OneCommand™ Manager Application

Version 6.0

User Manual

Emulex Connects™
Servers, Storage and People

P007450-01A Rev. A

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Introduction

The Emulex® OneCommand™ Manager application is a comprehensive management utility for Emulex LightPulse® host bus adapters (HBAs) and OneConnect™ universal converged network adapters (UCNAs) that provides a powerful, centralized adapter management suite. Adapter management includes discovery, reporting and management of local and remote adapters from a single console anywhere in the Storage Area Network (SAN) and across operating system platforms. Remote configuration capability can be provided by either Fibre Channel (FC) access via host systems on the same FC SAN or by Transmission Control Protocol/Internet Protocol (TCP/IP) access from IP addresses of remote machines. The OneCommand Manager application contains a graphical user interface (GUI) and a command line interface (CLI). This manual describes the OneCommand Manager application for the following operating systems:

- Windows
- Linux
- VMware ESX Server
- Solaris

This OneCommand Manager installation includes options to install the OneCommand Vision Sensor Application. The OneCommand Vision Sensor is designed to work with the Emulex OneCommand Vision system, it is designed to collect critical I/O performance data while consuming the smallest possible production server memory and CPU footprint.

The OneCommand Vision system is an intelligent application that enables proactive management of I/O within a data center environment. OneCommand Vision gives IT administrators the ability to maximize I/O resource utilization, identify bottlenecks, and enhance performance and availability by monitoring and analyzing the I/O traffic within the infrastructure. OneCommand Vision collects, analyzes and organizes critical I/O performance data; helping organizations establish performance baselines, proactively monitor performance against those baselines, and lower time to resolution when problems occur. For more information please visit http://www.emulex.com/vision/.

New Features in this Release

- Supports Emulex multi-ASIC OneConnect adapters
- Supports Emulex 16 Gb/s host bus adapters
- Management host mode with push discovery of remote hosts
- Windows OneInstall to install all drivers and the OneCommand Manager application in a single installation kit
- Installs the OneCommand Vision Sensor if desired.

Compatibility

See the Emulex website for specific information regarding supported operating systems and platforms.

Supported Features by Operating System

Not all OneCommand Manager application features are supported across all operating systems. The following table lists the OneCommand Manager application features and their operating system support.

Table 1: Supported Features by Operating System Cross-Reference

Feature/Task	Windows	Solaris	Linux	VMware ESX Server
OneCommand Manager application GUI	X	X	X	X*
OneCommand Manager application CLI	X	X	X	X
OneCommand Manager application Web Launch Interface utility	X	X	X	
Discover local hosts, adapters, targets and LUNs	X	X	X	X*
Discover remote hosts, adapters, targets and LUNs	X	X	X	X*
Enable local discovery of Emulex and OEM branded Emulex adapters	X	X	X	X*
Enable FC discovery of Emulex and OEM branded Emulex adapters	X	X	X	X*
Change an adapter's WWPN or WWNN	X	X	X	X*
Reset adapters	X	X	X	X*
Set up persistent binding	X			
Simultaneously set adapter driver parameters to multiple adapters	X	X	X	
Set global driver parameters to adapters	X	X	X	X**
FC/FCoE Boot from SAN	X	X	X	X
iSCSI configuration	X		X	X
Update firmware and FC boot code on a single adapter or multiple adapters using batch update	X	X	X	X*
Enable or disable the x86 BootBIOS, EFI or OpenBoot, PXE Boot	X	X	X	X*
Run diagnostic tests on adapters	X	X	X	X
Manage local adapters	X	X	X	X*
Manage FC remote and TCP/IP accessed adapters	X	X	X	X*
Locate adapters using beaconing	X	X	X	X
Mask and unmask LUNS	X	X		
Perform authentication using FC-SP DHCHAP	X		X***	

Table 1: Supported Features by Operating System Cross-Reference (Continued)

Feature/Task	Windows	Solaris	Linux	VMware ESX Server
Create and delete virtual ports	X	X	X	
Run in read-only mode	X	X	X	X*
Configure boot from SAN	X	X	X	X*
Modify an IP port number	X	X	X	X*
View vital product data	X	X	X	X*
View transceiver information	X	X	X	X*
Create SAN element reports	X	X	X	X*
Manage adapters using CIM	X			
Enable or disable FIP	X	X	X	X*
COMSTAR support		X****		
Adapter hot swapping/hot plugging	X			
Licensing	X	X	X	X
Personality change	X	X	X	X
Host grouping	X	X	X	
vNIC^	X		X	X
Installs OneCommand Vision Sensor	X^^	X^^	X	
Emulex dual-ASIC 4 port 8Gb/sec FC adapters	X	X	X	X
Emulex 16 Gb/s host bus adapters	X	X	X	X

* Supported only by hbacmd for the VMware release of the OneCommand Manager application. Remote management clients can perform these functions on ESX Server adapters using the OneCommand Manager application GUI.

** Temporary (not persistent) driver parameters are supported on VMware ESX 3i Update 4 and versions of VMware ESX 3.5 prior to Update 4.

***DHCHAP is not supported on RHEL6 and SLES11-SP1.

****Supported on OpenSolaris only.

^ vNIC is supported only on IBM virtual fabric adapters.

^^ Not supported on IA64 Windows 7 and x86/x64 Solaris 10, 11 systems

Note: The features described in this manual depend on the driver version installed on the adapter. Not all features may be available to you.

Known Issues

See the product release notes for the latest information.

Installing and Uninstalling OneCommand Manager Application Components

Installing the OneCommand Manager Application

In Windows

There are two ways to install the OneCommand Manager application in Windows:

- Attended installation using the GUI.
- Unattended installation using the command line.

> **Note:** If you are running the OneCommand Vision application, you must stop the OneCommand Vision sensor before installing the OneCommand Manager application.
>
> To stop the sensor:
> 1. Select **Start > Programs > Administrative Tools > Services**.
> 2. Stop the EmulexSensor service.
> 3. Stop the EmulexWMIAgent service.
> 4. Stop the Emulex PDH agent service.
> 5. Stop the EmulexScope agent service.
> 6. Install the OneCommand Manager application.
>
> To restart the sensor after the installation is complete:
> 1. Stop SNMP service if SNMPv2c [Stop Net-SNMP Agent if SNMPv3].
> 2. Start SNMP service if SNMPv2c [Start Net-SNMP Agent if SNMPv3].
> 3. Start the EmulexSensor service.

Attended Installation in Windows

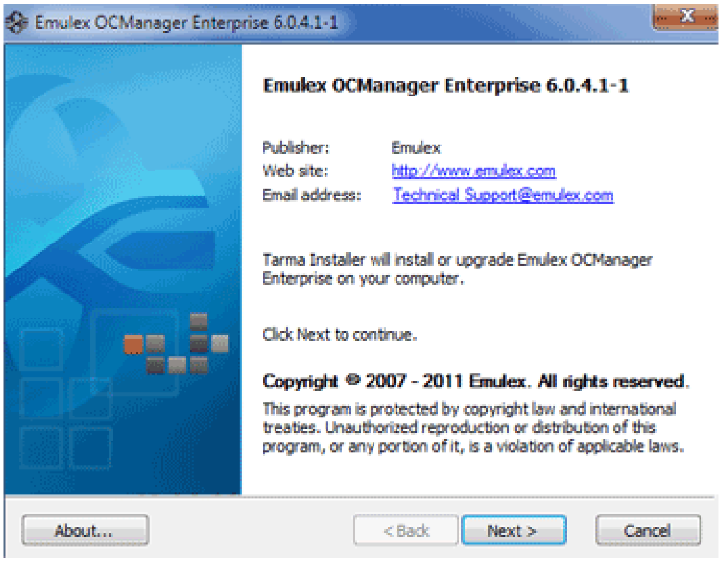
To install the OneCommand Manager application in Windows:

1. From the Emulex website, download the x64 or x86 OneCommand Manager Enterprise Kit installation file.

   > **Note:** For IA64 systems, use the x86 OneCommand Manager Enterprise installation file.

2. Navigate to the directory to which you downloaded the file.

3. Double click the elxocm<version>.exe. The Emulex OCManager Enterprise window appears.



Emulex OCManager Enterprise 6.0.4.1-1

Publisher: Emulex
Web site: http://www.emulex.com
Email address: Technical Support@emulex.com

Tarma Installer will install or upgrade Emulex OCManager Enterprise on your computer.

Click Next to continue.

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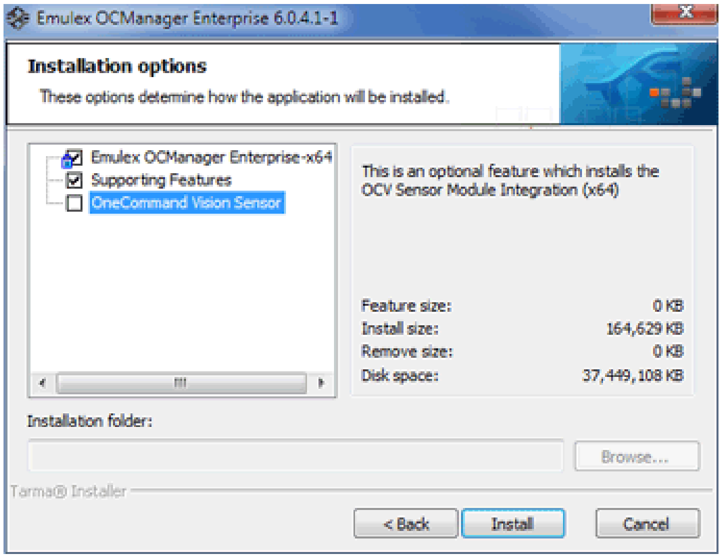
Figure 1: OCManager Enterprise window

4. Click **Next**. The Installation Options window appears.



Installation options

These options determine how the application will be installed.

- ☑ Emulex OCManager Enterprise-x64
- ☑ Supporting Features
- □ OneCommand Vision Sensor

This is an optional feature which installs the OCV Sensor Module Integration (x64)

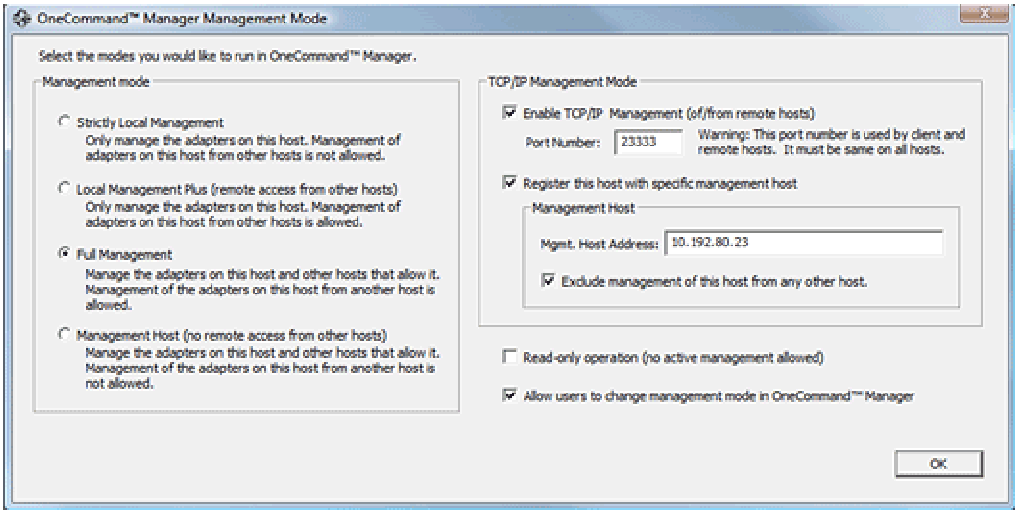
Feature size:	0 KB
Install size:	164,629 KB
Remove size:	0 KB
Disk space:	37,449,108 KB

Installation folder:

Figure 2: OCManager Enterprise Installation Options window

5. Check the applications that you want to install and click **Install**.

Note: You can also install the OneCommand Vision Sensor, but you must have the Windows SNMP service installed or the sensor installation will fail.



OneCommand™ Manager Management Mode

Select the modes you would like to run in OneCommand™ Manager.

Management mode

○ Strictly Local Management
Only manage the adapters on this host. Management of adapters on this host from other hosts is not allowed.

○ Local Management Plus (remote access from other hosts)
Only manage the adapters on this host. Management of adapters on this host from other hosts is allowed.

● 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.

○ Management Host (no remote access from other hosts)
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.

TCP/IP Management Mode

☑ Enable TCP/IP Management (of/from remote hosts)

Port Number: 23333 Warning: This port number is used by client and remote hosts. It must be same on all hosts.

☑ Register this host with specific management host

Management Host

Mgmt. Host Address: 10.192.80.23

☑ Exclude management of this host from any other host.

☐ Read-only operation (no active management allowed)

☑ Allow users to change management mode in OneCommand™ Manager

Figure 3: Management Mode dialog box

6. During installation the Management Mode dialog box appears. Choose the management mode you want and click **OK**. See “Changing Management and Read-Only Mode” on page 28 for more information about configuring management mode.
7. Check or uncheck the Enable TCP/IP Management checkbox to enable or disable remote management over TCP/IP. You can also change the TCP/IP port used (23333 is the IANA registered port for Emulex).
8. The Installation Completed window appears when the installation is finished. Click **Finish**. A shortcut is added to the Start menu. You do not need to reboot the system.

Unattended Installation in Windows

To install the OneCommand Manager application in Windows:

1. From the Emulex website, download the x64 or x86 OneCommand Manager Enterprise Kit installation file to your system.

   The kit is activated with the optional switch /q or /q2. The /q switch displays progress reports. The /q2 switch does not display progress reports.

   You must 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 example below.

   For example at the command prompt type:

   ```
   elxocm-windows-x86-5.01.00.10-4.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

2. 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 will be used and the feature will be disabled. If the switch is specified, the value can be a host name or an IP address which will be 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 it will process 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 will be used. If the switch is specified, the valid values are as follows:

     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 will occur. If this switch is not specified, the default TCP/IP port number 2333 will be used.

     If the management host option is selected, you must either 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, the TCP/IP port number may be entered on the command line.

In Solaris

The following must be installed for the utilities to function properly:

- The Solaris FC/FCoE inbox driver version 2.60 or later or the out of box driver version elxfc 4.00.xx.xx must be installed for FC/FCoE management.
- The NIC inbox driver version OCe1.20 or later or the out of box driver version 4.00 must be installed for UCNA management.

Note: If Emulex OneConnect UCNAs are installed on the system, the NIC driver must be installed and reporting all NIC ports. Otherwise, the OneCommand Manager application cannot manage UCNAs.

To install the OneCommand Manager application in Solaris:

1. Copy the Solaris utility kit to a temporary directory on your system.
2. Untar the utility kit:
   ```
   tar xvf elxocm-solaris-<version>.tar
   ```
3. Change to the newly created elxocm-solaris-<version> directory:
   ```
   cd ./elxocm-solaris-<version>/
   ```
4. Execute the install script to begin installation. If the HBAnyware utility, OneCommand Manager Core or OneCommand Manager Enterprise applications or the Solaris driver utilities are already present on the system, the install script attempts to remove them first:
   ```
   ./install
   ```
5. When prompted, choose whether or not to install the OneCommand Vision Sensor:
   ```
   Would you like to install the OneCommand Vision Sensor kits along with
   this installation?
   Enter y to install the kit.
   Enter n not to install the kit. (default)

   Enter the letter 'y' or 'n' y
   ```
6. When prompted, enter the type of management you want to use:
   ```
   Enter the type of management you want to use:
   1 Local Mode : HBA's on this Platform can be managed by OneCommand
   clients on this Platform Only.
   2 Managed Mode: HBA's on this Platform can be managed by local or
   remote OneCommand clients.
   3 Remote Mode : Same as '2' plus OneCommand clients on this Platform
   can manage local and remote HBA's.
   4 Management Host : Same as '1' plus OneCommand clients on this Platform
   can manage remote HBA's.
   ```
   If you select option 2, you are asked if you want to enable TCP/IP management from remote hosts.

   If you select option 3, you are asked if you want to enable TCP/IP management of/from remote hosts. You are prompted to enter the TCP/IP port number to use. (Leaving the field blank defaults to 23333.)

   If you select options 2 or 3, you are prompted for the managment host address. (Leaving the field blanks means none.)

   You can enter an IP address or host name. If you enter a management host address, you will be prompted to exclude management of this host from any other host.

If you select option 4, management of remote hosts is automatically selected and you are prompted to enter the TCP/IP port number to use. (Leaving the field blank defaults to 23333.)

> **Note:** Management hosts cannot be managed by remote hosts

7. If you answered **2, 3** or **4** in step 5, you must decide if you want the OneCommand Manager application to operate in read-only mode. Read-only mode prevents users from performing certain operations such as resetting adapters, updating an adapter's firmware and changing adapter driver properties and bindings. It only affects the local OneCommand Manager application interface. These operations can still be performed using remote management. Enter **<y>** for yes to allow the user to perform these operations, enter **<n>** for no if read-only mode is desired.
8. You are prompted about allowing users to change the management mode after installation. Enter **<y>** for yes, or **<n>** for no.

In Linux

The following must be installed before you can install the OneCommand Manager application:

- The appropriate driver for your operating system:
  - Linux driver version 8.2.0.33.3p or later (For RHEL5 and SLES10 operating systems.)
  - Linux driver version 8.3.5.X or later (For RHEL 6 SLES 11 SP1 operating systems.)

> **Note:** The RHEL 6 Enterprise kit requires the intallation of the libstdc++-5.so library. This library is available through the compat-libstdc++-33-3.2.3-68.<arch>.rpm or later. The PPC and x86_64 builds require the 64bit version installed which is installed in /usr/lib64.The i386 build requires the 32bit version installed which is installed in /usr/lib.

- Previous versions of the Linux driver must be uninstalled. You must run the uninstall script that shipped with the version of the Linux driver you want to remove.

To install the OneCommand Manager application in Linux:

1. Log on as ‘root’.
2. Download the utilities from the Emulex website or copy them from the installation CD.
3. Copy the installation and uninstallation scripts to a known location, for easy access by other users.
4. Copy the OneCommand elxocm-<Platform>-<AppsRev>.tgz file to a directory on the install machine.
5. Change to the directory to which you copied the tar file.
6. Untar the file.
   - For RHEL 5 and RHEL 6 type:
     ```
     tar zxvf elxocm-rhel5-rhel6-<apps_ver>-<rel>.tgz
     ```
   - For SLES 10 and SLES 11 type:
     ```
     tar zxvf elxocm-sles10-sles11-<apps_ver>-<rel>.tgz
     ```
7. Change to the elxocm directory created in step 6.
   - For RHEL 5 and RHEL 6 type:
     ```
     cd elxocm-rhel5-rhel6-<apps_ver>-<rel>
     ```
   - For SLES 10 and SLES 11 type:
     ```
     cd elxocm-sles10-sles11-<apps_ver>-<rel>
     ```

8. Run the install script. Type:

   ```
   ./install.sh
   ```

9. When promted, choose whether or not to install the OneCommand Vision Sensor:

   ```
   Would you like to install the OneCommand Vision Sensor kits along with
   this installation?
   Enter y to install the kit.
   Enter n not to install the kit. (default)

   Enter the letter 'y' or 'n' y
   ```

10. When prompted, enter the type of management you want to use:

    ```
    Enter the type of management you want to use:
    1 Local Mode : HBA's on this Platform can be managed by OneCommand
    clients on this Platform Only.
    2 Managed Mode: HBA's on this Platform can be managed by local or
    remote OneCommand clients.
    3 Remote Mode : Same as '2' plus OneCommand clients on this Platform
    can manage local and remote HBA's.
    4 Management Host : Same as '1' plus OneCommand clients on this Platform
    can manage remote HBA's.
    ```

    If you select option 2, you are asked if you want to enable TCP/IP management from remote hosts.

    If you select option 3, you are asked if you want to enable TCP/IP management of/from remote hosts. You are prompted to enter the TCP/IP port number to use. (Leaving the field blank defaults to 23333.)

    If you select options 2 or 3, you are prompted for the management host address. (Leaving the field blanks means none.)

    You can enter an IP address or host name. If you enter a management host address, you will be prompted to exclude management of this host from any other host.

    If you select option 4, management of remote hosts is automatically selected and you are prompted to enter the TCP/IP port number to use. (Leaving the field blank defaults to 23333.)

    Note: Management hosts cannot be managed by remote hosts

11. If you answered **2, 3** or **4** in step 5, you must decide if you want the OneCommand Manager application to operate in read-only mode. Read-only mode prevents users from performing certain operations such as resetting adapters, updating an adapter's firmware and changing adapter driver properties and bindings. It only affects the local OneCommand Manager application interface. These operations can still be performed using remote management. Enter **<y>** for yes to allow the user to perform these operations, enter **<n>** for no if read-only mode is desired.
12. You are prompted about allowing users to change the management mode after installation. Enter **<y>** for yes, or **<n>** for no.

In VMware ESX Server

For the best real-time management of Emulex adapters in VMware ESX and ESXi environments, the OneCommand Manager for VMware vCenter software plug-in (OCM for VMware) is highly recommended. For more information and to download go to http://www.emulex.com/products/software-solutions/device-management/onecommand-manager-for-vmware/overview.html.

The following must be installed before you can install the OneCommand Manager application:

- Emulex Driver for VMware ESX, version 8.2 or later is required only if FC/FCoE functionality is desired. Refer to the Emulex Driver for VMware ESX User Manual for specific information on driver support in ESX Releases.
- The NIC driver is required only if FCoE/iSCSI/NIC functionality is desired.
- The iSCSI driver is required only if iSCSI functionality is desired. (ESX 4.1 or later)

To install the OneCommand Manager application agent in VMware ESX Server:

1. Log into the ESX Server COS.
2. Copy the elxocmcore-esx<NN>-<version>.<arch>.rpm file to a directory on the install machine, where NN is 40 for ESX 4.0, 41 for an ESX 4.1 or 50 for an ESXi 5.0 system.
3. CD to the directory to which you copied the rpm file.
4. Install the rpm. Type:

   ```
   rpm -Uvh elxocmcore-esx<NN>-<version>.<arch>.rpm
   ```

   Where NN is 40 for ESX 4.0, 41 for an ESX 4.1 or 50 for an ESXi 5.0 system. The rpm contents are installed in /usr/sbin/ocmanager. The OneCommand Manager application Command Line Interface is also located in this directory.

Installing the OneCommand Manager Application Web Launch Interface

Prerequisites

In addition to the driver and OneCommand Manager application, the following prerequisites must be met before you install the Web Launch feature:

Note: The OneCommand Manager application Web Launch Interface is not supported on VMware ESX Server.

In Windows:

- Microsoft Internet Information Services (IIS) Server must be installed. See the Microsoft website for information on downloads and installation.
- The Windows Firewall feature may be enabled by default. If it is, you must add and enable three exceptions: HTTP port, java.exe and rmiregistry.exe.

Note: Allowing programs and/or ports through the firewall may increase the security risks. Use at your own discretion.

To enable the HTTP port:

1. Click **Add Port...** The Add a Port dialog box is displayed.
2. On the Add a Port dialog box, type `HTTP` as the Name and `80` as the Port Number.
3. Leave **TCP** enabled and click **OK**.

To enable the java.exe program:

1. Click **Add Program...** The Add a Program dialog box is displayed.
2. Click **Browse...**
3. Specify java.exe located in the OneCommand Manager JRE installation path. For example: `C:\Program Files\Emulex\util\JRE\bin\java.exe`.
4. Click **OK**.

To enable the rmiregistry.exe program:

1. Click **Add Program...**The Add a Program dialog box is displayed.
2. Click **Browse...** and specify the rmiregistry.exe located in the OneCommand Manager JRE installation path. For example:
`C:\Program Files\Emulex\util\JRE\bin\rmiregistry.exe.`
3. Click **OK**.
4. Click **OK** to apply the new firewall settings.

To add the MIME type:

1. Launch Server Manager.
2. Expand Roles.
3. Under Roles, expand Web Server (IIS).
4. Under Web Server (IIS), Click **Internet Information Services (IIS) Manager**.
5. In the right pane, find your server name under "Start Page" and click on it.
6. Double-click **MIME Types** listed under IIS group.
7. A MIME Types page appears. Under "Actions", click **Add...** A popup dialog box appears.
8. Add "jnlp" (without quotes) to the File name extension field.
9. Add "application/x-java-jnlp-file" (without quotes) to the MIME type field.
10. Click **OK**.

In Solaris and Linux:

- Apache Web server must be installed and running on the server that is hosting the Web Launch Service software.
- The Java Web Start application must be installed and running on the browser host.

The server on which you are installing the Web Launch Service package requires:

- An HTTP server configured to handle the JNLP MIME file type. The following MIME file type/ file extension must be added to your server configuration:

```
MIME type: application/x-java-jnlp-file
File Extension: jnlp
```

- The HTTP server must be running.

The client on which you are running the browser requires:

- Java must be installed. The specific requirements are:
  - Sun 32-bit Java 6.0 or later for Intel based systems (x86 and IA64)
  - 32-bit Java 6.0 or later for x86-64 systems
  - 32-bit Java 6.0 or later for RHEL 5 and SLES 10 (ppc64)

Refer to the appropriate vendor documentation for detailed instructions about configuring MIME types, configuring and starting the HTTP server and installing the JRE. See /opt/ELXocm/README_WEBLAUNCH.txt (Solaris) or /usr/sbin/ocmanager/README_WEBLAUNCH.txt (Linux) for more setup information.

Procedures

To install the OneCommand Manager application Web Launch Interface:

In Windows (Windows Server 2003, Windows Server 2008 and Windows Server 2008 R2):

1. Click **Programs>Emulex >OCManager WebLaunch Install**. Web Launch installation begins.

In Solaris and Linux:

1. Log on as ‘root’.
2. Navigate to the OneCommand Manager directory.
   - Solaris:

     ```
     cd /opt/ELXocm
     ```
   - Linux:

     ```
     cd /usr/sbin/ocmanager
     ```
3. Run the install script. Type:

   ```
   ./wsinstall
   ```
4. When prompted, enter the web server's document root directory. For example:
   - Solaris:

     ```
     /var/apache/htdocs
     ```
   - Linux:

     ```
     /srv/www/htdocs
     ```
     or
     ```
     /var/www/html
     ```
5. Confirm that the IP address of the host is the IP address that the web server uses. Answer **<y>** or **<n>** as appropriate. If you answer **<n>**, you are prompted for the IP address you want to use.
6. When asked if your web server is listening on the normal default HTTP port (80), answer **<y>** or **<n>** as appropriate. If you answer **<n>**, you are prompted for the port you want to use.

   Once you have entered the necessary information, you are notified when the installation of the OneCommand Manager application Web Launch package is complete. The Web Launch configuration files are created and Web Launch Service automatically starts.
7. To verify the installation, locate another client, open a web browser window and enter the following URL:

   `http://`*`IP_ADDR`*`:`*`PORT_NUM/`*`ocmanager.jnlp`

   where *IP_ADDR* is the IP address of the host on which you installed the OneCommand Manager application Web Launch service, and *PORT_NUM* is the TCP port number of the listening host’s web server. The standard OneCommand Manager application user interface appears.

   Note: It is not necessary to enter a port number if the standard HTTP port was chosen during configuration.

Installing the OneCommand Manager Application Command Line Interface

The OneCommand Manager application Command Line Interface (CLI) is a comprehensive management utility for Emulex host bus adapters (HBAs) and converged network adapters (CNAs) that provides support for commonly used commands without requiring installation of the OneCommand Manager application GUI. The OneCommand Manager application CLI can be installed separately without installing the OneCommand Manager application GUI. The OneCommand Manager CLI console application, named hbacmd, can be installed on Windows, Solaris, Linux and versions of VMware ESX Server that include a Console Operating System (COS). A single operation is performed by entering ’hbacmd’ followed by the command at the command line. For syntax information and details on using the OneCommand Manager application CLI, see “Using the OneCommand Manager Application Command Line Interface” on page 187.

Note: If you installed the OneCommand Manager application, the CLI is already installed.

In Windows

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

- Attended installation using the GUI.
- Unattended installation using the command line.

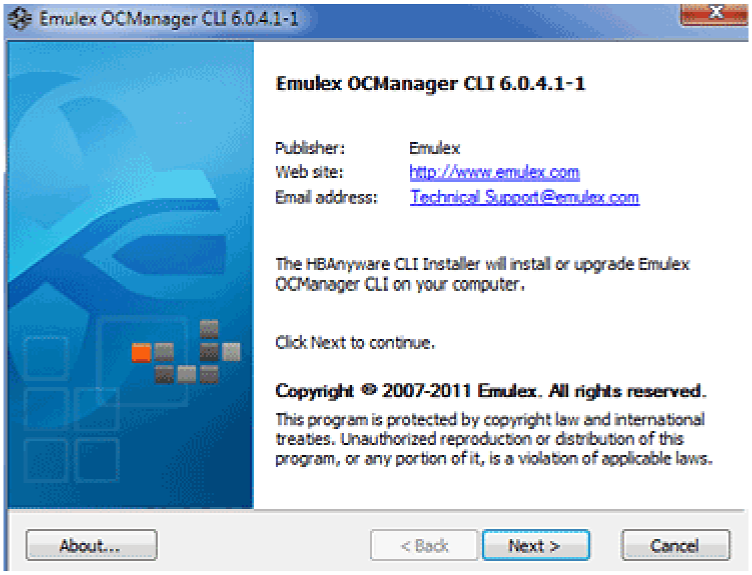
Attended Installation in Windows

To install the OneCommand Manager application CLI:

1. From the Emulex website, download the x64 or x86 OneCommand Manager Core Kit installation file.

   Note: For IA64 systems, use the x86 OneCommand Manager Core Kit installation file.

2. Navigate to the system directory where you download the file.
3. Double click the elxocmcore<version>.exe. The Emulex OCManager CLI window appears.



Emulex OCManager CLI 6.0.4.1-1

Emulex OCManager CLI 6.0.4.1-1

Publisher: Emulex
Web site: http://www.emulex.com
Email address: Technical Support@emulex.com

The HBAnyware CLI Installer will install or upgrade Emulex OCManager CLI on your computer.

Click Next to continue.

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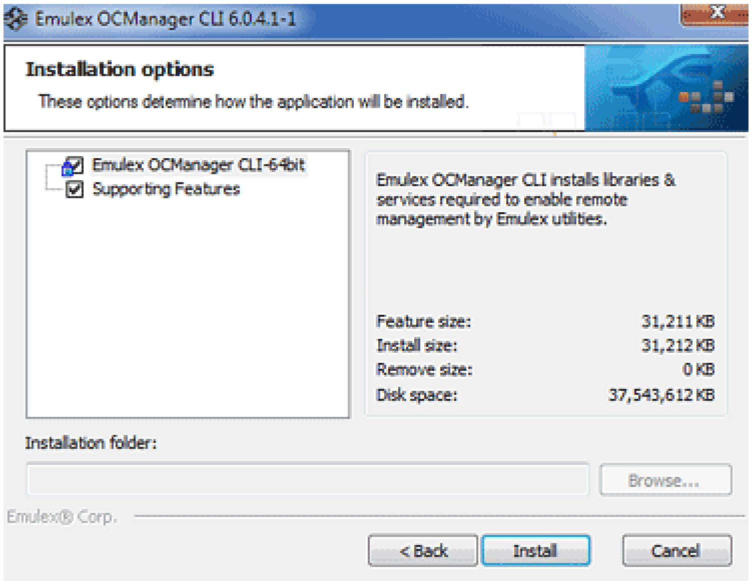
This program is protected by copyright law and international treaties. Unauthorized reproduction or distribution of this program, or any portion of it, is a violation of applicable laws.

Figure 4: OCManager CLI window

4. Click **Next**. The Installation options window appears.



Emulex OCManager CLI 6.0.4.1-1

Installation options

These options determine how the application will be installed.

☑ Emulex OCManager CLI-64bit

☑ Supporting Features

Emulex OCManager CLI installs libraries & services required to enable remote management by Emulex utilities.

Feature size:	31,211 KB
Install size:	31,212 KB
Remove size:	0 KB
Disk space:	37,543,612 KB

Installation folder:

Figure 5: OCManager CLI Installation options window

5. Click **Install**. The Operation in Progress window appears. The Installation completed window appears when the installation is finished.
6. Click **Finish**. You do not need to reboot the system.

Unattended Installation in Windows

To install the OneCommand Manager CLI application in Windows:

1. From the Emulex website, download the x64 or x86 OneCommand Manager Core Kit installation file to your system.
2. At the command prompt, set the optional switch to /q or /q2. The kit is activated with this optional switch. The /q switch displays some progress reports. The /q2 switch does not display progress reports.

   For example:

   ```
   elxocmcore-windows-x64-5.01.00.10-4.exe  /q2
   ```

In VMware ESX Server

To install the OneCommand Manager application CLI on a new system, install the specific rpm file for the driver for your VMware version.

Prerequisites

- To manage FCoE adapters, load LPFC driver version 8.2, or later.
- To manage NIC or iSCSI adapters, load driver version 2.102.440.0, or later.
- To manage iSCSI adapters, load the iSCSI driver.

Note: The iSCSI driver is not supported for VMware ESX 4.0.

Procedures

To install the OneCommand Manager application CLI:

1. Log into the ESX Server Host COS.
2. Copy the elxocmcore-esxNN-<*kit version*>.<*arch*>.rpm file to a directory on the install machine.
3. Change to the directory to which you copied the rpm file.
4. Install the rpm file. Type:

   ```
   rpm -Uvh elxocmcore-esxNN-<kit version>.<arch>.rpm
   ```

   Where NN is 40 for an ESX 4.0 system or 41 for an ESX 4.1 system. The rpm contents are installed in /usr/sbin/ocmanager. The OneCommand Manager application CLI is also located in this directory.

In a VMware ESX Server with an Existing HBAnyware CLI Kit Installed

To install the OneCommand Manager application CLI on a VMware system with an existing HBAnyware CLI installed:

1. Install the rpm file by entering the following command all on one line at the comand prompt:

   ```
   # rpm -Uvh elxocmcore-esxNN-<kit version>.<arch>.rpm
   ```

   Where NN is 40 for ESX 4.0, 41 for an ESX 4.1 or 50 for an ESXi 5.0 system.

Uninstalling Older HBAnyware Kits on VMware

To uninstall an older HBAnyware Kit on VMware:

1. Log into the ESX Server COS.
2. Type: `rpm -qa | grep elx` and locate either of the following rpm files:

   ```
   elxvmwarecorekit-<kit version>
   ```

   Or

   ```
   elxocmcore-esxNN-<kit version>
   ```

   Where NN is 40 for ESX 4.0, 41 for an ESX 4.1 or 50 for an ESXi 5.0 system.
3. Type:

   ```
   rpm -e elxvmwarecorekit-<kit version>
   ```

   Or

   ```
   rpm -e elxocmcore-esxNN-<kit version>
   ```

   Where NN is 40 for ESX 4.0, 41 for an ESX 4.1 or 50 for an ESXi 5.0 system.

In Linux

Prerequisites

For existing systems install the following drivers before installing the OneCommand Manager application CLI:

On LP21000 series adapters and OneConnect FCoE adapters:

- Linux driver version 8.2.0.33.3p or later (For RHEL5 and SLES10 operating systems.)
- Linux driver version 8.3.5.X (For RHEL6 and SLES 11 SP1 operating systems.)

Note: The RHEL 6 Enterprise kit requires the intallation of the libstdc++-5.so library. This library is available through the compat-libstdc++-33-3.2.3-68.<arch>.rpm or later. The PPC and x86_64 builds require the 64bit version which is installed in /usr/lib64.The i386 build requires the 32bit version which is installed in /usr/lib.

On OneConnect iSCSI adapters:

- iSCSI driver

On OneConnect NIC adapters:

- NIC driver

  Note: The NIC driver must also be installed if the adapter personality is iSCSI-NIC or FCoE-NIC.

- Use the latest or matching driver from the Emulex website.

For new systems, the specific driver rpm file for your Linux version must be installed.

Note: On RHEL 5.5, RHEL 5.6 and RHEL 6, the OneCommand Core rpm file requires the “Libnl” library. This library is not installed by default, but can be obtained from the OS distribution media.

- For i386 RHEL 5.5, RHEL 5.6 and RHEL 6, use the 32bit libnl library.
- For x86_64 RHEL 5.5, RHEL 5.6 and RHEL 6, use the 64bit libnl library.
- For ia64 RHEL 5.5, RHEL 5.6 and RHEL 6, use the 64bit libnl library.
- For PPC RHEL 5.5, RHEL 5.6 and RHEL 6, use the 32bit libnl library.

Procedures

To install the OneCommand Manager application CLI:

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

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

4. Change (use cd command) to the core kit directory created in step 3.

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

5. Run the install.sh script.

   ```
   ./install.sh
   ```

   Note: The core kit consists of 2 rpm files for each supported architecture and each supported version of Linux:
   1. elxocmlibhbaapi-*.rpm
   2. elxocmcore-*.rpm

In a Linux System with an Existing HBAnyware CLI Kit Installed

Note: The OneCommand Manager application core kit cannot be installed if a previous version of HBAnyware is installed.

You have two options when installing the OneCommand Manager application CLI on a Linux system:

- Upgrade - preserve existing settings
- Clean install - overwrite existing settings

To upgrade:

1. You must install the current core kit as detailed in *“In Linux” on page 16.*

   The rpm file handles the configuration file upgrade.

The install script executes an rpm upgrade (rpm -U *.rpm) to upgrade the installed version of the core kit to the current version.

Note: There is no upgrade path from an HBAnyware 4.x or 3.x core kit to a OneCommand Manager application 5.2.0.x core kit. You must uninstall previous versions of the HBAnyware utility before installing a OneCommand Manager application core kit. For information on uninstalling older versions of HBAnyware, see “Uninstalling Older HBAnyware Kits on Linux” on page 18.

To perform a clean install:

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

   Note: If an HBAnyware CLI or enterprise kit is installed, follow the procedure for “Uninstalling Older HBAnyware Kits on Linux” on page 18.

   Note: Your configuration files are backed up by rpm with an .rpmsave extension.

2. Install the specific rpm file for your driver for Linux version. For information on installing the rpm file, see “In Linux” on page 16.

Uninstalling Older HBAnyware Kits on Linux

Uninstalling an older HBAnyware core kit:

1. Run the following command to remove the core kit.

   ```
   rpm -e elxlinuxcorekit
   ```

Uninstalling an older HBAnyware enterprise kit:

1. Run the uninstall script located in /usr/sbin/hbanyware/scripts to remove the enterprise kit.

   Or

   Run the uninstall script located in the tar file to remove the enterprise kit.

   If the HBAnyware Security Configurator is installed, it must be uninstalled before uninstalling the HBAnyware utility. You must run the uninstall script that shipped with the version of HBAnyware Security Configurator that you want to remove. 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 to which you copied the tar file.
   c. Extract the tar file using the tar -xvf command.
   d. Change to the newly created directory.
   e. Run the uninstall script with the ssc parameter specified. Type:

      ```
      ./uninstall ssc
      ```

3. Uninstall the HBAnyware utility and the Application Helper Module:
   a. Log on as ‘root’.
   b. Change to the directory to which you copied 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:

      ```
      ./uninstall
      ```

In Solaris

Prerequisites

- The Solaris FC/FCoE driver version 2.60 or later must be installed for FC/FCoE management.
- The NIC driver version 1.20 or later must be installed for UCNA management.

> **Note:** If Emulex OneConnect UCNAs are installed on the system, the NIC driver must be installed and reporting all NIC ports. Otherwise, the OneCommand Manager application cannot manage UCNAs.

Procedures

To install the OneCommand Manager application CLI:

1. Copy the OneCommand Manager application core kit to a temporary directory on the system.
2. Untar the core kit. Type:

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

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

   ```
   ./install
   ```

   If the HBAnyware utility, the OneCommand Manager application core kit, the OneCommand Manager application enterprise kit, or the Solaris driver utilities are already present on the system, the install script attempts to first remove them.

Upgrading from the OneCommand Manager Application CLI to the Full-Featured OneCommand Manager Application Enterprise Kit

> **Note:** An upgrade can be performed only if the version of the OneCommand Manager application enterprise kit is the same or later than the OneCommand Manager application CLI version. You cannot downgrade a OneCommand Manager application CLI with a previous version of the OneCommand Manager application enterprise kit.

> **Note:** When the OneCommand Vision Sensor software is installed on production servers with Emulex adapters installed, the Sensor software may load and use some of the software components included in the OneCommand Manager application or HBAnyware utility software stacks. It is essential that the OneCommand Vision Sensor software be stopped before performing any upgrades, or updates, to the OneCommand Manager application or HBAnyware software stack components. For information on stopping the Sensor, refer the OneCommand Vision user manual.

In Windows

To upgrade from the OneCommand Manager application CLI to the full-featured OneCommand Manager application kit:

1. 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 application CLI and installs a full-featured version of the OneCommand Manager application that includes the CLI and the GUI.

In Linux

To upgrade from the OneCommand Manager application CLI to the full-featured OneCommand Manager application kit:

1. Run the install.sh script of the OneCommand Manager application enterprise kit.

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

In Solaris

To upgrade from the OneCommand Manager application CLI to the full-featured OneCommand Manager application kit:

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

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

   ```
   ./install
   ```

In VMware ESX Server

The full-featured OneCommand Manager application kit is not supported for VMware ESX Server.

Uninstalling the OneCommand Manager Application

Note: Do not uninstall the OneCommand Manager application if you are running, or intend to run, OneCommand Vision.

Note: Uninstalling the OneCommand Manager application also uninstalls the OneCommand Vision application.

To uninstall the OneCommand Manager application and OneCommand Manager application Web Launch Interface:

In Windows

1. (Windows 2003) Select **Start>Control Panel>Add/Remove Programs**.

   or

   (Windows 2008 & Windows 2008 R2) Select **Start>Control Panel>Programs>Uninstall a Program**.
2. If present, select **Emulex Common SAN Management [version]** and click **Remove** or **Uninstall**. Click **Yes**. The Emulex Common SAN Management components are removed from the system.
3. Select **Emulex OCManager Enterprise [version]** or **Emulex OCManager CLI [version]** and click **Remove** or **Uninstall**.

In Solaris

Note: If you installed the OneCommand Manager application Web Launch Interface, you must uninstall it before uninstalling the OneCommand Manager application. See "Uninstalling the OneCommand Manager Application Web Launch Interface Only" on page 21.

1. Log on as 'root'.
2. Run the OneCommand Manager uninstall script:

```
/opt/ELXocm/scripts/uninstall
```

In Linux

Note: If you installed the OneCommand Manager application Web Launch Interface, you must uninstall it before uninstalling the OneCommand Manager application. See "Uninstalling the OneCommand Manager Application Web Launch Interface Only" on page 21.

1. Log in as 'root'.
2. Change to the elxocm-<platform>-<version> installation directory.
3. Type:

```
./uninstall
```

In VMware

1. Log in as 'root'.
2. Type:

```
rpm -e elxocmcore-esxNN-<version>
```

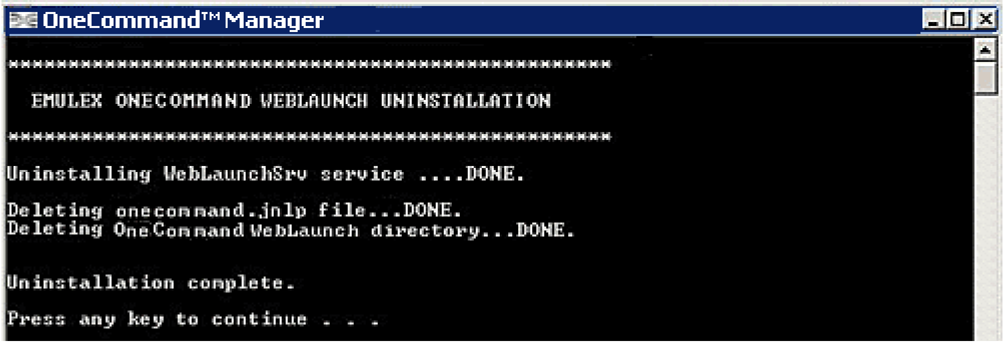
Where NN is 40 for ESX 4.0, 41 for an ESX 4.1 or 50 for an ESXi 5.0 system.

Uninstalling the OneCommand Manager Application Web Launch Interface Only

To uninstall the OneCommand Manager application Web Launch, but leave the OneCommand Manager application installed:

In Windows:

1. Select **Start>Programs>Emulex>OCManager WebLaunch Uninstall**. The following screen appears:



```
*****************************************************

  EMULEX ONECOMMAND WEBLAUNCH UNINSTALLATION

*****************************************************

Uninstalling WebLaunchSrv service ....DONE.

Deleting onecommand.jnlp file...DONE.
Deleting OneCommand WebLaunch directory...DONE.

Uninstallation complete.

Press any key to continue . . .
```

Figure 6: OneCommand Manager Web Launch Uninstallation screen

2. The OneCommand Manager application Web Launch Interface is removed. Press any key to continue.

In Solaris and Linux:

1. Log on as 'root'.

   Note: If you installed the OneCommand Manager application Web Launch Interface, you must uninstall it before uninstalling the OneCommand Manager application.

2. Execute the uninstallation script.
   - Solaris:

     ```
     /opt/ELXocm/wsuninstall
     ```
   - Linux:

     ```
     /usr/sbin/ocmanager/wsuninstall
     ```

This script stops the OneCommand Manager application Web Launch Interface service daemons (if they are running) and removes all Web Launch related files from the host.

Starting and Stopping the OneCommand Manager Application

In Windows:

To start the OneCommand Manager application:

1. On the Windows desktop, select **Start>All Programs>Emulex>OCManager**.

To stop the OneCommand Manager application:

1. From the OneCommand Manager application select **File>Exit**.

In Linux and Solaris:

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 directory:

Linux - /usr/sbin/ocmanager

Solaris - /opt/ELXocm

There are three basic daemon processes, included with OneCommand Manager installations, that are affected by these scripts. They are:

- elxhbamgrd - Remote management daemon which services requests from OneCommand Manager clients running on remote host machines.
- mili2d - MILI daemon that routes major portions of the local OneCommand Manager client CNA management requests.
- elxdiscoveryd - Discovery daemon responsible for maintaining all discovery data (remote and local) for OneCommand Manager clients running on the local machine.

elxhbamgrd and mili2d start at system boot time. elxdiscoveryd starts whenever the OneCommand Manager GUI process first runs on the host machine.

Additionally if the web-launch component of OneCommand Manager is installed, the daemon process, rmiserver, starts at system boot time. The start_weblaunch script starts this daemon, while the stop_weblaunch stops it.

Starting the OneCommand Manager Application Web Launch Interface

After the OneCommand Manager application Web Launch Interface software is installed and the Web Launch server is initialized, you can launch the OneCommand Manager application directly with your Web browser.

Note: Only the OneCommand Manager application GUI is exported to the requesting client. All adapter discovery and remote management operations are performed by resources running on the remote host that served the GUI component. Therefore, the SAN view displayed by the GUI is not from the client running the GUI, but rather from the host from which this GUI was retrieved.

To launch the OneCommand Manager application with your Web browser:

1. Open your web browser. Linux and Solaris users must log on as ‘root’.
2. Enter the URL of the ocmanager.jnlp file. Make sure that the URL specifies a remote server which has the OneCommand Manager application Web Launch Interface software installed and running.

   ```
   http://IP_ADDR:PORT_NUM/ocmanager.jnlp
   ```

   where *IP_ADDR* is the IP address of the host on which you installed the OneCommand Manager Web Launch Service, and *PORT_NUM* is the TCP port number of the listening hosts' Web server. If the port number is omitted, the default port 80 is used. The standard OneCommand Manager application user interface is displayed.

Managing Files when Running the OneCommand Manager Application Web Launch Interface

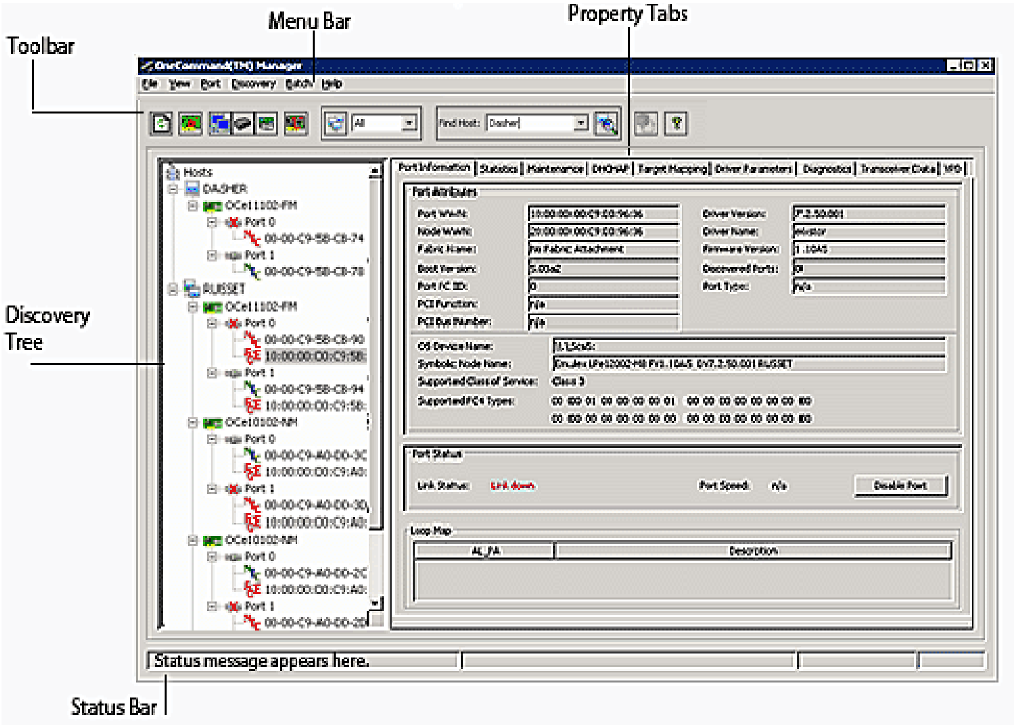
When running the OneCommand Manager application Web Launch Interface, all files (log files, driver parameter files, firmware files, etc.) are located on the browser launch host, which is not necessarily the same as the remote host that is specified in the Web Launch address.

Using the OneCommand Manager Application

Note: To properly view the OneCommand Manager application, ensure your system meets the following display requirements:
For Windows systems, the display resolution must be set to 800 by 600 or better.
For Linux and Solaris systems, the display resolution must be set to 1024 by 768 or better.
The display must run in 256-color mode or higher. OneCommand Manager application icons use 256 colors. If the display is set for 16 color mode, OneCommand Manager application icons are not displayed.

The OneCommand Manager Application Window Element Definitions

The OneCommand Manager application window contains five basic components: the menu bar, the toolbar, the discovery-tree, the property tabs and the status bar.



All

Find Host: Dasher

Port WWN: 10:00:00:00:C9:E0:96:36
Node WWN: 20:00:00:00:C9:E0:96:36
Fabric Name: No Fabric Attachment
Boot Version: 5.03a2
Port FC ID: 0
PCI Function: n/a
PCI Bus Number: n/a
Driver Version: 7.2.50.001
Driver Name: elxstor
Firmware Version: 1.10A5
Discovered Ports: 0
Port Type: n/a
OS Device Name: \\.\Scsi5:
Symbolic Node Name: Emulex LPe12002-M8 FV1.10A5 DV7.2.50.001 RUSSET
Supported Class of Service: Class 3
Supported FC4 Types: 00 00 01 00 00 00 00 01 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Link Status: Link down
Port Speed: n/a

Status message appears here.

Figure 7: OneCommand Manager application window

Note: The element you select in the discovery-tree determines whether a menu item or toolbar icon is active. For example, if you select the local host or other system host, the Reset Adapter item on the Adapter menu is unavailable. The Reset Adapter toolbar button is unavailable as well.

Note: Screenshots in this manual are for illustrative purposes only. Your system information can vary.

Note: The features displayed by your local OneCommand Manager application interface will match those of the remote server. When accessing a remote server running an older version of the OneCommand Manager application, features that are not supported by the server's older version of the OneCommand Manager application are unavailable.

Note: In some instances, the type of information displayed and available functionality is determined by the operating system in use.

The Menu Bar

The menu bar contains commands that enable you to perform a variety of tasks such as exiting the OneCommand Manager application, resetting adapters and sorting items in the discovery-tree view. Many of the menu bar commands are also available from the toolbar.

The Toolbar

The toolbar contains buttons that enable you to refresh the discovery-tree, reset the selected adapter and choose how you want to view discovered SAN elements in the discovery-tree. Many of the toolbar functions are also available from the menu bar.

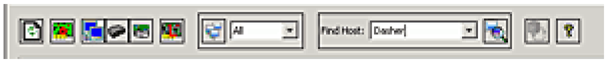


Figure 8: Toolbar

The toolbar is visible by default. Use the Toolbar item in the View menu to hide the toolbar. If the item is checked, the toolbar is visible.

The Toolbar Buttons

The toolbar buttons perform the following tasks:

Discovery Refresh button

- Initiates a discovery refresh cycle.

Reset button

- Resets the selected adapter.

The View Buttons on the Toolbar

The View buttons on the toolbar enable you to view SAN elements from the host, fabric, virtual ports, or by local or remote adapter perspective. By default, both local and remote adapters are displayed in Host view. The OneCommand Manager application displays elements in ascending order.

Host View button (default)

- Displays the host system.

Note: You cannot change host names using the OneCommand Manager application; names must be changed locally on that system.

- Displays the installed adapters within each host system.
- Displays adapter ports and the port numbers if available.
- Displays adapters by the WWNN if multiple adapters have the same model number.
- Displays the WWPN if targets are present. Multiple adapters can refer to the same target.
- Displays the LUN number if LUNs are present.
- COMSTAR ports are located on the same level in the discovery-tree as initiator ports, meaning that they branch out from adapters. Unlike initiator ports, however, targets do not branch out from COMSTAR ports. (COMSTAR ports are supported on OpenSolaris only.)

Note: COMSTAR ports are supported on OpenSolaris only.

Fabric View button

- Displays the FC/FCoE fabrics in the SAN with their fabric IDs.
- Displays the ports under each switch.
- If targets are present, displays each WWPN. Multiple adapters can refer to the same target.
- If LUNs are present, displays each LUN number.
- If the fabric ID is all zeros, no fabric is attached.

Note: iSCSI and NIC ports are not displayed in Fabric View.

Virtual Ports View button

- Displays virtual ports in the SAN.

Note: The Emulex emlxs driver for Solaris does not support COMSTAR running over virtual ports, so the Virtual Ports view only displays initiator ports.

Note: COMSTAR ports are supported on OpenSolaris only.

Note: iSCSI and NIC ports are not displayed in Virtual Ports View.

Local HBAs Only button

- Displays only local adapters.

Show Host Groups button and menu

- Displays hosts by their associated groups.
- Displays available host groups.

Find Host button and search field

- Enables you to search by host name for a particular host in the discovery-tree.

Refresh LUNS button

- Initiates a LUN discovery refresh cycle.

Help button

- Displays the OneCommand Manager application’s online help.

The Discovery-Tree

The discovery-tree (left pane) has icons that represent discovered hosts, adapters, ports, virtual ports, fabrics, targets and LUNs.

Using the View menu, the OneCommand Manager application allows you to control the way iSCSI initiator and target ports are identified in the discovery-tree. The "iSCSI Names" option displays all iSCSI ports by their iSCSI Qualified Name (IQN). The "iSCSI Alias" option displays each port by its alias.

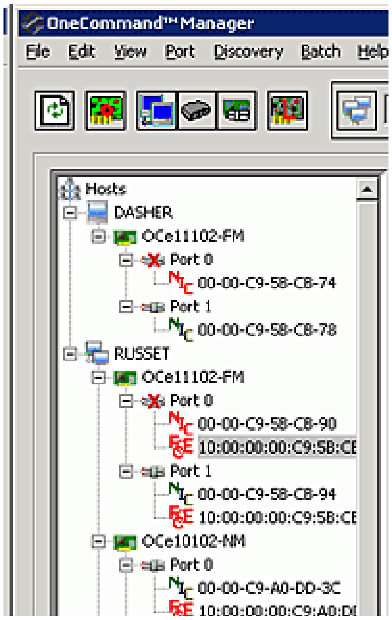


Figure 9: Discovery-tree

Discovery-Tree Icons

Discovery-tree icons represent the following:

The local host.

Other hosts connected to the system.

A green adapter icon with black descriptive text represents an online adapter. Blue text represents an adapter port that had previously been discovered, but currently is not being seen by the discovery engine (service). The adapter is removed from the discovery-tree if it still is not seen after the undiscovered adapter expiration time has elapsed (default is 1800 seconds, or 30 minutes). If the adapter is discovered again before the expiration time has elapsed, it reverts back to normal black text. See “Configuring Discovery and CIM Credentials” on page 36 for more information about discovery settings.

The port icon represents an adapter port. A port icon with a red X indicates the port is down.

Note: Multiport adapters are represented in the discovery-tree with separate port icons for each port with the port number displayed next to the icon.

The iSCSI icon represents an iSCSI PCI function instance. iSCSI functions can support up to sixteen logical adapters, with each logical adapter appearing in the discovery-tree as a separate child node under the respective iSCSI function. The green iSCSI icon represents an iSCSI PCI function on-line instance. A black iSCSI icon represents an iSCSI PCI function port-disabled instance. A red iSCSI icon represents an iSCSI PCI function link down instance.

The green FCoE icon represents an FCoE PCI function on-line instance. A black FCoE icon represents an FCoE PCI function port-disabled instance. A red FCoE icon represents an FCoE PCI function link down instance.

The NIC icon represents a NIC-Only PCI function instance. A green icon indicates this function instance is on-line, black indicates it is disabled, and red indicates a link down instance.

The ASIC node icon, only displayed for OneConnect dual ASIC 4 port 8Gb/sec FC adapters, represents each ASIC on the adapter. Each ASIC is managed independently. The ASIC node format: "ASIC bus#-sub-adapter#" represents the PCI bus number and the sub-adapter number which is a concatenation of the discovered port numbers for the ASIC. For example, "ASIC 64-12" represents PCI bus number 64 and 12 represents ports 1 and 2. If there were no discovered functions for a port on that ASIC the label would be "ASIC 64-2" (port 1 is missing).

The Virtual Port icon represents a virtual port.

The COMSTAR icon represents COMSTAR target mode ports. COMSTAR ports are unique in that a single port can be shown simultaneously as both a manageable adapter port and a regular target. When a COMSTAR port is seen as a target, it displays the Target discovery-tree icon and Target dialog box information. A COMSTAR icon with a red X indicates the port is down. (COMSTAR ports are supported on OpenSolaris only.)

The Target icon represents connections to individual storage devices.

The LUN icon represents connections to individual disk LUNs.

The Media Exchanger icon represents conections to individual media exchangers. A media exchanger is a jukebox-like device that is capable of swapping various media device instances (e.g. records or CDs) in and out.

The Tape LUN icon represents LUNs that are tape devices.

The Target Controller LUN icon represents LUNs that are storage controllers.

The Switch icon represents connections to the switch.

Expanding or Collapsing the Discovery-Tree View

You can also use the Expand/Collapse feature on the View menu to change the way discovered elements are displayed. By selecting one of the four levels the discovery-tree is expanded or collapsed to that level. You can choose Hosts/Fabrics (depending on the view), HBAs, Ports and Targets.

The Property Tabs

The property tabs display configuration, statistical and status information for network elements. The set of available tabs is context-sensitive, depending on the type of network element or adapter port currently selected in the discovery-tree.

The Status Bar

The status bar is located near the bottom of the OneCommand Manager application window. The status bar displays messages about OneCommand Manager application functions, such as “Discovery in progress” or the progress when performing an "Export SAN Info" operation.

The status bar is visible by default. Use the Status Bar item in the View menu to hide the status bar. When checked, the status bar is visible.

Changing Management and Read-Only Mode

During installation, a management and a read-only mode are selected. If modification of these settings after installation was selected, you can change the management mode:

- Strictly Local Management - This setting only allows management of adapters on this host. Management of adapters on this host from other hosts is not allowed.
- Local Management Plus - This setting only allows management of adapters on this host, but management of adapters on this host from another host is possible.
- Full Management - This setting enables you to manage adapters on this host and other hosts that allow it.
- Management Host - This setting allows this host to manage other hosts, but prevents it from being managed by other hosts.
- Enable TCP/IP Management (of/from remote host) - This setting enables you to manage remotes hosts or to manage this host remotely. If enabled, you must supply the port number (between 1024 and 65535). The default port number is 23333. If the port number or the Enable TCP/IP Management checkbox is changed, a set of warning messages may appear before changes are made. Click **Yes** to continue with the change.

  If the IP port number is changed, the utility restarts the OneCommand Manager Application discovery server and management agent to use the new settings. If the servers cannot be stopped and restarted, you are prompted to reboot the host for the new TCP/IP management settings to take effect.

CAUTION: The IP port number must be the same for all hosts that are to be managed. Setting an IP port number for one host to a different value than the other hosts will make the host unable to manage other hosts over TCP/IP using a different port, as well as make the host unmanageable over TCP/IP from other hosts using a different port.

- Register this host with specific management host - This setting enables you to register this host with a specific host for management. If enabled, you must supply the IP address or host name of the management host. You can also choose to prevent management of this host from any other host, but the management host. See “The Management Host” on page 29 for more information.

If Local Management Plus or Full Management mode are selected, you can also set read-only mode.

- Read-only operation - This setting prevents certain operations from being performed, such as resetting adapters, updating the adapter firmware image and changing adapter settings and driver properties. Dialog box controls that pertain to these tasks are completely hidden or disabled.

The Management Host

The OneCommand Manager application Management Host feature provides enhanced discovery and security by enabling a managed host to register with a management host. The management host receives these registrations when the remote host is started and updates its hosts file so the discovery server discovers the remotely managed host. You do not need to manually add remote hosts to be managed.

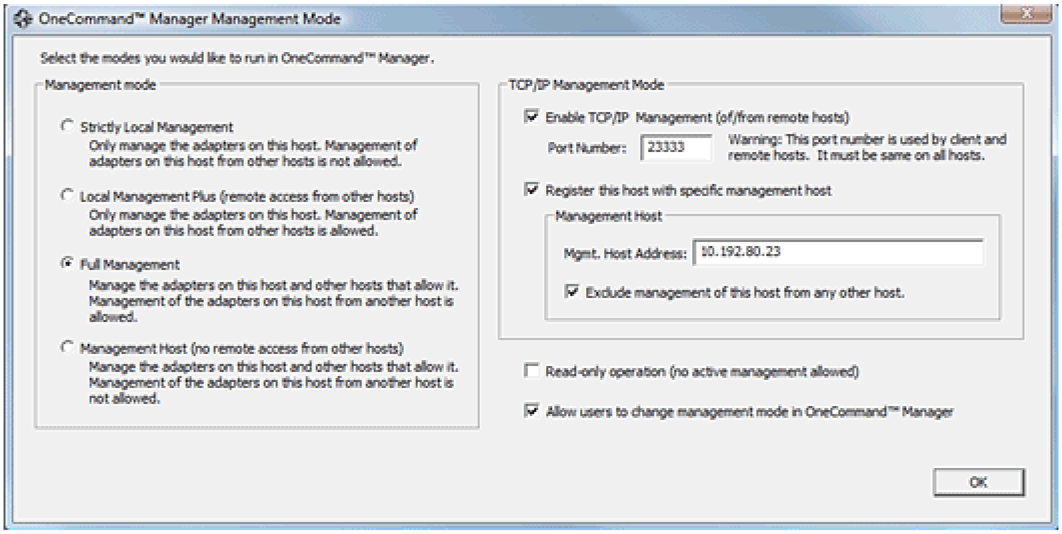
If you choose to exclude management from all hosts except the management host, the managed host will only respond to requests from the management host. All requests from other hosts are rejected. This TCP/IP management security solution only allows the management host to manage the remote host.

To change management/read-only mode:

Note: After making changes, you must restart the OneCommand Manager application to see the new management mode settings.

In Windows

1. From the **File** menu, select **Management Mode**. The Management Mode dialog box appears.



OneCommand™ Manager Management Mode

Select the modes you would like to run in OneCommand™ Manager.

Management mode

○ Strictly Local Management
Only manage the adapters on this host. Management of adapters on this host from other hosts is not allowed.

○ Local Management Plus (remote access from other hosts)
Only manage the adapters on this host. Management of adapters on this host from other hosts is allowed.

● 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.

○ Management Host (no remote access from other hosts)
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.

TCP/IP Management Mode

☑ Enable TCP/IP Management (of/from remote hosts)

Port Number: 23333

Warning: This port number is used by client and remote hosts. It must be same on all hosts.

☑ Register this host with specific management host

Management Host

Mgmt. Host Address: 10.192.80.23

☑ Exclude management of this host from any other host.

☐ Read-only operation (no active management allowed)

☑ Allow users to change management mode in OneCommand™ Manager

Figure 10: Management Mode dialog box

2. Choose the management type and read-only mode you want.
3. Click **OK**.

In Solaris

1. Run the following script:

   ```
   /opt/ELXocm/set_operating_mode
   ```
2. Choose the management type and read-only mode you want.

In Linux

1. Stop the OneCommand Manager application.
2. Run the following script:

   ```
   /usr/sbin/ocmanager/set_operating_mode
   ```
3. Choose the management type and read-only mode you want.

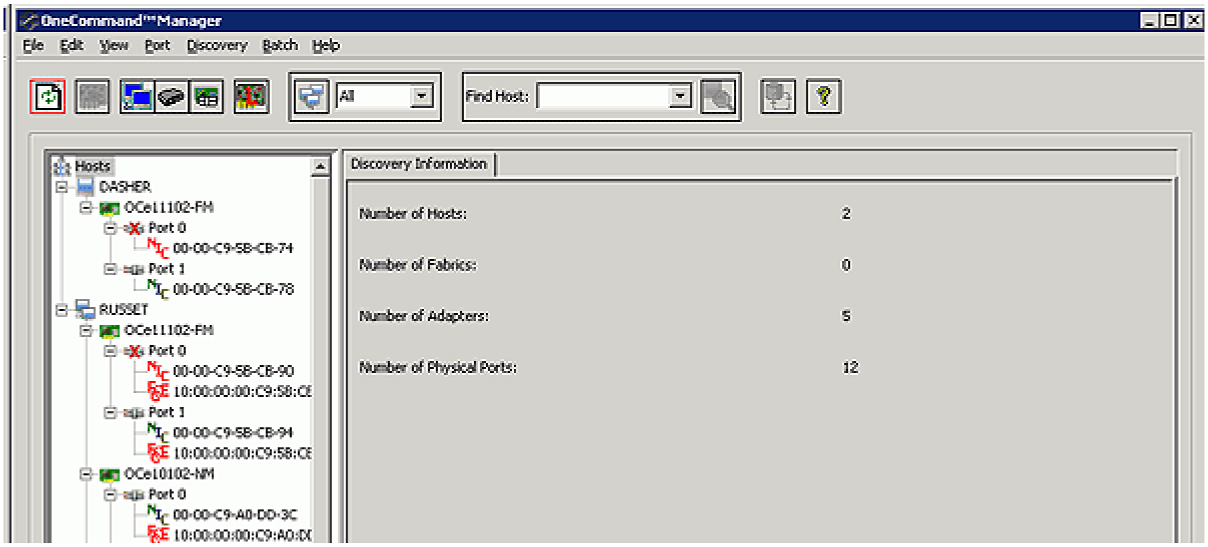
Configuring Discovery

Automatic FC Discovery

Adapters that have a physical FC connection to the same SAN are discovered automatically when the OneCommand Manager application is launched. Adapters that do not have a physical FC connection to the SAN, where the OneCommand Manager application is launched, can be discovered by sending management requests to the remote host using TCP/IP.

Note: The OneCommand Manager application can only discover and manage remote adapters on hosts running the OneCommand Manager application’s remote management server. Remote FC capabilities of the OneCommand Manager application are subject to fabric zoning. Hosts you want to discover and manage using the OneCommand Manager application must be in the same zone or discovered and managed through TCP/IP access.

Note: After adding an adapter to a running Windows system (commonly called a hot plug), click **Discovery Refresh** (↻) or reconnect to the discovery server to display the new adapter port in the discovery-tree. Hot plug is only supported by the OneCommand Manager application on Windows platforms.



Number of Hosts: 2

Number of Fabrics: 0

Number of Adapters: 5

Number of Physical Ports: 12

Figure 11: Discovery Information

Remote SAN Management Using TCP/IP Access Protocol

You can discover adapters on IPv4 and IPv6 TCP/IP hosts and on hosts configured to support the CIM interface that have the OneCommand Manager application installed. Remote SAN management over TCP/IP sends remote management requests using TCP/IP access protocol to remote hosts. TCP/IP access enables you to access adapters via their host IP-address or by the name of the host on which they reside. Since adapters can exist on a host, but not be a part of an FC network or are zoned on the switch to be hidden to other adapters, they do not appear during normal FC discovery. Thus, TCP/IP access enlarges the number of adapters that can be discovered and managed.

Note: In Windows, if you are running a firewall you may need to add the OneCommand Manager application remote server to the firewall's exception list. This remote server's path is:

```
\Program Files\Emulex\Util\Common\rmserver.exe
```

On an Itanium 64 host the path is:

```
\Program Files (x86)\Emulex\Util\Common\rmserver.exe
```

The principle differences between FC and TCP/IP access are:

- A TCP/IP host with or without an adapter installed does not need to connect to a fabric to manage other hosts.
- A TCP/IP management host can manage all of the adapters in a remote host, not just the ones connected to the same fabric. FC can only manage adapters connected to the same fabric.
- You can manage many more hosts since TCP/IP access is not constrained by the boundaries of a fabric or zoning.
- True board status (e.g. link down) is available since the FC path is not necessary to send a status request to the remote host.
- Adapter security in a TCP/IP environment is much more important since many more hosts are available for management and TCP/IP access is not affected by fabrics or zoning.
- Discovery of hosts in a TCP/IP environment is not automatic like FC discovery. You must add the hosts to be managed.

- You can add multiple IP addresses for the same host. However, only one of the IP addresses will be used by OneCommand Manager to manage the adapters on that host.

The Hosts File

The TCP/IP discovery function of the OneCommand Manager application discovery server relies on a file called the hosts file. This plain text file contains a list of hosts the utility attempts to discover. The discovery server does not attempt to discover hosts over TCP/IP through any other mechanisms (e.g. ping sweeps, broadcasts, etc.).

The hosts file is automatically created or modified when you perform any of the following operations:

- Adding a single host from the Add Remote Host window. If the host is discovered, the OneCommand Manager application adds its IP address and name to the host file.
- Scanning a range of IP addresses for hosts that can be managed. This function is performed in the Add Remote Hosts window. For each discovered host, the OneCommand Manager application adds its IP address and name to the host file.
- Removing a host from the host file using the Remove Remote Hosts window. For each removed host, the OneCommand Manager application removes its IP address and name from the host file.
- Adding or removing a host using the CLI.

Manually Editing the Hosts File

You can open the hosts file with any text editor, modify the contents and save the file. The name of the host file is “hbahosts.lst”. Once the file is modified and saved, the updated file is used after the next TCP/IP discovery cycle is complete. If the discovery server is running, it does not need to be restarted.

To manually edit the hosts file:

1. Locate and open the hosts file.

   Windows: The file is located on the system drive in the directory "\Program Files\Emulex\Util" or "\Program Files (x86)\Emulex\Util" for Itanium 64 hosts.

   Solaris: The file is located in the directory "/opt/ELXocm".

   Linux: The file is located in the directory "/usr/sbin/ocmanager".

2. Edit the file. Guidelines for editing the file are as follows:

   - Each line of the file starts with an IPv4 or IPv6 address. Following the IP address can be any number of tabs or spaces. This is followed by a “#” character, zero or more tabs or spaces and the name of the host for that IP address. The host name is not required for discovery. Its purpose is to make the file more readable and is used by the OneCommand Manager application to display the host name in the Remove Remote Hosts window when the host is not discovered. However, the discovery server only needs the IP address to discover the host.
   - IPv6 address tuples are delimited by colons and can be added in shortened notation as defined by the IPv6 address specification.
   - An IP port number can be specified after the IPv4 address by appending a colon and port number to the address (e.g. 10.192.80.24:23333).
   - An IP port number can be specified after an IPv6 address by putting the IPv6 address in brackets and following it with a colon and the port number. For example, [fe80::50f1:832:3ce4:8d30]:23333

- Each line in the file can be up to 1023 characters, although this is longer than is typically needed for a host IP address and host name. A line longer than 1023 characters is truncated, possibly causing discovery to not discover some of the hosts.
- Blank lines are ignored.

3. Save the file.

Copying the File

A hosts file on one host can be copied and used on another host. This is useful when there are multiple hosts on the same network running the OneCommand Manager application. For example, once the remote hosts are added to the hosts file on one host, you can copy it to other hosts so you do not need to create another hosts file.

Note: Due to the line terminator differences between Windows and Solaris or Linux hosts, the files cannot be shared between Windows hosts and Solaris or Linux hosts.

Adding a Single Host

The OneCommand Manager application enables you to specify a single TCP/IP host to manage. You can add a Remote Management Application Programming Interface (RMAPI) host or CIM host using the host name or IP address. If the host is successfully discovered it is added to the hosts file. If it has not been discovered over FC already, the host and its adapter ports are added to the discovery-tree. (Not available in read-only mode.)

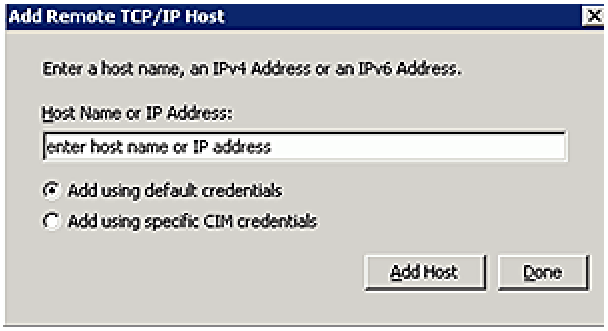
Prerequisites

- The OneCommand Manager application must be installed on the remote host.

Procedure

To add a single host:

1. From the **Discovery** menu, select **TCP/IP>Add Host**. The Add Remote TCP/IP Host dialog box appears.



Add Remote TCP/IP Host

Enter a host name, an IPv4 Address or an IPv6 Address.

Host Name or IP Address: enter host name or IP address

● Add using default credentials

○ Add using specific CIM credentials

Figure 12: Add Remote TCP/IP Host dialog box

2. Enter the name or the IPv4 or IPv6 address of the host to be added.

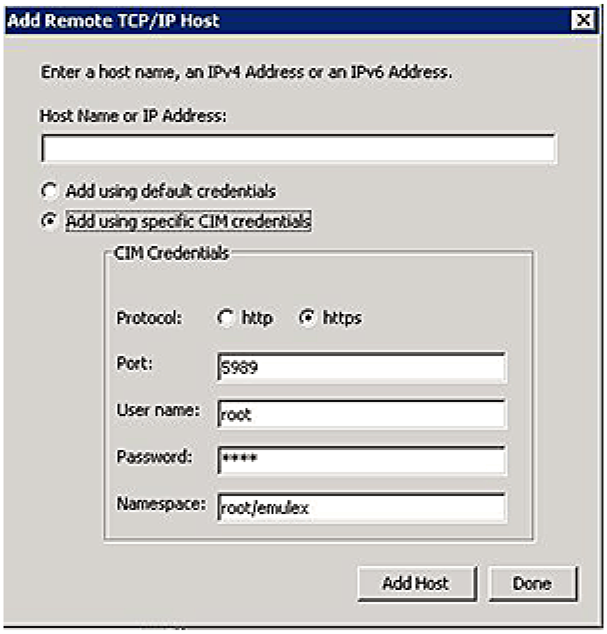
Note: Entering the IP address to identify the host avoids possible name resolution issues.

Note: IPv6 address tuples are delimited by colons and can be entered in a shortened form (i.e. supressing 0's) as defined by the IPv6 address specification.

3. Configure the discovery method:

- If you want to add the host using default discovery methods, check **Add using default credentials** and click **Add Host**. You will receive a message indicating whether the new host was successfully added.
- If you want to add the new host using specific CIM credentials, check **Add using specific CIM credentials**, modify any additional CIM settings and click **Add Host**. The Add Remote TCP/IP Host dialog box appears with default CIM settings.

Note: CIM clients are only supported on Windows remote GUI OneCommand Manager systems.



Add Remote TCP/IP Host

Enter a host name, an IPv4 Address or an IPv6 Address.

Host Name or IP Address:

○ Add using default credentials

● Add using specific CIM credentials

CIM Credentials

Protocol: ○ http ● https

Port: 5989

User name: root

Password: ****

Namespace: root/emulex

Figure 13: Add Remote TCP/IP Host dialog box with CIM Credentials

4. Edit the default CIM settings if necessary and click **Add Host**. You will receive a message indicating the new host was successfully added.

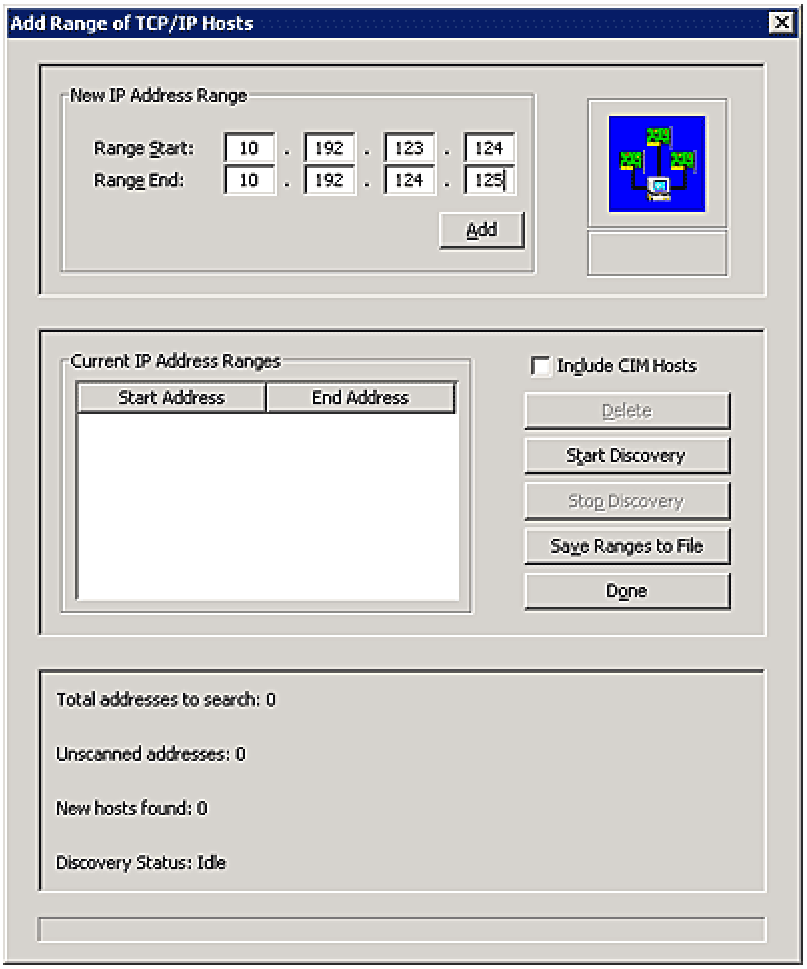
Adding a Range of Hosts

You find the TCP/IP-accessed manageable hosts by searching a range of IP addresses. The Add Range of TCP/IP Hosts dialog box enables you to build the initial list of TCP/IP accessed manageable hosts. (Not available in read-only mode.)

Note: The ranges of IP addresses are only scanned each time you open the Add Remote TCP/IP Hosts dialog box and click **Start Discovery**. The ranges are NOT automatically scanned by the discovery server during its discovery cycles.

Note: CIM is only supported on Windows systems.

Note: Adding a range of hosts is only supported for IPv4 addresses. It is not supported for IPv6 addresses.



Range Start: 10 . 192 . 123 . 124
Range End: 10 . 192 . 124 . 125

□ Include CIM Hosts

Total addresses to search: 0

Unscanned addresses: 0

New hosts found: 0

Discovery Status: Idle

Figure 14: Add Range of TCP/IP Hosts dialog box

Prerequisites

- The OneCommand Manager application must be installed on all remote hosts.

Procedure

To add a range of remote hosts:

1. From the **Discovery** menu, select **TCP/IP>Add Range of Hosts**. The Add Range of TCP/IP Hosts dialog box appears.
2. Enter the complete start and end address range (IPv4 only) and click **Add**. The added address range appears in the dialog box. Add any additional ranges you want to search.

3. Click **Start Discovery**. If an address is remotely manageable, it is added to the list of addresses that the discovery server will attempt to discover. The utility creates a host file if necessary, and checks each address in the range to determine if the host is available and remotely manageable. The number of addresses (of manageable hosts) discovered is periodically updated on the dialog box.

   Note: The number of addresses does not correspond directly to the number of hosts added to the discovery-tree.

   For example, some of the addresses discovered may be for hosts that have already been discovered over FC. However, new adapters can be discovered on those hosts that were not discovered over FC.

   Also, a host can have more than one IP address assigned to it. If multiple IP addresses for a host are discovered during the search, the host will be added to the discovery tree only once.

4. You can save the IP address ranges. Click **Save Ranges to File** to save the specified range(s) to a file so that these address ranges appear the next time you use the Add Range of TCP/IP Hosts dialog box.

Removing Hosts

Removing hosts that are no longer discovered improves the operation of the discovery server. For example, you may want to remove a host when it is removed from the network. (Not available in read-only mode.)

To remove hosts:

1. From the **Discovery** menu, select **TCP/IP>Remove Host(s)**. The Remove Hosts dialog box shows a list of discovered hosts. Any host that is not currently discovered appears in red. Click **Show Undiscovered Hosts Only** to display only currently undiscovered hosts.
2. From the Remove Hosts dialog box, select the hosts you want to remove. You can select all the displayed hosts by clicking **Select All**.
3. Click **Remove** to remove the selected hosts.

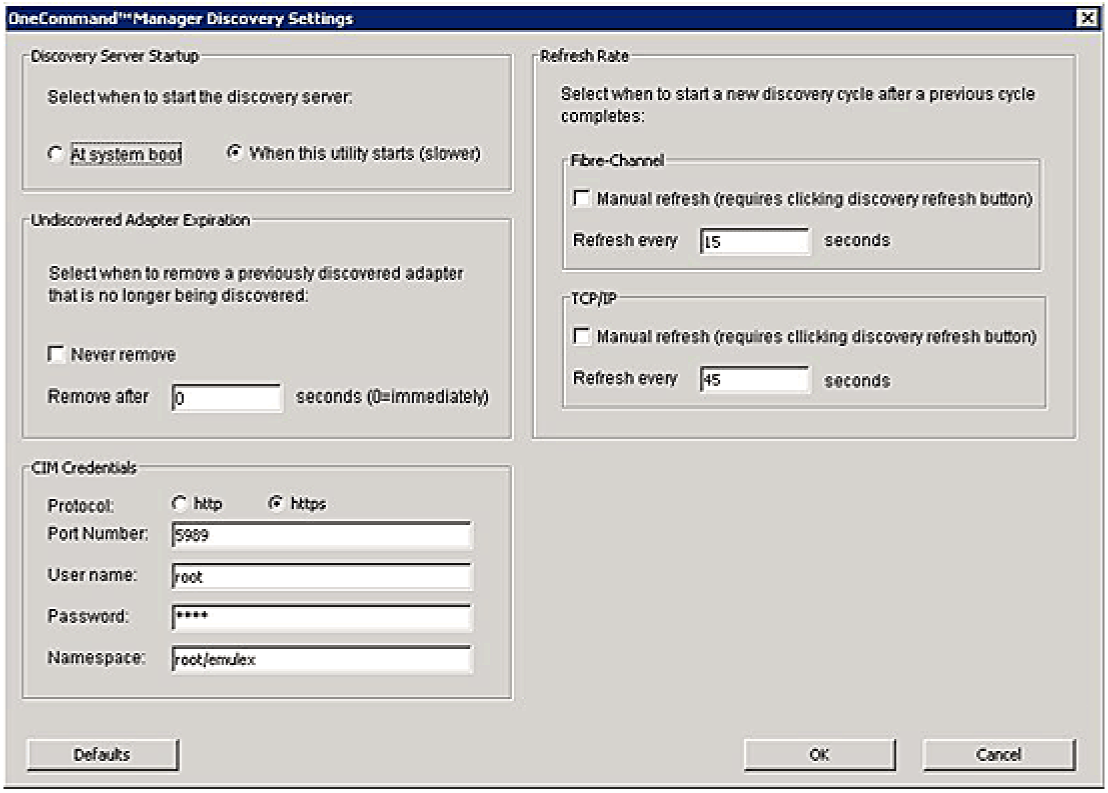
Configuring Discovery and CIM Credentials

Use the OneCommand Manager application Discovery Settings dialog box to configure several discovery server parameters. You can define when to start the discovery server, when to refresh FC and TCP/IP accessed discoveries and when to remove previously discovered adapters that are no longer being discovered. You can also define default CIM credentials such as the protocol, user name, port number, password and name space.

Note: Management of CIM hosts is only supported on Windows systems.

Note: The number of addresses does not correspond directly to the number of hosts added to the discovery-tree.

For example, some of the addresses discovered may be for hosts that have already been discovered over FC. However, new adapters can be discovered on those hosts that were not discovered over FC. Also, a host can have more than one IP address assigned to it. If multiple IP addresses for a host are discovered during the search, the host will be added to the discovery-tree only once. If the same host name appears for more than one host, the adapters of all these hosts will be displayed by the OneCommand Manager application as a single host entry.



OneCommand™ Manager Discovery Settings

Discovery Server Startup

Select when to start the discovery server:

○ At system boot ● When this utility starts (slower)

Undiscovered Adapter Expiration

Select when to remove a previously discovered adapter that is no longer being discovered:

□ Never remove

Remove after 0 seconds (0=immediately)

CIM Credentials

Protocol: ○ http ● https

Port Number: 5989

User name: root

Password: ****

Namespace: root/emulex

Refresh Rate

Select when to start a new discovery cycle after a previous cycle completes:

Fibre-Channel

□ Manual refresh (requires clicking discovery refresh button)

Refresh every 15 seconds

TCP/IP

□ Manual refresh (requires cllicking discovery refresh button)

Refresh every 45 seconds

Figure 15: Discovery Settings dialog box

To configure discovery settings:

1. From the Discovery menu, select **Modify Settings**. The Discovery Settings dialog box appears.
2. Define the discovery properties you want.
3. The CIM credentials group can be used to set the default CIM credentials which will be used by default to connect to all the ESX hosts that are managed through the CIM interface.
   - Protocol: The http or https protocol can be used to connect to the ESX hosts. The default port numbers used for http and https are 5988 and 5989 respectively. The port number will change automatically according to the protocol selected. The user can also manually change the port number. Since, by default, the HTTP is disabled on sfcb in ESXi host, user should use HTTPS to communicate to the ESXi host.
   - User name: The user name field contains the username with which to connect to the ESX hosts. By default this will be ‘root’
   - Password: This password field will contain the password of the user name which will be used to connect to the ESX host.
   - Namespace: Namespace is the namespace of the emulex provider.

     For ESX/ESXi 40 and 41, the namespace is ‘*root/emulex*’.

     For ESX 3.5, the namespace is ‘*elxhbacmpi/cimv2* ’.

Note: If the Emulex CIM Provider present in ESXi / ESX is inbox provider, then the namespace to be used is "elxhbacmpi/cimv2". If the out-of-box CIM Provider is installed, then the namespace to be used is "root/ emulex".

Table 2, "Namespaces Used for Providers," lists the namespaces to be used with the inbox providers and the out-of-the-box providers for various versions of ESX/ESXi:

Table 2: Namespaces Used for Providers

	Namespace	
	Inbox Provider	**Out-of-Box Provider**
ESX/ESXi 3.5	elxhbacmpi/cimv2	elxhbacmpi/cimv2
ESX/ESXi4.0	elxhbacmpi/cimv2	root/emulex
ESX/ESXi4.1	elxhbacmpi/cimv2	root/emulex

To check whether the CIM Provider is inbox or out-of-box, enter the following command on the ESX/ESXi host.

