functions      : 2
Maximum iSCSI Functions     : 2
Mixed Mode I/O Allowed      : Yes
Concurrent Mode I/O Allowed : Yes
ROCE Functions Allowed      : Yes
RebootRequired              : Yes

Active Configuration
  Profile ID  : 16
  MC Type     : None
  SR-IOV State: Disabled
  Port Assignments:
    Port 1: NIC
    Port 2: NIC

Reboot Configuration
  Profile ID  : 21
  MC Type     : None
  SR-IOV State: Disabled
  Port Assignments:
    Port 1 (p0): NIC+RoCE
    Port 2 (p1): NIC
```

```
Note: (pN) labels are the port parameter names to use in the SetAdapterPortConfig
command (e.g. p0=NIC, FCoE p1=NIC, iSCSI).
```

5.16.7 SetLinkConfig

The `SetLinkConfig` command changes the configured link configuration ID. The command can change the link configuration ID to a specific ID or to the factory default ID. When the link configuration ID is successfully changed, a reboot is required to activate the new link configuration. If the `GetAdapterPortConfig` command is run after changing the link configuration ID, the `Reboot Configuration` displayed reflects the default port configuration for the newly configured link configuration ID. You can update this configuration before rebooting to avoid an additional reboot.

NOTE The link reconfiguration feature is available on only some OCe14000-series adapters.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
SetLinkConfig <MAC|WWPN> <LinkID|default>
```

Parameters

MAC	The MAC address of any NIC+RoCE or iSCSI function on the adapter.
WWPN	The WWPN of any FCoE function on the adapter.
LinkID	The ID of the link configuration to set (use `GetLinkConfig` for list of IDs).
default	Sets the link configuration ID of the adapter to the factory default ID.

NOTE Using the defaults option for the `SetAdapterPortConfig` command also changes the link configuration ID to the factory default ID.

Example

```
>brcmhbacmd setlinkconfig 00-00-c9-12-34-56 2
Link configuration successfully changed. A reboot is required to activate the new
link configuration. However, before rebooting you can run the
GetAdapterPortConfig and SetAdapterPortConfig commands to view or change the
default link configuration.
```

5.17 UMC Commands

The adapter's physical ports provide a converged conduit for network and storage traffic. Each channel has its own unique MAC address. Each channel provides traffic management capabilities, such as enabling and disabling, minium and maximum bandwidth, and VLAN ID (for untagged packets). For additional information on UMC, refer to the *Emulex Universal Multichannel Reference Manual*.

The CLI's UMC commands allow viewing of the UMC configuration, enabling and disabling of the UMC at the adapter level, and the modification of some of the channel properties. The UMC commands cannot be used to manage other channel management types; see Section 5.5, Channel Management Commands for more information.

Considerations

- SR-IOV is not supported with UMC.
- The UMC command `UmcSetChanLink` is no longer available. Its functionality can be performed by the `UmcSetBw` command by setting the min and max bandwidths to 0.
- For Lenovo System X adapters, UMC mode might be referred to as SIMode.
- The UMC commands are not available on OCe11101-EM/EX or OCe11102-EM/EX adapters. If you attempt to use UMC commands with these adapters, the following error is returned:

```
ERROR: <251>: Hardware or firmware does not support command.
```

5.17.1 UmcEnable

This command enables or disables UMC on OCe11100-series adapters at the adapter level. A system reboot is required to make the change take effect.

The `UmcEnable` command will enable only UMC channel management, but it will disable any other channel management type that is in effect when it is used.

The `CMMode` command can also be used to enable UMC or other channel management modes.

If you are using an OCe14000-series adapter, you must set the *`mctype`* parameter in the `SetAdapterPortConfig` command to enable UMC. See Section 5.16.4, SetAdapterPortConfig (for OCe14000-Series Adapters) for more information.

NOTE If you use the `UmcEnable` command on an OCe14000-series adapter, an error message indicates that the command is not supported by the firmware or hardware.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
UmcEnable <WWPN | MAC Address> <0 | 1>
```

Parameters

WWPN	WWPN of the FCoE function on the adapter.
MAC Address	MAC address of any NIC function on the adapter.
0	Disables UMC or SIMode
1	Enables UMC or SIMode

Example

