



CIM Provider Package 3.8 Installation Guide

Version 1.0

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Supported Provider Versions

Provider	Versions
UCNA Providers	1.8
FC Providers	2.8

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1. Introduction

The Emulex[®] CIM Provider enables comprehensive management of Emulex host bus adapters (HBAs) and universal converged network adapters (UCNAs). It uses an industry standard Application Programming Interface (API) Common Manageability Programming Interface (CMPI v2.0) to manage various Emulex adapters.

During installation, the Emulex CIM Provider registers with a Web-based Enterprise Management (WBEM) server running a CIM Object Manager (CIMOM) service. It then internally communicates with the Emulex management API/drivers and handles inquiries and requests from various CIM clients.

Emulex provides the following two CIM Providers:

- Emulex UCNA CIM Provider – supports the basic UCNA (FCoE, iSCSI, and NIC) profile. This provider supports the inventory and active management of UCNAs. This provider also supports Link Up/Down events delivery using the Indication profile.
- Emulex FC HBA CIM Provider – supports the basic inventory and active management of Fibre Channel (FC) adapters. This provider also supports Link Up/Down events delivery using the Indication profile.

Supported Platforms

Table 1-1 shows the platforms supported with the Emulex CIM Provider Kits.

Table 1-1 Emulex CIM Provider Supported Platforms

Operating Systems	Emulex CIM Provider Kits
VMware ESX COS 4.1	elxocmcore-esx41-<kit version>.x86_64.rpm Note: Emulex OneCommand Manager Core Kit includes the CIM Provider.
VMware ESXi 5.0 and 5.1	vmware-esx-provider-emulex-cim-provider-50.<kit version>.zip
VMware Visor 4.1	vmware-esx-provider-emulex-cim-provider-410.<kit version>.zip

Supported CIM Provider Profiles

Emulex UCNAs and FC HBAs

- Profile Registration – DMTF DSP1033
- Software Inventory – DMTF DSP1023
- Host Discovered Resources – SNIA SMI-S 1.5 Part 6 Clause 7
- FCoE Initiator Ports – SNIA SMI-S 1.5 Part 2 Clause 22
- Software Update – DMTF DSP1025
- Record Log – DMTF DSP1010
- Access Points – SNIA SMI-S 1.5 Part 2 Clause 23

- Physical Package – SNIA SMI-S 1.5 Part 2 Clause 31
CIM Provider Package 3.8
Installation Guide
PCI Device – DMTF DSP1075
- Physical Assets Profile – DMTF DSP1011
- Storage HBA – SNIA SMI-S 1.5 Part 6 Clause 6
- Indication Profile (partial) – DMTF DSP1054

Emulex UCNAs Only

- Ethernet Port – DMTF DSP1014
- Host LAN Network Port – DMTF DSP1035
- IP Interface – DMTF DSP1036
- Diagnostics (CDMv2) – DMTF DSP1002
- iSCSI Initiator – SNIA SMI-S 1.5 Part 6 Clause 9
- iSCSI Initiator Ports Profile – SNIA SMI-S 1.5 Part 2 Clause 16

Emulex FC HBAs Only

- FC HBA – SNIA SMI-S 1.5 Part 6 Clause 5
- FC Initiator Ports Profile – SNIA SMI-S 1.5 Part 2 Clause 17
- FC HBA Diagnostic Profile – DMTF DSP1104

2. Installing the Emulex CIM Provider

Prerequisites

- An Emulex OneConnect UCNA for a UCNA provider
- An FC HBA for an FC provider
- The appropriate adapter driver
- The Emulex OneCommand Manager application for Linux or Windows

Note: See the VMware download page on the Emulex website or the vendor to verify the driver version or the OneCommand Manager application version that must be installed on your system.