```
~ # esxupdate --vib-view query | grep emulex-cim-provider
```

If the provider name is prefixed with `deb`, it is an inbox provider. If the provider name is prefixed with `cross`, it is an out-of-box provider as shown in the following response samples:

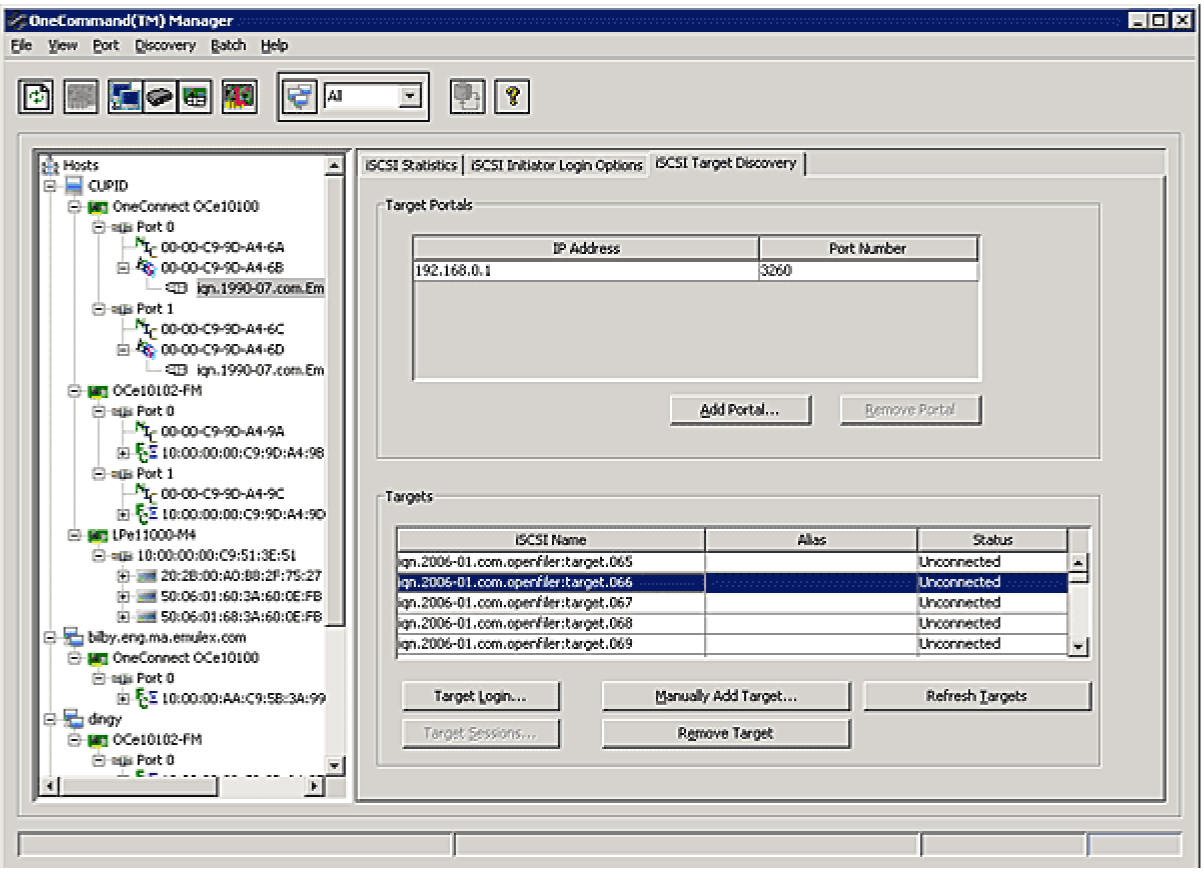
```
deb_emulex-cim-provider_410.2.0.32.1-207424
installed     2010-04-01T07:00:00+00:00