```
>brcmhbacmd UmcEnable 00-00-c9-bb-cc-aa 1
```

5.17.2 UmcGetParams

NOTE This command has been replaced by the `CMGetParams` command, and it is provided for backward compatibility only for OCe11100-series adapters.

This command shows the current UMC configuration for an adapter's physical port. The command's output is the current UMC state for the adapter followed by a table showing the port's channels and their UMC properties. The `Type` property also shows the protocol that is running on the channel. This is controlled by the `ChangePersonality` and `SetAdapterPortConfig` commands, not by the UMC commands. See

Section 5.15.1, ChangePersonality and Section 5.16.4, SetAdapterPortConfig (for OCe14000-Series Adapters) for more information.

Consideration

If you specify a MAC address that belongs to a newly disabled port, an error message indicates that the operation cannot be performed on this port.

For example, if you type the following command:

```
>brcmhbacmd umcgetparams 00-90-FA-41-22-F0
```

The following error message is displayed:

```
ERROR: This port is configured to be removed after reboot. Channel
Management properties are unavailable.
```

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
UmcGetParams <WWPN | MAC Address>
```

Parameters

WWPN	WWPN of an FCoE function on the port.
MAC Address	MAC address of any NIC function on the port.

Example

All NIC

```
>brcmhbacmd UmcGetParams 00-00-c9-bb-cc-aa

Active UMC State:       Enabled
Configured UMC State:   Enabled

Func# Type  MAC Address          LPVID  Min BW  Max BW
----- ----  -----------------    -----  ------  ------
0     NIC   00-00-c9-bb-cc-aa      2       25      50
1     NIC   00-00-c9-bb-cc-ab      3       0       0
2     NIC   00-00-c9-bb-cc-ac      4       25      50
3     NIC   00-00-c9-bb-cc-ad      5       50      75
```

NIC Plus Storage

```
>brcmhbacmd UmcGetParams 00-00-c9-bb-cc-aa

Active UMC State:       Enabled
Configured UMC State:   Enabled

Func# Type  MAC Address          LPVID  Min BW  Max BW
----- ----  -----------------    -----  ------  ------
0     NIC   00-00-c9-bb-cc-aa     1001    20      50
1     FCoE  00-00-c9-bb-cc-ab     n/a     50      100
2     NIC   00-00-c9-bb-cc-ac     1002    20      50
3     NIC   00-00-c9-bb-cc-ad     1003    10      75
```

5.17.3 UmcSetBW

NOTE This command has been replaced by the `CMSetBW` command, and it is provided for backward compatibility only for OCe11100-series adapters.

This command sets the minimum and maximum bandwidths for each channel (up to four) on the physical port. This command can also be used to disable the link on a channel by setting the minimum and maximum bandwidths of that channel to 0.

The total of the minimum bandwidths must add up to 100. An exception to this rule is for UMC/SIMODE configurations, in which both the minimum and maximum bandwidth for all channels are 0, effectively bringing the logical link down on all channels. The maximum bandwidth must have a value greater than or equal to the minimum bandwidth, and it must have a maximum value of 100.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
UmcSetBW <WWPN | MAC Address> <Min0,Max0> <Min1,Max1> <Min2,Max2> [Min3,Max3]
```

Parameters

MAC Address	MAC address of any NIC function on the port.
WWPN	WWPN of the FCoE function on the port.
Min0,Max0	Minimum and maximum bandwidths for channel 0.
Min1,Max1	Minimum and maximum bandwidths for channel 1.
Min2,Max2	Minimum and maximum bandwidths for channel 2.
Min3,Max3	Minimum and maximum bandwidths for channel 3.

Example

```
>brcmhbacmd UmcSetBW 00-00-c9-bb-cc-aa 25,50 0,50 50,75 25,100
```

Considerations

- This command is not supported on 1 Gb/s ports.
- If UMC is disabled when this command is executed, a warning message indicates that UMC is currently disabled and it must be enabled for these changes to take effect.
- If you specify a MAC address that belongs to a newly disabled port, an error message indicates that the operation cannot be performed on this port.

  For example, if you type the following command:

  ```
  >brcmhbacmd UmcSetBW  00-90-FA-41-22-F0 25,100 25,100 25,100 25,100
  ```

  The following message is displayed:

  ```
  ERROR: This port is configured to be removed after reboot. Bandwidth values
  can only be set on ports that will be available after reboot.
  ```

5.17.4 UmcSetLPVID

NOTE This command has been replaced by the `CMSetLPVID` command, and it is provided for backward compatibility only for OCe11100-series adapters.

This command sets the LPVID values for the UMC and SIMode NIC channels. Use the `UmcGetParams` command to determine the number of LPVIDs required. See Section 5.17.2, UmcGetParams for more information.

A reboot is not required for these changes take effect when UMC is enabled.

NOTE If the current multichannel mode is not UMC or SIMode, the `UmcSetLPVID` command fails.

If you specify a MAC address that belongs to a newly disabled port, an error message indicates that the operation cannot be performed on this port.

For example, if you type the following command:

```
>brcmhbacmd UmcSetLPVID 00-90-FA-41-22-F0 2 3 4 5 6 7 8 9
```

The following message is displayed:

```
ERROR: This port is configured to be removed after reboot. LPVID values can
only be set on ports that will be available after reboot.
```

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
UmcSetLPVID <WWPN|MAC> <LPVID0> <LPVID1> ... [LPVIDn]
```

Parameters

WWPN	WWPN of an FCoE function on the port.
MAC	MAC address of any NIC or iSCSI function on the port.
LPVID0	LPVID for channel 0.
LPVID1	LPVID for channel 1.
LPVIDn	LPVID for channel n.

Considerations for Using UmcSetLPVID

- LPVID values are in the range of 2 to 4094.
- Every NIC channel on a physical port must have a unique LPVID.
- For FCoE and iSCSI channels, 0 must be entered because LPVIDs can be specified only for NIC channels.
- LPVIDs specified for channels with protocols set to `None` are ignored.
- This command is not supported on 1 Gb/s ports.
- If channel management is disabled when this command is executed, an error message is displayed.

Examples

All NIC Channels

```
>brcmhbacmd UmcSetLPVID 00-00-c9-12-34-56 1001 1002 1003 1004
```

Storage on second Channel

```
>brcmhbacmd UmcSetLPVID 00-00-c9-12-34-56 1001 0 1002 1003
```

5.18 vPort Commands

The vPort Commands group manages virtual ports and functions only on FCoE adapters.

These commands are only supported for FCoE adapter functions.

NOTE In Linux, vPorts do not persist across system reboots. vPorts must be re-created after a system reboot.

5.18.1 CreateVPort

This command creates a virtual port with an automatically generated WWPN or a user-specified virtual WWPN on the specified physical port. If you specify `auto`, the virtual WWPN is generated automatically. Otherwise, you must specify the virtual WWPN for this parameter. If creation is successful, the WWPN is displayed as part of the output from the command. The *vname* optional parameter can be specified for the virtual port's name.

Supported By

Linux, Solaris, and Windows

Syntax

```
CreateVPort <physical WWPN> auto [vname]
```

-or-

```
CreateVPort <physical WWPN> <virtual WWPN> <virtual WWNN> [vname]
```

Parameters

physical WWPN	The WWPN of an FCoE function.
auto	The virtual WWPN is automatically generated for the virtual port.
vname	The virtual port's name (optional).
virtual WWPN	The virtual WWPN to create.
virtual WWNN	The virtual WWNN to create.

5.18.2 DeleteVPort

This command deletes the virtual port specified by a physical and virtual WWPN.

Supported By

Linux, Solaris, and Windows

Syntax

```
DeleteVPort <physical WWPN> <virtual WWPN>
```

Parameters

physical WWPN	The WWPN of an FCoE function.
virtual WWPN	The WWPN of the virtual port.

5.18.3 ListVPorts

This command lists virtual ports on the specified physical FCoE function. Leaving the physical WWPN parameter blank lists all virtual ports on all manageable hosts that support virtual ports.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
ListVPorts <physical WWPN>
```

Parameters

physical WWPN	The WWPN of an FCoE function.

5.18.4 VPortTargets

This command lists targets visible to the specified virtual port.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
VPortTargets <physical WWPN> <virtual WWPN>
```

Parameters

physical WWPN	The WWPN of an FCoE function.
virtual WWPN	The WWPN of the virtual port.

5.19 WWN Management Commands

NOTE These commands are supported only for FCoE functions.

The WWN Management Commands group validates WWNs carefully to avoid WWPN duplication, but WWNN duplication is acceptable. You might see error and warning messages if a name duplication is detected. Fulfill the activation requirement after each WWN is changed or restored. If pending changes exist, some diagnostic and maintenance features are not available.

5.19.1 ChangeWWN

This command allows you to change WWPNs and WWNNs, and it allows you to change the WWN to volatile or nonvolatile. If you attempt to select volatile on an adapter that does not support volatile WWNs, a `Not Supported` error is returned.

When a volatile change is supported, a reboot is required to activate the new value. Volatile names are active until system power-down or adapter power-cycle.

