BROADCOM®

OneCommand Manager Command Line Interface

User Manual

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Chapter 1: Introduction

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

The OneCommand Manager application can be installed on multiple operating systems: Windows®, Linux®, Solaris®, and VMware® ESXi.

For VMware ESXi hosts, you can manage adapters using the OneCommand Manager CLI on Windows, but you must install and use the appropriate Broadcom 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 disable), use the OneCommand Manager for VMware vCenter Server. For more details, see the *OneCommand Manager for VMware vCenter User Manual*.

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

1.1   Abbreviations

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
FC	Fibre Channel
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 System Interface
ISID	initiator session identifier
iSNS	Internet Storage Name Service
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	non-volatile random access memory
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 System 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 Multi-Channel
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 Manager Secure Management

OneCommand 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 Manager CLI. When users are authenticated, only they can perform the functions allowed by the OneCommand Manager user group to which they belong. If your systems are running in an LDAP or Active Directory domain, the OneCommand Manager CLI will authenticate the user with those defined in that domain. For Linux and Solaris systems, this is accomplished using PAM.

> **NOTE**   OneCommand Manager Secure Management is supported on Linux, Solaris, and Windows, but 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 Manager user groups. The user groups define the management capabilities for the user. Table 1 defines the OneCommand Manager user groups and each group's management capabilities.

Table 1 Secure Management User Privileges

Group Name	OneCommand 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 a user can belong to the administrator group or be the root user, they will not have full privileges to run the OneCommand Manager unless they are also a member of the ocmadmin group. Otherwise, when secure management is enabled, a root user or 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 Manager secure management status of the machines, and the domains to which the machines belong. The following tables, Table 2 on page 10, Table 3 on page 11, and Table 4 on page 11 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 username 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 Manager Secure Management Configuration Requirements

For systems to run in the OneCommand 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 Manager Secure Management must be able to access the OneCommand 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 Manager group names are listed with their member users, the system is ready to use OneCommand Manager secure management.

1.3   Secure Management Installation

The enabling or disabling of the Secure Management feature is specified at OneCommand 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 Manager groups described in the previous section (see Table 1 on page 10) are not configured on the machine at the time of the OneCommand Manager installation, the installation will fail when the secure management feature is selected.

> **NOTE**   Only a user with Administrator/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 Manager installations performed in interactive mode ask if OneCommand 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 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 Manager installations performed in unattended mode provide a switch option to enable OneCommand Manager Secure Management. If the OneCommand Manager Secure Management switch is not used with the installation, Secure Management is disabled.

1.3.2 Windows

During OneCommand 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 Linux and Solaris:

1. Log on as root.
2. Set secure management:
   — To set Secure Management Mode for Linux, type the following command:

   ```
   # /usr/sbin/ocmanager/set_operating_mode
   ```
   — To set Secure Management Mode for Ubuntu 14, type the following command:

   ```
   # /opt/emulex/ocmanager/scripts/set_operating_mode.sh
   ```
   — To set Secure Management Mode for Solaris, type the following command:

   ```
   # /opt/ELXocm/ocmanager/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 Manager with Secure Management Enabled

To run the OneCommand 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:

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

For example

```
>hbacmd 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 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 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 Manager CLI on Linux operating systems. You can install Linux with or without an existing OneCommand CLI kit. Additionally, you can install the OneCommand Manager CLI for Citrix®-based operating systems.

2.1.1 Citrix

Citrix is based on CentOS® Linux, however, for the OneCommand Manager CLI, Citrix is more comparable to VMware –, a hypervisor-style server for managing virtual machines. The Citrix XenServer® 6.2 operating system contains the OneCommand Manager CLI application; no additional installation is required. Citrix XenServer 6.0, 6.1, 6.5, and 7.0 operating systems require the OneCommand Manager CLI installation.

> **NOTE** Updated versions of OneCommand Manager CLI for Citrix XenServer are available as part of the Device Update Driver kit for Citrix XenServer 5.6 SP2 and Citrix XenServer 6.0. For the latest kit, go to http://www.broadcom.com.

2.1.2 Installing in Linux Without an Existing OneCommand CLI Kit

> **NOTE** For Secure Management, prior to installation, OneCommand groups must be configured on the LDAP network or the local host machine for Secure Management operation. Section 1.2.1, OneCommand Manager Secure Management Configuration Requirements on page 11 for configuration instructions.

2.1.2.1 Linux OneCommand Manager Requirements

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

2.1.2.1.1 Libnl Library

On RHEL 5.5 and later and RHEL 6 and later, the OneCommand Core rpm file requires the Libnl library. This library is not installed by default, but can be obtained from the operating system distribution media.

- For i386 RHEL 5.5, RHEL 5.6, and RHEL 6, use the 32-bit libnl library.
- For x86_64 RHEL 5.5, RHEL 5.6, and RHEL 6, use the 64-bit libnl library.
- For PPC RHEL 5.5, use the 32-bit libnl library.
- For PPC RHEL 6 and later, use the 64-bit libnl library.

2.1.2.1.2 libhbaapi Library

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

3. Copy the applications kit tar file to a directory on the installation machine.
4. Change to the directory where you copied the tar file.

5. Untar the file:

```
tar zxvf elxocmcore-<supported_os>-<app_ver>-<rel>.tgz
```

6. Change to the core kit directory created in step 3.

```
cd elxocmcore-<supported_os>-<app_ver>-<rel>
```

7. 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:

- elxocmlibhbaapi-*.rpm (on 64-bit platforms that support 32-bit applications, there are two of these files)
- elxocmcore-*.rpm
- elxocmcorelibs-*.rpm

8. 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**, an additional prompt is given for the management mode:

```
You selected: Secure Management Disabled
Select desired mode of operation for OneCommand 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 non-interactive (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 Manager core kit cannot be installed if a previous version of the HBAnyware utility is installed.

There are two options for installing the OneCommand 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 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 on page 14. 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 Manager 5.1 or later core kit. You must uninstall previous versions of the HBAnyware utility before installing a OneCommand Manager core kit. For information on uninstalling older versions of HBAnyware, see Section 2.1.5, Uninstalling Older HBAnyware Kits in Linux on page 17.

2.1.3.2 Performing a Clean Install (Removing Existing Settings)

1. Uninstall the existing OneCommand Manager CLI using the uninstall script included in the tar file or in /usr/sbin/ocmanager/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/ocmanager/scripts/uninstall.sh
   ```

   NOTE If an HBAnyware CLI or enterprise kit is installed, follow the procedure for Section 2.1.5, Uninstalling Older HBAnyware Kits in Linux on page 17.

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 on page 14.

2.1.4 Uninstalling in Linux

To uninstall the OneCommand Manager CLI in Linux:

1. Log on as root.
2. Perform one of the following tasks:
   — Run the uninstall_ocmanager.sh script located in /usr/sbin/hbanyware/scripts.
   — Run the uninstall.sh script located in the installation tar file.

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

   ```
   /opt/emulex/ocmanager/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 Manager CLI on Solaris operating systems.

2.2.1 Installing in Solaris

NOTE   For Secure Management, prior to installation, OneCommand groups must be configured on the LDAP network or the local host machine for Secure Management operation. Section 1.2.1, OneCommand Manager Secure Management Configuration Requirements on page 11 for configuration instructions.

To install the OneCommand Manager CLI in Solaris:

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

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

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

```
cd ./elxocmcore-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 core kit
— OneCommand Manager application enterprise kit
— Solaris driver 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 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 Manager CLI in Solaris:

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

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

> **NOTE**   The uninstall script can also be run in non-interactive (quiet) mode.
> Enter the following command to view the syntax:
>
> `./uninstall --help`

2.3   VMware ESXi

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

2.4   Windows

The following instructions are for installing and uninstalling the OneCommand Manager CLI on Windows operating systems. If you are installing the OneCommand Manager CLI on Windows operating systems, you can use an attended installation or an unattended installation.

2.4.1   Installing in Windows

There are two ways to install the OneCommand 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.

2.4.1.1   Attended Installation

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

Use the following syntax for the installation executable file:

`elxocmcore-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:

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

2.4.1.2   Unattended Installation

To install the OneCommand Manager CLI in Windows unattended:

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

2. Use the following syntax for the installation executable file:
   ```
   elxocmcore-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. You can enable Secure Management Mode by adding the sec=1 argument or disable it by sec=0. If the sec argument is not entered, Secure Management is disabled by default. See "OneCommand Manager Secure Management" on page 10 for more information.

   To enable Secure Management, at the command prompt, type the following command:
   ```
   elxocm-windows-<arch>-kit version>.exe sec=1 /q2
   ```
   To disable Secure Management, at the command prompt, type the following command:
   ```
   elxocm-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. You can select a Management Mode by adding the mmode argument and the ability to change that Management Mode by adding the change 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:
   ```
   elxocm-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 non-management-host user to select whether the OneCommand 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 non-management host options is selected, you can enter the TCP/IP port number on the command line.

2.4.2   Uninstalling in Windows

There are two ways to uninstall the OneCommand Manager CLI in Windows:

- Through the control panel
- Through the command line

2.4.2.1   Uninstalling through the Control Panel

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

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

The **Emulex OCManager CLI** components are removed from the system.

2.4.2.2   Uninstalling through the Command Line

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

1. Change to the appropriate uninstall directory:

    ```
    cd <Install Location>\Emulex\Util\Uninstall
    ```
2. Type the following command:

    ```
    uninstall_OCManager_Core.bat
    ```

2.4.3   Starting and Stopping Daemon Processes for Linux and Solaris Installations

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

- Linux – `/usr/sbin/ocmanager`
- Ubuntu 14 – `/opt/emulex/ocmanager/scripts`:
  - `stop_ocmanger.sh`
  - `start_ocmanager.sh`
- Solaris – `/opt/ELXocm`

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

The daemon processes start at system boot time.

Chapter 3: Updating to the OneCommand Manager Application Enterprise Kit

NOTE	The full-featured OneCommand Manager application enterprise kit is not supported on Citrix XenServer 5.6 SP2, Citrix XenServer 6.x or VMware ESXi server.

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

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

3.1 Linux

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

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

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

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

   ```
   ./install
   ```

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

```
/install --help
```

3.3 Windows

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

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

Chapter 4: CLI Client Command Usage

The CLI Client component of the OneCommand 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 `HbaCmd`. A single operation is performed by typing `hbacmd` at the command line, followed by a CLI client command and its possible parameters. For example:

```
hbacmd [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   HbaCmd Syntax Usage

The following syntax rules and usage apply to the `HbaCmd` 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 `hbacmd` (rather than `HbaCmd`). 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:

  ```
  hbacmd [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 Manager remote management agent.
  — The :port option is optional. If omitted, the OneCommand Manager remote management protocol uses the default TCP port. If specified, it uses the user-specified TCP port.
  — **Examples**
    Using the IP address:

  ```
  hbacmd h=138.239.91.121 ListHBAs
  ```

Using the host name:

```
hbacmd h=cp-hp5670 ListHBAs
```

— The h option is available for all commands except for the AddHost (on page 98), RemoveHost (on page 103), and the Version (on page 107) commands.

■ For FC/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:

```
hbacmd 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 NIC port with the specified MAC address with an extended timeout value of 1:

```
hbacmd 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 an HbaCmd 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 Manager 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 5.15.10, ListHBAs on page 102.

4.3   Secure Management CLI Interface

The secure management CLI interface is supported by Linux, Solaris, and Windows.

> **NOTE**   Users with root or Administrator privileges on the local machine will retain full OneCommand 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 HbaCmd 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 HbaCmd 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):

```
hbacmd  <cmd>
```

With Secure Management (as non-Root or non-Administrator User):

```
hbacmd  <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, HbaCmd Syntax Usage on page 23 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:

```
hbacmd h=192.168.1.122 m=sec u=jsmith p=password download 00-12-34-56-78-9A
oc11-4.6.96.2.ufi
```

4.4 CIM Client Interface

> **NOTE** In Linux and Solaris, you cannot use `HbaCmd` 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 Manager CLI on Windows, but you must install and use the appropriate Broadcom Emulex CIM Provider on the VMware ESXi host. For installation, see the *CIM Provider Package Installation Guide*.

> **NOTE** For VMware ESXi hosts, if advanced adapter management capabilities are required (such as iSCSI management), use the OneCommand Manager for VMware vCenter Server. For more details, see the *OneCommand Manager for VMware vCenter User Manual*.