VMware

Use one of the standard `esxcli/esxupdate` commands to install the vib/offline-bundle. For example:

In ESX 4.1, type the following command:

```
rpm -ivh < elxocmcore-esx41-<kit version>.x86_64.rpm
```

In ESXi 4.1, type the following command:

```
esxupdate --maintenancemode update --bundle=  
<vmware-esx-provider-emulex-cim-provider-<kit version>.zip>
```

If you are using a zipped file and have already unzipped it, type the following command:

```
esxupdate -b <vmware-esx-provider-emulex-cim-provider-<kit  
version>.vib> --maintenancemode --nodeps update
```

In ESXi 5.0 and 5.1

To install the signed zip/vib, type the following command:

```
esxcli software vib install -d<offline-bundle.zip>
```

If you are using a zipped file and have already unzipped it, type the following command:

```
esxcli software vib install  
--viburl=<file:/vmware-esx-provider-emulex.vib>
```

To install the unsigned zip/vib, use the `-no-sig-check` option. For example:

```
esxcli software vib install  
--viburl=file:/vmware-esx-provider-emulex.vib--sig-check
```

3. Frequently Asked Questions (FAQs)

This section provides answers to questions that you may encounter while using the Emulex CIM Provider.

If you still have questions that have not been answered in the FAQs or require additional information, contact an authorized Emulex technical support representative at tech.support@emulex.com, 800-854-7112 (US/Canada toll free), +1714-885-3402 (US/International), or +44 1189-772929 (Europe, Middle East, and Africa).

How Do You Update the Firmware on an Emulex Card?

The Software Update profile is supported on both the Emulex UCNA CIM Provider and the Emulex FC HBA CIM Provider. You must use this profile to update the firmware on the Emulex cards. The following methods are implemented in the Emulex specific Software Update profile:

- `InstallfromByteStream` - requires a custom CIM client, which can read the firmware file and create a `ByteStream` that is used for updating the firmware.
- `InstallfromURI` - supports two different types of URI (Uniform Resource Identifiers).
 - The firmware file to be updated is available locally on the machine hosting the Emulex adapter.
 - The firmware file to be updated is available on a remote machine like an `http` or an `https` server. In this case the Emulex UCNA CIM Provider uses the “`libcurl`” library available on the host machine, where the CIM Provider is running, to download the firmware file.

`Emulex CIM_SoftwareInstallationServiceCapabilities` class has the attribute `SupportedURISchemes` that indicates the supported URI schemes.

To update the firmware:

1. Enumerate the `CIM_SoftwareInstallationService` in Emulex's namespace. Select the `CIM_SoftwareInstallationService` specific to the adapter on which the firmware is to be updated.

For example, if the UCNA needs a firmware update, select the `ELXUCNA_SoftwareInstallationService` class instance.

```
wbemcli -noverify ein  
'https://root:<password>@<IP>/root/emulex:elxucna_softwareinstal  
lation-service' -nl
```

2. Enumerate the `CIM_FCPort` or `CIM_EthernetPort` depending on the adapter on which the firmware is to be updated. Select the desired port from the enumerated instances. For example:

```
wbemcli -noverify ein  
'https://root:<password>@<IP>/root/emulex:elxucna_ethernetport '  
-nl
```

3. Select the correct firmware file and choose one of the two methods detailed in steps 1 and 2 to update the firmware. For example:


```
wbemcli -nl -noverify cm
'https://root:<password>@<IP>/root/emulex:<elxucna_softwareinstallationservice instance>' InstallFromURI.URI="<Firmware file path>",Target=<elxucna_ethernetport instance>
```

How Do You Enable Logs or Collect Symptoms?

The Record Log profile is supported on both the Emulex UCNA CIM Provider and the Emulex FC HBA CIM Provider.

To enable provider logs:

1. Enumerate the ELXHBA_RecordLog (for an FC HBA) or the ELXUCNA_RecordLog (for a UCNA) class and note the provider log instance. If enumeration fails, perform the steps detailed in “Generating Provider Logs When Enumeration Fails” on page 9.

2. Set the provider log settings:

```
wbemcli -noverify cm
'https://root:<password>@<IP>/root/emulex:<Instance from step 1>'
  SetLogParams.LogLevel=5,logmode=2,tracepath='<file path>'
```

3. Set the provider log state:

```
wbemcli -noverify cm
'https://root:<password>@<IP>/root/emulex:<Instance from step 1>'
  RequestStateChange.RequestedState=2
```

4. Perform the operation that is not working as expected. The provider logs are available in the <file path> specified in step 2.
5. Contact an Emulex technical support representative with the provider logs and the system logs (/var/log/messages, or /var/log/syslog.log for ESXi 5.0 and 5.1).