For VMware ESXi:

- After changing the WWN of a function, update your zoning settings before you reboot your ESXi server. If the zoning is not updated before your reboot, the subsequent boot could take a long time.
- After changing the WWN of a function, you must reboot the ESXi system before trying to access the adapter on that system. For information on rebooting the ESXi system, refer to the VMware documentation.
- If you are using the CIM interface to access functions, after changing the WWN of a function, you must restart the CIMOM (that is, SFCB) on the ESXi system before trying to access the function on that system. For information on restarting the CIMOM, refer to the VMware documentation.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
ChangeWWN <WWPN> <New WWPN> <New WWNN> <Type>
```

Parameters

WWPN	The WWPN of an FCoE function.
New WWPN	The WWPN of the FCoE function.
New WWNN	The WWNN of an FCoE function.
Type	0 = Volatile 1 = Nonvolatile

5.19.2 GetWWNCap

This command shows if volatile change is supported for the WWPN.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
GetWWNCap <WWPN>
```

Parameters

WWPN	The WWPN of an FCoE function.

5.19.3 ReadWWN

This command reads different types of WWNs.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
ReadWWN <WWPN> <Type>
```

Parameters

WWPN	The WWPN of an FCoE function.

Type	0 = Volatile 1 = Nonvolatile 2 = Factory default 3 = Current 4 = Configured

5.19.4 RestoreWWN

This command changes the WWNs to the factory default or non-volatile values. The change is non-volatile.

NOTE A reboot is required to activate the new value.

For VMware ESXi:

- After changing the WWN of an function, you must reboot the ESXi system before trying to access the adapter on that system. For information on rebooting the ESXi system, refer to the VMware documentation available from the VMware website.
- If you are using the CIM interface to access adapters, after changing the WWN of a function, you must restart the CIMOM (that is, SFCB) on the ESXi system before trying to access the function on that system. For information on restarting the CIMOM, refer to the VMware documentation available from the VMware website.

Supported By

Linux, Solaris, Windows, and Windows + CIM Provider on a VMware host

Syntax