4.4.2 Syntax Rules for the CIM Interface

For the CIM interface, all the syntax rules in section Section 4.2, HbaCmd Syntax Usage on page 23 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:

```
hbacmd h=192.168.1.110 m=cim u=root p=password n=root/emulex listhbas
```

4.4.2.1 Syntax Options and Setting CIM Credentials

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

Option A

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

Option B

```
hbacmd <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 5.15.14, SetCimCred on page 104). This command sets only the CIM credentials. After you have set them, subsequent `HbaCmd` commands do not require you specify the CIM credentials on the command line.

Command syntax:

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

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

Command syntax:

```
hbacmd <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:

5. The information entered using the addhost command is looked up.

6. If no values exist, the information entered using the setcimcred command is used.

7. If no values exist, the following defaults are used:

```
username=root
password=root
namespace=root/emulex
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:

```
C:\Program Files\Emulex\Util\OCManager>hbacmd h=10.192.113.128 m=cim u=root
p=root n=root/emulex listhbas
```

For a list of HbaCmd commands supported through the CIM interface, see Section 4.4.3, CLI Client Commands Supported in CIM Interface on page 26.

4.4.3   CLI Client Commands Supported in CIM Interface

For a list of HbaCmd commands supported through the CIM interface see Table 6, CLI Client Command Reference on page 31.

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 ShowAdapterLicenseID
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 OneConnect® OCe11100-series, OCe14000-series and LPe16202 adapters.	HbaAttributes ServerAttributes SetPhyPortSpeed SetPortEnabled
Authentication Commands	These commands are used to configure a DHCHAP connection between an FC port and a switch port.	AuthConfigList DeleteAuthConfig GetAuthConfig GetAuthStatus InitiateAuth SetAuthConfig SetPassword
Boot Commands	This group manages the commands that enable or disable the network boot for NIC ports or the boot code for FC adapter ports. You can also show and change FC 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. DCB commands are for DCB management of only OneConnect adapters.	GetDCBParams GetPGInfo SetCnaPGBW SetDCBParam SetDCBPriority

Table 5 CLI Client Command Reference Functional Groups (Continued)

Command Group	Description	Commands
Diagnostic Commands	This group provides commands that enable you to detect cabling problems, to examine transceiver data, and flash memory load lists. Additionally, you can run specific diagnostic tests such as the Loopback test and POST test.	DPortTest EchoTest GetBeacon GetXcvrData LoadList LoopBackTest LoopMap PciData PostTest SetBeacon SetCableNVP TDRTest Wakeup
Driver Parameter Commands	You can 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 only supported for FC and FCoE ports.	DriverConfig GetDriverParams GetDriverParamsGlobal SaveConfig SetDriverParam SetDriverParamDefaults
Dump Commands	You can 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 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 only supported on OneConnect iSCSI ports.	AddARPTableEntry AddiSNSServer AddRouteTableEntry AddTarget AddTargetPortal CleariSNSServer DelARPTableEntry DeleteiSNSServer DelRouteTableEntry DiscoveriSNSServer ExportiSCSI GetInitiatorProperties GetiSCSILuns GetiSCSIPortStats GetNetworkConfiguration GetSessionInfo ImportiSCSI iSCSIPing ListSessions RemoveTarget RemoveTargetPortal SetBootTargetSession SetInitiatorProperties SetiSCSIBoot SetNetworkConfiguration SetTargetLoginProperties SetTargetProperties SetTargetLoginProperties ShowARPTable ShowiSNSServer ShowRouteTable ShowTarget ShowTargetPortal TargetLogin TargetLogout UpdateiSNSServer
LUN Masking Commands	The commands in this group manage LUN masking activities. LUN Masking is only supported for FC/FCoE ports.	GetLunList GetLunUnMaskByHBA GetLunUnMaskByTarget RescanLuns SetLunMask
LUN ExpressLane Commands	This group of commands enables, disables, and displays the ExpressLane status on a particular LUN.	GetExpressLaneLunList SetExpressLaneLunState

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 FecEnable GetCimCred GetQoSInfo GetVPD ListHBAs ListVFunctions Reset SetCimCred SRIOVEnable TargetMapping VEPAEnable Version
Persistent Binding Commands	This group of commands facilitates persistent binding operations. These commands are only supported for FC/FCoE ports.	AllNodeInfo BindingCapabilities BindingSupport PersistentBinding RemoveAllPersistentBinding RemovePersistentBinding SetBindingSupport SetPersistentBinding
Personality Change Commands	You can use this group of commands to change 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
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. UMC commands are only available on OneConnect adapters.	UmcEnable UmcGetParams UmcSetBW UmcSetLPVID
vPort Commands	vPort commands manage virtual ports and functions only on FC/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 running with pending changes, some diagnostic and maintenance features are not available.	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. Commands with an asterisk have CIM Interface Support.

Table 6 CLI Client Command Reference

Command	Linux		Solaris	Windows	VMware ESXi on Windows Hosts	CIM Interface Support[a]	Page
	RHEL, SLES, Ubuntu, and Oracle	Citrix					
AddARPTableEntry	✓		✓	✓*	✓		76
AddHost	✓	✓	✓	✓*		✓	98
AddiSNSServer	✓	✓	✓	✓	✓		76
AddRouteTableEntry	✓	✓	✓	✓	✓		77
AddTarget	✓	✓	✓	✓	✓		77
AddTargetPortal	✓	✓	✓	✓	✓		78
AllNodeInfo	✓	✓	✓	✓*	✓	✓	108
AuthConfigList	✓		✓	✓			42
BindingCapabilities			✓	✓			108
BindingSupport			✓	✓			108
ChangePersonality	✓	✓	✓	✓*	✓	✓	111
ChangeWWN	✓	✓	✓	✓*	✓	✓	148
CleariSNSServer	✓	✓	✓	✓	✓		79
CMGetParams	✓	✓	✓	✓*	✓	✓	48
CMMode	✓	✓	✓	✓*	✓	✓	51
CMSetBW	✓	✓	✓	✓*	✓	✓	51
CnaClearEventLog	✓	✓		✓	✓		99
CnaGetEventLog	✓	✓		✓	✓		99
CreateVPort	✓		✓	✓			146
DPortTest	✓	✓		✓*	✓	✓	59
DelARPTableEntry	✓	✓	✓	✓	✓		79
DeleteAuthConfig	✓	✓	✓	✓			43
DelRouteTableEntry	✓	✓	✓	✓	✓		80
DeleteDumpFiles	✓	✓	✓	✓*	✓	✓	70
DeleteiSNSServer	✓	✓	✓	✓	✓		80
DeleteVPort	✓		✓	✓			147
DiscoveriSNSServer	✓	✓	✓	✓	✓		80
Download	✓	✓	✓	✓*	✓	✓	99
DriverConfig	✓	✓		✓	✓		67
Dump	✓	✓	✓	✓*	✓	✓	70
EchoTest	✓	✓	✓	✓*	✓	✓	61
EnableBootCode	✓	✓	✓	✓*	✓	✓	46

Table 6 CLI Client Command Reference (Continued)

Command	Linux		Solaris	Windows	VMware ESXi on Windows Hosts	CIM Interface Support[a]	Page
	RHEL, SLES, Ubuntu, and Oracle	Citrix					
ExportSANInfo	✓	✓	✓	✓			100
ExportiSCSI		✓		✓			81
FecEnable	✓	✓	✓	✓*	✓	✓	101
GetBeacon	✓	✓	✓	✓*	✓	✓	62
GetAdapterPortConfig	✓	✓	✓	✓*	✓	✓	112
GetAuthConfig	✓		✓	✓			43
GetAuthStatus	✓		✓	✓			43
GetBootParams	✓	✓	✓	✓	✓		46
GetCimCred				✓			101
GetDCBParams	✓	✓	✓	✓*	✓	✓	54
GetDriverParams	✓	✓	✓	✓*	✓	✓	67
GetDriverParamsGlobal	✓	✓	✓	✓*	✓	✓	68
GetDumpDirectory	✓	✓	✓	✓*	✓	✓	71
GetDumpFile	✓	✓	✓	✓*	✓	✓	71
GetDumpFileNames	✓	✓	✓	✓*	✓	✓	72
GetExpressLaneLUNList	✓	✓		✓*	✓	✓	96
GetFCFInfo	✓	✓	✓	✓*	✓	✓	74
GetFIPParams	✓	✓	✓	✓*	✓	✓	74
GetInitiatorProperties	✓	✓	✓	✓	✓		81
GetiSCSILuns	✓	✓	✓	✓	✓		81
GetiSCSIPortStats	✓	✓	✓	✓	✓		82
GetLinkConfig	✓	✓	✓	✓	✓	✓	121
GetLunList	✓		✓	✓*	✓	✓	94
GetLunUnMaskByHBA			✓	✓			95
GetLunUnMaskByTarget			✓	✓			95
GetNetworkConfiguration	✓	✓	✓	✓	✓		82
GetPGInfo	✓	✓	✓	✓*	✓	✓	54
GetQosInfo	✓	✓	✓	✓*	✓	✓	101
GetRetentionCount	✓	✓	✓	✓*	✓	✓	72
GetSessionInfo	✓	✓	✓	✓	✓		83
GetVPD	✓	✓	✓	✓*	✓	✓	102
GetWWNCap	✓	✓	✓	✓*	✓	✓	149
GetXcvrData	✓	✓	✓	✓*	✓	✓	62
HbaAttributes	✓	✓	✓	✓*	✓	✓	38
Help	✓	✓	✓	✓	✓	N/A	35
ImportiSCSI		✓		✓			83

Table 6 CLI Client Command Reference (Continued)

Command	Linux		Solaris	Windows	VMware ESXi on Windows Hosts	CIM Interface Support[a]	Page
	RHEL, SLES, Ubuntu, and Oracle	Citrix					
InitiateAuth	✓		✓	✓			44
InstallAdapterLicense	✓	✓	✓	✓*	✓	✓	36
iSCSIPing	✓	✓	✓	✓	✓		84
ListHBAs	✓	✓	✓	✓*	✓	✓	102
ListProfiles	✓	✓	✓	✓*	✓	✓	121
ListSessions	✓	✓	✓	✓	✓		84
ListVFunctions	✓	✓	✓	✓*	✓	✓	147
ListVPorts	✓	✓	✓	✓			147
LoadList	✓	✓	✓	✓*		✓	62
LoopBackTest	✓	✓	✓	✓*	✓	✓	63
LoopMap	✓	✓	✓	✓	✓		63
PciData	✓	✓	✓	✓*		✓	64
PersistentBinding		✓	✓	✓	✓		108
PortAttributes	✓	✓	✓	✓*		✓	38
PortStatistics	✓	✓	✓	✓*	✓	✓	39
PostTest	✓	✓	✓	✓*	✓	✓	64
ReadWWN	✓	✓	✓	✓*	✓	✓	149
RemoveAllPersistentBinding			✓	✓	✓		109
RemovePersistentBinding			✓	✓			109
RemoveHost	✓	✓	✓	✓*		✓	102
RemoveTarget	✓	✓	✓	✓			84
RemoveTargetPortal	✓	✓	✓	✓	✓		85
RescanLuns	✓		✓	✓	✓		95
Reset	✓	✓	✓	✓*		✓	104
RestoreWWN	✓	✓	✓	✓*	✓	✓	149
SaveConfig	✓	✓	✓	✓	✓		68
ServerAttributes	✓	✓	✓	✓*	✓	✓	40
SetAdapterPortConfig	✓	✓	✓	✓*	✓	✓	122
SetAuthConfig	✓		✓	✓	✓		44
SetBeacon	✓	✓	✓	✓*		✓	65
SetBindingSupport			✓	✓	✓		109
SetBootParam	✓	✓	✓	✓			46
SetBootTargetSession	✓	✓	✓	✓	✓		85
SetCableNVP	✓	✓	✓	✓	✓		65
SetCnaPGBW	✓	✓	✓	✓*	✓	✓	55
SetCimCred				✓	✓		104

Table 6 CLI Client Command Reference (Continued)

Command	Linux		Solaris	Windows	VMware ESXi on Windows Hosts	CIM Interface Support[a]	Page
	RHEL, SLES, Ubuntu, and Oracle	Citrix					
SetDCBParam	✓	✓	✓	✓*		✓	55
SetDCBPriority	✓	✓	✓	✓*	✓	✓	57
SetDriverParam	✓	✓	✓	✓*	✓	✓	69
SetDriverParamDefaults	✓	✓	✓	✓	✓		69
SetDumpDirectory		✓			✓	✓	72
SetExpressLaneLUNState	✓	✓		✓*	✓	✓	97
SetFIPParam	✓	✓	✓	✓*	✓	✓	75
SetInitiatorProperties	✓	✓	✓	✓	✓		86
SetiSCSIBoot	✓	✓	✓	✓	✓		87
SetLinkConfig	✓	✓	✓	✓	✓	✓	141
SetLunMask			✓	✓	✓		96
SetNetworkConfiguration	✓	✓	✓	✓			87
SetPassword	✓		✓	✓	✓		45
SetPersistentBinding			✓	✓			110
SetPfcThrottle	✓	✓	✓	✓*		✓	104
SetPhyPortSpeed	✓	✓	✓	✓*	✓	✓	40
SetPortEnabled	✓	✓	✓	✓*	✓	✓	42
SetRetentionCount	✓	✓	✓	✓*	✓	✓	73
SetTargetLoginProperties	✓	✓	✓	✓	✓		88
SetTargetProperties	✓	✓	✓	✓	✓		89
SetTPLoginProperties	✓	✓	✓	✓*	✓		90
ShowAdapterLicenseFeatures	✓	✓	✓	✓*	✓	✓	37
ShowARPTable	✓	✓	✓	✓	✓		91
ShowiSNSServer	✓	✓	✓	✓	✓		91
ShowLicenseAdapterID	✓	✓	✓	✓*	✓	✓	37
ShowPersonalities	✓	✓	✓	✓*	✓	✓	112
ShowRouteTable	✓	✓	✓	✓	✓		91
ShowTarget	✓	✓	✓	✓	✓		91
ShowTargetPortal	✓	✓	✓	✓	✓		92
SRIOVEnable	✓	✓	✓	✓*	✓	✓	104
TargetLogin	✓	✓	✓	✓	✓		92
TargetLogout	✓	✓	✓	✓	✓		93
TargetMapping	✓	✓	✓	✓*	✓	✓	106
TDRTest	✓	✓	✓	✓	✓		65
UmcEnable	✓	✓	✓	✓*	✓	✓	142
UmcGetParams	✓	✓	✓	✓*	✓	✓	143

Table 6 CLI Client Command Reference (Continued)

Command	Linux		Solaris	Windows	VMware ESXi on Windows Hosts	CIM Interface Support[a]	Page
	RHEL, SLES, Ubuntu, and Oracle	Citrix					
UmcSetBw	✓	✓	✓	✓*	✓	✓	144
UmcSetLPVID	✓	✓	✓	✓*	✓	✓	145
UpdateiSNSServer	✓	✓	✓	✓	✓		94
VEPAEnable	✓	✓	✓	✓*	✓	✓	106
Version	✓	✓	✓	✓*	✓	✓	107
VPortTargets	✓	✓	✓	✓	✓		147
Wakeup	✓	✓	✓	✓			66

a.   iSCSI management is not supported using the CIM interface.

5.1   Help

This command displays command information for the `HbaCmd` 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, Windows, and VMware ESXi from a Windows remote host

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:

```
hbacmd help
```

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

```
hbacmd help setdcbparam
```

5.2   Adapter License Management Commands

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

For these commands, the WWPN or MAC address argument specifies the adapter the command is acting upon. The `HbaCmd` 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 only supported on ESXi systems if the CIM provider is used on a remote system.

NOTE	Adapter License Management commands are only supported on some OCe11100-series adapters. They are not available on LPe16202, 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 VMware ESXi from a Windows remote 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:

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

For VMware ESXi hosts:

```
hbacmd 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 list of licensed and licensable features, and features that are already licensed. The output is a list of features with an indication of whether or not the feature has been licensed.

Supported By

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

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

For VMware ESXi hosts:

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

5.2.3   ShowAdapterLicenseID

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

Supported By

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

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

For VMware ESXi hosts:

```
hbacmd 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. You can also set the port speed on OneConnect OCe11100-series, OCe14000-series, and LPe16202 adapters.

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 VMware ESXi from a Windows remote host

Syntax

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

Parameters

WWPN	The WWPN of an FC or FCoE function.
MAC	The MAC address of an FC or FCoE function.

Example

```
OCM: hbacmd hbaatt 10:00:00:90:fa:20:8f:8

HBA Attributes for 10:00:00:90:fa:20:8f:8

Host Name                      : WED-6
Manufacturer                   : Emulex Corporation
Serial Number                  : 4925382-1252000002
Model                          : 7101684
Model Desc                     : 7101684, Oracle Sun Storage 16Gb Fibre Channel LP
Universal HBA, Emulex
Node WWN                       : 20 00 00 90 fa 20 8f 8e
Node Symname                   : Emulex 7101684 FV10.4.223.1 DV10.2.222.1 WED-6
HW Version                     : 0000000B
FW Version                     : 10.6.x.y
Vendor Spec ID                 : 10DF
Number of Ports                : 1
Driver Name                    : elxfc
Device ID                      : E200
HBA Type                       : 7101684
Operational FW                 : 10.6.x.y
IEEE Address                   : 00 90 fa 20 8f 8e
Boot Code                      : Enabled
Boot Version                   : 10.6.x.y
Driver Version                 : 10.6.x.y
Board Temperature              : Normal
Function Type                  : FC
Sub Device ID                  : E20E
PCI Bus Number                 : 6
PCI Func Number                : 0
Sub Vendor ID                  : 10DF
```

```
IPL Filename                    : HL2RS2
Service Processor FW Name       : 10.6.x.y
ULP FW Name                     : 10.6.x.y
FC Universal BIOS Version       : 10.6.x.y
FC x86 BIOS Version             : 10.6.x.y
FC EFI BIOS Version             : 10.6.x.y
FC FCODE Version                : 10.6.x.y
Flash Firmware Version          : 10.6.x.y
```

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 VMware ESXi from a Windows remote host

Syntax

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

Parameters

WWPN   The WWPN of an FC or FCoE function.

MAC   The MAC address of a NIC or iSCSI function.

Example

```
hbacmd 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 VMware ESXi from a Windows remote host

Syntax

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

Parameters

WWPN	The WWPN of an FC or FCoE function.
MAC	MAC address of NIC function.
clear	Clear counters for 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 VMware ESXi from a Windows remote host

Syntax

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

Parameters

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

5.3.5   SetPhyPortSpeed

This command sets the port speed on OneConnect OCe11100-series, OCe14000-series, and LPe16202 adapters.

5.3.5.1   OneConnect OCe11100-Series and OCe14000-Series Adapters

The OneConnect OCe11100-series and the OCe14000-series 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 upon the port module type and the mode defined by 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 VMware ESXi from a Windows remote 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 OneConnect OCe11100-series and OCe14000-series adapters. 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 for OneConnect OCe11100-series and OCe14000-series adapters. 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, and 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 ten meters:

        hbacmd 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:

        hbacmd setphyportspeed 00-00-c9-a9-41-88 2 100Mb

If the command is successful the following is displayed:

        Successfully changed speed settings on port.

This command results in an error because you must include a value for the Length parameter if the Mode parameter is 2:

        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	Only OneConnect adapters do not require a reset when the adapter port is enabled or disabled. For FC adapters, when the SetPortEnabled command disables an FC port, the adapter must be reset to activate the new value.

Supported By

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

Syntax

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

Parameters

WWPN	The WWPN of an FC or 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 Authentication Commands

These commands are used to configure a DHCHAP connection between an FC function and a switch port.

NOTE	Authentication commands are only supported on LPe12000-series FC adapter ports. These commands are not available on OneConnect or LPe16000, LPe31000, and LPe32000-series adapters.

5.4.1 AuthConfigList

This command returns the list of WWPNs that have an authentication connection configuration with the specified adapter.

Supported By

Linux, Solaris, and Windows

Syntax

```
AuthConfigList <WWPN>
```

Parameters

WWPN	The WWPN of an FC function.

5.4.2   DeleteAuthConfig

This command deletes the authentication configuration on the adapter.

Supported By

Linux, Solaris, and Windows

Syntax

```
DeleteAuthConfig <WWPN1> <WWPN2> <PasswordType> <Password>
```

Parameters

WWPN1	The WWPN of an FC function.
WWPN2	Use ff:ff:ff:ff:ff:ff:ff:ff for a switch or use the WWPN for a target.
PasswordType	1 = ASCII 2 = Hexadecimal (binary) 3 = Password not yet defined
Password	The current password value.

5.4.3   GetAuthConfig

This command retrieves the authentication configuration for the adapter.

Supported By

Linux, Solaris, and Windows

Syntax

```
GetAuthConfig <WWPN1> <WWPN2>
```

Parameters

WWPN1	The WWPN of an FC function.
WWPN2	Use ff:ff:ff:ff:ff:ff:ff:ff for a switch or use the WWPN for a target.

5.4.4   GetAuthStatus

This command returns the current status for the authentication connection specified by WWPN 1 and WWPN2 (adapter and the switch). It includes the current authentication state (connected or failed). Currently authenticated connections specify the hash algorithm and DH group used in the DHCHAP associated with this connection. Failed status includes the failure reason.

Supported By

Linux, Solaris, and Windows

Syntax

```
GetAuthStatus <WWPN1> <WWPN2>
```

Parameters

WWPN1	The WWPN of an FC function.
WWPN2	Use ff:ff:ff:ff:ff:ff:ff:ff for a switch or use the WWPN for a target.

5.4.5   InitiateAuth

This command initiates the authentication configuration on the adapter.

Supported By

Linux, Solaris, and Windows

Syntax

```
InitiateAuth <WWPN1> <WWPN2>
```

Parameters

`WWPN1`	The WWPN of an FC function.
`WWPN2`	Use ff:ff:ff:ff:ff:ff:ff:ff for a switch or use the WWPN for a target.

5.4.6   SetAuthConfig

This command sets the authentication configuration for the adapter.

Supported By

Linux, Solaris, and Windows

Syntax

```
SetAuthConfig <WWPN1> <WWPN2> <PasswordType> <Password> <Param> <Value>
```

NOTE	Where multiple parameters and values are used, separate them using commas.

Parameters

`WWPN1`	The WWPN of an FC function.
`WWPN2`	Use ff:ff:ff:ff:ff:ff:ff:ff for a switch or use the WWPN for a target.
`PasswordType`	1 = ASCII 2 = hexadecimal (binary) 3 = Password not yet defined
`Password`	The current password value.
`Param`	The parameter names: ■ Mode ■ Timeout ■ Bidirectional ■ Hash-priority ■ DH-priority ■ Re-authentication ■ Re-authentication-interval

Value	The value is based on the type of <Param>:
	■ Mode: disabled, enabled, or passive
	■ Timeout: time in seconds
	■ Bi-directional = disabled or enabled
	■ Hash-priority: md5 or sha1 (md5 = first md5, then sha1; sha1 = first sha1, then md5)
	■ DH-priority: 1, 2, 3, 4, 5; any combination up to 5 digits
	■ Re-authentication: disabled or enabled
	■ Re-authentication-interval: 0, 10to 3600

5.4.7   SetPassword

This command sets the password on the adapter for an authenticated connection to the switch.

Supported By

Linux, Solaris, and Windows

Syntax

`SetPassword <WWPN1> <WWPN2> <Flag> <Cpt> <Cpw> <Npt> <Npw>`

Parameters

WWPN1	The WWPN of an FC function.
WWPN2	Must be ff:ff:ff:ff:ff:ff:ff:ff for a switch or the actual WWPN for a target.
Flag	1 = Local (password used by the adapter when the adapter authenticates to the switch)
	2 = Remote (password used by the adapter when the switch authenticates to the adapter)
Cpt	Current password type. 1 = ASCII 2 = hexadecimal (binary) 3 = Password not yet defined
Cpw	Current password value.
Npt	New password type. 1 = ASCII 2 = hexadecimal (binary)
Npw	New password value.

5.5   Boot Commands

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

CAUTION	Using the `EnableBootCode` or `SetBootParam` commands on an older FC adapter (for example, LPe12000) that is being used to boot from SAN is not advisable. After the command has completed, the system performs an adapter reset, which may cause a loss of connectivity to the SAN and possible loss of data. To perform these commands on an older FC adapter, you must make sure that the adapter is not currently being used to boot from SAN. Do one of the following: ■ Move the target adapter to a non-boot from SAN host.

■ If the host with the target adapter is also hosting other boot from SAN adapters, perform a boot from SAN using one of the other boot from SAN adapters. The target adapter can now be used.