cross_emulex-cim provider_410.3.1.16.1235786
installed     2010-10-11T09:39:04.047082+00:00
```

4. Choose the refresh rate settings you want to apply.
5. Click **OK** to apply your changes. Click **Defaults** to return the discovery properties to their default settings.

Configuring iSCSI Target Discovery

The iSCSI Target Discovery tab allows you to configure iSCSI target discovery related parameters.



Target Portals

IP Address	Port Number
192.168.0.1	3260

Targets

iSCSI Name	Alias	Status
iqn.2006-01.com.openfiler:target.065		Unconnected
iqn.2006-01.com.openfiler:target.066		Unconnected
iqn.2006-01.com.openfiler:target.067		Unconnected
iqn.2006-01.com.openfiler:target.068		Unconnected
iqn.2006-01.com.openfiler:target.069		Unconnected

Figure 16: iSCSI Target Discovery tab

To display the iSCSI Target Discovery tab:

1. From the discovery-tree, select the iSCSI port whose discovery settings you want to configure.
2. Select the **iSCSI Target Discovery** tab.

Target Discovery Field Definitions

- Target Portals - The Target Portals table contains all target portals that are queried for targets. Depending on the SAN setup, the contents of this table may be a subset of the available target portals, or it could contain the full set of target portals for all iSCSI targets.
- Targets - The Targets table contains all currently discovered targets. Targets in this table come from one of three possible sources:
    - The target was manually added.
    - The target was discovered via a target portal.
    - The target was found through an iSNS server query.

Target Discovery Buttons

- Add Portal - Click to add a target portal. See “Adding Target Portals” on page 40 for more information.
- Remove Portal - Click to remove a portal. See “Removing a Target Portal” on page 40 for more information.
- Target Login - Click to log in to a selected target. See “Logging into Targets” on page 40 for more information.
- Target Sessions - Click to view active sessions for the selected target. See “Viewing Target Sessions” on page 42 for more information.
- Manually Add Target - Click to manually add an iSCSI target. See “Manually Adding an iSCSI Target” on page 42 for more information.
- Remove Target - Click to manually remove an iSCSI target. See “Removing Targets” on page 42 for more information.
- Refresh Targets - Click to manually force a complete rediscovery of the targets, querying all configured iSNS servers and target portals.

Adding Target Portals

To add a target portal:

1. From the iSCSI Target Discovery tab, click **Add Portal**. The Add Target Portal dialog box appears.
2. Enter the server IP address and TCP port number and click **OK**. After successfully adding a target portal, that target portal's targets are discovered and appear in the target list.
3. Specify the Portal Login Options and Authentication type you want to use.
4. Click **OK**.

Removing a Target Portal

To remove a target portal:

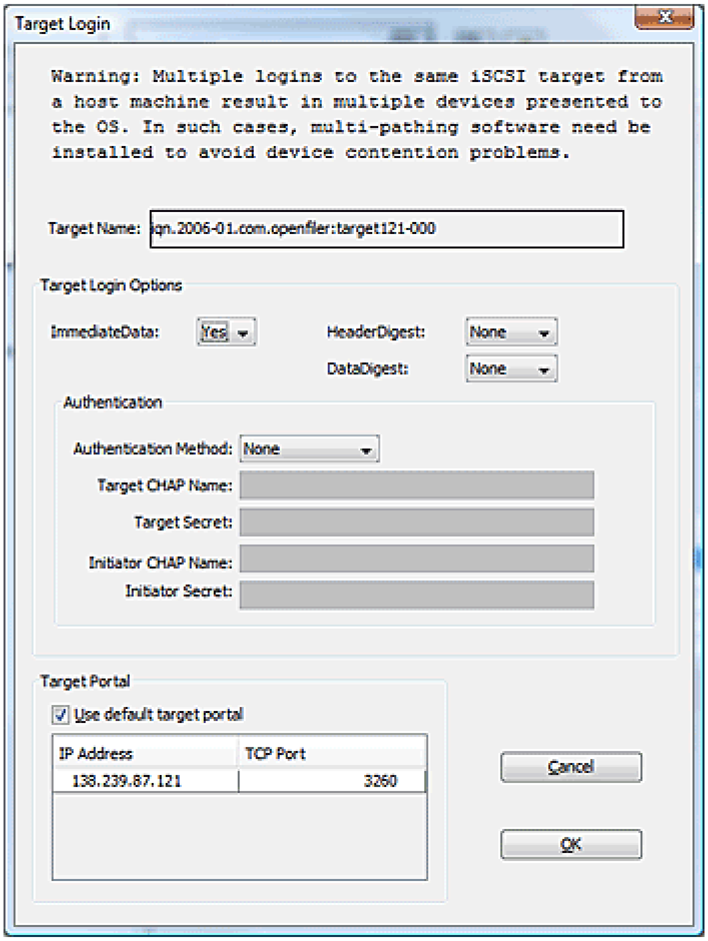
1. From the iSCSI Target Discovery tab, select the target portal you want to remove in the Target Portals table.
2. Click **Remove Portal**.

Note: The targets discovered on the target portal are not removed from the Targets list by the operation. They must be specifically removed by selecting them and clicking the Removet target button. However (except on ESX hosts), targets that are not logged in when the system is rebooted are removed.

Logging into Targets

Only connected targets, that is targets that are successfully logged into, are displayed in the discovery-tree. However, the Targets table in the iSCSI Target Discovery tab is composed of all discovered targets regardless of their connection status. The connection status of each target is displayed in the 'Status' column of the Targets table. Disconnected targets are targets that have not yet been logged into by the initiator.

Note: The target's login options are set at the time they are discovered from the target portal and match the target portal's login options. Changing the login options in the Initiator Login Options tab does not change the discovered targets login options.



Target Login

Warning: Multiple logins to the same iSCSI target from a host machine result in multiple devices presented to the OS. In such cases, multi-pathing software need be installed to avoid device contention problems.

Target Name: iqn.2006-01.com.openfiler:target121-000

Target Login Options

ImmediateData: Yes

HeaderDigest: None

DataDigest: None

Authentication

Authentication Method: None

Target CHAP Name:

Target Secret:

Initiator CHAP Name:

Initiator Secret:

Target Portal

☑ Use default target portal

IP Address	TCP Port
138.239.87.121	3260

Figure 17: Target Login dialog box

To log into a target:

1. From the iSCSI Target Discovery tab, select the target from the Targets table.
2. Click **Target Login**. The Target Login dialog box appears. The dialog box displays the Target Name and Target Alias of the target. When you log into a target and reboot the system, the OneConnect adapter automatically logs in to that target after the reboot is complete.
3. Specify the Target Login Options and Authentication type you want to use.
4. If more than one Target Portal is available to login into the target, you can select the target portal you want to use from the Target Portal list. To use the default Target Portal, check “Use default target portal.”
5. Click **OK**. If the target was successfully logged into, the target's status in the Targets table changes to 'Connected'.

Note: If you are logging into a target more than once, or you are logging into the same target from multiple iSCSI ports, you must have multi-pathing software installed to properly present the target's LUN(s) to the operating system.

Manually Adding an iSCSI Target

The iSCSI Target Discovery tab enables you to manually add and log into iSCSI targets.

To manually add an iSCSI target:

1. From the iSCSI Target Discovery tab, click **Manually Add Target**. The Add iSCSI Target dialog box appears.
2. Enter the target iSCSI name, target IP address and TCP port number.
3. Specify the Target Login Options and Authentication type you want to use.
4. Click **OK**. If the target was successfully added and logged into, the target appears as ‘Connnected’ in the Targets table.

Removing Targets

To remove a target:

1. Log out of all sessions for the target you want to remove.
2. From the iSCSI Target Discovery tab, select the target you want to remove and click **Remove Target**.

Note: In cases where the target still exists on the network, the removed target(s) may reappear (targets are periodically refreshed on the host system). Removing a target permanently removes targets from the OneCommand Manager configuration only after the target portal is removed from the OneCommand Manager configuration or the target portal or target have been physically removed from the network.

Viewing Target Sessions

The Target Sessions dialog box enables you to view active sessions for a currently connected target.

To view active sessions for a connected target:

1. From the iSCSI Target Discovery tab, select the target whose sessions you want to view and click **Target Sessions**. The Target Sessions dialog box appears.

   If there are multiple active sessions in progress, use the Session pull-down menu to select the session whose information you want to view. Click **Close** to close the dialog box.

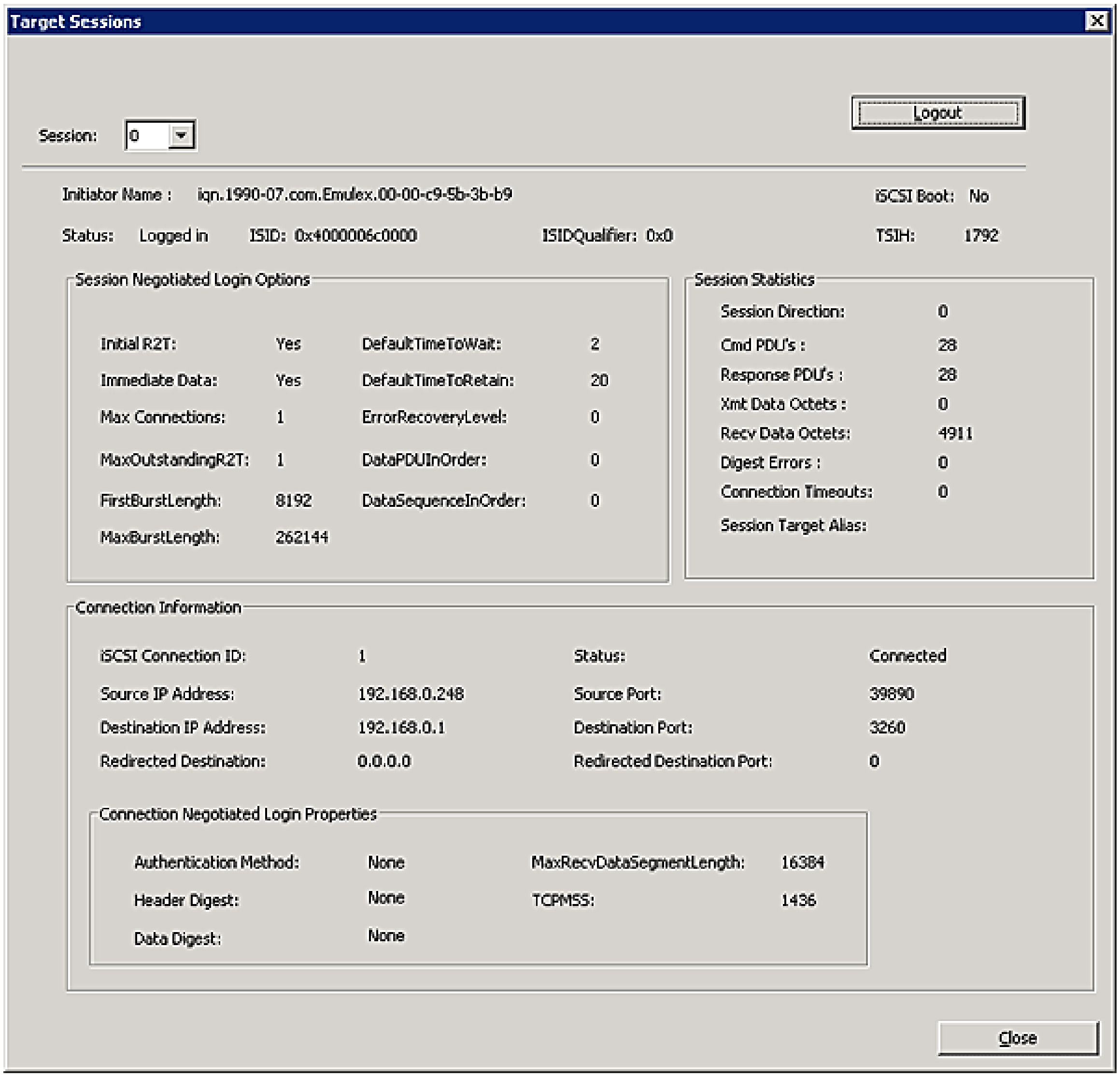
Logging out of Target Sessions

The Target Sessions dialog box enables you to log out of active sessions for a currently connected target.

To log out of active sessions for a connected target:

1. From the iSCSI Target Discovery tab, select the target whose sessions you want to log out of and click **Target Sessions**. The Target Sessions dialog box appears.
2. From the **Session** pull-down menu, select the session from which you want to log out.
3. Click **Close Session** to log out of the session.

Note: If all sessions are logged out, the target is disconnected and removed from the discovery-tree.



Session: 0

Initiator Name : iqn.1990-07.com.Emulex.00-00-c9-5b-3b-b9

iSCSI Boot: No

Status: Logged in ISID: 0x4000006c0000 ISIDQualifier: 0x0 TSIH: 1792

Session Negotiated Login Options

Initial R2T:	Yes	DefaultTimeToWait:	2
Immediate Data:	Yes	DefaultTimeToRetain:	20
Max Connections:	1	ErrorRecoveryLevel:	0
MaxOutstandingR2T:	1	DataPDUInOrder:	0
FirstBurstLength:	8192	DataSequenceInOrder:	0
MaxBurstLength:	262144		

Session Statistics

Session Direction:	0
Cmd PDU's :	28
Response PDU's :	28
Xmt Data Octets :	0
Recv Data Octets:	4911
Digest Errors :	0
Connection Timeouts:	0
Session Target Alias:	

Connection Information

iSCSI Connection ID:	1	Status:	Connected
Source IP Address:	192.168.0.248	Source Port:	39890
Destination IP Address:	192.168.0.1	Destination Port:	3260
Redirected Destination:	0.0.0.0	Redirected Destination Port:	0

Connection Negotiated Login Properties

Authentication Method:	None	MaxRecvDataSegmentLength:	16384
Header Digest:	None	TCPMSS:	1436
Data Digest:	None		

Figure 18: Target Sessions dialog box

Target Sessions Field Definitions

- Initiator Name - The initiator named used to log into the session.
- Status - The session status (logged in, login in progress, login failed, recovery, unknown).
- ISID - The initiator session identifier (unique for each session).
- ISID Qualifier - The first two bytes of the ISID (unique for each session).
- TSIH - The target session identifier handle. A tag generated by an iSCSI target to identify an iSCSI session with a specific iSCSI initiator.
- iSCSI Boot - “Yes” indicates a boot session. Logout is not possible from a boot session.

Session Negotiated Login Options Area

- InitialR2T - The initial request to transmit. When set to Yes, the initiator has to wait for the target to solicit SCSI data before sending it. When set to No, it allows the initiator to send a burst of unsolicited FirstBurstLength bytes.
- Immediate Data - When set to Yes, it allows the initiator to append unsolicited data to a command.
- MaxConnections - The maximum number of connections to targets that are allowed within a single session.
- MaxOutstandingR2T - The maximum number of outstanding request to transmits (R2Ts) per task within a session, each up to MaxBurstLength bytes.
- FirstBurstLength - The maximum amount of unsolicited data (in bytes) the initiator can send to the target during the execution of a single iSCSI command.
- MaxBurstLength - The maximum amount of either unsolicited or solicited data the initiator may send in a single burst. Any amount of data exceeding this value must be explicitly solicited by the target.
- DefaultTimeToWait - The minimum time to wait, in seconds, before the initiator attempts to reconnect or reassign a connection (or task) that has been dropped after an unexpected connection termination or reset. The initiator and target negotiate to determine this value.
- DefaultTimeToRetain - The maximum time, in seconds, to reassign a connection after the initial wait that is indicated in DefaultTimeToWait has elapsed. The initiator and target negotiate to determine this value.
- ErrorRecoveryLevel - The operational ErrorRecoveryLevel for the session. 0 indicates recovery only by session restart. 1 indicates recovery by reissuing commands, data, or status. 2 indicates connection failure recovery.
- DataPDUInOrder - The order of data protocol data units (PDUs) within a sequence.
- DataSequenceInOrder - The order between sequences.

Session Statistics Area

- Session Direction - The direction of iSCSI session. Valid values are InboundSession and OutboundSession.
- Cmd PDUs - The count of Command PDUs transferred on this session.
- Response PDUs - The count of Response PDUs transferred on this session.
- Xmt Data Octets - The count of data octets that were transmitted by the local iSCSI node on this session.
- Recv Data Octets - The count of data octets that were received by the local iSCSI node on this session.
- Digest Errors - The count of PDUs which were received on the session and contained header or data digest errors.
- Connection Timeouts - The count of connections within this session which have been terminated due to a timeout.
- Session Target Alias - The target alias for the session.

Connection Information Area

- iSCSI Connection ID - The iSCSI Connection ID assigned to the connection.
- Status - The status of the connection. Valid values are connected and unknown.
- Source IP Address - The source IP address for the connection.
- Source Port - The source TCP port number for the connection.

- Destination IP Address - The destination IP address for the connection.
- Destination Port - The destination TCP port number for the connection.
- Redirected Destination - The redirected IP address for the target.
- Redirected Destination Port - The redirected port number for the target.

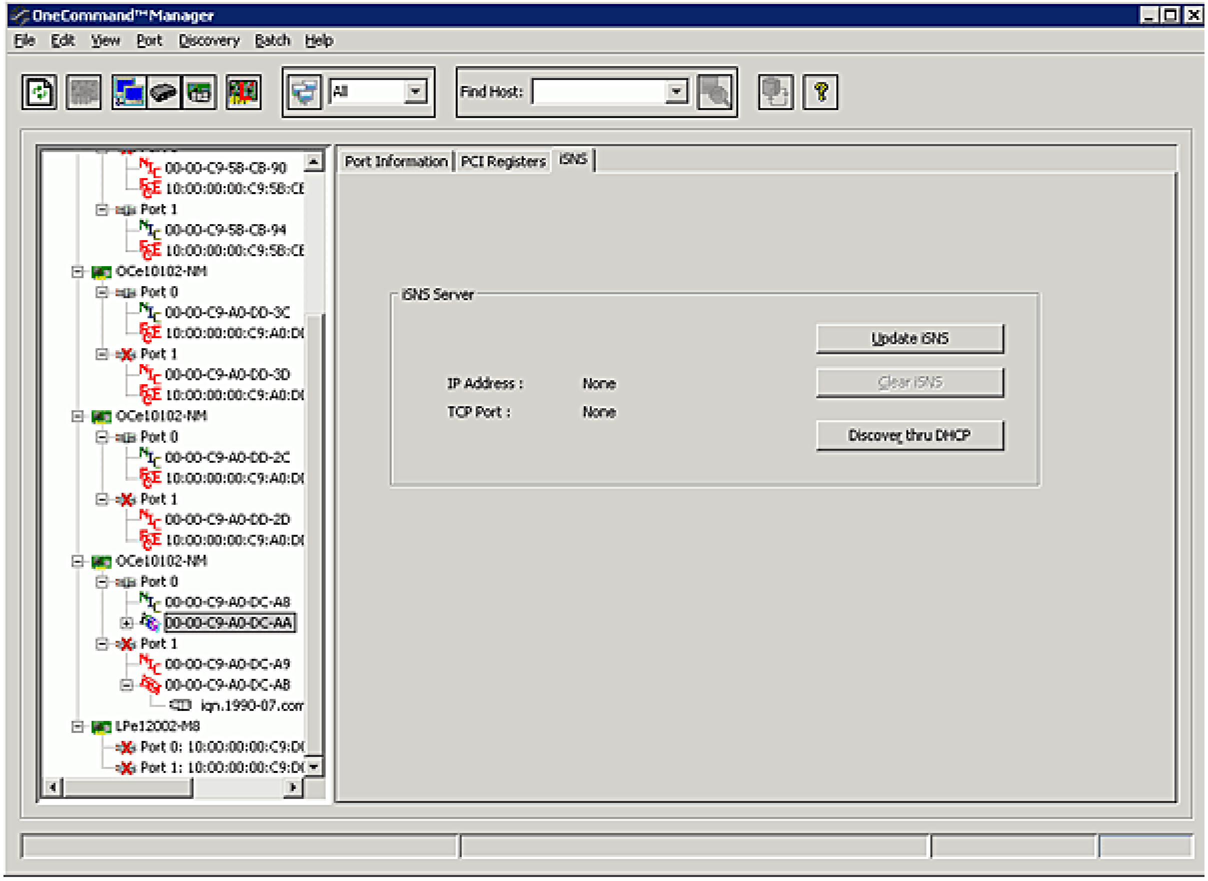
Connection Negotiated Login Options

- Authentication Method - The authentication method used for connection. Valid values are None, Mutual CHAP and One-Way CHAP.
- MaxRecdDataSegmentLength - The maximum data segment length in bytes an initiator or target can receive in an iSCSI PDU.
- Header Digest - When set to CRC32C, the integrity of an iSCSI PDU's header segments is protected by a CRC32C checksum.
- Data Digest - When set to CRC32C, the integrity of an iSCSI PDU's data segments is protected by a CRC32C checksum.
- TCPMSS - The maximum segment size for this connection. The driver uses this to determine the size of the data PDU whenever it is required to transmit the entire PDU with a single iSCSI header.

Configuring iSNS for iSCSI Target Discovery

An Internet Storage Name Server (iSNS) maintains a database of storage network elements that can be queried by other hosts within the SAN. iSCSI storage devices in particular can register targets with the iSNS for efficient discovery by iSCSI clients such as the OneCommand Manager application.

Use the iSCSI SNS tab to configure the iSNS server or to discover the server using DHCP.



IP Address : None

TCP Port : None

Figure 19: iSCSI SNS tab

To add a server:

1. Click **Update iSNS Server**. The Update iSNS Server dialog box appears.
2. Enter the server address and port and click **OK**.

   The new iSNS server is also queried for iSCSI targets and any discovered targets are added to the Target's table on the main Target Discovery tab.

To remove a server:

1. Click **Clear iSNS**. The iSNS server is removed and no longer queried during a target refresh.

   Note: The targets discovered using iSNS are not removed by clearing the iSNS server. They must be specifically removed in the iSCSI Target Discovery tab. However (except on ESX hosts), targets that are not logged in when the system is rebooted are removed.

To discover servers using DHCP:

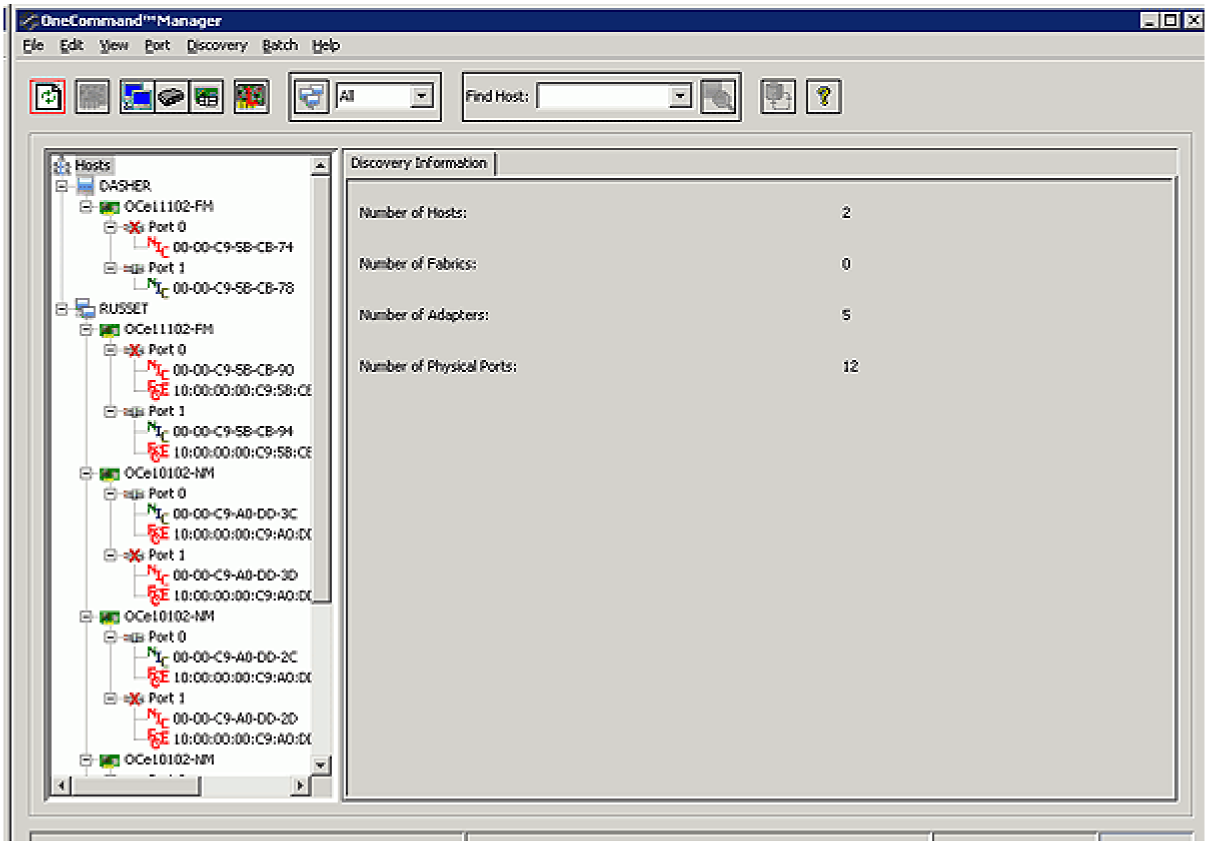
1. Click **Discover thru DHCP**. If an iSNS server can be discovered through a DCHP server, it is configured and queried for targets.

Viewing Discovery Information

The Discovery Information page contains a general summary of the discovered elements. The Host, Fabric or Virtual Port icon, depending upon which view you select, is the root of the discovery-tree, but it does not represent a specific network element. Expanding it reveals all hosts, LUNs, targets, adapter ports and virtual ports that are visible on the SAN.

To view discovery information:

1. Click the **Hosts, Fabrics** or **Virtual Port** icon at the root of the discovery-tree. Discovered SAN elements appear in the discovery-tree.
2. Select an element from the discovery-tree to learn more about it.



Number of Hosts: 2

Number of Fabrics: 0

Number of Adapters: 5

Number of Physical Ports: 12

Figure 20: Discovery Information (Host view selected)

Discovery Information Field Definitions

- Number of Hosts - The total number of discovered host computers containing manageable Emulex adapters. This includes servers, workstations, personal computers, multiprocessor systems and clustered computer complexes.
- Number of Fabrics - The total number of discovered fabrics.
- Number of Adapters - The total number of discovered adapters.
- Number of Physical Ports - The number of discovered physical ports that can be managed by this host.

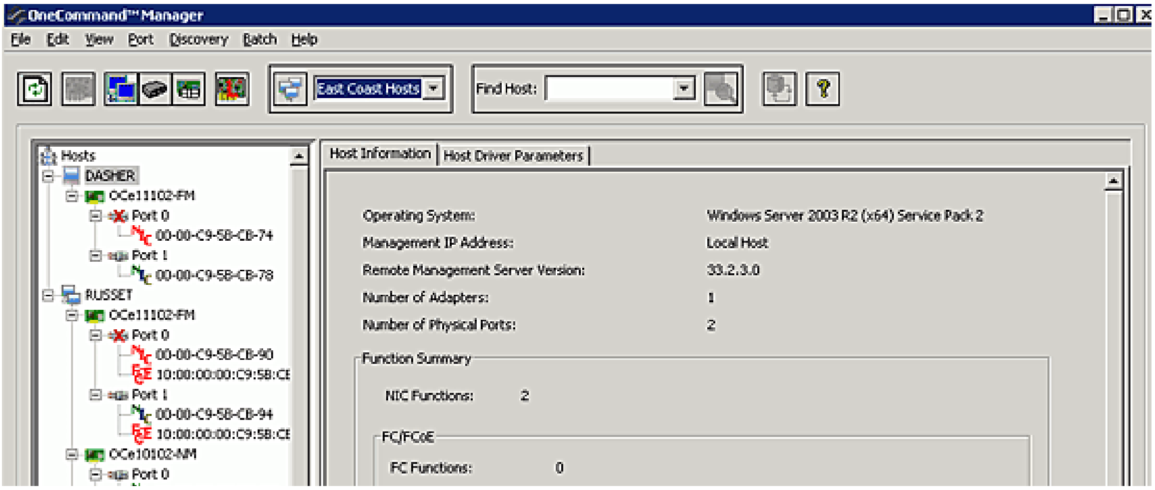
Viewing Host Grouping Information

The Host Group Information tab displays information about the selected host group, such as the group name, the total number of hosts and so on. See “Grouping Hosts” on page 50 to learn about creating host groups.

Note: Host grouping is not supported for VMware.

To view host grouping information:

1. From the discovery-tree, select the host group whose information you want to view.



Operating System: Windows Server 2003 R2 (x64) Service Pack 2
Management IP Address: Local Host
Remote Management Server Version: 33.2.3.0
Number of Adapters: 1
Number of Physical Ports: 2

Function Summary
NIC Functions: 2

FC/FCoE
FC Functions: 0

Figure 21: Host Group Information tab

Host Group Information Field Definitions

- Group Name - The name of the selected group.
- Number Hosts - The total number of hosts assigned to the group.
- Number of Adapters - The total number of discovered adapters in the group.
- Number of Ports - The total number of ports in the group.

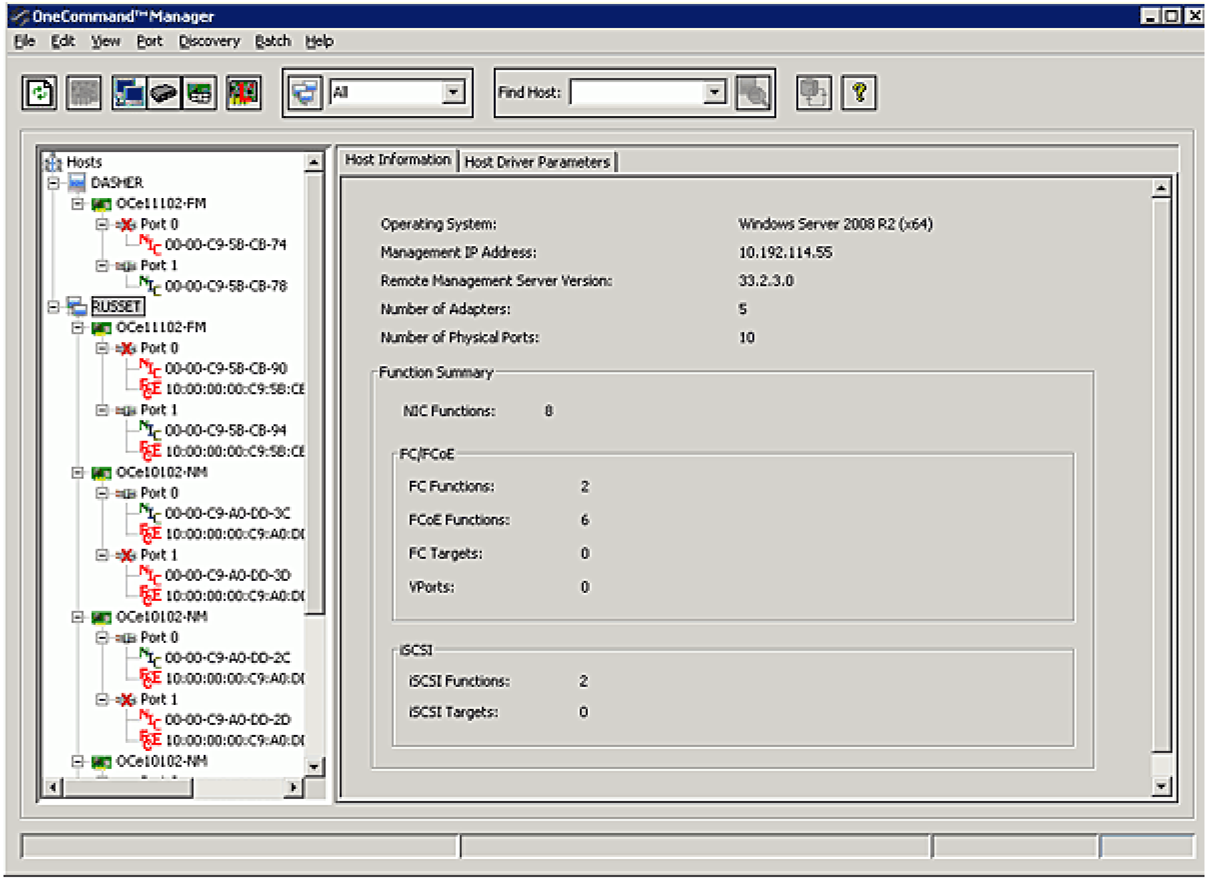
Viewing Host Information

There are two tabs that show host information: the Host Information tab and the Host Driver Parameters tab. The Host Information tab is read-only. The Host Driver Parameters tab enables you to view and define adapter driver settings for a specific host. See “The Host Driver Parameters Tab” on page 101 for more information about the Host Driver Parameters tab.

To view the Host Information and Host Driver Parameters tabs:

1. Do one of the following:
   - From **View** menu, click **Group Adapters by Host Name**.
   - From the toolbar, click **Group Adapters by Host Name**.
2. Select a host in the discovery-tree.
3. Select the **Host Information** tab or the **Host Driver Parameters** tab.

The Host Information tab displays information for the selected host including the number of adapters installed in the selected host, the number of fabrics to which it is connected and so on.



Operating System: Windows Server 2008 R2 (x64)

Management IP Address: 10.192.114.55

Remote Management Server Version: 33.2.3.0

Number of Adapters: 5

Number of Physical Ports: 10

Function Summary

NIC Functions: 8

FC/FCoE

FC Functions: 2

FCoE Functions: 6

FC Targets: 0

VPorts: 0

iSCSI

iSCSI Functions: 2

iSCSI Targets: 0

Figure 22: Host Information tab

Host Information Field Definitions

- Operating System - The operating system and version installed on the selected host.
- Management IP Address - If the host is discovered with FC, the Management IP Address field displays “Host discovered over Fibre Channel”. If the host has been added with TCP/IP access, the Management IP Address field displays the host's IP address, for example, 138.239.82.131. "Local Host" is displayed if you selected the host you are actually launching from.
- Remote Manager Server Version - The version of the OneCommand Manager application server that is running on the host. If different versions of the OneCommand Manager application are installed on different hosts in the SAN, those differences appear in this field.
- Number of Adapters - The number of adapters installed in the host.
- Number of Physical Ports - The number of discovered physical ports that can be managed by this host.
- CIM Provider Version - If the host is being managed using the CIM interface, the "CIM Provider Version" field displays the version of the Emulex CIM provider that is running on the remotely managed system.

Note: The CIM Provider Version field only appears if the host is managed through the CIM interface.

Function Summary Area

- NIC Functions - The number of NIC functions running on the discovered adapters on this host.
- FC Functions - The number of FC functions running on the discovered adapters on this host.
- FCoE Functions - The number of FCoE functions running on the discovered adapters on this host.
- FC Targets - The number of FC targets discovered on the FC/FCoE functions on this host.
- VPorts - The number of discovered virtual ports that can be managed by this host. (Not supported on VMware ESX servers being managed through the CIM interface.)
- iSCSI Functions - The number of iSCSI functions running on the discovered adapters on this host.
- iSCSI Targets - The number of iSCSI targets discovered on the iSCSI functions on this host.

Grouping Hosts

The OneCommand Manager application enables you to assign related hosts to host groups. Typically, hosts within the same host group share some common function or they may simply reside within the same organizational unit within an enterprise such as "Payroll" group, or a "Shipping/Receiving" group.

You can display the hosts in the discovery-tree in either a group centric format or in the host-based flat format. The Host grouping feature is available in Host view, Vport view or Fabric view mode.

Note: The same fabric may appear under more than one host group. For example, some ports on the fabric may be attached to ports/hosts in one host group, and other ports on the same fabric may be attached ports/hosts in a different host group.

You can also perform batch operations such as firmware download and driver parameter updates on a selected set of groups. See “Updating Firmware for Multiple Adapters” on page 147 for more information.

Note: Grouping hosts is not supported on VMware.

To display all hosts without grouping:

1. Do one of the following:
   - From the **View** menu, uncheck **Show Groups**.
   - From the toolbar unclick **Show Host Groups**.

To display all hosts groups:

1. Do one of the following:
   - From the **View** menu, check **Show Groups**.
   - From the toolbar click **Show Host Groups**.
2. From the **Available Host Group** list choose **All**.

To display all hosts assigned to a particular group:

1. Do one of the following:
   - From the **View** menu, check **Show Groups**.
   - From the toolbar click **Show Host Groups**.

2. From the **Available Host Group** list choose the group whose hosts you want to view.

Managing Host Groups

Use the Host Group Management dialog box to create and delete host groups, add and remove hosts and restore host groups.

Note: Managing host groups is not supported on VMware.

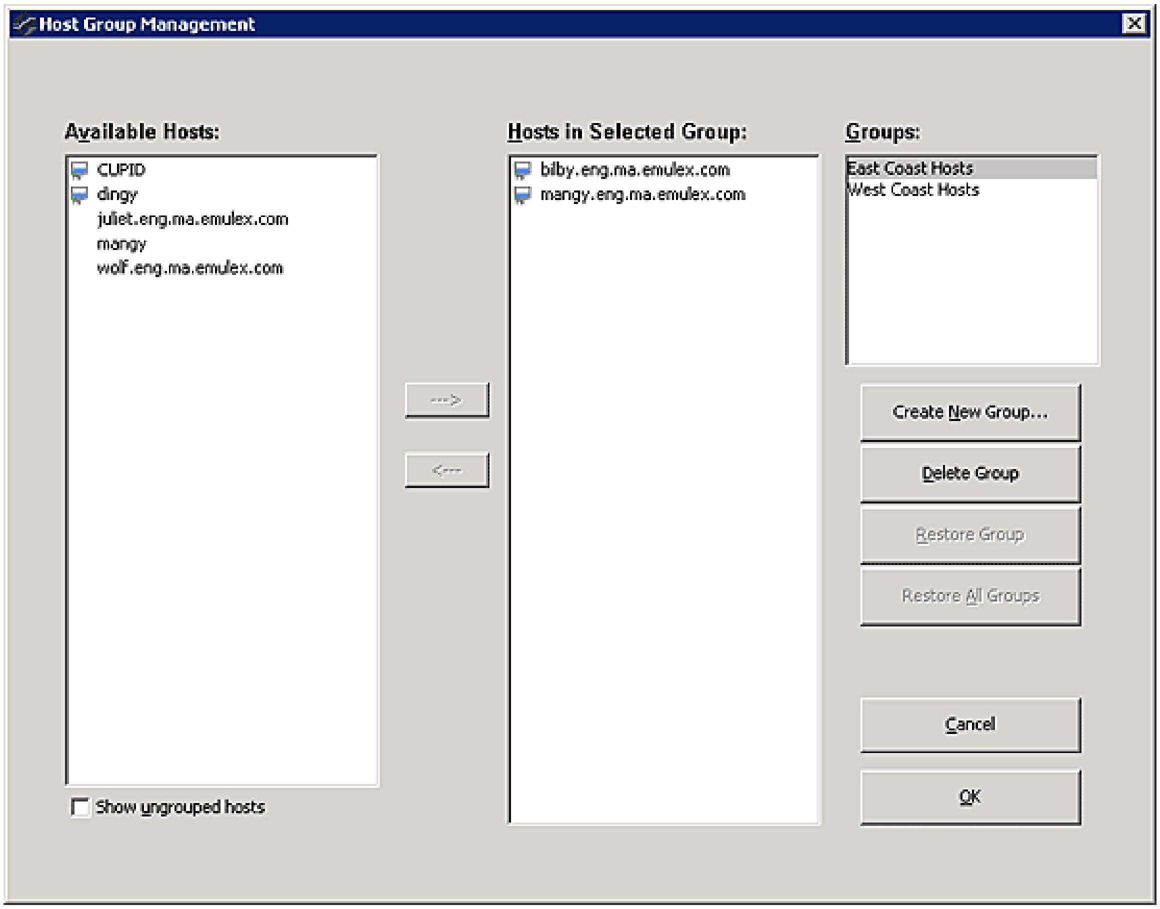


Figure 23: Host Group Management dialog box

Host Group Management Field Definitions

- Available Hosts -The list of hosts that can be added to a host group. You can select a host and right-click to see its group assignments.
- Show ungrouped hosts - When checked, displays only hosts that are currently assigned to a host group.
- Hosts in Selected Group - The list of hosts assigned to the currently selected host group.
- Groups - The list of the currently defined host groups. When you select a group in this list its host members appear in the Hosts in Selected Group list.

Host Group Management Buttons

- Add Host - Adds selected available hosts to the currently selected group.
- Remove Host - Removes selected hosts from the currently selected group.

- Create New Group - Enables you to create a new host group.
- Delete Group - Removes the currently selected host group.
- Restore Group - Returns the selected group's configuration to its original state.
- Restore All Groups - Returns all groups to to their original state.
- OK - Saves the current configuration changes and closes the dialog box.
- Cancel - Discards changes and closes the dialog box.

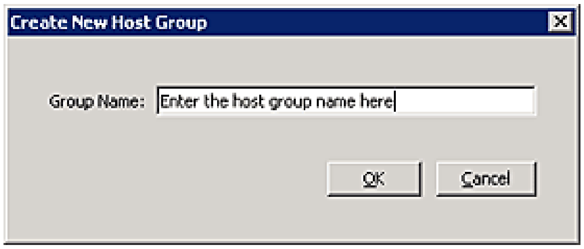
Host Group Management Icons

- Indicates that the host is currently assigned to a single host group.
- Indicates that the host is currently assigned to multiple host groups.

Creating a Host Group

To create a new host group:

1. From the **View** menu, select **Manage Groups**. The Host Group Management dialog box appears.
2. Click **Create New Group**. The Create New Host Group dialog box is displayed.


Create New Host Group

Group Name: Enter the host group name here

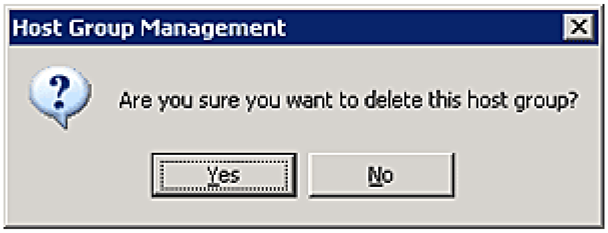
Figure 24: Create New Host Group dialog box

3. Enter the name of the group you want to create and click **OK**. The new group appears in the Groups list on the Host Group Management dialog box.

Deleting a Host Group

To delete a host group:

1. From the **View** menu, select **Manage Groups**. The Host Group Management dialog box appears.
2. From the **Groups** list, select the group you want to delete. The Host Group Management warning dialog box appears.


Host Group Management

Are you sure you want to delete this host group?

Figure 25: Host Group Management warning dialog box

3. Click **Yes** to delete the selected host group.

Adding a Host to a Host Group

To add a host to a group:

1. From the **View** menu, select **Manage Groups**. The Host Group Management dialog box appears.
2. From the **Groups** list, select the group to which you want to add the host.
3. From the **Available Hosts** list, select the host you want to add (or select multiple hosts by using Ctrl-Click or Shift-Click), and click **Add Host**. The selected host is removed from the Available Hosts list and is added to the Hosts in Selected Group list.
4. Click **OK** to commit your changes. The discovery-tree displays the new configuration.

Removing a Host from a Host Group

To remove a host from a host group:

1. From the **View** menu, select **Manage Groups**. The Host Group Management dialog box appears.
2. From the **Groups** list, select the group containing the host you want to remove.
3. From the **Hosts in Selected Group** list, select the host you want to remove and click **Remove Host**. The selected host is removed from the Hosts in Selected Group list and is added to the Available Hosts list.
4. Click **OK** to commit your changes. The discovery-tree displays the new configuration.

Restoring a Host Group

Click **Restore Group** to return the configuration settings for the currently selected host group to those in use when the dialog box was opened.

Note: If the currently selected group was created during the current configuration session, clicking **Restore Group** deletes the new group name.

Restoring all Host Groups

Click **Restore All Groups** to return the entire host group configuration to the state that existed when the dialog was opened. All host group assignments are returned to their original configuration. Any newly added host groups yet to be committed are removed, and any host groups that were deleted are restored.

Exporting Host Grouping Configurations

To export the host grouping configuration to a remote host, you must copy the various host group configuration files from the host on which the configuration was created to the remote host. Copy the entire contents of the config/hostgroups subdirectory under the OneCommand installation directory to the equivalent location on the remote system. The host groups configuration file locations for the supported platforms are:

Windows: InstallationDriveLetter:\Program Files\Emulex\Util\Config\hostgroups

Windows Itanium64: InstallationDriveLetter:\Program Files (x86)\Emulex\Util\Config\hostgroups

Linux: /usr/sbin/ocmanager/config/hostgroups

Solaris: /opt/ELXocm/config/hostgroups

Note: The host group configuration files are completely interchangeable between different operating systems. For example, the host group configuration files created on a Solaris hosts can be copied directly to a Linux or Windows host, with no conversion required.

Searching for Hosts

The OneCommand Manager application enables you to search the discovery-tree for a particular host by the host’s name. If the specified host name is found, the discovery-tree scrolls up or down to bring the desired host name into view.

This feature is especially useful when you are searching for a host in large installation with hundreds or thousands of hosts. It is also helpful in Fabric view mode, since the ports on a specific host may be dispersed among several fabrics making the ports on that host difficult to find in the discovery-tree.

To search for a host:

1. Do one of the following:
   - From the **Edit** menu, select **Find...** and enter the name of the host you are searching for into the **Find Host** field.
   - From the toolbar, enter the name of the host you are searching for into the **Find Host** field.
2. From the toolbar click **Find Host** or press **<Enter>** on the keyboard.

   The host you are searching for is highlighted in the discovery-tree.

   The Find Next option on the Edit menu, or pressing F3, enables you to continue searching for more instances of the name you specified.

Viewing Adapter Information

The adapter information that is displayed depends upon the type of adapter you select; LightPulse (FC) or OneConnect.

Viewing FC Adapter Information

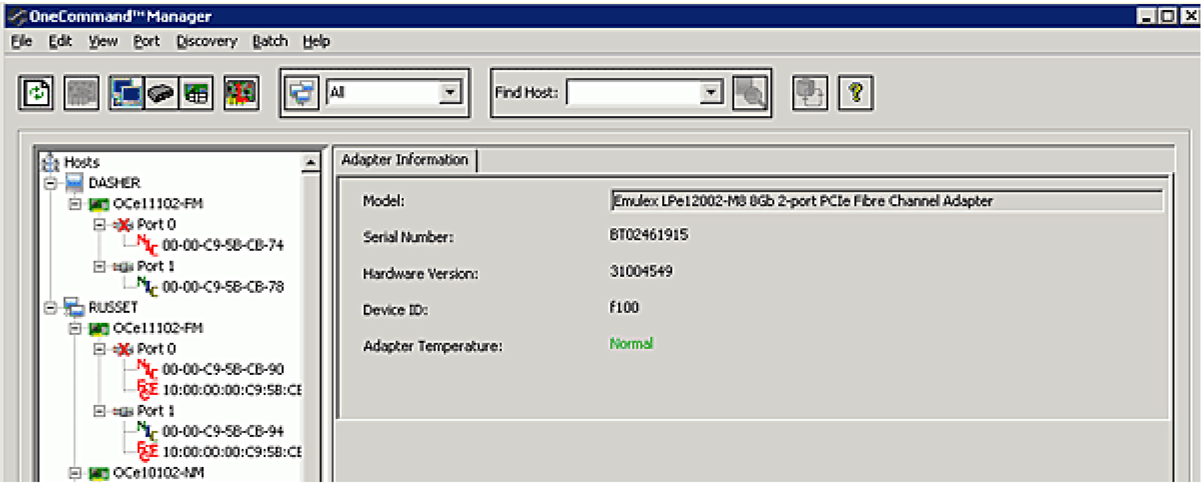
When you select a FC adapter from the discovery-tree, the Adapter Information tab contains general attributes associated with the selected FC adapter.

Note: Not all information is displayed on systems using CIM provider v1.2.1 on ESX 3i.

To view FC adapter information:

1. Select **Host**, **Fabric** or **Virtual Ports** view.

2. Select an FC adapter in the discovery-tree.



Model: Emulex LPe12002-M8 8Gb 2-port PCIe Fibre Channel Adapter

Serial Number: BT02461915

Hardware Version: 31004549

Device ID: f100

Adapter Temperature: Normal

Figure 26: FC Adapter Information tab

FC Adapter Information Field Definitions

- Model - The complete model name of the adapter.
- Serial Number - The manufacturer's serial number for the selected adapter.
- Hardware Version - For LightPulse adapters it displays the JEDEC ID. For OneConnect adapters it displays the board type and revision code.
- Device ID - The default device ID for the selected adapter. (Not supported on VMware ESX servers being managed through the CIM interface.)
- Adapter Temperature - If the adapter's temperature is not available, “Not Supported” is displayed. (Not supported on VMware ESX servers being managed through the CIM interface.) If supported by the adapter, this field displays the adapter's temperature and one of the following temperature-related status messages:
    - Normal: The adapter’s temperature is within normal operational range.
    - Warning: The adapter’s temperature is beyond normal operational range. If the temperature continues to increase, the adapter shuts down. You must determine the cause of the temperature problem and fix it immediately. Check for system cooling issues. Common causes of system cooling issues include clogged air filters, inoperable fans and air conditioning problems that cause high ambient air temperatures.
    - Exceeds operational range - Adapter stopped: The temperature has reached critical limit, forcing the adapter to shut down. You must determine the cause of the temperature problem and fix it before resuming operation. Check for system cooling issues. Common causes of system cooling issues include clogged air filters, inoperable fans and air conditioning problems that cause high ambient air temperatures.

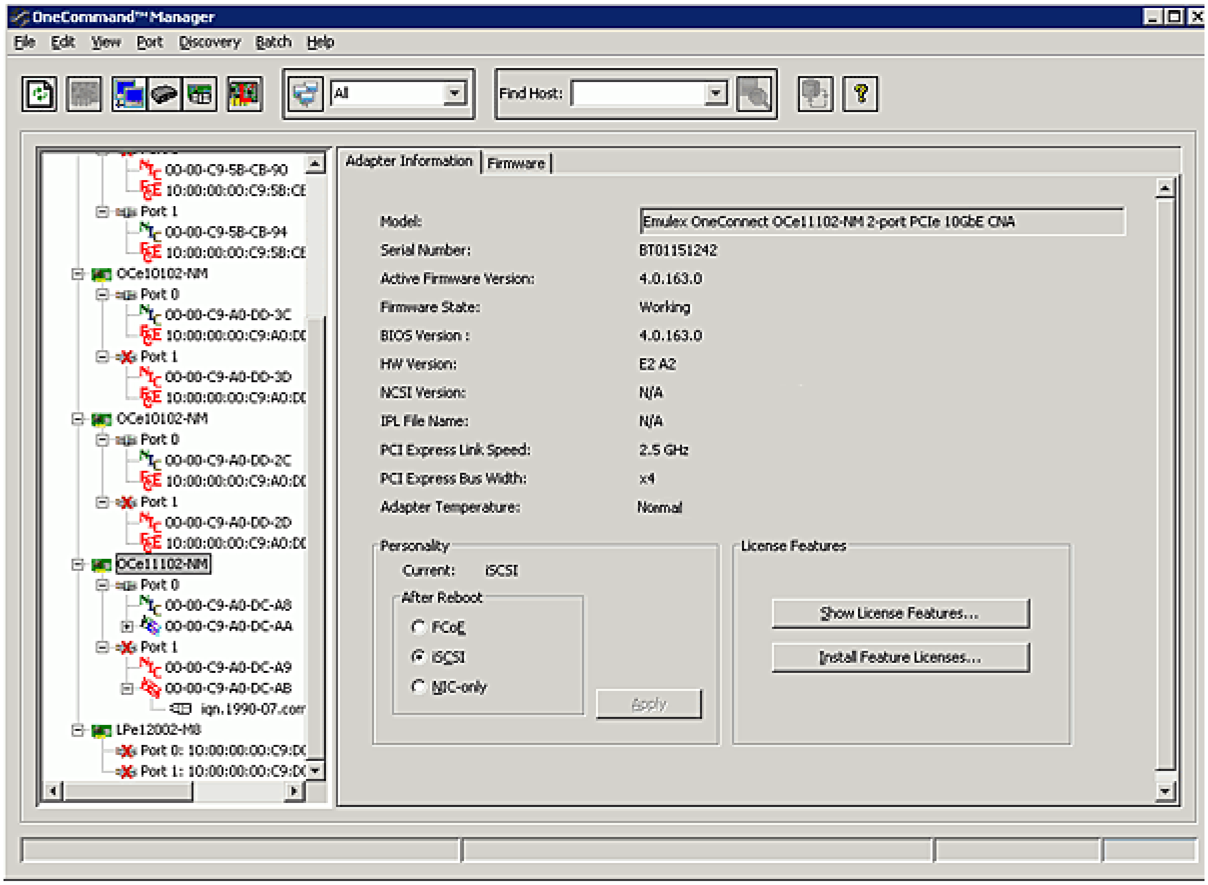
  After the system overheating issue is resolved and the adapter has cooled down, reboot the system or, if the system supports hot swapping, cycle the power of the adapter slot.

Viewing OneConnect Adapter Information

When you select a OneConnect adapter from the discovery-tree, the Adapter Information tab contains general attributes associated with the selected OneConnect adapter. You can also use this tab to view and enable licenses. See “Showing and Installing Licenses for OneConnect Adapters” on page 96 for more information.

To view general OneConnect adapter information:

1. Select **Host** view.
2. Select a OneConnect adapter in the discovery-tree.



Model: Emulex OneConnect OCe11102-NM 2-port PCIe 10GbE CNA
Serial Number: BT01151242
Active Firmware Version: 4.0.163.0
Firmware State: Working
BIOS Version : 4.0.163.0
HW Version: E2 A2
NCSI Version: N/A
IPL File Name: N/A
PCI Express Link Speed: 2.5 GHz
PCI Express Bus Width: x4
Adapter Temperature: Normal
Current: iSCSI

Figure 27: iSCSI Adapter Information tab

OneConnect Adapter Information Field Definitions

- Model - The model of the selected adapter.
- Serial Number - The serial number of the selected adapter.
- Active Firmware Version - The version of the firmware running on the selected adapter.
- Firmware State - The condition of the firmware.
- BIOS Version - The version of the BIOS in use.
- HW Version - The hardware version of the selected adapter.
- NCSI Version - The Network Controller Sideband Interface version.
- IPL File Name - The name of the IPL (Initial Program Load) file currently loaded.
- PCI Express Link Speed - The speed of the PCI bus in which the adapter running.
- PCI Express Bus Width - The number of lanes for the slot in which the adapter is running.
- Adapter Temperature - If the adapter's temperature is not available, “Not Supported” is displayed. (Not supported on VMware ESX servers being managed through the CIM interface.) If supported by the adapter, this field displays the adapter's temperature and one of the following temperature-related status messages:
    - Normal: The adapter’s temperature is within normal operational range.

- Warning: The adapter’s temperature is beyond normal operational range. If the temperature continues to increase, the adapter shuts down. You must determine the cause of the temperature problem and fix it immediately. Check for system cooling issues. Common causes of system cooling issues include clogged air filters, inoperable fans and air conditioning problems that cause high ambient air temperatures.
- Exceeds operational range: The temperature has reached critical limit. You must determine the cause of the temperature problem and fix it before resuming operation. Check for system cooling issues. Common causes of system cooling issues include clogged air filters, inoperable fans and air conditioning problems that cause high ambient air temperatures.

After the system overheating issue is resolved and the adapter has cooled down, reboot the system or, if the system supports hot swapping, cycle the power of the adapter slot.

Personality Area

- Current - The current personality in use by the adapter.
- After Reboot
  - FCoE - Check to choose the FCoE personality.
  - iSCSI - Check to choose the iSCSI personality.
  - NIC Only - Check to choose the NIC only personality.

Note: Some of the personalities may be disabled if the personality is not available on the adapter.

- Apply button - Click to apply the personality you choose. The system must be rebooted for your selection to take affect.

License Features Area

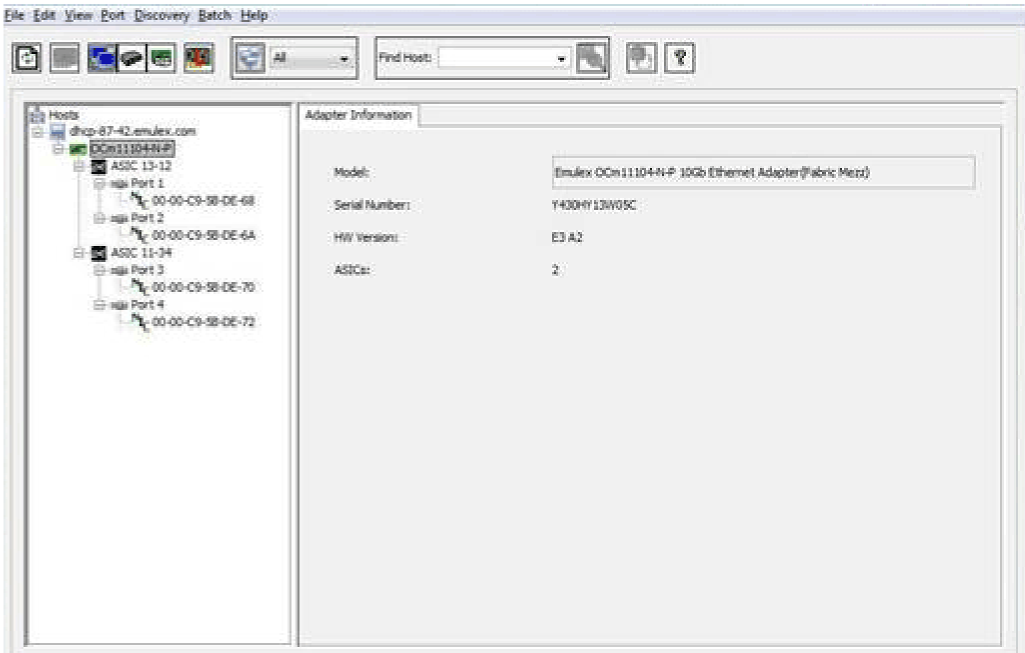
- Show License Features button - Click to show available licenses. See “Showing and Installing Licenses for OneConnect Adapters” on page 96 for more information.
- Install License Features button - Click to install licenses. See “Showing and Installing Licenses for OneConnect Adapters” on page 96 for more information.

Viewing OneConnect Multi-ASIC Adapter Information

When you select a OneConnect multi-ASIC adapter from the discovery-tree, the Adapter Information tab contains general attributes associated with the selected dual ASIC four-port OneConnect adapter.

To view general OneConnect multi-ASIC adapter information:

1. Select **Host** view.
2. Select a OneConnect multi-ASIC adapter in the discovery-tree.



Model: Emulex OCm11104-N-P 10Gb Ethernet Adapter(Fabric Mezz)

Serial Number: Y430HY13W05C

HW Version: E3 A2

ASICs: 2

Figure 28: OneConnect multi-ASIC Adapter Information

OneConnect Multi-ASIC Adapter Information Field Definitions

- Model - The model of the selected adapter.
- Serial Number - The serial number of the selected adapter.
- HW Version - The hardware version of the selected adapter.
- ASICs - The number of ASICs on the selected adapter.

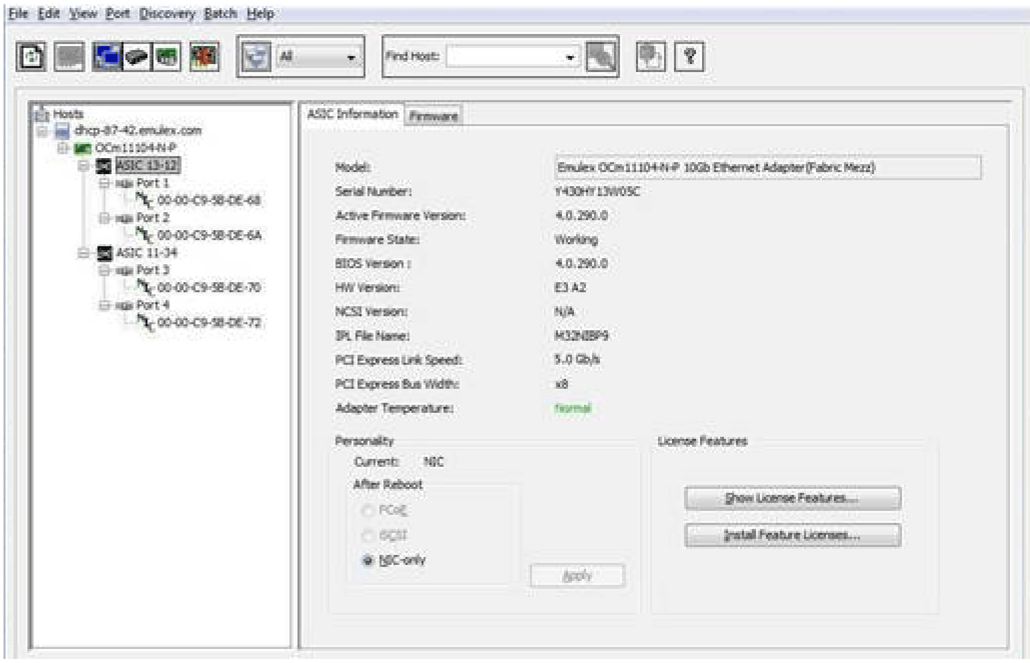
Viewing ASIC Information

When you select a OneConnect multi-ASIC adapter from the discovery-tree, the ASIC Information tab contains general attributes associated with the selected ASIC. You can also use this tab to view and enable licenses. See “Showing and Installing Licenses for OneConnect Adapters” on page 96 for more information.

To view general ASIC information:

1. Select **Host** view.

2. Select a OneConnect four-port adapter ASIC in the discovery-tree.



Model: Emulex OCm11104-N-P 10Gb Ethernet Adapter(Fabric Mezz)
Serial Number: Y430HY13W05C
Active Firmware Version: 4.0.290.0
Firmware State: Working
BIOS Version : 4.0.290.0
HW Version: E3 A2
NCSI Version: N/A
IPL File Name: M32NIBP9
PCI Express Link Speed: 5.0 Gb/s
PCI Express Bus Width: x8
Adapter Temperature: Normal

Personality
Current: NIC
After Reboot
○ FCoE
○ iSCSI
● NIC-only

License Features

Figure 29: ASIC Information tab

ASIC Information Field Definitions

- Model - The model of the selected adapter.
- Serial Number - The serial number of the selected adapter.
- Active Firmware Version - The version of the firmware running on the selected adapter.
- Firmware State - The condition of the firmware.
- BIOS Version - The version of the BIOS in use.
- HW Version - The hardware version of the selected adapter.
- NCSI Version - The Network Controller Sideband Interface version.
- IPL File Name - The name of the IPL (Initial Program Load) file currently loaded.
- PCI Express Link Speed - The speed of the PCI bus in which the adapter running.
- PCI Express Bus Width - The number of lanes for the slot in which the adapter is running.
- Adapter Temperature - If the adapter's temperature is not available, “Not Supported” is displayed. (Not supported on VMware ESX servers being managed through the CIM interface.) If supported by the adapter, this field displays the adapter's temperature and one of the following temperature-related status messages:
  - Normal: The adapter’s temperature is within normal operational range.
  - Exceeded operational range - Critical: The adapter’s temperature is beyond normal operational range. If the temperature continues to increase, the adapter shuts down. You must determine the cause of the temperature problem and fix it immediately. Check for system cooling issues. Common causes of system cooling issues include clogged air filters, inoperable fans and air conditioning problems that cause high ambient air temperatures.
  - Exceeds operational range: The temperature has reached critical limit. You must determine the cause of the temperature problem and fix it before resuming operation. Check for system cooling issues. Common causes of system cooling issues include clogged air filters, inoperable fans and air conditioning problems that cause high ambient air temperatures.

- After the system overheating issue is resolved and the adapter has cooled down, reboot the system or, if the system supports hot swapping, cycle the power of the adapter slot.

Personality Area

- Current - The current personality in use by the adapter.
- After Reboot
  - FCoE - Check to choose the FCoE personality.
  - iSCSI - Check to choose the iSCSI personality.
  - NIC Only - Check to choose the NIC only personality.

Note: Some of the personalities may be disabled if the personality is not available on the adapter.

- Apply button - Click to apply the personality you choose. The system must be rebooted for your selection to take affect.

License Features Area

- Show License Features button - Click to show available licenses. See “Showing and Installing Licenses for OneConnect Adapters” on page 96 for more information.
- Install License Features button - Click to install licenses. See “Showing and Installing Licenses for OneConnect Adapters” on page 96 for more information.

Viewing Port Information

The Port Information tab contains detailed information associated with the selected adapter port. The port information that is displayed depends upon the type of adapter you select, FC, FCoE, iSCSI or NIC.

Note: Not all information is displayed on systems using CIM provider v1.2.1 on ESX 3i.

Viewing FC Port Information

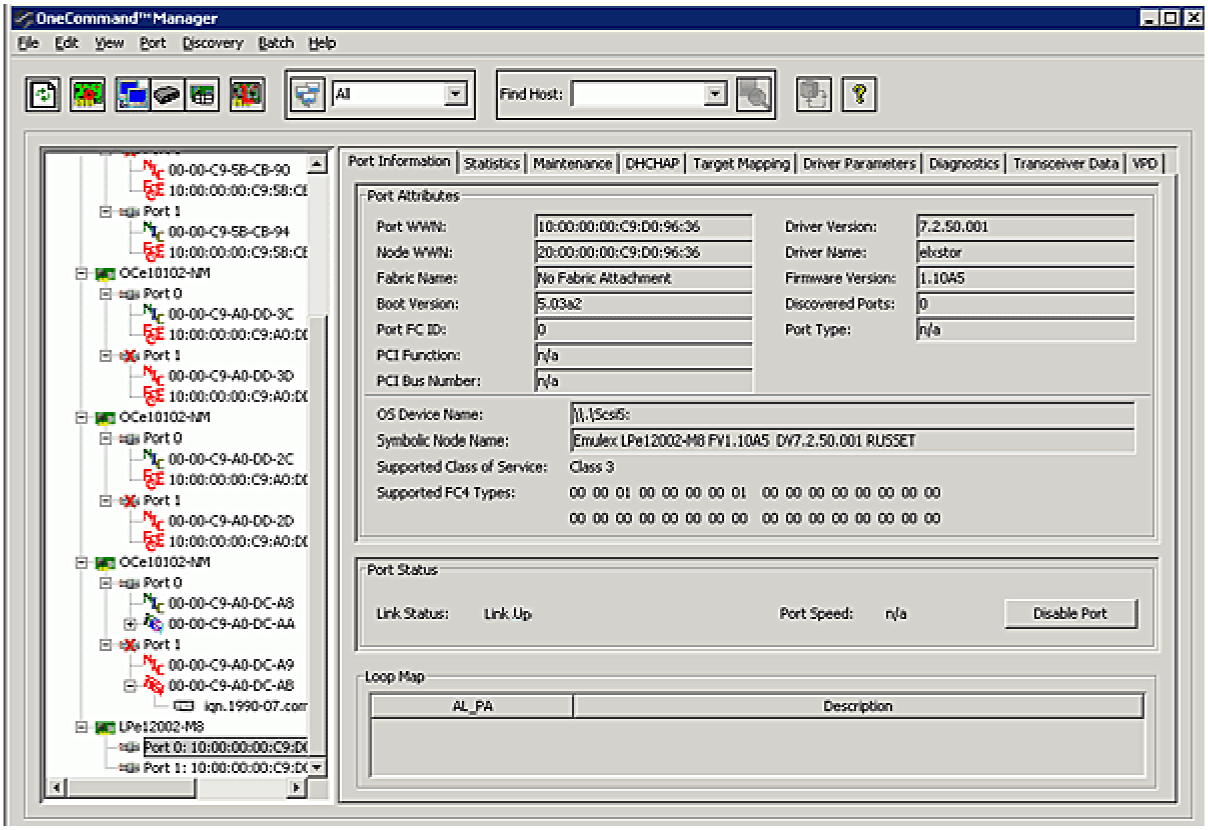
When you select an FC port from the discovery-tree, the Port Information tab contains general attributes associated with the selected FC adapter.

Note: Not all information is displayed on systems using CIM provider v1.2.1 on ESX 3i.

To view FC Port information:

1. Select **Host** or **Fabric** view.
2. Select a FC port in the discovery-tree.

3. Select the **Port Information** tab.



Port WWN: 10:00:00:00:C9:D0:96:36
Node WWN: 20:00:00:00:C9:D0:96:36
Fabric Name: No Fabric Attachment
Boot Version: 5.03a2
Port FC ID: 0
PCI Function: n/a
PCI Bus Number: n/a
Driver Version: 7.2.50.001
Driver Name: elxstor
Firmware Version: 1.10A5
Discovered Ports: 0
Port Type: n/a
OS Device Name: \\.\Scsi5:
Symbolic Node Name: Emulex LPe12002-M8 FV1.10A5 DV7.2.50.001 RUSSET
Supported Class of Service: Class 3
Supported FC4 Types: 00 00 01 00 00 00 00 01 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Link Status: Link Up
Port Speed: n/a

Figure 30: FC Port Information tab

FC Port Information Field Definitions

Port Attributes Area Field Definitions

- Port WWN - The Port World Wide Name of the adapter.
- Node WWN - The Node World Wide Name of the selected adapter.
- Fabric Name or Host Name - The Fabric Name field is displayed in Host view. This is a 64-bit worldwide unique identifier assigned to the fabric. The Host Name is displayed in Fabric view. The host name is the name of the host containing the adapter. (Not supported on VMware ESX servers being managed through the CIM interface.)
- Boot Version - The version of boot code installed on the selected adapter port. If the boot code is disabled, the field displays ”Disabled”.
- Port FC ID - The FC ID for the selected adapter port.
- Driver Version - The version of the driver installed for the adapter.
- Driver Name - The executable file image name for the driver as it appears in the Emulex driver download package.
- Firmware Version - The version of Emulex firmware currently active on the adapter port.
- Discovered Ports - The number of mapped and unmapped ports found during discovery by the Emulex adapter driver. The mapped ports are targets and the unmapped ports are non-targets such as switches or adapters.
- Port Type - The FC type of the selected adapter’s port. (Not available if the port link is down.)

- OS Device Name - The platform-specific name by which the selected adapter is known to the operating system. (Not supported on VMware ESX servers being managed through the CIM interface.)
- Symbolic Node Name - The FC name used to register the driver with the name server.
- Supported Class of Service - A frame delivery scheme exhibiting a set of delivery characteristics and attributes. There are three classes of service.
  - Class 1 provides a dedicated connection between a pair of ports with confirmed delivery or notification of non-delivery.
  - Class 2 provides a frame switched service with confirmed delivery or notification of non-delivery.
  - Class 3 provides a frame switched service similar to Class 2 but without notification of frame delivery or non-delivery.
- Supported FC4 Types - A 256-bit (8-word) map of the FC-4 protocol types supported by the port containing the selected adapter.

Port Status Area Field Definitions

- Link Status - The status of the link on the selected adapter port.
- Port Speed - The current port speed of the selected adapter port.

Loop Map Table Definitions

- The loop map shows the different ports present in the loop, and is present only if the port (adapter) is operating in loop mode. The simplest example would be to connect a JBOD directly to an adapter. When this is done, the port type is a private loop, and the loop map has an entry for the adapter, and one entry for each of the disks in the JBOD. (Not supported on VMware ESX servers being managed through the CIM interface. Not supported for COMSTAR ports. COMSTAR ports are supported on OpenSolaris only.)

Port Information Buttons

- Enable\Disable Port - Click to enable or disable the selected FC port. See “Enabling and Disabling FC Ports” on page 129 for more information.

Viewing FCoE Port Information

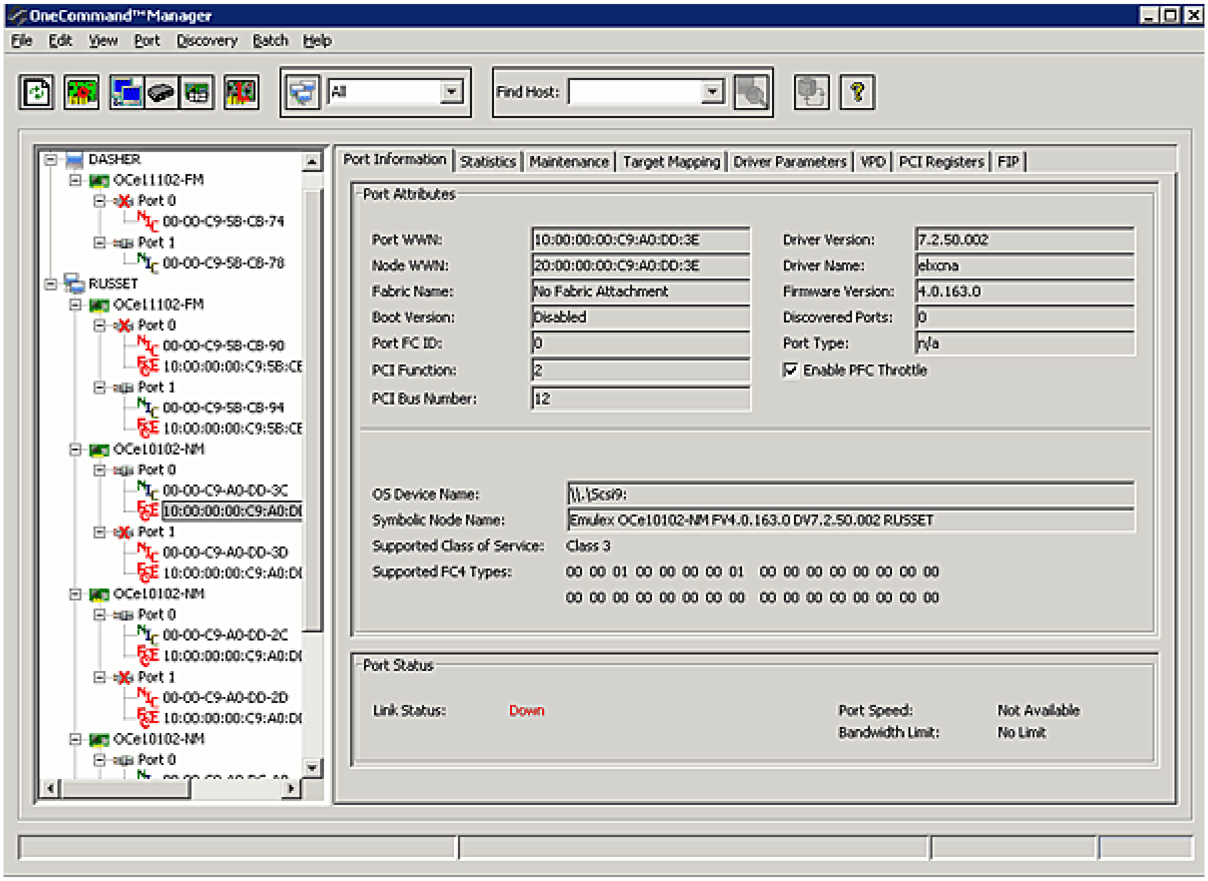
When you select an FCoE port from the discovery-tree, the Port Information tab contains general attributes associated with the selected FCoE port.

Note: Not all information is displayed on systems using CIM provider v1.2.1 on ESX 3i.

To view FCoE Port information:

1. Select **Host** or **Fabric** view.
2. Select an FCoE port in the discovery-tree.

3. Select the **Port Information** tab.



Port Attributes

Port WWN: 10:00:00:00:C9:A0:DD:3E
Node WWN: 20:00:00:00:C9:A0:DD:3E
Fabric Name: No Fabric Attachment
Boot Version: Disabled
Port FC ID: 0
PCI Function: 2
PCI Bus Number: 12

Driver Version: 7.2.50.002
Driver Name: elxcna
Firmware Version: 4.0.163.0
Discovered Ports: 0
Port Type: n/a
☑ Enable PFC Throttle

OS Device Name: \\.\Scsi9:
Symbolic Node Name: Emulex OCe10102-NM FV4.0.163.0 DV7.2.50.002 RUSSET
Supported Class of Service: Class 3
Supported FC4 Types: 00 00 01 00 00 00 00 01 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Port Status

Link Status: Down
Port Speed: Not Available
Bandwidth Limit: No Limit

Figure 31: FCoE Port Information tab

FCoE Port Information Field Definitions

Port Attributes Area Field Definitions

- Port WWN - The Port World Wide Name of the adapter.
- Node WWN - The Node World Wide Name of the selected adapter.
- Fabric Name or Host Name - The Fabric Name field is displayed in Host view. This is a 64-bit worldwide unique identifier assigned to the fabric. The Host Name is displayed in Fabric view. The host name is the name of the host containing the adapter. (Not supported on VMware ESX servers being managed through the CIM interface.)
- Boot Version - The version of boot code installed on the selected adapter port. If the boot code is disabled, the field displays ”Disabled”.
- Port FC ID - The FCoE ID for the selected adapter port.
- PCI Function - The PCI funtion number assigned by the system.
- Driver Version - The version of the driver installed for the adapter.
- Driver Name - The executable file image name for the driver as it appears in the Emulex driver download package.
- Firmware Version - The version of Emulex firmware currently active on the adapter port.
- Discovered Ports - The number of mapped and unmapped ports found during discovery by the Emulex adapter driver. The mapped ports are targets and the unmapped ports are non-targets such as switches or adapters.

- Port Type - The current operational mode of the selected adapter's port.
- Enable PFC Throttle checkbox - PFC throttle is enabled by default to prevent the loss of FCoE packets. Uncheck the box to disable PFC throttle.

  Note: The checkbox does not appear if the adapter does not support PFC throttle.

- OS Device Name - The platform-specific name by which the selected adapter is known to the operating system. (Not supported on VMware ESX servers being managed through the CIM interface.)
- Symbolic Node Name - The FC name used to register the driver with the name server.
- Supported Class of Service - A frame delivery scheme exhibiting a set of delivery characteristics and attributes. There are three classes of service.
  - Class 1 provides a dedicated connection between a pair of ports with confirmed delivery or notification of non-delivery.
  - Class 2 provides a frame switched service with confirmed delivery or notification of non-delivery.
  - Class 3 provides a frame switched service similar to Class 2 but without notification of frame delivery or non-delivery.
- Supported FC4 Types - A 256-bit (8-word) map of the FC-4 protocol types supported by the port containing the selected adapter.

Port Status Area Field Definitions

- Link Status - The status of the link on the selected adapter port.
- Port Speed - The current port speed of the selected adapter port.
- Bandwidth Limit - The QoS bandwidth restriction on the port.

Viewing iSCSI Port Information

When you select an iSCSI port from the discovery-tree, the iSCSI Port Info tab contains general attributes associated with the selected iSCSI adapter. You can also change the iSCSI port's TCP/IP configuration. See "Modifying TCP/IP iSCSI Port Configuration" on page 127 for more information. If the adapter supports vNIC, vNIC data is also displayed.

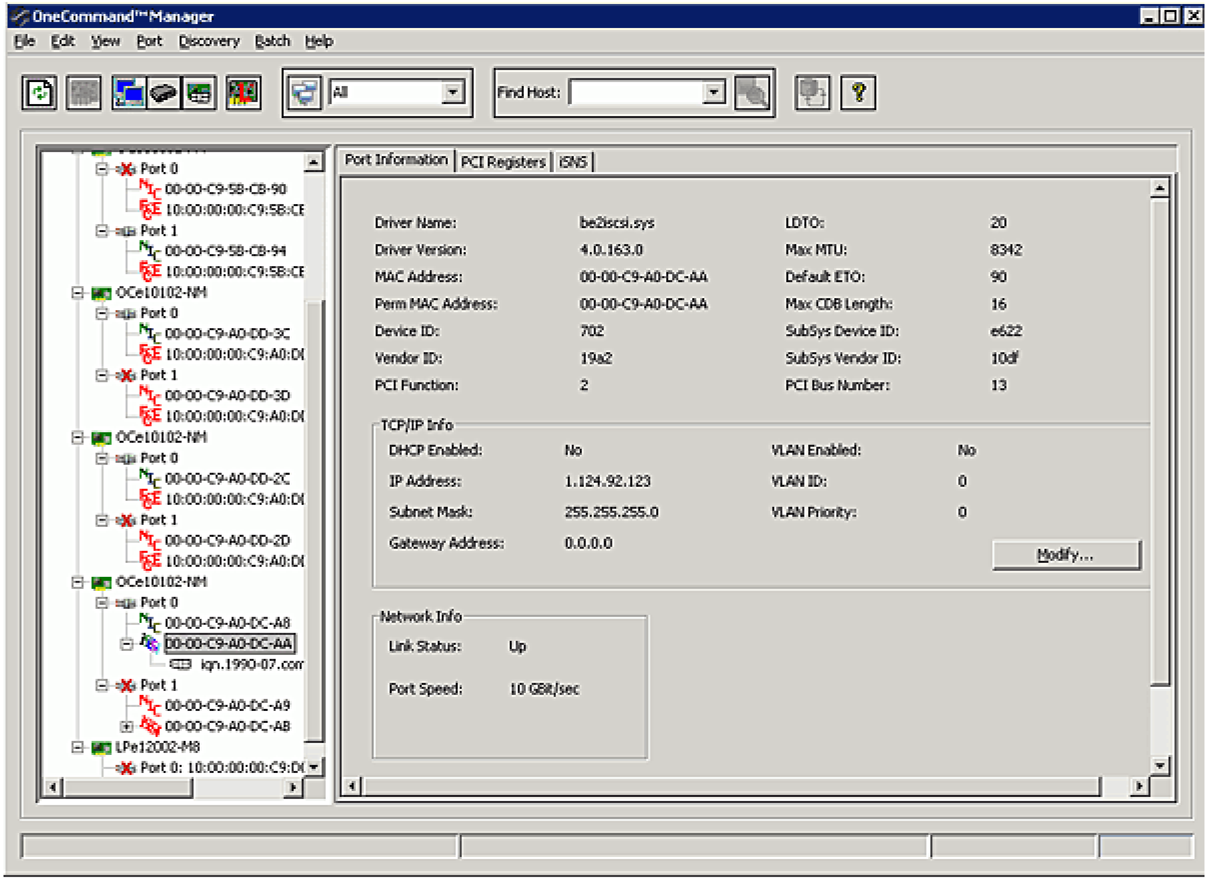
Note: No iSCSI port information is displayed by the CIM provider on any version of VMware ESX.

Note: vNIC is supported only on IBM virtual fabric adapters. For specific information as to whether it is supported on a specific adapter, see the release notes that are available on the IBM adapter pages on the Emulex website.

To view iSCSI port information:

1. Select **Host** or **Fabric** view.
2. Select an iSCSI port in the discovery-tree.

3. Select the **iSCSI Port Info** tab.



Driver Name: be2iscsi.sys
Driver Version: 4.0.163.0
MAC Address: 00-00-C9-A0-DC-AA
Perm MAC Address: 00-00-C9-A0-DC-AA
Device ID: 702
Vendor ID: 19a2
PCI Function: 2
LDTO: 20
Max MTU: 8342
Default ETO: 90
Max CDB Length: 16
SubSys Device ID: e622
SubSys Vendor ID: 10df
PCI Bus Number: 13

TCP/IP Info
DHCP Enabled: No
IP Address: 1.124.92.123
Subnet Mask: 255.255.255.0
Gateway Address: 0.0.0.0
VLAN Enabled: No
VLAN ID: 0
VLAN Priority: 0

Network Info
Link Status: Up
Port Speed: 10 GBit/sec

Figure 32: iSCSI Port Information tab

iSCSI Port Info Field Definitions

- Driver Name - The iSCSI driver file name.
- Driver Version - The iSCSI driver version.
- MAC Address - The iSCSI MAC address currently assigned to the port.
- Perm MAC Address - The original factory-assigned iSCSI MAC address.
- Device ID - The PCI device ID assigned to the iSCSI function.
- Vendor ID - The PCI vendor ID assigned to the iSCSI function.
- PCI Function - The PCI function number assigned to the iSCSI function.
- LDTO - (Link Down Time Out) The amount of time in seconds that the iSCSI driver delays reporting a link down error to the operating system.
- Max MTU - Maximum transmission unit for iSCSI traffic.
- Default ETO - The default extended timeout.
- Max CDB Length - Maximum SCSI command descriptor block size.
- SubSys Device ID - The PCI subsystem ID assigned to the iSCSI function.
- SubSys Vendor ID - The PCI subsystem vendor ID assigned to the iSCSI function.

TCP/IP Configuration Area

- DHCP Enabled - The DHCP authentication status of the selected port.

- IP Address - The iSCSI initiator IP address.
- Subnet Mask - The iSCSI initiator subnet mask.
- Gateway Address - The iSCSI initiator gateway address.
- VLAN Enabled - The VLAN enabled state for the iSCSI interface.
- VLAN ID - The VLAN identifier to use 0-4094 (only valid when VLAN is enabled). 0 indicates the VLAN is disabled.
- VLAN Priority - The VLAN priority for the iSCSI interface.

Network Info Area

- Link Status - The status of the link on the selected adapter port.
- Port Speed - The port speed at which the selected port is running.

vNIC Info Area (If supported)

- Name - The name assigned to the vNIC by an administrator during switch configuration.
- Outer VLAN ID - The VLAN identifier used between the NIC port and the switch. The switch maps this value into the VLAN ID used on the network.
- Min. Bandwidth - The minimum bandwidth (i.e. speed) at which the port is guaranteed to run.
- Max. Bandwidth - The maximum bandwidth (i.e. speed) at which the port is guaranteed to run.

Port Information Buttons (Not available in read-only mode.)

- Modify - Enables you to change TCP/IP settings for the selected port. You can change the port's VLAN tag, priority, IP address and more. See "Modifying TCP/IP iSCSI Port Configuration" on page 127 for more information.

Viewing NIC Port Information

When you select a NIC port from the discovery-tree, the NIC Port Info tab contains general attributes associated with the selected NIC port. If the adapter supports vNIC, vNIC data is also displayed.

Note: NIC ports do not exist only on NIC-Only adapters. NIC ports can also exist on iSCSI and FCoE adapters.

Note: vNIC is supported only on IBM virtual fabric adapters. For specific information as to whether it is supported on a specific adapter, see the release notes that are available on the IBM adapter pages on the Emulex website.

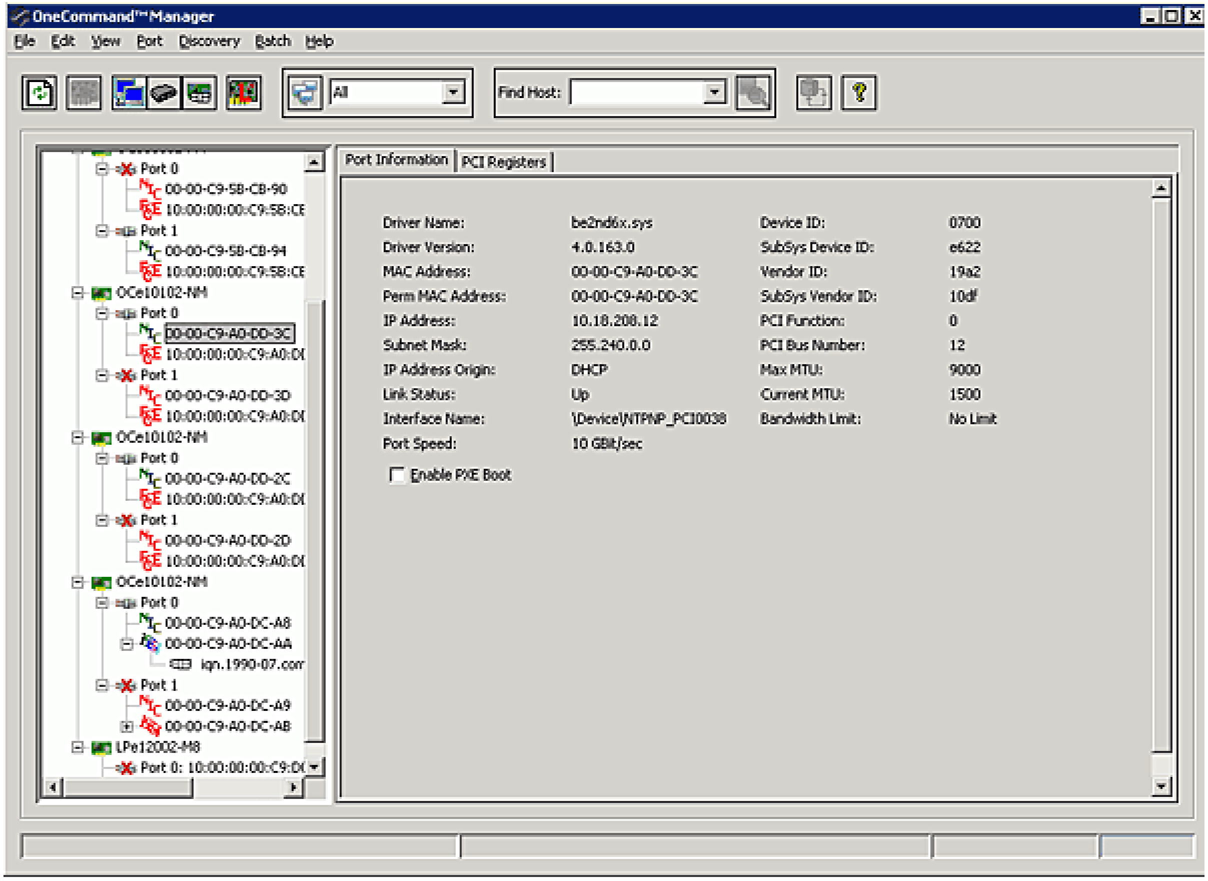
To view general NIC port information:

1. Select **Host** or **Virtual Ports** view.

   Note: In Virtual Ports view, NIC ports only appear on FCoE adapters. They do not appear on iSCSI or NIC-only adapters.

2. Select a NIC-Only adapter in the discovery-tree.

3. Select the **NIC Port Info** tab.



Driver Name:	be2nd6x.sys	Device ID:	0700
Driver Version:	4.0.163.0	SubSys Device ID:	e622
MAC Address:	00-00-C9-A0-DD-3C	Vendor ID:	19a2
Perm MAC Address:	00-00-C9-A0-DD-3C	SubSys Vendor ID:	10df
IP Address:	10.18.208.12	PCI Function:	0
Subnet Mask:	255.240.0.0	PCI Bus Number:	12
IP Address Origin:	DHCP	Max MTU:	9000
Link Status:	Up	Current MTU:	1500
Interface Name:	\Device\NTPNP_PCI0038	Bandwidth Limit:	No Limit
Port Speed:	10 GBit/sec		

□ Enable PXE Boot

Figure 33: NIC Port Info tab

NIC Port Info Field Definitions

- Driver Name - The NIC driver file name.
- Driver Version - The NIC driver version.
- MAC Address - The NIC MAC address currently assigned to the port.
- Perm MAC Address - The original factory assigned NIC MAC address.
- IPv4 Address - The IPv4 address for the NIC port.
- Subnet Mask - The subnet mask for the NIC port.
- IP Address Origin - The origin of the IP address (DHCP or Static).
- Device ID - The PCI device ID assigned to the NIC function.
- Subsys Device ID - The PCI subsystem ID assigned to the NIC function.
- Vendor ID - The PCI vendor ID assigned to the NIC function.
- Subsys Vendor ID - The PCI subsystem vendor ID assigned to the NIC function.
- PCI Function - The PCI function number assigned to the NIC function.
- Max MTU - The maximum transmission unit for iSCSI traffic.
- Current MTU - The current transmission unit for iSCSI traffic.
- Interface Name - The interface assigned to this port by the host operating system.
- Link Status - The status of the link on the selected adapter port.

- Bandwidth Limit - The QoS bandwidth restriction on the port. (Non vNIC adapters only)

vNIC Info Area (If supported)

- Name - The name assigned to the vNIC by an administrator during switch configuration.
- Outer VLAN ID - The VLAN identifier used between the NIC port and the switch. The switch maps this value into the VLAN ID used on the network.
- Min. Bandwidth - The minimum bandwidth (i.e. speed) at which the port is guaranteed to run.
- Max. Bandwidth - The maximum bandwidth (i.e. speed) at which the port is guaranteed to run.

Checkboxes

- Enable PXE Boot - (Preboot Execution Environment) Check the box to enable PXE Boot on the selected port.

Note: PXE Boot is only available on ports with PCI function 0 or 1.

Viewing Physical Port Information (OneConnect Adapters Only)

The Physical Port Info tab contains a general summarization of the PCI functions under that physical port and the current physical port status.

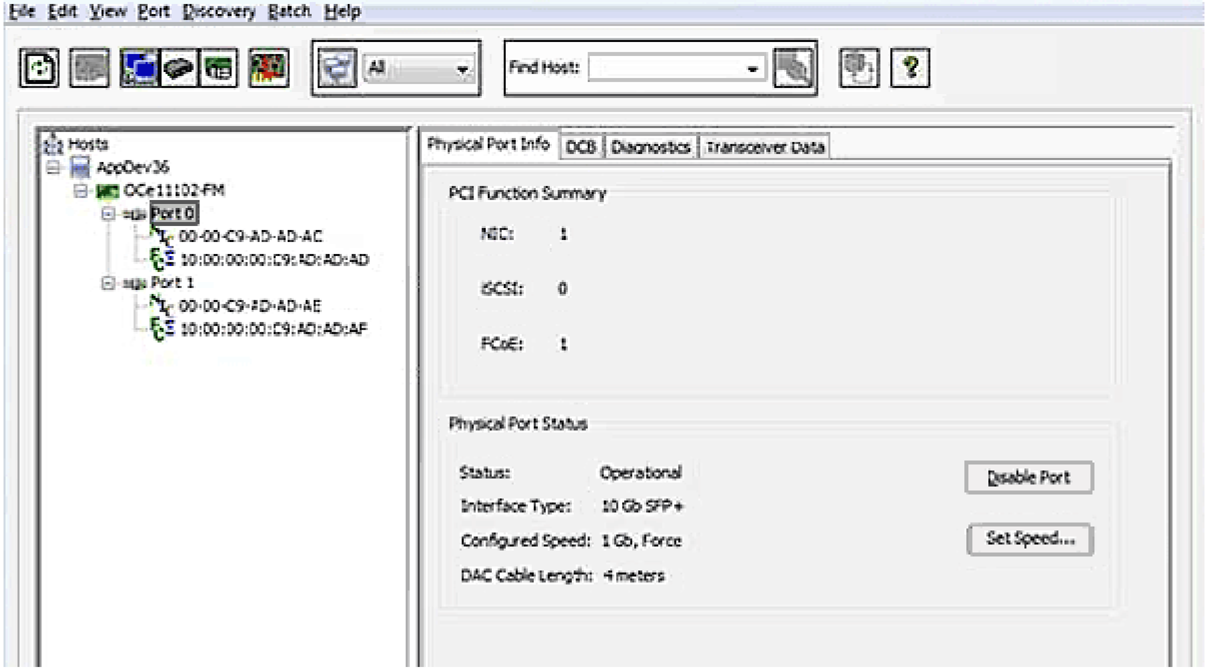
OneConnect OCe11100 series adapters also display additional Physical Port Status information including interface type, configured speed and DAC cable length. You can set the port speed and DAC cable length. See “Setting Port Speed and DAC Cable Length (OneConnect OCe11102 Series Adapters Only)” on page 129 for more information.

It also allows you to enable or disable the physical port. See “Enabling and Disabling Physical Ports (OneConnect Adapters Only)” on page 129 for more information.

To view physical port information:

1. Select **Host** view.
2. Select a OneConnect adapter port in the discovery-tree.

3. Select the **Physical Port Info** tab.



PCI Function Summary

NIC: 1

iSCSI: 0

FCoE: 1

Physical Port Status

Status: Operational

Interface Type: 10 Gb SFP+

Configured Speed: 1 Gb, Force

DAC Cable Length: 4 meters

Figure 34: Physical Port Info tab (OCE11102 adapter port selected)

Viewing Port Statistics

The Statistics tab provides cumulative totals for various error events and statistics on the port. Some statistics are cleared when the adapter is reset. The Port Statistics information that is displayed depends upon the type of adapter you select, FC, iSCSI or NIC-Only.

Note: Not all information is displayed on systems using CIM provider v1.2.1 on ESX 3i.

Viewing FC/FCoE Port Statistics

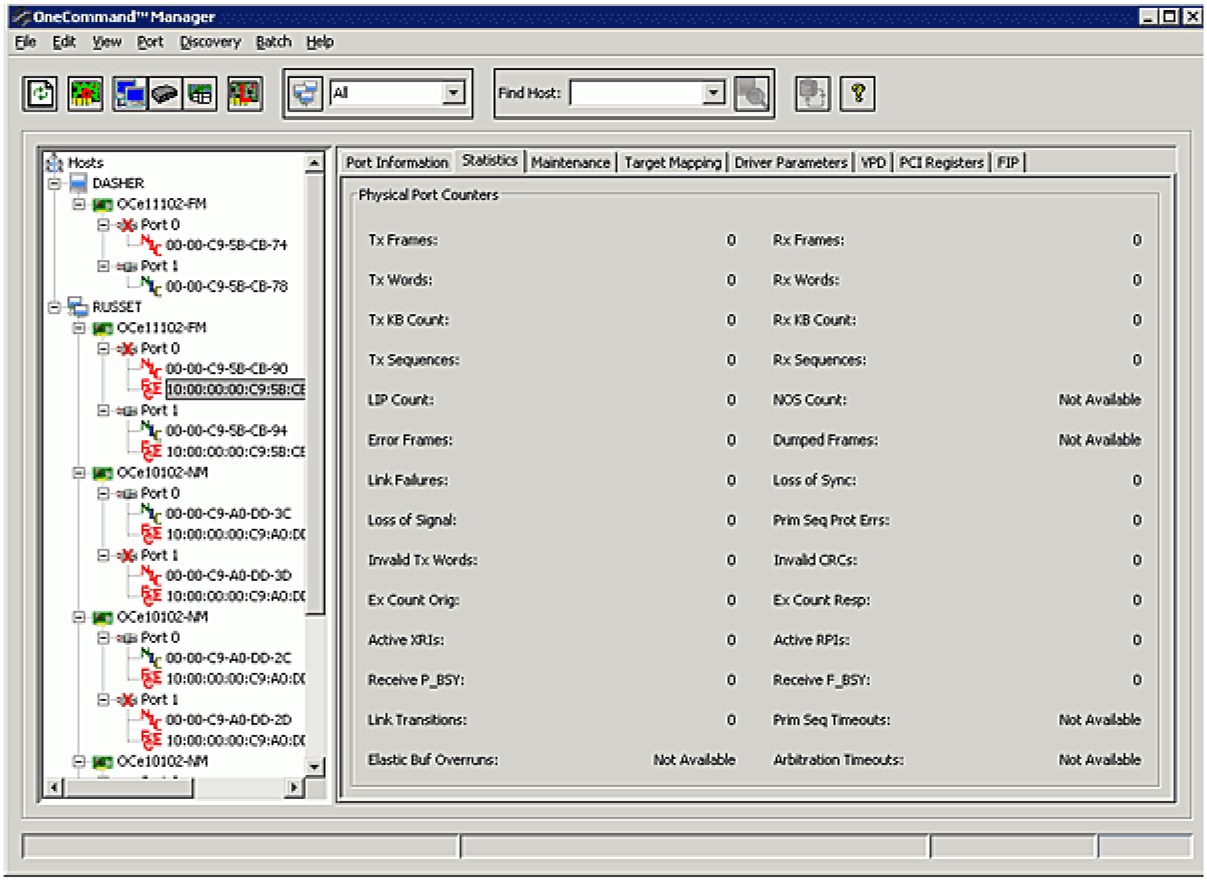
When you select an FC/FCoE port from the discovery-tree, the Port Statistics tab contains statistics associated with the selected port.

Note: Not all information is displayed on systems using CIM provider v1.2.1 on ESX 3i.

To view FC port statistics:

1. Select **Host** or **Fabric** view.
2. Select an FC/FCoE adapter port in the discovery-tree.

3. Click the **Statistics** tab.



Physical Port Counters

Tx Frames:	0	Rx Frames:	0
Tx Words:	0	Rx Words:	0
Tx KB Count:	0	Rx KB Count:	0
Tx Sequences:	0	Rx Sequences:	0
LIP Count:	0	NOS Count:	Not Available
Error Frames:	0	Dumped Frames:	Not Available
Link Failures:	0	Loss of Sync:	0
Loss of Signal:	0	Prim Seq Prot Errs:	0
Invalid Tx Words:	0	Invalid CRCs:	0
Ex Count Orig:	0	Ex Count Resp:	0
Active XRIs:	0	Active RPIs:	0
Receive P_BSY:	0	Receive F_BSY:	0
Link Transitions:	0	Prim Seq Timeouts:	Not Available
Elastic Buf Overruns:	Not Available	Arbitration Timeouts:	Not Available

Figure 35: Statistics tab

Port Statistics Field Definitions

- Tx Frames - FC frames transmitted by this adapter port.
- Tx Words - FC words transmitted by this adapter port.
- Tx KB Count - FC kilobytes transmitted by this adapter port.
- Tx Sequences - FC sequences transmitted by this adapter port.
- LIP count - The number of loop initialization primitive (LIP) events that have occurred for the port. This field is not supported if the topology is not arbitrated loop. Loop initialization consists of the following:
  - Temporarily suspending loop operations.
  - Determining whether loop capable ports are connected to the loop.
  - Assigning AL_PA IDs.
  - Providing notification of configuration changes and loop failures.
  - Placing loop ports in the monitoring state.
- Error Frames - The number of frames received with cyclic redundancy check (CRC) errors.
- Link Failures - The number of times the link has failed. A link failure is a possible cause of a timeout.
- Loss of Signal - The number of times the signal was lost.
- Invalid Tx Words - The total number of invalid words transmitted by this adapter port.

- Ex Count Orig - The number of FC exchanges originating on this port. (Not supported on VMware ESX servers being managed through the CIM interface.)
- Active XRIs - The number of active exchange resource indicators. (Not supported on VMware based ESX platforms using the CIM interface.)
- Received P_BSY - The number of FC port-busy link response frames received.
- Link Transitions - The number of times the SLI port sent a link attention condition.
- Elastic Buf Overruns - The number of times the link interface has had its elastic buffer overrun.
- Rx Frames - The number of FC frames received by this adapter port.
- Rx Words - The number of FC words received by this adapter port.
- Rx KB Count - The received kilobyte count by this adapter port.
- Rx Sequences - The number of FC sequences received by this adapter port. (Not supported on VMware ESX servers being managed through the CIM interface.)
- NOS count - The number of NOS events that have occurred on the switched fabric. (Not currently supported for Emulex Windows drivers or arbitrated loop.)
- Dumped Frames - The number of frames that were lost due to a lack of host buffers available. (Not currently supported for the SCSIport Miniport driver, the Storport Miniport driver or the driver for Solaris.)
- Loss of Sync - The number of times loss of synchronization has occurred.
- Prim Seq Prot Errs - The primitive sequence protocol error count. This counter is incremented whenever there is any type of protocol error.
- Invalid CRCs - The number of frames received that contain CRC failures.
- Ex Count Resp - The number of FC exchange responses made by this port. (Not supported on VMware ESX servers being managed through the CIM interface.)
- Active RPIs - The number of remote port indicators. (Not supported on VMware ESX servers being managed through the CIM interface.)
- Receive F_BSY - The number of FC port-busy link response frames received.
- Primitive Seq Timeouts - The number of times a primitive sequence event timed out. (Not supported on VMware ESX servers being managed through the CIM interface.)
- Arbitration Timeouts - The number of times the arbitration loop has timed out. Large counts could indicate a malfunction somewhere in the loop or heavy usage of the loop. (Not supported on VMware ESX servers being managed through the CIM interface.)

If you selected a COMSTAR port, the following information is also displayed:

Note: COMSTAR ports are supported on OpenSolaris only.

- SCSI Write I/O Count - The number of SCSI write I/O requests received.
- SCSI Write KB Count - The total number of kilobytes written.
- Total SCSI I/O Count - The number of SCSI I/O requests received.
- No Receive Buffer Count - The number of SCSI I/O requests that were dropped.
- Queue Depth Overflow Count - The number of SCSI I/O requests received after a QFULL condition.
- Dropped SCSI I/O Count - The number of dropped SCSI I/O operations.
- Aborted SCSI I/O Count - The number of aborted SCSI I/O operations.
- Outstanding SCSI I/O Count - The number of SCSI I/O requests currently pending.
- SCSI Read I/O Count - The number of SCSI Read I/O requests received.

- SCSI Read KB Count - The total number of kilobytes read.
- SCSI Status Errors - The number of SCSI status errors sent to the initiator.
- SCSI Queue Full Errors - The number of QFULL errors sent to the initiator.
- SCSI Sense Errors - The number of times sense data was sent to the initiator.
- SCSI Residual Over - The number of residual overruns returned to the initiator.
- SCSI Residual Under - The number of residual underruns returned to the initiator.

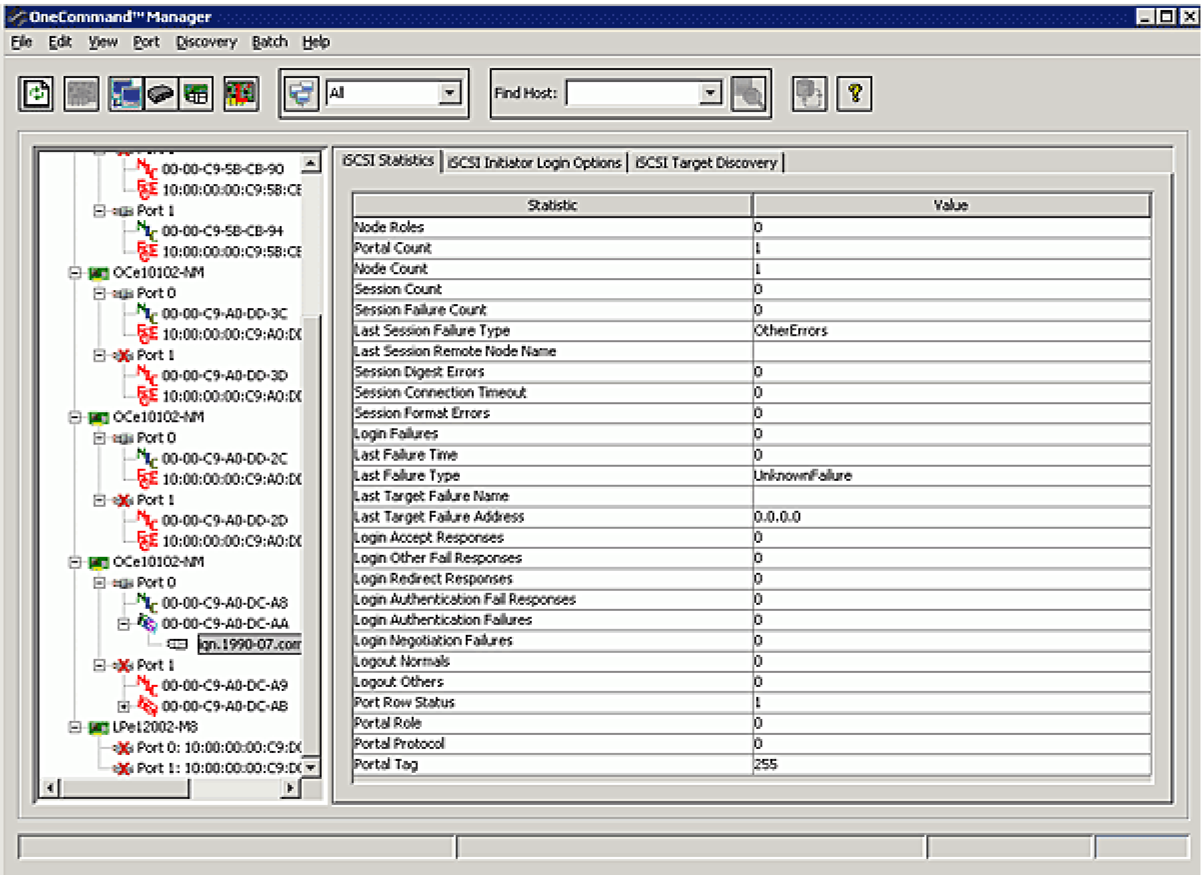
Viewing iSCSI Statistics

When you select an iSCSI initiator from the discovery-tree, the iSCSI Statistics tab contains statistics associated with the selected initiator.

Note: No iSCSI information is displayed when using the CIM provider for VMware ESX.

To view iSCSI port statistics:

1. Select **Host** view.
2. Select an iSCSI initiator node in the discovery-tree.
3. Click the **iSCSI Statistics** tab.



Statistic	Value
Node Roles	0
Portal Count	1
Node Count	1
Session Count	0
Session Failure Count	0
Last Session Failure Type	OtherErrors
Last Session Remote Node Name	
Session Digest Errors	0
Session Connection Timeout	0
Session Format Errors	0
Login Failures	0
Last Failure Time	0
Last Failure Type	UnknownFailure
Last Target Failure Name	
Last Target Failure Address	0.0.0.0
Login Accept Responses	0
Login Other Fail Responses	0
Login Redirect Responses	0
Login Authentication Fail Responses	0
Login Authentication Failures	0
Login Negotiation Failures	0
Logout Normals	0
Logout Others	0
Port Row Status	1
Portal Role	0
Portal Protocol	0
Portal Tag	255

Figure 36: iSCSI Statistics tab

iSCSI Statistics Field Definitions

- Node Roles - The node role for this iSCSI initiator.

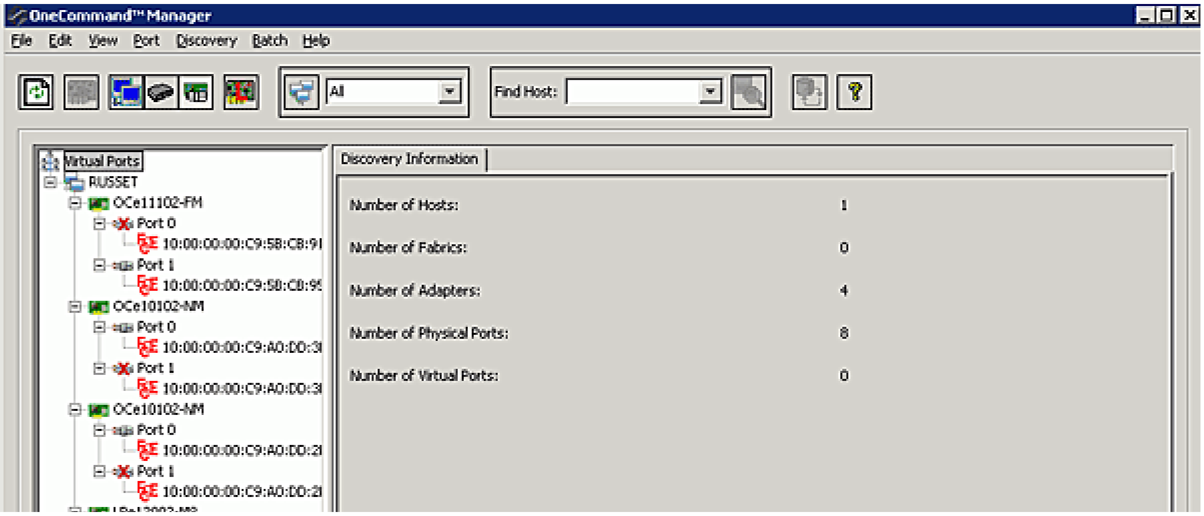
- Portal Count - The number of rows in the iscsiPortaltypeTable which are currently associated with this iSCSI instance.
- Node Count - The number of rows in the iscsiNodetypeTable which are currently associated with this iSCSI instance.
- Session Count -The number of rows in the iscsiSessiontypeTable which are currently associated with this iSCSI instance.
- Session Failure Count - The number of times a session belonging to this port has failed.
- Last Session Failure Type - The type of failure encountered in the last session failure.
- Last Session Remote Node Name - The iSCSI name of the remote node from the failed session.
- Session Digest Errors - The count of sessions which failed due to receipt of a PDU containing header or data digest errors.
- Session Connection Timeout - The count of sessions which failed due to a sequence exceeding a time limit.
- Session Format Errors - The count of sessions which failed due to receipt of an iSCSI PDU that contained a format error.
- Login Failures - The number of times a login from this initiator failed.
- Last Failure Time - The timestamp of the most recent failure of a login attempt from this initiator. A value of 0 indicates that no failures have occurred.
- Last Failure Type - A description of the last failure.
- Last Target Failure Name - The UTF-8 string name of the target that most recently failed a login request from this initiator.
- Last Target Failure Address - The Internet Network Address of the target that most recently failed.
- Login Accept Responses - The count of Login Response PDUs received by this initiator that were accepted.
- Login Other Fail Responses - The count of Login Response PDUs received by this initiator with any status code not counted by the other objects.
- Login Redirect Responses - The count of Login Response PDUs received by the initiator with status class Redirection.
- Login Authentication Fail Responses - The count of Login Response PDUs with status class 0x201 Authentication Failed received by this initiator.
- Login Authentication Failures - The number of times the initiator has aborted a login because the target could not be authenticated.
- Login Negotiation Failures - The number of times the initiator has aborted a login because parameter negotiation with the target failed.
- Logout Normals - The count of Logout Command PDUs generated by this initiator with reason code normal.
- Logout Others - The count of Logout Command PDUs generated by this initiator with any status code other than normal.
- Port Row Status - This field allows entries to be dynamically added and removed from this table via Simple Network Management Protocol (SNMP).
- Portal Role - The role of a portal. A portal can operate in either one of two roles as a target portal and/or an initiator portal.
- Portal Protocol - The portal's transport protocol.
- Portal Tag - The portal’s aggregation tag when the portal is used as an initiator.

Viewing FC Virtual Port Information (FC and FCoE Adapters Only)

Use the Virtual Ports tab to view information about FC virtual ports and their associated targets and LUNs.

To view virtual port information:

1. Do one of the following:
   - From the **View** menu, select **Group Adapters by Virtual Port**.
   - From the toolbar, click **Group Adapters by Virtual Port**.



Number of Hosts: 1

Number of Fabrics: 0

Number of Adapters: 4

Number of Physical Ports: 8

Number of Virtual Ports: 0

Figure 37: Virtual Ports Information

Virtual Port Information Field Definitions

- Number of Hosts - The total number of hosts discovered in the SAN.
- Number of Fabrics - The total number of fabrics discovered in the SAN.
- Number of Adapters - The total number of adapters discovered in the SAN.
- Number of Physical Ports - The total number of physical ports discovered in the SAN.
- Number of Virtual Ports - The total number of virtual ports discovered in the SAN.

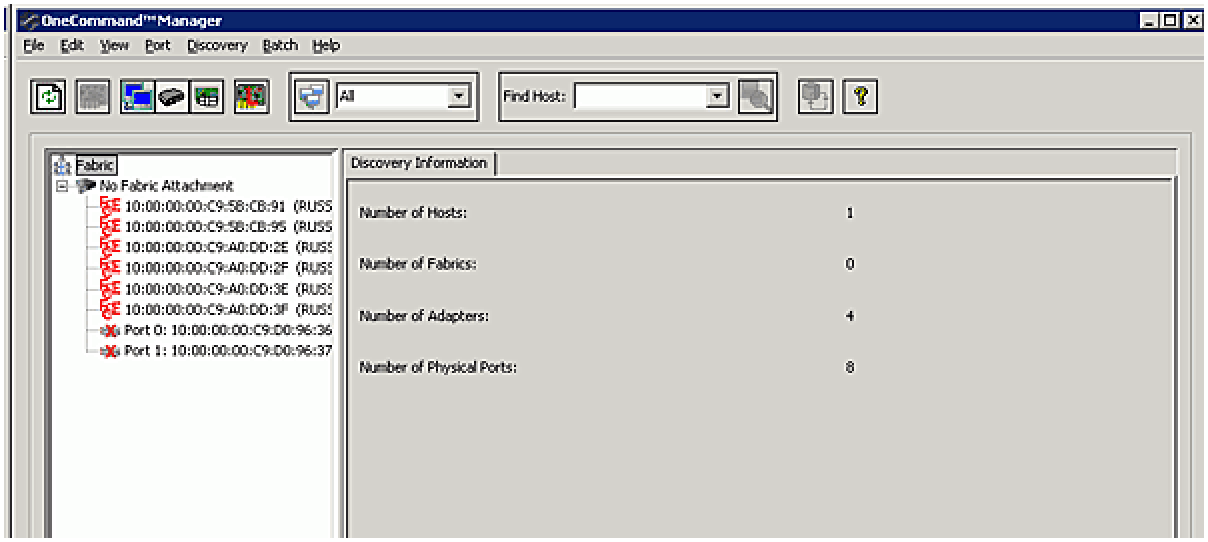
Viewing FC Fabric Information (FC and FCoE Adapters Only)

The Discovery Information tab contains information about the selected fabric.

To view fabric discovery information:

1. Do one of the following:
   - From the **View** menu, select **Group Adapters by Fabric Address**.
   - From the toolbar, click **Group Adapters by Fabric Address**.

The Discovery Information tab shows information about the fabric.


OneCommand™ Manager
File Edit View Port Discovery Batch Help
All
Find Host:
Fabric
No Fabric Attachment
10:00:00:00:C9:58:CB:91 (RUSS
10:00:00:00:C9:58:CB:95 (RUSS
10:00:00:00:C9:A0:DD:2E (RUSS
10:00:00:00:C9:A0:DD:2F (RUSS
10:00:00:00:C9:A0:DD:3E (RUSS
10:00:00:00:C9:A0:DD:3F (RUSS
Port 0: 10:00:00:00:C9:D0:96:36
Port 1: 10:00:00:00:C9:D0:96:37
Discovery Information

Number of Hosts: 1

Number of Fabrics: 0

Number of Adapters: 4

Number of Physical Ports: 8

Figure 38: Fabric Discovery Information

Discovery Information Field Definitions

- Number of Hosts - The number of hosts discovered or seen by this host on the selected fabric.
- Number of Fabrics - The number fabrics identified during discovery.
- Number of Adapters - The number of adapters discovered by this host on the selected fabric.
- Number of Physical Ports - The number of discovered physical ports on this host that can be managed by this host.

Viewing Transceiver Information

The Transceiver Data tab enables you to view transceiver information such as vendor name, serial number, part number and so on. If the adapter/transceiver does not support some or all of the transceiver data, the fields display N/A.

Where the Transceiver tab is found depends upon the type of adapter you select, FC or OneConnect.

Note: Not supported on systems using CIM provider v1.2.1 on ESX 3i.

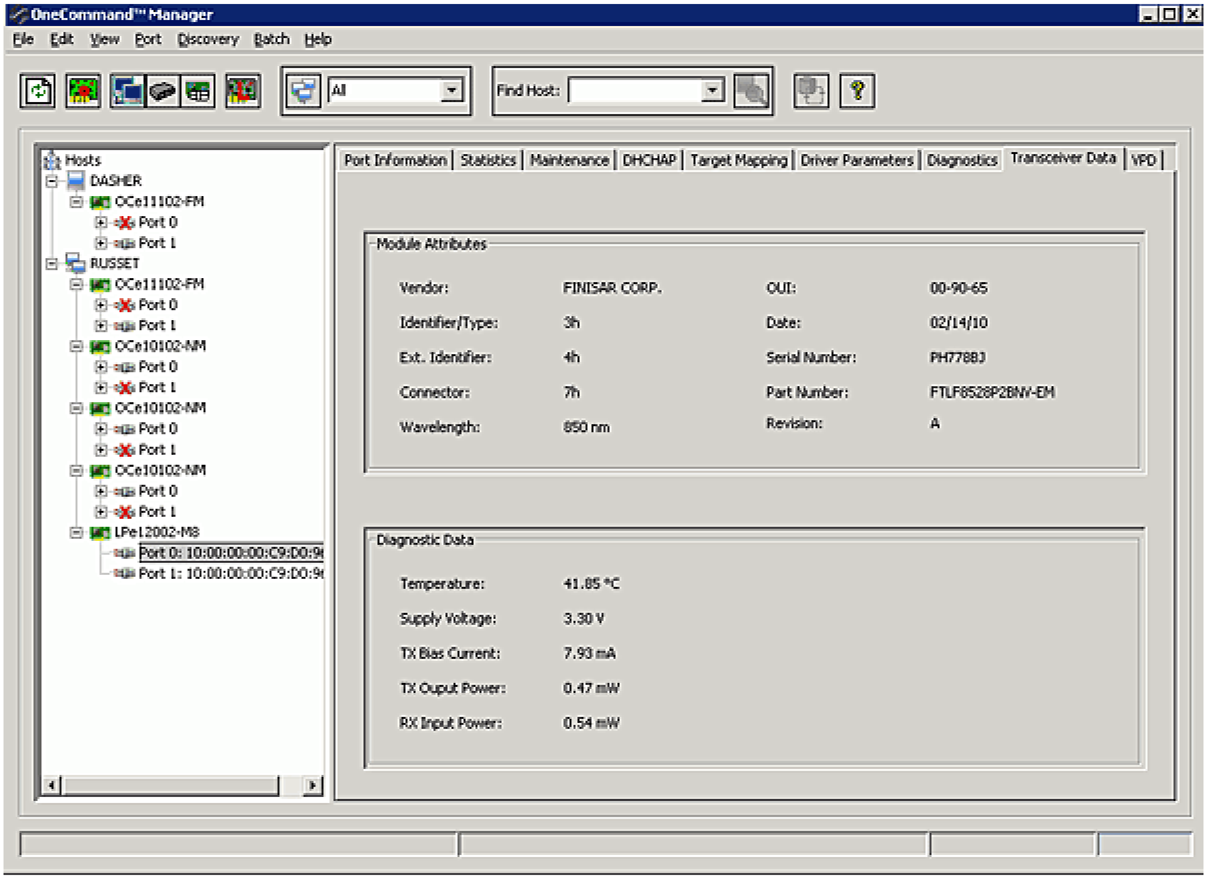
Viewing FC Transceiver Information

When you select an FC port from the discovery-tree, the Transceiver Data tab contains information associated with the selected port.

To view FC transceiver information:

1. Select **Host** or **Fabric** view.
2. In the discovery-tree, select the FC port whose transceiver information you want to view.

3. Select the **Transceiver Data** tab.



Module Attributes

Vendor: FINISAR CORP.
Identifier/Type: 3h
Ext. Identifier: 4h
Connector: 7h
Wavelength: 850 nm
OUI: 00-90-65
Date: 02/14/10
Serial Number: PH7788J
Part Number: FTLF8528P2BNV-EM
Revision: A

Diagnostic Data

Temperature: 41.85 °C
Supply Voltage: 3.30 V
TX Bias Current: 7.93 mA
TX Ouput Power: 0.47 mW
RX Input Power: 0.54 mW

Figure 39: FC Transceiver Data tab

Transceiver Data Field Definitions

Module Attributes Area

- Vendor - The name of the vendor.
- Identifier/Type - The identifier value that specifies the physical device described by the serial information.
- Ext. Identifier - Additional information about the transceiver.
- Connector - The external optical or electrical cable connector provided as the media interface.
- Wavelength - The nominal transmitter output wavelength at room temperature.
- OUI - The vendor’s Organizationally Unique Identifier. It is also known as the IEEE Company Identifier for the vendor.
- Date - The vendor’s date code in the MM/DD/YY format.
- Serial Number - The serial number provided by the vendor.
- Part Number - The part number provided by the SFP vendor.
- Revision - The vendor revision level.

Diagnostic Data Area

- Temperature - The internally measured module temperature.
- Supply Voltage - The internally measured supply voltage in the transceiver.

- TX Bias Current - The internally measured TX bias current.
- TX Output Power - The measured TX output power
- RX Input Power - The measured RX input power.

Viewing OneConnect Adapter Transceiver Information

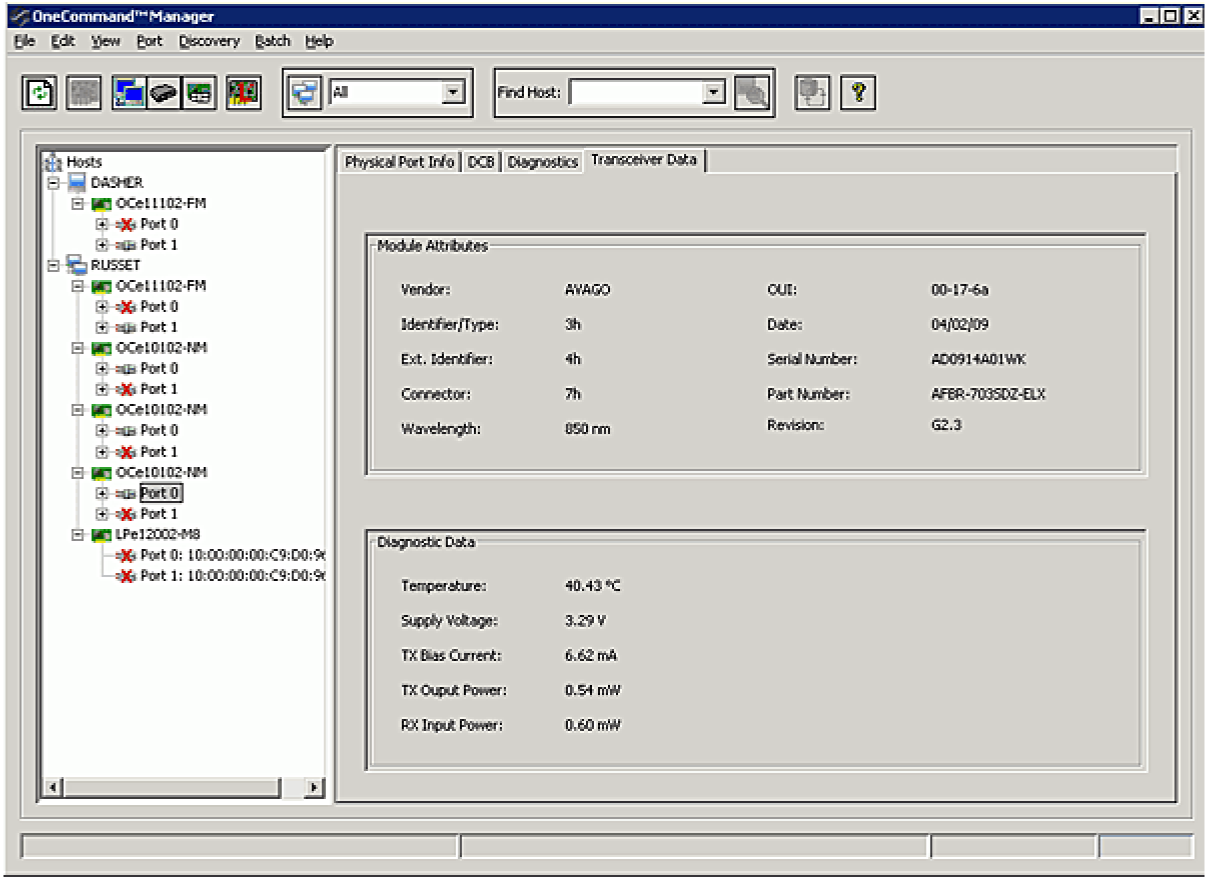
When you select an OneConnect adapter port from the discovery-tree, the Transceiver Data tab contains information associated with the selected port.

To view OneConnect transceiver information:

1. Select **Host** or **Fabric** view.

   Note: iSCSI and NIC-Only adapters do not appear in Fabric view.

2. In the discovery-tree, select the OneConnect adapter port whose transceiver information you want to view.
3. Select the **Transceiver Data** tab.



Module Attributes

Vendor:	AVAGO	OUI:	00-17-6a
Identifier/Type:	3h	Date:	04/02/09
Ext. Identifier:	4h	Serial Number:	AD0914A01WK
Connector:	7h	Part Number:	AFBR-703SDZ-ELX
Wavelength:	850 nm	Revision:	G2.3

Diagnostic Data

Temperature:	40.43 °C
Supply Voltage:	3.29 V
TX Bias Current:	6.62 mA
TX Ouput Power:	0.54 mW
RX Input Power:	0.60 mW

Figure 40: OneConnect Transceiver Data tab

Transceiver Data Field Definitions

Module Attributes Area

- Vendor - The name of the vendor.
- Identifier/Type - The identifier value that specifies the physical device described by the serial information.
- Ext. Identifier - Additional information about the transceiver.

- Connector - The external optical or electrical cable connector provided as the media interface.
- Wavelength - The nominal transmitter output wavelength at room temperature.
- OUI - The vendor’s Organizationally Unique Identifier. It is also known as the IEEE Company Identifier for the vendor.
- Date - The vendor’s date code in the MM/DD/YY format.
- Serial Number - The serial number provided by the vendor.
- Part Number - The part number provided by the SFP vendor.
- Revision - The vendor revision level.

Diagnostic Data Area

- Temperature - The internally measured module temperature.
- Supply Voltage - The internally measured supply voltage in the transceiver.
- TX Bias Current - The internally measured TX bias current.
- TX Output Power - The measured TX output power.
- RX Input Power - The measured RX input power.

Viewing PHY Data (OneConnect OCe11100 series Adapters Only)

The PHY Data Tab displays port level operational parameters, error rates, and counters that are protocol and personality independent for OneConnect OCe11100 series adapter ports.

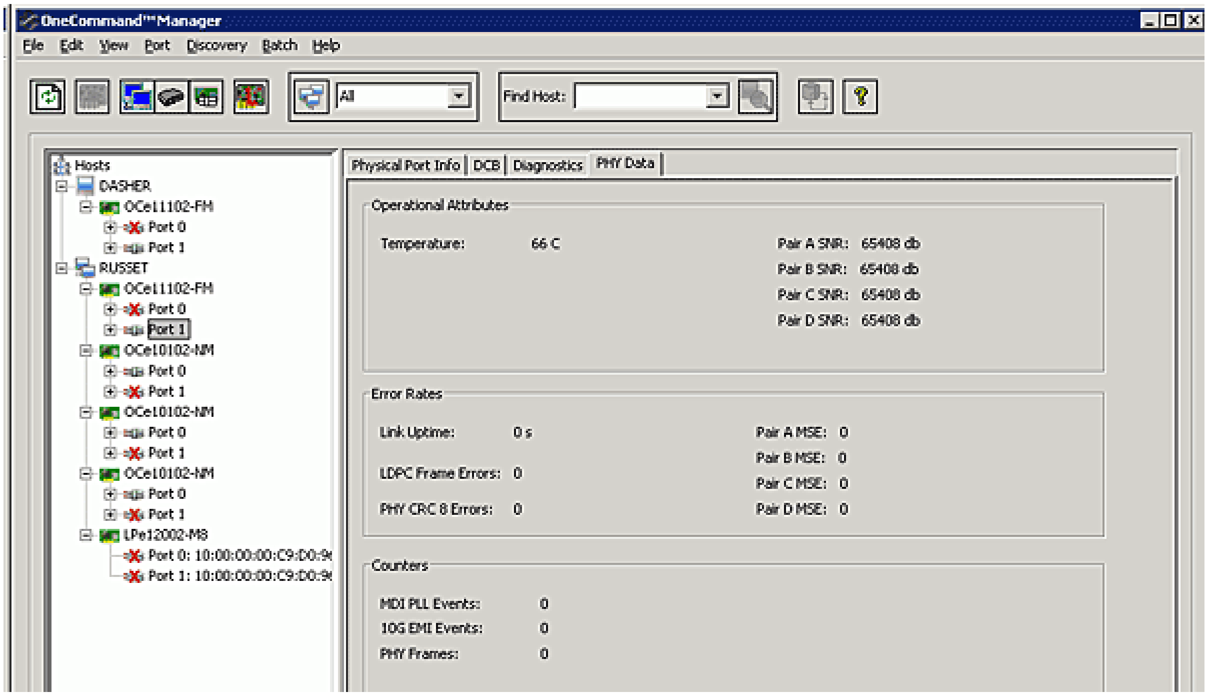
To view OneConnect OCe11100 series adapter port PHY information:

1. Select **Host** or **Fabric** view.

   Note: iSCSI and NIC-Only adapters do not appear in Fabric view.

2. In the discovery-tree, select the OneConnect OCe11100 series adapter port whose PHY information you want to view.

3. Select the **PHY Data** tab.



Operational Attributes

Temperature: 66 C

Pair A SNR: 65408 db
Pair B SNR: 65408 db
Pair C SNR: 65408 db
Pair D SNR: 65408 db

Error Rates

Link Uptime: 0 s
LDPC Frame Errors: 0
PHY CRC 8 Errors: 0

Pair A MSE: 0
Pair B MSE: 0
Pair C MSE: 0
Pair D MSE: 0

Counters

MDI PLL Events: 0
10G EMI Events: 0
PHY Frames: 0

Figure 41: PHY Data tab

PHY Data Field Definitions

Operational Attributes Area

- Pair A/B/C/D Signal-to-Noise (SNR) Margin - Displays the CNA's MDI interface average SNR margin for twisted pairs A, B, C & D.

Error Rates Area

- Low Density Parity Check (LDPC) Frame Errors - The LDPC counter tracks the number of LDPC frames received by CNA's MDI interface that can not be corrected. This counter self-clears at MDI link down.
- Pair A/B/C/D Mean Squared Error (MSE) - Displays the CNA's MDI interface average Mean Square Error relative to the transmitted codewords for twisted pairs A, B, C & D.

Counters Area

- MDI PLL Events - The MDI PLL Event counter tracks events that affect CNA's normal operation. This counter self-clears at MDI link down.
- 10G EMI Events - The 10G EMI Event counter tracks the number of single-tone interference detected by CNA's MDI signals. This counter holds its value at MDI link down and self-clears at the next link up.
- PHY Frames - Counts the number of PHY frames transmitted and received since the MDI link has been established. This counter holds its value at MDI link down and self-clears at the next link up.

Viewing Vital Product Data (VPD)

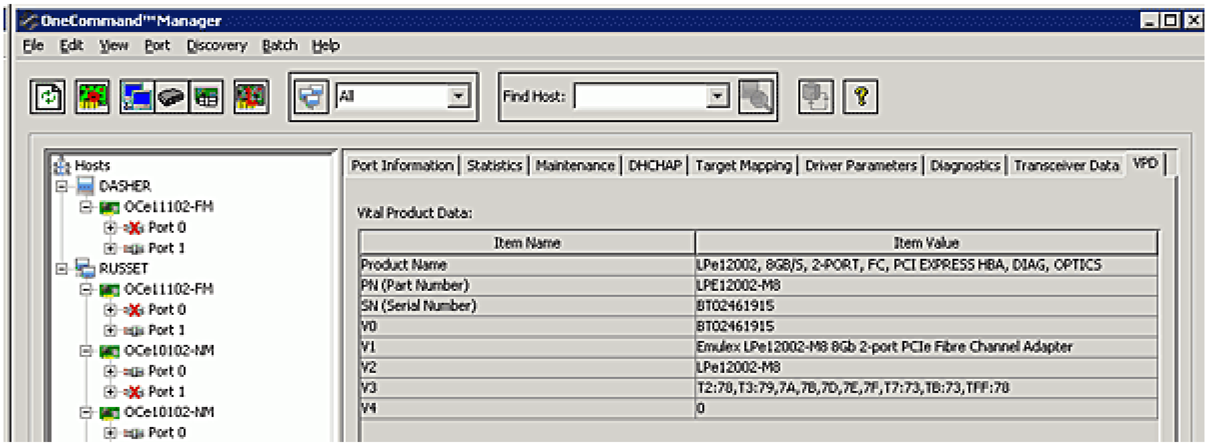
Viewing VPD (FC adapters)

The VPD tab displays vital product data (if available) for the selected FC adapter port such as the product name, part number, serial number and so on.

Note: Not supported on systems using CIM provider v1.2.1 on ESX 3i.

To view VPD information:

1. Select **Host** or **Fabric** view.
2. In the discovery tree, select the FC port whose VPD information you want to view.
3. Select the **VPD** tab.



Vital Product Data:

Item Name	Item Value
Product Name	LPe12002, 8GB/S, 2-PORT, FC, PCI EXPRESS HBA, DIAG, OPTICS
PN (Part Number)	LPE12002-M8
SN (Serial Number)	BT02461915
V0	BT02461915
V1	Emulex LPe12002-M8 8Gb 2-port PCIe Fibre Channel Adapter
V2	LPe12002-M8
V3	T2:78,T3:79,7A,7B,7D,7E,7F,T7:73,T8:73,TFF:78
V4	0

Figure 42: FC VPD tab

VPD Table Definitions

- Product Name - Product information about the selected adapter port.
- PN (Part Number) - The adapter's part number.
- SN (Serial Number) - The adapter's serial number.
- VO - Vendor unique data. “V” indicates a vendor-specific field. An adapter may have none, one or more of these fields defined. Valid values for this field are “VO” (the letter “O”, not the number zero) and “Vx” (where “x” is a number).

Note: Some adapters may show additional VPD information such as EC (EC level) and MN (manufacturer ID).

Viewing VPD (OneConnect adapters)

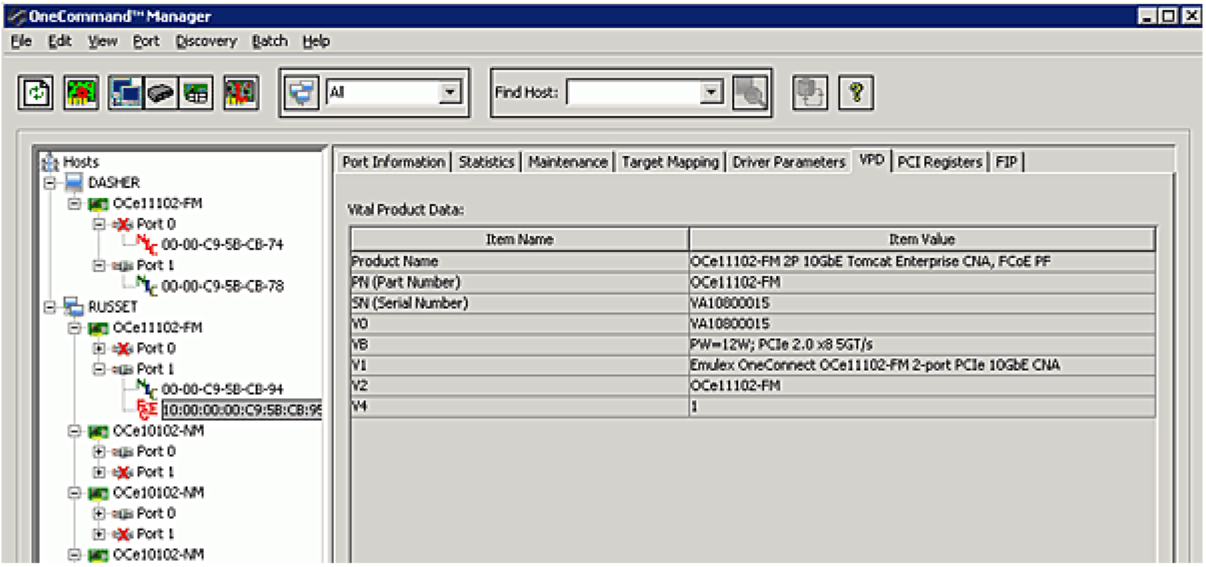
The VPD tab displays vital product data (if available) for the selected OneConnect adapter port such as the product name, part number, serial number and so on.

Note: Not supported on systems using CIM provider v1.2.1 on ESX 3i.

To view VPD information:

1. Select **Host** or **Fabric** view.
2. In the discovery tree, select the OneConnect NIC, iSCSI or FCoE port whose VPD information you want to view.

3. Select the **VPD** tab.



Vital Product Data:

Item Name	Item Value
Product Name	OCe11102-FM 2P 10GbE Tomcat Enterprise CNA, FCoE PF
PN (Part Number)	OCe11102-FM
SN (Serial Number)	VA10800015
V0	VA10800015
VB	PW=12W; PCIe 2.0 x8 5GT/s
V1	Emulex OneConnect OCe11102-FM 2-port PCIe 10GbE CNA
V2	OCe11102-FM
V4	1

Figure 43: OneConnect VPD tab

VPD Table Definitions

- Product Name - Product information about the selected adapter port.
- PN (Part Number) - The adapter's part number.
- SN (Serial Number) - The adapter's serial number.
- VO - Vendor unique data. “V” indicates a vendor-specific field. An adapter may have none, one or more of these fields defined. Valid values for this field are “VO” (the letter “O”, not the number zero) and “Vx” (where “x” is a number).

Note: Some adapters may show additional VPD information such as EC (EC level) and MN (manufacturer ID).

Viewing Maintenance/Firmware Information

Use the Maintenance or Firmware tabs to view firmware information and update firmware for LightPulse adapters. For FC/FCoE adapters, you can also configure boot from SAN and change WWPN and WWNN information for the selected adapter port. (Not available in read-only mode.)

The maintenance/firmware information that is displayed depends upon the type of adapter you select, FC/FCoE.

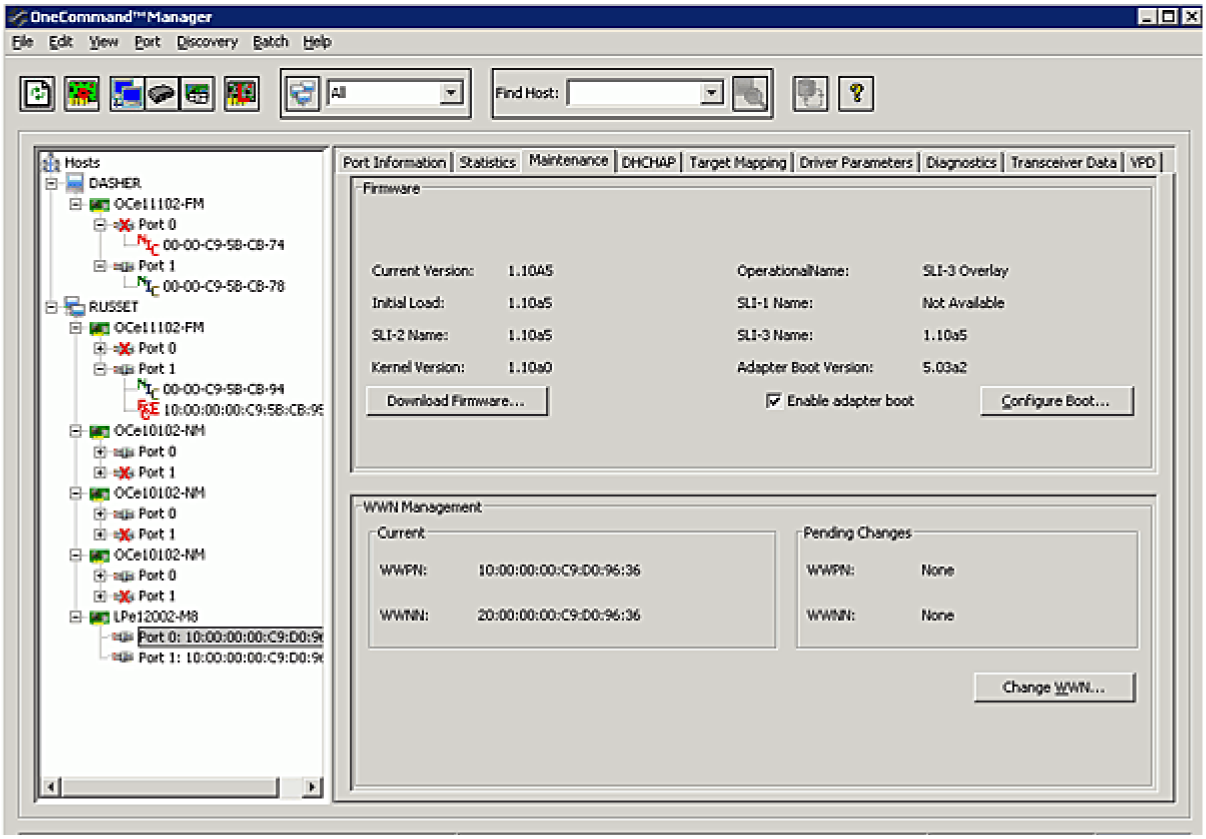
Note: Not all information is displayed on systems using CIM provider v1.2.1 on ESX 3i. and CIM provider v2.0 on ESX 4i.

Viewing FC Maintenance Information

To view FC firmware information:

1. Select **Host** or **Fabric** view.
2. Select an FC adapter port in the discovery-tree.

3. Select the **Maintenance** tab.



Current Version: 1.10A5
Initial Load: 1.10a5
SLI-2 Name: 1.10a5
Kernel Version: 1.10a0
OperationalName: SLI-3 Overlay
SLI-1 Name: Not Available
SLI-3 Name: 1.10a5
Adapter Boot Version: 5.03a2
☑ Enable adapter boot

Current
WWPN: 10:00:00:00:C9:D0:96:36
WWNN: 20:00:00:00:C9:D0:96:36

Pending Changes
WWPN: None
WWNN: None

Figure 44: FC Maintenance tab

Maintenance Tab Field Definitions

Firmware Area

- Current Version - The Emulex firmware version number for this model of adapter.
- Initial Load - The firmware version stub responsible for installing SLI code into its proper slot. (Not available on VMware ESX servers being managed through the CIM interface.)
- SLI-2 Name - The name of the SLI-2 firmware overlay. (Not available on VMware ESX servers being managed through the CIM interface.)
- Kernel Version - The version of the firmware responsible for starting the driver. (Not available on VMware ESX servers being managed through the CIM interface.)
- Operational Name - The name of the operational firmware for the selected adapter. (Not available on VMware ESX servers being managed through the CIM interface.)
- SLI-1 Name - The name of the SLI-1 firmware overlay. (Not available on VMware ESX servers being managed through the CIM interface.)
- SLI-3 Name - The name of the SLI-3 firmware overlay. (Not available on VMware ESX servers being managed through the CIM interface.)
- Adapter Boot Version - Displays one of the following:
    - The selected adapter port's boot code version if boot code is present.
    - “Disabled” if the boot code is disabled.

  - “Not Present” if boot code is not loaded. If boot code is not loaded, the Enable Adapter boot checkbox is not visible and you cannot configure the selected port to boot from SAN.

- Enable adapter boot checkbox - Check this box if you want the adapter to load and execute boot code during system startup. Click **Configure Boot** to configure boot from SAN. See “Configuring Boot from SAN” on page 161 for more information. (Not available in read-only mode.)

Note: Enabling adapter boot only causes the adapter to load the boot code and execute it during system startup. It does not mean that the adapter will boot from SAN. To boot from SAN, the boot type must be enabled. Do this in the Boot from SAN configuration window for each boot type. In addition, the BIOS must be configured to boot from SAN.

WWN Management Area

Note: Not supported on COMSTAR and VMware ESX servers being managed through the CIM interface. COMSTAR ports are supported on OpenSolaris only.

Current

- WWPN - The World Wide Port Name for the selected adapter port.
- WWNN - The World Wide Node Name for the selected adapter port.

Pending Changes

- WWPN - Works in conjunction with the Change WWN button. Displays the World Wide Port Name you assigned for the selected adapter port, but the system must be rebooted for these changes to take effect and appear under the “Current” listing. See “Configuring Boot from SAN” on page 161 for more information.
- WWNN - Works in conjunction with the Change WWN button. Displays the World Wide Node Name you assigned for the selected adapter port, but the system must be rebooted for these changes to take effect and appear under the “Current” listing. See “Configuring Boot from SAN” on page 161 for more information.

Maintenance Tab Buttons (Not available in read-only mode.)

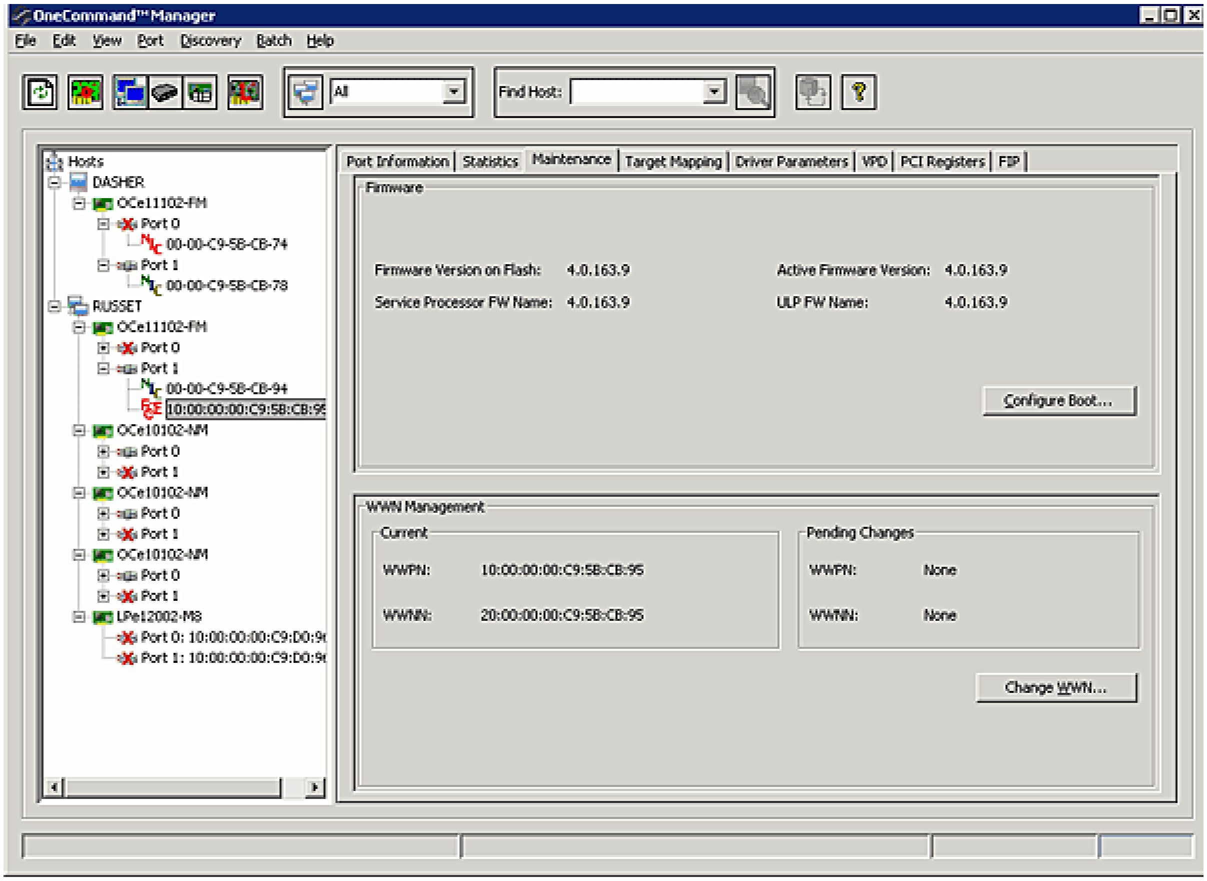
- Update Firmware - Click to update firmware on the selected port. See “Updating Adapter Firmware” on page 146 for more information.
- Configure Boot - Check **Enable adapter boot** and click **Configure Boot** to configure boot from SAN. See “Configuring Boot from SAN” on page 161 for more information. (Not available on VMware ESX servers being managed through the CIM interface.)
- Change WWN - Click to change the selected adapter port's World Wide Node Name or World Wide Port Name. See “Changing World Wide Name Configuration (FC/FCoE Ports Only)” on page 134 for more information. (Not available on VMware ESX servers being managed through the CIM interface.)

Viewing FCoE Maintenance Information

To view FCoE firmware information:

1. Select **Host** or **Fabric** view.
2. Select an FCoE adapter port in the discovery-tree.

3. Select the **Maintenance** tab.



Firmware Version on Flash: 4.0.163.9

Active Firmware Version: 4.0.163.9

Service Processor FW Name: 4.0.163.9

ULP FW Name: 4.0.163.9

Current

WWPN: 10:00:00:00:C9:5B:CB:95

WWNN: 20:00:00:00:C9:5B:CB:95

Pending Changes

WWPN: None

WWNN: None

Figure 45: FCoE Maintenance tab

Maintenance Tab Field Definitions

Firmware Area

- Firmware Version on Flash - Specifies the firmware version stored on the adapter's non-volatile storage. When the system restarts, this version becomes the active firmware version.
- Service Processor FW Version - Specifies the firmware version that is currently operational on the adapter.
- Active Firmware Version - The version of firmware running on the selected adapter.
- ULP FW Name - The firmware version running on the (Upper Layer Protocol) processors within the ASIC.

WWN Management Area

Note: Not supported on COMSTAR and VMware ESX servers being managed through the CIM interface. COMSTAR ports are supported on OpenSolaris only.

Current

- WWPN - The World Wide Port Name for the selected adapter port.
- WWNN - The World Wide Node Name for the selected adapter port.

Pending Changes

- WWPN - Works in conjunction with the Change WWN button. Displays the World Wide Port Name you assigned for the selected adapter port, but the system must be rebooted for these changes to take effect and appear under the “Current” listing. See “Configuring Boot from SAN” on page 161 for more information.
- WWNN - Works in conjunction with the Change WWN button. Displays the World Wide Node Name you assigned for the selected adapter port, but the system must be rebooted for these changes to take effect and appear under the “Current” listing. See “Configuring Boot from SAN” on page 161 for more information.

Maintenance Tab Buttons (Not available in read-only mode.)

- Configure Boot - Click **Configure Boot** to configure boot from SAN. See “Configuring Boot from SAN” on page 161 for more information. (Not available on VMware ESX servers being managed through the CIM interface.)
- Change WWN - Click to change the selected adapter port's World Wide Node Name or World Wide Port Name. See “Changing World Wide Name Configuration (FC/FCoE Ports Only)” on page 134 for more information. (Not available on VMware ESX servers being managed through the CIM interface.)

Viewing OneConnect Adapter Firmware Information

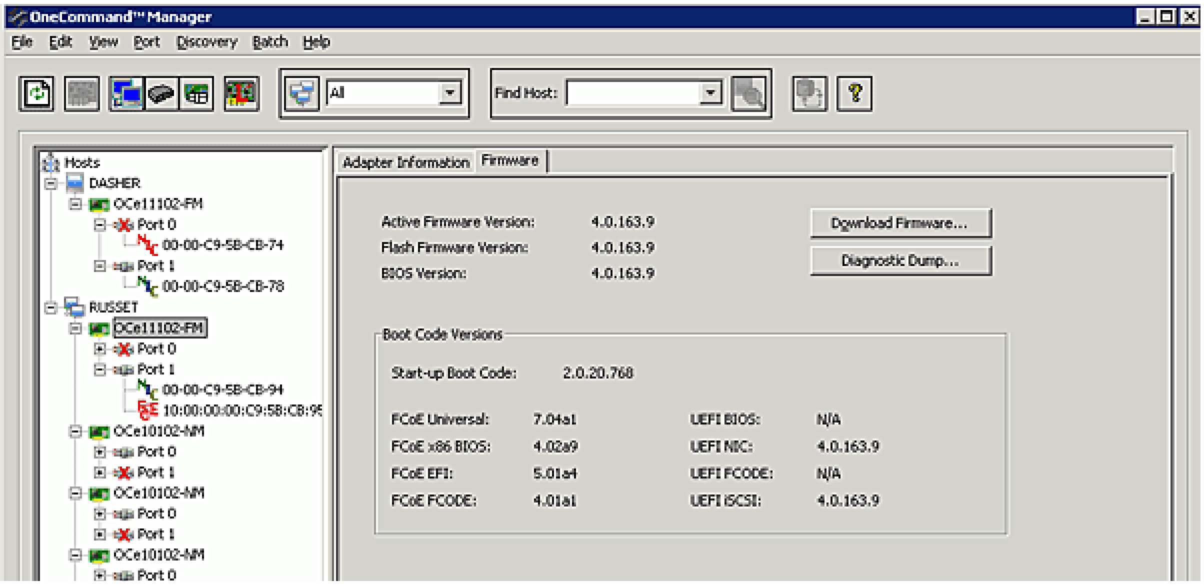
Unlike LightPulse adapters, OneConnect adapter firmware is maintained on an adapter-specific instead of port-specific basis. Use this tab to download firmware and create diagnostic dumps for the selected adapter.

To view OneConnect firmware information:

1. Select **Host** view.

   Note: iSCSI and NIC-Only adapters do not appear in Fabric view.

2. Select a OneConnect adapter in the discovery-tree.
3. Select the **Firmware** tab.



Active Firmware Version: 4.0.163.9
Flash Firmware Version: 4.0.163.9
BIOS Version: 4.0.163.9

Start-up Boot Code: 2.0.20.768

FCoE Universal:	7.04a1	UEFI BIOS:	N/A
FCoE x86 BIOS:	4.02a9	UEFI NIC:	4.0.163.9
FCoE EFI:	5.01a4	UEFI FCODE:	N/A
FCoE FCODE:	4.01a1	UEFI iSCSI:	4.0.163.9

Figure 46: OneConnect Firmware Tab

Firmware Tab Field Definitions

- Active Firmware Version - The firmware version currently being used by the adapter.
- Flash Firmware Version - The flash firmware version currently being used by the adapter.
- BIOS Version - The version of the BIOS currently being used by the adapter.

Boot Code Versions Area

- Startup-up Boot Code - The boot code version currently being used by the adapter.

  Note: This is the version of the code that boots the adapter. It has no relation to the FC, iSCSI, or PXE boot code versions.

- FCoE Universal - The combined flash image that includes three system specific FCoE Boot images (Open Boot, x86, EFI 2.0).
- FCoE x86 BIOS - The single flash image containing x86 Boot for FCoE only.
- FCoE EFI - The single flash image containing EFI for FCoE only.
- FCoE FCODE - The single flash image containing Open Boot FCode for FCoE only.
- UEFI BIOS - The combined flash image that includes two boot images (UEFI NIC and UEFI Open Boot FCode).
- UEFI NIC - The single flash image containing UEFI for NIC and PXE Boot.
- UEFI FCODE - The single flash image containing Fcode for NIC only.
- UEFI iSCSI - The single flash image containing UEFI for iSCSI only.

Firmware Tab Buttons (Not available in read-only mode.)

- Download Firmware - Click to update firmware on the selected adapter. See “Updating Adapter Firmware” on page 146 for more information.
- Diagnostic Dump - Click to create a diagnostic dump for the selected adapter. See “Creating Diagnostic Dumps” on page 184 for more information.

Viewing Target Information

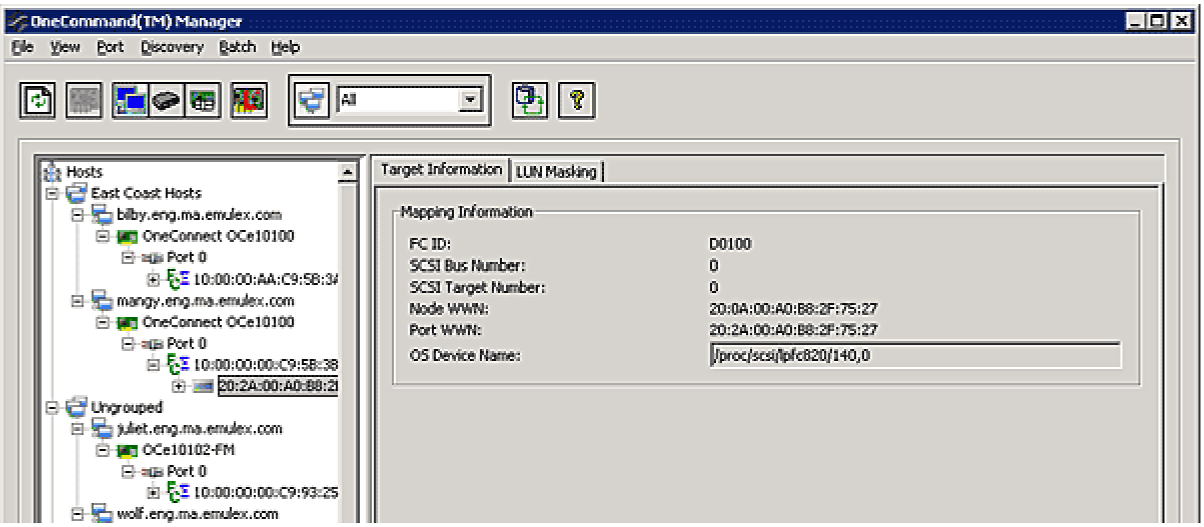
Target Information contains information specific to the selected storage device. The type of information that is displayed depends on the type of adapter you select, FC or iSCSI.

Viewing FC/FCoE Target Information

When you select a target associated with an FC/FCoE adapter from the discovery-tree, the Target Information tab displays information associated with that target.

To view FC/FCoE target information:

1. Select **Host**, **Fabric** or **Virtual Port** view.
2. In the discovery-tree, select the FC/FCoE target whose information you want to view. The Target Information tab appears.



Mapping Information

FC ID: D0100
SCSI Bus Number: 0
SCSI Target Number: 0
Node WWN: 20:0A:00:A0:B8:2F:75:27
Port WWN: 20:2A:00:A0:B8:2F:75:27
OS Device Name: /proc/scsi/lpfc820/140,0

Figure 47: Target Information tab

Target Information Field Definitions

Mapping Information Area

- FC ID - The FC ID for the target; assigned automatically in the firmware.
- SCSI Bus Number - The SCSI bus number to which the target is mapped.
- SCSI Target Number - The target's identifier on the SCSI bus.
- Node WWN - A unique 64-bit number, in hexadecimal, for the target (N_PORT or NL_PORT).
- Port WWN - A unique 64-bit number, in hexadecimal, for the fabric (F_PORT or Switched Fabric Loop Port [FL_PORT]).
- OS Device Name - The operating system device name.

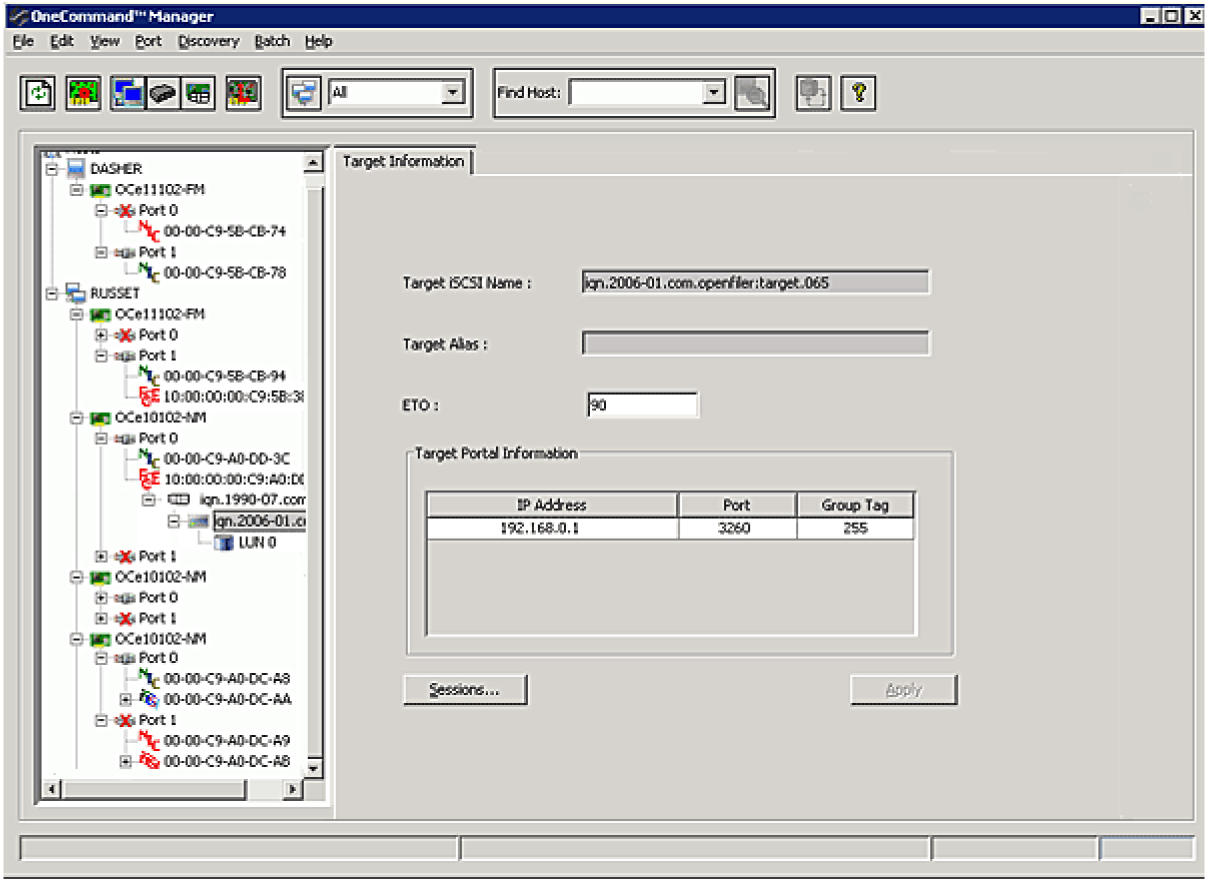
Viewing iSCSI Target Information

When you select a target associated with a iSCSI adapter from the discovery-tree, the Target Information tab displays information associated with that target.

To view iSCSI target information:

1. Select **Host** view.

2. In the discovery-tree, select the iSCSI target whose information you want to view. The Target Information tab appears.



Target iSCSI Name : iqn.2006-01.com.openfiler:target.065

Target Alias :

ETO : 90

Target Portal Information

IP Address	Port	Group Tag
192.168.0.1	3260	255

Figure 48: iSCSI Target Information tab

Target Information Field Definitions

- Target iSCSI Name - The iSCSI name assigned to the target.
- Target Alias - The iSCSI alias assigned to the target. This is assigned at the target portal, not by the OneCommand Manager application.
- ETO - (Extended Timeout Value) The ETO for the target. The driver ensures that I/Os are not “timed out” until this time has expired (from the time the target stopped responding). You can change this value if you want.

Target Portal Information Area

- IP Address - The IP address through which the initiator communicates with the target.
- Port - The TCP port through which the initiator communicates with the target.
- Group Tag - The tag of the group for which sub-groups must be refreshed.

Target Information Buttons

- Sessions... - Click to view the currently active sessions for the target. See “Viewing Target Sessions” on page 42 for more information.
- Apply - Click to save and apply your ETO changes.

Viewing LUN Information

The LUN Information tab contains information about the selected logical unit number (LUN). The type of information that is displayed depends on the type of adapter you select, FC or iSCSI.

Note: LUNs that are associated with a manageable COMSTAR port do not appear in the discovery-tree and cannot be configured using the OneCommand Manager application or hbacmd utilities. To view the LUNs using the OneCommand Manager application, you must view the COMSTAR port as a target. COMSTAR ports are supported on OpenSolaris only.

Note: The Refresh LUNs button only refreshes the LUN list for the currently selected target.

Note: On Linux systems, to make LUNs that are newly added to a storage array appear on the host, the following script must run from the command shell:

```
/usr/sbin/lpfc/lun_scan all
```

This prevents you from having to reboot. If the host machine is rebooted after the LUN is added to the target array, you do not need to run the script.

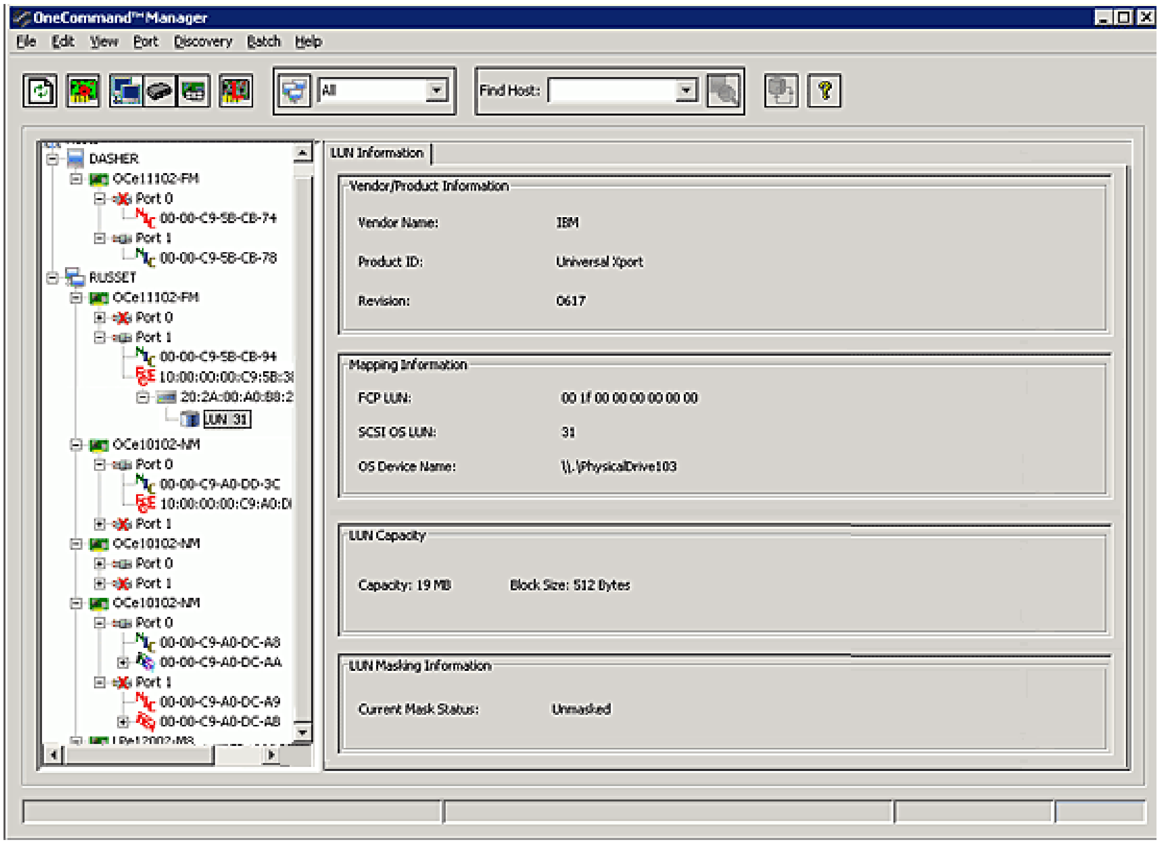
Viewing FC/FCoE LUN Information

When you select a LUN associated with an FC/FCoE adapter from the discovery-tree, the LUN tab displays information associated with that LUN.

To view the LUN information:

1. Select **Host**, **Fabric** or **Virtual Port** view.
2. From the discovery-tree, select an FC/FCoE port.

3. Select the LUN whose information you want to view. The LUN Information tab appears.



Vendor/Product Information

Vendor Name: IBM

Product ID: Universal Xport

Revision: 0617

Mapping Information

FCP LUN: 00 1f 00 00 00 00 00 00

SCSI OS LUN: 31

OS Device Name: \\.\PhysicalDrive103

LUN Capacity

Capacity: 19 MB Block Size: 512 Bytes

LUN Masking Information

Current Mask Status: Unmasked

Figure 49: FC/FCoE LUN Information tab

FC/FCoE LUN Information Field Definitions

Vendor Product Information Area

- Vendor Name - The name of the vendor of the LUN.
- Product ID - The vendor-specific ID for the LUN.
- Revision - The vendor-specific revision number for the LUN.

Mapping Information Area

- FCP LUN - The FC identifier used by the adapter to map to the SCSI OS LUN.
- SCSI OS LUN - The SCSI identifier used by the OS to map to the specific LUN.
- OS Device Name - The name assigned by the OS to the LUN.

LUN CapacityArea

> **Note:** LUN capacity information is only provided when the LUN is a mass-storage (disk) device. Other devices like tapes and scanners, etc. do not display capacity.

- Capacity - The capacity of the LUN, in megabytes.
- Block Size - The length of a logical unit block in bytes.

LUN Masking Area

- Current Mask Status - Possible states are masked or unmasked.

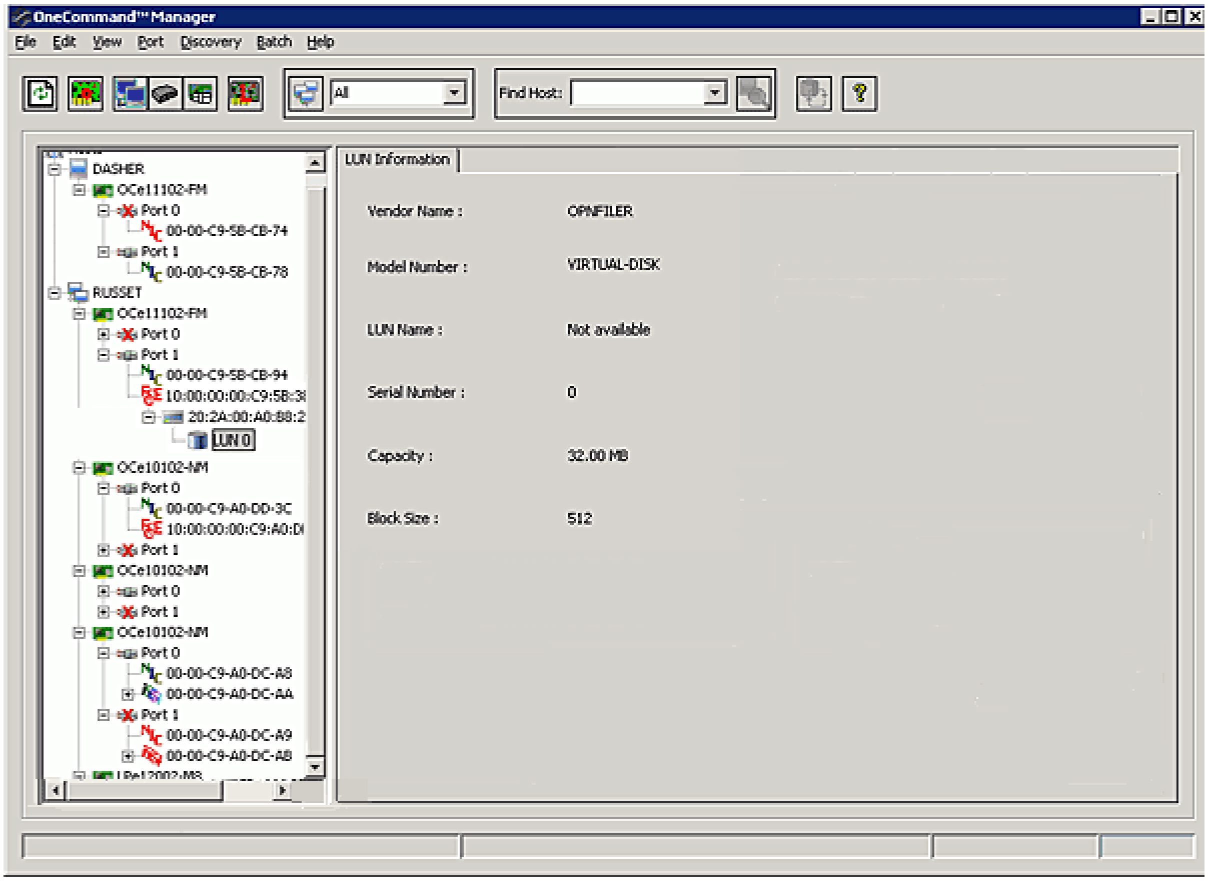
> **Note:** See “Masking and Unmasking LUNs (Windows)” on page 156 for more information on LUN Masking.

Viewing iSCSI LUN Information

When you select a LUN associated with an iSCSI adapter from the discovery-tree, the LUN Information tab displays information associated with that LUN.

To view the LUN information:

1. Select **Host** view.
2. From the discovery-tree, select the iSCSI LUN whose information you want to view. The LUN Information tab appears.



Vendor Name : OPNFILER

Model Number : VIRTUAL-DISK

LUN Name : Not available

Serial Number : 0

Capacity : 32.00 MB

Block Size : 512

Figure 50: iSCSI LUN Information tab

iSCSI LUN Information Field Definitions

- Vendor Name - The name of the vendor of the LUN.
- Model Number - The vendor’s model number for the LUN.
- LUN Name - The name of the LUN. (Available only on ESX platforms.)
- Serial Number - The vendor’s serial number for the LUN.
- Capacity - The capacity of the LUN, in megabytes.
- Block Size - The length of a logical unit block in bytes.

Viewing FC/FCoE Target Mapping (Windows and Solaris)

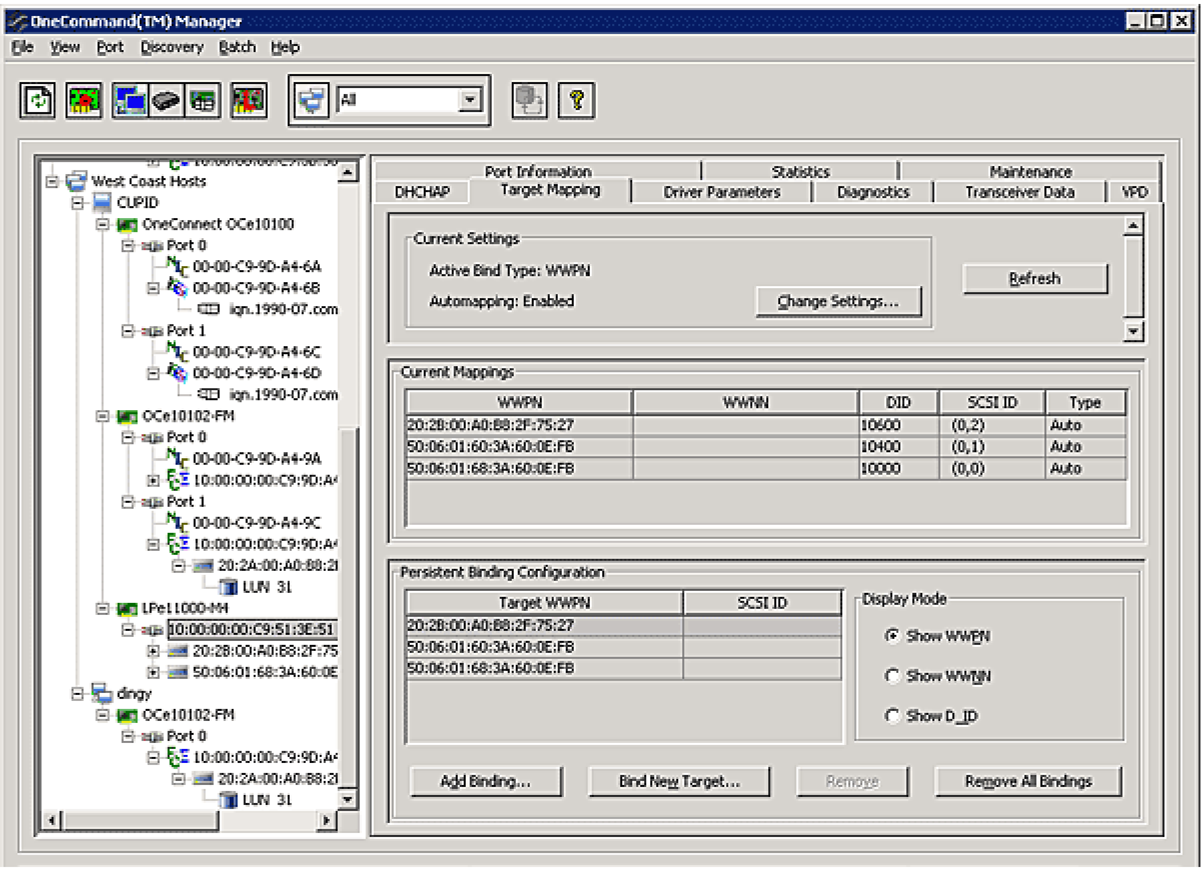
The Target Mapping tab enables you to view current target mapping and to set up persistent binding.

Note: Persistent binding is not supported on Solaris systems.

Note: The Target Mapping tab is not available on COMSTAR ports.

To view target mapping:

1. Select **Host** or **Fabric** view.
2. In the discovery-tree, select the FC/FCoE adapter port whose target mapping information you want to view.
3. Select the **Target Mapping** tab.



Current Settings

Active Bind Type: WWPN

Automapping: Enabled

Current Mappings

WWPN	WWNN	DID	SCSI ID	Type
20:28:00:A0:B8:2F:75:27		10600	(0,2)	Auto
50:06:01:60:3A:60:0E:FB		10400	(0,1)	Auto
50:06:01:68:3A:60:0E:FB		10000	(0,0)	Auto

Persistent Binding Configuration

Target WWPN	SCSI ID
20:28:00:A0:B8:2F:75:27	
50:06:01:60:3A:60:0E:FB	
50:06:01:68:3A:60:0E:FB	

Display Mode

● Show WWPN

○ Show WWNN

○ Show D_ID

Figure 51: Target Mapping tab

Target Mapping Field Definitions

Current Settings Area

- Active Bind Type - WWPN, WWNN, or a destination identifier (D_ID).
- Automapping - The current state of SCSI device automapping: enabled (default) or disabled.

Current Mappings Area

- This table lists current mapping information for the selected adapter port.

Persistent Binding Configuration Area

- This table lists persistent binding information for the selected adapter port. (Not available on VMware ESX servers being managed through the CIM interface.)

Display Mode Radio Buttons

- Show WWPN, Show WWNN or Show D_ID options enable you to choose how to display information in the Persistent Binding Configuration table.

Target Mapping Buttons

- Refresh - Click to refresh the Target Mapping tab.
- Change Settings - Click to enable or disable automapping, choose a bind type and enable or disable LUN mapping and unmasking. (Not available on VMware ESX servers being managed through the CIM interface.)
- Add Binding - Click to add a persistent binding.
- Bind New Target - Click to add a target that does not appear in the Persistent Binding table.
- Remove - Click to remove the selected binding.
- Remove All Bindings - Click to remove all persistent bindings that are displayed.

Viewing Target Mapping (Linux and VMware ESX)

Use this tab to view target mapping. The Target Mapping tab is read-only.

Note: Persistent binding is not supported by the Linux 2.6 kernel, the Emulex 8.2 version of the driver for Linux or by VMware ESX Server.

Note: Not all information is displayed on systems using CIM provider v1.2.1 on ESX 3i and CIM provider v2.0 on ESX 4i.

To view target mapping:

1. Select **Host** or **Fabric** view.
2. Select the adapter port in the discovery-tree whose target mapping information you want to view.
3. Select the **Target Mapping** tab.

Target Mapping Field Definitions

Current Settings Area

- Active Bind Type - N/A
- Automapping - N/A

Current Mappings Area

- This table lists current mapping information for the selected adapter.

Persistent Binding Configuration Area

- N/A

Display Mode Radio Buttons

- N/A

Target Mapping Buttons

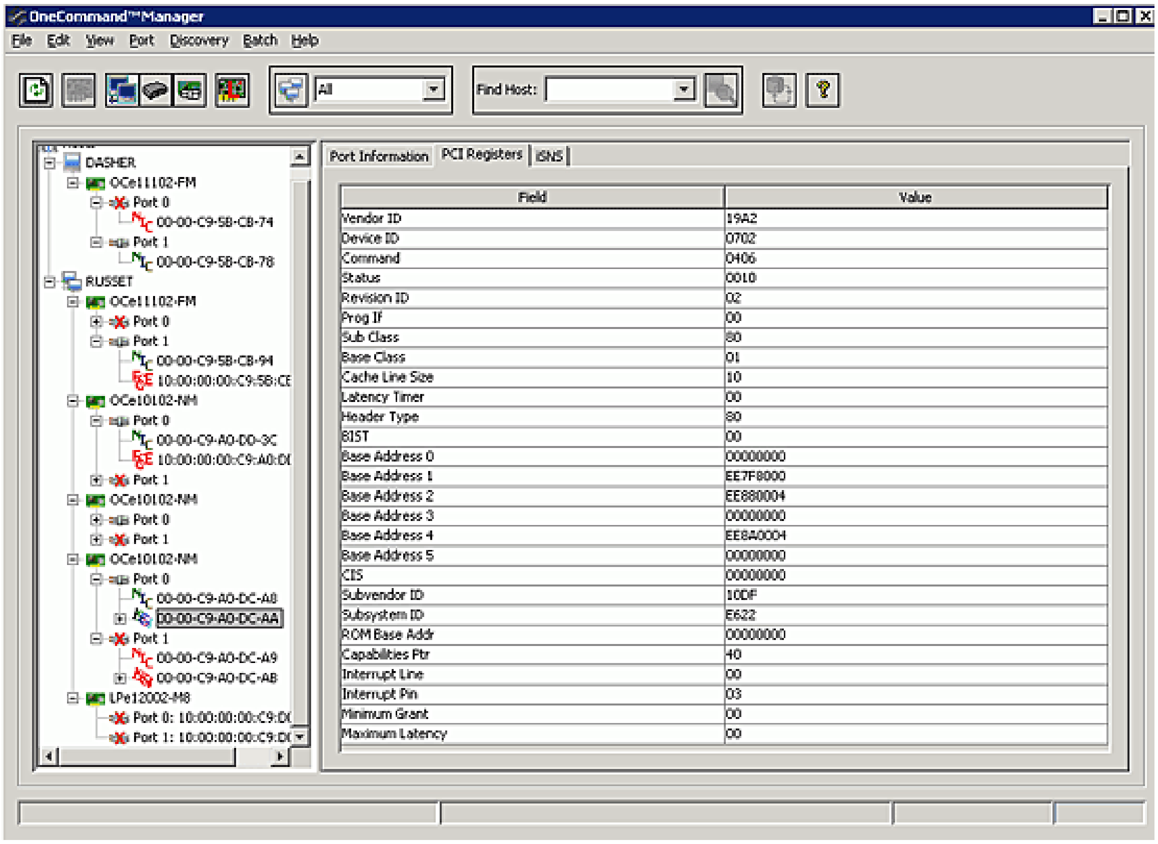
- N/A

Viewing iSCSI and NIC PCI Registers

The PCI Registers tab contains PCI information about the selected NIC or iSCSI function. The type of information that is displayed depends on the type of function you select, FC, iSCSI, or NIC -only. See "Viewing the PCI Registers" on page 172 for FC PCI register information.

Viewing iSCSI PCI Registers

The iSCSI PCI Registers tab displays base PCI registers.



Field	Value
Vendor ID	19A2
Device ID	0702
Command	0406
Status	0010
Revision ID	02
Prog IF	00
Sub Class	80
Base Class	01
Cache Line Size	10
Latency Timer	00
Header Type	80
BIST	00
Base Address 0	00000000
Base Address 1	EE7F8000
Base Address 2	EE880004
Base Address 3	00000000
Base Address 4	EE8A0004
Base Address 5	00000000
CIS	00000000
Subvendor ID	10DF
Subsystem ID	E622
ROM Base Addr	00000000
Capabilities Ptr	40
Interrupt Line	00
Interrupt Pin	03
Minimum Grant	00
Maximum Latency	00

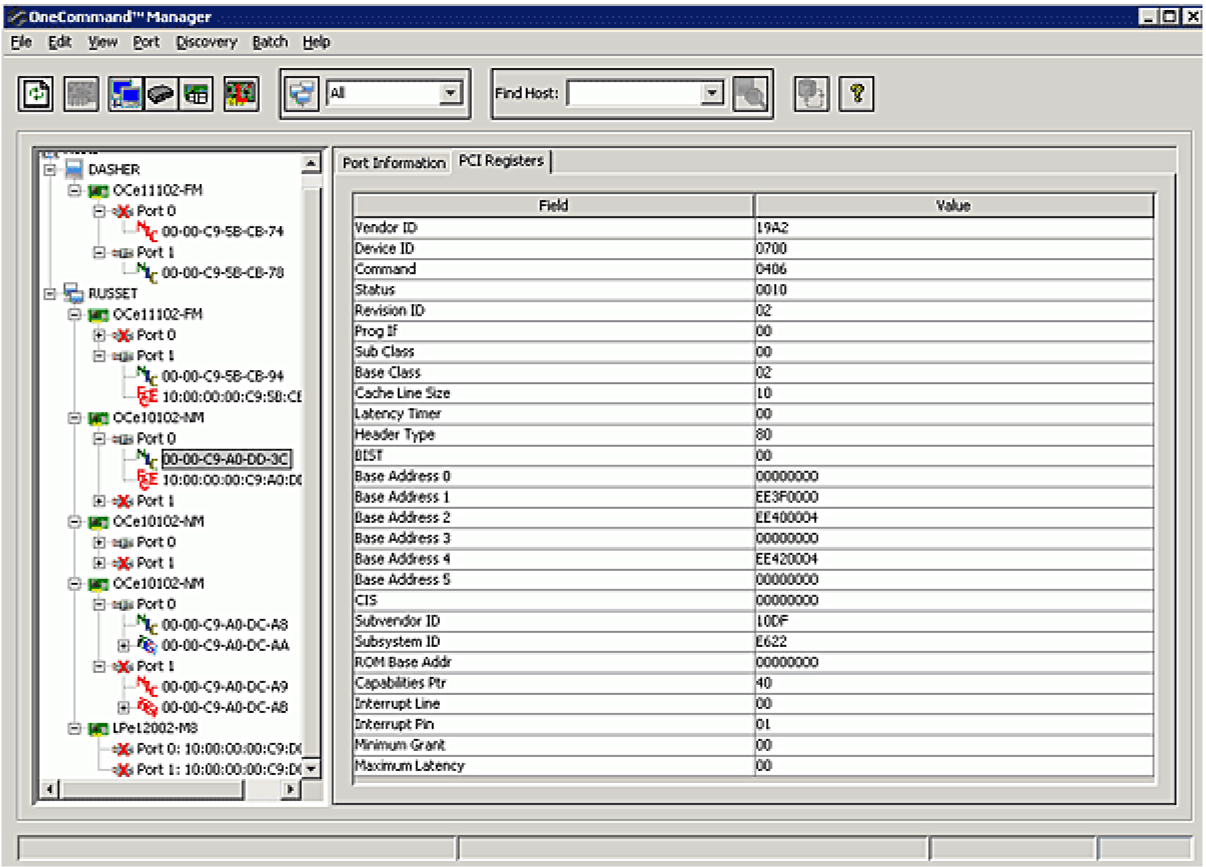
Figure 52: iSCSI PCI Registers tab

To view iSCSI PCI registers:

1. From the discovery-tree, select the iSCSI function whose PCI information you want to view.
2. Select the **iSCSI PCI Registers** tab.

Viewing NIC PCI Registers

The NIC PCI Registers tab displays base PCI registers.



Field	Value
Vendor ID	19A2
Device ID	0700
Command	0406
Status	0010
Revision ID	02
Prog If	00
Sub Class	00
Base Class	02
Cache Line Size	10
Latency Timer	00
Header Type	80
BIST	00
Base Address 0	00000000
Base Address 1	EE3F0000
Base Address 2	EE400004
Base Address 3	00000000
Base Address 4	EE420004
Base Address 5	00000000
CIS	00000000
Subvendor ID	10DF
Subsystem ID	E622
ROM Base Addr	00000000
Capabilities Ptr	40
Interrupt Line	00
Interrupt Pin	01
Minimum Grant	00
Maximum Latency	00

Figure 53: NIC PCI Registers tab

To view NIC PCI registers:

1. From the discovery-tree, select the NIC function whose PCI information you want to view.
2. Select the **NIC PCI Registers** tab.

Managing Adapters

This section describes the various adapter management functions you can perform using the OneCommand Manager application.

Managing Devices using CIM

VMware on the Visor-based ESX platforms uses the Common Interface Model (CIM) as the only standard management mechanism for device management. OneCommand Manager uses the standard CIM interfaces to manage the adapters in the ESX COS and Visor environments and supports CIM-based device and HBA management. OneCommand Manager also supports existing HBA management functionality based on its proprietary management stack and the standard HBAAPI interface.

To manage the adapters on an ESX/ESXi host using OneCommand Manager, you must install the Emulex CIM Provider on the host.

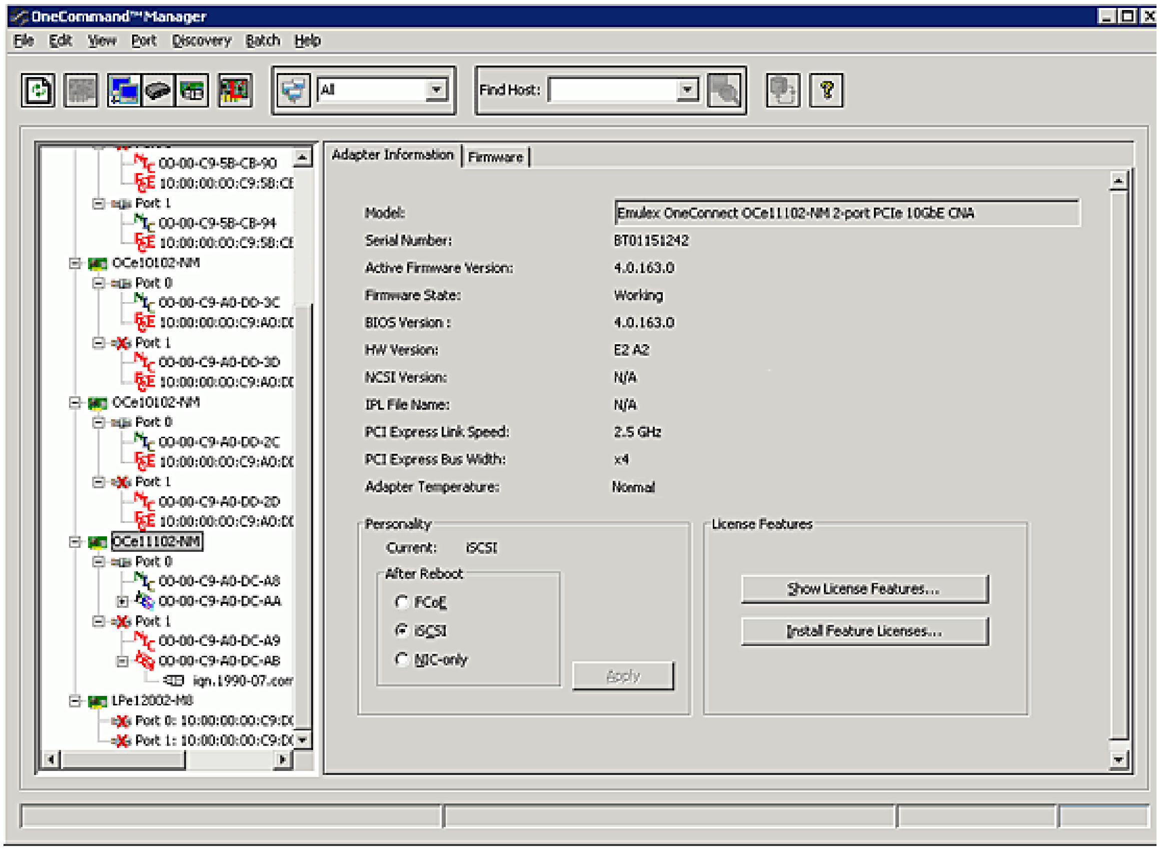
ESX/ESXi 3.5, 4.0 , 4.1 and 5.0 come with an inbox Emulex CIM Provider. The inbox Emulex CIM Provider enables you to manage Emulex LightPulse adapters, but not Emulex UCNA adapters. To manage Emulex UCNA adapters, you must install the out-of-box Emulex CIM Provider. The Emulex CIM Provider is available as a 'core kit' rpm in the ESX COS platform and as an offline bundle in ESXi platforms. VMWare recommends using the offline bundle to upgrade software on VMWare platforms.

For more information about the ESX Patch Management activities, refer to the VMware website.

Showing and Installing Licenses for OneConnect Adapters

The OneCommand Manager application allows you to view available licenses and install licenses to enable features such as FCoE or iSCSI personalities on OneConnect adapters without having to "re-wire" the adapter.

Using the Adapter Information tab, you can view what licenses are available and install licenses for a OneConnect adapter.



Model: Emulex OneConnect OCe11102-NM 2-port PCIe 10GbE CNA
Serial Number: BT01151242
Active Firmware Version: 4.0.163.0
Firmware State: Working
BIOS Version : 4.0.163.0
HW Version: E2 A2
NCSI Version: N/A
IPL File Name: N/A
PCI Express Link Speed: 2.5 GHz
PCI Express Bus Width: x4
Adapter Temperature: Normal

Personality
Current: iSCSI
After Reboot
○ FCoE
● iSCSI
○ NIC-only

License Features

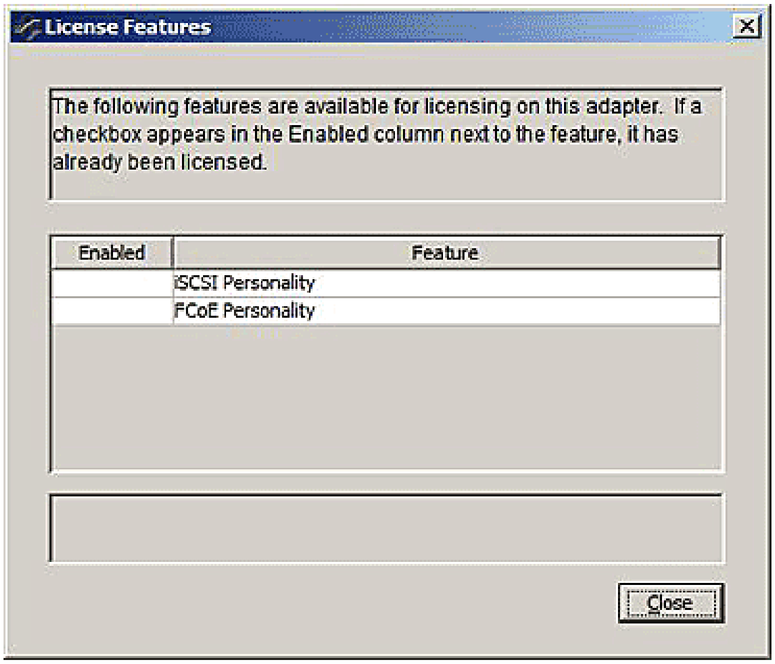
Figure 54: OneConnect Adapter Information tab

Showing Licenses

To view the available licenses for a OneConnect adapter:

1. From the discovery-tree, select the OneConnect adapter whose licenses you want to view. The Adapter Information tab is displayed.
2. On the Adapter Information tab click **Show License Features**. The License Features window appears. An X in the Enabled column indicates that the feature is licensed and enabled for that adapter.

Note: An empty Feature list means the adapter has no licensable features.



The following features are available for licensing on this adapter. If a checkbox appears in the Enabled column next to the feature, it has already been licensed.

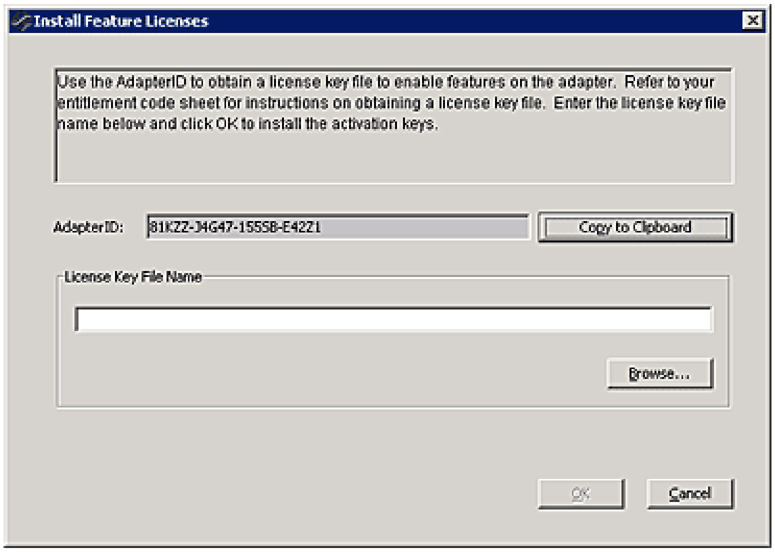
Enabled	Feature
	iSCSI Personality
	FCoE Personality

Figure 55: Licensed Features window

Installing Licenses

To install licenses for a OneConnect adapter:

1. From the discovery-tree, select the OneConnect adapter whose licenses you want to install. The Adapter Information tab is displayed.
2. From the Adapter Information tab, click **Install Feature Licenses**. The Install Feature Licenses dialog box appears displaying the AdapterID.



Use the AdapterID to obtain a license key file to enable features on the adapter. Refer to your entitlement code sheet for instructions on obtaining a license key file. Enter the license key file name below and click OK to install the activation keys.

AdapterID: 81KZZ-J4G47-155SB-E42Z1

Figure 56: Install Feature Licenses dialog box

3. Following the instructions you received with the Entitlement Code, go to the License website and enter the AdapterID and Entitlement Code.

   Note: The Copy to Clipboard button enables you to copy the AdapterID to the clipboard so you can paste it into a file or in the AdapterID field at the License website.

4. When the AdapterID and Entitlement Code are successfully validated, download a License Key File containing one or more activation keys.
5. Using the Install Feature Licenses dialog box, enter the name of the License Key File (or click **Browse** to use a file browser to find the file) and click **OK**.
6. A dialog box appears confirming that you want to install the licenses. Click **OK**.
7. A dialog box appears notifying you that the installation was successful or why it failed. Click **OK**.

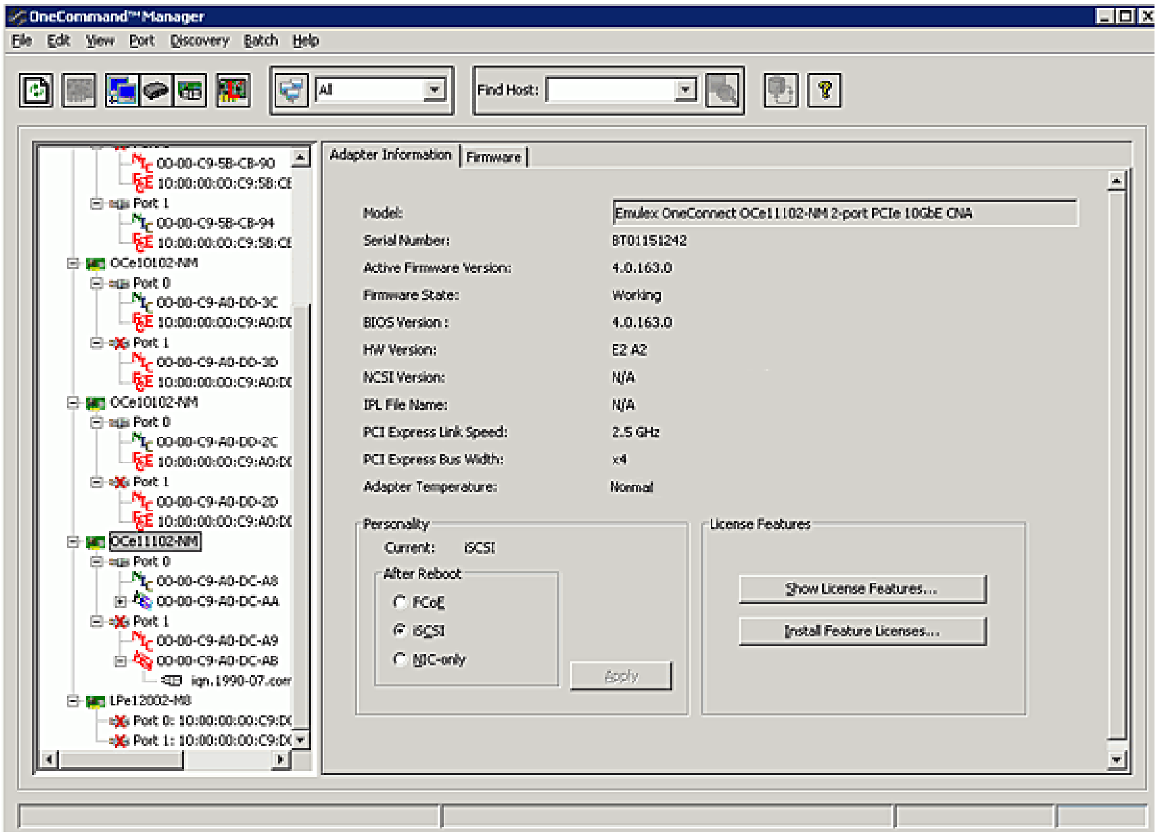
Changing Personalities on OneConnect Adapters

The OneCommand Manager application enables you to change the personality or protocol running on OneConnect adapters.

When you change the personality of the adapter and reboot the host, the adapter starts running the new personality or protocol. The personalities that OneConnect adapters currently run are NIC-only, NIC + FCoE, and NIC + iSCSI. In some cases the adapters are pre-configured to support multiple personalities. In other cases you must install a license key before the adapter can support multiple personalities. See “Showing and Installing Licenses for OneConnect Adapters” on page 96 for more information.

Note: The three different personalities may not always be available on an adapter. For example, a NIC + FCoE adapter can change to a NIC-only or NIC + iSCSI adapter, but an iSCSI adapter may not be able to change to a NIC + FCoE adapter.

Use the Adapter Information tab to make personality changes.



Model: Emulex OneConnect OCe11102-NM 2-port PCIe 10GbE CNA
Serial Number: BT01151242
Active Firmware Version: 4.0.163.0
Firmware State: Working
BIOS Version : 4.0.163.0
HW Version: E2 A2
NCSI Version: N/A
IPL File Name: N/A
PCI Express Link Speed: 2.5 GHz
PCI Express Bus Width: x4
Adapter Temperature: Normal

Personality
Current: iSCSI
After Reboot
○ FCoE
● iSCSI
○ NIC-only

License Features

Figure 57: OneConnect Adapter Information tab

To change the personality of a OneConnect adapter:

1. From the discovery-tree, select the OneConnect adapter whose personality you want to change. The Adapter Information tab is displayed.
2. From the Personality area of the Adapter Information tab, select the personality type you want and click **Apply**.

   Note: If the adapter does not support personalities, personality controls are not displayed. Also, if the adapter does not support a particular personality type that control is disabled.

3. Reboot the host for the personality change to take effect.

Configuring the FC/FCoE Adapter Driver

The OneCommand Manager application displays available driver parameters along with their defaults and maximum and minimum settings. A description of the selected parameter is also provided. This section contains information you should be aware of when working with driver parameters. For a more detailed description of specific driver parameters, refer to the appropriate Emulex driver User Manual. (Not available in read-only mode.)

Note: This section only applies to FC and FcoE adapters. It does not apply to NIC-Only and iSCSI adapters.

Note: In Solaris and Linux, you can also specify parameters when loading the driver manually. (Not available in read-only mode.) Refer to the appropriate driver manual for instructions.

Activation Requirements

A parameter has one of the following activation requirements:

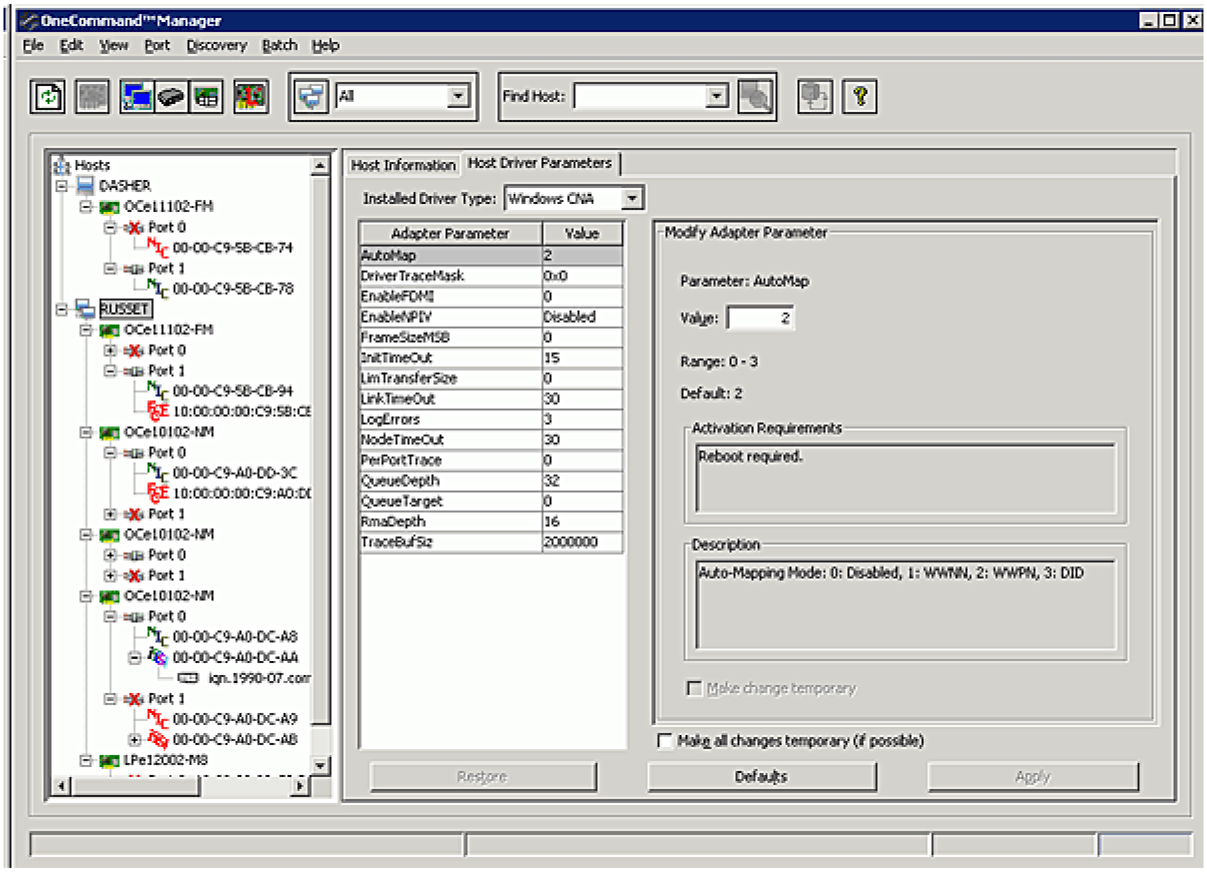
- Dynamic - The change takes effect while the system is running.
- Reset - Requires an adapter reset from the utility before the change takes effect.
- Reboot - Requires reboot of the entire machine before the change takes effect. In this case, you are prompted to perform a reboot when you exit the utility.

The Host Driver Parameters Tab

The Host Driver Parameters tab enables you to view and edit the adapter driver parameter settings contained in a specific host. The host driver parameters are global values and apply to all adapters in that host unless they are overridden by parameters assigned to a specific adapter using the adapter Driver Parameters tab. For each parameter, the tab shows the current value, the range of acceptable values, the default value, and whether the parameter is dynamic. A dynamic parameter allows the change to take effect without resetting the adapter or rebooting the system.

For information on changing parameters for a single adapter, see “Setting Driver Parameters” on page 103. For information on changing parameters for the host, see “Setting Driver Parameters for All Adapters in a Host” on page 105.

Note: If there are no discovered FC or FCoE adapters, the entire Host Driver Parameters tab is grayed-out. This occurs because there are no adapters to which the host driver parameters apply.



Installed Driver Type: Windows CNA

Adapter Parameter	Value
AutoMap	2
DriverTraceMask	0x0
EnableFDMI	0
EnableNPIV	Disabled
FrameSizeMSB	0
InitTimeOut	15
LimTransferSize	0
LinkTimeOut	30
LogErrors	3
NodeTimeOut	30
PerPortTrace	0
QueueDepth	32
QueueTarget	0
RmaDepth	16
TraceBufSiz	2000000

Modify Adapter Parameter

Parameter: AutoMap

Value: 2

Range: 0 - 3

Default: 2

Activation Requirements

Reboot required.

Description

Auto-Mapping Mode: 0: Disabled, 1: WWNN, 2: WWPN, 3: DID

☐ Make change temporary

☐ Make all changes temporary (if possible)

Figure 58: Host Driver Parameters tab

Host Driver Parameters Tab Field Definitions

- Installed Driver Type - The current drivers installed on this host. If there is more than one driver type installed, the Installed Driver Types drop-down menu shows a list of all driver types that are installed on the adapters in the host and enables you to select the particular driver type to configure.
- Adapter Parameter table - A list of adapter driver parameters for the selected driver type and their current values.

Modify Adapter Parameter Area

- Adapter-specific information is displayed in this area. This can include value, range, default, activation requirements and description.

Driver Parameters Tab Buttons (Not available in read-only mode.)

- Restore - If you changed driver parameters, but did not click **Apply** and you want to restore the parameters to their last saved values, click **Restore**.
- Defaults - Click to reset all driver parameter values to their default (out-of-box) values.

  Note: Driver parameter values are not supported on hosts being managed through the CIM interface.

- Apply - Click to apply any driver parameter changes. If you changed a driver parameter that is not dynamic, you may need to reset the adapter port or create a new ramdisk and reboot the system.

Setting Driver Parameters

The Driver Parameters tab for adapters and hosts enable you to modify driver parameters for a specific adapter or all adapters in a host.

For example, if you select a host in the discovery-tree, you can globally change the parameters for all adapters in that host. If you select an adapter port in the discovery-tree, you can change the lpfc_use_adisc, lpfc_log_verbose and the lpfc_nodev_tmo parameters for only that adapter.

Note: VMware supports local and global parameter changes for all driver parameters.

For each parameter, the Driver Parameters tabs show the current value, the range of acceptable values, the default value, and the activation requirement. You can also restore parameters to their default settings.

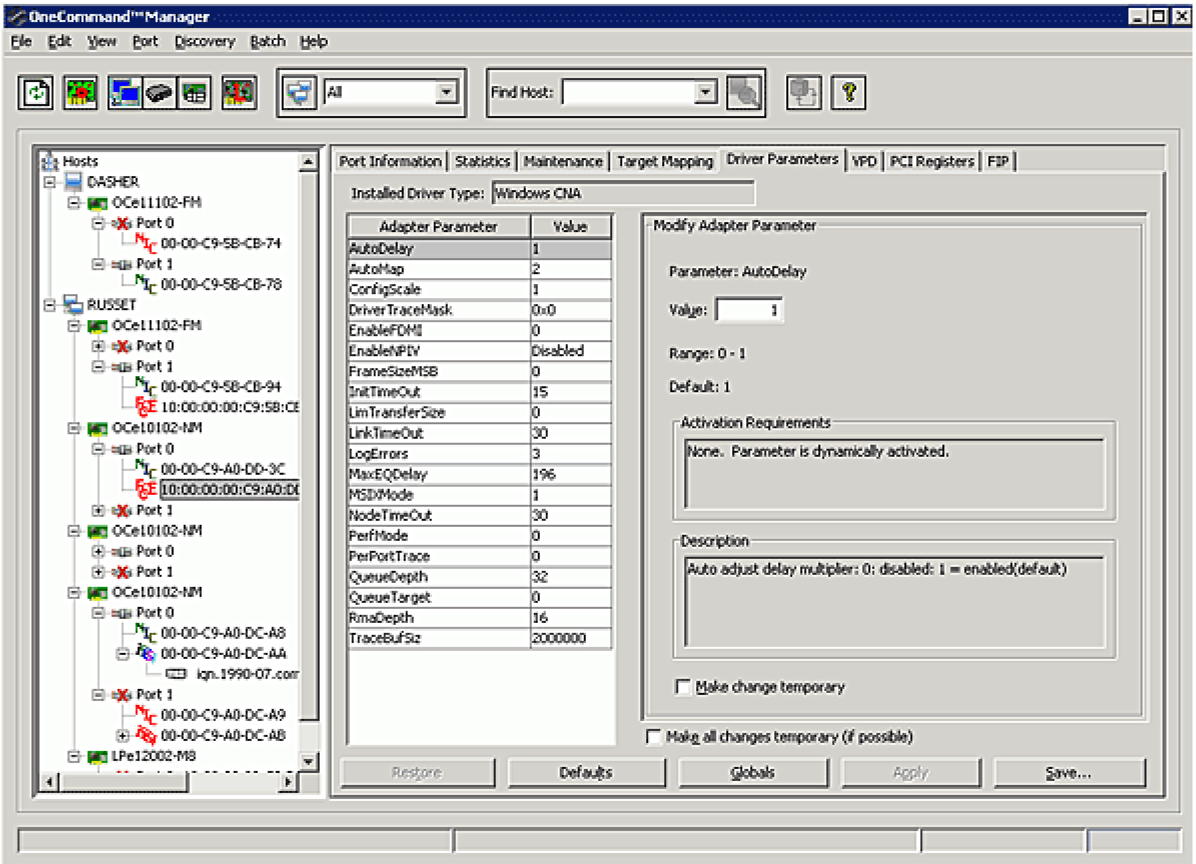
You can apply driver parameters for one adapter to other adapters in the system using the Driver Parameters tab, thereby simplifying multiple adapter configuration. See “Creating a Batch Mode Driver Parameters File” on page 107 for more information.

Note: The Linux 2.6 kernel only supports setting some of the driver parameters for individual adapters. Some driver parameters must be applied to all adapters contained in the host. See the Emulex Driver for Linux User Manual for more detail.

Setting Driver Parameters for a Single Adapter

To change the driver parameters for a single adapter:

1. Select **Host** or **Fabric** view.
2. In the discovery-tree, select the FC or FCoE adapter port whose parameters you want to change.
3. Select the **Driver Parameters** tab. The parameter values for the selected adapter are displayed.



Installed Driver Type: Windows CNA

Adapter Parameter	Value
AutoDelay	1
AutoMap	2
ConfigScale	1
DriverTraceMask	0x0
EnableFDMI	0
EnableNPIV	Disabled
FrameSizeMSB	0
InitTimeOut	15
LimTransferSize	0
LinkTimeOut	30
LogErrors	3
MaxEQDelay	196
MSIXMode	1
NodeTimeOut	30
PerfMode	0
PerPortTrace	0
QueueDepth	32
QueueTarget	0
RmaDepth	16
TraceBufSiz	2000000

Modify Adapter Parameter

Parameter: AutoDelay

Value: 1

Range: 0 - 1

Default: 1

Activation Requirements

None. Parameter is dynamically activated.

Description

Auto adjust delay multiplier: 0: disabled: 1 = enabled(default)

□ Make change temporary

□ Make all changes temporary (if possible)

Figure 59: Driver Parameters tab - Adapter Selected

4. In the Driver Parameters tab, click the parameter that you want to change. A description of the parameter appears on the right side of the tab.
5. Enter a new value in the Value field in the same hexadecimal or decimal format as the current value or select a value from the drop-down menu. If you enter a value and the current value is in hexadecimal format, it is prefaced by “0x” (for example, 0x2d). You can enter a new hexadecimal value without the “0x”. For example, if you enter ff10, this value is interpreted and displayed as “0xff10”.
6. If you want the change to be temporary (causing the parameter to revert to its last permanent setting when the system is rebooted), check the **Make change temporary** box. This option is available only for dynamic parameters.
7. If you are making changes to multiple parameters, and you want all the changes to be temporary, check the **Make all changes temporary** box. This setting overrides the setting of the **Make change temporary** box. Only dynamic parameters can be made temporary.
8. Click **Apply**.

Restoring All Parameters to Their Earlier Values

If you changed parameters, but did not click **Apply** and you want to restore the parameters to their last saved values, click **Restore**.

Resetting All Default Values

To reset all parameter values to their default (factory) values, click **Defaults**.

Setting an Adapter Parameter Value to the Host Adapter Parameter Value

To set an adapter parameter value to the corresponding host parameter value:

1. Select **Host** or **Fabric** view.
2. In the discovery-tree, select the adapter port.
3. Select the **Driver Parameters** tab.
4. Click **Globals**. All parameter values are now the same as the global, or host, values.
5. To apply the global values, click **Apply**.

Saving Adapter Driver Parameters to a File

To save a desired adapter parameter configuration click **Save**. To apply your configuration changes, click **Apply**.

Note: OneCommand Manager application Web Launch Interface driver parameters files are saved on the host that the browser was launched from, not the host IP specified in browser.

Each definition is saved in a comma-delimited file with the following format:

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

The file is saved in the Emulex Repository directory.

In Windows: \Program Files\Emulex\Util\Emulex Repository or
\Program Files (x64)\Emulex\Util\Emulex Repository for any IA64/x64 systems

In Linux: /usr/sbin/ocmanager/RMRepository

In VMware ESX: /etc/cim/emulex/RMRepository

In Solaris: /opt/ELXocm/RMRepository

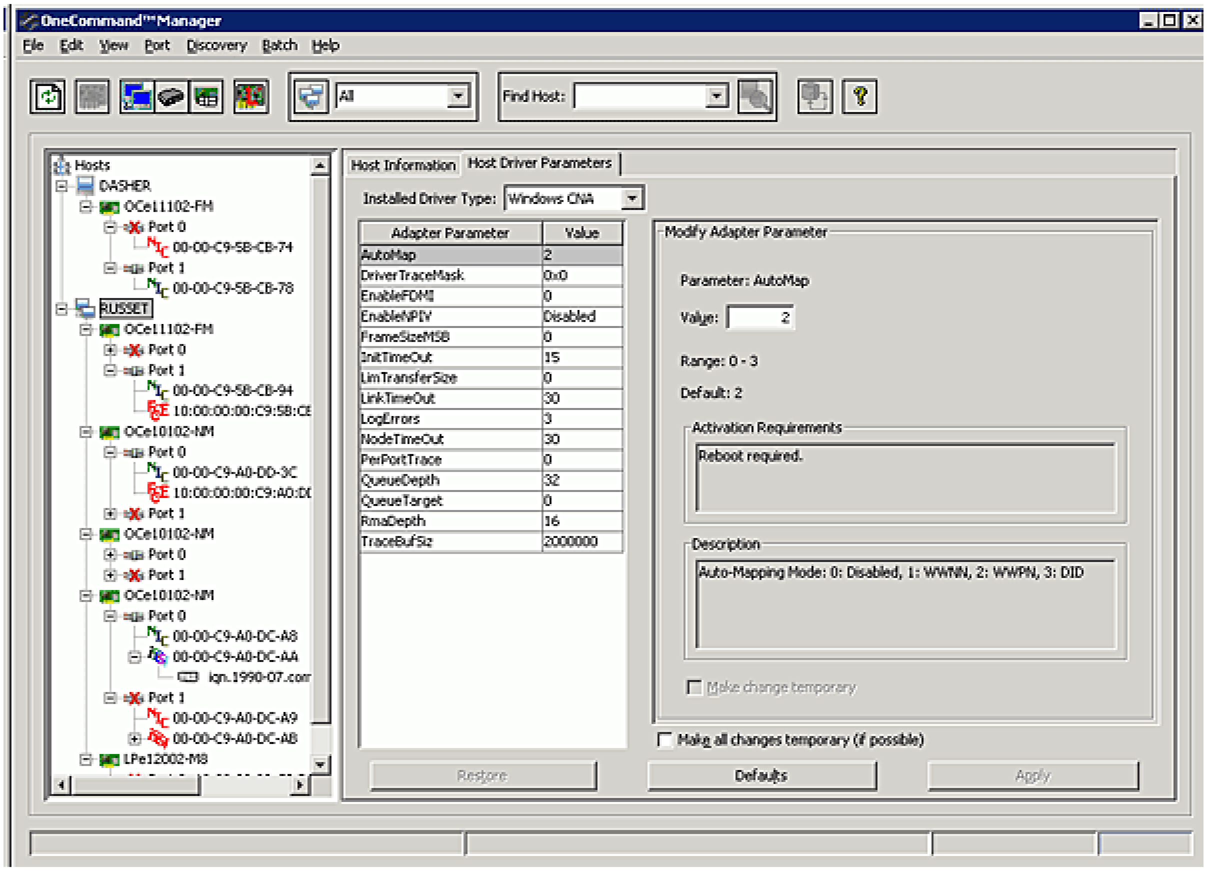
The OneCommand Manager application can then use the Batch Driver Parameter Update function to apply these saved settings to any or all compatible adapters on the SAN.

Note: Host driver parameters and persistent binding settings cannot be saved.

Setting Driver Parameters for All Adapters in a Host

To change the driver parameters for all adapters installed in a host:

1. Do one of the following:
    - From the **View** menu, click **Group Adapters by Host Name**.
    - From the toolbar, click **Group Adapters by Host Name**.
2. In the discovery-tree, click the host whose adapter driver parameters you want to change.
3. Select the **Host Driver Parameters** tab. If there are adapters with different driver types installed, the **Installed Driver Types** menu shows a list of all driver types and driver versions that are installed. Select the driver whose parameters you want to change. This menu does not appear if all the adapters are using the same driver.
4. In the Host Driver Parameters tab, click the parameter that you want to change. A description of the parameter appears on the right side of the tab.



Installed Driver Type: Windows CNA

Adapter Parameter	Value
AutoMap	2
DriverTraceMask	0x0
EnableFDMI	0
EnableNPIV	Disabled
FrameSizeMSB	0
InitTimeOut	15
LimTransferSize	0
LinkTimeOut	30
LogErrors	3
NodeTimeOut	30
PerPortTrace	0
QueueDepth	32
QueueTarget	0
RmaDepth	16
TraceBufSiz	2000000

Modify Adapter Parameter

Parameter: AutoMap

Value: 2

Range: 0 - 3

Default: 2

Activation Requirements

Reboot required.

Description

Auto-Mapping Mode: 0: Disabled, 1: WWNN, 2: WWPN, 3: DID

☐ Make change temporary

☐ Make all changes temporary (if possible)

Figure 60: Host Driver Parameters tab - Host Selected

5. Enter a new value in the Value field in decimal or hexadecimal format, depending on how the current value is presented. If the value is in hexadecimal format, it is prefaced by “0x” (for example -”0x2d”).
6. To make a change temporary (the parameter to revert to its last permanent setting when the system is rebooted), check **Make changes temporary**. This option is available only for dynamic parameters.
7. To make changes to multiple parameters, check **Make all changes temporary**. Only dynamic parameters can be made temporary.
8. Click **Apply**.

Changing Non-dynamic Parameter Values (Linux 8.2)

To change non-dynamic parameter values for Linux version 8.2:

1. Navigate to the /usr/sbin/ocmanager directory and run the scripts to stop the OneCommand Manager application processes. Type:

   ```
   ./stop_ocmanager
   ```
2. Stop all I/O to LPFC attached devices.
3. Unload the LPFC driver. Type:

   ```
   modprobe -r lpfc
   ```
4. Reload the driver. Type:

   ```
   modprobe lpfc
   ```

5. If DHCHAP authentication is currently employed on this machine, start up the Emulex FC authentication service. Type:

   ```
   /etc/init.d/fcauthd start
   ```

6. Start the elxhbamgr service (remote service). Type:

   ```
   ./start_ocmanager
   ```

   The OneCommand Manager application discovery service starts automatically when you launch the application.

   Note: If DHCHAP authentication is currently employed on Emulex adapters on this machine, you must type "`/etc/init.d/fcauthd start`" to restart the authentication daemon.

   If the machine has the OneCommand Manager application Web Launch Interface installed, the RMI services must be restarted. Type:

   ```
   ./start_weblaunch
   ```

   Note: For changes to persist after a reboot, you must create a new ramdisk image. Refer to the Emulex Driver for Linux User Manual for more information.

Changing Non-dynamic Parameter Values (VMware ESX)

To change non-dynamic parameter values:

1. Navigate to the /usr/sbin/ocmanager directory and run the scripts to stop the OneCommand Manager application processes. Type:

   ```
   ./stop_ocmanager
   ```

2. Stop all I/O to LPFC attached devices.
3. Reboot the system.

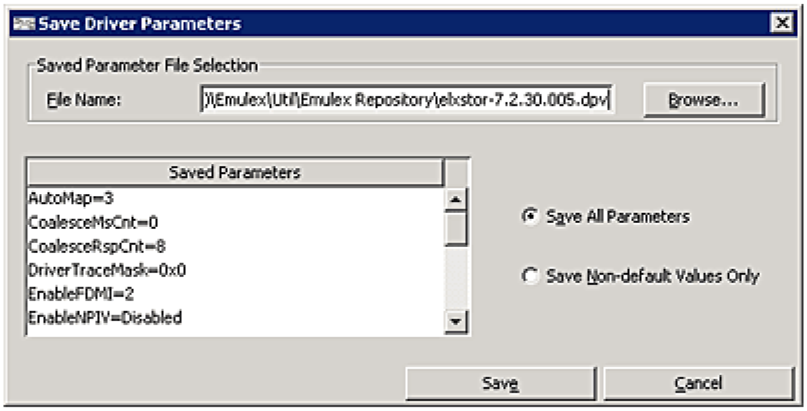
Creating a Batch Mode Driver Parameters File

You can apply driver parameters for one adapter to other adapters in the system using the Driver Parameters tab. When you define parameters for an adapter, you create a .dpv file. The .dpv file contains parameters for that adapter. After you create the .dpv file, the OneCommand Manager application enables you to assign the .dpv file parameters to multiple adapters in the system. (Not available in read-only mode.)

To create the .dpv file:

1. Select **Host** or **Fabric** view.
2. Select the adapter port whose parameters you want to apply to other adapters from the discovery-tree.
3. Select the **Driver Parameters** tab.
4. Set the driver parameters.
5. After you define the parameters for the selected adapter, click **Apply**.

6. Click **Save**. The Save Driver Parameters dialog box appears. You can save the file to a different directory or change its name.



File Name:)\Emulex\Util\Emulex Repository\elxstor-7.2.30.005.dpv

AutoMap=3
CoalesceMsCnt=0
CoalesceRspCnt=8
DriverTraceMask=0x0
EnableFDMI=2
EnableNPIV=Disabled

● Save All Parameters

○ Save Non-default Values Only

Figure 61: Save Driver Parameters dialog box

7. Use the two radio buttons to choose the type of parameters to save. You can save all parameters or only those parameters whose current values differ from their corresponding default values.

   A list of the saved parameters and their current values show in the Saved Parameters box.

8. Click **Save**.

Assigning Batch Mode Parameters

To assign batch mode parameters to adapters:

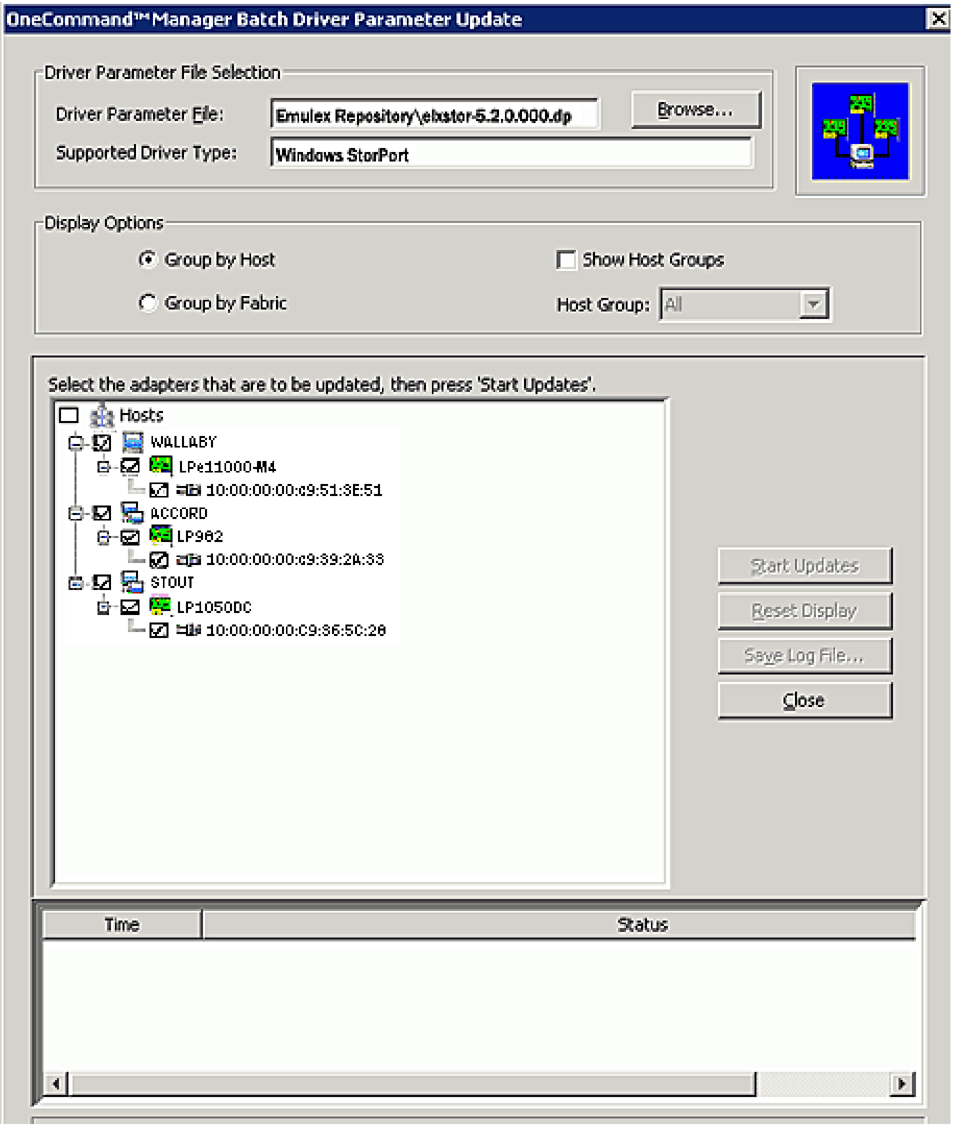
1. From the **Batch** menu, select **Update Driver Parameters**. (You do not need to select any discovery-tree elements at this time.)
2. When the Batch Driver Parameter Update dialog box appears, click **Browse**.
3. The Driver Parameter File Selection dialog box appears. Select the file you want to use and click **OK**. A dialog box appears notifying you that the OneCommand Manager application is searching for compatible adapters.

   Once compatible adapters are found, the Driver Parameter File field of the Batch Driver Parameter Update dialog box displays the selected file's path. The “Supported Models” text field displays a list of all adapter models that are compatible with the selected file. The set of compatible adapters appears in the dialog box’s discovery-tree.

   Using the Display Options settings you can choose how adapters are displayed in the discovery-tree. Clicking **Group by Host** displays adapters in a host-centric view. Clicking **Group by Fabric** shows hosts in a fabric-centric view with their fabric addresses. The WWPN and host name for each downloadable port is displayed under its respective fabric.

   You can also display host groups by checking **Show Host Groups**. To display a particular host group, choose that group from the **Host Group** menu.

   Checkboxes next to the host and adapter entries are used to select or deselect an entry. Checking an adapter selects or removes that adapter; checking a host removes or selects all eligible adapters for that host.



OneCommand™ Manager Batch Driver Parameter Update

Driver Parameter File Selection

Driver Parameter File: Emulex Repository\elxstor-5.2.0.000.dp

Supported Driver Type: Windows StorPort

Display Options

● Group by Host

○ Group by Fabric

□ Show Host Groups

Host Group: All

Select the adapters that are to be updated, then press 'Start Updates'.