```
RestoreWWN <WWPN> <Type>
```

Parameters

WWPN	The WWPN of an FCoE function.
Type	0 = Restore default WWNs 1 = Restore NVRAM WWNs

Appendix A: OneCommand CNA Manager Error Messages

Table 9 contains a list of some of the error messages that may be encountered during a OneCommand CNA Manager session.

Table 9 OneCommand CNA Manager Error and Warning Messages

Error Message	Command	Description
`Error: Read-only management mode is currently set on this host. The requested command is not permitted in this mode.`	Active management commands that change a property on an adapter or host.	This message is returned when some commands are attempted when the CLI is configured for read-only mode. See Section 4.1.1, CLI in Read-Only Mode.
`ERROR: <180>: Authentication: User unknown`	All	The specified user name is not valid or could not be authenticated by the system. See Section 1.2, OneCommand CNA Manager Secure Management, for more information.
`ERROR: <181>: Authentication: Insufficient credentials`	All	The specified user name and password are valid and the user is a member of an OneCommand CNA Manager group. However, the OneCommand CNA Manager group does not have sufficient privileges to execute the specified command. See Section 1.2, OneCommand CNA Manager Secure Management, for more information.
`ERROR: <183>: Secure Mgmt: user not a member of OCM group`	All	The specified user name and password could be authenticated, but the user is not a member of an OneCommand CNA Manager group. See Section 1.2, OneCommand CNA Manager Secure Management, for more information.
`ERROR: <206>: Authentication Failed`	All	This indicates either a valid user name with an invalid password, or a general user authentication error. See Section 1.2, OneCommand CNA Manager Secure Management, for more information.
`Not supported.`	`ChangeWWN`	If a volatile change is requested on an adapter that does not support volatile WWNs, it returns a `Not Supported` error. See Section 5.19.1, ChangeWWN.
`ERROR: This port is configured to be removed after reboot. Channel Management properties are unavailable.`	`CMGetParams` `UmcGetParams`	If you specify a MAC address that belongs to a newly disabled port, an error message will be displayed indicating that the operation cannot be performed on this port. See Section 5.5.1, CMGetParams.

`ERROR: This port is configured to be removed after reboot. Bandwidth values can only be set on ports that will be available after reboot.`	`CMSetBW`
	`UmcSetBW`
	`UmcSetLPVID`
		If you specify a MAC address that belongs to a newly disabled port, this error message is displayed indicating that the operation cannot be performed on this port. See Section 5.5.3, CMSetBW, and Section 5.17, UMC Commands.

`ERROR: This port is configured to be removed after reboot. LPVID values can only be set on ports that will be available after reboot.`	`CMSetLPVID`	If you specify a MAC address that belongs to a newly disabled port, an error message will be displayed indicating that the operation cannot be performed on this port. See Section 5.5.4, CMSetLPVID.
`ERROR: Download Failed due to invalid firmware digital signature. Please contact customer support for additional help.` `ERROR: <203>: Failed validating firmware digital signature`	`Download`	If you attempt to update unauthenticated firmware for a secure OCe14000B-series adapter, this error message is displayed. See Section 5.13.4, Download.

Table 9 OneCommand CNA Manager Error and Warning Messages (Continued)

Error Message	Command	Description
ERROR: Download Failed due to missing digital signature in firmware file. Please contact customer support for additional help. ERROR: <209>: Firmware digital signature missing	Download	If you attempt to update unsecured firmware for a secure OCe14000B-series adapter, this error message is displayed. See Section 5.13.4, Download.
Warning: SR-IOV is not enabled at an adapter-wide level. Run the SetAdapterPortConfig command in order to enable SR-IOV on all NIC functions.	GetAdapterPortConfig	This message is displayed following the normal output of the GetAdapterPortConfig command indicating that not all NIC functions have SR-IOV enabled.
ERROR: <222>: DCB not available	GetDCBParams SetDCBParam GetPGInfo SetDCBPriority SetCnaPGBW	These commands are not available on OCe11101-EM/EX or OCe11102-EM/EX adapters. See Section 5.6, DCB Commands.
ERROR: HBACMD_GetDumpFile: RM_GetDumpFile call failed (2) ERROR: <2>: Not Supported	GetDumpFile	Dump files are copied from the Dump directory of the remote host to the Dump directory of the local host. Specifying a local port identifier for this command returns an error, because the source and destination directory are the same. See Section 5.9.4, GetDumpFile.
ERROR: The Adapter does not support Port Removal. F0 cannot be set to NONE. ERROR: The specified function cannot be set to NONE. ERROR: <4>: Invalid Argument	SetAdapterPortConfig	These error messages are generated if you attempt to remove a port on an unsupported adapter. See Section 5.16.4.2, Removing a Port.
ERROR: Invalid f0 parameter. Must be NIC or NIC+RoCE. ERROR: The specified function cannot be set to NONE. ERROR: <4>: Invalid Argument	SetAdapterPortConfig	These error messages are generated if you attempt to set the first function from the first port to None. See Section 5.16.4.2, Removing a Port.
ERROR: If f0 is set to None, all functions on the port must be set to NONE. ERROR: <4>: Invalid Argument	SetAdapterPortConfig	These error messages are generated if you attempt to set the first function from a port other than the first port to None. See Section 5.16.4.2, Removing a Port.
Adapter configuration successfully set to new configuration. System reboot required to activate it. The multichannel type has been changed. Be sure to use the additional multichannel commands to set the other multichannel properties in order to complete the configuration. Multichannel properties can only be set on newly added ports after system reboot.	SetAdapterPortConfig	If you add a port back while also enabling multichannel mode, a warning message is displayed to notify you that multichannel properties can only be set on this port after a system reboot has been performed. See Section 5.16.4.3, Adding a Port While Enabling Multichannel Mode.

Table 9 OneCommand CNA Manager Error and Warning Messages (Continued)

Error Message	Command	Description
`Error: <431> Cable length required for force mode and interface type`	`SetPhyPortSpeed`	This error is displayed when a length value is not included when the mode is set to 2. Example: `brcmhbacmd setphyportspeed 00-00-c9-a9-41-88 2 100Mb` See Examples.

`There are no license features for this adapter`	`ShowLicenseAdapterID`
	`InstallAdapterLicense`
	`ShowAdapterLicenseFeatures`
		Adapter License Management commands are not available on OCe11101-EM/EX or OCe11102-EM/EX adapters. See Section 5.2, Adapter License Management Commands.

`ERROR: <251>: Hardware or firmware does not support command.`	`SRIOVEnable`
	`UmcEnable`
	`UmcGetParams`
	`UmcSetBW`
	`UmcSetLPVID`
	`SetPhyPortSpeed`
		These commands are not available on OCe11101-EM/EX or OCe11102-EM/EX adapters. See Section 5.13.14, SRIOVEnable, Section 5.17, UMC Commands, and Section 5.3.5, SetPhyPortSpeed.

`Hardware Does Not Support`	`VEPAEnable`	VEPA Management is only supported for OCe1400x NIC ports that have SR-IOV enabled. For all other board types and port types, this feature is undefined. See Section 5.13.16, VEPAEnable.
`ERROR: <223>: VEPA is only settable on NIC ports when the reboot configuration is non-multichannel and SR-IOV is enabled.`	`VEPAEnable`	When the next boot configuration does not have SR-IOV enabled or multichannel is enabled, this error message is displayed.

Appendix B: License Notices

B.1 Secure Hash Algorithm (SHA-1) Notice

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