5.5.1 EnableBootCode

This command is used to perform either of the following:

■ Enable or disable network boot for NIC functions. 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.

■ Enable or disable the boot code for an FC/FCoE function. If the boot code is disabled on the FC function, the adapter does not boot from the SAN, regardless of the value for the EnableBootFromSan boot parameter. If the boot code is enabled on the FC function, the adapter boots from the SAN if the EnableBootFromSan parameter is also enabled.

> **NOTE** To enable or disable boot on an iSCSI target, see Section 5.12.24, SetiSCSIBoot on page 87.

Supported By

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

Syntax

```
EnableBootCode <WWPN|NIC MAC> <Flag> <NetworkBootMethod>
```

Parameters

WWPN	The WWPN of an FC function.
NIC MAC	The MAC address of a NIC function.
Flag	D = Disable the boot code. E = Enable the boot code.
NetworkBootMethod	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. This parameter is not required for FC or FCoE functions, and is only specified when enabling network boot.

Examples

The following example enables iBFT for a NIC:

```
C:\Program Files\Emulex\Util\OCManager>HBACMD  EnableBootCode
00-00-c9-11-22-33 e iBFT
```

The following example disables network boot:

```
C:\Program Files\Emulex\Util\OCManager>HBACMD  EnableBootCode
00-00-c9-11-22-33 d
```

5.5.2 GetBootParams

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

Supported By

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

Syntax

`GetBootParams <WWPN> <Type>`

Parameters

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

5.5.3 SetBootParam

This command changes the FC boot parameters. You can change function parameters and boot device parameters for x86, OpenBoot, and UEFI 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, Windows, and VMware ESXi from a Windows remote host

Syntax

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

Parameters

`WWPN`	The WWPN of an FC function.
`Type`	Possible values are x86, OpenBoot, or UEFI.
`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`	UEFI	{ 0, 1, 2 }

`DevicePathSelection`	UEFI	{ 0, 1 }
`MaxLunsPerTarget`	UEFI	{ Value }
`ResetDelayTimer`	UEFI	{ 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 }

5.6 Channel Management Commands

These commands enable and disable channel management and set channel properties for CNAs. Channel management is not supported on LPe16202 adapters.

NOTE	OneCommand 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 5.19, UMC Commands on page 142 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 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 Manager application will display the channel properties, but not allow modification; except for vNIC1 where the LPVID (inner VLAN ID) can be modified.

Additionally, the OCe14000-series adapters support NPar. Use the `GetAdapterPortConfig` and `SetAdapterPortConfig` command to manage NPar for these adapters. See Section 5.18.1, GetAdapterPortConfig on page 112 and Section 5.18.4, SetAdapterPortConfig (for OCe14000-Series Adapters) on page 122. For Lenovo® System X adapters, UMC mode is referred to as SIMode.

NOTE	SR-IOV is not supported with channel management.

5.6.1 CMGetParams

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

5.6.1.1 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 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 VMware ESXi from a Windows remote 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 will be displayed indicating that the operation cannot be performed on this port.

For example, if you type the following command:

```
>hbacmd 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

Use the following table to locate the appropriate examples for your application.

Example Types	Location
Multichannel Disabled	See page 49.
Multichannel Enabled - UMC, NIC-only	See page 49.
Multichannel Enabled - UMC, with Storage	See page 50.
Multichannel Disabled - Lenovo System X	See page 50.
Multichannel Enabled - Lenovo System X UFP	See page 50.
Dell® NPar Disabled	See page 50.
Dell NPar Enabled - 4 Functions per Port	See page 51.

Multichannel Disabled

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

Multichannel Enabled - UMC, NIC-only

```
>hbacmd 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

```
>hbacmd 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

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

Multichannel Enabled - Lenovo System X UFP

```
>hbacmd 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

```
>hbacmd 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.

```
>hbacmd 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
```

5.6.2   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 5.18.4, SetAdapterPortConfig (for OCe14000-Series Adapters) on page 122 for more information. If you use the `CMMode` command on an OCe14000-series adapter, an error message is displayed indicating the command is not supported by the firmware or hardware.

Supported By

Linux, Solaris, Windows, and VMware ESXi from a Windows remote 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 5.6.1, CMGetParams on page 48) to enable channel management.

Example

```
>hbacmd 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.

5.6.3   CMSetBW

This command sets the minimum and maximum bandwidths for each channel on the physical port. For UMC/SIMode configurations, this command can also be used to disable a channel's logical link by setting both the min and max 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 upon the adapter model. See Section 5.6.1, CMGetParams on page 48 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 both the minimum and maximum bandwidth 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 will be displayed indicating that the operation cannot be performed on this port.

  For example, if you type the following command:

      >hbacmd 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 VMware ESXi from a Windows remote 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-Multichannel

Down Logical Link on 3rd Channel of a 4-Channel per Port Adapter

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

```
>hbacmd 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
```

5.6.4   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 5.6.1, CMGetParams on page 48 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 VMware ESXi from a Windows remote 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 will be displayed indicating that the operation cannot be performed on this port.

  For example, if you type the following command:

  ```
  >hbacmd 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

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

8 Channels, Storage on 2nd channel

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

5.7 DCB Commands

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

DCB commands are only for DCB management of OneConnect adapters. They 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
```

5.7.1 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 that the adapter port's DCB parameter is set to.

Supported By

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

Syntax

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

Parameters

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

Example

```
hbacmd h=10.192.203.154 GetDCBParams 00-00-c9-93-2f-d8
```

5.7.2 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 VMware ESXi from a Windows remote host

Syntax

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

Parameters

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

Example

```
hbacmd h=10.192.203.154 getpginfo 00-00-c9-93-2f-d8
```

5.7.3   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 VMware ESXi from a Windows remote host

Syntax

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

Parameters

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

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

5.7.4   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 only available on the OCe140000-series of adapters.

Supported By

Linux, Solaris, Windows, and VMware ESXi from a Windows remote 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> on page 56 and LLDP Settings for <Param> and <Value> on page 57.
`Value`	The parameter value. See DCB Settings for <Param> and <Value> on page 56 and LLDP Settings for <Param> and <Value> on page 57.

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.
NOTE	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.
NOTE	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.
NOTE	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: `hbacmd 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 alpha-numeric format. 0 = Disabled 1 = Enabled
TxSysDesc	Transmit System Description: provides a description of the network entity in an alpha-numeric format. 0 = Disabled 1 = Enabled
TxSysName	Transmit System Name: provides the system's assigned name in an alpha-numeric format. 0 = Disabled 1 = Enabled
TxSysCap	Transmit System Capabilities: 0 = Disabled 1 = Enabled

Example

```
hbacmd h=10.190.103.165 m=cim u=root p=Host001 n=root/emulex SetDCBParam
00-00-c9-3c-f7-88 fcoepriority 3
```

5.7.5   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 5.7.3, SetCnaPGBW on page 55).

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 VMware ESXi from a Windows remote 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

```
hbacmd 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
```

5.8   Diagnostic Commands

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

CAUTION	Using the `LoopBackTest`, `PciData`, or `PostTest` commands on an older FC adapter (for example, LPe12000) that is being used to boot from SAN is not advisable. After the command has completed, the system performs an adapter reset, which may cause a loss of connectivity to the SAN and possible loss of data. To perform these commands on an older FC adapter, you must make sure that the adapter is not currently being used to boot from SAN. Do one of the following: ■ Move the target adapter to a non-boot from SAN host.

- If the host with the target adapter is also hosting other boot from SAN adapters, perform a boot from SAN using one of the other boot from SAN adapters. The target adapter can now be used.

5.8.1   DPortTest

D_Port, also called ClearLink, is a set of diagnostic tests that allows you to detect physical cabling issues that result in increased error rates and intermittent behavior.

This command is only supported for LPe16000, LPe31000, and LPe32000 - series FC adapters connected to D_Port-enabled Brocade switches.

> **NOTE**   Do not enable D_Port on the switch port.

The `DPortTest` command runs a series of tests including local electrical loopback, loopback to the remote optics, loopback from the remote port to the local optics, and a full-device loopback test with data integrity checks. It also provides an estimate of cable length, from the switch to the adapter, to validate that a proper buffering scheme is in place.

The various tests allow some fault isolation, so you can distinguish faults that are the result of marginal cables, optics modules, and connectors or optics seating. If the adapter, firmware, SFP, or switch do not support D_Port testing, an error is generated.

D_Port tests run with the physical connection in an offline diagnostic state, so normal I/O cannot be sent through the physical port while the test is in progress. While the port is in D_Port mode, the link will appear down on that port; similar to an unplugged cable.

> **NOTE**   The `DPortTest` command only runs in on-demand mode with the host initiating the tests with the switch.
>
> If you are using D_Port in a boot from SAN configuration, the configuration must have redundant paths to the boot LUN, and only one of the redundant adapter ports should be set to D_Port.

Supported By

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

Syntax

`DPortTest <WWPN>`

Parameters

WWPN   The WWPN of the FC function on the adapter.

Considerations when using D_Port

- A test failure occurs if the `DPortTest` command is run with a switch that does not support D_Port testing.
- Typing <CTL-C> while the D_Port tests are running terminates the tests and the completed results are displayed.
- If the Overall Test Result is FAILED, you must either rerun the tests successfully, or reset the adapter port to bring up the link.
- If a test phase fails, the D_Port diagnostics are automatically stopped. As a result, test phases that would have occurred after the failure are not displayed.
- If there is more than one error in a single test phase, multiple lines are displayed showing each error.

Examples

Use the following table to locate the appropriate examples for your application.

Example Types	Location
Successful Test	See page 60.
Test Failures	See page 60.

Successful Test

```
>hbacmd DPortTest 10:00:00:00:c9:d1:a2:d0

Running D_Port Tests. Please wait. Polling for results...........................

D_Port Test Status:      Passed
Buffers Required:        1
Frame Size:              2112
Round Trip Latency:      1898 nanoseconds
Estimated Cable Length: 172  meters


=============================================================================
Test Phase                Result    Latency   Local Errors   Remote Errors
=============================================================================
Electrical Loopback       Passed    122
Optical Loopback          Passed    1898
Reverse Optical Loopback  Skipped   0
Link Traffic              Passed    0
```

Test Failures

```
>hbacmd DPortTest 10:00:00:00:c9:d1:a2:d0

Running D_Port Tests. Please wait. Polling for
results...............................

D_Port Test Status:      Failed
Buffers Required:        0
Frame Size:              0
Round Trip Latency:      0    nanoseconds
Estimated Cable Length: 0    meters


=============================================================================
Test Phase                Result    Latency   Local Errors   Remote Errors
=============================================================================
Electrical Loopback       Failed    n/a

>hbacmd DPortTest 10:00:00:00:c9:d1:a2:d0

Running D_Port Tests. Please wait. Polling for
results...............................

D_Port Test Status:      Failed
Buffers Required:        0
Frame Size:              0
Round Trip Latency:      0    nanoseconds
```

```
Estimated Cable Length: 0      meters


========================================================================
Test Phase                  Result    Latency   Local Errors   Remote Errors
========================================================================
Electrical Loopback         Passed    0
Optical Loopback            Failed    n/a

>hbacmd DPortTest 10:00:00:00:c9:d1:a2:d0


Running D_Port Tests. Please wait. Polling for
results..............................

D_Port Test Status:    Failed
Buffers Required:      1
Frame Size:            2112
Round Trip Latency:    1898 nanoseconds
Estimated Cable Length: 172  meters


========================================================================
Test Phase                  Result    Latency   Local Errors   Remote Errors
========================================================================
Electrical Loopback         Passed    127
Optical Loopback            Passed    1898
Reverse Optical Loopback    Skipped   0
Link Traffic                Failed    n/a
```

5.8.2   EchoTest

This command runs the echo test on FC functions. It is only supported on LP12000-series adapters.

NOTE	The `EchoTest` command fails if the target WWPN does not support the `ECHO ELS` command.

Supported By

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

Syntax

EchoTest <WWPN Source> <WWPN Destination> <Count> <StopOnError> <Pattern>

Parameters

WWPN Source	The WWPN of the originating FC function.
WWPN Destination	The WWPN of the destination (echoing) FC functions.
Count	The number of times to run the test. Use 0 to run the test indefinitely.
StopOnError	Checks if the test must be halted on error: 0 = No halt 1 = Halt on error
Pattern	Hexadecimal data pattern to transmit (up to 8 characters).