To disable provider logs, enter the following command:

```
wbemcli -noverify cm
'https://root:<password>@<IP>/root/emulex:<Instance from step 1>'
  RequestStateChange.RequestedState=3
```

Generating Provider Logs When Enumeration Fails

To enable provider logs when enumeration fails:

1. Stop the CIMOM.
2. Create a file “emulex_fc_provider.dmp (for FC HBA)” or “emulex_ucna_provider.dmp (for UCNA)” in “/etc” location, and manually enter the following two lines (without spaces):

```
2,5,2
/tmp/providerlogs.txt
```

3. Start the CIMOM and enumerate the Emulex classes in the “root/emulex” namespace.
4. Perform the operation which is not working as expected. The provider logs are available in </tmp/providerlogs.txt> specified in step 2.

5. Contact an Emulex technical support representative with the provider logs and the system logs (/var/log/messages, or /var/log/syslog.log for ESXi 5.0 and 5.1).

How Do You Execute a Diagnostic Test for the Emulex UCNA Adapter?

To execute a diagnostic test with the Emulex CIM Provider:

1. Get the instance of the managed element (ethernet port). For example:

```
wbemcli -noverify ein
'https://root:<password>@<IP>/root/emulex:elxucna_ethernetport'
-nl
```

2. Get the instance of the ELXUCNA_DiagnosticTest class. For example:

```
wbemcli -noverify ein
'https://root:<password>@<IP>/root/emulex:elxucna_diagnostictest'
-nl
```

3. Invoke the method RunDiagnosticservice on the elxucna_diagnostictest. For example:

```
wbemcli -noverify cm
'https://root:<password>@<IP>/root/emulex:<Diagnostic Test
instance from step 2>'
RunDiagnosticservice.ManagedElement=<ManagedElement instance
from step 1>'
```

4. A CIM_ConcreteJob instance is created for each diagnostic test run. For example:

```
wbemcli -noverify ein
'https://root:<password>@<IP>/root/emulex:elxucna_concretejob'
-nl
```

5. Results of the diagnostic test runs are available in ELXUCNA_DiagnosticCompletionRecord class instances. For example:

```
wbemcli -noverify ein
'https://root:<password>@<IP>/root/emulex:elxucna_diagnosticcompletionrecord'
-nl
```

6. The diagnostic logs can be cleared using the ClearLog function of ELXUCNA_DiagnosticsLog class. For example:

```
wbemcli -noverify cm
'https://root:<password>@<IP>/root/emulex:<Corresponding
Diagnostic log instance>' ClearLog
```

How Do You Execute a Diagnostic Test for an FC Adapter?

To execute a diagnostic test with an FC adapter:

1. Get the instance of the managed element (ELXHBA_PortController). For example:

```
wbemcli -noverify ein
'https://root:<password>@<IP>/root/emulex:elxhba_portcontroller'
-nl
```

2. Get the instance of the ELXHBA_FCHBADiagnostictest class. For example:

```
wbemcli -noverify ein
'https://root:<password>@<IP>/root/emulex:elxhba_diagnostictest'
-nl
```

3. Invoke the method RunDiagnosticservice on the ELXHBA_FCHBADiagnostictest. For example:

```
wbemcli -noverify cm
'https://root:<password>@<IP>/root/emulex:<Diagnostic Test
instance from step 2>'
RunDiagnosticservice.ManagedElement=<ManagedElement instance
from step 1>'
```

4. A CIM_ConcreteJob instance is created for each diagnostic test run. For example:

```
wbemcli -noverify ein
'https://root:<password>@<IP>/root/emulex:elxhba_concretejob'
-nl
```

5. Results of the diagnostic test runs are available in ELXHBA_DiagnosticCompletionRecord class instances. For example:

```
wbemcli -noverify ein
'https://root:<password>@<IP>/root/emulex:elxhba_diagnosticcompl
etionrecord' -nl
```

6. The diagnostic logs can be cleared using the ClearLog function of ELXHBA_DiagnosticsLog class. For example:

```
wbemcli -noverify cm
'https://root:<password>@<IP>/root/emulex:<Corresponding
Diagnostic log instance>' ClearLog
```

How Do You Discover vNICs using the Emulex CIM Provider?