```
□ Hosts
  ☑ WALLABY
    ☑ LPe11000-M4
      ☑ 10:00:00:00:c9:51:3E:51
  ☑ ACCORD
    ☑ LP982
      ☑ 10:00:00:00:c9:39:2A:33
  ☑ STOUT
    ☑ LP1050DC
      ☑ 10:00:00:00:C9:36:5C:28
```

Figure 62: Batch Driver Parameters Update dialog box

4. Make your selections and click **Start Update**. The OneCommand Manager application Batch Driver Parameter Update dialog box shows the current status of the update. When the update completes, a final summary shows the number of adapters that were successfully processed, and the number of adapters for which one or more parameter updates failed.
5. If you want, click **Save Log File** to save a report of the update.

Configuring DCB (Data Center Bridging) Parameters

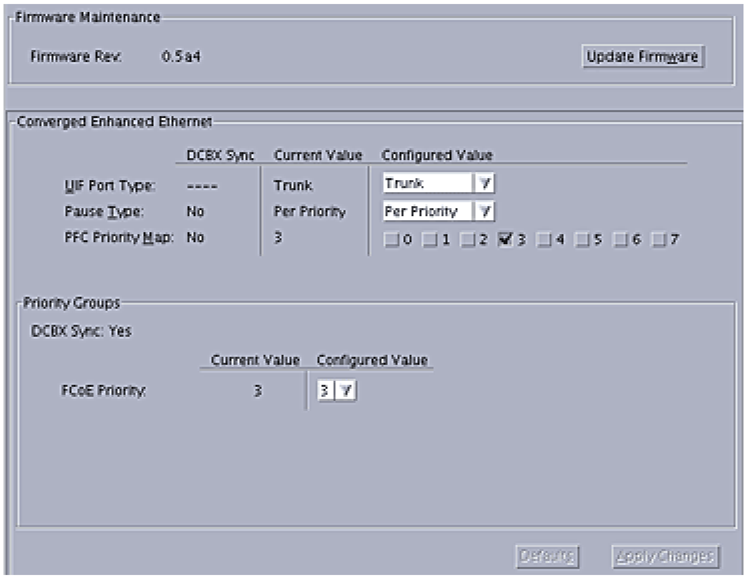
Configuring CEE/FCoE-Specific Parameters (LP21000 Series Adapters Only)

The CEE tab allows you to view and configure the CEE-specific parameters for the selected port. The CEE tab only appears if you select an LP21000 series adapter from the discovery-tree.

- When DCBX is present, the Current Values are received from the switch and can only be changed by configuring the switch. Changing the Configured Values saves the values to the adapter, but they will not be used.
- When DCBX is NOT present, the Current Values reflect the values being used by the adapter. Changes to Configured Values take effect immediately and are copied to the Current Values column.

To view and configure DCB/FCoE parameters for FC adapters:

1. From the discovery-tree, select an FC CEE adapter (such as an LP21000).
2. Select the **CEE/FCoE** tab.
3. Make any setting changes you want.
4. Click **Apply Changes**.



Firmware Maintenance

Firmware Rev: 0.5a4

Converged Enhanced Ethernet

	DCBX Sync	Current Value	Configured Value
UIF Port Type:	----	Trunk	Trunk
Pause Type:	No	Per Priority	Per Priority
PFC Priority Map:	No	3	□ 0 □ 1 □ 2 ☑ 3 □ 4 □ 5 □ 6 □ 7

Priority Groups

DCBX Sync: Yes

	Current Value	Configured Value
FCoE Priority:	3	3

Figure 63: CEE/FCoE tab, Configuration area

CEE/FCoE Tab Field Definitions

Converged Enhanced Ethernet Area Field Definitions

- UIF Port Type - Select between Access and Trunk port types using the menu. The DCBX Sync column indicates if the feature parameter exchange with the switch was successful. “Yes” means it was successful. “No” means it was not successful. The Current Value column indicates the current setting for the value.
- Pause Type - Select the Ethernet flow control type. Select between standard PAUSE flow control and Per Priority based PAUSE flow control. Per Priority based flow control means the Ethernet network is seen as 8 virtual lanes (a.k.a. “Priorities”) of traffic rather than one. Possible drop

down values are Standard and Per Priority. The DCBX Sync column indicates if the feature parameter exchange with the switch was successful. “Yes” means it was successful. “No” means it was not successful. The Current Value column indicates the current setting for the value.

- PFC Priority Map - A series of eight checkboxes that can only be selected if the Pause Type is set to “Per Priority”. Selected values correspond to the flow control priorities being used by the board. The value of the FCoE Priority must always be included among the PFC Priority Map values. Select a number of values from 1 to 8. Possible values are 0 to 7.

Priority Area Field Definitions

- DCBX Sync - Indicates if the feature parameter exchange with the switch was successful. “Yes” means it was successful. “No” means it was not successful.
- FCoE Priority - The available values for the FCoE Priority parameter. Possible drop down values are 0 to 7.

CEE/FCoE Tab Buttons

- Update Firmware - Enables you to update CEE firmware on the selected adapter. See “Updating CEE Firmware for a Single Adapter (LP21000 Series Adapters Only)” on page 150 for more information.
- Defaults - Returns the dialog box parameters to their factory settings.
- Apply Changes - Applies any changes made under the Configured Value column. If DCBX is present on the attached fabric switch, these changes are saved in non-volatile memory, but not loaded. If DCBX is not present, changes made in the Configured Value column may or may not take effect, depending on the switch's configuration. You are notified of any failures to save the configured values to the CEE adapter's non-volatile memory.

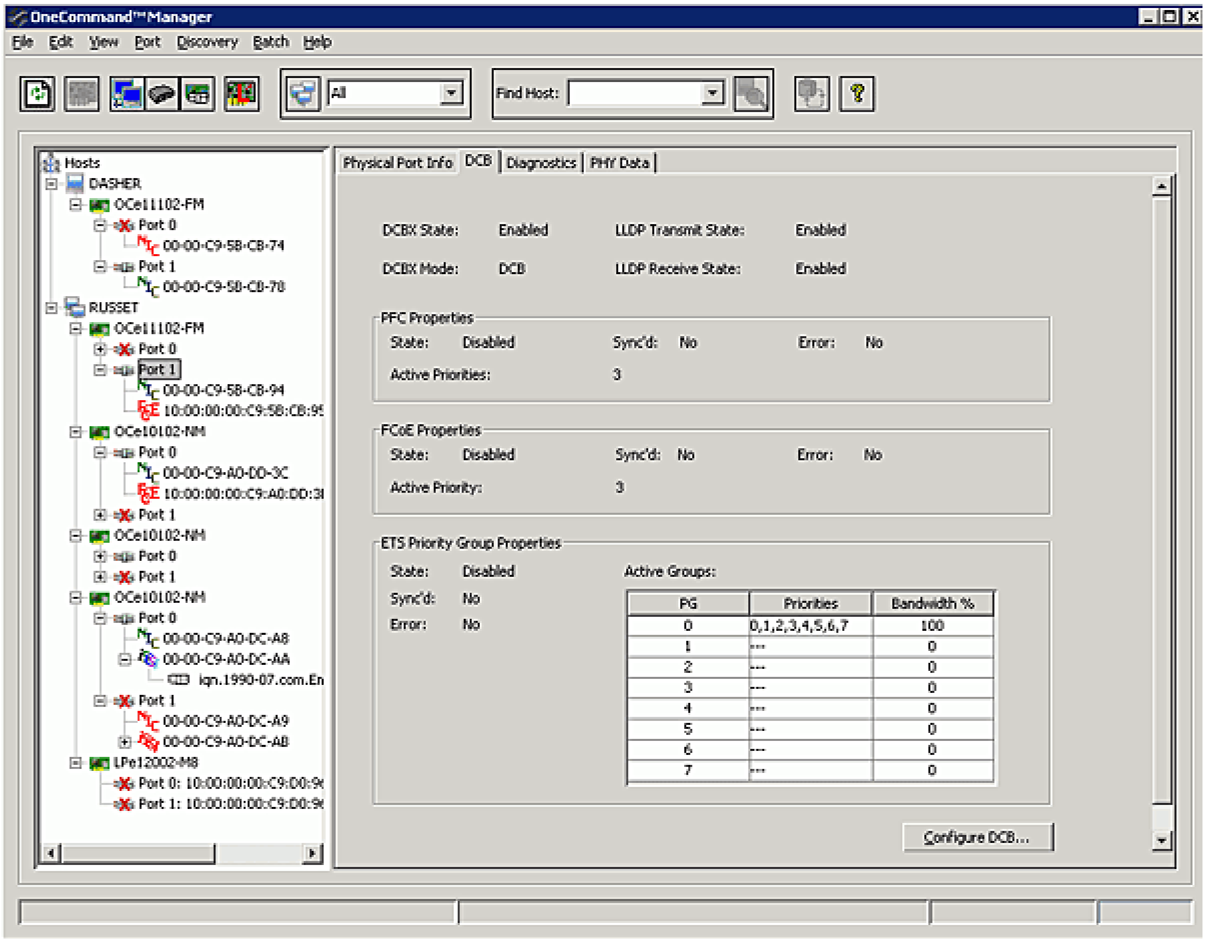
Configuring DCB Parameters for OneConnect Adapter Ports

The DCB tab displays parameters for OneConnect adapter ports.

To view the DCB parameters for OneConnect adapter ports:

1. From the discovery-tree, select the adapter port whose DCB properties you want to view.

2. Select the **DCB** tab.



DCBX State: Enabled LLDP Transmit State: Enabled

DCBX Mode: DCB LLDP Receive State: Enabled

PFC Properties

State: Disabled Sync'd: No Error: No

Active Priorities: 3

FCoE Properties

State: Disabled Sync'd: No Error: No

Active Priority: 3

ETS Priority Group Properties

State: Disabled

Sync'd: No

Error: No

Active Groups:

PG	Priorities	Bandwidth %
0	0,1,2,3,4,5,6,7	100
1	---	0
2	---	0
3	---	0
4	---	0
5	---	0
6	---	0
7	---	0

Figure 64: DCB tab (FCoE adapter port selected)

DCB Tab Field Definitions

- DCBX State - The current DCBX (Data Center discovery and Capability exchange protocol) state (enabled or disabled).
- DCBX Mode - The DCBX mode can be either DCB or CIN.

> **Note:** DCBX mode also configures FIP mode. If DCBX mode is DCB, FIP is enabled. If it is CIN, FIP is disabled.

- LLDP Transmit State - DCBX uses Link Layer Discovery Protocol (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.
- LLDP 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.

PFC Properties Area

- State - Enabled means that flow control in both directions (Tx and Rx) is enabled.
- Active Priority - Lists the priorities with PFC set to Enabled.
- Sync'd - If yes, the PFC priorities have been set by the peer. This parameter cannot be set.

- Error - The state of Error feature. The error feature indicates whether an error has occurred during the configuration exchange with the peer. Error is also set to YES when the Compatible method for the feature fails.

FCoE Properties Area (FCoE ports only)

- State - The FCoE state. It can be Enabled or Disabled.
- Active Priorites - The current active priority assigned for FCoE.
- Sync'd - If yes, the FCoE priority has been set by the peer. This parameter cannot be set.
- Error - The state of FCoE Error feature. The error feature indicated whether an error has occurred during the configuration exchange with the peer. Error is also set to YES when the Compatible method for the feature fails.

ETS Priority Group Properties Area

- State - The FCoE or NIC-only state. It can be Enabled or Disabled.
- Sync'd - If yes, the Priority Groups have been set by the peer. This parameter cannot be set.
- Error - The state of Error feature. The error feature indicated whether an error has occurred during the configuration exchange with the peer. Error is also set to YES when the Compatible method for the feature fails.

Active Groups

- PG - The Priority Group number. It can be 0 to 7.
- Priorities - The priorities that are assigned to each Priority Group. It is represented in comma separated format.
- Bandwidth % - The percentage of available link bandwidth allocated to a particular Priority Group.
- Max Configurable PGs - This field indicates maximum number of priority groups that can be configured on the selected OneConnect adapter port.

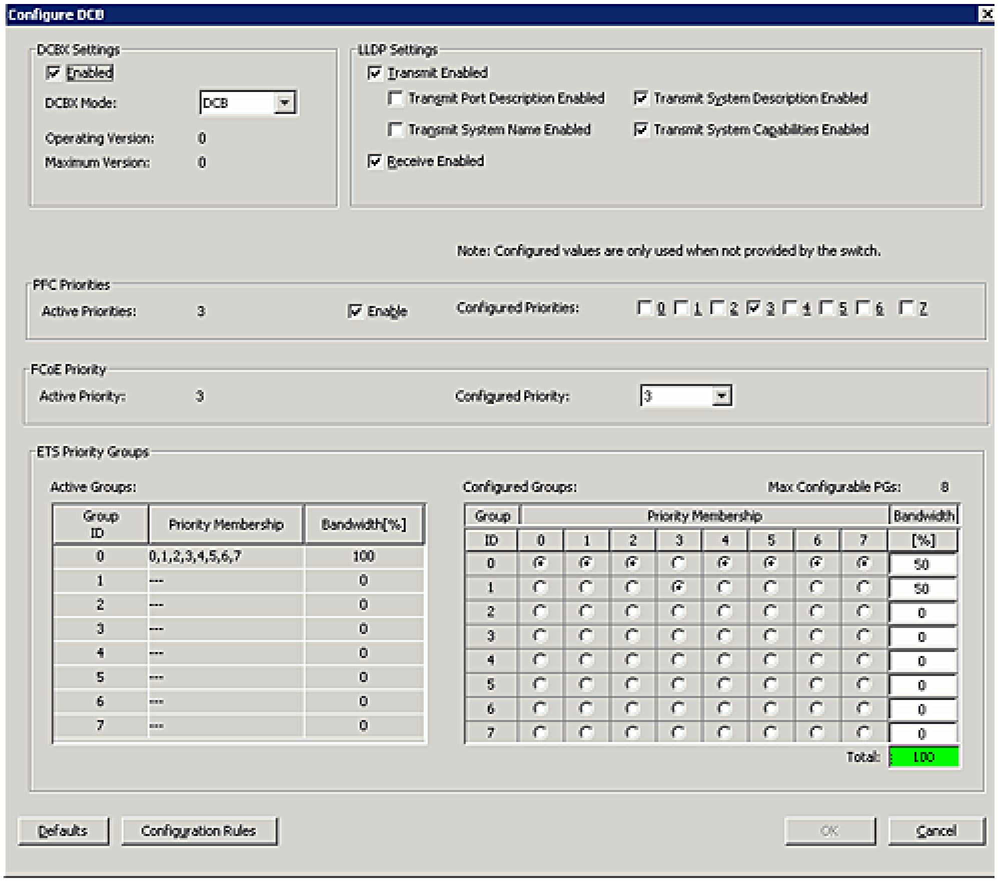
DCB Tab Buttons

- Configure DCB - Click to configure DCB parameters. See the instructions below.

To configure DCB for OneConnect adapter ports:

1. From the discovery-tree, select the adapter port whose DCB properties you want to configure.
2. Select the **DCB** tab.
3. Click **Configure DCB**. The Configure DCB dialog box appears.
4. Configure the settings you want and click **OK**.

Note: An error message is displayed if you try to configure more priority groups than the adapter supports. The "Max Configurable PGs" field shows the number of priority groups supported by the adapter.



DCBX Settings

☑ Enabled

DCBX Mode: DCB

Operating Version: 0

Maximum Version: 0

LLDP Settings

☑ Transmit Enabled

☐ Transmit Port Description Enabled

☑ Transmit System Description Enabled

☐ Transmit System Name Enabled

☑ Transmit System Capabilities Enabled

☑ Receive Enabled

Note: Configured values are only used when not provided by the switch.

PFC Priorities

Active Priorities: 3

☑ Enable

Configured Priorities: ☐ 0 ☐ 1 ☐ 2 ☑ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7

FCoE Priority

Active Priority: 3

Configured Priority: 3

ETS Priority Groups

Active Groups:

Group ID	Priority Membership	Bandwidth[%]
0	0,1,2,3,4,5,6,7	100
1	---	0
2	---	0
3	---	0
4	---	0
5	---	0
6	---	0
7	---	0

Configured Groups: Max Configurable PGs: 8

Group	Priority Membership								Bandwidth
ID	0	1	2	3	4	5	6	7	[%]
0	●	●	●	○	●	●	●	●	50
1	○	○	○	●	○	○	○	○	50
2	○	○	○	○	○	○	○	○	0
3	○	○	○	○	○	○	○	○	0
4	○	○	○	○	○	○	○	○	0
5	○	○	○	○	○	○	○	○	0
6	○	○	○	○	○	○	○	○	0
7	○	○	○	○	○	○	○	○	0
								Total:	100

Figure 65: Configure DCB dialog box for FCoE adapter ports (DCBX enabled)

Configure DCB Dialog Box Field Definitions

DCBX Settings Area

- Enabled - DCBX can be enabled or disabled. With DCBX enabled, the configured values are used only if the switch does not provide them. With DCBX disabled, the configured values are used.
- DCBX Mode - The DCBX mode can be set to CEE or Cisco-Intel-Nuova (CIN). Changes to the DCBX mode require a reboot of the host.
- Operating Version - Operating version of the DCBX protocol. The system adjusts as needed to operate at the highest version supported by both link partners. This setting cannot be changed.
- Maximum Version - The highest DCBX protocol version supported by the system. Version numbers start at zero. The DCBX protocol must be backward compatible with all previous versions. This setting cannot be changed.

LLDP Settings Area

- Transmit Enabled - LLDP Transmit can be enabled or disabled.
- Transmit Port Description Enabled - Provides a description of the port in an alpha-numeric format. The value equals the ifDescr object, if the LAN device supports RFC 2863.
- Transmit System Name Enabled - Provides the system's assigned name in an alpha-numeric format. The value equals the sysName object, if the LAN device supports RFC 3418.

- Transmit System Description Enabled - Provides a description of the network entity in an alphanumeric format. This includes system's name and versions of hardware, operating system and networking software supported by the device. The value equals the sysDescr object, if the LAN device supports RFC 3418.
- Transmit System Capabilities Enabled - Indicates the primary function(s) of the device and whether or not these functions are enabled on the device. The capabilities are indicated by two octets. Bits 0 through 7 indicate Other, Repeater, Bridge, WLAN AP, Router, Telephone, DOCSIS cable device and Station respectively. Bits 8 through 15 are reserved.
- Receive Enabled - LLDP Receive can be enabled or disabled.

PFC Priorities Area

- Active Priorities - The priorities that are marked active for PFC.
- Enable - When checked, PFC is enabled.
- Configured Priorities - The priorities that are configured, but might not yet be active.

FCoE Priority Area (FCoE ports only)

- Active Priority - The active FCoE priority.
- Configured Priority - The configured FCoE priority.

ETS Priority Groups Area

Active Groups

- Group ID - The Priority Group ID.
- Priority Membership - The different priorities that are assigned to the various Priority Groups. This is the currently active configuration.
- Bandwidth - The bandwidths that are assigned to different Priority Groups. This is the currently active configuration.

Configured Groups

- Group ID - The Priority Group ID.
- Priority Membership - The configured priority membership grouping.
- Bandwidth % - The configured value of bandwidth for the different Priority Groups.
- Max Configurable PGs - The maximum number of Priority Groups that can be configured.

Configure DCB Dialog Box Buttons

- Defaults - Click to return parameters to default FCoE DCB settings.
- Configuration Rules - Click to display the window that lists the rules for configuring FCoE priority group information.

  You must observe the following rules when configuring priority groups for FCoE adapter ports:

1 One and only one priority is configured for the FCoE priority.

2. A maximum of two PFC priorities can be selected and one of them must match the FCoE priority.

Note: Not all adapters support two PFC priorities. Adapters that do not support two PFC priorities display an error message if you try to configure more than one PFC priority.

3. The priority group to which the FCoE priority is assigned must contain no other priorities.

4. The additional PFC priority must be assigned to a priority group which has no other priorities.

5. Bandwidths of all the priority groups must add up to 100%.

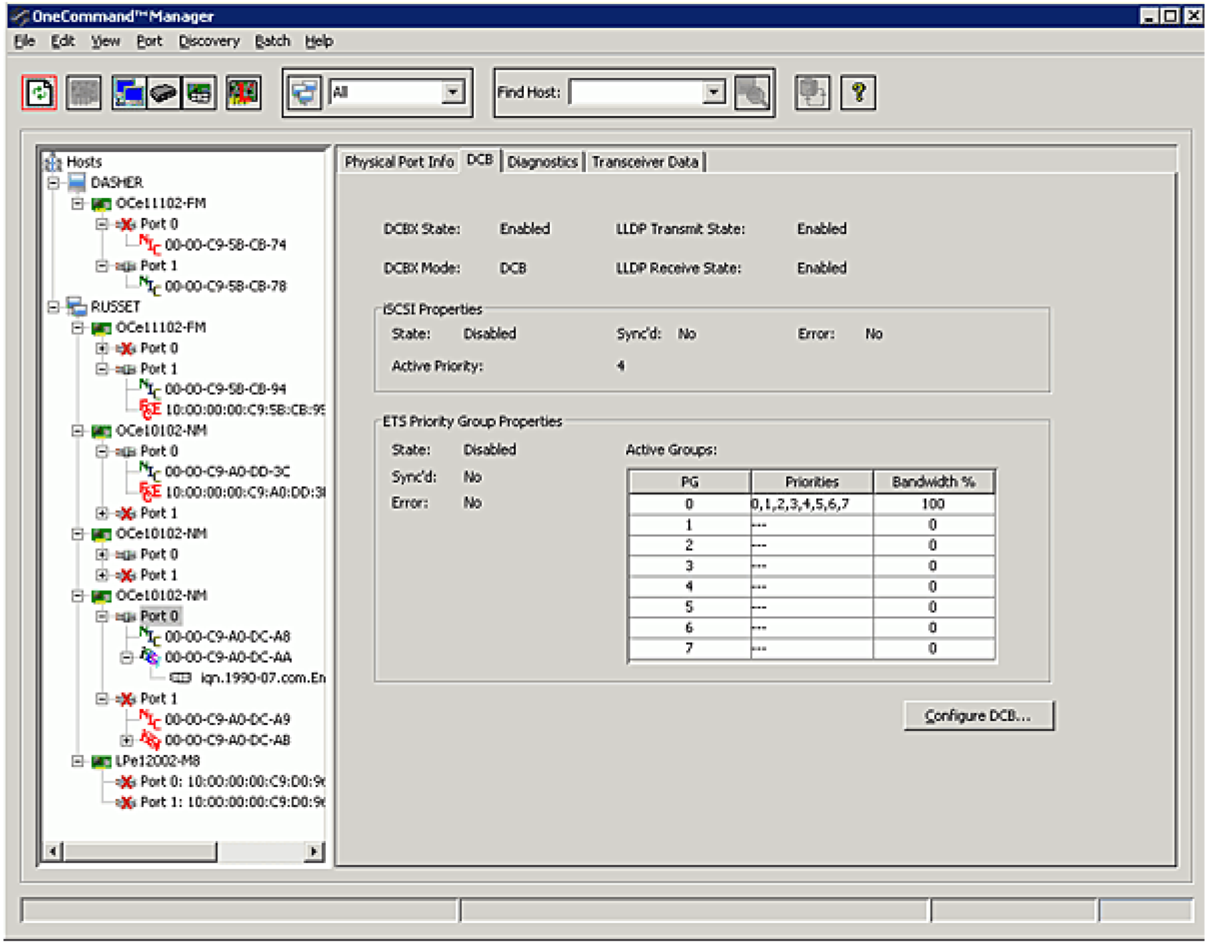
- OK - Click to apply and save your changes.
- Cancel - Click to discard any changes you made.

Configuring DCB Parameters for iSCSI Adapter Ports

The DCB tab displays parameters for iSCSI adapter ports.

To view the DCB parameters for iSCSI adapter ports:

1. From the discovery-tree, select the iSCSI adapter port whose DCB properties you want to view.
2. Select the **DCB** tab.



DCBX State: Enabled
LLDP Transmit State: Enabled
DCBX Mode: DCB
LLDP Receive State: Enabled

iSCSI Properties
State: Disabled
Sync'd: No
Error: No
Active Priority: 4

ETS Priority Group Properties
State: Disabled
Sync'd: No
Error: No

Active Groups:

PG	Priorities	Bandwidth %
0	0,1,2,3,4,5,6,7	100
1	---	0
2	---	0
3	---	0
4	---	0
5	---	0
6	---	0
7	---	0

Figure 66: DCB tab for iSCSI adapter ports (OneConnect adapter selected)

DCB Tab Field Definitions

- DCBX State -The current DCBX (Data Center discovery and Capability exchange protocol) state (enabled or disabled).
- DCBX Mode - The DCBX mode can be either CEE or CIN.
- LLDP Transmit State - DCBX uses Link Layer Discovery Protocol (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.
- LLDP Receive States - 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.

PFC Properties Area

Note: PFC is not supported on all the iSCSI adapter ports.

- State - Enabled means that flow control in both directions (Tx and Rx) is enabled.
- Active Priority - Lists the priorities with PFC set to Enabled.
- Sync'd - If yes, the PFC priorities have been set by the peer. This parameter cannot be set.
- Error - The state of Error feature. The error feature indicates whether an error has occurred during the configuration exchange with the peer or when the compatible method for the feature fails.

iSCSI Properties Area

- State - The iSCSI state. It can be Enabled or Disabled.
- Active Priority - The current active priority assigned for iSCSI.
- Sync'd - If yes, the iSCSI priority has been set by the peer. This parameter cannot be set.
- Error - The state of the iSCSI Error feature. The error feature indicates whether an error has occurred during the configuration exchange with the peer.

ETS Priority Group Properties Area

- State - The current Priority Group state. It can be Enabled or Disabled.
- Sync'd - If yes, the Priority Groups have been set by the peer. This parameter cannot be set.
- Error - The state of iSCSI Error feature. The error feature indicates whether an error has occurred during the configuration exchange with the peer.

Active Groups

- PG - The Priority Group number. It can be 0 to 7.
- Priorities - The priorities that are assigned to each Priority Group. It is represented in comma separated format.
- Bandwidth % - The percentage of available link bandwidth allocated to a particular Priority Group.
- Max Configurable PGs - This field indicates maximum number of priority groups that can be configured on the selected OneConnect adapter port.

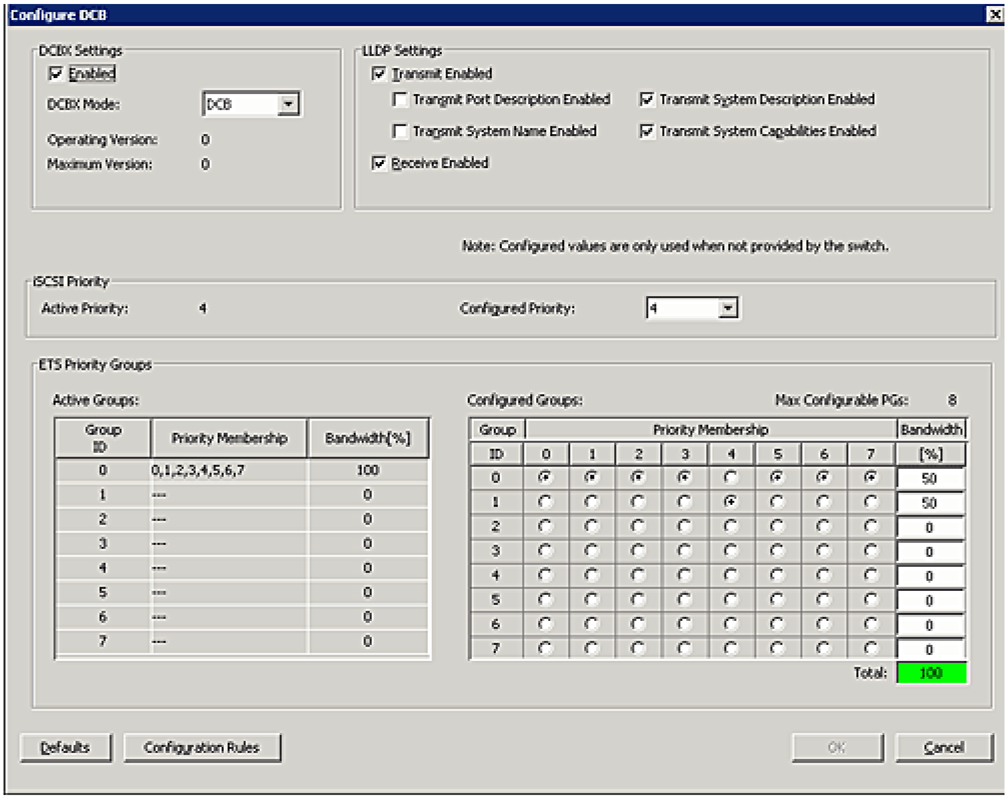
DCB Tab Buttons

- Configure DCB - Click to configure DCB parameters. See the instructions below.

To configure DCB for iSCSI adapter ports:

1. From the discovery-tree, select the iSCSI adapter port whose CEE properties you want to configure.
2. Select the **DCB** tab.
3. Click **Configure DCB**. The Configure DCB dialog box appears.
4. Configure the settings you want and click **OK**.

Note: An error message is displayed if you try to configure more priority groups than the adapter supports. The “Max Configurable PGs” field shows the number of priority groups supported by the adapter.



DCBX Settings

☑ Enabled

DCBX Mode: DCB

Operating Version: 0

Maximum Version: 0

LLDP Settings

☑ Transmit Enabled

☐ Transmit Port Description Enabled

☑ Transmit System Description Enabled

☐ Transmit System Name Enabled

☑ Transmit System Capabilities Enabled

☑ Receive Enabled

Note: Configured values are only used when not provided by the switch.

iSCSI Priority

Active Priority: 4

Configured Priority: 4

ETS Priority Groups

Active Groups:

Group ID	Priority Membership	Bandwidth[%]
0	0,1,2,3,4,5,6,7	100
1	---	0
2	---	0
3	---	0
4	---	0
5	---	0
6	---	0
7	---	0

Configured Groups:

Max Configurable PGs: 8

Group	Priority Membership								Bandwidth
ID	0	1	2	3	4	5	6	7	[%]
0	●	●	●	●	○	●	●	●	50
1	○	○	○	○	●	○	○	○	50
2	○	○	○	○	○	○	○	○	0
3	○	○	○	○	○	○	○	○	0
4	○	○	○	○	○	○	○	○	0
5	○	○	○	○	○	○	○	○	0
6	○	○	○	○	○	○	○	○	0
7	○	○	○	○	○	○	○	○	0
								Total:	100

Figure 67: Configure DCB dialog box for iSCSI adapter ports (DCBX enabled)

Configure DCB Dialog Box Field Definitions

DCBX Settings Area

- Enabled - DCBX can be enabled or disabled. With DCBX enabled, the configured values are used only if the switch does not provide them. With DCBX disabled, the configured values are used. Changes to the DCBX state require a reboot of the host.
- DCBX Mode - The DCBX mode can be set to CEE or CIN. Changes to the DCBX mode require a reboot of the host.
- Operating Version - The operating version of the DCBX protocol. The system adjusts as needed to operate at the highest version supported by both link partners. This setting cannot be changed.

- Maximum Version - The highest DCBX protocol version supported by the system. Version numbers start at zero. The DCBX protocol must be backward compatible with all previous versions. This setting cannot be changed.

LLDP Settings Area

- Transmit Enabled - LLDP Transmit can be enabled or disabled.
- Transmit Port Description Enabled - Provides a description of the port in an alpha-numeric format. The value equals the ifDescr object, if the LAN device supports RFC 2863.
- Transmit System Name Enabled - Provides the system's assigned name in an alpha-numeric format. The value equals the sysName object, if the LAN device supports RFC 3418.
- Receive Enabled - LLDP Receive can be enabled or disabled.
- Transmit System Description Enabled - Provides a description of the network entity in an alpha-numeric format. This includes the system's name and versions of hardware, operating system and networking software supported by the device. The value equals the sysDescr object, if the LAN device supports RFC 3418.
- Transmit System Capabilities Enabled - Indicates the primary function(s) of the device and whether or not these functions are enabled on the device. The capabilities are indicated by two octets. Bits 0 through 7 indicate Other, Repeater, Bridge, WLAN AP, Router, Telephone, DOCSIS cable device and Station respectively. Bits 8 through 15 are reserved.

PFC Priorities Area

- Active Priorities - The priorities that are marked active for PFC.
- Enable - When checked, PFC is enabled.
- Configured Priorities - The priorities that are configured, but might not yet be active. A maximum of two PFC priority check boxes can be selected, out of which one of them must match the iSCSI priority. The additional PFC priority would be for the Ethernet traffic. This additional PFC priority must be assigned to a priority group which has no other priorities.

iSCSI Priority Area

- Active Priority - The active iSCSI priority.
- Configured Priority - The configured iSCSI priority.

ETS Priority Groups Area

Active Groups

- Group ID - The Priority Group ID.
- Priority Membership - The different priorities that are assigned to the various Priority Groups. This is the currently active configuration.
- Bandwidth % - The bandwidths that are assigned to different Priority Groups. This is the currently active configuration.

Configured Groups

- Group ID - The Priority Group ID.
- Priority Membership - The configured priority membership grouping.
- Bandwidth % - The configured value of bandwidth for the different Priority Groups.
- Max Configurable PGs - The maximum number of Priority Groups that can be configured.

Configure DCB Dialog Box Buttons

- Defaults - Click to return parameters to default iSCSI DCB settings.

- Configuration Rules - Click to display the iSCSI Priority window that lists the rules for configuring iSCSI priorities.

  You must observe the following rules when configuring priority groups for iSCSI adapter ports:

  1 Only one priority can be configured as the iSCSI priority.

  2. A maximum of two PFC priorities can be selected and one of them must match the iSCSI priority.

  Note: Not all adapters support two PFC priorities. Adapters that do not support two PFC priorities display an error message if you try to configure more than one PFC priority.

  3. The priority group to which the iSCSI priority is assigned must contain no other priorities.

  4. The additional PFC priority must be assigned to a priority group which has no other priorities.

  5. Bandwidths of all the priority groups must add up to 100%.
- OK - Click to apply and save your changes.
- Cancel - Click to discard any changes you made.

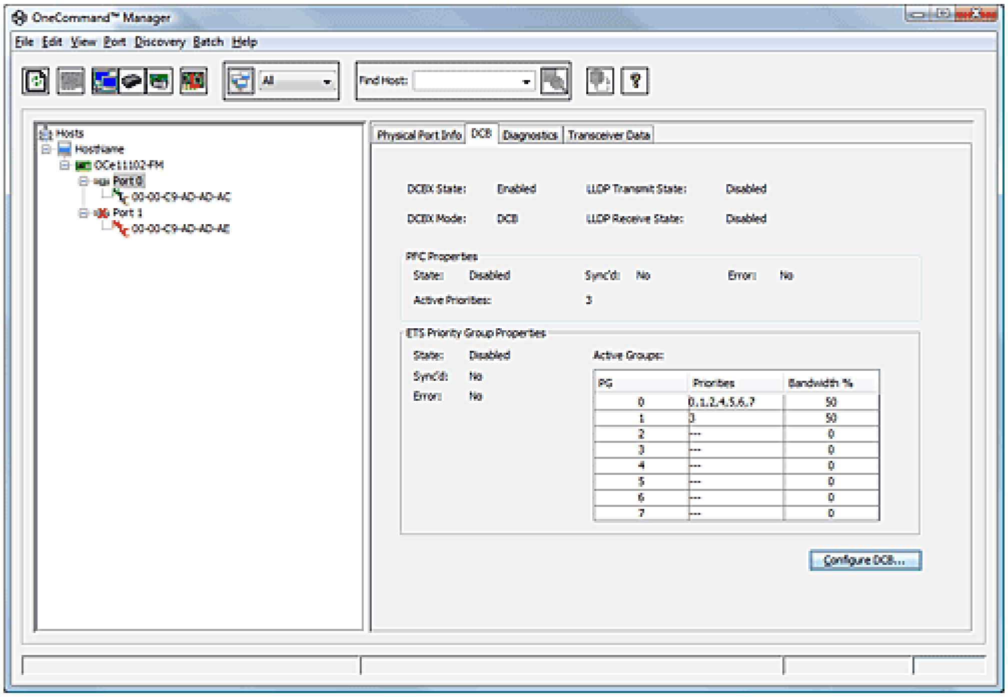
Configuring DCB Parameters for NIC-Only Adapter Ports

The DCB tab displays parameters for NIC-only adapter ports.

Note: Only OneConnect OCe11102 UCNAs support DCB for NIC-only ports.

To view the DCB parameters for NIC-only adapter ports:

1. From the discovery-tree, select the NIC adapter port whose DCB properties you want to view.
2. Select the **DCB** tab.



DCBX State: Enabled LLDP Transmit State: Disabled

DCBX Mode: DCB LLDP Receive State: Disabled

PFC Properties

State: Disabled Sync'd: No Error: No

Active Priorities: 3

ETS Priority Group Properties

State: Disabled

Sync'd: No

Error: No

Active Groups:

PG	Priorities	Bandwidth %
0	0,1,2,4,5,6,7	50
1	3	50
2	---	0
3	---	0
4	---	0
5	---	0
6	---	0
7	---	0

Figure 68: DCB tab for NIC adapter ports (OneConnect adapter selected)

DCB Tab Field Definitions

- DCBX State -The current DCBX (Data Center discovery and Capability exchange protocol) state (enabled or disabled).
- DCBX Mode - The DCBX mode can be either CEE or CIN.
- LLDP Transmit State - DCBX uses Link Layer Discovery Protocol (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.
- LLDP Receive States - 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.

PFC Properties Area

Note: PFC is not supported on all the iSCSI adapter ports.

- State - Enabled means that flow control in both directions (Tx and Rx) is enabled.
- Active Priority - Lists the priorities with PFC set to Enabled.
- Sync'd - If yes, the PFC priorities have been set by the peer. This parameter cannot be set.
- Error - The state of Error feature. The error feature indicates whether an error has occurred during the configuration exchange with the peer or when the compatible method for the feature fails.

NIC Properties Area

- State - The NIC state. It can be Enabled or Disabled.
- Active Priority - The current active priority assigned for NIC.
- Sync'd - If yes, the NIC priority has been set by the peer. This parameter cannot be set.
- Error - The state of the NICI Error feature. The error feature indicates whether an error has occurred during the configuration exchange with the peer.

ETS Priority Group Properties Area

- State - The current Priority Group state. It can be Enabled or Disabled.
- Sync'd - If yes, the Priority Groups have been set by the peer. This parameter cannot be set.
- Error - The state of NIC Error feature. The error feature indicates whether an error has occurred during the configuration exchange with the peer.

Active Groups

- PG - The Priority Group number. It can be 0 to 7.
- Priorities - The priorities that are assigned to each Priority Group. It is represented in comma separated format.
- Bandwidth % - The percentage of available link bandwidth allocated to a particular Priority Group.
- Max Configurable PGs - This field indicates maximum number of priority groups that can be configured on the selected OneConnect adapter port.

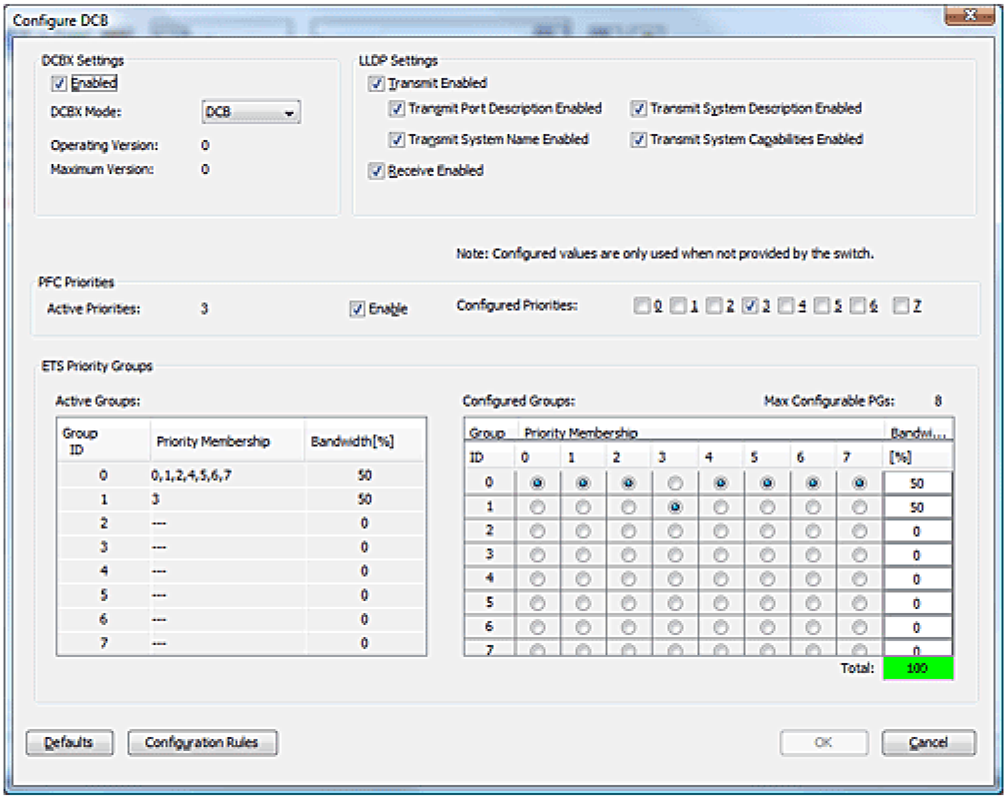
DCB Tab Buttons

- Configure DCB - Click to configure DCB parameters. See the instructions below.

To configure DCB for NIC adapter ports:

1. From the discovery-tree, select the NIC adapter port whose CEE properties you want to configure.
2. Select the **DCB** tab.
3. Click **Configure DCB**. The Configure DCB dialog box appears.
4. Configure the settings you want and click **OK**.

Note: An error message is displayed if you try to configure more priority groups than the adapter supports. The “Max Configurable PGs” field shows the number of priority groups supported by the adapter.



DCBX Settings

☑ Enabled

DCBX Mode: DCB

Operating Version: 0

Maximum Version: 0

LLDP Settings

☑ Transmit Enabled

☑ Transmit Port Description Enabled ☑ Transmit System Description Enabled

☑ Transmit System Name Enabled ☑ Transmit System Capabilities Enabled

☑ Receive Enabled

Note: Configured values are only used when not provided by the switch.

PFC Priorities

Active Priorities: 3 ☑ Enable

Configured Priorities: □ 0 □ 1 □ 2 ☑ 3 □ 4 □ 5 □ 6 □ 7

ETS Priority Groups

Active Groups:

Group ID	Priority Membership	Bandwidth[%]
0	0,1,2,4,5,6,7	50
1	3	50
2	---	0
3	---	0
4	---	0
5	---	0
6	---	0
7	---	0

Configured Groups: Max Configurable PGs: 8

Group	Priority Membership								Bandwi...
ID	0	1	2	3	4	5	6	7	[%]
0	●	●	●	○	●	●	●	●	50
1	○	○	○	●	○	○	○	○	50
2	○	○	○	○	○	○	○	○	0
3	○	○	○	○	○	○	○	○	0
4	○	○	○	○	○	○	○	○	0
5	○	○	○	○	○	○	○	○	0
6	○	○	○	○	○	○	○	○	0
7	○	○	○	○	○	○	○	○	0

Total: 100

Figure 69: Configure DCB dialog box for NIC adapter ports (DCBX enabled)

Configure DCB Dialog Box Field Definitions

DCBX Settings Area

- Enabled - DCBX can be enabled or disabled. With DCBX enabled, the configured values are used only if the switch does not provide them. With DCBX disabled, the configured values are used. Changes to the DCBX state require a reboot of the host.
- DCBX Mode - The DCBX mode can be set to CEE or CIN. Changes to the DCBX mode require a reboot of the host.
- Operating Version - The operating version of the DCBX protocol. The system adjusts as needed to operate at the highest version supported by both link partners. This setting cannot be changed.

- Maximum Version - The highest DCBX protocol version supported by the system. Version numbers start at zero. The DCBX protocol must be backward compatible with all previous versions. This setting cannot be changed.

LLDP Settings Area

- Transmit Enabled - LLDP Transmit can be enabled or disabled.
- Transmit Port Description Enabled - Provides a description of the port in an alpha-numeric format. The value equals the ifDescr object, if the LAN device supports RFC 2863.
- Transmit System Name Enabled - Provides the system's assigned name in an alpha-numeric format. The value equals the sysName object, if the LAN device supports RFC 3418.
- Receive Enabled - LLDP Receive can be enabled or disabled.
- Transmit System Description Enabled - Provides a description of the network entity in an alpha-numeric format. This includes the system's name and versions of hardware, operating system and networking software supported by the device. The value equals the sysDescr object, if the LAN device supports RFC 3418.
- Transmit System Capabilities Enabled - Indicates the primary function(s) of the device and whether or not these functions are enabled on the device. The capabilities are indicated by two octets. Bits 0 through 7 indicate Other, Repeater, Bridge, WLAN AP, Router, Telephone, DOCSIS cable device and Station respectively. Bits 8 through 15 are reserved.

PFC Priorities Area

- Active Priorities - The priorities that are marked active for PFC.
- Enable - When checked, PFC is enabled.
- Configured Priorities - The priorities that are configured, but might not yet be active. A maximum of two PFC priority check boxes can be selected, out of which one of them must match the iSCSI priority. The additional PFC priority would be for the Ethernet traffic. This additional PFC priority must be assigned to a priority group which has no other priorities.

ETS Priority Groups Area

Active Groups

- Group ID - The Priority Group ID.
- Priority Membership - The different priorities that are assigned to the various Priority Groups. This is the currently active configuration.
- Bandwidth % - The bandwidths that are assigned to different Priority Groups. This is the currently active configuration.

Configured Groups

- Group ID - The Priority Group ID.
- Priority Membership - The configured priority membership grouping.
- Bandwidth % - The configured value of bandwidth for the different Priority Groups.
- Max Configurable PGs - The maximum number of Priority Groups that can be configured.

Configure DCB Dialog Box Buttons

- Configuration Rules - Click to display the NIC Priority window that lists the rules for configuring NIC priorities.

  You must observe the following rules when configuring priority groups for NIC-Only adapter ports:

1 Only one PFC priority can be configured.
2. The PFC Priority must be assigned to a priority group which has no other priorities.
3. Bandwidths of all the priority groups must add up to 100%.

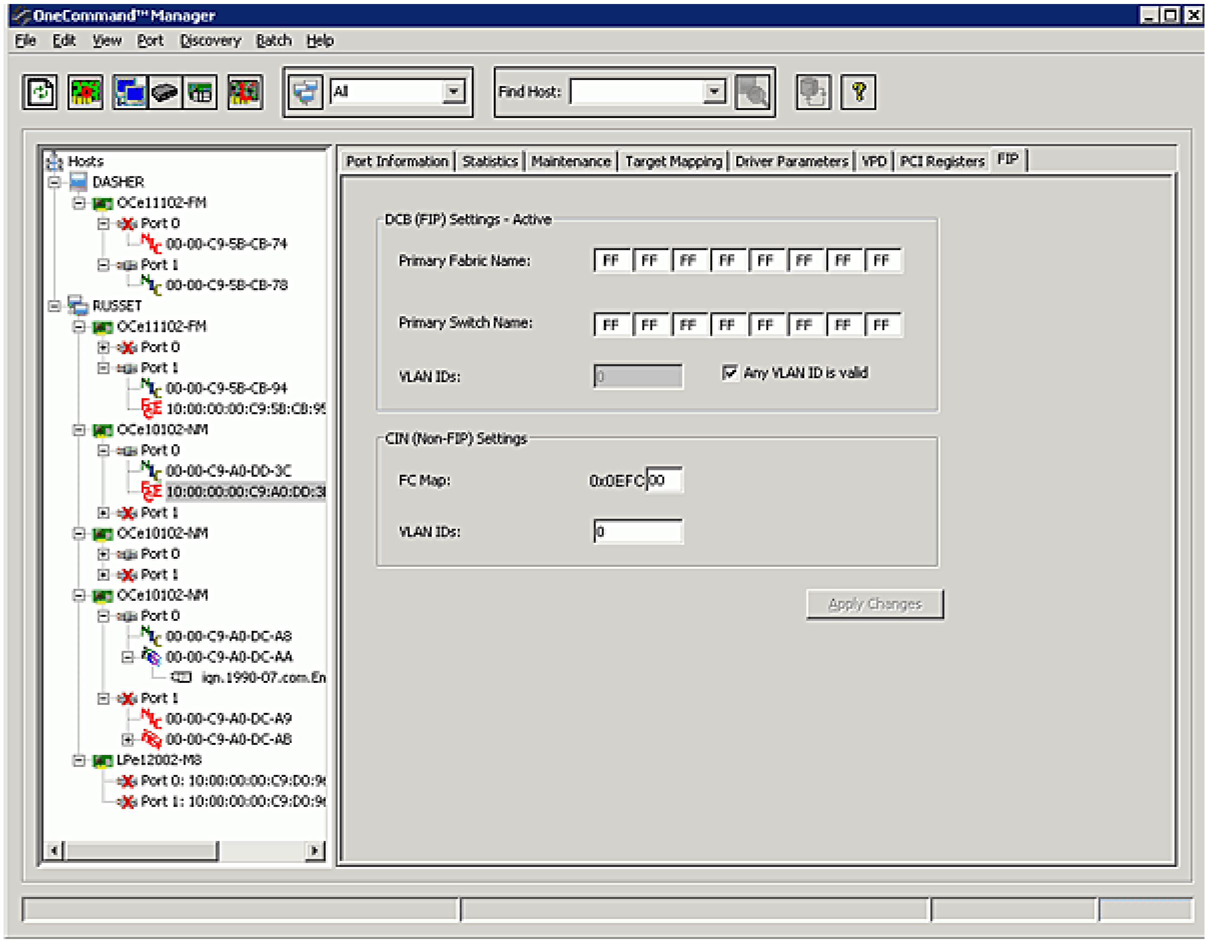
- OK - Click to apply and save your changes.
- Cancel - Click to discard any changes you made.

Configuring FCoE Initialization Protocol (FIP) for FCoE Adapters

The FIP tab enables you to configure FIP for FCoE adapters.

To configure FIP:

1. From the discovery-tree, select the FCoE adapter whose FIP properties you want to configure.
2. Select the **FIP** tab.
3. Set the parameters you want and click **Apply Changes**.



DCB (FIP) Settings - Active

Primary Fabric Name: FF FF FF FF FF FF FF FF

Primary Switch Name: FF FF FF FF FF FF FF FF

VLAN IDs: 0 ☑ Any VLAN ID is valid

CIN (Non-FIP) Settings

FC Map: 0x0EFC 00

VLAN IDs: 0

Figure 70: FIP tab for FCoE adapters

FIP Dialog Box Field Descriptions

DCB Settings Area

Note: DCB settings are only applicable when the DCBX Mode in the DCB tab is set to DCB.

Note: In the illustration, the "DCB (FIP) Settings" group box also has "Active" its title. This means that DCB (FIP) is the current DCBX mode (DCBX mode is set from the DCB tab). If CIN (Non-FIP) was the current DCBX mode, "Active" would be in the "CIN (Non-FIP) Settings" group box title.

- Primary Fabric Name - Indicates the FC Fabric's WWN to which to connect. If the Primary Fabric Name is wild, i.e. all 0xFFs, then connection to any fabric name is allowed.
- Primary Switch Name - Indicates the FC Switch's WWN to which to connect. If the Primary Switch Name is wild, i.e. all 0xFFs, then connection to any switch name is allowed.
- VLAN ID - Determines the VLAN where the adapter FCoE services are available. It can have a value from 0-4095 and supports wild card values if “Any” is checked.
- Any VLAN ID is valid check box - When checked, the VLAN ID field of the FCoE forwarder can be any valid value.

CIN Settings Area

- FC Map - Enter the bit value that completes the fabric-provided MAC address (FPMA).
- VLAN ID - Determines the VLAN where the adapter FCoE services are available. It can have a value from 0-4095.

Managing Ports

Changing Adapter Port Names (FC Ports Only)

The OneCommand Manager application enables you to change FC adapter port names. (Not available in read-only mode.)

For example, you may want to identify a particular adapter port with the function it supports, such as a tape drive, scanner, or some other device. Use any characters you want for names, and names can be up to 255 characters in length. You can also revert to the adapter's default name.

Note: Although you can change the adapter port’s displayed name from the default WWN, the change occurs in the discovery-tree only. The WWN is still active, it is simply replaced for display purposes with the name you enter. For example, the Port WWN field of the Port Information tab is not changed. Also, any change you make to the adapter port names in your discovery-tree are seen only by you; users running the OneCommand Manager application on another host do not see your name changes.

To change the name of an adapter:

1. From the discovery-tree, select the FC port whose name you want to change.
2. Do one of the following:
   - Select **Edit Name** from the **Port** menu.
   - From the discovery-tree, right-click the port whose name you want to change and select **Change Name**.
3. Edit the port name in the discovery-tree.

To use the adapter port’s default name:

1. From the discovery-tree, select the FC port whose name you want to change.
2. Do one of the following:
   - Select **Use Default Name** from the **Port** menu.

- From the discovery-tree, right-click the port whose name you want to change and select **Restore Default Name**.

Resetting Adapter Ports (FC/FCoE Ports Only)

You can reset remote and local adapter ports. (Not available in read-only mode or on NIC or iSCSI adapter ports.)

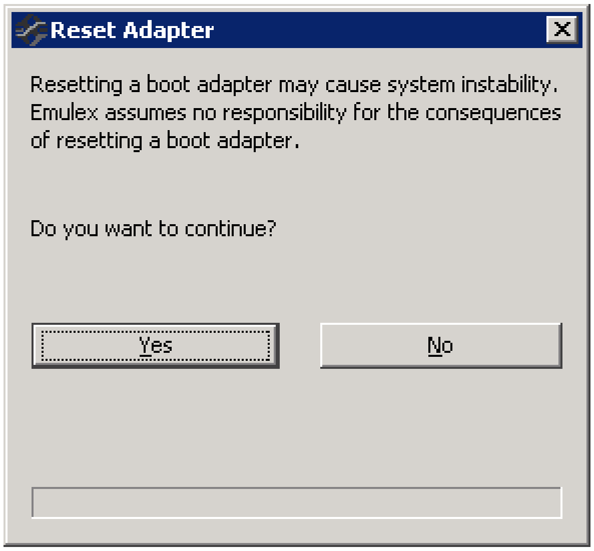
Caution: Do not reset your adapter port while copying or writing files. This could result in data loss or corruption.

Note: For OneConnect FCoE ports, a reset is only necessary to activate updated driver parameters or FIP settings. It does not actually perform an adapter level reset of the port.

To reset the adapter port:

1. In the discovery-tree, select the adapter port you want to reset.
2. Do one of the following:
   - From the **Port** menu, click **Reset Port**.
   - Click the **Reset** toolbar button.

   The following warning appears:



Resetting a boot adapter may cause system instability. Emulex assumes no responsibility for the consequences of resetting a boot adapter.

Do you want to continue?

Figure 71: Reset Warning

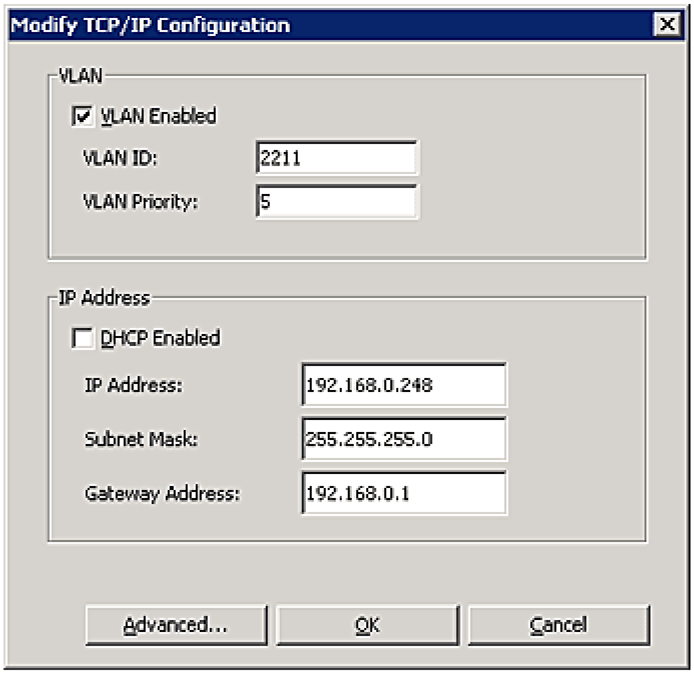
3. Click **Yes**. The adapter port resets.

   The reset can require several seconds to complete. While the adapter port is resetting, the status bar shows “Reset in progress.” When the reset is finished, the status bar shows “Reset Completed”.

Modifying TCP/IP iSCSI Port Configuration

The Modify TCP/IP Configuration dialog box allows you to enable or disable VLANs, assign VLAN IDs and priorities, enable or disable DHCP and change the IP address and subnet mask and gateway address for the selected iSCSI port.

Note: Checking DHCP Enabled to automatically obtain an IP address disables the IP address and subnet mask fields.



VLAN

☑ VLAN Enabled

VLAN ID: 2211

VLAN Priority: 5

IP Address

□ DHCP Enabled

IP Address: 192.168.0.248

Subnet Mask: 255.255.255.0

Gateway Address: 192.168.0.1

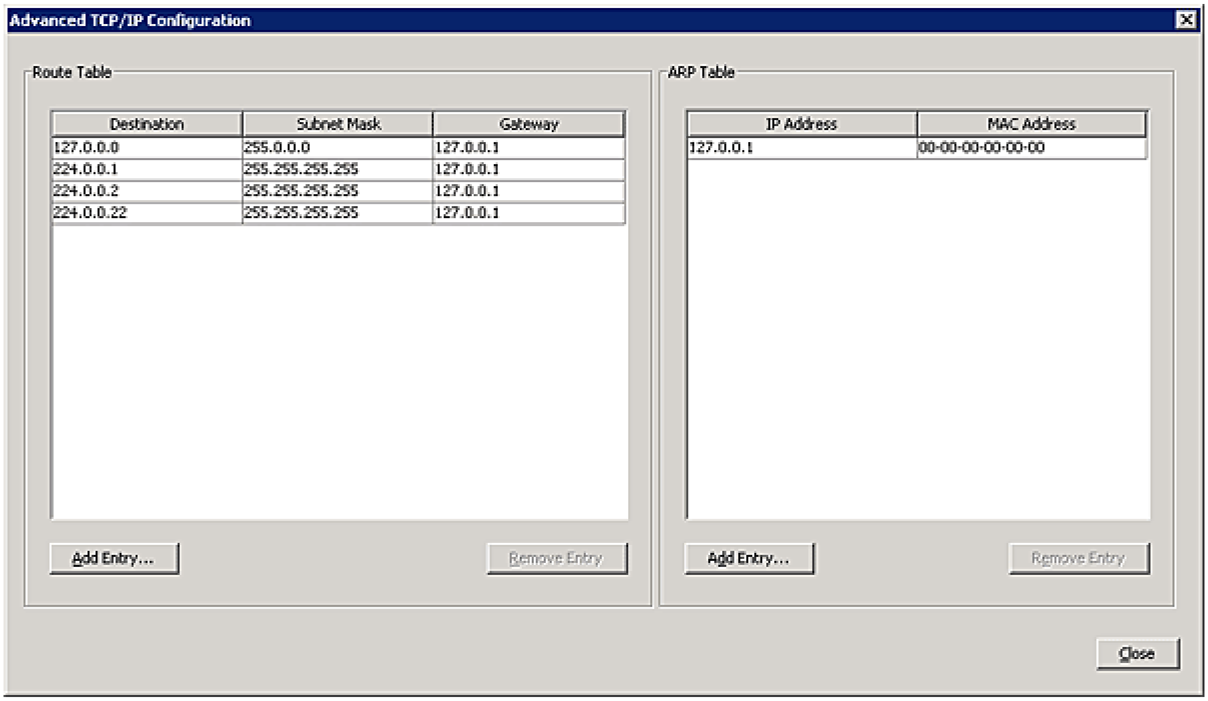
Figure 72: Modify TCP/IP Configuration dialog box

To modify TCP/IP configurations for iSCSI ports:

1. From the discovery-tree, select the iSCSI port whose configuration you want to modify.
2. Select the **iSCSI Port Info** tab and click **Modify**. The Modify TCP/IP Configuration dialog box appears.
3. Make your changes and click **OK**.

Advanced TCP/IP Configuration

The Advanced TCP/IP Configuration dialog box enables you to add and remove Route and Address Resolution Procotol (ARP) Table entries for the selected iSCSI port.



Advanced TCP/IP Configuration

Route Table

Destination	Subnet Mask	Gateway
127.0.0.0	255.0.0.0	127.0.0.1
224.0.0.1	255.255.255.255	127.0.0.1
224.0.0.2	255.255.255.255	127.0.0.1
224.0.0.22	255.255.255.255	127.0.0.1

ARP Table

IP Address	MAC Address
127.0.0.1	00-00-00-00-00-00

Figure 73: Advanced TCP/IP Configuration dialog box

To add table entries:

1. From the discovery-tree, select the iSCSI port whose configuration you want to modify.
2. Select the **iSCSI Port Info** tab and click **Modify**. The Modify TCP/IP Configuration dialog box appears.
3. Click **Advanced**. The Advanced TCP/IP Configuration dialog box appears.
4. From the Route Table or ARP Table sections, click **Add Entry**.
5. Enter the Route Table or ARP Table information and click **OK**. The entry you added appears in the table.

To delete table entries:

1. From the discovery-tree, select the iSCSI port whose configuration you want to modify.
2. Select the **iSCSI Port Info** tab and click **Modify.** The Modify TCP/IP Configuration dialog box appears.
3. Click **Advanced**. The Advanced TCP/IP Configuration dialog box appears.
4. From the Route Table or ARP Table sections, select the entry you want to delete and click **Remove Entry**. The entry you removed is deleted from the table.

Enabling and Disabling FC Ports

Using the Port Information tab you can enable or disable FC ports. When you disable an FC port, you disable all functions for the port. Disabled ports appear in the discovery-tree with a red X.

Note: Ensure there is no I/O traffic on the port before disabling it and never disable a boot port.

To enable or disable an FC port:

1. In the discovery-tree, select the FC port you want to enable or disable.
2. Select the **Port Information** tab.
3. Click **Enable Port** or **Disable Port**.

Enabling and Disabling Physical Ports (OneConnect Adapters Only)

Using the Physical Port Info tab you can enable or disable the physical port. When you disable a physical port, you disable all functions, such as iSCSI and NIC, for the port. Disabled ports appear in the discovery-tree with a red X.

Note: You cannot disable a port if PXE Boot is enabled or if any of the iSCSI target sessions are boot sessions.

To enable or disable a physical port:

1. In the discovery-tree, select the physical port you want to enable or disable.
2. Select the **Physical Port Info** tab.
3. Click **Enable Port** or **Disable Port**.

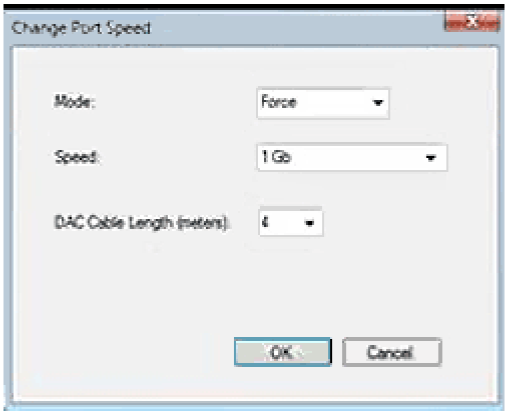
Setting Port Speed and DAC Cable Length (OneConnect OCe11102 Series Adapters Only)

The Physical Port info tab enables you to set port speed and DAC cable lengths for OCe11102 series adapters.

To set the port speed for OCe11102 series adapters:

1. From the discovery-tree, select the OCe11102 series adapter port whose speed you want to change.

2. Click **Set Speed** on the Physical Port Info tab. The Change Port Speed dialog box appears.



Change Port Speed

Mode: Force

Speed: 1 Gb

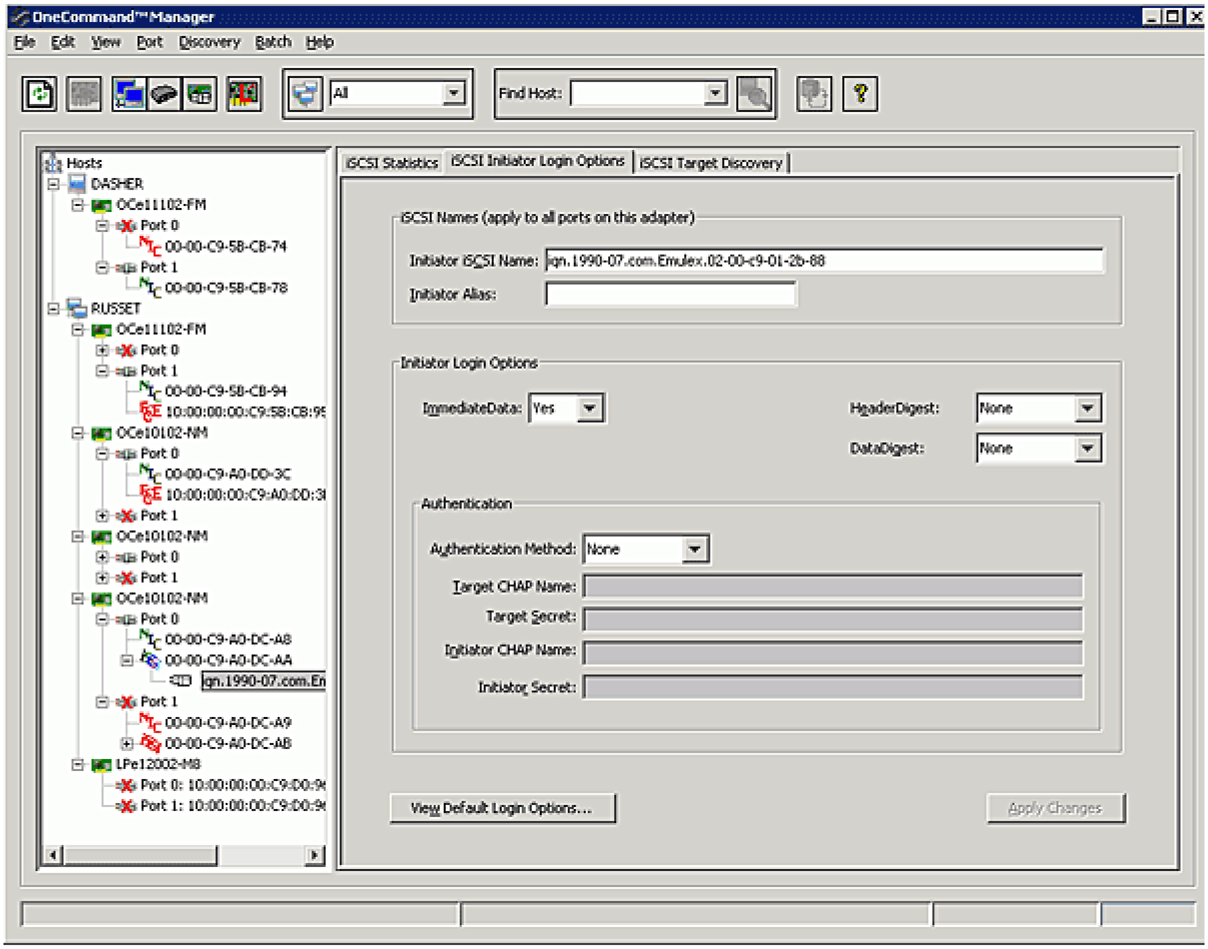
DAC Cable Length (meters): 4

Figure 74: Change Port Speed dialog box (Force mode/10Gb speed selected)

3. Set the desired mode and port speed.
4. If you set the Mode to “Force” and the Speed to “10 GB SFP+” you must set the DAC cable length.
5. Click **OK**.

Configuring iSCSI Port Initiator Login Options

The iSCSI Initiator Login Options dialog box enables you to configure the set of login options used by the iSCSI initiator when logging into a target portal or by the target portal when it is discovering targets. The discovered targets inherit the login options used during this discovery. Target portals discovered via iSNS also use these login options. The dialog box contains the initiator iSCSI Qualified Name (IQN) and fields for manually entering the IQN and an optional initiator alias. Initiator login options are controlled using several drop down boxes. You can also configure the initiator authentication method and view the factory default login options.



iSCSI Names (apply to all ports on this adapter)

Initiator iSCSI Name: iqn.1990-07.com.Emulex.02-00-c9-01-2b-88

Initiator Alias:

Initiator Login Options

ImmediateData: Yes

HeaderDigest: None

DataDigest: None

Authentication

Authentication Method: None

Target CHAP Name:

Target Secret:

Initiator CHAP Name:

Initiator Secret:

Figure 75: iSCSI Initiator Login Options tab

Initiator Login Options Tab Field Definitions

iSCSI Names Area

- Initiator iSCSI Name - The iSCSI qualifier name of the initiator.
- Initiator Alias - An optional non-unique string used to identify the initiator.

Initiator Login Options Area

- ImmediateData - Defines whether the initiator may append unsolicited data to a SCSI command. Possible values are “Yes” and “No”.

- HeaderDigest - When set to “CRC32C”, and the initiator is configured accordingly, the integrity of an iSCSI PDU's header segments are protected by a CRC32C checksum. Possible values are “CRC32C” and “None”.
- DataDigest - When set to “CRC32C” and the initiator is configured accordingly, the integrity of an iSCSI PDU's data segment is protected by a CRC32C checksum. Possible values are “CRC32C” and “None”.

Authentication Area

- Authentication Method - Three options are available for the Authentication method: “None”, “One-Way CHAP” and “Mutual CHAP”. One-Way CHAP requires only that the authenticator (iSCSI target) authenticate the iSCSI initiator. Mutual CHAP requires that both the iSCSI target and iSCSI initiator authenticate each other. When “None” is selected, no authentication is performed.
- Target CHAP Name - The iSCSI login name sent by the initiator to the target for authentication. This parameter is required for both One-Way CHAP and Mutual CHAP authentication. The parameter is also known as the username. It can be any sequence of characters and numbers. The minimum length of the name is 1 character and the maximum length is 256 characters.
- Target Secret - The iSCSI login secret sent by the initiator to the target for authentication. This parameter is required for both One-Way CHAP and Mutual CHAP authentication. It can be any sequence of characters and numbers. The minimum length of the secret is 12 characters and maximum length is 16 characters.
- Initiator CHAP Name - The iSCSI login name sent by the target to the initiator for authentication. This parameter is only required for Mutual CHAP authentication. The parameter is also known as the username. It can be any sequence of characters and numbers. The minimum length of the name is 1 character and the maximum length is 256 characters.
- Initiator Secret - The iSCSI login secret sent by the target to the initiator for authentication. This parameter is only required for Mutual CHAP authentication. It can be any sequence of characters and numbers. The minimum length of the secret is 12 characters and the maximum length is 16 characters.

Target Information Tab Buttons

- View Default Login Options - Click this button to see the default login settings.
- Apply Changes - Click this button to save and apply your changes.

To configure iSCSI port initiator login:

1. In the discovery-tree, select the iSCSI port you want to configure.
2. Select the **iSCSI Initiator Login Options** tab and make your changes.
3. Click **Apply Changes**.

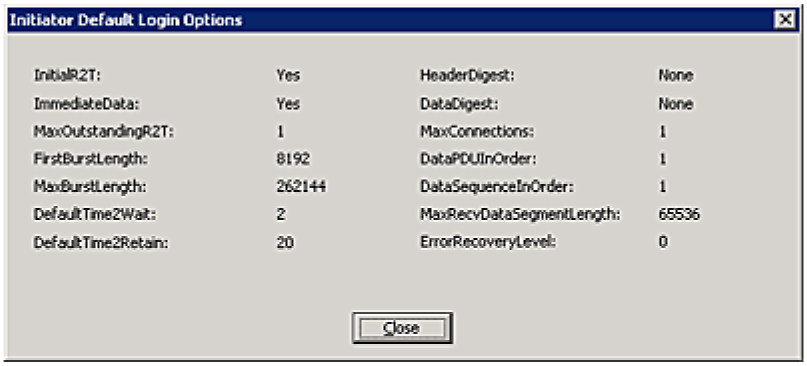
Note: Any changes to the iSCSI initiator name and alias apply to all ports on the adapter (i.e. all iSCSI ports share the iSCSI initiator name and alias).

Note: On Windows platforms running the Microsoft iSCSI initiator, the initiator iSCSI name is the Microsoft iSCSI iqn. If you change it, the change remains in effect until the system is rebooted. After reboot, the Microsoft iqn is used again as the iSCSI initiator name.

To view default login options:

1. In the discovery-tree, select the iSCSI port whose default login settings you want to view.

2. Select the **iSCSI Initiator Login Options** tab and click **View Default Login Options**. The Initiator Default Login Options window appears.



Initiator Default Login Options

InitialR2T:	Yes	HeaderDigest:	None
ImmediateData:	Yes	DataDigest:	None
MaxOutstandingR2T:	1	MaxConnections:	1
FirstBurstLength:	8192	DataPDUInOrder:	1
MaxBurstLength:	262144	DataSequenceInOrder:	1
DefaultTime2Wait:	2	MaxRecvDataSegmentLength:	65536
DefaultTime2Retain:	20	ErrorRecoveryLevel:	0

Figure 76: Initiator Default Login Options window

Initiator Default Login Options Field Definitions

- Immediate Data - If set to Yes, allows the initiator to append unsolicited data to a command.
- MaxOutstandingR2T - The maximum number of outstanding request to transmit's (R2T's) per task within a session, each up to MaxBurstLength bytes.
- FirstBurstLength - The maximum amount of unsolicited data (in bytes) the initiator can send to the target during the execution of a single iSCSI command.
- MaxBurstLength - The maximum amount of either unsolicited or solicited data the initiator may send in a single burst. Any amount of data exceeding this value must be explicitly solicited by the target.
- DefaultTime2Wait - The minimum time to wait, in seconds, before the initiator attempts to reconnect or reassign a connection (or task) that has been dropped after an unexpected connection termination or reset. The initiator and target negotiate to determine this value.
- DefaultTime2Retain - The maximum time, in seconds, to reassign a connection after the initial wait that is indicated in DefaultTime2Wait has elapsed. The initiator and target negotiate to determine this value.
- DataPDUInOrder - The order of data PDUs within a sequence.
- DataSequenceInOrder - The order between sequences.
- HeaderDigest - The valid values for this property are CRC32C or None. If set to CRC32C and the initiator is configured accordingly, the integrity of an iSCSI PDU's header segments is protected by a CRC32C checksum.
- DataDigest - The valid values for this property are CRC32C or None. If set to CRC32C and the initiator is configured accordingly, the integrity of an iSCSI PDU's data segment is protected by a CRC32C checksum.
- MaxConnections - The maximum number of connections to targets that are allowed within a single session.
- MaxRecvDataSegmentLength - The maximum data segment length in bytes an initiator or target can receive in an iSCSI PDU.
- ErrorRecoveryLevel - The operational ErrorRecoveryLevel for the session. 0 indicates recovery only by session restart. 1 indicates recovery by reissuing commands, data, or status. 2 indicates connection failure recovery.

Changing World Wide Name Configuration (FC/FCoE Ports Only)

The Maintenance tab enables you to change the World Wide Port Name (WWPN) and the World Wide Node Name (WWNN) of a selected adapter port. For example, you might want to use an installed adapter as a standby in case another installed adapter fails. By changing the standby adapter's WWPN or WWNN it can assume the identity and configuration (e.g. driver parameters, persistent binding settings, etc.) of the failed adapter.

There are three options for referencing WWNs:

- Factory Default WWN - As shipped from the factory.
- Non-Volatile WWN - Values that are saved in non-volatile adapter’s flash memory that survives a reboot and/or power outage.
- Volatile WWN - A temporary value that is saved in volatile memory on the flash. If volatile WWNs are set, they are used instead of the non-Volatile WWNs.

  Volatile WWN changes require a warm system reboot in order to take effect. Volatile WWN changes are lost on systems that power cycle the adapters during the reboot.

Caution: Changing volatile WWNs takes the selected adapter offline. Ensure that this adapter is not controlling a boot device and all I/O activity on this adapter is stopped before proceeding. Emulex assumes no responsibility for the consequences of making volatile WWN changes on a boot adapter.

Note: To avoid address conflicts, do not assign a WWNN or WWPN with the OneCommand Manager application if you also use another address management tool.

Note: The Change WWN button is disabled for adapters selected on remote hosts running older versions of the OneCommand Manager application . The WWPN and WWNN in the Pending Changes area show “n/a” instead of “none”. This also happens when the remote host is busy processing some critical task and WWN Management cannot obtain the current state of WWN management.

Note: In an environment where preboot management exists, A WWPN/WWNN modified by the OneCommand Manager application can be overridden by preboot management such as IBM BOFM and industry standard CLP.

For example:
1. In an environment with CLP/BOFM:
The OneCommand Manager application modifies the WWNN/WWPN. The OneCommand Manager application requires a reboot to complete the change. After reboot, the CLP string is sent during system boot and rewrites the WWNN/WWPN or EFIBoot finds the BOFM protocol and uses the default WWNN/WWPN per BOFM's command.

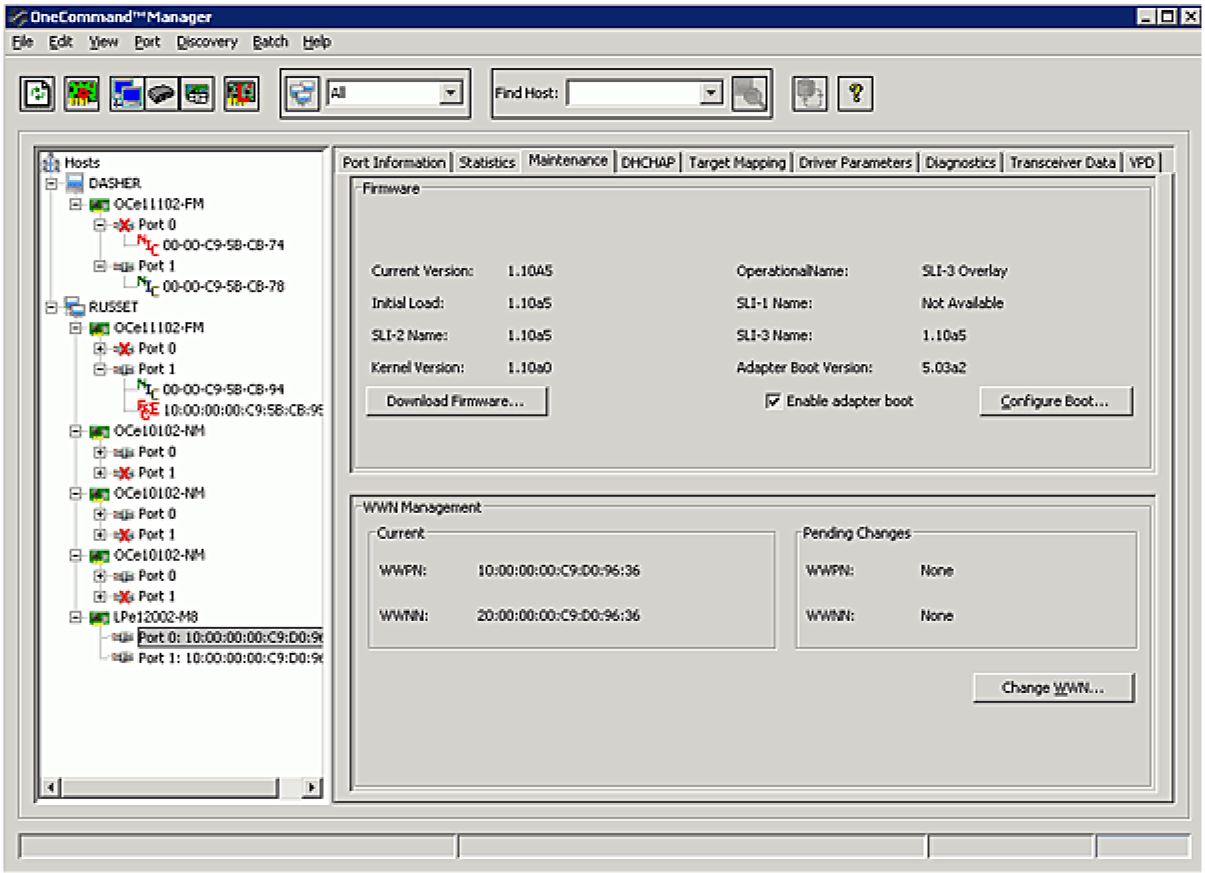
2. In environment without CLP/BOFM:
The OneCommand Manager application modifies the WWNN/WWPN. The OneCommand Manager application requires a reboot to complete the change. The system comes up and the OneCommand Manager application-modified WWNN/WWPN is used.

To change a port's WWPN or WWNN:

1. Do one of the following:
   - From the **View** menu, click **Group Adapters by Host Name**.

- From the toolbar, click **Group Adapters by Host Name**.
- From the **Host Grouping** menu, select **Group Adapter by Fabric Names**.

2. In the discovery-tree, select the port whose information you want to change.
3. Select the **Maintenance** tab.



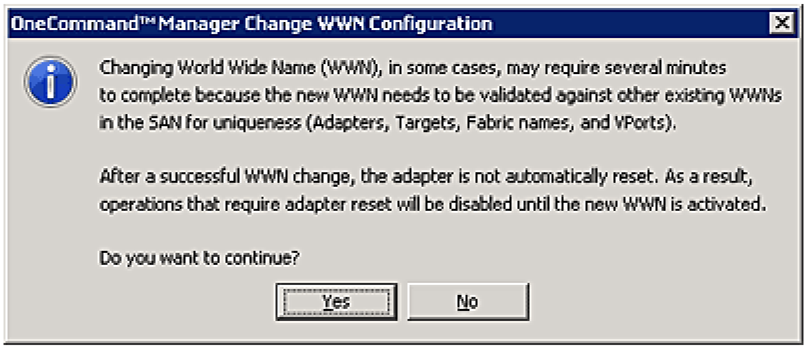
Current Version: 1.10A5
Initial Load: 1.10a5
SLI-2 Name: 1.10a5
Kernel Version: 1.10a0
OperationalName: SLI-3 Overlay
SLI-1 Name: Not Available
SLI-3 Name: 1.10a5
Adapter Boot Version: 5.03a2
☑ Enable adapter boot

Current
WWPN: 10:00:00:00:C9:D0:96:36
WWNN: 20:00:00:00:C9:D0:96:36

Pending Changes
WWPN: None
WWNN: None

Figure 77: Maintenance tab

4. Click **Change WWN**. The following warning appears:



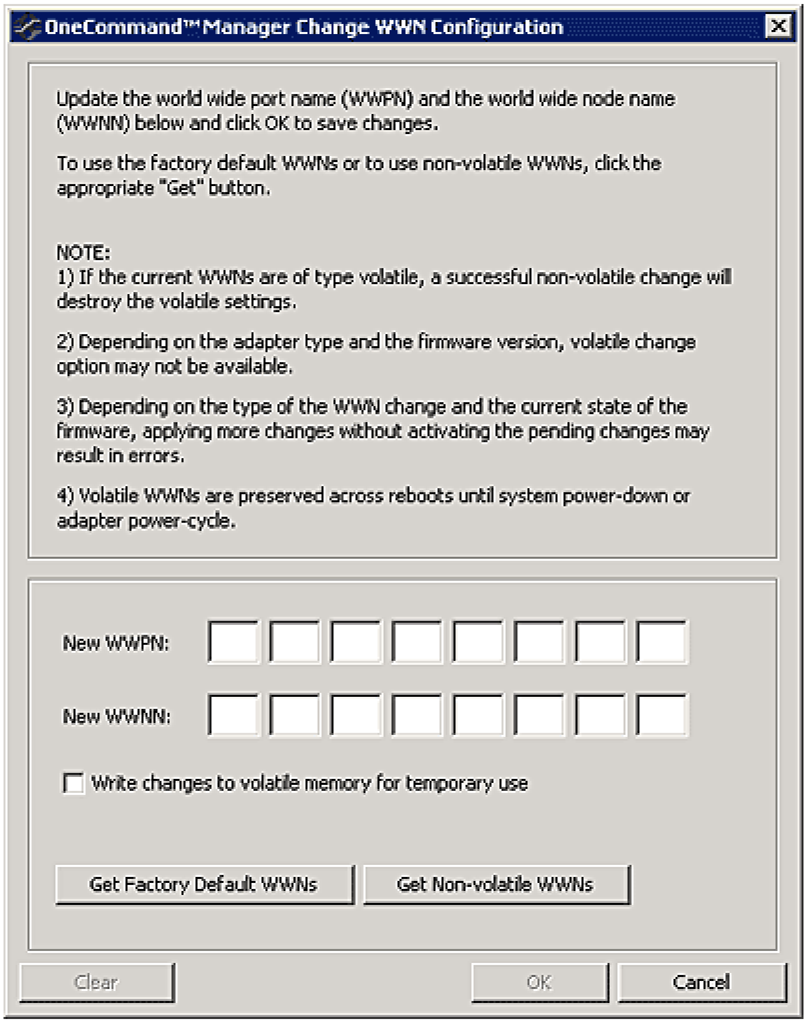
Changing World Wide Name (WWN), in some cases, may require several minutes to complete because the new WWN needs to be validated against other existing WWNs in the SAN for uniqueness (Adapters, Targets, Fabric names, and VPorts).

After a successful WWN change, the adapter is not automatically reset. As a result, operations that require adapter reset will be disabled until the new WWN is activated.

Do you want to continue?

Figure 78: Warning About Changing WWN

5. Click **Yes**. The Change World Wide Name Configuration dialog box appears.



Update the world wide port name (WWPN) and the world wide node name (WWNN) below and click OK to save changes.

To use the factory default WWNs or to use non-volatile WWNs, click the appropriate "Get" button.

NOTE:
1) If the current WWNs are of type volatile, a successful non-volatile change will destroy the volatile settings.

2) Depending on the adapter type and the firmware version, volatile change option may not be available.

3) Depending on the type of the WWN change and the current state of the firmware, applying more changes without activating the pending changes may result in errors.

4) Volatile WWNs are preserved across reboots until system power-down or adapter power-cycle.

New WWPN:

New WWNN:

□ Write changes to volatile memory for temporary use

Figure 79: Change World Wide Name Configuration dialog box

6. Do one of the following:
   - Enter a new WWPN and/or WWNN.
   - Click **Get Factory Default WWNs** to load the settings that were assigned when the adapter was manufactured to the New WWPN and WWNN settings. These values can then be modified if desired and saved as Volatile or Non-Volatile WWNs.
   - Click **Get Non-Volatile WWNs** to load the current Non-Volatile WWN settings to the New WWPN and WWNN settings. These values can then be modified if desired and saved to volatile or non-volatile memory.You can edit the data returned from the button.
7. Check **Write changes to volatile memory for temporary use** to save the New WWPN and New WWNN settings as Volatile WWNs. If unchecked, the New WWPN and New WWNN settings are saved as Non-Volatile WWNs.

Note: If the adapter or firmware does not support Volatile WWNs, the “Write changes to volatile memory for temporary use” checkbox is disabled. This type of change is supported locally and via TCP/IP connections. This checkbox is disabled for remote in-band adapters regardless of adapter models and firmware version.

8. Click **OK**. The New WWPN and new WWNN values are saved for Volatile or Non-Volatile use. The new WWPN and WWNN appear in the Pending Changes section in the WWN Management area of the Maintenance tab.
9. Reboot the system for the changes to take effect. The new WWPN and WWNN will appear in the Pending Changes section of the Maintenance dialog box until the system is rebooted. After rebooting, the changes are applied and appear in the Current section of the Maintenance dialog box.

Note: For VMware ESX 3i and ESXi 4.x: After changing the WWN of an adapter, you must reboot the system before trying to access the adapter on that system. Refer to VMware’s documentation to learn how.

Note: For ESXi 4.x: If you are using the CIM Interface to access adapters, after changing the WWN of an adapter you must restart the CIMOM (i.e. SFCB) on the ESX 4.0 system before trying to access the adapter on that system. Refer to VMware’s documentation to learn how to restart the CIMOM.

Creating and Deleting FC Virtual Ports (FC and FCoE Ports Only)

Creating Virtual Ports

The OneCommand Manager application can automatically generate the WWPN for the virtual port based on the WWPN for the physical port or you can manually type the WWPN. You cannot generate virtual ports on 1 Gb/s and 2 Gb/s adapters.

Note: Neither the OneCommand Manager application nor the hbacmd utility can be used to create or delete virtual ports on any VMware ESX server. Whereas VMware ESX server supports NPIV, only VMware management tools can be used to create and delete virtual ports.

Note: In Linux, virtual ports do not persist across system reboots.

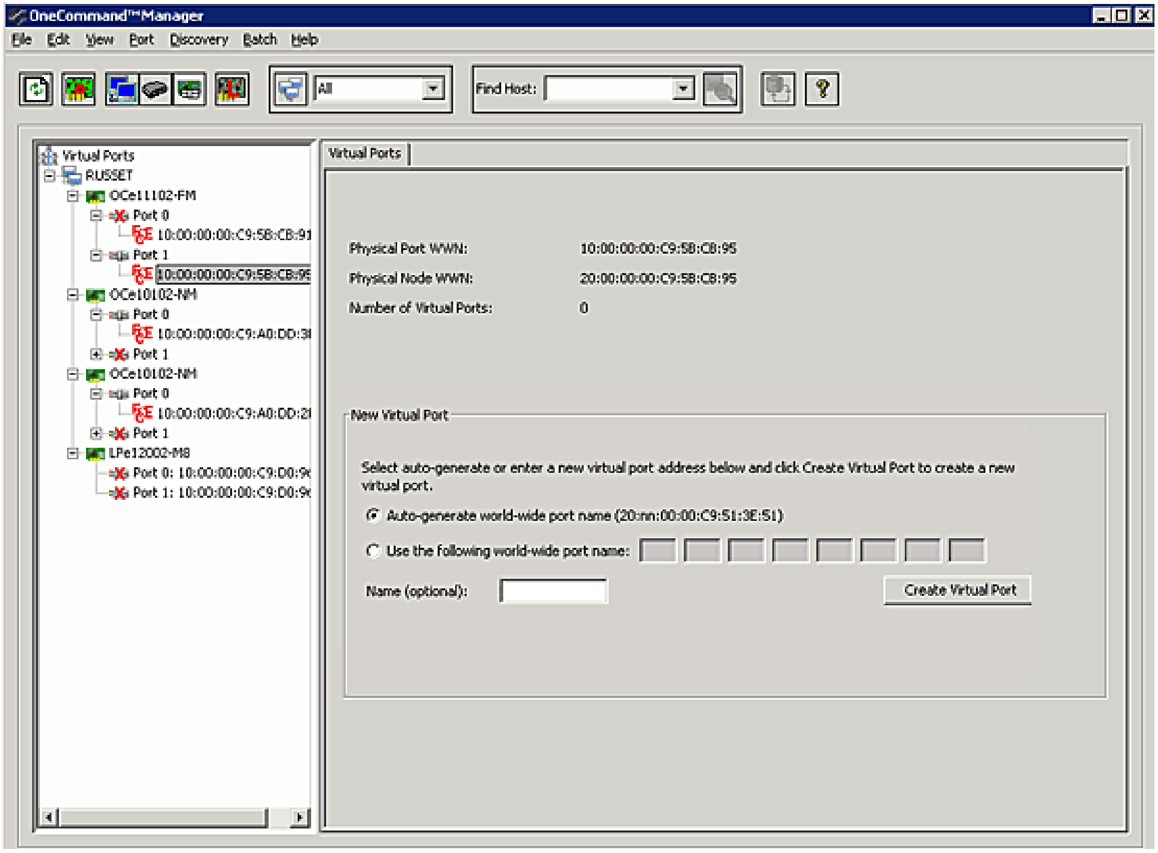
The NPIV driver parameter must be enabled before attempting to create a virtual port. The driver parameter name varies slightly depending upon your operating system:

- For Windows: enableNPIV. On the Storport Miniport system, the SLIMode driver parameter must also be set to 0 or 3.
- For Solaris: enable-npiv
- For Linux 8.2: lpfc_enable_npiv

See “Configuring the FC/FCoE Adapter Driver” on page 100 for more information on enabling driver parameters.

To create a virtual port:

1. Do one of the following:
   - From the **View** menu, select **Group Adapters by Virtual Ports**.
   - From the toolbar, click **Group Adapters by Virtual Ports**.
2. From the discovery-tree, select the adapter port on which you want to create a virtual port. The Virtual Ports tab appears.



Physical Port WWN: 10:00:00:00:C9:5B:CB:95

Physical Node WWN: 20:00:00:00:C9:5B:CB:95

Number of Virtual Ports: 0

New Virtual Port

Select auto-generate or enter a new virtual port address below and click Create Virtual Port to create a new virtual port.

● Auto-generate world-wide port name (20:nn:00:00:C9:51:3E:51)

○ Use the following world-wide port name:

Name (optional):

Create Virtual Port

Figure 80: Virtual Ports tab

3. Do one of the following:

    - Check **Auto-generate world wide port name**. The OneCommand Manager application creates the unique WWPN for the new virtual port based on the WWPN of the physical port. This option allows you to automatically create up to 255 unique virtual ports for each physical port. It also has the advantage that the new WWPN is unique.

    Note: After auto-generating 255 unique virtual ports, you cannot auto-generate any more virtual ports even if you delete existing auto-generated ports. However, you can still enter your own World-Wide Port Name to create a virtual port.

    - Check **Use the following world-wide port name** and enter a unique WWPN you want to use. You can create as many virtual ports as you want. A valid port name must have one of the following formats:

    ```
    10:00:xx:xx:xx:xx:xx:xx
    2x:xx:xx:xx:xx:xx:xx:xx
    3x:xx:xx:xx:xx:xx:xx:xx
    5x:xx:xx:xx:xx:xx:xx:xx
    ```

    where x is a hexadecimal value.

    Caution: Ensure that a manually entered WWPN is unique to your particular SAN. Failure to do so could result in a non-functioning SAN and data loss.

4. Enter an optional name for the virtual port if you want. You can give the new virtual port any name you want up to 99 characters in length. This name is used as part of the Symbolic Node Name for the VPort.
5. Click **Create Virtual Port**. A dialog box appears notifying you that the virtual port was created. The dialog box also displays the new virtual port's WWPN. Each virtual port has its own WWPN, but its WWNN is the same as the physical port's WWNN.

   Note: If you entered a WWPN that is already in use, you are prompted to enter another WWPN.

6. Click **OK**. The new virtual port is added to the discovery-tree under the physical port where it was created and the Number of Virtual Ports field is updated.

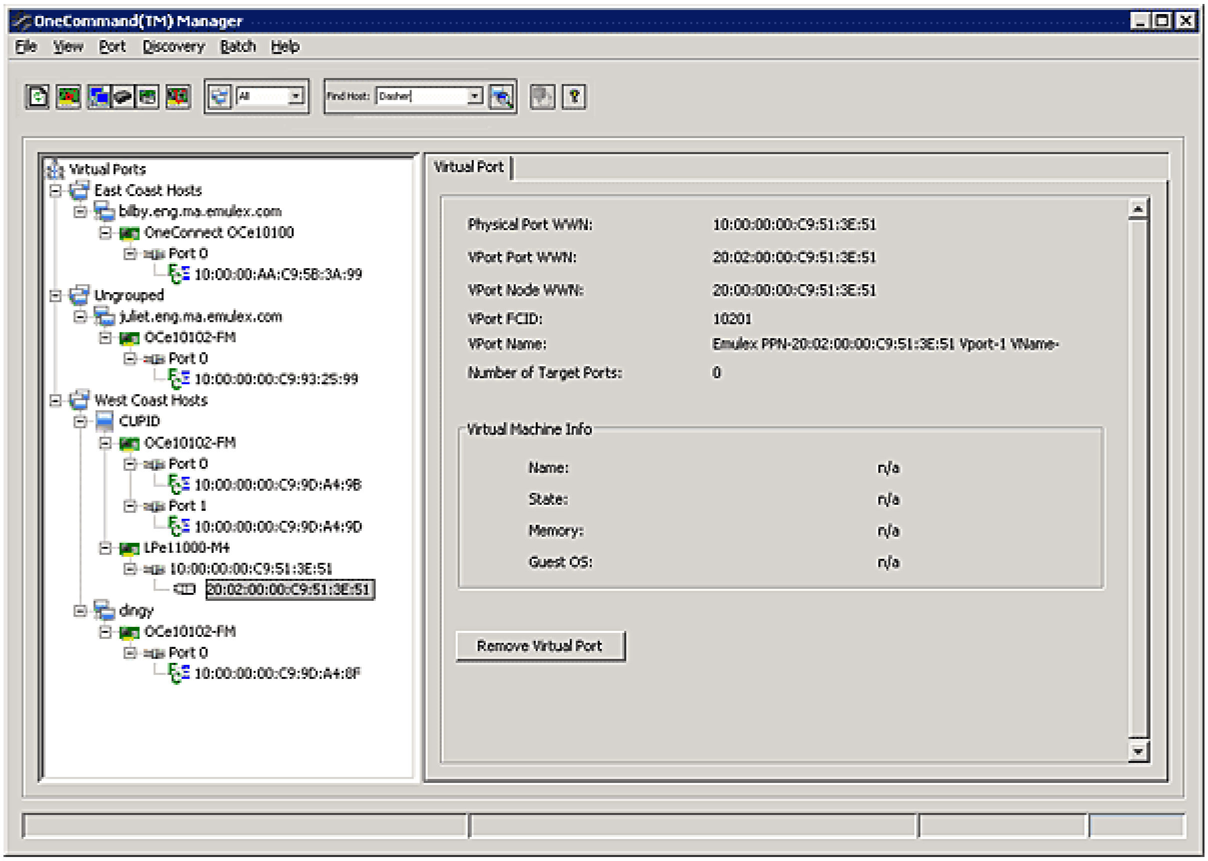
   Note: The OneCommand Manager application automatically refreshes its discovery after a virtual port is created. However, targets for a new virtual port may not be discovered during the refresh. Therefore, you must refresh the discovery until the targets appear under the virtual port in the discovery-tree.

Deleting Virtual Ports

Note: Neither the OneCommand Manager application nor the hbacmd utility can be used to create or delete virtual ports on any VMware ESX server. Whereas VMware ESX server supports NPIV, only VMware management tools can be used to create and delete virtual ports.

To delete a virtual port:

1. Do one of the following:
   - From the **View** menu, select **Group Adapters by Virtual Ports**.
   - From the toolbar, click **Group Adapters by Virtual Ports**.
2. From the discovery-tree, select the virtual port you want to delete. The Virtual Ports tab appears.