5.8.3 GetBeacon

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

Supported By

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

Syntax

```
GetBeacon <WWPN|MAC>
```

Parameters

WWPN	The WWPN of the FC/FCoE function on the port.
MAC	The MAC address of the NIC or iSCSI function on the port.

5.8.4 GetXcvrData

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

Supported By

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

Syntax

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

Parameters

WWPN	The WWPN of an FC or FCoE function on the port.
MAC	The MAC address of a NIC or iSCSI on the port.
Optional	The type of SFP data to display: ■ 1 = Formatted SFS data (default) ■ 2 = Raw SFS data

Example

```
C:\Program Files\emulex\Util\OCManager>hbacmd h=10.192.203.154 m=cim u=root
p=Swamiji001 n=root/emulex GetXcvrData 00-00-c9-93-2f-d6
```

5.8.5 LoadList

This command shows the flash memory load list data for the FC function on the adapter. It is not supported for OneConnect and LPe16202-series adapters.

Supported By

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

Syntax

```
LoadList <WWPN>
```

Parameters

WWPN	The WWPN of the FC function on the adapter.

5.8.6 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 VMware ESXi from a Windows remote host

Syntax

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

Parameters

WWPN	The WWPN of an FC or FCoE function on the port.
MAC	The MAC address of a NIC or iSCSI function on the port.
Type	The type of loopback test to run: ■ 0 = PCI loopback test; not supported for OneConnect or LPe16202 adapters ■ 1 = Internal loopback test; not supported for OneConnect or LPe16202 adapters ■ 2 = External loopback test (requires loopback plug) ■ 3 = DMA loopback test; only supported for OneConnect adapters (not supported for LPe16202 adapters). ■ 4 = PHY loopback test; only supported for OneConnect adapters ■ 5 = MAC loopback test; only supported for OneConnect adapters
Count	Number of times to run the test. Possible values are 1 to 99,9999. To run the test infinitely, use 0.
StopOnError	Checks if 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

```
hbacmd h=10.192.193.154 m=cim u=root p=Swamiji001 n=root/emulex LoopBackTest
00-00-c9-93-2f-9f 4 120 0
```

5.8.7 LoopMap

This command shows the arbitrated loop map data.

NOTE	This command is only supported for FC functions.

Supported By

Linux, Solaris, and Windows

Syntax

```
LoopMap <WWPN>
```

Parameters

WWPN   The WWPN of the FC function

5.8.8   PciData

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

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

Supported By

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

Syntax

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

Parameters

WWPN   The WWPN of an FC or FCoE function.

MAC   The MAC address of a NIC or iSCSI function.

Example

```
C:\Program Files\emulex\Util\OCManager>hbacmd h=10.192.203.154 m=cim u=root
p=Swamiji001 n=root/emulex 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
```

5.8.9   PostTest

This command runs the POST on the adapter.

NOTE   This command is not supported for OneConnect, LPe15000, LPe16000, LPe31000, and LPe32000 series adapters.

Supported By

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

Syntax

```
PostTest <WWPN>
```

Parameters

WWPN   The WWPN of the FC port.

5.8.10   SetBeacon

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

Supported By

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

Syntax

```
SetBeacon <WWPN> <BeaconState>
```

Parameters

WWPN	The WWPN of an FC 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

5.8.11   SetCableNVP

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

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

Supported By

Linux, Solaris, and Windows

Syntax

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

Parameters

WWPN	The WWPN of an FC or 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.

5.8.12   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 if any cable faults are compromising the integrity of the link. The test requires that the cable be free of disturbances, down, and quiet. It is best if the cable is not terminated; however, if it is terminated, then 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

```
hbacmd 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.
```

5.8.13   Wakeup

This command shows the firmware's wakeup parameters for the FC function on the adapter.

> **NOTE**   This command is not supported for LPe16000-series and LPe162000-series adapters.

Supported By

Linux, Solaris, and Windows

Syntax

```
Wakeup <WWPN>
```

Parameters

> WWPN   The WWPN of an FC function.

5.9 Driver Parameter Commands

The Driver Parameter Commands group allow you can show, set, and save the driver parameter values. You can also change the parameters back to factory default values.

NOTE	Driver Parameter commands are only supported for FC and 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 only returns 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 the `GetDriverParams` command) to force the driver parameter values for the specified adapter to be saved. Inaccurate values may be saved if the G flag is used for this command.

- The list of available driver parameters that can be configured are different depending upon the operating system and protocol (FC or FCoE).

5.9.1 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, Windows, and VMware ESXi from a Windows remote host

Syntax

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

Parameters

WWPN	The WWPN of an FC or FCoE function.
FileName	The name of the `.dpv` file, which is stored in the Emulex Repository directory.
Flag	G = Make change global (all FC and/or FCoE functions on this host). N = Make change non-global (function-specific).

NOTE	On Windows hosts, depending upon the .dpv file specified, the settings are applied to either the FC or FCoE functions, but not both at the same time. This is because FC and FCoE have separate drivers. The `.dpv` file will have settings for only one of the driver types.

5.9.2 GetDriverParams

This command shows the name and values of each parameter.

Supported By

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

Syntax

```
GetDriverParams <WWPN>
```

Parameters

WWPN   The WWPN of an FC or FCoE function.

NOTE   On Windows, if an FC function is specified, the global parameters for
              the FC driver with be displayed. IF an FCoE function is specified, the
              global parameter for the FCoE driver is displayed.

5.9.3   GetDriverParamsGlobal

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

Supported By

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

Syntax

```
GetDriverParamsGlobal <WWPN>
```

Parameters

WWPN   The WWPN of an FC or FCoE function.

NOTE   On Windows, if an FC function is specified, the global parameters for
              the FC driver is displayed. If an FCoE function is specified, the global
              parameters for the FCoE driver is displayed.

5.9.4   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.

Supported By

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

Syntax

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

Parameters

WWPN   The WWPN of an FC or 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.

NOTE	On Windows hosts, depending upon the WWPN specified, the settings are saved for either the FC or FCoE functions, but not both at the same time. This is because FC and FCoE have separate drivers. The `.dpv` file will be saved with the settings for only one of the driver types.

5.9.5 SetDriverParam

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

Supported By

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

Syntax

```
SetDriverParam <WWPN> <Flag1> <Flag2> <Param> <Value> <enable-dtm>
```

Parameters

WWPN	The WWPN of an FC or FCoE function.
Flag1	L = Make change local for only this function. G = Make change global (all FC and/or 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).
enable-dtm	P = Make change permanent (persist across reboot).

NOTE	On Windows hosts, if the G (global) flag is specified, the changes depend upon the WWPN specified; the settings are applied to either the FC or FCoE functions, but not both at the same time. This is because FC and FCoE have separate drivers.

Example

To enable dynamic target mode:

```
hbacmd SetDriverParam 10:00:00:00:c9:ff:ff:ff L P enable-dtm 1
```

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

5.9.6 SetDriverParamDefaults

This command changes all values to the default for the adapter(s).

Supported By

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

Syntax

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

Parameters

WWPN	The WWPN of an FC or FCoE function.

Flag1   L = Make change local for only this function .
         G = Make change global (applies to all FC and FCoE functions on this host).

Flag2   P = Make change permanent (the change persists across reboot).
         T = Make change temporary.

NOTE	On Windows hosts, if the G (global) flag is specified, the changes depend upon the WWPN specified, the defaults are applied to either the FC or FCoE functions, but not both at the same time. This is because FC and FCoE have separate drivers.

5.10   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 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 following adapter types:

- OneConnect and LPe16202 adapters (Enhanced FAT Dump) – `.edf` extension
- OneConnect adapters (Core Dump) – `.core` extension
- LPe16000, LPe31000, and LPe32000 – series adapters (except LPe16202) – `.bin` extension
- LPe12000-series adapters – `.dmp` extension

5.10.1   DeleteDumpFiles

This command deletes all diagnostic dump files for an adapter.

Supported By

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

Syntax

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

Parameters

WWPN   The WWPN of an FC or FCoE function on the adapter.

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

5.10.2   Dump

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

NOTE	In some cases, a core dump can be performed on an inoperative OneConnect adapter. To view inoperative adapters on the local host, use the `ListHBAs down` command. See Section 5.15.10, ListHBAs on page 102.

For OneConnect adapters, if the core optional parameter is not specified, an Enhanced FAT Dump is performed by default.

Supported By

Linux, Solaris, Windows, and VMware ESXi from a Windows remote 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 a OneConnect adapter (local host only).
Options	For available core dump options, contact Broadcom technical support.

5.10.3   GetDumpDirectory

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

NOTE	The dump directory can only be set on VMware ESXi hosts.
	The dump directory applies to all adapters in the server. There is not a separate dump directory for each adapter.

Supported By

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

Syntax

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

Parameters

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

5.10.4   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 directory is the same.

Dump directory:

- Windows – `SystemDrive_Letter:\Program Files\Emulex\Util\Dump`
- Linux – `/var/opt/emulex/ocmanager/Dump`
- Solaris – `/opt/ELXocm/Dump`
- VMware ESXi – The dump directory set using the `SetDumpDirectory` command.

Supported By

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

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

5.10.5   GetDumpFileNames

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

Supported By

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

Syntax

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

Parameters

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

Example

```
hbacmd h=10.192.193.154  GetDumpFileNames
```

5.10.6   GetRetentionCount

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

Supported By

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

Syntax

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

Parameters

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

5.10.7   SetDumpDirectory

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

Supported By

VMware ESXi from a Windows remote 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. There is no separate dump directory for each adapter.

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:

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

5.10.8   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 VMware ESXi from a Windows remote 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

```
hbacmd h=10.192.193.154 m=cim u=root p=Swamiji001 n=root/emulex SetRetentionCount
00-00-c9-93-2f-9f 6
```

5.11 FCoE Commands

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

> **NOTE**   These commands are supported only on OneConnect and LPe16202 FCoE adapters.

5.11.1 GetFCFInfo

This command shows the FCF information of the FCoE function.

Supported By

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

Syntax

```
GetFCFInfo <WWPN>
```

Parameters

WWPN   The WWPN of an FCoE function.

Example

```
hbacmd 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
```

5.11.2 GetFIPParams

This command gets the FIP parameters of an FCoE function.

Supported By

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

Syntax

```
GetFIPParams <WWPN>
```

Parameters

WWPN   The WWPN of an FCoE function.

Example

```
hbacmd 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
```

5.11.3 SetFIPParam

This command sets the FIP parameters of an FCoE function.

Supported By

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

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

5.12 iSCSI Commands

The iSCSI Commands group support 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`

5.12.1   AddARPTableEntry

This command adds an ARP table entry.

Supported By

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

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.

5.12.2   AddiSNSServer

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

> **NOTE**   For OCe11000-series and OCe11100-series adapters, only one iSNS server can be configured. For OCe14000-series adapters, up to four iSNS servers can be configured.

Supported By

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

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.

5.12.3   AddRouteTableEntry

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

Supported By

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

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.

5.12.4   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 Target CHAP Name and Target Secret. For example:
  ```
  hbacmd 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:
  ```
  hbacmd AddTarget 00-11-22-33-44-55 192.168.1.1 8000 iscsitarget Auth=1
  "TgtCHAPName" "TargtSecret1" "InitCHAPName" "InitialSecret1"
  ```

Supported By

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

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.

5.12.5 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:

```
hbacmd 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:

```
hbacmd 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, Solaris, Windows, and VMware ESXi from a Windows remote host

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.

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

Syntax

```
CleariSNSServer <MAC_Address>
```

Parameters

MAC_Address	The MAC address of an iSCSI function.

5.12.7   DelARPTableEntry

This command removes an ARP table entry.

Supported By

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

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.

5.12.8   DeleteiSNSServer

This command is used to delete an iSNS server from the current iSNS server list.

Supported By

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

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.

5.12.9   DelRouteTableEntry

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

Supported By

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

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.

5.12.10   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	The OneConnect adapters can detect one iSNS Server, and the OCe14000-series adapters can detect up to four iSNS Servers.

Supported By

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

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.

5.12.11   ExportiSCSI

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

```
hbacmd ExportiSCSI > targets.xml
```

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

Syntax

```
GetInitiatorProperties <MAC_Address>
```

Parameters

MAC_Address   The MAC address of an iSCSI function.

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

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)

5.12.14   GetiSCSIPortStats

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

Supported By

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

Syntax

```
GetiSCSIPortStats <MAC_Address>
```

Parameters

MAC_Address	The MAC address of an iSCSI function.

5.12.15   GetNetworkConfiguration

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

Supported By

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

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
```

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

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.