```
Virtual Ports
  East Coast Hosts
    bilby.eng.ma.emulex.com
      OneConnect OCe10100
        Port 0
          10:00:00:AA:C9:5B:3A:99
  Ungrouped
    juliet.eng.ma.emulex.com
      OCe10102-FM
        Port 0
          10:00:00:00:C9:93:25:99
  West Coast Hosts
    CUPID
      OCe10102-FM
        Port 0
          10:00:00:00:C9:9D:A4:9B
        Port 1
          10:00:00:00:C9:9D:A4:9D
      LPe11000-M4
        10:00:00:00:C9:51:3E:51
          20:02:00:00:C9:51:3E:51
    dingy
      OCe10102-FM
        Port 0
          10:00:00:00:C9:9D:A4:8F
```

Physical Port WWN: 10:00:00:00:C9:51:3E:51

VPort Port WWN: 20:02:00:00:C9:51:3E:51

VPort Node WWN: 20:00:00:00:C9:51:3E:51

VPort FCID: 10201

VPort Name: Emulex PPN-20:02:00:00:C9:51:3E:51 Vport-1 VName-

Number of Target Ports: 0

Virtual Machine Info

Name: n/a

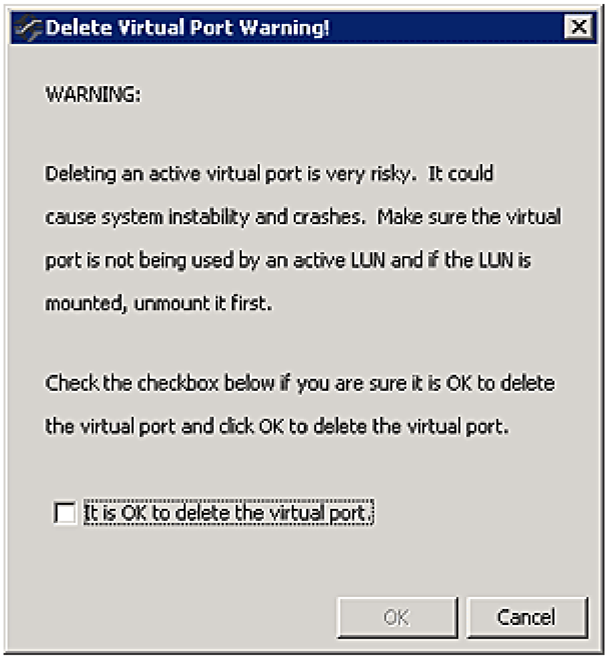
State: n/a

Memory: n/a

Guest OS: n/a

Figure 81: Virtual Port tab

3. Click **Remove Virtual Port.** The Delete Virtual Port Warning dialog box appears.



Delete Virtual Port Warning!

WARNING:

Deleting an active virtual port is very risky. It could cause system instability and crashes. Make sure the virtual port is not being used by an active LUN and if the LUN is mounted, unmount it first.

Check the checkbox below if you are sure it is OK to delete the virtual port and click OK to delete the virtual port.

□ It is OK to delete the virtual port.

Figure 82: Delete Virtual Port Warning

> **Note:** The link on the physical port must be up to delete a virtual port. The Remove Virtual Port button on the Virtual Port tab is disabled if the link is down.

4. Check **It is OK to delete the virtual port** and click **OK**. You are notified that the virtual port is no longer available and that it was removed from the discovery-tree.
5. Click **OK**.

Using FC-SP DHCHAP Authentication (Windows, Linux 8.2 and Solaris)

Use the DHCHAP tab to view and configure FC-SP DHCHAP (Diffie-Hellmann Challenge Handshake Authentication Protocol). You can authenticate an adapter to a switch.

Note: DHCHAP is available only for physical ports, not for virtual ports.

Note: DHCHAP is not supported on COMSTAR ports.

Note: DHCHAP is not supported on RHEL6+ and SLES11-SP1+.

Note: DHCHAP is not supported on OneConnect adapters.

Once DHCHAP has been activated and configured, manually initiate authentication per adapter by clicking on the Initiate Authentication button or by inducing a fabric login (FLOGI) time per the FC-SP standard to the switch. A FLOGI can also be caused by bringing the link between the switch and adapter down and then up. (Not available in read-only mode.)

Authentication must be enabled at the driver level. Authentication is disabled by default. To enable DHCHAP using the Driver Parameters tab, enable one of the following parameters: enable-auth (in Windows), enable-auth (Solaris) or enable-auth (in Linux 8.2).

Note: The authentication driver parameters are only available on local hosts. The OneCommand Manager application GUI does not display this driver parameter for any remote hosts.

Linux Considerations

To activate FC-SP/Authentication between the adapter host port and fabric F_Port using DHCHAP, you must modify the DHCHAP-associated driver properties in the driver configuration file.

The Emulex driver for Linux version 8.2.0.x supports MD5 and SHA-1 hash functions and supports the following DH groups: Null, 1024, 1280, 1536, and 2048.

Note: This version of the driver supports N-Port to F-Port authentication only and does not support N-Port to N-Port authentication.

Enabling Authentication

Enabling authentication is a two step process. To enable authentication:

- The fcauthd daemon must be running.
- The lpfc_enable_auth module parameter must be set to enabled.

The lpfc_enable_auth Module Parameter

Use the lpfc_enable_auth module parameter to enable or disable authentication support. This module parameter can be set when loading the driver to enable or disable authentication on all Emulex adapters in the system, or it can be set dynamically after the driver is loaded to enable or disable authentication for each port (physical and virtual). The default setting for the lpfc-enable-auth module parameter is disabled.

The fcauthd Daemon

The Emulex LPFC driver requires the fcauthd daemon to perform authentication tasks for it. To enable authentication you must have this daemon running. If you want to load the driver with authentication enabled, the fcauthd daemon should be running prior to driver load. The driver can start with authentication enabled if the daemon is not running, but all ports are placed into an error state. When the daemon is started the driver should discover the daemon and reset the adapter to enable the driver to perform authentication. To test if this daemon is running, start the daemon, or stop the daemon, you must use the /etc/init.d/fcauthd script. This script accepts the standard daemon parameters: start, stop, reload, status, restart, and condrestart.

The script syntax is /etc/init.d/fcauthd <parameter>.

Note: The 8.2.0.X driver connects directly to the fcauthd daemon. To unload the driver you must first stop the fcauthd daemon. This closes the netlink connection and allows the LPFC driver to unload.

fcauthd Daemon Parameters

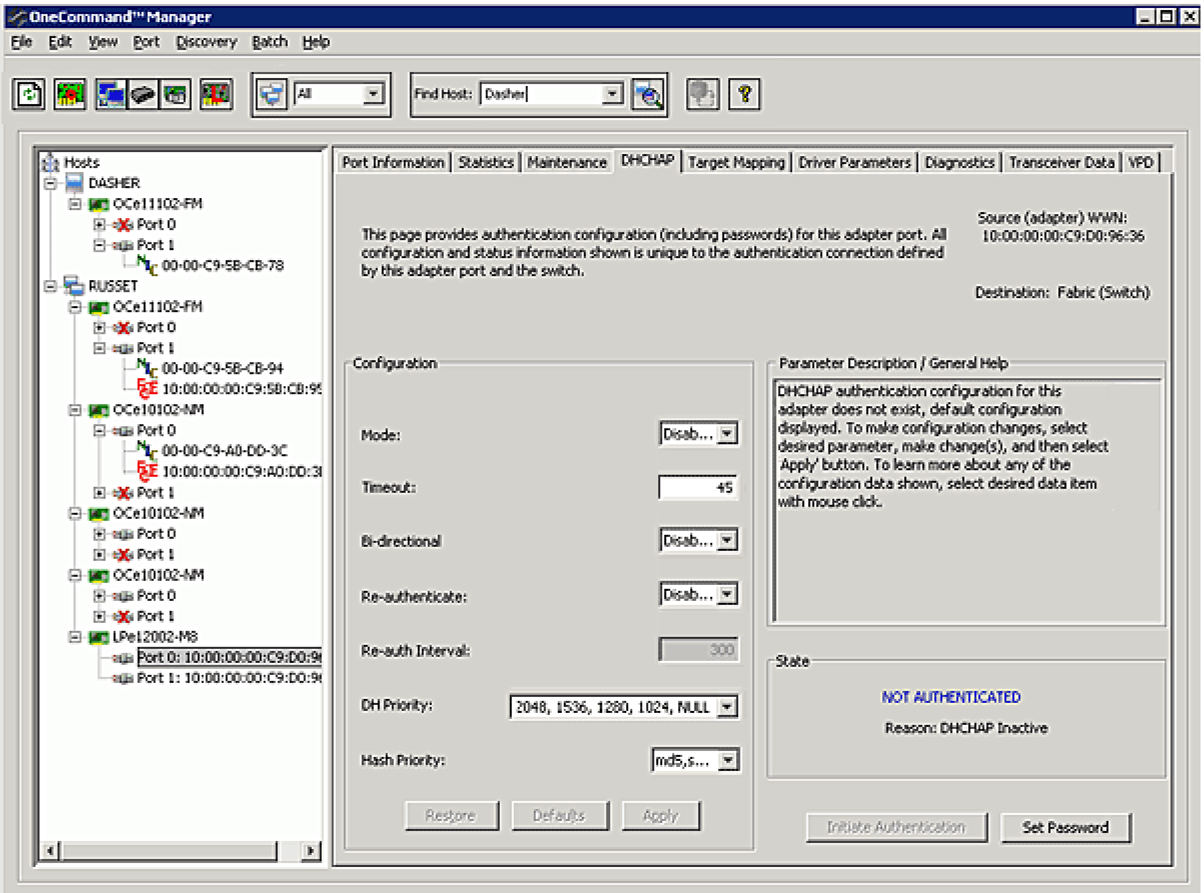
The fcauthd daemon supports the following parameters:

- start - To start the fcauthd daemon pass the start command to the fcauthd script. This command loads the daemon into memory, opens a netlink connection to the driver, and reads the authentication configuration database into memory for use by the LPFC driver.

- stop - To stop the fcauthd daemon pass the stop command to the fcauthd script. This command takes down the netlink connection between the fcauthd daemon and the LPFC driver and stops the fcauthd daemon.
- reload - The reload command reloads the authentication configuration database into memory. This is done whenever the database is changed by another application (the OneCommand Manager application) or by you. If the database is changed, the new configuration information is not used until the fcauthd daemon reloads the database.
- status - This command is used to show the current status of the fcauthd daemon. The status should be either running or stopped.
- restart - The restart command performs a stop and then a start.
- condrestart - The conditional restart command checks the status of the fcauthd daemon. If it is running it issues a stop and then a start command. If the fcauthd daemon is not running nothing happens.

The DHCHAP Tab

The DHCHAP tab enables you to configure authentication.



Find Host: Dasher

This page provides authentication configuration (including passwords) for this adapter port. All configuration and status information shown is unique to the authentication connection defined by this adapter port and the switch.

Source (adapter) WWN: 10:00:00:00:C9:D0:96:36

Destination: Fabric (Switch)

Mode: Disab...

Timeout: 45

Bi-directional Disab...

Re-authenticate: Disab...

Re-auth Interval: 300

DH Priority: 2048, 1536, 1280, 1024, NULL

Hash Priority: md5,s...

DHCHAP authentication configuration for this adapter does not exist, default configuration displayed. To make configuration changes, select desired parameter, make change(s), and then select 'Apply' button. To learn more about any of the configuration data shown, select desired data item with mouse click.

NOT AUTHENTICATED

Reason: DHCHAP Inactive

Figure 83: DHCHAP tab

DHCHAP Tab Field Definitions

- Source - The WWPN of the adapter port.
- Destination - The fabric (switch).

Configuration Area

- Mode - The mode of operation. There are three modes: Enabled, Passive and Disabled.
  - Enabled - The adapter initiates authentication after issuing an FLOGI to the switch. If the connecting device does not support DHCHAP authentication, the software still continues with the rest of the initialization sequence.
  - Passive - The adapter does not initiate authentication, but participates in the authentication process if the connecting device initiates an authentication request.
  - Disabled - The adapter does not initiate authentication or participate in the authentication process when initiated by a connecting device. This is the default mode.
- Timeout - During the DHCHAP protocol exchange, if the switch does not receive the expected DHCHAP message within a specified time interval, authentication failure is assumed (no authentication is performed). The time value ranges from 20 to 999 seconds.
- Bi-Directional - If enabled, the adapter driver supports authentication initiated by either the switch or the adapter. If disabled, the driver supports adapter initiated authentication only.
- Re-authenticate - If enabled, the driver can periodically initiate authentication.
- Re-auth Interval - The value in minutes that the adapter driver uses to periodically initiate authentication. Valid interval ranges are 10 to 3600 minutes. The default is 300 minutes.
- DH Priority - The priority of the five supported DH Groups (Null group, and groups 1,2,3, and 4) that the adapter driver presents during the DHCHAP authentication negotiation with the switch.
- Hash Priority - The priority of the two supported hash algorithms (MD5 and SHA1) that the adapter driver presents during the DHCHAP authentication negotiation with the switch (default is MD5 first, then SHA1,2,3...).
- State - Possible states are Not Authenticated, Authentication In Progress, Authentication Success and Authentication Failed.

Changing Authentication Configuration

To view or change authentication configuration:

1. In the discovery-tree, select the adapter whose configuration you want to view or change.
2. Select the **DHCHAP** tab. (If the fields on this tab are “grayed out” (disabled) authentication has not been enabled at the driver level.)
3. Change configuration values as you want.

   Note: You can only configure DHCHAP on the local host.

4. Click **Apply**. You are prompted for the current password (local password) to validate the configuration change request. The verification request only appears if a local password has been defined for this adapter.
5. Enter the password and click **OK**.

   To return settings to the status before you started this procedure, click **Restore** before you click **Apply**. Once you click **Apply**, changes can not be cancelled.

   To return all settings to the default configuration, click **Defaults**. Be careful as this also resets the password(s) to NULL for this configuration.

   To initiate an immediate authentication, click **Initiate Authentication**. This request is sent to the driver, even if you have not made any changes to the setup.

   Note: To successfully authenticate with the switch using DHCHAP, you only need to set the configuration mode to enabled and set the local password. The local password must be set to the identical value as the switch for the DHCHAP authentication to succeed.

Changing Your Password

To change your password:

1. From the discovery-tree, select the adapter whose password you wish to change.
2. Select the **DHCHAP** tab and click **Set Password**. The Password dialog box is displayed.
3. Choose **Set Local Password** or **Set Remote Password**.
   - Local password is used by the adapter driver when the adapter initiates authentication to the switch (typical use).
   - Remote password is used by the adapter driver when the switch authenticates with the adapter. This is only possible when bi-directional is checked on the DHCHAP tab.
4. If you want to see the password characters entered in the dialog box, check **Show Characters**.
5. Provide the current value for the password to validate the 'set new password' request (unnecessary if this is the first time the password is set for a given adapter).
6. Enter the new password.
7. Select alpha-numeric or hex format.
8. Click **OK**.

Caution: Do not forget the password once one has been assigned. Once a password is assigned to an adapter, subsequent DHCHAP configuration settings for that adapter including 'default configuration' or new passwords require you to enter the existing password to validate your request (i.e. no further changes can be made without the password).

Note: Additional help is available by clicking Help on the Set Password dialog box.

Viewing the Error and Event Log

For Solaris and Linux systems, a simple shell script checks the /var/adm/messages and /var/log/messages files respectively for recent Emulex driver DHCHAP events and outputs them to a default location.

To view the error and event log:

1. Click **Event Log History** on the Authenticate tab.

Updating Adapter Firmware

The OneCommand Manager application enables you to update firmware for a single adapter or simultaneously for multiple adapters.

Updating Firmware for a Single Adapter

Using the Maintenance or Firmware tab, you can update firmware on local and remote adapters. The firmware file must be downloaded from the Emulex website and extracted to a local drive before you can perform this procedure. (Not available in read-only mode.)

- The Emulex driver must be installed.
- The OneCommand Manager application must be installed.
- The firmware zip file must be downloaded from the Emulex website, unzipped and extracted to a folder on a local drive.
- If the adapter is already connected to a boot device, the system must be in a state in which this type of maintenance can be performed:
    - I/O activity on the bus has been stopped.
    - Cluster software, or any other software that relies on the adapter to be available, is stopped or paused.

Note: For OEM branded adapters, see the OEM’s website or contact the OEM’s customer service department or technical support department for the firmware files.

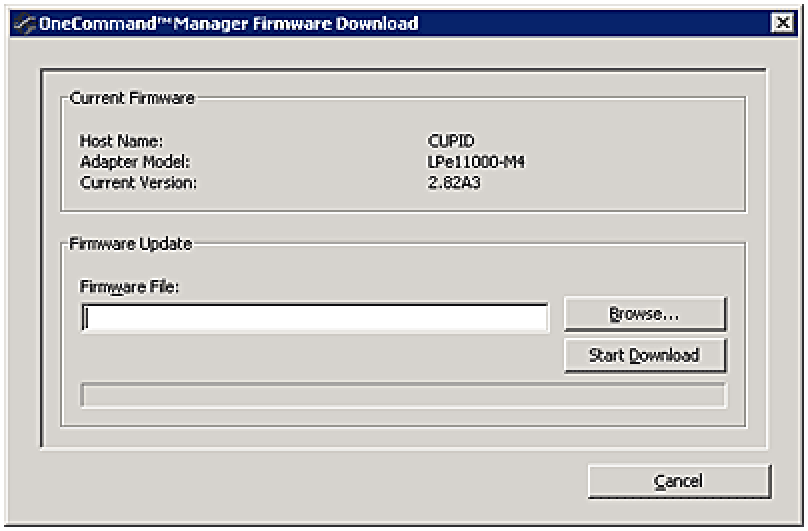
Note: You cannot update firmware with the OneCommand Manager application on a Sun-branded adapter.

To update firmware for a single adapter, adapter port or ASIC:

Note: For FC adapters you update the firmware on the port. (For example, multi-port adapters require a firmware download on each port.) For OneConnect UCNAs and OneConnect 16 Gb/s HBAs you update the firmware for the entire adapter. For OneConnect dual ASIC 4 port 8Gb/sec FC adapters, you update the firmware on the ASIC. (For example, dual ASIC 4 port 8Gb/sec FC adapters require a firmware download on each ASIC.)

1. Select **Host** or **Fabric** view.
2. In the discovery-tree, select the adapter, FC port or ASIC whose firmware you want to update.

3. Select the **Maintenance** or **Firmware** tab and click **Update Firmware**. If the warning screen appears, click **Yes**. The Firmware Download dialog box appears.



Host Name: CUPID
Adapter Model: LPe11000-M4
Current Version: 2.82A3

Figure 84: Firmware Download dialog box

4. Using the Firmware Download dialog box, navigate to the unzipped, extracted image file you want to download. The firmware image may be specified either by entering the image file's full pathname in the “Firmware File” field or by clicking the **Browse** button.

   If you click **Browse**, the Firmware File Selection dialog box appears. Select the file you want to use and click **OK**. The Firmware Download dialog box appears.

5. Click **Start Download**. A warning dialog box appears.
6. Click **Yes**. A status bar shows the progress of the download. The adapter in the discovery-tree is displayed in black text when the update is complete.

   Note: The adapter in the discovery-tree is displayed in red text when it is offline.

7. Click **Close**. The Firmware tab displays the updated firmware information for the selected adapter.

   If you are updating the firmware on a dual-channel FC adapter, repeat steps 1 through 7 to update the firmware on the second port or use the “Updating Firmware for Multiple Adapters” procedure.

   Note: If the state of the FC boot code on the board has changed, this change is reflected immediately on the Port Information tab.

Updating Firmware for Multiple Adapters

Use batch mode to install firmware on multiple adapters in a single step. Batch firmware loading is restricted to a single firmware file and to all accessible adapters for which that file is compatible. (Not available in read-only mode).

Note: Stop other OneCommand Manager application functions while batch loading is in progress.

Note: When using the OneCommand Manager application Web Launch Interface the firmware file must reside on the host where the browser window was launched from, not the host that was specified in the web address.

Note: VMware ESX hosts managed through the CIM interface will list all the adapters regardless of whether the selected firmware can update the adapter. You must manually deselect the non-matching adapters.

Before you can perform a batch update, the firmware file must be downloaded from the Emulex website and extracted to a directory on your local drive.

To update firmware for multiple adapters:

1. From the **Batch** menu, select **Download Firmware**.

   Note: You do not need to select a particular tree element for this operation.

2. When the Batch Firmware Download dialog box appears, click **Browse**.
3. The Firmware File Selection dialog box appears. Select the file you want to use and click **OK**. A dialog box appears notifying you that the OneCommand Manager application is searching for compatible adapters.

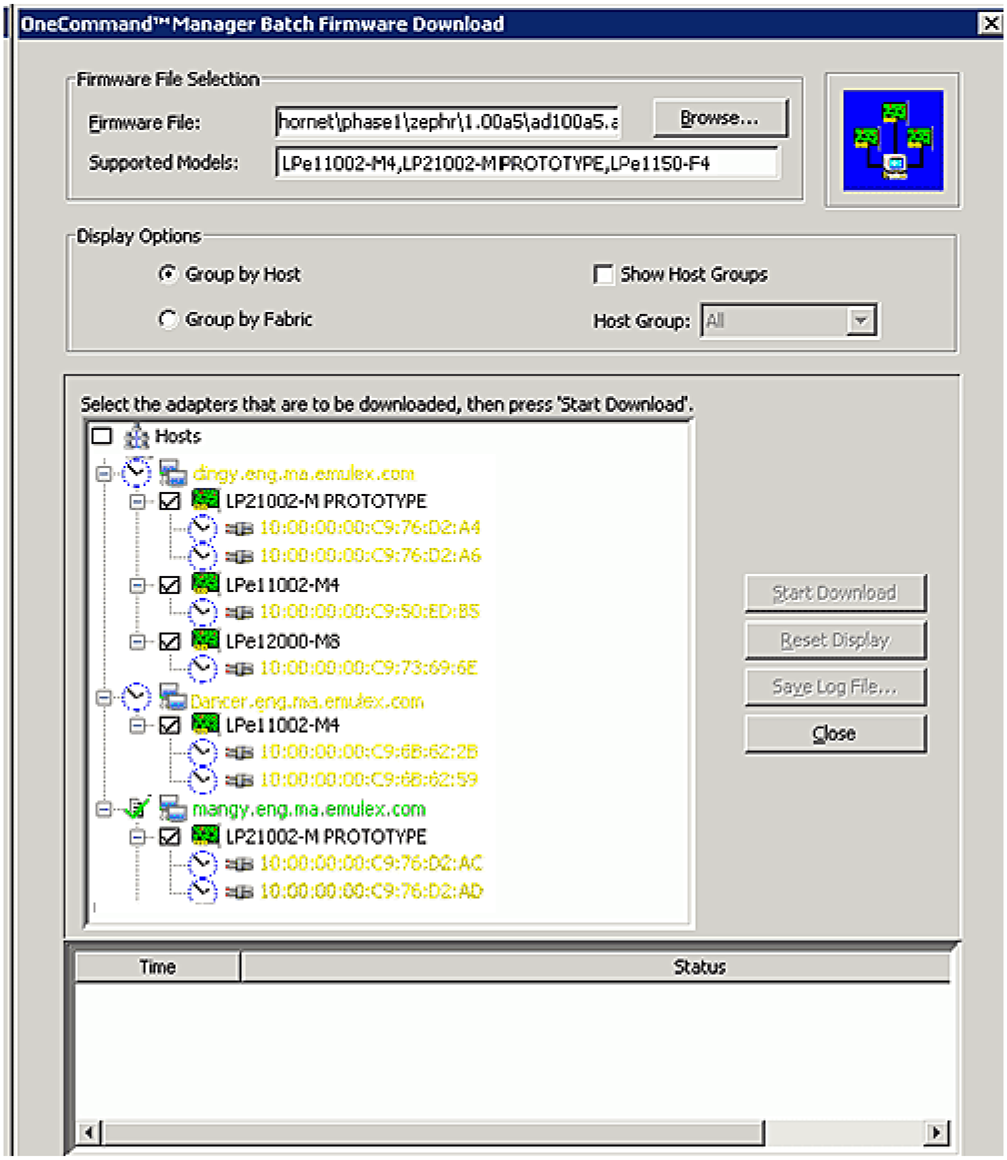
   Once compatible adapters are found, the “Firmware File” text area of the main Batch Download dialog displays the selected image file's path. The “Supported Models” text field displays a list of all adapter models that are compatible with the selected image file. The set of compatible adapters appears in the dialog box’s discovery-tree.

   Using the Display Options settings you can choose how adapters are displayed in the discovery-tree. Clicking **Group by Host** displays adapters in a host-centric view. Clicking **Group by Fabric** shows hosts in a fabric-centric view with their fabric addresses. The WWPN and host name for each downloadable port is displayed under its respective fabric.

   You can also display host groups by checking **Show Host Groups**. To display a particular host group, choose that group from the **Host Group** menu.

   Checkboxes next to the host, adapter and ASIC entries are used to select or deselect an entry. Checking an adapter selects or removes that adapter; checking a host removes or selects all eligible adapters for that host.

   For adapters where each individual port or ASIC can have new firmware downloaded, you can select the ports or ASICs on the adapter to which you want to download firmware.



OneCommand™ Manager Batch Firmware Download

Firmware File Selection

Firmware File: hornet\phase1\zephr\1.00a5\ad100a5.a

Supported Models: LPe11002-M4,LP21002-M PROTOTYPE,LPe1150-F4

Display Options

● Group by Host

○ Group by Fabric

□ Show Host Groups

Host Group: All

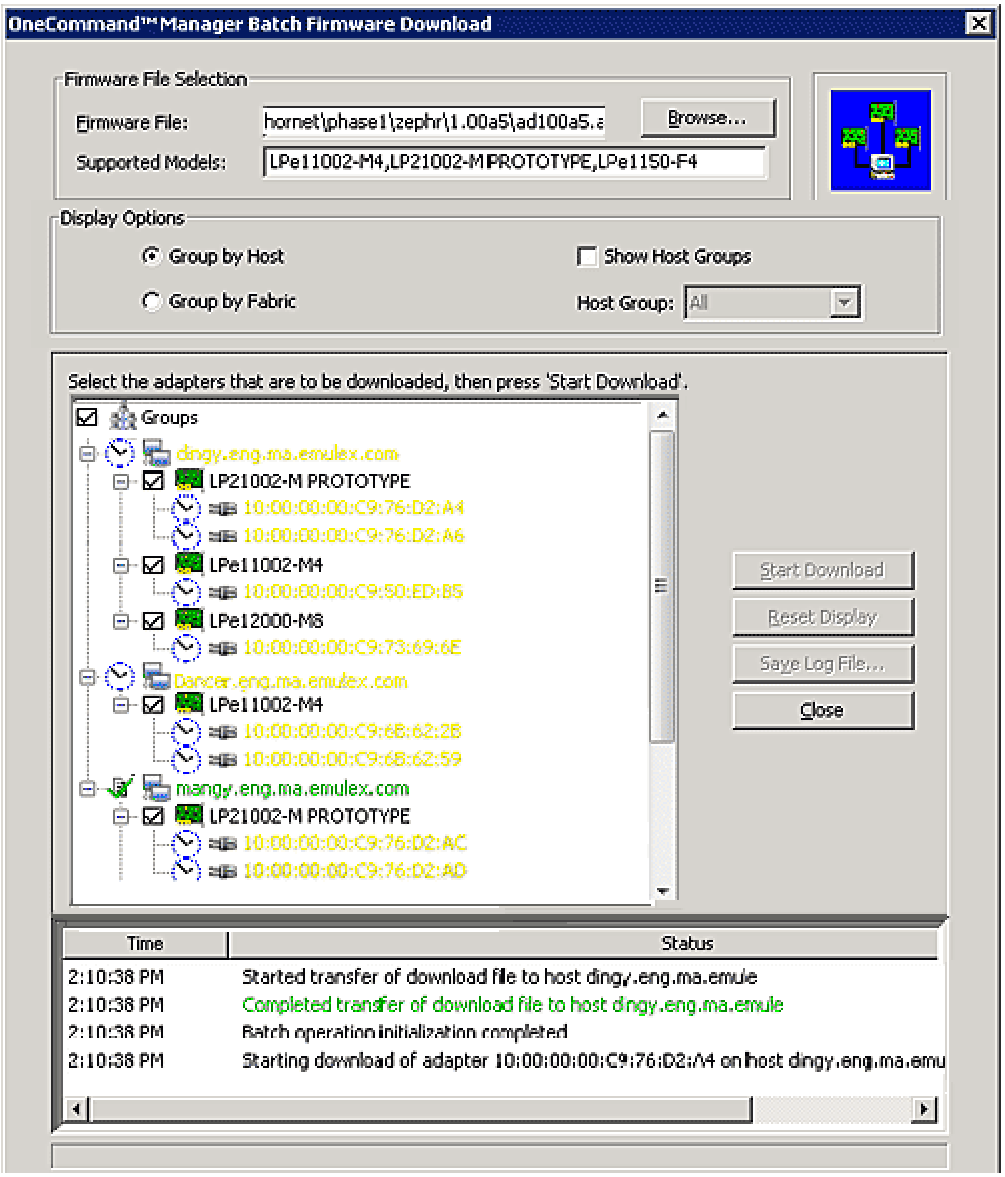
Select the adapters that are to be downloaded, then press 'Start Download'.

```
□ Hosts
⊟ dingy.eng.ma.emulex.com
   ⊟ ☑ LP21002-M PROTOTYPE
         10:00:00:00:C9:76:D2:A4
         10:00:00:00:C9:76:D2:A6
   ⊟ ☑ LPe11002-M4
         10:00:00:00:C9:50:ED:B5
   ⊟ ☑ LPe12000-M8
         10:00:00:00:C9:73:69:6E
⊟ Dancer.eng.ma.emulex.com
   ⊟ ☑ LPe11002-M4
         10:00:00:00:C9:6B:62:2B
         10:00:00:00:C9:6B:62:59
⊟ ✓ mangy.eng.ma.emulex.com
   ⊟ ☑ LP21002-M PROTOTYPE
         10:00:00:00:C9:76:D2:AC
         10:00:00:00:C9:76:D2:AD
```

Time	Status

Figure 85: Batch Firmware Download dialog box, selecting adapters to update

4. Make your selections and click **Start Download**. When downloading begins, the tree-view displays the progress. As firmware for a selected adapter is being downloaded, it appears orange in the tree-view. Once successful downloading is complete, the entry changes to green. If the download fails, the entry changes to red.



Firmware File: hornet\phase1\zephr\1.00a5\ad100a5.a

Supported Models: LPe11002-M4,LP21002-M PROTOTYPE,LPe1150-F4

● Group by Host   □ Show Host Groups

○ Group by Fabric   Host Group: All

Select the adapters that are to be downloaded, then press 'Start Download'.

```
☑ Groups
  dingy.eng.ma.emulex.com
    ☑ LP21002-M PROTOTYPE
        10:00:00:00:C9:76:D2:A4
        10:00:00:00:C9:76:D2:A6
    ☑ LPe11002-M4
        10:00:00:00:C9:50:ED:B5
    ☑ LPe12000-M8
        10:00:00:00:C9:73:69:6E
  Dancer.eng.ma.emulex.com
    ☑ LPe11002-M4
        10:00:00:00:C9:6B:62:28
        10:00:00:00:C9:6B:62:59
  mangy.eng.ma.emulex.com
    ☑ LP21002-M PROTOTYPE
        10:00:00:00:C9:76:D2:AC
        10:00:00:00:C9:76:D2:AD
```

```
Time         Status
2:10:38 PM   Started transfer of download file to host dingy.eng.ma.emule
2:10:38 PM   Completed transfer of download file to host dingy.eng.ma.emule
2:10:38 PM   Batch operation initialization completed
2:10:38 PM   Starting download of adapter 10:00:00:00:C9:76:D2:A4 on host dingy.eng.ma.emu
```

Figure 86: Batch Firmware Download dialog box, download complete

5. When downloading is finished, you can click **Save Log File** to save copy of the activity log.

Updating CEE Firmware for a Single Adapter (LP21000 Series Adapters Only)

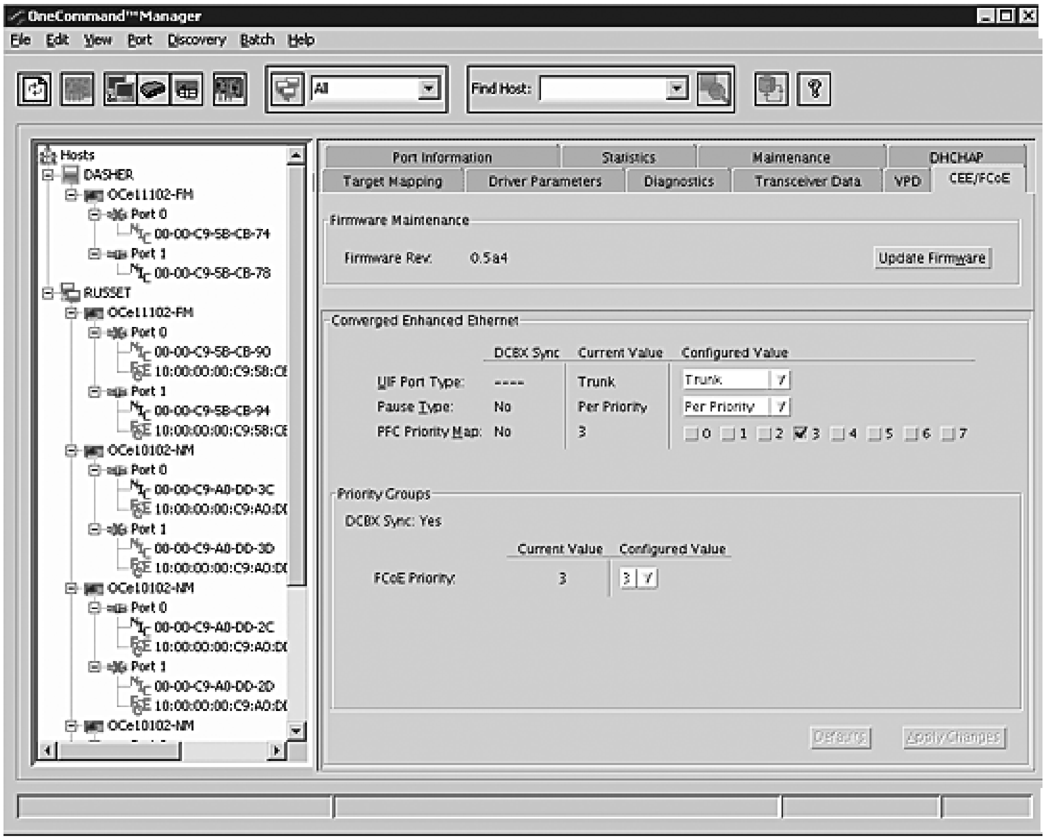
To support configuration of LP21000 and LP21002 adapters, the OneCommand Manager application includes a CEE/FCoE tab. This tab is only shown when an LP21000 or LP21002 adapter is selected in the discovery-tree. The CEE/FCoE tab allows you to update firmware on the adapter port and to configure or view CEE/FCoE-specific settings.

Note: CEE firmware image filenames end with a .bin extension.

Note: CEE is not supported on VMware ESX servers being managed through the CIM interface.

To update CEE firmware on a single LP21000 or LP21002 port:

1. Select **Host** or **Fabric** view.
2. In the discovery-tree, select the LP21000 or LP21002 port whose firmware you want to update.
3. Select the **CEE/FCoE** tab.



Firmware Maintenance

Firmware Rev: 0.5a4

Converged Enhanced Ethernet

	DCBX Sync	Current Value	Configured Value
UIF Port Type:	----	Trunk	Trunk
Pause Type:	No	Per Priority	Per Priority
PFC Priority Map:	No	3	□ 0 □ 1 □ 2 ☑ 3 □ 4 □ 5 □ 6 □ 7

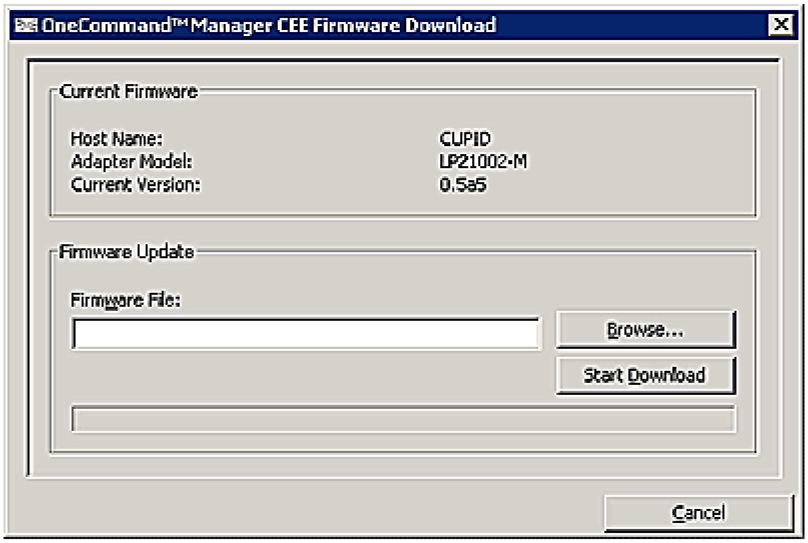
Priority Groups

DCBX Sync: Yes

	Current Value	Configured Value
FCoE Priority:	3	3

Figure 87: CEE/FCoE tab

4. Click **Update Firmware**. The CEE Firmware Download dialog box is displayed.



Current Firmware

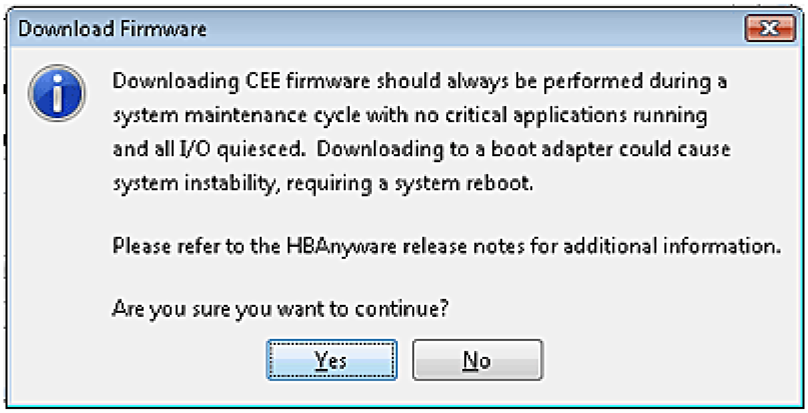
Host Name: CUPID
Adapter Model: LP21002-M
Current Version: 0.5a5

Firmware Update

Firmware File:

Figure 88: CEE Firmware Download dialog box

5. Specify the desired firmware image. Do one of the following in the CEE Firmware Download dialog box:
   - Type the firmware file name. There are two ways to enter the file name in the Firmware File field:
     - If the file is **not** located in the OneCommand Manager application repository, type the full path and filename of the firmware image file.
     - If the firmware file **is** located in the OneCommand Manager application repository, type only the filename. The OneCommand Manager application repository can be found in the following paths:
       - `/opt/ELXocm/RMRepository/` (Solaris)
       - `/usr/sbin/ocmanager/RMRepository/` (Linux)
       - `C:\Program Files\Emulex\Util\Emulex Repository\` (Windows)
       - `/etc/cim/emulex/RMRepository/`(VMware ESX 4.0 and VMware ESX 4.1)
   - Click **Browse**. Use the Firmware File Selection dialog box to locate the firmware image and click **OK**. The CEE Firmware Download dialog box is displayed with the path you just browsed to.
6. Click **Start Download** on the CEE Firmware Download dialog box. A warning message similar to the following is displayed:



Download Firmware

Downloading CEE firmware should always be performed during a system maintenance cycle with no critical applications running and all I/O quiesced. Downloading to a boot adapter could cause system instability, requiring a system reboot.

Please refer to the HBAnyware release notes for additional information.

Are you sure you want to continue?

Figure 89: CEE Download Firmware warning

7. Click **Yes** on the Download Firmware warning. The status of the download appears on the OneCommand Manager Application Firmware Download window.

Updating CEE Firmware on Multiple Adapters (LP21000 Series Adapters Only)

Use batch mode to install CEE firmware on multiple LP21000 or LP21002 adapters in a single step. Batch firmware loading is restricted to a single firmware file and to all accessible adapters for which the file is compatible. (Not available in read-only mode).

Note: Stop other OneCommand Manager application functions while batch loading is in progress.

Before you can perform a batch update, the firmware file must be downloaded from the Emulex website and extracted to a directory on your local drive.

To update CEE firmware on multiple adapters:

1. From the **Batch** menu, select **Download CEE Firmware**. The Batch CEE Firmware Download dialog box appears.

   Note: You do not need to select a particular tree element for this operation.

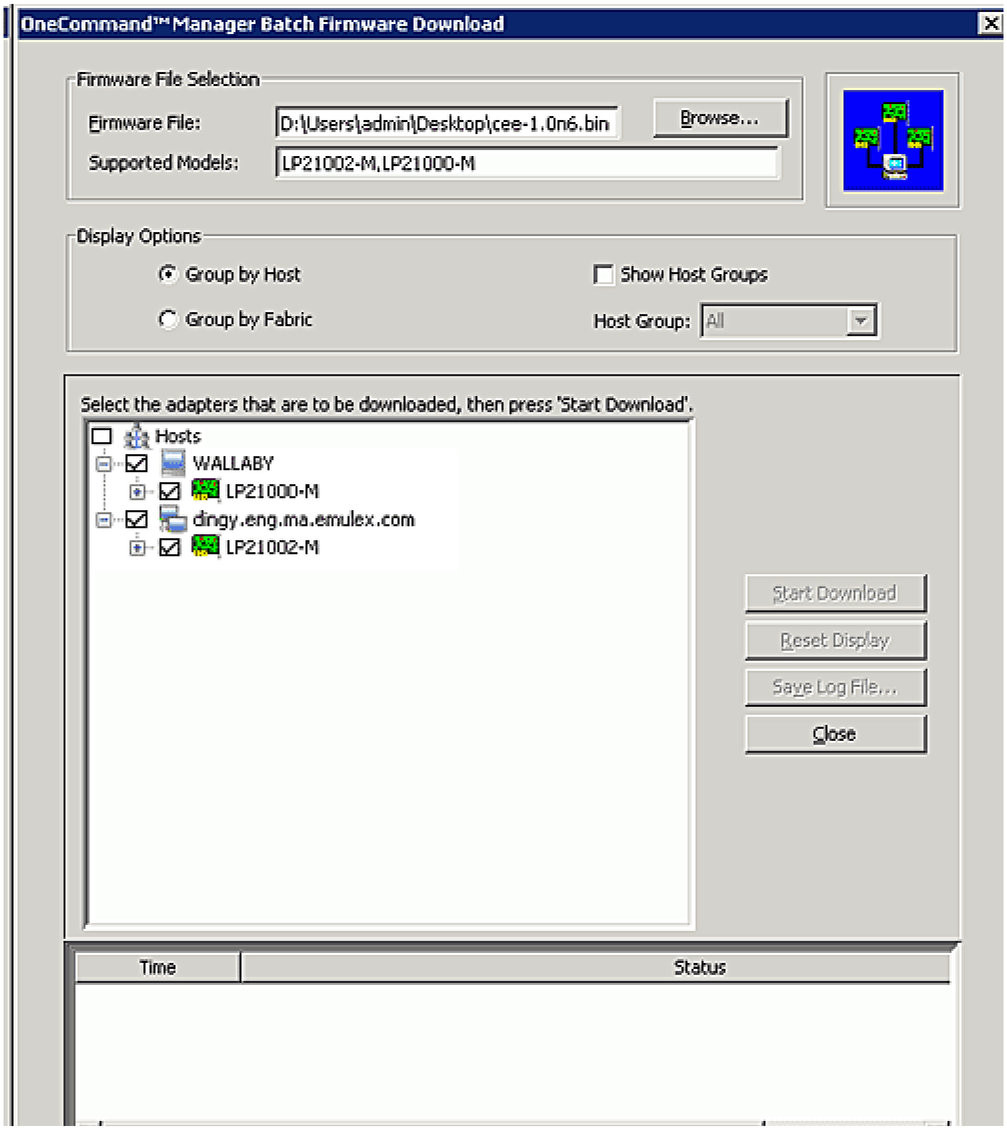
2. Click **Browse**. The Firmware File Selection dialog box appears.
3. Navigate to the firmware file you want to use and click **OK**.

   A tree-view appears showing all adapters and their corresponding hosts for which the selected firmware file is compatible. Checkboxes next to the host and adapter entries are used to select or deselect an entry. Checking an adapter selects or removes that adapter; checking a host removes or selects all eligible adapters for that host.

   Using the Display Options settings you can choose how adapters are displayed in the discovery-tree. Clicking **Group by Host** displays adapters in a host-centric view. Clicking **Group by Fabric** shows hosts in a fabric-centric view with their fabric addresses. The WWPN and host name for each downloadable port is displayed under its respective fabric.

   You can also display host groups by checking **Show Host Groups**. To display a particular host group, choose that group from the **Host Group** menu.

   You can display host groups by checking **Show Host Groups**. To display a particular host group, choose that group from the **Host Group** menu.



Firmware File Selection

Firmware File: D:\Users\admin\Desktop\cee-1.0n6.bin

Supported Models: LP21002-M,LP21000-M

Display Options

● Group by Host

○ Group by Fabric

□ Show Host Groups

Host Group: All

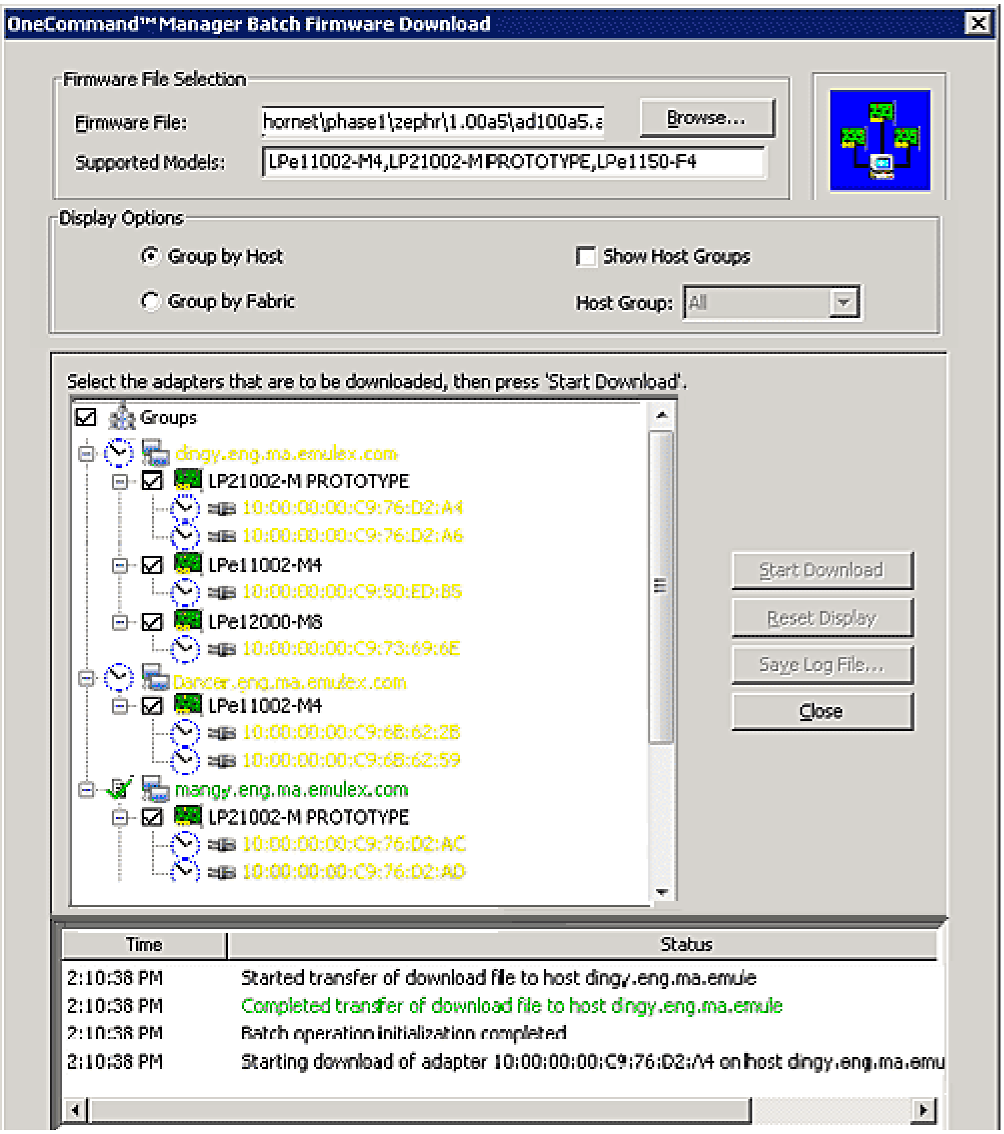
Select the adapters that are to be downloaded, then press 'Start Download'.

- □ Hosts
  - ☑ WALLABY
    - ☑ LP21000-M
  - ☑ dingy.eng.ma.emulex.com
    - ☑ LP21002-M

Figure 90: Batch CEE Firmware Download dialog box, selecting adapters to update

4. Make your selections and click **Start Download**.

When downloading begins, the tree-view displays the progress. As firmware for a selected adapter is being downloaded, it appears orange in the tree-view. Once successful downloading is complete, the entry changes to green. If the download fails, the entry is changed to red.



OneCommand™ Manager Batch Firmware Download

Firmware File Selection

Firmware File: hornet\phase1\zephr\1.00a5\ad100a5.a

Supported Models: LPe11002-M4,LP21002-M PROTOTYPE,LPe1150-F4

Display Options

● Group by Host ○ Group by Fabric □ Show Host Groups Host Group: All

Select the adapters that are to be downloaded, then press 'Start Download'.

```
☑ Groups
  dingy.eng.ma.emulex.com
    ☑ LP21002-M PROTOTYPE
        10:00:00:00:C9:76:D2:A4
        10:00:00:00:C9:76:D2:A6
    ☑ LPe11002-M4
        10:00:00:00:C9:50:ED:B5
    ☑ LPe12000-M8
        10:00:00:00:C9:73:69:6E
  Dancer.eng.ma.emulex.com
    ☑ LPe11002-M4
        10:00:00:00:C9:6B:62:2B
        10:00:00:00:C9:6B:62:59
  ✓ mangy.eng.ma.emulex.com
    ☑ LP21002-M PROTOTYPE
        10:00:00:00:C9:76:D2:AC
        10:00:00:00:C9:76:D2:AD
```

Time	Status
2:10:38 PM	Started transfer of download file to host dingy.eng.ma.emule
2:10:38 PM	Completed transfer of download file to host dingy.eng.ma.emule
2:10:38 PM	Batch operation initialization completed
2:10:38 PM	Starting download of adapter 10:00:00:00:C9:76:D2:A4 on host dingy.eng.ma.emu

Figure 91: Batch CEE Firmware Download dialog box, download complete

5. When downloading is finished, you can click **Save Log File** to save a copy of the activity log.

Mapping and Masking (FC and FCoE Ports Only)

Automapping SCSI Devices (Windows)

The driver defaults to automatically mapping SCSI devices. The procedures in this section apply if the default has been changed.

To automap SCSI devices:

1. Display driver parameters for the host or adapter - select the **Driver Parameters** tab or the **Host Driver Parameters** tab.
2. Select the **AutoMap** parameter. Several fields about the parameter appear on the right side of the tab.
3. Select **Enabled**.
4. To apply your changes, click **Apply**.
5. Reboot the system for this change to take effect.

Mapping and Masking Defaults (Windows)

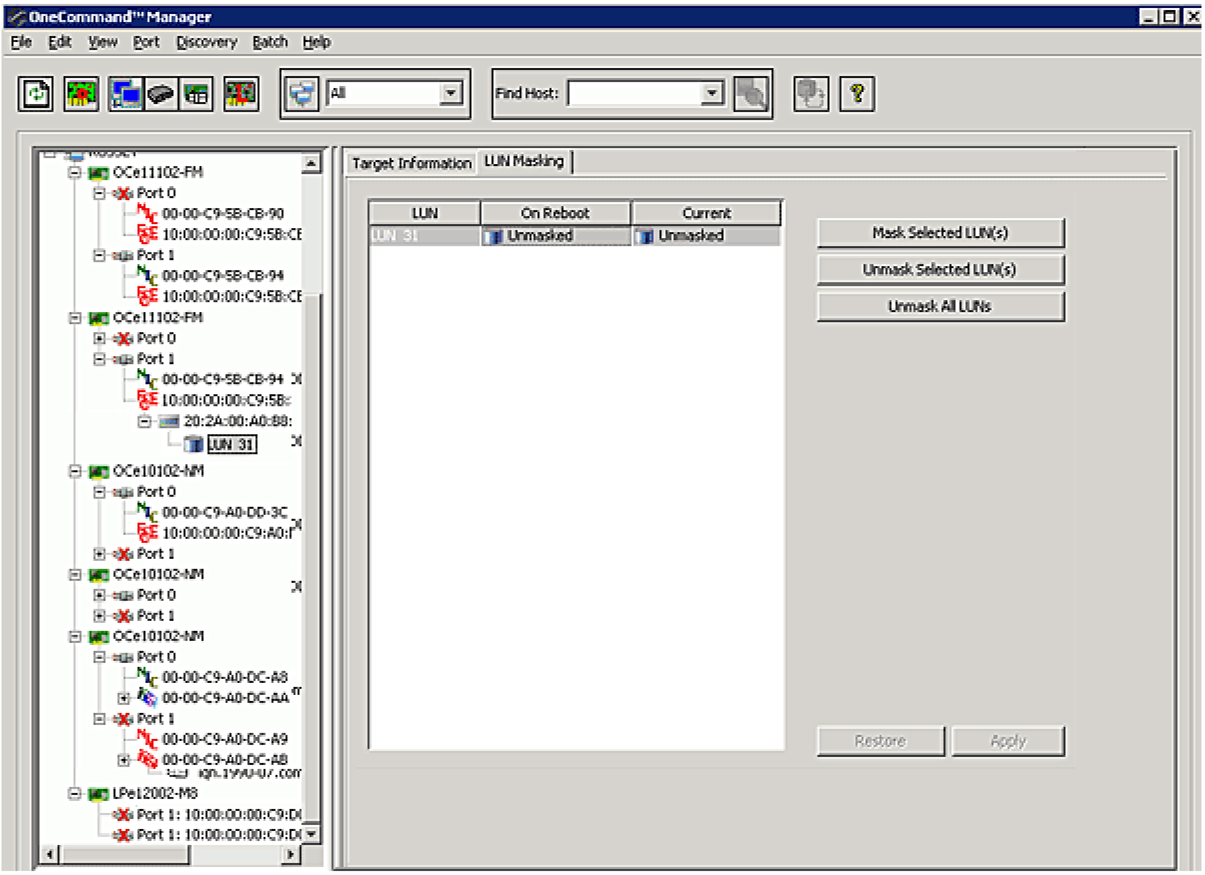
Table 3: Mapping and Masking Window Defaults

Field (Function)	Default	Description	Window
Globally Automap All Targets	Enabled	Emulex driver detects all FC devices attached to the Emulex adapters.	Global Automap
Globally Automap All LUNs	Enabled	Assigns an operating system LUN ID to a FC LUN ID for all LUNs behind all targets in the system area network.	Global Automap
Globally Unmask All LUNs	Enabled	Allows the operating system to see all LUNs behind all targets.	Global Automap
Automap All LUNs (Target Level)	Disabled	With Globally Automap All LUNs disabled, this parameter assigns an operating system LUN ID to a FC LUN ID for all LUNs behind the selected target.	LUN Mapping
LUN Unmasking (Target Level)	Disabled	Allows the operating system to see all LUNs behind the selected target. With this parameter disabled, each individual LUN can be masked or unmasked.	LUN Mapping

Masking and Unmasking LUNs (Windows)

LUN masking refers to whether or not a LUN is visible to the operating system. A LUN that has been masked is not available and is not visible to the OS. You can use the OneCommand Manager application to mask or unmask LUNs at the host level.

Note: The LUN Masking tab is not shown in Virtual Port view because LUN masking is not available for virtual ports.



LUN	On Reboot	Current
LUN 31	Unmasked	Unmasked

Figure 92: LUN Masking tab

LUN Masking Conventions and Guidelines

LUN icons in the discovery-tree reflect the live mask state currently in use by the driver. Green LUN icons indicate unmasked LUNs. Gray LUN icons indicate masked LUNs. Red text indicates that a LUN mask has been changed, but not applied (saved).

LUN Masking Column Definitions

- LUN – The FC LUN number.
- On Reboot – The 'On Reboot' column shows the mask configuration currently saved to the configuration file on disk (Solaris) or to the Registry (Windows). Normally, for a specific LUN, the states reported in the 'On Reboot' and 'Current' column are identical. However, there can be times where these do not match. For example, the hbacmd utility can be used to change only the 'Current' mask state for a LUN and not touch the 'On Reboot' mask state contained in the configuration file.
- Current – The 'Current' column displays the live mask state currently in use by the driver. When you first see the LUN Masking tab, the mask states displayed in the 'Current' column are identical to the mask states for the corresponding LUNs in the discovery-tree.

To change the mask status of a LUN:

1. Select **Host** view.
2. From the discovery-tree, select the SCSI target whose LUN masking state you want to change. A set of LUNs appears below the selected SCSI target.

3. Select the **LUN Masking** tab. This tab contains a list of the same set of LUNs that appear below the SCSI target in the discovery-tree.
4. In the LUN list of the LUN Masking tab, select one or more LUNs. The Mask Selected LUNs, Unmask Selected LUNs, Unmask All LUNs, Restore and Apply buttons become active as appropriate. For example, if the LUN is currently unmasked, only the Mask Selected LUNs button is active.
5. Change the mask status: click **Mask Selected LUN(s)**, **Unmask Selected LUN(s)** or **Unmask All LUNs** as appropriate. Mask status changes appear in red text.

   Note: To return all mask settings to their status before you started this procedure, click Restore before you click Apply. Once you click Apply, changes cannot be cancelled by clicking Restore. To unmask all LUNs, click Unmask All LUNs. This button is always active. Be sure to also click Apply to commit the changes.

6. Click **Apply** to commit the changes. An informational message is displayed that confirms the mask status has changed and the red text changes to black.

Using Automapping and Persistent Binding (Windows)

Set up persistent binding on remote and local adapters. Global automapping assigns a binding type, target ID, SCSI Bus and SCSI ID to the device. The binding type, SCSI Bus and SCSI ID can change when the system is rebooted. With persistent binding applied to one of these targets, the WWPN, SCSI Bus and SCSI ID remain the same when the system is rebooted. (Not available in read-only mode.)

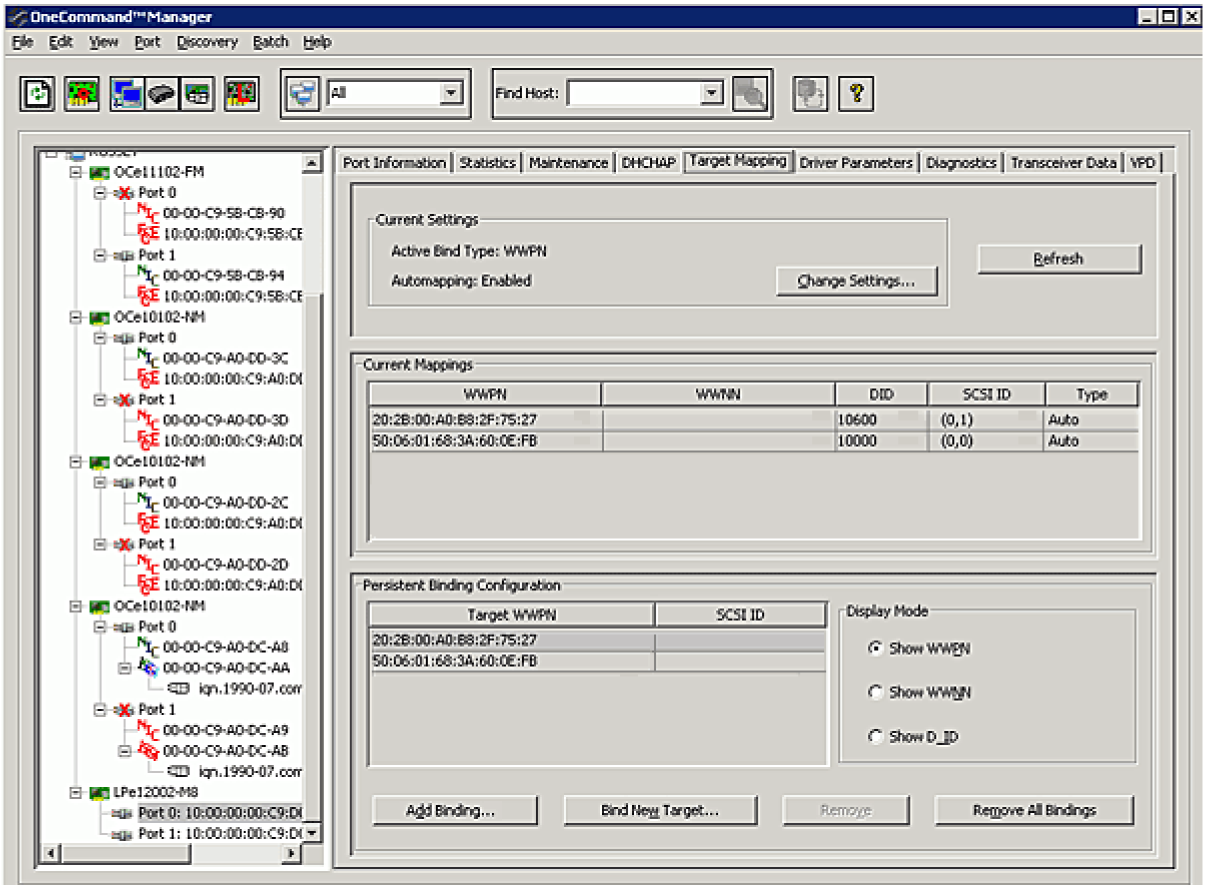
The driver refers to the binding information at during system boot. When you create a persistent binding, the OneCommand Manager application tries to make that binding dynamic. However, the binding must meet all of the following criteria to be dynamic:

- The SCSI ID (target/bus combination) specified in the binding request must not be mapped to another target. For example, the SCSI ID must not already appear in the 'Current Mappings' table under 'SCSI ID'. If the SCSI ID is already in use, then the binding cannot be made dynamic, and a reboot is required.
- The target (WWPN, WWNN or DID) specified in the binding request must not be mapped to a SCSI ID. If the desired target is already mapped, then a reboot is required.
- The bind type (WWPN, WWNN or DID) specified in the binding request must match the currently active bind type shown in the Current Settings area of the Target Mapping tab. If they do not match, then the binding cannot be made active.

Changing Automapping Settings

To change automapping settings:

1. Select **Host** or **Fabric** view.
2. In the discovery-tree, select the adapter port you want to set up with persistent binding.
3. Select the **Target Mapping** tab. All targets are displayed.



Current Settings

Active Bind Type: WWPN

Automapping: Enabled

Current Mappings

WWPN	WWNN	DID	SCSI ID	Type
20:2B:00:A0:B8:2F:75:27		10600	(0,1)	Auto
50:06:01:68:3A:60:0E:FB		10000	(0,0)	Auto

Persistent Binding Configuration

Target WWPN	SCSI ID
20:2B:00:A0:B8:2F:75:27	
50:06:01:68:3A:60:0E:FB	

Display Mode

● Show WWPN

○ Show WWNN

○ Show D_ID

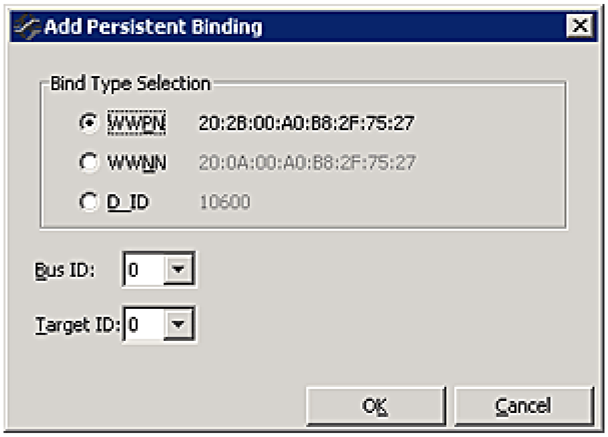
Figure 93: Target Mapping tab

4. Target mappings are displayed by WWPN, WWNN, or D_ID. “PB”, indicates mapping from persistent binding, while “Auto”, indicates an automapped target. In the Display Mode section, choose the display mode you want to use.
5. If you want click **Change Settings**. The Mapped Target Settings dialog box appears. You can enable or disable auto-mapping and change the active bind type. Click **OK**.
6. Reboot the system for changes to take effect.

Adding a Persistent Binding

To add a persistent binding:

1. Select **Host** or **Fabric** view.
2. In the discovery-tree, select the adapter port you want to set up with persistent binding.
3. Select the **Target Mapping** tab. All targets are displayed. In the Targets Table, click the target that you want to bind.
4. Click **Add Binding**. The Add Persistent Binding dialog box is displayed.



Bind Type Selection

● WWPN 20:2B:00:A0:B8:2F:75:27

○ WWNN 20:0A:00:A0:B8:2F:75:27

○ D_ID 10600

Bus ID: 0

Target ID: 0

Figure 94: Add Persistent Binding dialog box

5. Select the bind type that you want to use (WWPN, WWNN or D_ID).
6. Select the Bus ID and target ID that you want to bind, and click **OK**.

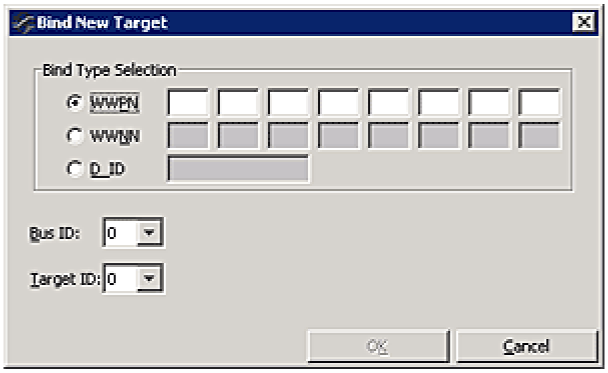
Note: Automapped targets have entries only in the second column of the Targets Table. Persistently bound targets have entries in the second and third columns. In this case, the third column contains the SCSI Bus and target numbers you specified in the Add Persistent Binding dialog box. This binding takes effect only after the local machine is rebooted.

Binding a Target that Does Not Appear in the Persistent Binding Table

To bind a target that does not appear in the Persistent Binding table on the Target Mapping tab:

Note: It is possible to specify a SCSI bus and target that have already been used on behalf of a different FC target. Attempting to bind a target already in the Persistent Binding table on the Target Mapping tab results in an error message, “Target already in target list. Use the Add Binding button.”

1. Select **Host** or **Fabric** view.
2. In the discovery-tree, select the adapter port you want to set up with persistent binding.
3. Select the **Target Mapping** tab. All targets are displayed.
4. Click **Bind New Target**. The Bind New Target dialog box is displayed.



Bus ID: 0

Target ID: 0

Figure 95: Bind New Target dialog box

5. Click the type of binding you want to use, and type the WWPN, WWNN or D_ID you want to bind to the target.
6. Select the Bus ID and Target ID that you want to bind, and click **OK**.

   Note: A target does not appear on the target list if automapping is disabled and the target is not already persistently bound.

Adding New Targets Using sd.conf (Solaris 8, 9 and 10)

You can perform on-the-fly configuration changes, without rebooting, using the OneCommand Manager application. For Solaris 8, you must first add the new targets to the sd.conf file using a text editor.

To add new targets using sd.conf (Solaris 8):

1. Edit the Solaris SCSI configuration file (sd.conf):