5.12.17   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 5.12.11, ExportiSCSI on page 81).
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.

```
hbacmd 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
```

5.12.18   iSCSIPing

This command issues ICMP echo requests to an iSCSI target.

Supported By

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

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.

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

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.

5.12.20   RemoveTarget

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

Supported By

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

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.

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

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.

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

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

5.12.23   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 is used by the target to authenticate the initiator. For example:

    ```
    hbacmd 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:

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

Supported By

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

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.

5.12.24 SetiSCSIBoot

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

Supported By

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

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

5.12.25 SetNetworkConfiguration

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

Supported By

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

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 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 only valid on OCe14000-series adapters.

5.12.26 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 return 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:

      hbacmd SetTargetLoginProperties 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:

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

Supported By

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

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.

5.12.27 SetTargetProperties

This command sets the ETO value of an iSCSI target.

Supported By

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

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

5.12.28   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:

      hbacmd 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:

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

Supported By

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

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.

5.12.29 ShowARPTable

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

Supported By

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

Syntax

```
ShowARPTable <MAC_Address>
```

Parameters

MAC_Address   The MAC address of an iSCSI function.

5.12.30 ShowiSNSServer

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

Supported By

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

Syntax

```
ShowiSNSServer <MAC_Address>
```

Parameters

MAC_Address   The MAC address of an iSCSI function.

5.12.31 ShowRouteTable

This command shows the route table for an iSCSI function.

Supported By

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

Syntax

```
ShowRouteTable <MAC_Address>
```

Parameters

MAC_Address   The MAC address of an iSCSI function.

Example

```
hbacmd h=10.192.203.240 ShowRouteTable 00-00-c9-a0-ce-77
```

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

Syntax

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

NOTE	Only a single command option can be specified with this command. That is, you can only specify either 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.

5.12.33   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, Solaris, 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.

5.12.34   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:

```
hbacmd 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:

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

Supported By

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

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.

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

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.

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

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).

5.13 LUN Masking Commands

The LUN Masking Commands group manage LUN masking activities.

> **NOTE** LUN Masking commands are only supported for FC/FCoE functions.
> Linux does not support the `GetLunUnMaskByHBA`, `GetLunUnMaskByTarget`, and `SetLunMask` commands.
> Solaris and VMware ESXi from a Windows remote host do not support the `GetLunUnMaskbyHBA`, `GetLunUnMaskbyTarget`, `RescanLuns`, and `SetLunMask` commands.

5.13.1 GetLunList

This command queries for the presence of any masked LUNs.

Supported By

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

Syntax

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

Parameters

`HBA WWPN`	The WWPN of an FC or 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

5.13.2 GetLunUnMaskByHBA

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

Supported By

Solaris and Windows

Syntax

`GetLunUnMaskByHBA <HBA WWPN> <Option>`

Parameters

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

5.13.3 GetLunUnMaskByTarget

This command queries for any unmasked LUNs by target.

Supported By

Solaris and Windows

Syntax

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

Parameters

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

5.13.4 RescanLuns

This command rescans LUNs to find any new LUNs.

Supported By

Linux, Solaris, and Windows

Syntax

`RescanLuns <HBA WWPN> <Target WWPN>`

Parameters

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

5.13.5   SetLunMask

This command masks the specified LUNs.

Supported By

Solaris and Windows

Syntax

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

Parameters

HBA WWPN	The WWPN of an FC or 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

5.14   LUN ExpressLane Commands

The LUN ExpressLane Commands group enables, disables and displays the ExpressLane status on a particular LUN.

The OneCommand Manager application allows you set special priority queuing for selected LUNs by making them ExpressLane LUNs. ExpressLane LUN performance is superior to that of regular LUNs. You can enable ExpressLane LUNs attached to both physical and virtual ports. ExpressLane LUN assignments persist across system reboots.

> **NOTE**   ExpressLane is only supported on LPe16000, LPe31000, and LPe32000-series FC adapters.

For Linux operating systems, if ExpressLane LUNs are created, the VPort needs to be recreated after a system boot because they do not persist across system reboots. If the VPort is recreated with the same WWPN that the ExpressLane LUN was previously assigned to and that same LUN is then detected, it becomes an ExpressLane LUN again.

5.14.1   GetExpressLaneLunList

This command displays LUNs on a target and their respective ExpressLane status.

Supported By

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

NOTE	For Linux and VMware operating systems, only ExpressLane-enabled LUNs are shown by this command. LUNS without ExpressLane-enabled support are not shown.
NOTE	ExpressLane LUNs are only supported on 16 Gb FC ports.

Syntax

```
GetExpressLaneLunList <WWPN> [vport=<vPort WWPN>] <Target WWPN> <Option>
```

Parameters

WWPN	The WWPN of the FC function connected to the target or physical WWPN if virtual ports are selected.
vPort WWPN	The WWPN of an optional vPort allowing you to get the ExpressLane LUNs of a vPort.
Target WWPN	The WWPN of the target LUNs.
Option	0 = Get information from driver
	1 = Get information from configuration

Example

```
>hbacmd h=10.192.87.198 GetExpressLaneLunList 10:00:00:00:00:87:01:98
20:22:d4:ae:52:6e:6f:08 0

Number of LUNs: 4
     FCP_LUNOS_LUN           ExpressLane
------------------- ------ ------------
0000 0000 0000 00000          No
0001 0000 0000 00001          Yes
0002 0000 0000 00002          No
0003 0000 0000 00003          Yes
```

5.14.2 SetExpressLaneLunState

This command enables or disables ExpressLane on a particular LUN.

NOTE	ExpressLane cannot be enabled for Masked LUNs.

Supported By

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

Syntax

SetExpressLaneLunState <WWPN> [vport=<vPort WWPN>] <Target WWPN> <Lun> <State> <Option>

Parameters

WWPN	The WWPN of the FC/FCoE function connected to the target or physical WWPN if virtual ports are selected.
vPORT WWPN	The WWPN of an optional vPort allowing you to set the state of a vPort LUN.
Target WWPN	The WWPN of the target LUNs.

LUN	The LUN number on which to set the ExpressLane status.
	Obtain the LUN number from the output of the GetExpressLaneLunList command under the OS LUN column.
State	0 = Disable ExpressLane, 1=Enable ExpressLane
Option	0 = Set ExpressLane LUN state in driver to temporary, until reboot
	1 = Set ExpressLane LUN state in the configuration to persist across reboots
	2 = Set ExpressLane LUN state in both driver and in the configuration to persist across reboots

Example

```
>hbacmd h=10.192.87.198 SetExpressLaneLUNState 10:00:00:00:00:87:01:98
20:22:d4:ae:52:6e:6f:08 2 1 2
```

5.15   Miscellaneous Commands

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

5.15.1   AddHost

This command adds a host to the hosts file for remote TCP/IP management in the OneCommand Manager application. The adapters for these hosts are also presented by the ListHBAs command (see Section 5.15.10, ListHBAs on page 102).

Supported By

Linux, Solaris, and Windows

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 hbacmd is not available for the AddHost command.

To add VMware ESXi hosts to Windows the OneCommand 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 on page 26.

Parameters

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

5.15.2   CnaClearEventLog

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

NOTE	This command is only supported for OneConnect and LPe16202 adapters.

Supported By

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

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.

5.15.3   CnaGetEventLog

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

NOTE	This command is only supported for OneConnect adapters.

Supported By

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

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.

5.15.4   Download

This command downloads a firmware image to the port FC 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, LPe31000-series, or LPe32000-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. See the installation manual for the adapter for more information.

- If you attempt to update unauthenticated firmware for a secure OCe14000B-series, LPe31000-series, or LPe32000-series adapter, the following error message will be 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, LPe31000-series, or LPe32000-series adapter, the following error message will be 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
  ```

- Updating firmware or boot code on an older Fibre Channel adapter (for example, LPe12000) that is being used to boot From SAN is not advisable. After the update has completed, the system performs an adapter reset, which may cause a loss of connectivity to the SAN and possible loss of data. To update firmware on an older Fibre Channel adapter, you must make sure that the adapter is not currently being used to boot from SAN. Perform one of the following:

  — Move the adapter to be updated to a non-boot from SAN host, and perform the update from that location.

  — If the host with the adapter that needs to be updated is also hosting other boot from SAN adapters, perform a boot from SAN using one of the other boot from SAN adapters. The target adapter can now be updated, since it is no longer being used for boot from SAN.

- For 16Gb HBA firmware downloads, the OneCommand Manager application only accepts `.grp` files.

- For OneConnect and LPe15000, LPe16000, LPe31000, and LPe32000-series adapters, the WWPN or MAC address is used to identify the adapter, and the updated firmware applies to the entire adapter. Older FC HBA models require downloading the firmware to each FC port.

Supported By

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

Syntax

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

Parameters

WWPN	The WWPN of an FC or 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).

5.15.5   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 `hbacmd` 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).

5.15.6   FecEnable

This command enables or disables FEC on LPe16000, LPe31000, and LPe32000-series FC adapters.

Supported By

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

Syntax

FecEnable WWPN <0|1>

Parameters

`WWPN`   The WWPN of the FC function.

`0`   Disables FEC on the function

`1`   Enables FEC on the function

5.15.7   GetCimCred

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

NOTE   The password is encrypted.

Supported By

Windows

Syntax

`GetCimCred`

Parameters

None.

5.15.8   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 VMware ESXi from a Windows remote host

Syntax

`GetQoSInfo <MAC_Address>`

Parameters

        `MAC`   The MAC address of a NIC function.

Example

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

5.15.9   GetVPD

This command shows the port's VPD.

Supported By

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

Syntax

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

Parameters

        `WWPN`   The WWPN of an FC or FCoE function.

        `MAC`   The MAC address of a NIC or iSCSI function.

5.15.10   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 VMware ESXi from a Windows remote host

Syntax

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

Parameters

`local`	Displays only local adapters.
`m=model`	Model filter. Append * to the end of the model name for a wildcard match. For example: LP9*
`pt=type`	The port type filter. Valid types are NIC, RoCE, iSCSI, FC, and FCoE.
`down`	Displays only the NIC functions of OneConnect and LPe16202 adapters on the local system in which the adapter's ARM processor has stopped. This is used to detect adapters that need a core dump collected in addition to ones that may not respond to commands from the OneCommand Manager CLI or application.

5.15.11   ListVFunctions

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

Supported By

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

Syntax

```
ListVFunctions <MAC>
```

Parameters

        `MAC`   The MAC address of a NIC function.

Example

```
hbacmd ListVFunctions 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.
```

5.15.12 RemoveHost

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

Supported By

Linux, Solaris, and Windows

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 `hbacmd` is not available for the RemoveHost command.

Parameters

        `host_address` The host to remove.

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

5.15.13   Reset

This command resets the FC/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 only applies to FC and FCoE functions.
	For OneConnect and LPe16202 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 FC or FCoE function.

5.15.14   SetCimCred

This command sets the default CIM credentials. You must specify all four credentials: username, password, namespace, and port number. Default credentials are used if any credential is not in the `hbacmd` 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 `hbacmd` commands do not require you to specify the CIM credentials in the command line.

Parameters

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

5.15.15   SRIOVEnable

This command enables or disables SR-IOV on a NIC function or all NIC functions on an OCe14000-series 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 will return an error if channel management is enabled.

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.

For OCe14000-series adapters, it is preferable to use the `SetAdapterPortConfig` command (see Section 5.18.4, SetAdapterPortConfig (for OCe14000-Series Adapters) on page 122) to enable or disable SR-IOV.

NOTE	SR-IOV is not supported with RoCE configurations.

Supported By

Linux, Windows, and VMware ESXi from a Windows remote 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 NIC function with MAC address 00-00-c9-12-34-56:

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

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

```
>hbacmd 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.