```
#vi /kernel/drv/sd.conf
             .
             .
             .
name="sd" parent="lpfc" target=17 lun=1;
name="sd" parent="lpfc" target=18 lun=10;
name="sd" parent="lpfc" target=19 lun=15;
             .
             .
             .
```

2. Save the file and exit the text editor.

Configuring Boot from SAN

You can use the OneCommand Manager application to configure a system to boot from an attached FC/ FCoE LUN. Boot from SAN allows servers on a storage network to boot their operating systems directly from a SAN storage device, typically identified by its WWPN and a LUN located on the device. By extending the server system BIOS, boot from SAN functionality is provided by the BootBIOS contained on an Emulex adapter in the server. When properly configured, the adapter then permanently directs the server to boot from a LUN on the SAN as if it were a local disk. (COMSTAR ports do not support boot from SAN.)

Boot Types

Using the Maintenance tab, you can enable, disable or configure boot from SAN for x86 BootBIOS, EFIBoot and OpenBoot (also know as FCode).

- x86 BootBIOS works with the existing BIOS on x64 and x86 systems.
- OpenBoot (FCode) works with the existing system BIOS on Solaris SPARC systems using the SFS driver and on Linux PowerPC systems. OpenBoot is also called FCode.
- EFIBoot works with Intel Itanium 64-bit and x64-based systems and provides 64-bit system boot capability through the use of the EFI (Extensible Firmware Interface) Shell.

Emulex provides Universal Boot and Pair Boot code images that contain multiple types of boot code. These images provide multi-platform support for boot from SAN. Universal Boot and Pair Boot transparently determine your system platform type and automatically execute the proper boot code image in the adapter. These code images reside in adapter flash memory, allowing easier adapter portability and configuration between servers.

The configuration regions on the adapter store the configuration data for each of these boot types.

Note: x86 and OpenBoot share the same configuration memory space. You cannot configure an adapter for both x86 and OpenBoot *at the same time*. If you try, a message appears that the existing boot type configuration will be overwritten by the new configuration.

Note: Boot from SAN configuration does not affect current system operation. The changes only take effect upon reboot if you have configured it correctly.

Boot Device Parameters

The boot LUN for all three boot types is in the range of 0-255. EFIBoot and OpenBoot (FCode) also support an 8-byte LUN, which you can use instead of the single-byte LUN. You must select which LUN type to configure.

- For OpenBoot, you must also provide a Target ID parameter.
- The OneCommand Manager application runs on a running OS, so you must boot the host to configure boot from SAN with the OneCommand Manager application.
- You must work from a running host that supports the OneCommand Manager application. Often, this host has booted from a direct-attached drive. With the OneCommand Manager application, you can configure a direct boot host to boot from a SAN. You can modify an existing boot from SAN configuration or configure boot from SAN on an adapter for installation in another host so it can boot from SAN.
- You must know what boot code type the adapter has; the OneCommand Manager application cannot detect this. Without knowing this, you could configure a boot type but not be able to boot from it since the adapter lacks the correct boot code.
- You must know what boot code type the system supports; the OneCommand Manager application cannot detect this. You can configure any boot type, but if the system does not support that type, it cannot boot from SAN.
- If you manage adapters on a remote host that is running a version of the OneCommand Manager application that does not support boot from SAN, the Configure Boot button does not appear.

  Note: You can configure boot from SAN before boot by using the Emulex Boot BIOS setup command line interface that runs during system startup. See the Emulex Boot BIOS setup program documentation for details.

- One of the following FC or FCoE adapter drivers must be installed:
  - Storport Miniport or UCNA driver for Windows
  - Emulex driver for Linux
  - Solaris emlxs FCA Driver
  - VMware ESX 4.0 or 4.1

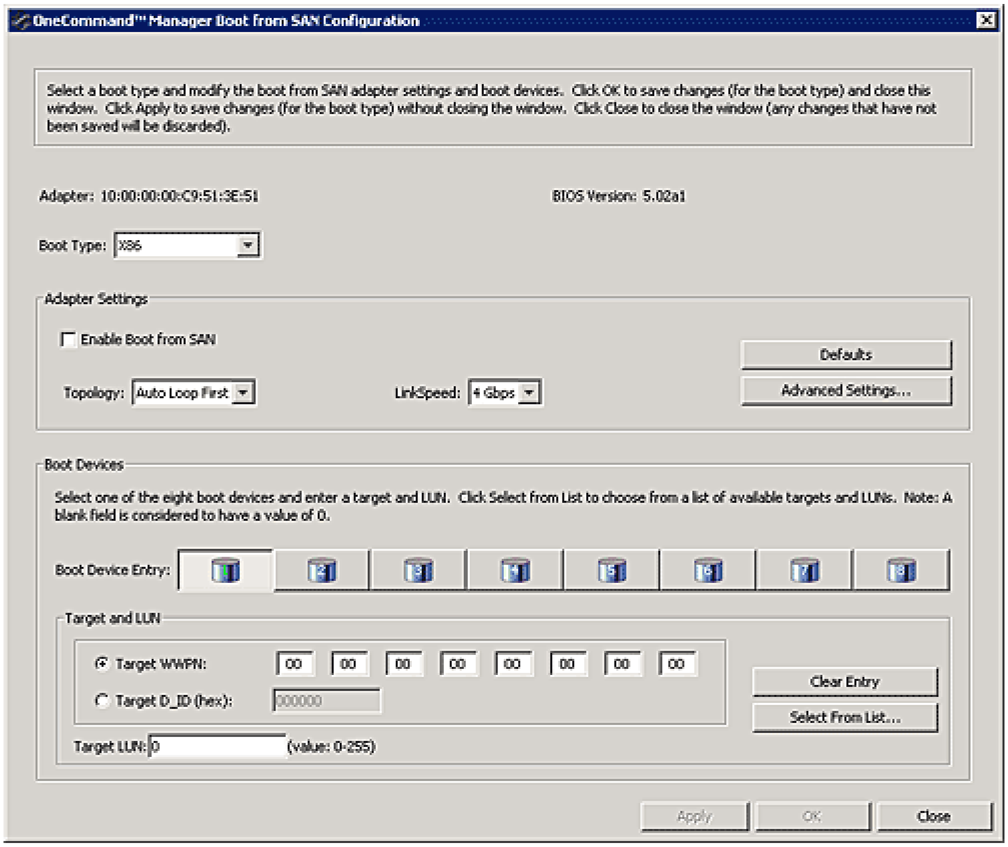
To configure boot from SAN:

1. Select **Host** or **Fabric** view.
2. In the discovery-tree, click the FC or FCoE adapter port on which you want to enable boot from SAN.

3. Select the **Maintenance** tab, check **enable adapter boot** (if available) and click **Configure Boot**. The Boot from SAN Configuration dialog box appears.

Note: The Configure Boot button is disabled if the Enable Adapter Boot checkbox is not checked. If boot code is not present on the adapter, the Enable Adapter Boot checkbox and Configure Boot button are not displayed on the Maintenance tab.

Note: For OneConnect adapters, boot is always enabled and cannot be disabled.



OneCommand™ Manager Boot from SAN Configuration

Select a boot type and modify the boot from SAN adapter settings and boot devices. Click OK to save changes (for the boot type) and close this window. Click Apply to save changes (for the boot type) without closing the window. Click Close to close the window (any changes that have not been saved will be discarded).

Adapter: 10:00:00:00:C9:51:3E:51

BIOS Version: 5.02a1

Boot Type: X86

Adapter Settings

□ Enable Boot from SAN

Topology: Auto Loop First

LinkSpeed: 4 Gbps

Boot Devices

Select one of the eight boot devices and enter a target and LUN. Click Select From List to choose from a list of available targets and LUNs. Note: A blank field is considered to have a value of 0.

Boot Device Entry: 1 2 3 4 5 6 7 8

Target and LUN

● Target WWPN: 00 00 00 00 00 00 00 00

○ Target D_ID (hex): 000000

Target LUN: 0 (value: 0-255)

Figure 96: Boot from SAN Configuration dialog box

The Boot from SAN Configuration dialog box varies for each boot type. Figure 96 depicts the boot from SAN configuration for the x86 type boot.

4. Verify the adapter address and boot version to make sure you configure the correct adapter and that it has the boot code version you want.
5. From the **Boot Type** menu, select x86, EFIBoot or OpenBoot.

Note: x86 and OpenBoot share the same configuration memory space. You cannot configure an adapter for both x86 and OpenBoot at the same time. When you select one of these boot types and the configuration region is configured for the other boot type, a message appears warning that making changes overwrites the other boot-type configuration.

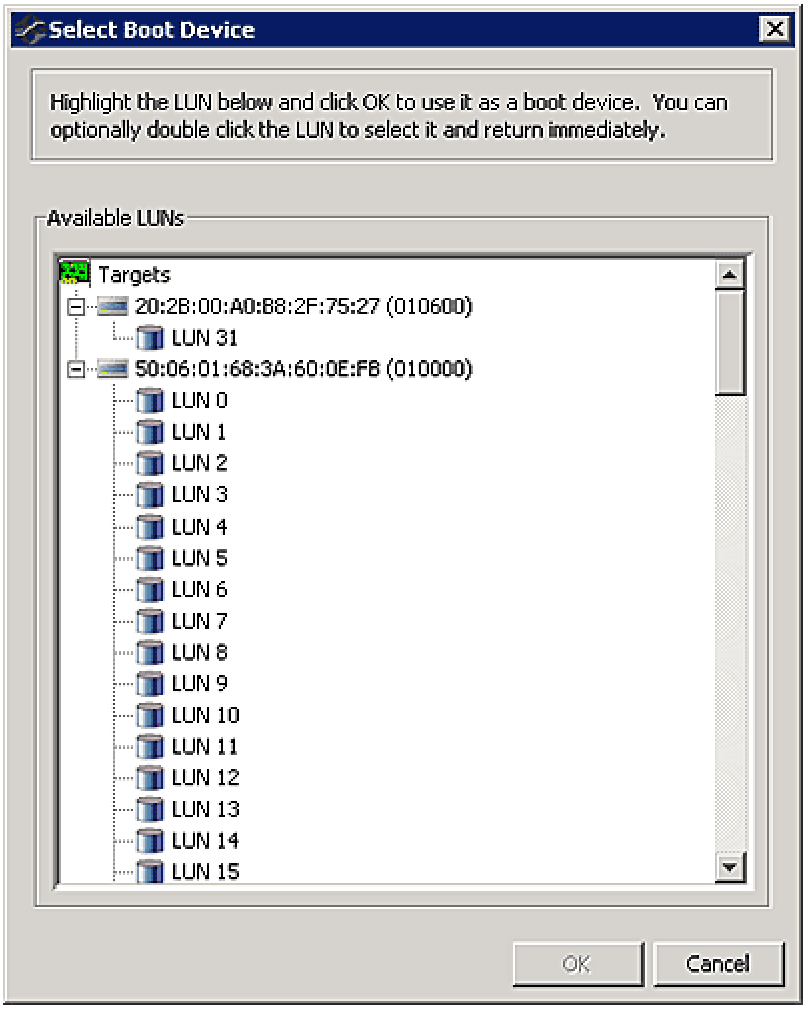
Note: If you modified the settings for the current boot type and then change to a new boot type, a message appears telling you to save the current settings before changing to the new boot type.

---

6. Check **Enable Boot from SAN** and for FC ports, set the Topology and Link Speed.

   Note: Topology and link speed are not available for OneConnect adapters.

   - Topology options are :
     - Auto, Loop First (default)
     - Auto, Point to Point First
     - Loop
     - Point to Point
   - Link speed options are:
     - Auto (default)
     - 1 Gb/s (if available)
     - 2 Gb/s (if available)
     - 4 Gb/s (if available)
     - 8 Gb/s (if available)
7. If you want, click **Advanced Settings** to configure autoscan, spinup delay and so on. See “Configuring Advanced Settings (Boot from SAN)” on page 165 for more information.
8. For x86 and EFIBoot, select one or more boot devices. For OpenBoot, select only one boot device.
9. Do one of the following on the Boot from SAN Configuration window:
   - Select **Target WorldWide Port Names**, type the numbers and click **OK**.
   - Select **Target D_ID**, type the numbers and click **OK**.
   - Select **Target LUN**, type the number and click **OK**.
     - For EFIBoot and OpenBoot, type in an 8-byte LUN (hex) and a target ID for the LUN. Also, you must enter the LUN value in “big endian” (most-significant byte, or “big end” first) order and enter all 16 characters including leading zeroes.
   - Click **Select from List**, select the target from a list of discovered LUNs (if available) and click **OK** on the Select Boot Device window. While you can manually enter the target and LUN from the Boot from SAN Configuration dialog box, it is easier to select an existing LUN from this window. (See Figure 97.) The OneCommand Manager application attempts to update the boot parameters. If successful, a window appears with a confirmation message. Click **OK** on this confirmation window.



Highlight the LUN below and click OK to use it as a boot device. You can optionally double click the LUN to select it and return immediately.

Figure 97: Select Boot Device window (for x86 or EFIBoot)

10. On the Boot from SAN Configuration dialog box, click **Apply** to save your changes, but leave the dialog box open or click **OK** to apply the changes and close the dialog box.

Note: Click **Close** to close the Boot from SAN Configuration dialog box without saving your changes. A message appears to discard your changes.

11. Reboot the system for your changes to take effect.

Configuring Advanced Settings (Boot from SAN)

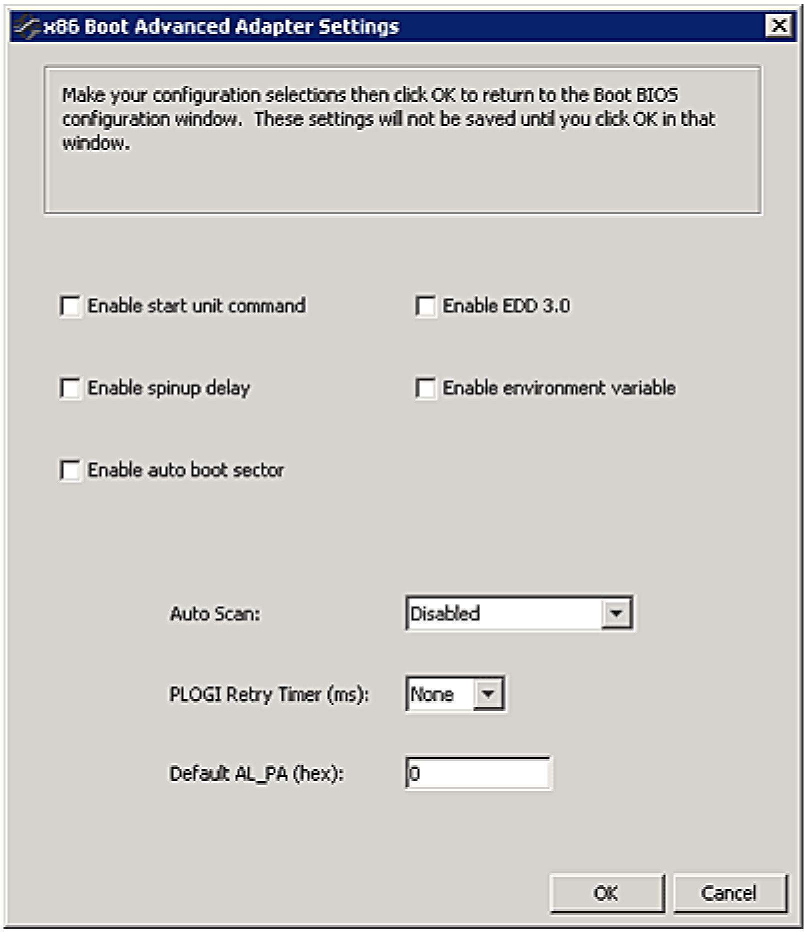
The OneCommand Manager application provides advanced settings for each boot type. From the Boot from SAN Configuration dialog box, click **Advanced Settings**. A boot type-specific dialog box allows you to enable options such as spinup delay and autoscan. If you do not use advanced settings, the default values are used.

If you make changes you must click **OK** to save the changes and close the dialog box. You can click **Cancel** and close the dialog box without saving the changes.

Note: If you do not enter the advanced settings and the configuration for the boot type is new, default values are used. The default settings are given with descriptions of the Advanced Adapter Settings dialog boxes in the following sections.

x86 Boot Advanced Adapter Settings dialog box

Using this dialog box, you configure advanced settings for the selected x86 adapter. All checkboxes are cleared (off) by default. All changes require a reboot to activate.



x86 Boot Advanced Adapter Settings

Make your configuration selections then click OK to return to the Boot BIOS configuration window. These settings will not be saved until you click OK in that window.

☐ Enable start unit command
☐ Enable EDD 3.0
☐ Enable spinup delay
☐ Enable environment variable
☐ Enable auto boot sector

Auto Scan: Disabled

PLOGI Retry Timer (ms): None

Default AL_PA (hex): 0

Figure 98: x86 Boot Advanced Adapter Settings dialog box

x86 Boot Advanced Adapter Settings Definitions

- Enable Start unit command - Issues the SCSI start unit command. You must know the specific LUN to issue.
- Enable EDD 3.0 - Enables the Enhanced Disk Drive (EDD) option (shows the path to the boot device). Available on Intel Itanium servers only.

Note: An x86 series system could hang during Windows 2000 Server installation if EDD 3.0 is enabled.

- Enable spinup delay - If at least one boot device has been defined, and the spinup delay is enabled, the BIOS searches for the first available boot device.
  - If a boot device is present, the BIOS boots from it immediately.

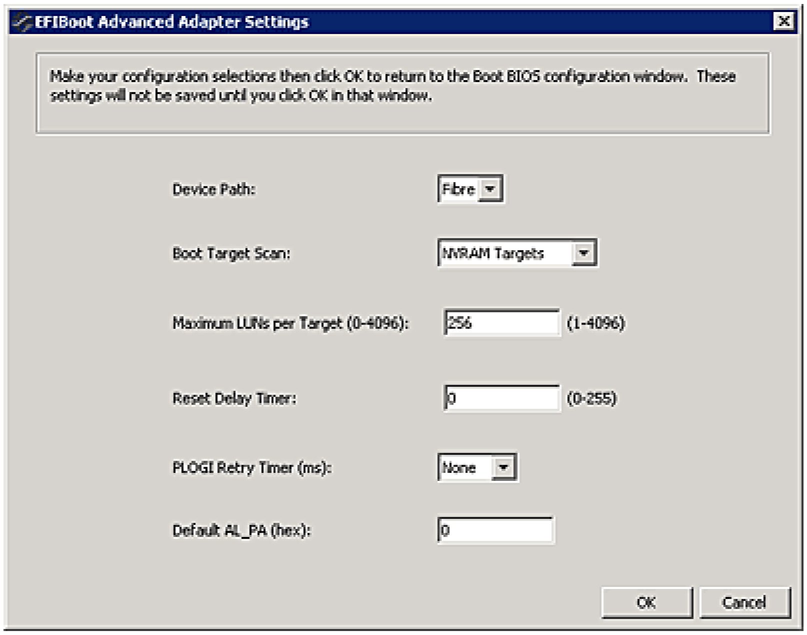
- If a boot device is not ready, the BIOS waits for the spinup delay and, for up to three additional minutes, continues the boot scanning algorithm to find another multi-boot device.

Note: The default topology is auto topology with loop first. Change this topology setting, if necessary, before configuring boot devices.

  - If no boot devices have been defined and auto scan is enabled, then the BIOS waits for five minutes before scanning for devices.
  - In a private loop, the BIOS attempts to boot from the lowest target AL_PA it finds.
  - In an attached fabric, the BIOS attempts to boot from the first target found in the NameServer data.
- Enable environment variable - Sets the boot controller order if the system supports the environment variable.
- Enable auto boot sector - Automatically defines the boot sector of the target disk for the migration boot process, which applies only to HP MSA1000 arrays. If there is no partition on the target, the default boot sector format is 63 sectors.
- Set Auto Scan - With auto scan enabled, the first device issues a Name Server Inquiry. The boot device is the first DID, LUN 0, or not LUN 0 device returned, depending on the option you select. Only this device is the boot device and it is the only device exported to the Multi-boot menu. Auto Scan is available only if none of the eight boot entries is configured to boot via DID or WWPN. Emulex strongly recommends that you use the Configure Boot Devices menu to configure eight boot entries for fabric point-to-point, public loop or private loop configurations. Set to one of the following:
  - Disabled (default)
  - Any First Device
  - First LUN 0 Device
  - First non-LUN 0 Device
- Set the PLOGI Retry Timer - Sets the interval for the PLOGI (port log in) retry timer. This option is especially useful for Tachyon-based RAID arrays. Under very rare occasions, a Tachyon-based RAID array resets itself and the port goes offline temporarily in the loop. When the port comes to life, the PLOGI retry interval scans the loop to discover this device. This default setting is None (0 msec). Set to one of the following:
  - None (default)
  - 50 ms
  - 100 ms
  - 200 ms
- Type the Default AL_PA number - It has a range of 00-EF (default=0). Changes the AL_PA (Arbitrated Loop Physical Address) of the selected adapter. (Not available for OneConnect adapters.)

EFIBoot Advanced Adapter Settings dialog box

Use the EFIBoot Advanced Adapter Settings dialog box to configure the advanced settings for the selected EFIBoot adapter.



EFIBoot Advanced Adapter Settings

Make your configuration selections then click OK to return to the Boot BIOS configuration window. These settings will not be saved until you click OK in that window.

Device Path: Fibre

Boot Target Scan: NVRAM Targets

Maximum LUNs per Target (0-4096): 256 (1-4096)

Reset Delay Timer: 0 (0-255)

PLOGI Retry Timer (ms): None

Default AL_PA (hex): 0

Figure 99: EFIBoot Advanced Adapter Settings dialog box

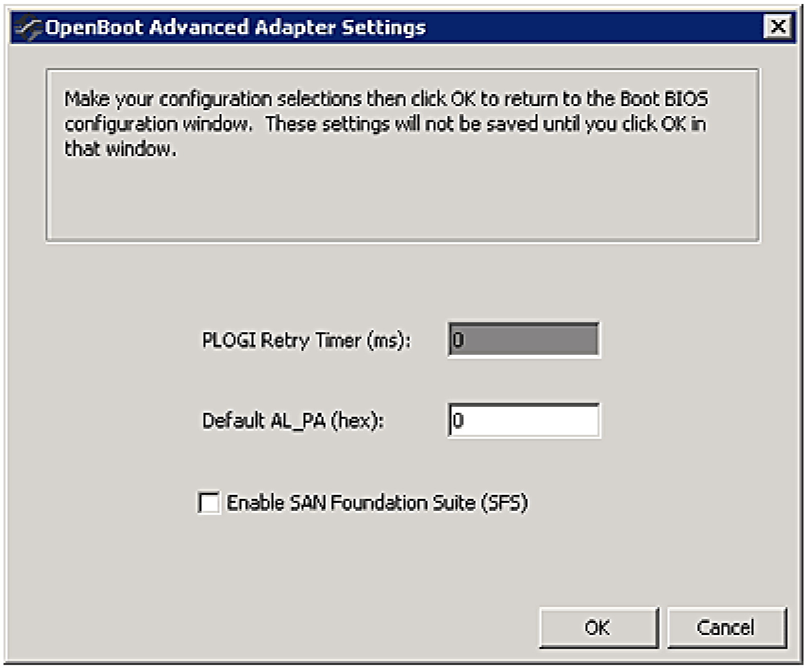
EFIBoot Advanced Adapter Settings Field Definitions

- Device Path - Makes the Fibre driver appear as a SCSI driver.
  - Fibre (default)
  - SCSI
- Boot Target Scan - This option is available only if none of the eight boot entries are configured to boot via DID or WWPN.
  - NVRAM Targets (default) - Discovers only LUNs that are saved to the adapter Non-Volatile Random Access Memory (NVRAM).
  - Discovered Targets - Discovers all devices that are attached to the FC port. Discovery can take a long time on large SANs.
  - None
  - EFIBootFCScanLevel: NVRAM Targets and EFIBootFCScanLevel: Discovered Targets - Allows 3rd party software to toggle between Boot Path from NVRAM and Boot Path from Discovered Targets by manipulating an EFI system NVRAM variable.
- Maximum LUNs per Target - Sets the maximum number of LUNs that are polled during device discovery. The range is 1 to 4096. The default is 256.
- Reset Delay Timer in seconds - Sets a value for delay device discovery. The range is 0 to 255. The default is 0.
- PLOGI Retry Timer - Sets the interval for the PLOGI (port log in) retry timer. This option is especially useful for Tachyon-based RAID arrays. Under very rare occasions, a Tachyon-based RAID array resets itself and the port goes offline temporarily in the loop. When the port comes online again the PLOGI retry interval scans the loop to discover this device.
  - 50 ms
  - 100 ms

  - 200 ms
- Default AL_PA number - The range is 0x 00-EF. The default is 0x00. This option changes the AL_PA (Arbitrated Loop Physical Address) of the selected adapter. (Not available for OneConnect adapters.)

OpenBoot Advanced Adapter Settings dialog box

Use this dialog box to configure the Advanced Adapter Settings for the selected OpenBoot adapter.


OpenBoot Advanced Adapter Settings

Make your configuration selections then click OK to return to the Boot BIOS configuration window. These settings will not be saved until you click OK in that window.

PLOGI Retry Timer (ms): 0

Default AL_PA (hex): 0

□ Enable SAN Foundation Suite (SFS)

Figure 100: OpenBoot Advanced Settings dialog box

OpenBoot Advanced Adapter Field Definitions

- PLOGI Retry Timer - Sets the PLOGI Retry timer value. Range is 0 to 0xFF.
- Default AL_PA (hex) - Sets the default AL_PA. The range is 0 to 0xEF. The default is 0. (Not available for OneConnect adapters.)
- Enable the Software Foundation Suite (SFS) - Check to enable the Software Foundation Suite (SFS) driver (the emlxs driver). The default is the LPFC driver.

Exporting SAN Information

The OneCommand Manager application enables you to create reports about discovered SAN elements. Reports are generated in .xml and .csv format and include all the SAN information that is displayed through the various OneCommand Manager application tabs.

Note: Creating a SAN report can take several minutes for a large SAN.

To create a SAN report:

1. From the **File** menu, select **Export SAN** Info.
2. Browse to a folder and enter a filename with the .xml or .csv extension.
3. Click **Save** to start the export process.

   During the export process, progress is displayed in the lower right hand side of the progress bar. On Windows, you cannot change views, reset, or download firmware during the export process.

Diagnostics

Note: Diagnostic tests can only be performed on a local adapter or on a remote adapter connected via TCP/IP. Diagnostic tests cannot be performed on remote adapters connected via FC.

Note: Diagnostic dumps can only be generated for local LightPulse adapters or for remote LightPulse adapters connected via TCP/IP. Diagnostic dumps cannot be generated for remote adapters connected via FC.

Note: Not supported on systems using CIM provider v1.2.1 on ESX 3i. and only partially supported on systems using CIM provider v2.0 on ESXi 4.x.

Note: Quick Test, POST Test, and the Advanced Diagnostic Test buttons are disabled for any remote adapter that is managed in-band.

Note: Diagnostics are not supported on COMSTAR ports.

LightPulse FC HBA Diagnostics

This section describes the diagnostics available for LightPulse FC adapters. For OneConnect adapter diagnostics, see “OneConnect Diagnostics” on page 180.

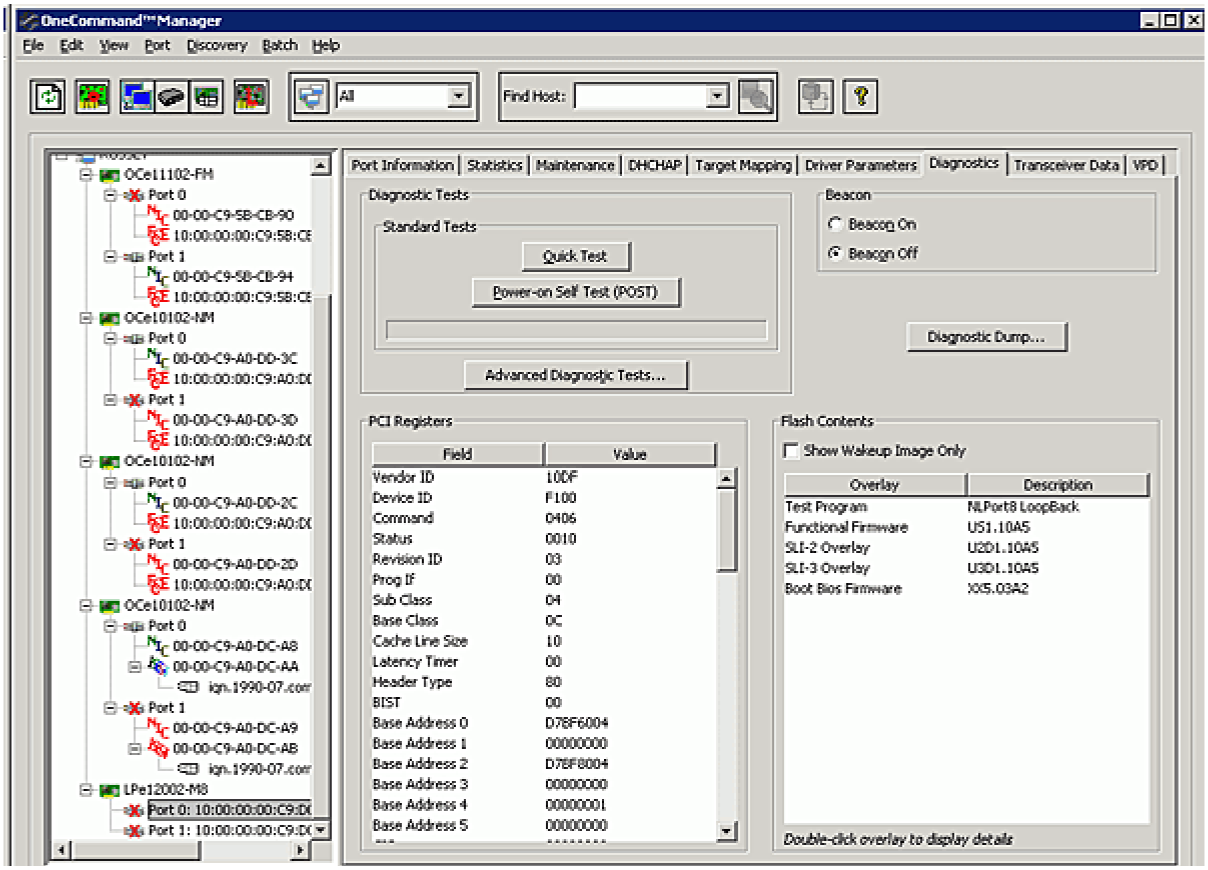
Use the Diagnostics tab to:

- View flash load list, PCI registers and wakeup parameter information.
- Run these tests on Emulex adapters installed in the system: (Not available in read-only mode.)
  - PCI Loopback
  - Internal Loopback
  - External Loopback
  - Power-On Self Test (POST)
  - Echo (End-to-End)
  - Quick Test
- Perform a diagnostic dump and retrieve dump files from remote hosts. (Not available in read-only mode. For 16Gb/s HBAs, refer to “Creating Diagnostic Dumps” on page 184 in the "OneConnect Diagnostics" section.)
- Control adapter beaconing (Not available in read-only mode.)

All functions are supported locally and remotely on hosts managed with TCP/IP access.

Viewing Flash Contents, PCI Registers and Wakeup Information

The Diagnostics tab shows PCI register dump information and flash memory contents. The information is read-only and is depicted below.



PCI Registers

Field	Value
Vendor ID	10DF
Device ID	F100
Command	0406
Status	0010
Revision ID	03
Prog IF	00
Sub Class	04
Base Class	0C
Cache Line Size	10
Latency Timer	00
Header Type	80
BIST	00
Base Address 0	D78F6004
Base Address 1	00000000
Base Address 2	D78F8004
Base Address 3	00000000
Base Address 4	00000001
Base Address 5	00000000

Flash Contents

□ Show Wakeup Image Only

Overlay	Description
Test Program	NLPort8 LoopBack
Functional Firmware	US1.10A5
SLI-2 Overlay	U2D1.10A5
SLI-3 Overlay	U3D1.10A5
Boot Bios Firmware	XX5.03A2

Double-click overlay to display details

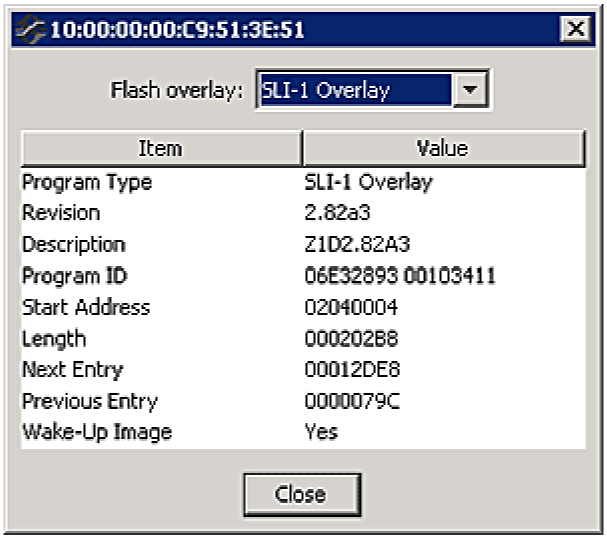
Figure 101: PCI Registers and Flash Contents of the Diagnostics tab

Viewing Flash Contents

If you check the **Show Wakeup Image Only** checkbox, the flash overlays that are not loaded when the system is booted no longer display. This checkbox defaults to unchecked.

Viewing Overlay Details

If you double-click on a flash overlay, another window appears with details about that overlay.



10:00:00:00:C9:51:3E:51

Flash overlay: SLI-1 Overlay

Item	Value
Program Type	SLI-1 Overlay
Revision	2.82a3
Description	Z1D2.82A3
Program ID	06E32893 00103411
Start Address	02040004
Length	000202B8
Next Entry	00012DE8
Previous Entry	0000079C
Wake-Up Image	Yes

Figure 102: Overlay Detail window

To see the details of a different flash overlay image, you can either close the details window and double-click on another overlay name, or choose a different overlay name from the Flash overlay menu.

Viewing the PCI Registers

The PCI Registers appear directly on the Diagnostics tab.

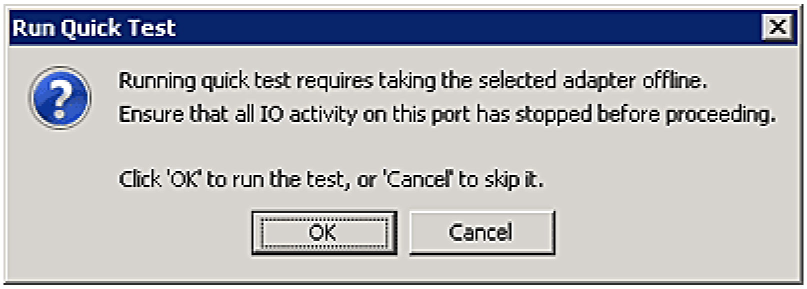
Running a Quick Test

The Diagnostics tab enables you to run a “quick” diagnostics test on a selected adapter. The Quick Test consists of 50 PCI Loopback test cycles and 50 Internal Loopback test cycles. (Not available in read-only mode or on LightPulse adapters in ESXi hosts.)

Note: Internal and External Loopback tests are not available for LP2100 and LP21002 adapters.

To use quick test:

1. From the discovery-tree, select the adapter port on which you want to run the Quick Test.
2. Select the **Diagnostics** tab and click **Quick Test**. A warning message appears.



Run Quick Test

Running quick test requires taking the selected adapter offline.
Ensure that all IO activity on this port has stopped before proceeding.

Click 'OK' to run the test, or 'Cancel' to skip it.

Figure 103: Quick Test Warning

3. Click **OK** to run the test. The Quick Diagnostic Test window appears displaying the PCI Loopback and Internal Loopback test results.

Running a Power On Self Test (POST)

The POST is a firmware test normally performed on an adapter after a reset or restart. The POST does not require any configuration to run. (Not available in read-only mode or on LightPulse adapters in ESXi hosts.)

To run the POST:

1. From the discovery-tree, select the adapter port on which you want to run the POST.
2. Select the **Diagnostics** tab and click **Power-on Self Test (POST)**. A warning dialog box appears.
3. Click **OK**. A POST window appears displaying POST information.

Using Beaconing

The beaconing feature enables you to force a specific adapter's LEDs to blink in a particular sequence. The blinking pattern acts as a beacon, making it easier to locate a specific adapter among racks of other adapters. (Not available in read-only mode.)

When you enable beaconing, the two LEDs blink rapidly in unison for 24 seconds, after which the LEDs report the adapter health status for 8 seconds. When the 8 seconds are up, the adapter returns to beaconing mode. This cycle repeats indefinitely until you disable this feature or you reset the adapter.

Note: The beaconing buttons are disabled if the selected adapter does not support beaconing.

To enable or disable beaconing:

1. From the discovery-tree, select the adapter port whose LEDs you want to set.
2. Select the **Diagnostics** tab and click **Beacon On** or **Beacon Off**.

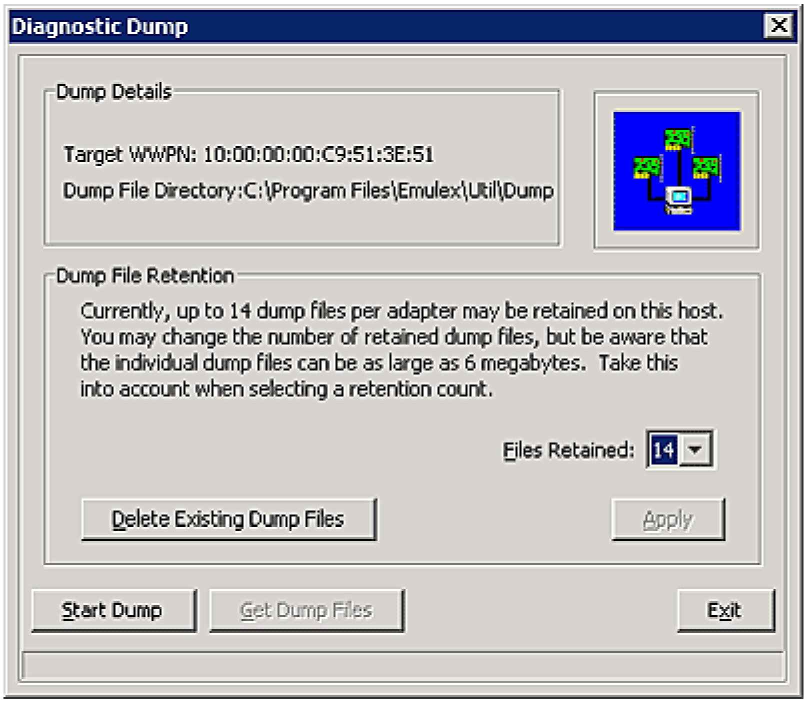
Creating Diagnostic Dumps

The diagnostic dump feature enables you to create a “dump” file for a selected adapter. Dump files contain various information such as firmware version, driver version and so on, that is particularly useful when troubleshooting an adapter. You can also retrieve dump files from remote hosts. (Not available in read-only mode. For 16Gb/s HBAs refer to the OneConnect section “Creating Diagnostic Dumps” on page 184.)

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

To start a diagnostic dump:

1. From the discovery-tree, select an adapter port whose diagnostic information you want to dump.
2. Select the **Diagnostics** tab and click **Diagnostic Dump**. The Diagnostic Dump dialog box appears. You can specify how many files you want to retain using the Files Retained counter. Click **Delete Existing Dump Files** to remove existing dump files for the selected adapter port from your system.



Target WWPN: 10:00:00:00:C9:51:3E:51

Dump File Directory:C:\Program Files\Emulex\Util\Dump

Currently, up to 14 dump files per adapter may be retained on this host. You may change the number of retained dump files, but be aware that the individual dump files can be as large as 6 megabytes. Take this into account when selecting a retention count.

Files Retained: 14

Figure 104: Diagnostic Dump dialog box

3. Click **Start Dump**. A warning message appears about taking the adapter offline.

   Note: For VMware systems you must set a dump directory before initiating a dump. The dump directory must be a "Storage" partition (a datastore) under the directory /vmfs/volumes.

4. Click **OK**. Dump files are created. Where these files are created depends upon your operating system:

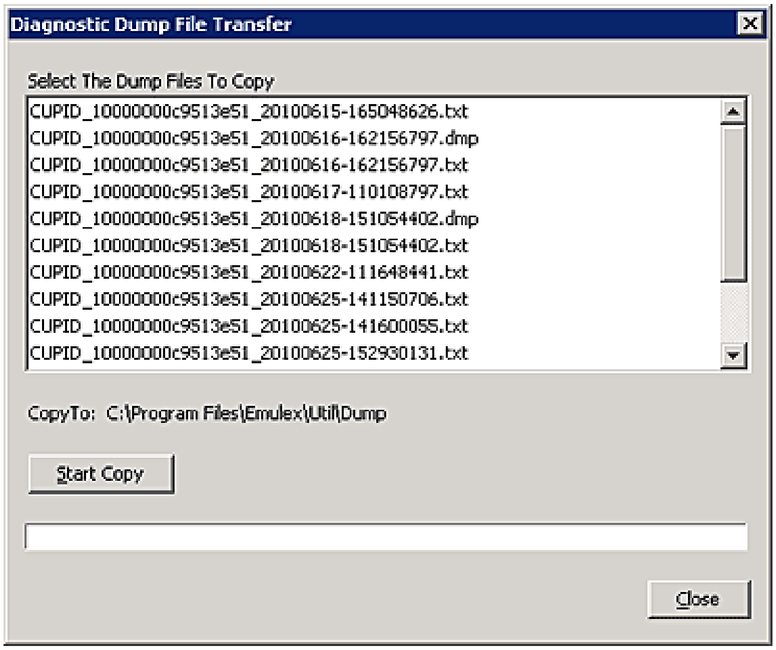
   - Windows - %ProgramFiles%Util\Dump\
   - Solaris - /opt/ELXocm/Dump
   - Linux - /usr/sbin/ocmanager/Dump
   - VMware - a dump directory you created under /vmfs/volumes.

   Two files are created:

   - *<Hostname_WWPN_Date-Time>*.dmp
   - *<Hostname_WWPN_Date-Time>*.txt

5. To obtain remote host dump files and copy them to your local system, click **Get Dump Files**. The Diagnostic Dump File Transfer dialog box appears.

   Note: The Get Dump Files button is disabled when a local adapter port is selected.



Diagnostic Dump File Transfer

Select The Dump Files To Copy

```
CUPID_10000000c9513e51_20100615-165048626.txt
CUPID_10000000c9513e51_20100616-162156797.dmp
CUPID_10000000c9513e51_20100616-162156797.txt
CUPID_10000000c9513e51_20100617-110108797.txt
CUPID_10000000c9513e51_20100618-151054402.dmp
CUPID_10000000c9513e51_20100618-151054402.txt
CUPID_10000000c9513e51_20100622-111648441.txt
CUPID_10000000c9513e51_20100625-141150706.txt
CUPID_10000000c9513e51_20100625-141600055.txt
CUPID_10000000c9513e51_20100625-152930131.txt
```

CopyTo: C:\Program Files\Emulex\Util\Dump

Figure 105: Diagnostic Dump File Transfer dialog box

6. Select the files you want to copy (multiple selections are available) and click **Start Copy**. The remote dump files will be copied to your local Dump folder. The local dump folder locations are described in step 4.

Running Advanced Diagnostic Tests

The Advanced Diagnostics feature gives you greater control than the Quick Test over the type of diagnostics tests that run. Through Advanced Diagnostics, you can specify which tests to run, the number of cycles to run and what to do in the event of a test failure. (Not available in read-only mode or on LightPulse adapters in ESXi hosts.)

Note: Internal and External Loopback tests are not available for LP21000 and LP21002 adapters.

To run advanced diagnostics tests:

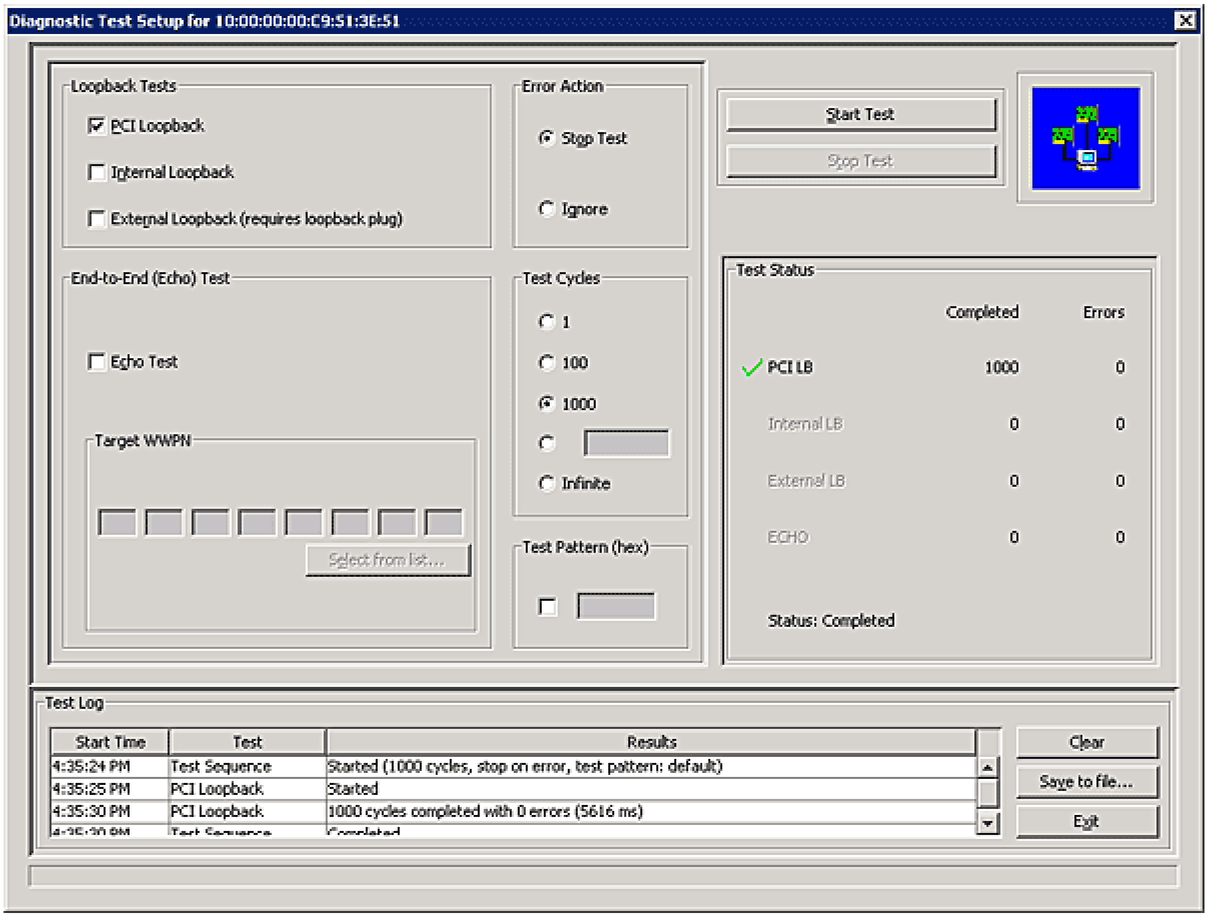
Click **Advanced Diagnostic Tests** on the Diagnostics tab to view the Diagnostic Test Setup dialog box.

You can run four types of tests:

- PCI Loopback
- Internal Loopback
- External Loopback
- End-to-End (ECHO)

Note: You cannot run the External Loopback test and ECHO test concurrently. If you select External Loopback the ECHO test section is disabled and vice versa.

Test results and the status of running tests are time stamped and appear in the Test Log area.



Diagnostic Test Setup for 10:00:00:00:C9:51:3E:51

Loopback Tests
- ☑ PCI Loopback
- ☐ Internal Loopback
- ☐ External Loopback (requires loopback plug)

Error Action
- ● Stop Test
- ○ Ignore

End-to-End (Echo) Test
- ☐ Echo Test

Target WWPN

Test Cycles
- ○ 1
- ○ 100
- ● 1000
- ○
- ○ Infinite

Test Pattern (hex)
- ☐

Test Status

	Completed	Errors
✓ PCI LB	1000	0
Internal LB	0	0
External LB	0	0
ECHO	0	0

Status: Completed

Test Log

Start Time	Test	Results
4:35:24 PM	Test Sequence	Started (1000 cycles, stop on error, test pattern: default)
4:35:25 PM	PCI Loopback	Started
4:35:30 PM	PCI Loopback	1000 cycles completed with 0 errors (5616 ms)
4:35:30 PM	Test Sequence	Completed

Figure 106: Diagnostic Test Setup

Running Loopback Tests

To run a loopback test, use the Loopback Test section of the Advanced Diagnostics dialog box.

Loopback Test Combinations

Run the following loopback test combinations using the appropriate checkboxes:

- PCI Loopback Test - A firmware controlled diagnostic test in which a random data pattern is routed through the PCI Bus without being sent to an adapter link port. The returned data is subsequently validated for integrity.
- Internal Loopback Test - A diagnostic test in which a random data pattern is sent down to an adapter link port, then is immediately returned without actually going out on the port. The returned data is subsequently validated for integrity.
- External Loopback Test - A diagnostic test in which a random data pattern is sent down to an adapter link port. The data goes out the port and immediately returns via a loopback connector. The returned data is subsequently validated for integrity.

Note: You cannot run the External Loopback test and ECHO test concurrently. If you select External Loopback the ECHO test section is disabled and vice versa.

Error Action

Enables you to define what is to be done in the event of a test failure. There are two error action options:

- Stop Test - Do not log the error and abort the test. No further tests are run.
- Ignore - Log the error and proceed with the next test cycle.

Test Cycles

Enables you to specify test cycles three ways:

- Select an established cycle count by clicking on the corresponding radio button.
- Enter a custom cycle count in the blank field in the Test Cycles area.
- Set the test to run until you manually click Stop Test, by selecting the Infinite radio button.

Test Pattern

Enter a custom test pattern to be used in tests that transfer data. The test pattern can be up to 8 hexadecimal bytes.

Test Status

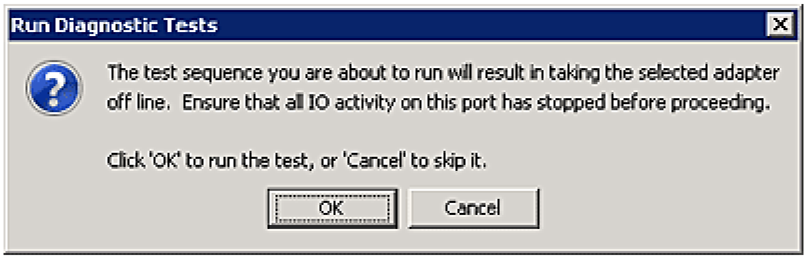
The Test Status area displays how many completed cycles of each test ran, as well as the number of errors.

To run loopback tests:

1. From the discovery-tree, select the adapter port on which you want to run the Loopback Test.
2. Select the **Diagnostics** tab and click **Advanced Diagnostics Tests**. From the Loopback Test section of the dialog box, choose the type of Loopback test you want to run and define the loopback test parameters.

   Note: You must insert a loopback plug in the selected adapter before running an External Loopback test.

3. Click **Start**. The following warning appears:

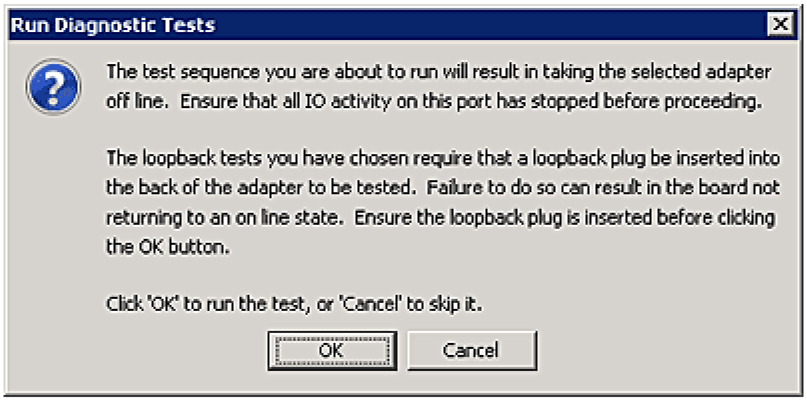


The test sequence you are about to run will result in taking the selected adapter off line. Ensure that all IO activity on this port has stopped before proceeding.

Click 'OK' to run the test, or 'Cancel' to skip it.

Figure 107: Run Diagnostic Tests Warning

4. Click **OK**. If you choose to run an External Loopback test the following window appears:


Run Diagnostic Tests

The test sequence you are about to run will result in taking the selected adapter off line. Ensure that all IO activity on this port has stopped before proceeding.

The loopback tests you have chosen require that a loopback plug be inserted into the back of the adapter to be tested. Failure to do so can result in the board not returning to an on line state. Ensure the loopback plug is inserted before clicking the OK button.

Click 'OK' to run the test, or 'Cancel' to skip it.

Figure 108: Advanced Diagnostic Tests Warning window for External Loopback

5. Click **OK**. The progress bar indicates that the test is running.

   Periodic test feedback, consisting of the current loopback test/cycle plus the completion status of each type of test, is displayed in the Test Log section of the dialog box. Click **Clear** to erase the contents of the log display or click **Save to File** to save the log file.

Running End-to-End (ECHO) Tests

Run echo tests using the End-to-End (ECHO) Test section of the Diagnostics tab. The end-to-end test enables you send an ECHO command/response sequence between an adapter port and a target port. (Not available in read-only mode.)

Note: Not all remote devices respond to an echo command.
You cannot run the ECHO test and the External Loopback test concurrently. If you select the ECHO Test the External Loopback test is disabled.

To run end-to-end echo tests:

1. From the discovery-tree, select the adapter port from which to initiate the End-to-End (ECHO) Test.
2. Select the **Diagnostics** tab. Click **Advanced Diagnostic Tests**.

   Check **Echo Test**. Enter the World Wide Port Name (WWPN) for the target.
   or
   Click **Select From List** if you do not know the actual WWPN of the test target. The Select Echo Test Target dialog box appears. Select the port to test from the tree-view and click **Select**. All relevant information for the selected port is automatically added to the Target Identifier section of the Diagnostics dialog box.

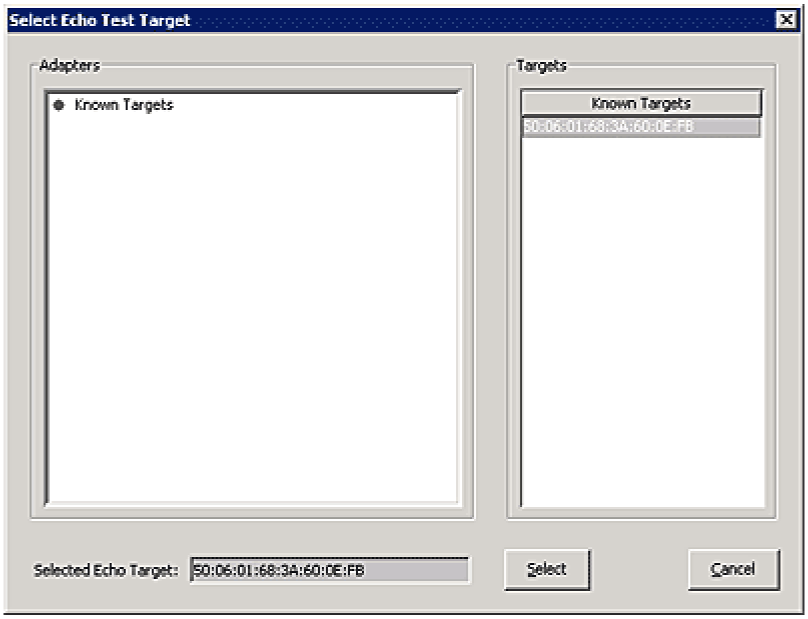
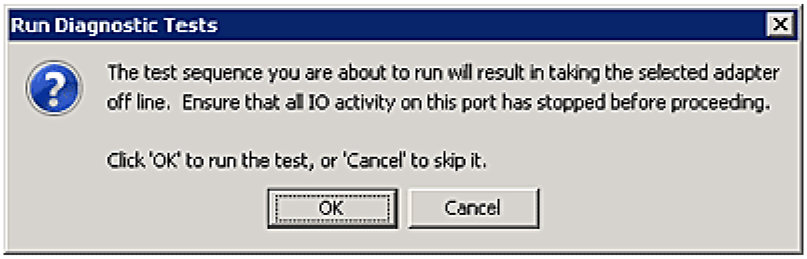


Figure 109: Select Echo Test Target window

3. Define the other parameters you want to use and click **Start Test**. The following warning window appears:



The test sequence you are about to run will result in taking the selected adapter off line. Ensure that all IO activity on this port has stopped before proceeding.

Click 'OK' to run the test, or 'Cancel' to skip it.

Figure 110: Advanced Diagnostic Tests Warning window

4. Click **OK**. A result screen appears and the test results appear in the Test Log. Click **Clear** to erase the contents of the log display or click **Save to File** to save the log file.

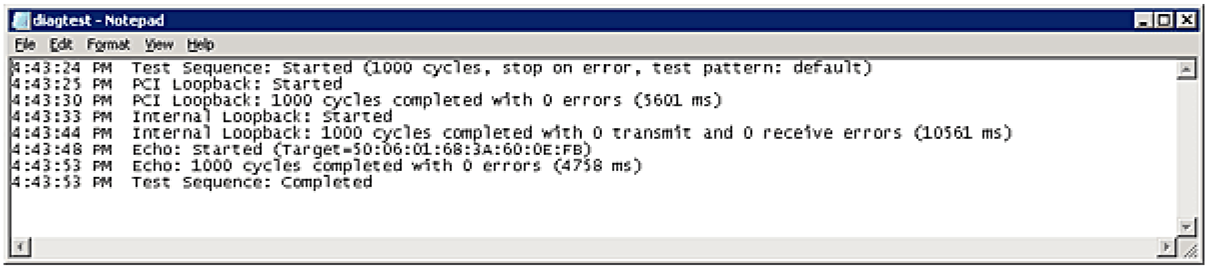
Saving the Log File

You can save the test log to a log file for later viewing or printing. When new data is written to a saved file, the data is appended to the end of the file. Each entry has a two-line header that contains the identifier of the adapter being tested and the date and time of the test. Over time, the data accumulates to form a chronological history of the diagnostics performed on the adapter. (Not available in read-only mode.)

The default location is:

- In Windows: the OneCommand Manager application install directory on your local drive
- In Solaris: /opt/ELXocm/Dump
- In Linux: /usr/sbin/ocmanager/Dump
- In VMware Server: There is no default directory for VMware.

After writing an entry into the log, you are prompted to clear the display. The default name of the saved file is DiagTest.log. An example of a saved log file appears below:



```
4:43:24 PM   Test Sequence: Started (1000 cycles, stop on error, test pattern: default)
4:43:25 PM   PCI Loopback: Started
4:43:30 PM   PCI Loopback: 1000 cycles completed with 0 errors (5601 ms)
4:43:33 PM   Internal Loopback: Started
4:43:44 PM   Internal Loopback: 1000 cycles completed with 0 transmit and 0 receive errors (10561 ms)
4:43:48 PM   Echo: Started (Target=50:06:01:68:3A:60:0E:FB)
4:43:53 PM   Echo: 1000 cycles completed with 0 errors (4758 ms)
4:43:53 PM   Test Sequence: Completed
```

Figure 111: Example of a DiagTest.log window

To save the log file:

1. After running a test from the Diagnostic Test Setup dialog box, click **Save to File**. The Select Diagnostic Log file Name dialog box appears. The default name of a saved file is DiagTest.log.
2. Browse to the desired directory, change the log file name if you want and click **Save**.

OneConnect Diagnostics

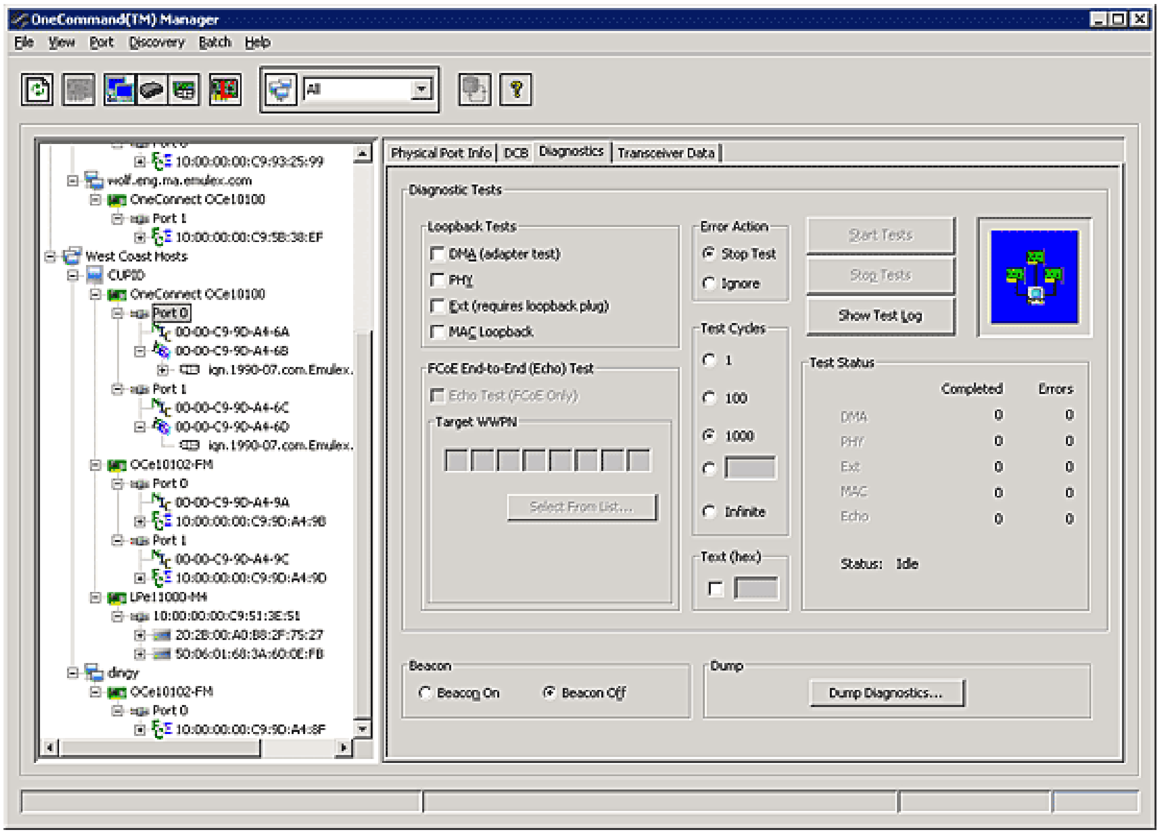
This section describes the diagnostics for OneConnect adapters. For FC adapter diagnostics, see “LightPulse FC HBA Diagnostics” on page 170.

Note: Diagnostics are not available in read-only mode. See “Changing Management and Read-Only Mode” on page 28 for more information.

Use the Diagnostics tab to:

- Run these tests on OneConnect adapters installed in the system:
  - DMA Loopback
  - PHY Loopback
  - MAC Loopback
  - End-to-End (ECHO) (FCoE only)
  - External Loopback
- Perform a diagnostic dump and retrieve dump files from remote hosts.
- Control adapter beaconing

All functions are supported locally and remotely on hosts managed with TCP/IP access. Test results and the status of running tests are time stamped and appear in the Test Status area.



Loopback Tests
☐ DMA (adapter test)
☐ PHY
☐ Ext (requires loopback plug)
☐ MAC Loopback

FCoE End-to-End (Echo) Test
☐ Echo Test (FCoE Only)
Target WWPN

Error Action
● Stop Test
○ Ignore

Test Cycles
○ 1
○ 100
● 1000
○
○ Infinite

Text (hex)
☐

Test Status

	Completed	Errors
DMA	0	0
PHY	0	0
Ext	0	0
MAC	0	0
Echo	0	0

Status: Idle

Beacon
○ Beacon On ● Beacon Off

Figure 112: NIC Diagnostics tab

OneConnect Loopback Test Combinations

Run the following loopback test combinations using the appropriate checkboxes:

- DMA Loopback Test - The DMA loopback test sends data from the host to the adapter, then back to the host, where it is checked for data miscompute errors. All tests except the DMA loopback test are run on the currently selected port. The DMA loopback test is run across the entire adapter. The same diagnostic is therefore executed regardless of the currently selected physical port. Also, unlike other diagnostics, this test affects the operation of all ports on the adapter. (Not available on ESXi systems.)
- PHY Loopback Test - The PHY loopback test connects the transmit output of the physical layer to the receive input of the physical layer. The data is transmitted, received and checked for data miscompute errors.
- External Loopback Test - A diagnostic test in which a random data pattern is sent down to an adapter link port. The data goes out the port and immediately returns via a loopback connector. The returned data is subsequently validated for integrity.
- MAC Loopback - MAC loopback connects the transmit output of the MAC controller to the receive input of the MAC controller (bypassing the PHY).

FCoE End to End Echo Test

The end-to-end test enables you send an ECHO command/response sequence between an adapter port and a target port. (Not available on ESXi systems.)

> **Note:** Not all remote devices respond to an echo command. You cannot run the ECHO test and the External Loopback test concurrently. If you select the ECHO Test the External Loopback test is disabled.

Error Action

Enables you to define what is to be done in the event of a test failure. There are two error action options:

- Stop Test - Do not log the error and abort the test. No further tests are run.
- Ignore - Log the error and proceed with the next test cycle.

Test Cycles

Enables you to specify test cycles three ways:

- Select an established cycle count by clicking on the corresponding radio button.
- Enter a custom cycle count in the blank field in the Test Cycles area.
- Set the test to run until you manually click Stop Test, by selecting the Infinite radio button.

Test Pattern

Enter a custom test pattern to be used in tests that transfer data. The test pattern can be up to 8 hexadecimal bytes.

Test Status

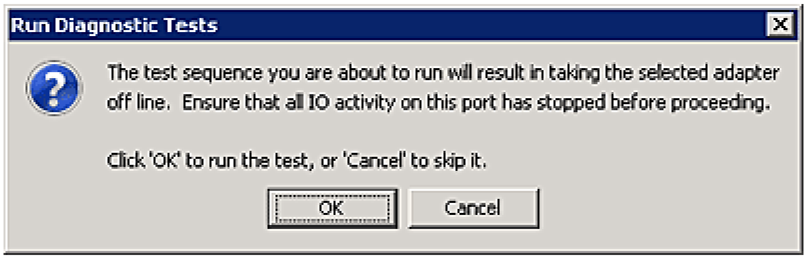
The Test Status area displays how many completed cycles of each test ran, as well as the number of errors.

To run loopback tests:

1. From the discovery-tree, select the adapter port on which you want to run the Loopback Test.
2. Select the **Diagnostics** tab. From the Loopback Test section of the dialog box, choose the type of Loopback test you want to run and define the loopback test parameters.

> **Note:** You must insert a loopback plug in the selected adapter before running an External Loopback test. Also, you must ensure that the NIC function of the port goes to a link up state. See the Troubleshooting section if the NIC link fails to come up.

3. Click **Start**. The following warning appears:



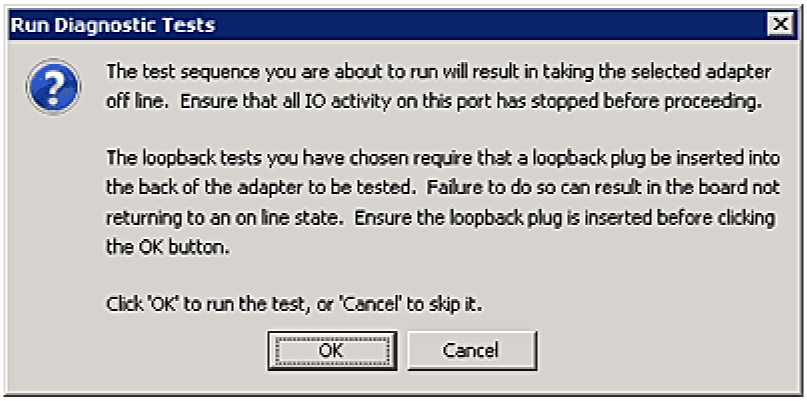
Run Diagnostic Tests

The test sequence you are about to run will result in taking the selected adapter off line. Ensure that all IO activity on this port has stopped before proceeding.

Click 'OK' to run the test, or 'Cancel' to skip it.

Figure 113: Run Diagnostic Tests Warning

4. Click **OK**. If you choose to run an External Loopback test the following window appears:



Run Diagnostic Tests

The test sequence you are about to run will result in taking the selected adapter off line. Ensure that all IO activity on this port has stopped before proceeding.

The loopback tests you have chosen require that a loopback plug be inserted into the back of the adapter to be tested. Failure to do so can result in the board not returning to an on line state. Ensure the loopback plug is inserted before clicking the OK button.

Click 'OK' to run the test, or 'Cancel' to skip it.

Figure 114: Advanced Diagnostic Tests Warning window for External Loopback

5. Click **OK**. The progress bar indicates that the test is running.

   Periodic test feedback, consisting of the current loopback test/cycle plus the completion status of each type of test, is displayed in the Test Status section of the dialog box. Click **Show Test Log** to view and save the log file.

Using Beaconing

The beaconing feature enables you to force a specific adapter's LEDs to blink in a particular sequence. The blinking pattern acts as a beacon, making it easier to locate a specific adapter among racks of other adapters. (Not available in read-only mode.)

When you enable beaconing for LightPulse adapters, the two LEDs blink rapidly in unison for 24 seconds, after which the LEDs report the adapter health status for 8 seconds. When the 8 seconds are up, the adapter returns to beaconing mode. This cycle repeats indefinitely until you disable this feature or you reset the adapter.

When you enable beaconing for OneConnect adapters, the two LEDs blink rapidly in unison until you disable beaconing.

Note: The beaconing buttons are disabled if the selected adapter does not support beaconing.

To enable or disable beaconing:

1. From the discovery-tree, select the adapter port whose LEDs you want to set.
2. Select the **Diagnostics** tab and click **Beacon On** or **Beacon Off**.

Saving the Log File

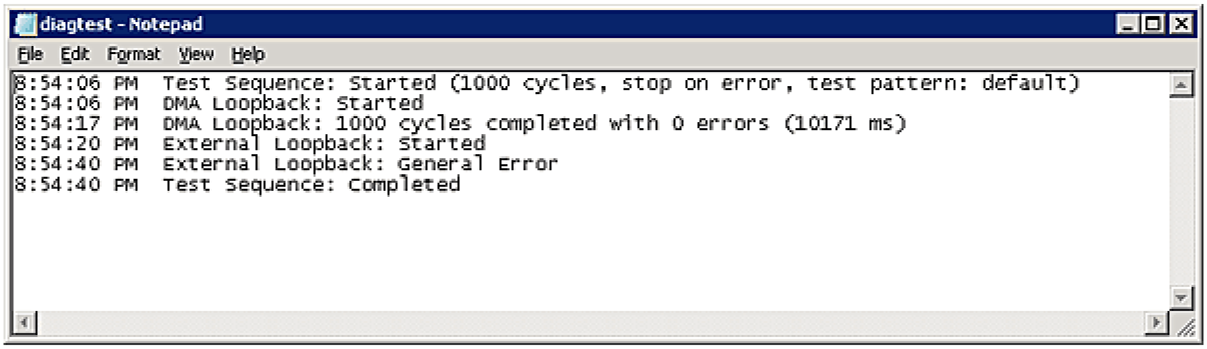
You can save the test log to a log file for later viewing or printing. When new data is written to a saved file, the data is appended to the end of the file. Each entry has a two-line header that contains the identifier of the adapter being tested and the date and time of the test. Over time, the data accumulates to form a chronological history of the diagnostics performed on the adapter. (Not available in read-only mode.)

The default location is:

- In Windows: the OneCommand Manager application install directory on your local drive
- In Solaris: /opt/ocmanager/Dump
- In Linux: /usr/sbin/ocmanager/Dump

- In VMware Server: There is no default directory for VMware.

After writing an entry into the log, you are prompted to clear the display. The default name of the saved file is DiagTest.log. An example of a saved log file appears below:



```
8:54:06 PM  Test Sequence: Started (1000 cycles, stop on error, test pattern: default)
8:54:06 PM  DMA Loopback: Started
8:54:17 PM  DMA Loopback: 1000 cycles completed with 0 errors (10171 ms)
8:54:20 PM  External Loopback: Started
8:54:40 PM  External Loopback: General Error
8:54:40 PM  Test Sequence: Completed
```

Figure 115: Example of a DiagTest.log window

To save the log file:

1. After running a test from the Diagnostic tab, click **Save Test Log**. The Diagnostic Test Log dialog box appears. The default name of a saved file is DiagTest.log.
2. Browse to the desired directory, change the log file name if you want and click **Save to file**.

Creating Diagnostic Dumps

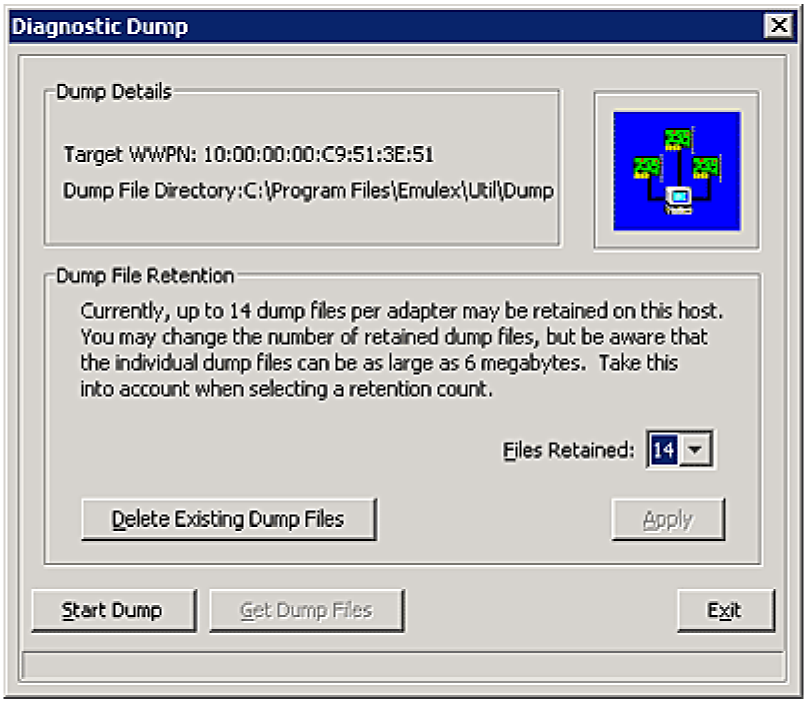
The diagnostic dump feature enables you to create a “dump” file for a selected adapter. Dump files contain various information such as firmware version, driver version and so on, that is particularly useful when troubleshooting an adapter. You can also retrieve dump files from remote hosts. (Not available in read-only mode.)

To start a diagnostic dump:

1. From the discovery-tree, select an adapter whose diagnostic information you want to dump.
2. Select the **Firmware** tab and click **Diagnostic Dump**. The Diagnostic Dump dialog box appears.

   For hosts being managed through the CIM interface, the Set Dump Directory button enables you to set the dump directory for ESX host dumps. (VMware only)

   Specify how many files you want to retain using the Files Retained counter. Click **Delete Existing Dump Files** to remove existing dump files for the selected adapter from your system.



Diagnostic Dump

Dump Details

Target WWPN: 10:00:00:00:C9:51:3E:51

Dump File Directory:C:\Program Files\Emulex\Util\Dump

Dump File Retention

Currently, up to 14 dump files per adapter may be retained on this host. You may change the number of retained dump files, but be aware that the individual dump files can be as large as 6 megabytes. Take this into account when selecting a retention count.

Files Retained: 14

Figure 116: Diagnostic Dump dialog box

3. Click **Start Dump**. Dump files are created. Where these files are created depends upon your operating system:

Note: For VMware systems you must set a dump directory before initiating a dump. The dump directory must be a "Storage" partition (a datastore) under the directory /vmfs/volumes.

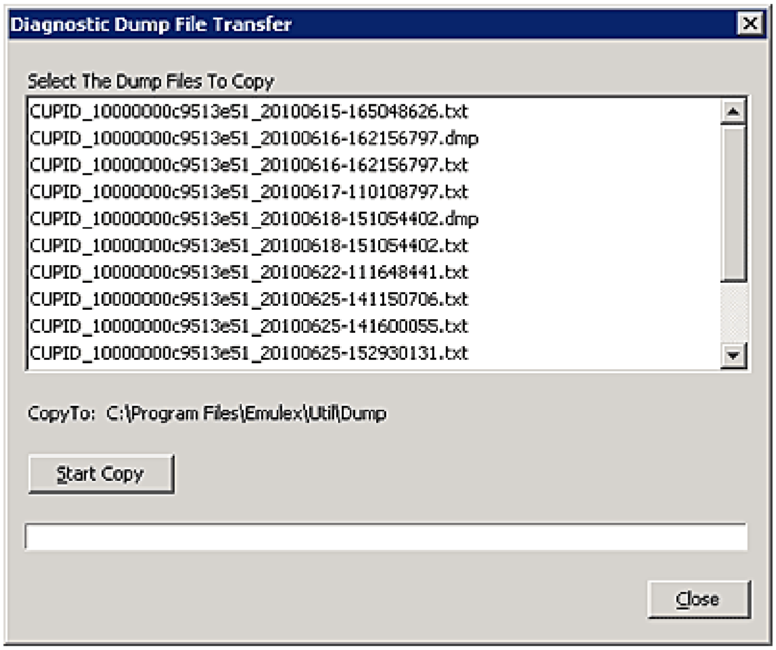
- Windows - %ProgramFiles%Util\Dump\
- Solaris - /opt/ocmanager/Dump
- Linux - /usr/sbin/ocmanager/Dump
- VMware - a dump directory you create under /vmfs/volumes.

Two files are created:

- *<Hostname_WWPN_Date-Time>*.dmp
- *<Hostname_WWPN_Date-Time>*.txt

4. To obtain remote host dump files and copy them to your local system, click **Get Dump Files**. The Diagnostic Dump File Transfer dialog box appears.

Note: The Get Dump Files button is disabled when a local adapter port is selected.



Select The Dump Files To Copy

```
CUPID_10000000c9513e51_20100615-165048626.txt
CUPID_10000000c9513e51_20100616-162156797.dmp
CUPID_10000000c9513e51_20100616-162156797.txt
CUPID_10000000c9513e51_20100617-110108797.txt
CUPID_10000000c9513e51_20100618-151054402.dmp
CUPID_10000000c9513e51_20100618-151054402.txt
CUPID_10000000c9513e51_20100622-111648441.txt
CUPID_10000000c9513e51_20100625-141150706.txt
CUPID_10000000c9513e51_20100625-141600055.txt
CUPID_10000000c9513e51_20100625-152930131.txt
```

CopyTo: C:\Program Files\Emulex\Util\Dump

Figure 117: Diagnostic Dump File Transfer dialog box

5. Select the files you want to copy (multiple selections are available) and click **Start Copy**. The remote dump files are copied to your local Dump folder. The local dump folder locations are described in step 4.

Using the OneCommand Manager Application Command Line Interface

The Command Line Interface (CLI) Client component of the OneCommand Manager application provides access to the capabilities of the Remote Management library from a console command prompt. This component is intended for use in scripted operations from within shell scripts or batch files. The CLI Client is a console application named HbaCmd. Each time you run this application from the command line, a single operation is performed.

The first parameter of this command is the requested operation. When the specified operation is completed, the command prompt is displayed. Most operations retrieve information about an entity on the storage area network (SAN) and show that information on the console.

Most of the CLI Client commands require one or more additional parameters that specify the nature of the command. For FC ports the world wide port name (WWPN) of the adapter must be specified.

For example, run the following command to display the port attributes for the adapter with the specified WWPN:

```
hbacmd PortAttributes 10:00:00:00:c9:20:20:20
```

For iSCSI and NIC ports the MAC address must be specified.

For example, run the following command to set the target properties for the CNA port with the specified MAC address:

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

The command sets the extended timeout value to 1.

The OneCommand Manager CLI can be run in TCP/IP mode by making the first argument h=<*host*>. For example:

```
hbacmd h=cp-hp5670 ListHBAs
hbacmd h=138.239.91.121 ListHBAs
```

Managing Devices Using CIM

VMware on the Visor-based ESX platforms uses the Common Interface Model (CIM) as the only standard management mechanism for device management. OneCommand Manager uses the standard CIM interfaces to manage the adapters in the ESX COS and Visor environments and supports CIM-based device and HBA management. OneCommand Manager also supports existing HBA management functionality based on its proprietary management stack and the standard HBAAPI interface.

To manage the adapters on an ESX/ESXi host using OneCommand Manager, you must install the Emulex CIM Provider on the host.

ESX/ESXi 3.5, 4.0, and 4.1 come with an inbox Emulex CIM Provider. The inbox Emulex CIM Provider enables you to manage Emulex LightPulse adapters, but not Emulex UCNA adapters. To manage Emulex UCNA adapters, you must install the out-of-box Emulex CIM Provider. The Emulex CIM Provider is available as a 'core kit' rpm in the ESX COS platform and as an offline bundle in ESXi platforms. VMWare recommends using the offline bundle to upgrade software on VMWare platforms.

For more information about the ESX Patch Management activities, refer to the VMware website.

You can use the following syntax for issuing CIM-based commands:

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

Before issuing the syntax B, do one of the following:

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

For example:

```
hbacmd <m=cim> AddHost <IPAddress> [u=userid] [p=password] [n=namespace]
```

Or

- Set the default CIM credentials using the SetCimCred command.

Note: This command sets only the CIM credentials. Once you have set these, subsequent HbaCmd commands do not require you specify the CIM credentials on the command line.

For example:

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

Note: If you specify the command with the discovery method "m=cim" and you do not specify the CIM credentials (userid, password, or namespace) the default value for the missing CIM credential is obtained in the following order:
(1) The information entered using the addhost command is looked up.
(2) If no values exist, the information entered using the setcimcred command is used.
(3) If no values exist, the following credentials are used:
username = root,
password = root,
namespace = root/emulex
portnum = 5988

Note: The OneCommand Manager CLI running on VMware ESX 4.0/4.1 or ESXi 5.0 COS does not support management of adapters using the CIM interface.

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

In Windows:

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

Note: In Linux, VMware and Solaris, you cannot use hbacmd as a CIM client.

The output displayed is similar to the following:

```
Manageable HBA List

Port WWN : 10:00:00:00:c9:6b:62:2b
Node WWN : 20:00:00:00:c9:6b:62:2b
Fabric Name: 00:00:00:00:00:00:00:00
Flags  : 00000000
```

```
Host Name : eng.ma.emulex.com
Mfg    : Emulex Corporation
Serial No. : BG73539764
Port Number: n/a
Mode   : Initiator
Discovery : cim

Port WWN : 10:00:00:00:c9:6b:62:59
Node WWN : 20:00:00:00:c9:6b:62:59
Fabric Name: 00:00:00:00:00:00:00:00
Flags  : 00000000
Host Name : eng.ma.emulex.com
Mfg    : Emulex Corporation
Serial No. : BG73539764
Port Number: n/a
Mode   : Initiator
Discovery : cim

C:\Program Files\Emulex\Util\OCManager>hbacmd h=10.192.113.128 m=cim u=root
p=root n=root/emulex portattributes 10:00:00:00:c9:6b:62:2b

Port Attributes for 10:00:00:00:c9:6b:62:2b

Node WWN     : 20 00 00 00 c9 6b 62 2b
Port WWN     : 10 00 00 00 c9 6b 62 2b
Port Symname :
Port FCID    : 0000
Port Type    : Fabric
Port State   : Unknown
Port Service Type: 12
vNIC Name    :
vNIC Outer VLAN ID:
vNIC Min. Bandwidth:
vNIC Max. Bandwidth:
Port Supported FC4: 00 00 01 20 00 00 00 01
                    00 00 00 00 00 00 00 00
             00 00 00 00 00 00 00 00
                    00 00 00 00 00 00 00 00
Port Active FC4: 00 00 01 00 00 00 00 01
                    00 00 00 00 00 00 00 00
             00 00 00 00 00 00 00 00
             00 00 00 00 00 00 00 00
Max Frame Size: 2048
```

```
OS Device Name:
Num Discovered Ports: 0
Fabric Name: 00 00 00 00 00 00 00 00
```

- If you specify the parameter 'm=cim,' the CLI uses the CIM interface to talk to the CIM server running on ESX to get the management information.
- If you do not specify the parameter 'm=cim, the CLI uses the RM interface to talk to the RM server to get the management information.

The CLI Client Command Reference

Using the CLI Client

Syntax Rules

The syntax rules for HbaCmd are as follows:

- All commands must start with ‘hbacmd’ in lowercase in Linux, Solaris, and VMware which are case sensitive.
- The requested operation must contain at least three characters, or as many as needed to distinguish it from any other operation.
- Whenever a WWPN is specified, individual fields are separated by colons (:) or spaces ( ). When using space separators, the entire WWPN must be enclosed in quotes (“).
- When a MAC address is specified the fields are separated by a dash (-).
- Fields using angle brackets < > are required.
- Fields using square brackets [ ] are optional.

Syntax Rules for CIM

The syntax of the existing HbaCmd commands are the same except for the additional m=cim option for getting the data from the ESXi host. Following is a list of HbaCmd commands supported through the CIM interface.

- AddHost
- AllNodeInfo
- CEEDownload
- ChangePersonality
- ChangeWWN
- ClearAllAadapterLicenses
- DeleteDumpFiles
- Download
- Dump
- EnableBootCode
- GetBeacon
- GetDCBParams
- GetDriverParams
- GetDriverParamsGlobal
- GetDumpDirectory
- GetDumpFile
- GetDumpFileNames
- GetFcfInfo
- GetFipParams
- GetLunList
- GetPGInfo

- GetQosInfo
- GetRetentionCount
- GetVPD
- GetWWNCap
- GetXcvrData
- HbaAttributes
- InstallAdapterLicense
- ListHbas
- LoadList
- Test
- PciData
- PortAttributes
- PortStatistics
- ReadWWN
- RemoveHost
- Reset
- RestoreWWN
- ServerAttributes
- SetBeacon
- SetCableNVP
- SetCnaPGBW
- SetDCBParam
- SetDCBPriority
- SetDriverParam
- SetDriverParamDefaults
- SetDumpDirectory
- SetFIPParam
- SetRetentionCount
- ShowAdapterLicenseFeatures
- ShowLicenseAdapterID
- ShowPersonalities
- TargetMapping

The Command Reference

CLI Client commands are supported for Windows, Solaris, Linux and VMware ESX.

Commands Not Supported in Linux and Solaris

Note: The following commands are not supported in Linux and Solaris:
PersistentBinding
SetPersistentBinding
RemovePersistentBinding
RemoveAllPersistentBinding
BindingCapabilities
BindingSupport
SetBindingSupport
SetPfcThrottle *

*SetPfcThrottle is supported in Linux but not in Solaris.

Commands Not Supported in VMware ESX

Note: The following commands are not supported in VMware ESX:
BindingCapabilities
BindingSupport
CreateVPort
DeleteVPort
GetLunMaskByHBA
GetLunMaskByTarget
PersistentBinding
RescanLuns
RemoveAllPersistentBinding
RemovePersistentBinding
SetBindingSupport
SetLunMask
SetPersistentBinding

Commands Supported in CIM Interface

Commands Supported in CIM Provider 3.0

Note: The following commands are supported by the CIM Provider 3.0 for UCNA:
Download
ChangeWWN
GetWWNCap
GetXcvrData
LoadList
Loopbacktest
GetBeacon
SetBeacon
ReadWWN
Reset
RestoreWWN

Commands Supported in CIM Provider 3.1

Note: In addition to the commands supported by the CIM Provider 3.0, the following commands are supported by the CIM Provider 3.1:
Dump
GetDCBParams
GetDumpDierctory
GetDumpFile
GetDumpFileNames
GetFCFInfo
GetFipParams
GetRetentionCount
GetPGInfo
SetDCBParam
SetCnaPgBw
SetDCBPriority
SetDumpDirectory
SetFIPParam
SetRetentionCount

Commands Supported in CIM Provider 3.2

Note: In addition to the commands supported by the CIM Provider 3.0 and 3.1, the following commands are supported by the CIM Provider 3.2:
ChangePersonality
InstallAdapterLicense
ShowAdapterLicenseFeatures
ShowLicenseAdapterID
ShowPersonalities

Commands Supported in CIM Provider 3.4.4

Note: In addition to the commands supported by the CIM Provider 3.0, 3.1 and 3.2, the following command is supported by the CIM Provider 3.4.4:
SetCableNVP

Commands Supported in CIM Provider 3.5

Note: In addition to the commands supported by the CIM Provider 3.0, 3.1, 3.2 and 3.4.4, the following command is supported by the CIM Provider 3.5:
SetPhyPortSpeed

Commands Supported in Target-mode Ports

Note: The following HbaCmd commands are supported for managing target-mode ports:
DeleteDumpFiles
Download
DriverConfig
ExportSanInfo
GetDCBParams
GetDriverParams
GetDriverParamsGlobal
GetDumpDirectory
GetFCFInfo
GetFIPParams
GetPGInfo
GetPortStatistics
GetRetentionCount
GetVPD
GetXcvrData
HbaAttributes
ListHBAs
PortAttributes
Reset
SaveConfig
ServerAttributes
SetDCBPGBW
SetDCBParam
SetDriverParam
SetDriverParamDefaults
SetFIPParam
SetPortEnabled
SetRetentionCount
All other HbaCmd commands return the error message:
`"Not Supported for Target Mode Adapters."`

Parameters Not Supported in the CIM Interface

The following parameters are not supported ESX 3i U4 via CIM Provider v 2.0.9.x:

- HbaAttributes
  - Opt ROM Version
  - Operational FW
- ServerAttributes
  - FW Resource Path
  - DP Resource Path

Read-Only Mode

The OneCommand Manager CLI does not allow the execution of certain commands when it is configured for read-only mode. An error message returns 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.
```

Help Command

The HbaCmd help command lists help for the HbaCmd console application.

Help

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Description: Help is displayed at three levels. The command hbacmd help lists (by groups) all the commands. The command hbacmd groupname, lists all the commands in the group. The command help commandname shows the help for the specific command.

Parameters:

[GroupName] - All commands in the group.

[CmdName] - Any CLI command.

Adapter License Management Commands

Note: In these commands, the WWPN or MAC address argument is given (only one is used) to specify the adapter the command is acting upon. This is how hbacmd identifies the adapter. It does not imply that the command works on the specified port.

Note: Adapter License Management Commands are supported on OneConnect adapters only.

InstallAdapterLicense

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

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

Parameters:

License File - The path to the license key file containing the license keys obtained from the License website

WWPN - Adapter’s FCoE port WWPN

MAC - Adapter’s NIC or iSCSI port address

Example:

For non-ESXi hosts

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

For ESXi hosts

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

ShowAdapterLicenseFeatures

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description:

This command displays the list of licensed and licensable features as well as features that are already licensed. The output is a list of features with an indication of whether or not the feature has been licensed.

Parameters:

WWPN - Adapter’s FCoE port WWPN

MAC - Adapter’s NIC or iSCSI port address

Example:

For non-ESXi hosts

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

For ESXi hosts

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

ShowLicenseAdapterID

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: 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.

Parameters:

WWPN - Adapter’s FCoE port WWPN

MAC - Adapter’s NIC or iSCSI port address

Example:

For non-ESXi hosts

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

For ESXi hosts

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

Attributes Commands

HbaAttributes

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=<IPAddress>] hbaattributes <WWPN>
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: This command shows a list of all adapter attributes for all ports on the adapter. The type of information listed may vary according to the adapter model.

Parameters:

h - Host’s IP address

WWPN - WWPN of the adapter

PortAttributes

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd <h=IPAddress of host> PortAttributes <WWPN|MAC>
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

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

Parameters:

h - Host’s IP address

WWPN - Port’s WWPN

MAC - MAC address of the NIC or iSCSI port

PortStatistics

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd PortStatistics <WWPN>
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: This command shows all port statistics for the adapter. The type of information listed may vary according to the adapter model.

Parameters:

WWPN - Adapter’s WWPN

ServerAttributes

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: This command shows a list of server attributes for the adapter. The type of information listed may vary according to the adapter model.

Parameters:

WWPN - Adapter’s WWPN

MAC - MAC address of the NIC or iSCSI port

SetPfcThrottle

Note: The PFC Throttle state returns when using the PortAttributes command for OneConnect adapters. However for OneConnect adapters with older firmware that does not support PfcThrottle and for non-OneConnect adapters, the PFC Throttle state does not return when using the PortAttributes command.

Supported by: Windows and Linux

Syntax:

```
hbacmd SetPfcThrottle <WWPN> <0|1>
```

Description: This command returns the FfcThrottle state as enabled or disabled.

Parameters:

WWPN - Adapter’s WWPN

PfcThrottle state-

0 for Disable

1 for Enable

SetPortEnabled

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Description: This command enables or disables the FC or CNA port.

Parameters:

WWPN - Adapter’s WWPN

MAC - MAC address of the NIC or iSCSI port

PortEnable -

0 for Disable

1 for Enable

Note: Ensure all I/O on the port is stopped, before disabling the port.

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

SetPhyPortSpeed

Note: The SetPhyPortSpeed command is available in OneConnect OCe11102 adapters only.

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Description: This command sets the port speed on OneConnect OCe11102 adapters.

Parameters:

WWPN - Adapter’s WWPN

MAC - MAC address of the NIC port

Mode - Mode number

0 for Default

1 for Auto-Negotiate

2 for Force

Speed - Speed string that is required for Mode = 1 or 2

Length - DAC cable length in meters

Note: When Mode = 0, the Speed and Length arguements are ignored. When Mode = 1, the Length arguement is ignored.

Example:

The following example configures the port to a forced speed of 1 Gb/sec with a cable length of 2 meters.

```
hbacmd setphyportspeed 00-00-c9-ad-ad-ac 2 1Gb 2
```

Authentication Commands

Note: Authentication commands are supported on FC adapter ports only.

AuthConfigList

Supported by: Windows, Solaris and Linux

Syntax:

```
hbacmd AuthConfigList <WWPN>
```

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

Parameters:

WWPN - Adapter’s WWPN

DeleteAuthConfig

Supported by: Windows, Solaris and Linux

Syntax:

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

Description: This command deletes the authentication configuration on the adapter.

Parameters:

WWPN1 - Adapter’s WWPN

WWPN2 - Must be "ff:ff:ff:ff:ff:ff:ff:ff" for a switch or the actual WWPN for a target

PasswordType -

1 = ASCII

2 = Hex (binary)

3 = Password not yet defined

Password - Current password value

GetAuthConfig

Supported by: Windows, Solaris and Linux

Syntax:

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

Description: This command retrieves the authentication configuration for the adapter.

Parameters:

WWPN1 - Adapter’s WWPN

WWPN2 - Must be "ff:ff:ff:ff:ff:ff:ff:ff" for a switch or the actual WWPN for a target

GetAuthStatus

Supported by: Windows, Solaris and Linux

Syntax:

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

Description: This command returns the current status for the authentication connection specified by WWPN 1 and 2 (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.

Parameters:

WWPN1 - Adapter’s WWPN

WWPN2 - Must be "ff:ff:ff:ff:ff:ff:ff:ff" for a switch or the the actual WWPN for a target

InitiateAuth

Supported by: Windows, Solaris and Linux

Syntax:

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

Description: This command initiates the authentication configuration on the adapter.

Parameters:

WWPN1 - Adapter’s WWPN

WWPN2 - Must be "ff:ff:ff:ff:ff:ff:ff:ff" for a switch or the actual WWPN for a target

SetAuthConfig

Supported by: Windows, Solaris and Linux

Syntax:

```
hbacmd SetAuthConfig <WWPN1> <WWPN2> <PasswordType> <Password> <Parameter>
<Value>
```

Description: This command sets the authentication configuration for the adapter.

Parameters:

WWPN1 - Adapter’s WWPN

WWPN2 - Must be "ff:ff:ff:ff:ff:ff:ff:ff" for a switch or the actual WWPN for a target

PasswordType -

1 = ASCII

2 = Hex (binary)

3 = Password not yet defined

Password - Current password value

Parameter -
Mode
Timeout
Bi-directional
Hash-priority
DH-priority
Re-authentication
Re-authentication-interval

Value - Parameter-specific value:
Mode = <disabled, enabled, passive>
Timeout = time in seconds
Bi-directional = <disabled, enabled>
Hash-priority = <md5, 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, enabled>
Re-authentication-interval = < 0, 10 - 3600>

SetPassword

Supported by: Windows, Solaris and Linux

Syntax:

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

Description: This command sets the password for the adapter.

Parameters:

WWPN1 - Adapter’s WWPN

WWPN2 - Must be "ff:ff:ff:ff:ff:ff:ff:ff" for switch, or the actual WWPN for target

Flag -
1 = Local (password used by adapter when adapter authenticates to the switch)
2 = Remote (password used by adapter when switch authenticates to the adapter)

Cpt - Current password type:
1 = ASCII
2 = Hex (binary)
3 = Password not yet defined

Cpw - Current password value

Npt - New password type:
1 = ASCII
2 = Hex (binary)

Npw - New password value

Boot Commands

Note: Boot commands are supported on FC/FCoE adapter ports only.

EnableBootCode

Note: This command is not supported for OneConnect adapters. The boot code is always enabled on OneConnect adapters.

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd EnableBootCode <WWPN|MAC> <Flag>
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: This command enables or disables the boot code on the FC adapter or the Preboot Execution Environment (PXE) BIOS of the NIC on the CNA adapter. If the boot code is disabled on the FC adapter, the adapter does not boot from the SAN, regardless of the value for the EnableBootFromSan boot param. If the boot code is enabled on the FC adapter, the adapter boots from the SAN if the EnableBootFromSan parameter is also enabled. Disabling the PXE BIOS on the CNA adapter's NIC prevents booting from the NIC. Enabling the PXE BIOS on the CNA adapter's NIC allows booting from the NIC.

Parameters:

WWPN - Adapter’s WWPN

MAC - The MAC address of the NIC or iSCSI port

Flag -

D = Disable the boot code

E = Enable the boot code

GetBootParams

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Description: This command shows the 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.

Parameters:

WWPN - Adapter’s WWPN

Type - X86, UEFI, OB

SetBootParam

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Description: This command changes the boot parameters. You can change adapter parameters and boot device parameters for OpenBoot, x86, and UEFI boot.

- When changing adapter parameters, omit the BootDev keyword and value; otherwise, an error is reported.
- When changing bootdevice 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.

Parameters:

WWPN - Adapter’s WWPN

Type - X86, UEFI, OB

Param - Parameter name

Value1 - Parameter value

BootDev - The boot device

Value2 - Boot device entry number: (0 - 7)

CEE Commands

Note: Converged Enhanced Ethernet (CEE) commands are for CEE management of LP21000 series adapters only.

CEEDownload

Note: Supported for LP21000 series adapters only. Not supported for OneConnect adapters.

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd CEEDownload <WWPN> <Filename>
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: This command updates the CEE firmware on the adapter.

Parameters:

WWPN - Adapter’s WWPN

Filename - Name of the file to download

GetCEEParams

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd GetCEEParams <WWPN>
```

Description: This command shows the CEE parameters.

Parameters:

WWPN - CNA's WWPN

SetCEEParam

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd SetCEEParam <WWPN> <Param> <Value>
```

Description: This command sets or clears the Internal Host PFC flag. SetCEEParam configures one of the CEE parameters.

Parameters:

WWPN - World Wide Port Name of the adapter

Param - Parameter name

LP21000-M and LP21002-M parameters:

Pausetype - 1 = Standard, 2 = Per Pause Priority

pfcflag - 0 = Clear, 1= Set

pfcpriority - (0-0xff)

fcoepriority - (0-7)

fcoeformat - (0 or 0x10000)

Uifporttype - 1 = Access, 2 = Trunk

Value - Parameter Value

Where multiple values are possible, they should be specified using comma separated values.

Data Center Bridging Commands

Note: Data Center Bridging (DCB) commands are for DCB management of OneConnect adapters only.

GetDCBParams

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: This command shows the Internal Host PFC flag value and DCBX mode (DCB version), as well as, the LLDP state for iSCSI, FCoE and NIC CNAs.

Parameters:

WWPN - Adapter’s WWPN

MAC - MAC address of the NIC or iSCSI port

Example:

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

GetPGInfo

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: This command shows the bandwidth percentages for all the priority groups for the port. Additionally, this command displays the number of priority groups supported by an adapter.

Parameters:

WWPN - The WWPN address of the FCoE port

MAC - MAC address of the NIC or iSCSI port

Example:

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

SetCnaPGBW

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd SetCnaPGBW <WWPN|MAC> <BW0 … BW7>
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: This command sets the bandwidth percentage of a priority group according to the following rules:

1. Bandwidths BW0 to BW7 must add up to 100%.
2. Bandwidth can be assigned to a priority group that has priorities.

Parameters:

WWPN - Adapter’s WWPN

MAC - MAC address of the NIC or iSCSI port

BW - Bandwidth allocated for each priority group

Example:

This command sets the bandwidth of PGID0 to 50 PGID1 to 50 and the rest to 0%.

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

SetDCBParam

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: This command configures the DCB and LLDP settings on the OneConnect adapter.

Parameters:

WWPN - Adapter’s WWPN

MAC - MAC address of the NIC or iSCSI port

OneConnect adapter parameters: (1= enabled 0 = disabled)

Note: The OneConnect adapter parameters doe not apply to LP21xxx adapters.

DCBXState - The current DCBX (Data Center discovery and Capability exchange protocol) state

DCBXMode - The DCBX mode can be either DCB or CIN.

Note: DCBX mode also configures FIP mode. If DCBX mode is DCB, FIP is enabled. If it is CIN, FIP is disabled.

PFCEnable - Enabled means that flow control in both directions (Tx and Rx) is enabled.

FCoEPriority - You must specify a single priority (0-7). [only for FCoE adapters]

iSCSIPriority - You must specify a single priority (0-7). [only for iSCSI adapters]

PFCPriorities - Specify PFCPriorities as a single priority or as a list of comma separated values. Comma separated list of up to 7 values ranging from 0-7.

Default - Setting the SetDCBParam arguments to default sets all CNA DCB params (including priority groups) to their default values.

For example:

```
    hbacmd SetDCBParam <WWPN|MAC> defaults
```

Link Layer Discovery Protocol (LLDP) parameters:(1= enabled 0 = disabled)

TxState (Transmit State)- DCBX uses Link Layer Discovery Protocol (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.

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.

TxPortDesc (Transmit Port Description)- Provides a description of the port in an alpha-numeric format. The value equals the ifDescr object, if the LAN device supports RFC 2863.

TxSysDesc (Transmit System Description)- Provides a description of the network entity in an alpha-numeric format. This includes the system's name and versions of hardware, operating system and networking software supported by the device. The value equals the sysDescr object, if the LAN device supports RFC 3418.

TxSysName (Transmit System Name) - Provides the system's assigned name in an alpha-numeric format. The value equals the sysName object, if the LAN device supports RFC 3418.

TxSysCap (Transmit System Capabililities) -Indicates the primary function(s) of the device and whether or not these functions are enabled on the device. The capabilities are indicated by two octets. Bits 0 through 7 indicate Other, Repeater, Bridge, WLAN AP, Router, Telephone, DOCSIS cable device and Station respectively. Bits 8 through 15 are reserved.

Where multiple values are possible, specify them with a comma-separated list.

Example:

```
# hbacmd h=10.192.203.151 m=cim u=root p=Swamiji001 n=root/emulex setdcbparam
00-00-c9-3c-f7-88 fcoepriority 3
```

SetDCBPriority

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd SetDCBPriority <WWPN|MAC> <PFC Priorities> <Priorities of PGID0> <
Priorities of PGID1>...<Priorities of PGID7>
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: This command sets the priorities for a priority group. The values must be set according to the following rules:

1. The priorities range from 0 to 7.
2. The Priority group IDs (PGID) range from 0 to 7.
3. A priority can exist in only one priority group.
4. All priorities must appear once in any of the eight (PG0-PG7) priority groups.
5. Each set of priorities for a group must be separated by a space.
6. Specify multiple priorities for the same group by a comma-separated list.
7. To specify *none*, use "-" for the argument.
8. The same priority values cannot be specified to different groups.
9. All priorities (0 to 7) must be assigned to some PGID.
10. Not all PGIDs must be assigned a priority.
11. Not all adapters support two PFC priorities and eight priority groups. For Adapters, if you exceed the PFC priorities or priority groups an error message appears.

FCoE Adapter Specific Rules:

1. Minimum of one and a maximum of two PFC priorities can be configured.
2. One of the PFC priorities must match FCoE priority.
3. The additional PFC priority must be assigned to a priority group which has no other priorities.
4. The FCoE priority must be assigned to a priority group which has no other priorities.

iSCSI Adapter Specific Rules:

1. Minimum of one and a maximum of two PFC priorities can be configured.
2. One of the PFC priorities must match iSCSI priority.
3. The additional PFC priority must be assigned to a priority group which has no other priorities.
4. The iSCSI priority must be assigned to a priority group which has no other priorities.

NIC Adapter Specific Rules:

1. Only one PFC priority can be configured.
2. The PFC priority must be assigned to a priority group which has no other priorities.

Parameters:

WWPN - Adapter’s WWPN

MAC - MAC address of the NIC or iSCSI port

PFCPriorities - PFC priority that is a comma separated list of up to 7 values ranging from 0-7.

Priorities of PGID - Priority group membership that is a comma separated list of priorities ranging in value for 0-7.

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
```

Diagnostic Commands

EchoTest

Note: This command is not supported for OneConnect adapters.

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Description: This command runs the echo test on adapters.

Note: Support for remote adapter is TCP/IP access only. The EchoTest command fails if the target WWPN does not support the ECHO ELS command.

Parameters:

WWPN Source - WWPN of the originating adapter

WWPN Destination - WWPN of the destination (echoing) adapter

Count - Number of times to run the test (0 = run 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)

GetBeacon

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: This command shows the current beacon state, ON or OFF.

Parameters:

WWPN - WWPN of the FC port

MAC - MAC address of the NIC or iSCSI port

GetXcvrData

Note: GetXcrvData is not supported for OneConnect OCe11100 series adapters.

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd GetXcvrData <WWPN|MAC>
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: This command shows transceiver data such as vendor name and serial number.

Parameters:

WWPN: Adapter’s WWPN port

MAC - MAC address of the NIC or iSCSI port

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
```

LoadList

Note: Not supported for OneConnect adapters.

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd LoadList <WWPN>
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: This command shows the flash memory load list data for the adapter.

Parameters:

WWPN - Adapter’s WWPN

LoopBackTest

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: This command runs the loop test on the adapter specified by the WWPN or MAC address. Only PHY loopback test and MAC loopback tests are enabled for OneConnect adapters.

Note: Loopback tests can be run on FC ports being managed locally or remotely managed through TCP/IP-based management.

Parameters:

WWPN - WWPN of the FC or FCoE port

MAC - MAC address of the NIC or iSCSI port

Type - Type of loopback test to run

0 = PCI LoopBack Test
1 = Internal LoopBack Test
2 = External LoopBack Test (requires loopback plug)
3 = DMA Loopback Test
4 = PHY Loopback Test
5 = MAC Loopback Test

Note: Loopback tests 0 and 1 are not supported for OneConnect adapters.
Loopback tests 3, 4 and 5 are only supported for OneConnect adapters.

Count - Number of times to run the test (0 = run test infinitely, Range = 1...99,999)

StopOnError - Checks if the test must be halted on error

0 = No halt

1 = Halt

Pattern (optional) - 1 to 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
```

LoopMap

Note: Supported for FC ports only.

Supported by: Windows, Solaris and Linux

Syntax:

```
hbacmd LoopMap <WWPN>
```

Description: This command shows the arbitrated loop map data.

Parameters:

WWPN - Adapter's WWPN

PciData

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd PciData <WWPN|MAC> <Type>
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See "SetCimCred" on page 250.

Description: This command shows PCI configuration data.

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.

Only the base PCI registers return. The extended PCI registers are not available on a CNA.

Parameters:

WWPN - Adapter's WWPN port

MAC - MAC address of the NIC or iSCSI port

Type:

1 = Formatted SFS data

2 = Raw SFS data

The OneCommand Manager CLI has a command that displays wakeup parameter information, much the same way that the OneCommand Manager application displays it in its own control field.

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
```

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
```

PostTest

Note: Not supported for OneConnect adapters.

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd PostTest <WWPN>
```

Description: This command runs the POST on the adapter. Support for a remote adapter is via TCP/IP access only.

Parameters:

WWPN - Adapter’s WWPN

SetBeacon

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: This command turns the beacon ON or OFF.

Parameters:

WWPN - WWPN of the FC port

MAC - MAC address of the NIC or iSCSI port

BeaconState - New state of the beacon:

0 = Off

1= On

SetCableNVP

Note: This command supports only OneConnect OCe11100 series adapters.

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Description: This command sets the nominal velocity of propagation (N-V-P), required for the TDR test, for the cable that connects to the phyical port associated with the WWPN or MAC.

Parameters:

WWPN - WWPN of the FC port

MAC - MAC address of the NIC or iSCSI port

NVP - A percentage value between 1 and 100 (Consult your cable documentation to obtain the proper NVP value)

Wakeup

Note: Not supported for OneConnect adapters.

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd Wakeup <WWPN>
```

Description: This command wakes up the adapter.

Parameters:

WWPN - Adapter’s WWPN

Driver Parameter Commands

Note: Supported for FC and FCoE ports only.

Note: Driver parameters that are set temporarily and globally (using the "G" and "T" flags) must be read using the "GetDriverParams" hbacmd command to view the current value of the parameter. The "GetDriverParamsGlobal" hbacmd command returns only permanently set driver parameter values. Additionally, if temporary, global values have been set for one or more driver parameters, the "SaveConfig" hbacmd command must be run with the "N" flag (using the "N" flag is analogous to the hbacmd command "GetDriverParams") 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.

Note: The DriverConfig and SetDriverParamDefaults commands are not supported for Solaris.

DriverConfig

Supported by: Windows, Linux and VMware ESX

Syntax:

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

Description: 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 platform adapter.

Parameters:

WWPN - Adapter's WWPN

FileName - Name of the .dpv file (stored in the Emulex Repository directory)

Flag -

G = Make change global (all adapters on this host)

N = Make change non-global (adapter-specific)

GetDriverParams

Supported by: Windows, Solaris, Linux and VMware ESX 4.0.

Syntax:

```
hbacmd GetDriverParams <WWPN>
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See "SetCimCred" on page 250.

Description: This command shows the name and values of each parameter.

Parameters:

WWPN - Adapter's WWPN

GetDriverParamsGlobal

Supported by: Windows, Solaris, Linux and VMware ESX 4.0.

Syntax:

```
hbacmd GetDriverParamsGlobal <WWPN>
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

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

Parameters:

WWPN - Adapter’s WWPN

SaveConfig

Note: Driver parameters that are set temporarily and globally (using the "G" and "T" flags) must be read using the "GetDriverParams" hbacmd command to view the current value of the parameter. The "GetDriverParamsGlobal" hbacmd command returns only permanently set driver parameter values. Additionally, if temporary, global values have been set for one or more driver parameters, the "SaveConfig" hbacmd command must be run with the "N" flag (using the "N" flag is analogous to the hbacmd command "GetDriverParams") 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.

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Description: 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 is of the form:

`<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.

Parameters:

WWPN - Adapter’s WWPN

FileName - Name of the file that contains the driver parameters list

Flag -

G = Save the global parameter set

N = Save the local (adapter-specific) parameter set

SetDriverParam

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

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

Parameters:

WWPN - Adapter’s WWPN

Flag1 -

L = Make change local for this adapter only

G = Make change global (all adapters on this host)

Flag2 -

P = Make change permanent (persists across reboot)

T = Make change temporary

Param - Name of the parameter to modify

Value - New parameter value, decimal or hex (0xnnn)

SetDriverParamDefaults

Supported by: Windows, Linux and VMware ESX

Syntax:

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

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

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

Parameters:

WWPN - Adapter’s WWPN

Flag1 -

L = Make changes local for this adapter only

G = Make changes global (all adapters on this host)

Flag2 -

P = Make changes permanent (persists across reboot)

T = Make changes temporary

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 for instance. This information is useful when 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 binary files and text files (.txt). The binary files have the following extensions depending on the adapter type:

- OneConnect™ CNAs - .edf extension
- 16-Gb HBAs - .bin extension
- Legacy and LightPulse™ adapters - .dmp extension

DeleteDumpFiles

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See "SetCimCred" on page 250.

Description: This command deletes all diagnostic dump files for the adapter.

Parameters:

WWPN - Adapter's WWPN

MAC - MAC address of the CNA port

Dump

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd Dump <WWPN|MAC>
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See "SetCimCred" on page 250.

For LightPulse adapters only:

```
hbacmd h=ipaddress[:port] m=cim [u=username] [p=password] [n=root/emulex] Dump
<WWPN|MAC>
```

Description: This command creates a diagnostic dump file in the hbacmd dump file directory.

Parameters:

WWPN - Adapter’s WWPN

MAC - MAC address of the CNA port

h - Host’s IP address.

m - cim

u - root

p - <password>

n - <namespace>

GetDumpDirectory

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd h=ipaddress[:port] m=cim [u=username] [p=password] [n=root/emulex]
GetDumpDirectory <WWPN|MAC>
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

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

Note: The dump directory applies to all adapters in the server. There is *not* a separate dump directory for each adapter.

Parameters:

WWPN - Adapter’s WWPN

MAC - MAC address of the CNA port

SetDumpDirectory

Supported by: VMware ESX/ESXi

Syntax:

ESX/ESXI using the CIM interace:

```
hbacmd h=ipaddress[:port] m=cim [u=username] [p=password] [n=root/emulex]
setdumpdirectory <DumpDirectoryName>
```

ESX using the RM (remote management) interface:

```
hbacmd h=ipaddress[:port] setdumpdirectory <DumpDirectoryName>
```

Description: This command sets the dump directory for the ESX/ESXi host. The ‘Dump’ feature works only if the Dump directory is set for the ESX/ESXi host.

To use the SetDumpDirectory command, you must have a directory mapped under /vmfs/volumes where the files will be 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.

Note: For VMware systems you must set a dump directory before initiating a dump. The dump directory must be a "Storage" partition (a datastore) under the directory /vmfs/volumes.

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

Note: The dump directory applies to all adapters in the server. There is no separate dump directory for each adapter.

Parameters:

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

h - Host's IP address

m - cim

u - root

p - <password>

n - <namespace>

Example:

```
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
```

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

GetDumpFile

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=ipAddress] GetDumpFile <WWPN|MAC> <filename>
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See "SetCimCred" on page 250.

Description: This command gets the dump file. For dump file retrieval over FC/FCoE, the WWPN of a remote FC/FCoE port is required to access the remote host. This command gets the user specified dump file to local client's dump directory. The dump directory (local and remote) is named *Dump*, and is placed under the OCManager installation directory. Since, the 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 the following error, since the source and destination directory is the same.

```
ERROR: HBACMD_GetDumpFile: RM_GetDumpFile call failed (2)
ERROR: <2>: Not Supported
```

Dump directory:

For Windows:	C:\Program Files\Emulex\Util\Dump
For Linux:	/usr/sbin/ocmanager/Dump
For Solaris:	/opt/ELXocm/Dump
For ESX:	The dump directory set using the SetDumpDirectory command.

Parameters:

WWPN - Adapter’s WWPN

MAC - MAC address of the CNA port

<filename> - Name of the dump file to be copied from the remote hostExample:

```
hbacmd h=10.192.193.154 m=cim u=root p=Swamiji001 n=root/emulex getdumpfile  BG-
HBANYWARE-15_10000000c97d1314_20100120-032820421.dmp
```

GetDumpFileNames

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd  GetDumpFileNames <WWPN|MAC>
```

Or

```
hbacmd <h=ipAddress> GetDumpFileNames
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

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

Parameters:

WWPN - Adapter’s WWPN

MAC - MAC address of the CNA port

h - Host’s IP address

Example:

```
hbacmd h=10.192.193.154 m=cim u=root p=Swamiji001 n=root/emulex getdumpfilenames
```

GetRetentionCount

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd GetRetentionCount <WWPN|MAC>
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

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

Parameters:

WWPN - Adapter’s WWPN

MAC - MAC address of the CNA port

SetRetentionCount

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd SetRetentionCount <WWPN|MAC> <Value>
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: 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.

Parameters:

WWPN - Adapter’s WWPN

MAC - MAC address of the CNA port

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
```

FCoE Commands

Note: These commands are supported only on OneConnect FCoE ports.

GetFCFInfo

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd GetFCFInfo <WWPN>
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: This command shows the FCF information of the OneConnect adapter in FCoE mode.

Parameters:

WWPN - Adapter’s WWPN

Example

```
# hbacmd getfcfinfo 10:00:00:00:c9:3c:f7:88
```

GetFIPParams

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd GetFIPParams <WWPN>
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: This command gets the FIP parameters of the OneConnect adapter in FCoE mode.

Parameters:

WWPN - Adapter’s WWPN

Example:

```
#hbacmd getfipparams 10:00:00:00:c9:5b:3a:6d
```

SetFIPParam

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: This command sets the FIP parameters of the OneConnect adapter in FCoE mode.

Parameters:

WWPN - Adapter’s WWPN

Param - FIP parameter name (The five parameters are pfabric, pswitch, vlanid, fcmap and cinvlanid.)

Value - FIP parameter value and the valid range for the FIP parameter

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
```

iSCSI Commands

Note: iSCSI commands are supported only on OneConnect iSCSI ports.

Note: VMware ESX 4.0 does not support iSCSI.

The following commands support the iSCSI interface in the OneCommand Manager CLI. The commands and their syntax are listed here.

<…> = Required, […] = Optional

The MAC address <*MAC_Address*> of the CNA 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 4: Option Names on page 227) and enter the value.

The following abbreviations are available for use when setting the option name for a "`option_name=value`" option. The abbreviations are not case sensitive.

Table 4: Option Names

Option Name	Abbreviation	Example
ImmediateData	id	id=1
DataDigest	dd	dd=1
HeaderDigest	hd	hd=1
Auth	au	au=1
Initiator_name	in	in= initiator name
Initiator_alias	ia	ia= initiator alias
DHCP	dh	dh=1
VLAN_ENABLED	ve	ve=1
VLAN_ID	vi	vi=1
Priority	pr	pr=1

AddARPTableEntry

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] AddARPTableEntry <MAC_Address>
<Dest_MAC_Address> <Dest_IP_Address>
```

Description: This command adds an Address Resolution Protocol table entry.

Parameters:

MAC_Address - MAC address of the CNA port

Dest_MAC_Address - Destination MAC address to add to the ARP table

Dest_IP_Address - Destination IP address to add to the ARP table

AddRouteTableEntry

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] AddRouteTableEntry <MAC_Address>
<Dest_IP_Address> <Subnet_Mask> <Gateway>
```

Description: This command adds a new route table entry to the route table of the specified port.

Parameters:

MAC_Address - MAC address of the CNA port

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

AddTarget

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] AddTarget <MAC_Address> <Target_IP>
<Port> <iscsi_target_name> [ImmediateData=<0|1>] [HeaderDigest=<0|1>]
[DataDigest=<0|1>] [Auth=<0|1|2> "TgtCHAPName" "TgtSecret" "InitCHAPName"
"InitSecret"]
```

Description: This command adds a target to the list of targets seen by the initiator and logs into the target once it has been successfully created. This command requires that you specify a valid 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. When you set the authentication method <*Auth*> to a value other than 0, you must set additional parameters to specify the initiator CHAP name, target CHAP name, and initiator and target secret strings. Each string should be enclosed in quotations to avoid mishandling by the Windows, Linux, Solaris, or VMware shell's parser.

If you set the authentication method to "One-Way CHAP (value of 1)", you must also specify the "Target CHAP Name" and "Target Secret."

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 (value of 2)" you must specify all 4 values.

Example:

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

Parameters:

MAC_Address - MAC address of the CNA port

Port - Port number of the target portal (value: 1024-65535)

iscsi_target_name - Target's iSCSI name enclosed in quotes (string length:11-255)

Target_IP - IP address of the target portal

ImmediateData -

0 = No

1 = Yes (default: 1)

HeaderDigest -

0 = None

1= CRC32C (default: 0)

DataDigest -

0 = None

1= CRC32C (default: 0)

Auth -

0 = None

1= One-Way CHAP

2 = Mutual CHAP (default: 0)

TgtCHAPName - Target CHAP name enclosed in quotes (string length: 1-256)

TgtSecret - Target Secret enclosed in quotes (string length: 12-16)

InitCHAPName - Initiator CHAP name enclosed in quotes (string length: 1-256)

InitSecret - Initiator Secret enclosed in quotes (string length: 12-16)

Note: If you set Auth to 1, you must also specify the TgtCHAPName and TgtSecret. If you set Auth to a value of 2, you must also specify the TgtCHAPName, TgtSecret, InitCHAPName, and InitSecret must also be specified.

AddTargetPortal

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

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] AddTargetPortal <MAC_Address>
<Target_IP> <Port> [ImmediateData=<0|1>] [HeaderDigest=<0|1>] [DataDigest=<0|1>]
[Auth=<0|1|2> "TgtCHAPName" "TgtSecret" "InitCHAPName" "InitSecret"]
```

Description: This command adds a new SendTarget Portal for the initiator and runs a target discovery once the SendTarget Portal is created. This command requires that you specify a valid 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. When you set the authentication method <*Auth*> to a value other than 0, you must set additional parameters to specify the initiator CHAP name, target CHAP name, and initiator and target secret strings. Each string should be enclosed in quotations to avoid mishandling by the Windows, Linux, Solaris, or VMware shell's parser.

If you set the authentication method to "One-Way CHAP (value of 1)", you must also set the "Target CHAP Name" and "Target Secret."

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 (value of 2)", You must specify all 4 values.

Example:

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

Parameters:

MAC_Address - MAC address of the CNA port

Target_IP - IP address of the target portal

Port - Port number of the target portal (value: 1024-65535)

ImmediateData -

0 = No

1 = Yes (default: 1)

HeaderDigest -

0 = None

1= CRC32C (default: 0)

DataDigest -

0 = None

1= CRC32C (default: 0)

Auth -

0 = None

1= One-Way CHAP

2 = Mutual CHAP (default: 0)

TgtCHAPName - Target CHAP name enclosed in quotes (string length: 1-256)

TgtSecret - Target Secret enclosed in quotes (string length: 12-16)

InitCHAPName - Initiator CHAP name enclosed in quotes (string length: 1-256)

InitSecret - Initiator Secret enclosed in quotes (string length: 12-16)

Note: If Auth is set to 1, the TgtCHAPName and TgtSecret must be specified. If Auth is set to a value of 2, the TgtCHAPName, TgtSecret, InitCHAPName, and InitSecret must also be specified.

CleariSNSServer

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] CleariSNSServer <MAC_Address>
```

Description: This command clears the configured iSNS server and disables iSNS target discovery. If there is no iSNS server currently configured, this command does nothing.

Parameters:

MAC_Address - MAC address of the CNA port

DelARPTableEntry

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] DelARPTableEntry <MAC_Address>
<Dest_MAC_Address> <Dest_IP_Address>
```

Description: This command removes an ARP (Address Resolution Protocol) table entry.

Parameters:

MAC_Address - MAC address of the CNA port.

Dest_MAC_Address - Destination MAC address to remove from the ARP table.

Dest_IP_Address - Destination IP address to remove from the ARP table.

DelRouteTableEntry

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] DelRouteTableEntry <MAC_Address>
<Dest_IP_Address> <Subnet_Mask> <Gateway>
```

Description: This command removes a route table entry from the specified port.

Parameters:

MAC_Address - MAC address of the CNA port

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

DiscoveriSNSServer

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] DiscoveriSNSServer <MAC_Address>
```

Description: This command discovers an iSNS server address through DHCP. If the DHCP server returns an iSNS server address, it replaces the configured iSNS server and can be viewed using the ShowiSNSServer command.

Parameters:

MAC_Address - MAC address of the CNA port

GetInitiatorProperties

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] GetInitiatorProperties <MAC_Address>
```

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

Parameters:

MAC_Address - MAC address of the CNA port

> **Note:** These properties are set as the target portal's login properties to be used when discovering the targets on the target portal. The discovered targets inherit these properties.

GetiSCSILuns

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] GetiSCSILuns <MAC_Address>
<iscsi_target_name>
```

Description: This command shows all the LUNs and their information for a specified target. The iSCSI target name <*iscsi_target_name*> tells the command to gather the information from the specified iSCSI target.

Parameters:

MAC_Address - MAC address of the CNA port

iscsi_target_name - Target’s iSCSI name enclosed in quotes (string length:11-255)

GetiSCSIPortStats

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] GetiSCSIPortStats <MAC_Address>
```

Description: This command shows all the port statistics for a specified port.

Parameters:

MAC_Address - MAC address of the CNA port

GetSessionInfo

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] GetSessionInfo <MAC_Address>
<iscsi_target_name> <TSIH | <ISID_Qual Target_IP>>
```

Description: This command lists all session information for a specified 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*>. 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.

Parameters:

MAC_Address - MAC address of the CNA port

iscsi_target_name - Target’s iSCSI name enclosed in quotes (string length:11-255)

TSIH - TSIH value of the session (value: 1-65535)

ISID_Qual - ISID qualifier of the session (value: 0-65535)

Target_IP - The Target's IP address

Note: You must specify either the TSIH value or the ISID qualifier. If ISID qualifier is specified you must also specify the Target’s ID address.

iSCSIPing

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] iSCSIPing <MAC_Address> <IP_Address>
```

Description: This command issues ICMP echo requests to a target.

Parameters:

MAC_Address - MAC address of the CNA port

IP_Address - IP address of target to send ICMP echo request

ListSessions

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] ListSessions <MAC_Address>
<iscsi_target_name>
```

Description: This command lists all the sessions on a specified target. The iSCSI target name <*iscsi_target_name*> instructs the command to gather the information from the listed iSCSI target name.

Parameters:

MAC_Address - MAC address of the CNA port

iscsi_target_name - Target's iSCSI name enclosed in quotes (string length:11-255)

RemoveTarget

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] RemoveTarget <MAC_Address>
<iscsi_target_name>
```

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

Parameters:

MAC_Address - MAC address of the CNA port

iscsi_target_name - Target's iSCSI name enclosed in quotes (string length:11-255)

RemoveTargetPortal

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] RemoveTargetPortal <MAC_Address>
<Target_IP> <Port>
```

Description: This command removes the SendTarget Portal containing the target IP <*Target_IP*> and the port <*Port*> from the list of portals for the specified initiator.

Parameters:

MAC_Address - MAC address of the CNA port

Target_IP - IP address of the target portal

Port - Port number of the Target portal (value: 1024-65535)

SetInitiatorProperties

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
 hbacmd [h=host_IP[:port] | hostname[:port]] 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"]
```

Description: This command sets the initiator properties for the specified port. 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. When you set authentication method <*Auth*> to a value other than 0, you must set additional parameters to specify the initiator, target CHAP name, and secret strings. Enclose these strings in quotations to avoid mishandling by the Windows, Linux, Solaris, or VMware shell's parser.

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

Additionally, these properties are used for iSNS target discovery to set the discovered target's login properties.

Example:

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

If you specify the authentication method to "Mutual CHAP (value of 2)", you must specify all 4 values.

Example:

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

Parameters:

MAC_Address - MAC address of the CNA port

Initiator_Name - Initiator iSCSI name enclosed in quotes (string length: 1-224)

Initiator_Alias - Initiator iSCSI alias enclosed in quotes (string length: 0-32)

ImmediateData -

0 = No

1 = Yes (default: 1)

HeaderDigest -

0 = None

1= CRC32C (default: 0)

DataDigest -

0 = None

1= CRC32C (default: 0)

Auth -

0 = None

1= One-Way CHAP

2 = Mutual CHAP (default: 0)

TgtCHAPName - Target CHAP name enclosed in quotes (string length: 1-256)

TgtSecret - Target Secret enclosed in quotes (string length: 12-16)

InitCHAPName - Initiator CHAP name enclosed in quotes (string length: 1-256)

InitSecret - Initiator Secret enclosed in quotes (string length: 12-16)

Note: If you set Auth to 1, you must also specify the TgtCHAPName and TgtSecret. If you set Auth is set to a value of 2, you must also specify the TgtCHAPName, TgtSecret, InitCHAPName, and InitSecret.

SetNetworkConfiguration

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] SetNetworkConfiguration
<MAC_Address> <VLAN_ENABLED=<0|1> [<VLAN_ID=<0-4096>> <Priority=<0-7>>]
<DHCP=<0|1>> [<IP_Address> <Subnet_Mask> [Gateway]]
```

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

Parameters:

MAC_Address - MAC address of the CNA port

VLAN_ENABLED - 0 = Disabled, 1 = Enabled

VLAN_ID - VLAN ID of the interface (value: 0-4095)

Priority - VLAN priority of the interface (value: 0-7)

DHCP -

0 = Disabled

1 = Enabled

IP_Address - New IP address (for example: 10.192.1.1)

Subnet_Mask - Subnet Mask (for example: 255.255.255.0)

Gateway - Gateway (for example: 10.192.1.1)

Note: VLAN_ID and Priority are required only if VLAN_ENABLED is enabled; otherwise, these values should be omitted.

Note: IP_Address and Subnet_Mask are required only if DHCP is disabled; otherwise these values should be omitted.

SetTargetLoginProperties

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] SetTargetLoginProperties
<MAC_Address> <iscsi_target_name> [ImmediateData=<0|1>] [HeaderDigest=<0|1>]
[DataDigest=<0|1>] [Auth=<0|1|2> "TgtCHAPName" "TgtSecret" "InitCHAPName"
"InitSecret"]
```

Description: 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. When you set the authentication method <*Auth*> to a value other than 0, you must set additional parameters to specify the initiator CHAP name, target CHAP name, and initiator and target secret strings. Each string should be enclosed in quotations to avoid mishandling by the Windows, Linux, Solaris, or VMware shell's parser.

Example:

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

If you set the authentication method to "Mutual CHAP (value of 2)", you must also specify all 4 values.

Example:

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

Parameters:

MAC_Address - MAC address of the CNA port

iscsi_target_name - Target’s iSCSI name enclosed in quotes (string length:11-255)

ImmediateData -

0 = No

1 = Yes (default: 1)

HeaderDigest -

0 = None

1= CRC32C (default: 0)

DataDigest -

0 = None

1= CRC32C (default: 0)

Auth -

0 = None

1= One-Way CHAP

2 = Mutual CHAP (default: 0)

TgtCHAPName - Target CHAP name enclosed in quotes (string length: 1-255)

TgtSecret - Target Secret enclosed in quotes (string length: 12-16)

InitCHAPName - Initiator CHAP name enclosed in quotes (string length: 1-255)

InitSecret - Initiator Secret enclosed in quotes (string length: 12-16)

Note: If you set Auth is set to 1, you must specify the TgtCHAPName and TgtSecret. If you set Auth to a value of 2, you must specify the TgtCHAPName, TgtSecret, InitCHAPName, and InitSecret.

SetTargetProperties

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] SetTargetProperties <MAC_Address>
<iscsi_target_name> <ETO>
```

Description: This command sets the Extended TimeOut (ETO) value of a target. This command requires you specify the iSCSI target name <*iscsi_target_name*> and the Extended Timeout <*ETO*> values.

Parameters:

MAC_Address - MAC address of the CNA port

iscsi_target_name - Target’s iSCSI name enclosed in quotes (string length:11-255)

ETO - Extended Timeout Option for the target (value differs depending on the OS):

Windows: 0 - 3600

Solaris, Linux and ESX: 0 - 30

SetTPLoginProperties

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] SetTPLoginProperties <MAC_Address>
<Target_IP> <Port> [ImmediateData=<0|1>] [HeaderDigest=<0|1>] [DataDigest=<0|1>]
[Auth=<0|1|2> TgtCHAPName TgtSecret InitCHAPName InitSecret]
```

Description: This command sets a target portal's login properties. This command requires that you specify a valid 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. When you set the authentication method <*Auth*> to a value other than 0, you must set additional parameters to specify the initiator CHAP name, target CHAP name, and initiator and target secret strings. Each string should be enclosed in quotations to avoid mishandling by the Windows, Linux, Solaris, or VMware shell's parser.

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

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 (value of 2)", you must specify all 4 values.

Example:

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

Parameters:

MAC_Address - MAC address of the CNA port

Target_IP - IP address of the target portal

Port - Port number of the target portal (value: 1024-65535)

ImmediateData - 0 = No, 1= Yes (default: 1)

HeaderDigest - 0 = None, 1= CRC32C (default: 0)

DataDigest - 0 = None, 1= CRC32C (default: 0)

Auth - 0 = None, 1= One-Way CHAP, 2 = Mutual CHAP (default: 0)

TgtCHAPName - Target CHAP name enclosed in quotes (string length: 1-256)

TgtSecret - Target Secret enclosed in quotes (string length: 12-16)

InitCHAPName - Initiator CHAP name enclosed in quotes (string length: 1-256)

InitSecret - Initiator Secret enclosed in quotes (string length: 12-16)

Note: If you set Auth to 1, you must specify the TgtCHAPName and TgtSecret. If you set Auth to a value of 2, you must specify the TgtCHAPName, TgtSecret, InitCHAPName, and InitSecret.

ShowARPTable

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] ShowARPTable <MAC_Address>
```

Description: This command shows the current Address Resolution Protocol table for the specified port.

Parameters:

MAC_Address - MAC address of the CNA port

ShowiSNSServer

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] ShowiSNSServer <MAC_Address>
```

Description: This command shows the currently configured Internet Storage Name Server. This command also indicates whether or not iSNS discovery is enabled.

Parameters:

MAC_Address - MAC address of the CNA port

ShowRouteTable

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] ShowRouteTable <MAC_Address>
```

Description: This command shows the route table for a specific port.

Parameters:

MAC_Address - MAC address of the CNA port

Example:

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

ShowTarget

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] ShowTarget <MAC_Address>
[<iscsi_target_name> | refreshtargets]
```

Description: This command shows the properties for a specified target. If you do not specify the iSCSI target name <*iscsi_target_name*>, all targets and their associated properties return. If you specify *refreshtargets* in place of the iSCSI target name, all targets are refreshed before returning the information. If you provide no iSCSI Target name and do not specify *refreshtargets*, only the targets from the last refresh are displayed.

Parameters:

MAC_Address - MAC address of the CNA port

iscsi_target_name - Target’s iSCSI name enclosed in quotes (string length:11-255)

refreshtargets - Refresh all targets before displaying the information

Note: Only one command option can be specified with this command. If you provide the <*iscsi_target_name*>, you cannot specify refreshtargets. Likewise, if you specify refreshtargets then you cannot specify the <*iscsi_target_name*>.

ShowTargetPortal

Supported by: Windows, Solaris, and Linux

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] ShowTargetPortal <MAC_Address>
[<Target_IP> <Port>]
```

Description: This command shows the properties for a specified SendTarget Portal. If the Target_IP and Port are not specified, all SendTarget Portals and their associated properties return.

Parameters:

MAC_Address - MAC address of the CNA port

Target_IP - IP address of the target portal

Port - Port number of the target portal

TargetLogin

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] TargetLogin <MAC_Address>
<iscsi_target_name> [target_portal_ip <port>]  [ImmediateData=<0|1>]
[HeaderDigest=<0|1>] [DataDigest=<0|1>] [Auth=<0|1|2> "TgtCHAPName" "TgtSecret"
"InitCHAPName" "InitSecret"]
```

Description: This command logs in to a target. The iSCSI target name <*iscsi_target_name*> is the only mandatory option. The target's portal <*target_portal*> and port <*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. When you set the authentication method <*Auth*> to a value other than 0, you must set additional parameters to specify the initiator CHAP name, target CHAP name, and initiator and target secret strings. Each string should be enclosed in quotations to avoid mishandling by the Windows, Linux, Solaris, or VMware shell's parser.

If you set the authentication method to "One-Way CHAP (value of 1)", you must also specify the "Target CHAP Name" and "Target Secret."

Example:

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

If the you set the authentication method to "Mutual CHAP (value of 2)", you must specify all 4 values.

Example:

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

Parameters:

MAC_Address - MAC address of the CNA port

iscsi_target_name - Target’s iSCSI name enclosed in quotes (string length:11-255)

Port - Port number of the target portal (value: 1024-65535)

ImmediateData -

0 = No

1= Yes (default: 1)

HeaderDigest -

0 = None

1= CRC32C (default: 0)

DataDigest -

0 = None

1= CRC32C (default: 0)

Auth -

0 = None

1= One-Way CHAP

2 = Mutual CHAP (default: 0)

TgtCHAPName - Target CHAP name enclosed in quotes (string length: 1-255)

TgtSecret - Target Secret enclosed in quotes (string length: 12-16)

InitCHAPName - Initiator CHAP name enclosed in quotes (string length: 1-255

InitSecret - Initiator Secret enclosed in quotes (string length: 12-16)

Note: If you set Auth to 1, you must specify the TgtCHAPName and TgtSecret. If you set Auth to 2, you must specify the TgtCHAPName, TgtSecret, InitCHAPName, and InitSecret.

TargetLogout

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] TargetLogout <MAC_Address>
<iscsi_target_name> <TSIH | <ISID_Qual Target_IP>
```

Description: This command logs out of a target. The required fields are 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*>.

Parameters:

MAC_Address - The MAC address of the CNA port

iscsi_target_name - Target’s iSCSI name enclosed in quotes (string length:11-255)

TSIH - TSIH value of the session to log out (values: 1-65535)

ISID_Qual - ISID qualifier of the session to logout (value: 0-65535)

Target_IP - The Target's IP address

UpdateiSNSServer

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] UpdateiSNSServer <MAC_Address>
<Server_IP> <Port>
```

Description: This command updates the configured iSNS server. This command requires the server IP <*Server_IP*> and port number <*Port*> of the iSNS server be available to respond to the iSNS requests.

Parameters:

MAC_Address - MAC address of the CNA port

Server_IP - IP address of the iSNS server to configure

Port - Port number of the iSNS server to configure (value: 1024-65535)

LUN Masking Commands

Note: Supported for FC/FCoE ports only.

Note: LUN masking commands are not supported by Linux.

Note: The GetLunMaskbyHBA, GetLunMaskbyTarget, RescanLuns, and SetLunMask commands are not supported for VMware ESX and Solaris.

GetLunList

Supported by: Windows and Solaris

Syntax:

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

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: This command queries for the presence of any masked LUNs.

Parameters:

HBA WWPN - Adapter’s WWPN

Target WWPN - World wide port name of the target

Option -

0 = Get information from driver

1 = Get information from configuration

GetLunUnMaskByHBA

Supported by: Windows and Solaris

Syntax:

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

Description: This command queries for the presence of any unmasked LUNs by adapter.

Parameters:

HBA WWPN - Adapter’s WWPN

Option -

0 = Get information from driver

1 = Get information from configuration

GetLunUnMaskByTarget

Supported by: Windows and Solaris

Syntax:

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

Description: This command queries for any unmasked LUNs by target.

Parameters:

HBA WWPN - Adapter’s WWPN

Target WWPN - Target’s WWPN

Option -

0 = Get information from driver

1 = Get information from configuration

RescanLuns

Supported by: Windows and Solaris

Syntax:

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

Description: This command rescans LUNs to find any new LUNs.

Parameters:

HBA WWPN - Adapter’s WWPN

Target WWPN - Target’s WWPN

SetLunMask

Supported by: Windows and Solaris

Syntax:

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

Description: This command masks the specified LUNs.

Parameters:

HBA WWPN - Adapter’s WWPN

Target WWPN - Target’s WWPN

Option -

0 = Send information to the driver

1 = Send information to configuration (make persistent)

2 = Send information to both

Lun - Starting LUN number

LunCount - 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

Miscellaneous Commands

<…> = Required, […] = Optional

AddHost

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd AddHost host_address
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: This command adds a host to the hosts file for TCP/IP management in the OneCommand Manager GUI. The adapters for these hosts are also presented by the listhbas command. The host_address can be an IP address, using the IPv4 or IPv6 format, or a host name.

Parameters:

host_address - Host to add

CnaClearEventLog

Note: Supported for OneConnect adapters only.

Supported by: Windows, Linux and VMware ESX

Syntax:

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

Description: This command clears the CNA eventlog specified by the WWPN or MAC address.

Parameters:

WWPN - WWPN of the CNA FCoE port

MAC - MAC address of NIC or iSCSI port of the CNA

CnaGetEventLog

Note: Supported for OneConnect adapters only.

Supported by: Windows, Linux and VMware ESX

Syntax:

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

Description: This command shows the CNA event log specified by the WWPN or MAC address.

Parameters:

WWPN: Adapter’s WWPN port

MAC - MAC address of the NIC or iSCSI port

Download

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Note: For 16-Gb HBA firmware downloads, OneCommand Manager only accepts .grp files.

Description: Loads the firmware image to the FC or CNA port specified by the WWPN or MAC address.

Parameters:

WWPN - Port’s WWPN

MAC - The MAC address of the NIC or iSCSI port

FileName - The name and location of the firmware image (any file accessible to the CLI client)

Note: For OneConnect and 16-Gb HBA adapters, while the WWPN or MAC address is used to identify the adapter, the updated firmware applies to all ports on that adapter. It is not necessary to download the firmware on all the adapter ports of a OneConnect adapter or a 16-Gb HBA adapter.

ExportSANInfo

Note: Emulex recommends that you redirect this output to a file with proper extension, '.xml' for XML-formatted files and '.csv' for CSV-formatted files.

Note: Due to the amount of information that must be obtained and reported, this command can take a long time on large SAN configurations.

Supported by: Windows, Solaris Linux and VMware ESX

Syntax:

```
hbacmd ExportSANInfo [format]
```

Note: [format] is optional. If the format parameter is specified as csv, adapter information is shown in csv format. If the format parameter is specified as xml, adapter information is shown in xml format. Leaving the format parameter blank shows the data in xml format.

Description: For reporting purposes, this command captures the SAN information in xml or csv format. As large amount of information is output from this command Emulex recommends that you re-direct the output to a file.

Parameters:

Format:

csv - Output information in CSV format

xml - Output information in XML format (default)

GetCimCred

Supported by: Windows

Syntax:

```
hbacmd GetCimCred
```

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

Note: The password is encrypted.

Parameters: None

GetElxSecInfo

Supported by: Windows and Linux

Syntax:

```
hbacmd GetElxSecInfo
```

Description: This command shows the version of the ElxSec system.

Parameters: None

GetQoSInfo

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd [h=host_IP[:port] | hostname[:port]] GetQoSInfo <MAC_Address>
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: This command shows the QoS information for a specified NIC port.

Parameters:

h - Host’s IP address or hostname

WWPN - Adapter’s WWPN port

MAC - MAC address of the NIC or iSCSI port

Example:

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

GetVPD

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: This command shows the port’s Vital Product Data (VPD).

Parameters:

WWPN - Adapter’s WWPN

MAC - MAC address of iSCSI or NIC port

ListHBAs

Supported by: Windows, Solaris, Linux and VMware ESX

Description: This command shows a list of the manageable Emulex adapters found by local, remote in-band (FC), and remote out-of-band (TCP/IP) 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.

Syntax:

```
hbacmd [h=<IPAddress>] listhbas [local] [m=model] [pt=type]
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Parameters:

h - Host’s IP address

local - Only display local adapters

m=model - Model filter (append * to end of model name for wildcard match, e.g. LP9*)

pt=type - Port type filter (valid types: NIC, iSCSI, FC, FCoE)

RemoveHost

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd RemoveHost host_address
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: 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.

Parameters:

host_address - Host to remove

Reset

Note: Supported only for FC and FCoE ports. Not supported for NIC and iSCSI ports.

Note: For OneConnect FCoE ports, 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 adapter port.

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd Reset <WWPN>
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: This command resets the adapter. An adapter reset can require several seconds to complete, especially for remote devices. When the reset is completed, the system command prompt is displayed.

Parameters:

WWPN - Adapter’s WWPN

SetCimCred

Supported by: VMware

Syntax:

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

Note: Use this command to set only the CIM credentials. Once this is done, subsequent hbacmd commands do not require you to specify the CIM credentials in the command line.

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

Parameters:

h - Port’s IP Address

m - cim

username - root - Login User ID of the VMware ESX

password - Login password of the VMware ESX

namespace - Namespace where the Emulex provider is registered in the sfcb CIMOM of VMware ESX, specifically root/emulex

portnum - Port number of the sfcb CIMOM listening to that is, 5988 (HTTP) or 5989 (HTTPS)

TargetMapping

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd TargetMapping <WWPN>
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

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

Parameters:

WWPN - Adapter’s WWPN

Version

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd Version
```

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

Parameters: None

Persistent Binding Commands

Note: Supported for FC/FCoE ports only.

Note: Not supported on Linux, Solaris or VMware ESX; PersistentBinding, SetPersistentBinding, RemovePersistentBinding, Remove All Persistent Binding, BindingCapabilities, BindingSupport and SetBindingSupport.

Note: In order for a binding to take effect immediately (SetPersistentBinding parameter, Scope = I or B), the SCSIBus and SCSITarget 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 are available to be persistently bound. Also, the BindType 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.

AllNodeInfo

Supported by: Windows, Solaris and Linux

Syntax:

```
hbacmd AllNodeInfo <WWPN>
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

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

Parameters:

WWPN - Adapter’s WWPN

BindingCapabilities

Supported by: Windows and Solaris

Syntax:

```
hbacmd BindingCapabilities <WWPN>
```

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

Parameters:

WWPN - Adapter’s WWPN

BindingSupport

Supported by: Windows and Solaris

Syntax:

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

Description: This command shows the binding support for the adapter.

Parameters:

WWPN - Adapter’s WWPN

Source -

C = Configuration support

L = Live support

PersistentBinding

Supported by: Windows and Solaris

Syntax:

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

Description: This command specifies which set of persistent binding information (configured or live state) is requested.

Parameters:

WWPN - Adapter’s WWPN

Source -

C = Configuration

L = Live

RemoveAllPersistentBinding

Supported by: Windows and Solaris

Syntax:

```
hbacmd RemoveAllPersistentBinding <WWPN>
```

Description: Removes all persisting bindings for the adapter.

Parameters:

WWPN - Adapter’s WWPN

RemovePersistentBinding

Supported by: Windows and Solaris

Syntax:

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

Description: 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.

Parameters:

WWPN - Adapter’s WWPN

BindType -

P = Remove binding by WWPN

N = Remove binding by WWNN

D = Remove binding by D_ID

ID -

Target WWPN if BindType = P

Target WWNN if BindType = N

Target D_ID if BindType = D

SCSIBus - Bus number of the SCSI device

SCSITarget - Target number of the SCSI device

SetBindingSupport

Supported by: Windows and Solaris

Syntax:

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

Description: This command enables and sets the binding support(s) for the adapter.

Parameters:

WWPN - Adapter’s WWPN

BindFlag:

*D = Binding by D_ID

P = Binding by WWPN

*N = Binding by WWNN

*A = Binding by Automap

DA = Binding by D_ID and Automap

PA = Binding by WWPN and Automap

NA = Binding by WWNN and Automap

* *Not available for the Storport Miniport driver*

SetPersistentBinding

Supported by: Windows and Solaris

Syntax:

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

Description: 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.

Parameters:

WWPN - Adapter’s WWPN

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:

Target WWPN if BindType = P

Target WWNN if BindType = N

Target D_ID if BindType = D

SCSIBus: Bus number of the SCSI device

SCSITarget: Target number of the SCSI device

Personality Change Commands

TheOneCommand Manager application enables you to change the personality or protocol running on OneConnect adapters. When you change the personality of the adapter and reboot the host, the adapter starts running the new personality or protocol. The personalities that OneConnect adapters currently run are NIC-only, NIC + FCoE, and NIC + iSCSI. In some cases the adapters are pre-configured to support multiple personalities. In other cases you must install a license key before the adapter can support multiple personalities. See “Adapter License Management Commands” on page 196 for more information.

Note: The three different personalities may not always be available on an adapter. For example, a NIC+FCoE adapter can change to a NIC-only or a NIC + iSCSI adapter, but an ISCSI adapter may not be able to change to a NIC + FCoE adapter.

Note: It is possible to install one (or more) driver kits for the current personality, then change the personality and no longer have the driver(s) necessary to run the adapter. If you change personalities you must install the appropriate drivers. Drivers are available on the Emulex website.

ChangePersonality

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd ChangePersonality <WWPN|MAC> <personality_type>
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description:

This command changes the personality on the adapter. Requires reboot after successful change.

Parameters:

WWPN - CNA’s WWPN

MAC - MAC address of iSCSI or NIC Port

Personality Type - NIC, iSCSI, or FCoE.

Example:

For non-ESXi hosts

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

For ESXi hosts

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

ShowPersonalities

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd ShowPersonalities <WWPN|MAC>
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description:

This command displays the list of personalities available on the adapter. The personality type is displayed as either NIC, iSCSI, or FCoE.

Parameters:

WWPN - CNA’s WWPN

MAC - MAC address of iSCSI or NIC port

Example:

For non-ESXi hosts

```
>hbacmd ShowPersonalities 00-12-34-56-78-9A
```

For ESXi hosts

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

Virtual Port (VPort) Commands

Note: Supported by FC and FCoE adapter ports only.

<…> = Required, […] = Optional

CreateVPort

Supported by: Windows, Solaris and Linux

Syntax:

```
hbacmd CreateVPort <physical WWPN> auto [vname]
```

Or

```
hbacmd CreateVPort <physical WWPN> <virtual WWPN> <virtual WWNN> [vname]
```

Description: 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 optional [vname] parameter can be specified for the virtual port's name.

Note: In Linux, VPorts do not persist across system reboots.

Parameters:

Physical WWPN - WWPN of the object adapter

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

DeleteVPort

Supported by: Windows, Solaris and Linux

Syntax:

```
hbacmd DeleteVPort <physical WWPN> <virtual WWPN>
```

Description: This command deletes the virtual port specified by a physical and virtual WWPN.

Parameters:

Physical WWPN - Adapter’s WWPN

Virtual WWPN - The WWPN of the virtual port

ListVMs

Note: This command lists information for VMware ESX only.

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd ListVMs <physical WWPN> <virtual WWPN>
```

Description: This command lists all virtual machines and their information for all manageable ports.

If you specify the host with the “h=<host>” option or just give the physical WWPN, only the virtual machines for that host return. If you specify the physical port and the virtual port, only the virtual machine for the specified virtual port returns.

The virtual machine name is only displayed if the virtual port is associated with a virtual machine on VMware ESX 4.0/4.1 or ESXi 5.0. If you are running this command on any other server that has virtual ports, you will not see the virtual machine name.

Parameters:

Physical WWPN - Adapter’s WWPN

Virtual WWPN - The WWPN of the virtual port

ListVPorts

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd ListVPorts <physical WWPN>
```

Description: This command lists virtual ports on the specified physical port. Leaving the physical WWPN parameter blank lists all virtual ports on all manageable hosts that support virtual ports.

Parameters:

Physical WWPN - Adapter's WWPN

VPortTargets

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Description: This command lists targets visible to the specified virtual port.

Parameters:

Physical WWPN - Adapter's WWPN

Virtual WWPN - The WWPN of the virtual port

WWN Management Commands

Note: Supported for FC/FCoE adapter ports only.

Note: WWN Management validates WWNs carefully to avoid name duplication. Therefore, you may see error and warning messages if a name duplication is detected. Emulex strongly recommends that the activation requirement be fulfilled after each WWN change or restore. When running with "pending changes", some diagnostic and maintenance features are not allowed.

ChangeWWN

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See "SetCimCred" on page 250.

Description: This command changes the volatile or non-volatile state of WWNs. If the volatile change is requested on an adapter that does not support volatile WWNs, it returns a "not supported error."

Note: When a volatile change is supported, a reboot is required to activate the new setting. Volatile names are active until system power-down or adapter power-cycle.

Note: For VMware ESX: After changing the WWN of an adapter, be sure your zoning settings are updated before you reboot your ESX server. If the zoning is not updated before your reboot, the subsequent boot may take a long time.

Note: For VMware ESX: After changing the WWN of an adapter, you must reboot the ESX system before trying to access the adapter on that system. For information on rebooting the ESX system, refer to VMware documentation.

Note: For ESX COS: If you are using the CIM interface to access adapters, after changing the WWN of an adapter you must restart the CIMOM (that is, SFCB) on the ESX COS system before trying to access the adapter on that system. For information on restarting the CIMOM, refer to VMware documentation.

Parameters:

WWPN - Adapter’s WWPN

New WWPN - New adapter’s WWPN

New WWNN - New adapter’s WWNN

Type:

0 = Volatile

1 = Non-Volatile

GetWWNCap

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

```
hbacmd GetWWNCap <WWPN>
```

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

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

Parameters:

WWPN - Adapter’s WWPN

ReadWWN

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: This command reads different types of WWNs.

Parameters:

WWPN - Adapter’s WWPN

Type -

0 = Volatile

1 = Non-Volatile

2 = Factory Default

3 = Current

4 = Configured

RestoreWWN

Supported by: Windows, Solaris, Linux and VMware ESX

Syntax:

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

Note: For managing ESX/ESXi hosts from a Windows client, add the m=cim option to the command. The default CIM credentials must be set using the SetCimCred command. See “SetCimCred” on page 250.

Description: This command changes the WWNs to the factory default or non-volatile values. (Change is non-volatile).

Note: A reboot is required to activate the new setting.

Note: For VMware ESX: After changing the WWN of an adapter, you must reboot the ESX system before trying to access the adapter on that system. For information on rebooting the ESX system, refer to VMware documentation.

Note: For ESX COS: If you are using the CIM interface to access adapters, after changing the WWN of an adapter you must restart the CIMOM (that is, SFCB) on the ESX COS system before trying to access the adapter on that system. For information on restarting the CIMOM, refer to VMware documentation.

Parameters:

WWPN - Adapter’s WWPN

Type -

0 - Restore Default WWNs

1 - Restore NVRAM WWNs

Troubleshooting

There are several circumstances in which your system may operate in an unexpected manner. The Troubleshooting section explains many of these circumstances and offers one or more workarounds for each situation.

General Situations

Table 5: General Situations

Situation	Resolution
After installing and starting the OneCommand Manager application, the status bar says "Initializing discovery engine...", but after waiting for awhile, nothing is displayed in the discovery-tree.	It is possible the discovery server was not installed properly and therefore is not running. Try uninstalling and re-installing the OneCommand Manager application package.
The Web Launch interface cannot be started. When you attempt to start the OneCommand Manager application Web Launch Interface client interface, you receive an error message stating "Unable to launch OneCommand."	If the JRE/Web Start version present on your system does not meet the minimum required by the OneCommand Manager application, a temporary copy of the correct Web Start version will be downloaded automatically. This will be used to open the OneCommand Manager application Web Launch Interface client interface and is then discarded once you terminate your session. On some systems, however, security settings or other factors may prevent this download from completing successfully, resulting in this error. To fix the problem, manually update the JRE on your system to the version required by the OneCommand Manager application.
The FC link fails to come up.	Verify that an 8 Gb/s adapter is not attempting to connect to a 1 Gb/s device. Only 2 Gb/s, 4 Gb/s and 8 Gb/s devices are supported on 8 Gb/s adapters.
The other utilities install, but the OneCommand Manager application does not.	You have attempted to install the utilities before installing the Emulex driver. Perform the installation tasks in the following order: 1. Install the Emulex driver (see the Installation section of the driver manual). 2. Install the utilities (see the Installation section of the driver manual).
When attempting to start the OneCommand Manager application, the Web browser displays “Emulex Corporation OneCommand Demo of OneCommand WebStart web n.n.n.n...”	The document caching mechanism sometimes behaves erratically if more than one version of Java Runtime is installed on the browser client. There are two workarounds for this problem: • Exit the browser and restart it. The OneCommand Manager application Web Launch Interface starts successfully. • Uninstall all non-essential versions of the Java Runtime. The OneCommand Manager application Web Launch Interface requires that only a single version of the Java Runtime be installed on the browser client. This single version must be Java 6.0 or later for all platforms.

Table 5: General Situations (Continued)

Situation	Resolution
In the OneCommand Manager application discovery-tree, multiple UCNA FCoE or iSCSI ports are grouped under a single physical port.	Ensure the Emulex NIC driver is loaded and that the operating system sees ALL NIC ports. They do not need to be plumbed or configured; just visible to the OS.
Operating error occurs when attempting to run the OneCommand Manager application. When you attempt to run the utility, an operating system error may occur. The computer may freeze.	Reboot the system.
Cannot see multiple zones on the same screen of my management server running the OneCommand Manager application.	Provide a physical FC connection into each of the zones. For each zone you want to see, connect a OneCommand Manager application enabled port into that zone. Use Out-of-Band discovery (Ethernet) to connect to the undiscovered servers.
Cannot see other adapters or hosts. Although the OneCommand Manager application is installed, only local adapters are visible. The other adapters and hosts in the SAN cannot be seen.	The utility uses in-band data communication, meaning that the management server running the utility must have a physical FC connection to the SAN. All the adapters in the SAN will be visible if: • The other servers have an FC connection to your zone of the SAN. Check fabric zoning. • All other adapters are running the OneCommand Manager application and the appropriate driver. • The other adapters are Emulex adapters. **Note:** The OneCommand Manager application must be running on all remote hosts that are to be discovered and managed. Remote capabilities of the OneCommand Manager application are subject to fabric zoning configuration. Remote hosts to be discovered and managed by the OneCommand Manager application must be in the same zone.
The SAN management workstation does not have a physical FC connection into the SAN because the other management tools are all out-of-band. Can the OneCommand Manager application be run on this SAN management workstation?	The OneCommand Manager application can communicate with remote adapters using out-of-band access as long as the remote host is running the OneCommand Manager application. To solve this problem: 1. Start the OneCommand Manager application. 2. From the **Main** menu, select **Discovery/Out-of-Band/Add Host**. The Add Remote Host dialog box appears. 3. In the Add Remote Host dialog box, enter either the name or the IP-address of the host and click **OK.** When the selected host is discovered, that host and any adapters running on it will be displayed in the discovery-tree.

Table 5: General Situations (Continued)

Situation	Resolution
Unwanted remote servers appear in the OneCommand Manager application.	To prevent remote servers from appearing in the OneCommand Manager application, do one of the following on the remote systems: • In Windows, disable the OneCommand Manager application service. • In Linux, stop the elxhbamgr daemon by running the /usr/sbin/ocmanager/stop_ocmanager script. • In Solaris, stop the elxhbamgr service by issuing the command "svcadm disable elxhbamgr". Disabling this service or process prevents the local servers from being seen remotely.
Running a dump command on LP9002 adapters using TCP/IP based management causes error "ERROR: <302>".	Run the command in-band or locally on these adapters.

Emulex Driver for Linux and OneCommand Manager Application Situations

Table 6: Emulex Driver for Linux and OneCommand Manager Application Situations

Situation	Resolution
FC link fails to come up.	For LP21000 adapters, ensure the adapter is not in maintenance mode and that it is not running the manufacturing firmware.
NIC Link fails to come up.	For Emulex OneConnect OCe1010X adapters, you may need to properly configure the network interface using system administration utilities.
The OneCommand Manager application software package will not install. An error message states that: “inserv Service Elxlpfc has to be enabled for service ElxDiscSrvinserv: exiting now/sbin/ inserv failed exit code 1.”	Reinstall the driver with the lpfc-install script.
If a SAN configuration has 256 targets mapped by the LPFC driver, any additional added targets do not get a target ID mapping by the driver and cause target discovery to fail. Removing targets or reinitializing the link does not solve the problem.	Unload and reload the driver to reset available target IDs. Ensure that the SAN configuration is correct prior to reloading the driver. This will clear the driver’s consistent binding table and free target IDs for new target nodes.
In some cases, after loading an OEM supplied combined firmware/OpenBoot image you will not be able to enable BootBIOS from the lputil Boot BIOS Maintenance menu.	1. Download the current OpenBoot only image for your adapter from the Emulex website. 2. Load the current OpenBoot only image following steps listed in Updating BootBIOS section of this manual. 3. Run lputil, return to the Boot BIOS Maintenance menu. 4. Enable BootBIOS.

Table 6: Emulex Driver for Linux and OneCommand Manager Application Situations (Continued)

Situation	Resolution
rmmod fails to unload LPFC driver module due to ERROR: Module LPFC is in use. This message can appear when you attempt to remove the driver and there is a Logical Volume Group dependent on the driver.	Make the Logical Volume Group unavailable. Type: `lvchange -a n xxxxxxx` where xxxxxx is the Volume Group Name.
Slow targets or extended link faults on the storage side may result in storage being marked off-line by the mid-layer and remaining off-line (not recovered) when the link faults are corrected.	The 8.2 version of the driver should eliminate this problem. However, if you experience off-line device issues, increase the SCSI command timeout to a value greater than or equal to sixty seconds. Emulex also provides a script which addresses this issue (for 2.6 kernels). To access the lun_change_state.sh script, click http://www.emulex.com/files/downloads/linux/tools.html, then click the link to the appropriate driver, and click the Linux tools link.
Under certain conditions of an I/O load, some targets cannot retire an I/O issued by a Linux initiator within the default timeout of 30 seconds given by the SCSI midlayer. If the situation is not corrected, the initiator-to-target condition deteriorates into abort/ recovery storms leading to I/O failures in the block layer. These types of failures are preceded by a SCSI IO error of hex 6000000.	Emulex provides a script which addresses this issue. To access the set_target_timeout.sh script, click http://www.emulex.com/files/downloads/linux/tools.html, then click the link to the appropriate driver, and click the Linux tools link.
LPFC driver fails to recognize an adapter and logs “unknown IOCB” messages in the system log during driver load. The adapter is running outdated firmware.	Upgrade adapter firmware to minimum supported revision listed in installation guide (or newer).
rmmod of LPFC driver hangs and module reference count is 0.	Due to a small race condition in the kernel it is possible for an rmmod command to hang. Issue the `rmmod -w` command. If this does not help, reboot the computer.
System panics when booted with a failed adapter installed.	Remove the failed adapter and reboot.
rmmod fails to unload driver due to device or resource busy. This message occurs when you attempt to remove the driver without first stopping the OneCommand Manager application, when the OneCommand Manager application is installed and running or when FC disks connected to a LightPulse adapter are mounted.	Stop the OneCommand Manager application before attempting to unload the driver. The script is located in the /usr/sbin/ocmanager directory. Type: ./stop_ocmanager Unmount any disks connected to the adapter. Unload the driver. Type: rmmod lpfc
Driver install fails. The lpfc-install script fails to install the driver.	The install script may fail for the following reasons: • A previous version of the driver is installed. Run the /usr/src/lpfc/lpfc-install --uninstall script and then try to install the driver. • The current driver is already installed. • The kernel source does not match the standard kernel name or you are running a custom kernel.

Table 6: Emulex Driver for Linux and OneCommand Manager Application Situations (Continued)

Situation	Resolution
"No module lpfc found for kernel" error message. When upgrading the kernel, rpm generates the following error: "No module lpfc found for kernel KERNELVERSION". A recently upgraded kernel cannot find the ramdisk. After upgrading the kernel, the kernel cannot find the ramdisk which halts or panics the system. The driver is not loaded after a system reboot after upgrading the kernel.	These three situations may be resolved by upgrading the kernel. There are two ways to install the driver into an upgraded kernel. The method you use depends on whether or not you are upgrading the driver. • Upgrade the kernel using the same version of the driver. • Upgrade the kernel using a new version of the driver. See the Installation section of the driver manual for these procedures.
Driver uninstall fails. The lpfc-install --uninstall script fails with an error.	Try the following solutions: • Uninstall the OneCommand Manager application by running the ./uninstall script from the OneCommand Manager application installation directory. • Unmount all FC disk drives. • Unload the LPFC driver.
lpfc-install script exit code.	The lpfc-install script contains exit codes that can be useful in diagnosing installation problems. See the lpfc-install script for a complete listing of codes and definitions.
The OneCommand Manager application software package will not install. An error message states that: "inserv Service Elxlpfc has to be enabled for service ElxDiscSrvinserv: exiting now/sbin/ inserv failed exit code 1."	Reinstall the driver with the lpfc-install script.
The Emulex driver for Linux does not load in ramdisk for a custom built kernel.	Custom built kernels are not supported by Emulex. However, the Emulex install script will attempt to install the driver into a ramdisk that follows the naming scheme used by Red Hat or SLES kernels. • The Red Hat naming scheme for IA64 ramdisk images is: /boot/efi/efi/redhat/initrd-KERNELVERSION.img. • The Red Hat naming scheme for ramdisk images on all other architectures is: /boot/initrd-KERNELVERSION.img. • SLES names follow a similar scheme for IA64. If a custom built kernel has a ramdisk image that does not follow the appropriate naming scheme, the name of the image can be changed using the following procedure: 1. Change the name of the ramdisk image to match either the Red Hat or SLES naming scheme, depending on the distribution being used. 2. Update any file links to the OneCommand Manager application ramdisk image. 3. Edit the boot loader configuration file: (i.e., /etc/lilo.conf, /etc/yaboot.conf, /boot/grub/grub.conf, /boot/grub/menu.lst), find any references to the old ramdisk image name, and replace them with the new name. 4. Reboot the system to verify the changes. 5. Install the Emulex LPFC Linux driver kit.

Table 6: Emulex Driver for Linux and OneCommand Manager Application Situations (Continued)

Situation	Resolution
The Linux SCSI subsystem only sees 8 LUNs when more are present.	Some SCSI drivers will not scan past 8 LUNs when the target reports as a SCSI-2 device. Force a SCSI bus scan with /usr/sbin/lpfc/lun_scan. SuSE supplies /bin/rescan-scsi-bus.sh which can be changed to scan everything.
Cannot see any adapters.	Try the following solutions: 1. Perform an 'lsmod' to see if the Emulex drivers are loaded. Look for an error message on the command line stating the LPFC driver is not loaded. If this is the case, do an insmod of the LPFC driver and re-launch the OneCommand Manager application. 2. Exit the OneCommand Manager application and run the following sripts in this order: 1.) /usr/sbin/ocmanager/stop_ocmanager - stops the OneCommand Manager application daemons 2.) /usr/sbin/ocmanager/start_ocmanager - starts the OneCommand Manager application daemons 3.) /usr/sbin/ocmanager/ocmanager - starts the OneCommand Manager application gui The adapters should be visible. If they are not visible, reboot your system.
Cannot see other adapters or hosts. Although the OneCommand Manager application is installed, only local adapters are visible. The other adapters and hosts in the SAN cannot be seen.	All the adapters in the SAN will be visible if: • The other servers have a connection to your zone of the SAN. Check fabric zoning. • The elxhbamgr processes are running on remote hosts (enter ps -ef | grep elxhbamgr). • All other adapters are running the OneCommand Manager application and the appropriate driver. • The other adapters are Emulex adapters. **Note:** The OneCommand Manager application services must be running on all remote hosts that are to be discovered and managed.
Cannot see new LUNs.	Try the following: 1. Click the **Refresh LUNs** button in the toolbar. 2. Exit the OneCommand Manager application and restart the OneCommand Manager application. If new LUNs are visible, you are finished. If that doesn't work, try the following: 1. Exit the OneCommand Manager application. 2. Navigate to /usr/sbin/ocmanager. 3. Run ./stop_ocmanager to stop both the elxhbamgr and elxdiscovery processes. 4. Run ./start_ocmanager and ./start_elxdiscovery to restart both processes. 5. Start the OneCommand Manager application.

Table 6: Emulex Driver for Linux and OneCommand Manager Application Situations (Continued)

Situation	Resolution
Unwanted remote servers appear in the OneCommand Manager application.	To remove out-of-band (TCP/IP) managed systems: 1. From the main menu, select **Discovery-->TCP/IP-->Remove Host(s)...** 2. Select all hosts that you would like to stop discovering. 3. Select **Remove**. 4. Click **Done** to exit. To remove in-band (FC) managed systems: 1. Log into the remote systems that you would like to stop discovering. 2. Stop the elxhbamgr processes: • Windows: Stop the "Emulex HBA Management" service. • Linux: Run the /usr/sbin/ocmanager/stop_ocmanager script. • Solaris: Run the /opt/ELXocm/stop_ocmanager script.
The OCM CLI command to "GetDriverParamsGlobal" implicitly returns the permanent (i.e. across reboots) values of the global driver parameters. The temporary global value is only returned if there is no current assignment of the permanent global value.	If you want the current (temporary) value of the adapter driver parameter, use the "GetDriverParams" command instead of the "GetDriverParamsGlobal" command.

Emulex Driver for Solaris and OneCommand Manager Application Situations

Table 7: Emulex Driver for Solaris and OneCommand Manager Application Situations

Situation	Resolution
NIC Link fails to come up.	For Emulex OneConnect OCe1010X adapters, you may need to properly configure the network interface using system administration utilities.

VPorts and OneCommand Manager Application Situations

Table 8: VPorts and OneCommand Manager Application Situations

Situation	Resolution
VPort creation failure.	If an error occurs during VPort creation, an error message indicates the failure. There are several conditions that must be met before a virtual port can be created. This may be the problem. For a detailed list of unsatisfied conditions: 1. Start the OneCommand Manager application. 2. Select **View>Group Adapters by Virtual Port** from the Main menu. 3. In the discovery-tree, select the physical port on which you would like to create a virtual port. 4. The Virtual Ports tab should contain a list of unsatisfied conditions (if any) that are preventing a virtual port from being created. If there are no unsatisfied conditions, yet VPort creation still fails, contact Emulex technical support.
Virtual ports for unsupported adapter or host.	When you select an unsupported adapter port or host that is running an older version of the OneCommand Manager application, “Virtual Ports not available on this HBA or Host” appears in the Virtual Port window.
Port not ready.	The controls in the New Virtual Port box of the Virtual Port window are replaced by a list of reasons why VPorts cannot be created. The reasons can be one or more of the following: • The driver NPIV parameter is disabled. • SLI-3 is not being used by a port. • Adapter port is out of resources for additional virtual ports. • The port is not connected to a fabric. • The fabric switch does not support virtual ports. • The fabric switch is out of resources for additional virtual ports. • The port link state is down.