```
C:\Program Files\Emulex\Util\OCManager>hbacmd 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).
```

5.15.16   TargetMapping

This command shows a list of mapped targets and the LUNs for the port.

Supported By

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

Syntax

```
TargetMapping <WWPN>
```

Parameters

WWPN	The WWPN of an FC or FoE adapter.

5.15.17   VEPAEnable

This command enables or disables VEPA Management. 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, and this command returns a `Hardware Does Not Support` error. In addition, when the next boot configuration does not have SR-IOV enabled or 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 VMware ESXi from a Windows remote 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.

5.15.18   Version

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

Supported By

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

Syntax

For the remote management interface:

```
Version
```

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

For VMware ESXi using the CIM interface:

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

Parameters

None

5.16   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 FC target is already automapped. If automapping is disabled, the binding takes effect immediately if the FC 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 only supported for FC/FCoE ports.

The following persistent binding commands are not supported on Linux or VMware ESXi:

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

5.16.1   AllNodeInfo

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

Supported By

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

Syntax

```
AllNodeInfo <WWPN>
```

Parameters

WWPN   The WWPN of an FC or FCoE function.

5.16.2   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 FC or FCoE function.

5.16.3   BindingSupport

This command shows the binding support for the FC/FCoE function.

Supported By

Solaris and Windows

Syntax

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

Parameters

WWPN   The WWPN of an FC or FCoE function.

Source   C = Configuration support
           L = Live support

5.16.4   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 FC or FCoE function.
Source	C = Configuration support L = Live support

5.16.5   RemoveAllPersistentBinding

This command removes all persisting bindings for the FC/FCoE function.

Supported By

Solaris and Windows

Syntax

```
RemoveAllPersistentBinding <WWPN>
```

Parameters

WWPN	The WWPN of an FC or FCoE function.

5.16.6   RemovePersistentBinding

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

Supported By

Solaris and Windows

Syntax

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

Parameters

WWPN	The WWPN of an FC or 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.

5.16.7   SetBindingSupport

This command enables and sets the binding support(s) for the FC/FCoE function.

Supported By

Solaris and Windows

Syntax

`SetBindingSupport <WWPN> <BindFlag>`

Parameters

WWPN	The WWPN of an FC or 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

5.16.8 SetPersistentBinding

This command sets a persistent binding between an FC 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 FC or 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.

5.17 Personality Change Commands

NOTE	These commands are not available on LPe16202 adapters.

The OneCommand 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 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.

5.17.1   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 5.18.4, SetAdapterPortConfig (for OCe14000-Series Adapters) on page 122 for more information.

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

NOTE	RoCE is only available on OCe14000-series adapters.

Supported By

Linux, Solaris, Windows, and VMware ESXi from a Windows remote 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 5.17.2, ShowPersonalities on page 112.
Profile_ID	Optionally specifies the profile ID number to used to identify the personality. This number can be obtained from Section 5.18.3, 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.

Example

Changing to FCoE personality:

```
hbacmd ChangePersonality 00-12-34-56-78-9A fcoe
```

Changing to FCoE personality:

```
hbacmd changepersonality 00-00-c9-12-34-56 fcoe
```

Changing to NIC + RoCE personality with Profile ID 21:

```
hbacmd ChangePersonality 00-00-c9-12-34-56 nic+roce 21
hbacmd ShowPersonalities 00-00-c9-12-34-56
Adapter Personalities:
NIC
NIC+RoCE (configured)
iSCSI
FCoE (active)
```

5.17.2   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 VMware ESXi from a Windows remote 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

```
>hbacmd showpersonalities 00-00-c9-12-34-56

Adapter Personalities:
NIC
NIC+RoCE
iSCSI
FCoE (active) (configured)
```

5.18   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.

5.18.1   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 if RoCE is supported on the adapter and if a reboot is currently required to activate the new configuration.

The number of functions displayed per port depends upon 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 only displays the port protocol assignments. For the entire multi channel configuration, use the .

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 multi channel 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 VMware ESXi from a Windows remote 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

Use the following table to locate the appropriate examples for your application.

Example Types	Location
Tabular output	See page 114
2 port adapter, with the table option.	See page 114.
4-Port Adapter	See page 115.
2-port adapter, port number starting at 1	See page 116.
UMC	See page 117.
NIC+RoCE	See page 117.
Default output format with a disabled port	See page 60.
Tabular output format with a disabled port	See page 118.
Default output with port added back	See page 119.
Tabular output with port added back	See page 120.

5.18.1.1   Tabular Output

The adapter configuration information is displayed in a table format when the table (tab or tabular) option is specified.

```
>hbacmd 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).
```

5.18.1.2   2-port Adapter, with the Table Option

```
>hbacmd 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).

5.18.1.3   4-Port Adapter

```
>hbacmd 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).

5.18.1.4   2-Port Adapter, Port Number Starting at 1

```
>hbacmd 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).

5.18.1.5   UMC

```
>hbacmd 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).

5.18.1.6   NIC+RoCE

```
>hbacmd 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).
```

5.18.1.7 Default Output Format with a Disabled Port

If you have removed a port, the `GetAdapterPortConfig` output will no longer display 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, and 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).
```

5.18.1.8 Tabular Output Format with a Disabled Port

```
>hbacmd 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
```

5.18.1.9   Default Output with Port Added Back

```
>hbacmd 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).
```

5.18.1.10   Tabular Output with Port Added Back

```
>hbacmd 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.
```

5.18.2 GetLinkConfig

This command displays the active and configured link configuration IDs and lists the available link configurations (descriptions).

> **NOTE**   The link reconfiguration feature is only available on some OCe14000-series adapters.

Supported By

Windows and VMware ESXi from a Windows remote host

Syntax

```
GetLinkConfig <MAC|WWPN>
```

Parameters

WWPN   The WWPN of any FC or FCoE function on the adapter.

MAC   The MAC address of any NIC+RoCE or iSCSI function on the adapter.

Example

```
OCM: hbacmd 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
```

5.18.3 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 VMware ESXi from a Windows remote host

Syntax

```
ListProfiles <MAC|WWPN>
```

Parameters

MAC   MAC address of any NIC, NIC+RoCE or iSCSI function on the adapter.

WWPN   WWPN of any FC/FCoE function on the adapter.

Example

> **NOTE**   Different adapter models will have a different set of profiles.

```
>hbacmd 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
```

5.18.4   SetAdapterPortConfig (for OCe14000-Series Adapters)

This command can be used to 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 will fail 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 depends upon the available ports, and multichannel and NPar state.

To support up to 16 functions on an adapter, ARI must be available on the system with the following conditions: 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 the Windows Server® 2012 and later, and any management tools that you use must support ARI, such as OneCommand Manager 10.2 and later. If these conditions are not met, although you may configure all 16 functions, only eight functions will be present and discovered by the OneCommand 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.
	NParEP support is available only on Dell 13G or newer systems.
	Only OCe14000-series adapters support ARI.

NOTE	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 UM,C 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 VMware ESXi from a Windows remote 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.
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).
- fm- Mth 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 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 in the following table.

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 5.18.5.1.7, NParEP Mode on page 134 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 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 fm are None, iSCSI, FCoE or NIC. NIC for f1 through fm can only be specified for multichannel configurations. Except for NPar, iSCSI and FCoE are limited to f1 and f2.

- NIC+RoCE can only be specified as the f0 parameter with no other f parameters specified and 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 upon the adapter model and configuration type; for example, non-multichannel, multichannel, RoCE, and NPar. If an incorrect number of functions are 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 5.18.3, ListProfiles on page 121 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 need 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 set to None to disable multichannel. If not specified, the currently configured multichannel type (including None) remains unchanged. See page 123 for supported multichannel types.

- If the functions being set to None are the last function(s) 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 only be specified when the mctype= parameter is set to NPar or when the currently configured multichannel type is NPar.

- When disabling NPar (mctype=none), NParEP Mode is automatically disabled.

- A reboot is required to activate the new port configuration.

Examples

Use the following table to locate the appropriate examples for your application.

Example Types	Location
One storage protocol plus SR-IOV	See page 125.
Two storage protocols-- 2 Ports	See page 125.
RoCE	See page 126.
Enabling NPar with SR-IOV	See page 126.
Removing a Port	See page 129

One Storage Protocol Plus SR-IOV

```
>hbacmd SetAdapterPortConfig 00-00-c9-12-34-56 p0=nic,iscsi p1=nic,fcoe
p2=nic,fcoe p3=nic sriov=1

>hbacmd 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 Plus 2 Ports

```
>hbacmd SetAdapterPortConfig 00-00-c9-12-34-56 p0=nic,iscsi,fcoe p1=nic,fcoe

>hbacmd 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

```
>hbacmd SetAdapterPortConfig 00-00-c9-12-34-56 p0=nic+roce p1=nic p2=nic
p3=nic+roce pid=21
>hbacmd 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

```
>hbacmd 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.

5.18.4.1   Multichannel Configurations

For additional information about universal multichannel, see the *Universal Multi-Channel Reference Guide*.

> **NOTE**   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, it must be enabled in the
> system BIOS, and the operating system must support ARI. If these
> conditions are not met, although you may configure all sixteen
> functions, only eight functions will be present and detected by the
> OneCommand Manager application after a reboot.

5.18.4.1.1   Enabling and Disabling Multichannel

Use the mctype parameter in the `SetAdapterPortConfig` command to enable or disable multichannel on an adapter. This parameter is required to enable multichannel. For a list of supported mctypes, see page 123.

Disable multichannel on an adapter by setting the 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 used to enable or disable multichannel for
> OCe11100-series adapters cannot be used on OCe14000-series
> adapters. If it is used, an error message is generated. Use the
> `SetAdapterPortConfig` command.

Examples

Enable Multichannel for UMC:

> >hbacmd 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:

> >hbacmd SetAdapterPortConfig 00-00-c9-12-34-56 p0=nic,iscsi p1=nic,fcoe p2=nic,fcoe p3=nic,iscsi
> mctype=none

5.18.4.1.2   Showing Multichannel Configuration

The `CMGetParams` command shows the current multichannel configuration for an adapter's physical port. See Section 5.6.1, CMGetParams on page 48 for more information.

5.18.4.1.3   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 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

Use the following table to locate the appropriate examples for your application.

Example Types	Location
UMC 4-Port, 4 Channels per Port	See page 128.
Enable UMC on 2-Port - 8 Channels per Port	See page 129.

UMC 4-Port, 4 Channels per Port

```
>hbacmd 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.

>hbacmd 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

```
>hbacmd 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.

>hbacmd 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).
```

5.18.4.1.4   Setting Multichannel Bandwidths

See Section 5.6.3, CMSetBW on page 51 for more information.

5.18.4.2   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 on page 151 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:

```
hbacmd setAdapterPortConfig 00-90-fa-41-22-f0 p0=NIC p1=none pid=16
```

The following output will be 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 also set the rest of the functions from that port to None, or 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:

```
>hbacmd 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
```

5.18.4.3   Adding a Port While Enabling Multichannel Mode

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.

For example, if you type the following command:

```
hbacmd 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.
```

5.18.4.4   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 is displayed to notify you that multichannel properties can only be set on this port after a system reboot has been performed.

For example, if you type the following command:

```
hbacmd 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.
```

5.18.5   Lenovo System X Multichannel for OCe14000-Series Adapters

For Lenovo System X multichannel configuration, three different 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 on page 131.

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

5.18.5.1   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 Manager application after a reboot.

5.18.5.1.1   Enabling and Disabling NPar

To enable NPar, set the mctype parameter in the `SetAdapterPortConfig` command to NPar. When enabling NPar, the additional function protocols must be specified 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 existing `CMMode` command, used to enable or disable multichannel for 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 5.18.5.1.9.1, Default NPar Bandwidths on page 138 for more information.

5.18.5.1.2   Showing NPar Configuration

Both the `GetAdatperPortConfig` command and the `CMGetParams` command show different aspects of the NPar configuration.

5.18.5.1.3   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 5.18.1, GetAdapterPortConfig on page 112 for more information.

5.18.5.1.4   Examples Using GetAdatperPortConfig

Use the following table to locate the appropriate examples for your application.

Example Types	Location
NPar disabled - 2 Ports, NParEP Mode Disabled	See page 132.
NPar enabled - 2 Ports, NParEP Mode Enabled on Reboot	See page 132.

NPar disabled - 2 Ports, NParEP Mode Disabled

```
>hbacmd 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

```
>hbacmd 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).
```

5.18.5.1.5   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 5.6.1, CMGetParams on page 48 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.

5.18.5.1.6   Examples Using CMGetParams

Use the following table to locate the appropriate examples for your application.

Example Types	Location
NPar Disabled	See page 133.
NPar Enabled — 8 Partitions per Port	See page 134.

NPar Disabled

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

NPar Enabled — 4 Partition per Port

```
>hbacmd 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

```
>hbacmd 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
```

5.18.5.1.7 NParEP Mode

For NPar adapters, you can change the total number of partitions displayed and configured on the adapter to eight when the NParEP Mode property is disabled or up to 16 when the NParEP Mode property is enabled. Use the nparepmode parameter in the `SetAdapterPortConfig` command to enable or disable this property. See page 123 for mor information.

| NOTE | 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 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 5.18.5.1.9.1, Default NPar Bandwidths on page 138 for more information.

Syntax

```
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 its factory default configuration. No additional parameters should be specified with the default 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[,...fM]] where: ■ f0 - First function protocol on port (must be NIC or NIC+RoCE). ■ f1 - Second function protocol on port (optional). ■ fm- Mth 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 5.18.5.1.7, NParEP Mode on page 134 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

5.18.5.1.8   Setting NPar Function Protocols

When NPar is enabled, the protocols for additional functions on each port can be specified depending upon the board model, the number of ports available on the adapter, and the NParEPMode setting, otherwise they are set to None; meaning there is no protocol running on the function. The `SetAdapterPortConfig` command configures the protocols running on each function.

After enabling NPar mode with the `SetAdapterPortConfig` command, default bandwidths are automatically assigned to each partition with an assigned protocol. See Section 5.18.5.1.9.1, Default NPar Bandwidths on page 138 for more information.

The following rules apply when using the `SetAdapterPortConfig` command with multichannel enabled to configure NPar:

- First function on a port is always NIC. NIC+RoCE is not available when NPar is enabled.
- Storage can be configured only on the 2nd, 3rd, or 4th partitions. A total of 2 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

Use the following table to locate the appropriate examples for your application.

Example Types	Location
4 Ports - NParEP Mode-Disabled, 2 Functions per Port	See page 135.
2 Ports - NParEP Mode-Disabled, 4 Functions per Port	See page 136.
4 Ports - NParEPMode-Enabled, 4 Functions per Port	See page 137.

4 Ports - NParEP Mode-Disabled, 2 Functions per Port

```
>hbacmd 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.

>hbacmd 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

```
>hbacmd 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.

>hbacmd 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

```
>hbacmd 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.
>hbacmd 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).
```

5.18.5.1.9   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 5.6.3, CMSetBW on page 51 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 upon the adapter model. See
Section 5.18.1, GetAdapterPortConfig on page 112 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. The
following example shows that there are four functions for each port number under Reboot Configuration, which

requires that four sets of bandwidths be specified; a minimum and a maximum. 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. Even though you are allowed to set the minimum bandwidths on some enabled functions to 0, you are not allowed to 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 for None, must be 0.

NOTE	A reboot is not required for bandwidth changes to take effect when channel management is enabled or when currently running NPar on the adapter.
NOTE	Setting the minimum and maximum bandwidths to zero will 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.

5.18.5.1.9.1   Default NPar Bandwidths

After enabling or disabling NParEP Mode or NPar, 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 may cause an uneven distribution when 100 divides evenly by the number of partitions; meaning some partitions minimum bandwidths 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 5.6.3, CMSetBW on page 51 for more information.

Examples

Use the following table to locate the appropriate examples for your application.

Example Types	Location
4 Partitions per Port	See page 138.
4 Partitions per Port - third, fourth Partition Protocol = None	See page138.
8 Partitions per Port - 2-Port adapter, NParEP Mode Enabled, Last Channel MinBandwith = 0	See page138.

4 Partitions per Port

```
>hbacmd CMSetBW 00-00-c9-12-34-56 15,50 30,100 40,100 15,50
>hbacmd 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, Fourth Partition Protocol = None

```
>hbacmd CMSetBW 00-00-c9-12-34-56 50,100 60,100 0,0 0,0

>hbacmd 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

```
>hbacmd cmsetbw 00-00-c9-12-34-56 10,100, 30,100 10,100, 10,100, 10,100, 10,100,
10,100, 10,100

>hbacmd 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
```

5.18.5.1.10 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 `SetAdapterPortConfig` command to configure these ports. See Section 5.18.4, SetAdapterPortConfig (for OCe14000-Series Adapters) on page 122 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 5.17.1, ChangePersonality on page 111 for more information.

Examples

Use the following table to locate the appropriate examples for your application.

Example Types	Location
Disable NPar - 4 Ports, All NIC	See page 140.
2 Ports - Switching from all NIC to NIC+RoCE on First Port. Run Profile 21: RoCE-2	See page 141.

Disable NPar - 4 Ports, All NIC

```
>hbacmd 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.
>hbacmd 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.
Run Profile 21: RoCE-2

```
>hbacmd 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.
>hbacmd 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).
```

5.18.6 SetLinkConfig

The `SetLinkConfig` command changes the configured link configuration ID. It can change it to a specified 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 only available on some OCe14000-series adapters.

Supported By

Windows and VMware ESXi from a Windows remote 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 FC/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 will also change the link configuration ID to the factory default ID.

Example

```
>hbacmd 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.
```

5.19   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 Multi-Channel Reference Guide*.

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 5.6, Channel Management Commands on page 48 for more information.

UMC commands are available only on OneConnect adapters.

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 may 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.
  ```

5.19.1   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 only enable UMC channel management, but it will disable any channel management type 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 5.18.4, SetAdapterPortConfig (for OCe14000-Series Adapters) on page 122 for more information.

NOTE	If you try using the `UmcEnable` command on an OCe14000-series adapter, an error message is displayed indicating the command is not supported by the firmware or hardware.

Supported By

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

```
>hbacmd UmcEnable 00-00-c9-bb-cc-aa 1
```

5.19.2   UmcGetParams

NOTE	This command has been replaced by the CMGetParams command and 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 the UMC commands. See Section 5.17.1, ChangePersonality on page 111 and Section 5.18.4, SetAdapterPortConfig (for OCe14000-Series Adapters) on page 122 for more information.

Consideration

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.

For example, if you type the following command:

```
>hbacmd 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 VMware ESXi from a Windows remote 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

```
>hbacmd 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

```
>hbacmd 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
```

5.19.3   UmcSetBW

NOTE	This command has been replaced by the CMSetBW command and 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 when 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 have a maximum value of 100.

Supported By

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

```
>hbacmd 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 is displayed indicating that UMC is currently disabled and 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 will be displayed indicating that the operation cannot be performed on this port.

  For example, if you type the following command:

  ```
  >hbacmd 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.
  ```

5.19.4 UmcSetLPVID

NOTE	This command has been replaced by the `CMSetLPVID` command and 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 5.19.2, UmcGetParams on page 143 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 will be displayed indicating that the operation cannot be performed on this port.

For example, if you type the following command:

```
>hbacmd 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 VMware ESXi from a Windows remote 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 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/s ports.
- If channel management is disabled when this command is executed, an error message is displayed.

Examples

All NIC Channels

```
>hbacmd UmcSetLPVID 00-00-c9-12-34-56 1001 1002 1003 1004
```

Storage on 2nd Channel

```
>hbacmd UmcSetLPVID 00-00-c9-12-34-56 1001 0 1002 1003
```

5.20 vPort Commands

The vPort Commands group manages virtual ports and functions only on FC/FCoE adapters.

NOTE	These commands are only supported for FC and FCoE adapter functions.
NOTE	In Linux, VPorts do not persist across system reboots. VPorts must be recreated after a system reboot.

5.20.1 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 FC or 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.

5.20.2   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 FC or FCoE function.
virtual WWPN	The WWPN of the virtual port.

5.20.3   ListVPorts

This command lists virtual ports on the specified physical FC/FCoE function. Leaving the physical WWPN parameter blank lists all virtual ports on all manageable hosts that support virtual ports.

Supported By

Linux, Solaris, and Windows

Syntax

```
ListVPorts <physical WWPN>
```

Parameters

physical WWPN	The WWPN of an FC or FCoE function.

5.20.4   VPortTargets

This command lists targets visible to the specified virtual port.

Supported By

Linux, Solaris, and Windows

Syntax

```
VPortTargets <physical WWPN> <virtual WWPN>
```

Parameters

physical WWPN   The WWPN of an FC or FCoE function.

virtual WWPN   The WWPN of the virtual port.

5.21   WWN Management Commands

WWN Management Commands group validates WWNs carefully to avoid WWPN duplication, but WWNN duplication is acceptable. You may see error and warning messages if a name duplication is detected. Fulfill the activation requirement after each WWN is changed or restored. If there are pending changes, some diagnostic and maintenance features are not available.

NOTE   These commands are only supported for FC/FCoE functions.

CAUTION   Using the ChangeWWN or RestoreWWN commands on an older FC adapter (for example, LPe12000) that is being used to boot from SAN is not advisable. After the command has completed, the system performs an adapter reset, which may cause a loss of connectivity to the SAN and possible loss of data. To perform these commands on an older FC adapter, you must make sure that the adapter is not currently being used to boot from SAN.

Do one of the following:

- Move the target adapter to a non-boot from SAN host.
- If the host with the target adapter is also hosting other boot from SAN adapters, perform a boot from SAN using one of the other boot from SAN adapters. The target adapter can now be used.

5.21.1   ChangeWWN

This command allows you to change WWPNs and WWNNs, and it allows you to change it to volatile or non-volatile. 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.

For ESXi:

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 VMware ESXi from a Windows remote host

Syntax

```
ChangeWWN <WWPN> <New WWPN> <New WWNN> <Type>
```

Parameters

WWPN	The WWPN of an FC or FCoE function.
New WWPN	The WWPN of the FC or FCoE function.
New WWNN	The WWNN of an FC or FCoE function.
Type	0 = Volatile 1 = Non-Volatile

5.21.2   GetWWNCap

This command shows if volatile change is supported for the WWPN.

Supported By

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

Syntax

```
GetWWNCap <WWPN>
```

Parameters

WWPN	The WWPN of an FC or FCoE function.

5.21.3   ReadWWN

This command reads different types of WWNs.

Supported By

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

Syntax

```
ReadWWN <WWPN> <Type>
```

Parameters

WWPN	The WWPN of an FC or FCoE function.
Type	0 = Volatile 1 = Non-Volatile 2 = Factory Default 3 = Current 4 = Configured

5.21.4   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, see the VMware documentation available from the VMware website.

For ESXi:

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, see the VMware documentation available from the VMware website.

Supported By

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

Syntax

```
RestoreWWN <WWPN> <Type>
```

Parameters

WWPN	The WWPN of an FC or FCoE function.
Type	0 = Restore Default WWNs 1 = Restore NVRAM WWNs

Appendix A: OneCommand Manager Error Messages

contains a list of some of the error messages that may be encountered during a OneCommand Manager session.

Table 9 OneCommand Manager Error and Warning Messages

Error Message	Command(s)	Description
`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: 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 on page 23.
`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 5.21.1, ChangeWWN on page 148.

`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 on page 35.

`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 5.10.4, GetDumpFile on page 71.
`ERROR: <180>:  Authentication: User unknown`	All	The specified username is not valid or could not be authenticated by the system. See Section 1.2, OneCommand Manager Secure Management on page 10 for more information.
`ERROR: <181>: Authentication: Insufficient credentials`	All	The specified username and password are valid and the user is a member of an OneCommand Manager group. However, the OneCommand Manager group does not have sufficient privileges to execute the specified command. See Section 1.2, OneCommand Manager Secure Management on page 10 for more information.

Table 9 OneCommand Manager Error and Warning Messages (Continued)

Error Message	Command(s)	Description
`ERROR: <183>: Secure Mgmt: user not a member of OCM group`	All	The specified username and password could be authenticated, but the user is not a member of an OneCommand Manager group. See Section 1.2, OneCommand Manager Secure Management on page 10 for more information.
`ERROR: <206>: Authentication Failed`	All	This indicates either a valid username, but invalid password, or a general user authentication error. See Section 1.2, OneCommand Manager Secure Management on page 10 for more information.

`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 5.7, DCB Commands on page 54.

`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 5.15.15, SRIOVEnable on page 104, Section 5.19, UMC Commands on page 142, and Section 5.3.5, SetPhyPortSpeed on page 40.

`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: `hbacmd setphyportspeed 00-00-c9-a9-41-88 2 100Mb` See Examples on page 41.

`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 5.18.4.2, Removing a Port on page 129.

`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 5.18.4.2, Removing a Port on page 129.

Table 9 OneCommand Manager Error and Warning Messages (Continued)

Error Message	Command(s)	Description
```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 5.18.4.2, Removing a Port on page 129.

```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 5.18.4.3, Adding a Port While Enabling Multichannel Mode on page 130.

```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 5.6.3, CMSetBW on page 51 and Section 5.19, UMC Commands on page 142.

Appendix B: License Notices

B.1   Secure Hash Algorithm (SHA-1) Notice

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