To determine vNICs using the Emulex CIM Provider:

1. Find all the CIM_VLANEndpoint instances whose SystemName property has a value equal to the name of the desired host. These instances are vNIC endpoints.
2. Find the CIM_EndpointIdentity instance associating the CIM_VLANEndpoint instance to a CIM_LANEndpoint instance. Follow the association to the CIM_LANEndpoint.

3. Find the instance of CIM_DeviceSAPImplementation instance that associates the CIM_LANEndpoint to an instance of CIM_EthernetPort. Follow the associations to the CIM_EthernetPort instance representing the vNIC.

To determine vNICs hosted by a UCNA in a particular host:

1. Find the CIM_Card instance for the UCNA.
2. Find the vNICs in the host as detailed earlier, based on the version of the CIM Provider.
3. For each CIM_EthernetPort representing a vNIC:
 - a. Find the instance of CIM_ControlledBy associating the CIM_EthernetPort to an instance of CIM_PortController. Follow the association to the CIM_PortController instance.
 - b. Find the instance of CIM_Realizes associating the CIM_PortController to an instance of CIM_PhysicalConnector. Follow the association to the CIM_PhysicalConnector instance.
 - c. Find the instance of CIM_Container associating the CIM_PhysicalConnector to an instance of CIM_Card.
4. Each CIM_EthernetPort with a CIM_Container instance referencing the CIM_Card instance found in step 1 is hosted by the targeted UCNA.

To determine vNICs operating over the same physical port:

1. Find the CIM_PhysicalConnector instance representing the port in question. The key value for CIM_PhysicalConnector instances contains the serial number of the UCNA hosting the port and the port number assigned to the physical port.
2. Find the vNICs in the host as detailed earlier, based on the version of the CIM Provider. For each CIM_EthernetPort representing a vNIC:
 - a. Find the instance of CIM_ControlledBy associating the CIM_EthernetPort to an instance of CIM_PortController. Follow the association to the CIM_PortController instance.
 - b. Find the instance of CIM_Realizes associating the CIM_PortController to an instance of CIM_PhysicalConnector.
3. Each CIM_EthernetPort with a CIM_Realizes instance referencing the CIM_PhysicalConnector instance found in step 1 is running over the targeted physical port.

4. Troubleshooting

The following error message may appear if the CIM hosts are not properly added to the OneCommand Manager application:

```
"Unknown or invalid host specified"
```

There could be instances when even with all the drivers, CIM Provider, and the CIM Client on a Windows machine properly installed, the CIM hosts might still not get added to the OneCommand Manager application. Listed below are the most common reasons for this:

- The machine with the specified IP is not reachable. Try pinging the machine.
- The specified protocol (HTTP/HTTPS) is not supported by the CIMOM. Most often the CIMOM will be configured to use HTTPS. Therefore, if you are trying to connect with HTTP, you might get an error. Try using HTTPS instead.
- The namespace specified is invalid. For ESX/ESXi 4.1 systems, ensure that the namespace conforms to the "Namespaces Used for Providers" table in the *OneCommand Manager Command Line Interface User Manual*. For ESXi 5.0 and 5.1 systems, ensure that the namespace for the Emulex MN provider is 'root/emulex'.
- The username or the password specified is invalid. Verify that the username given is correct, and try retyping the password.
- The CIMOM is not running on the ESX/ESXi host. Try restarting the CIMOM. You can check whether the CIMOM (sfcb) is running by typing one of these commands.

```
/etc/init.d/sfcbd-watchdog status
```

or

```
ps -ef | grep sfcb
```

If the CIMOM is listening to a different port than 5988 or 5989, the connection might not take place. You can configure the sfcb CIMOM settings by editing `/etc/sfcb/sfcb.cfg`.

If you still experience problems when adding the host, run the following commands on the ESX/ESXi host and send the output to the Emulex Technical Support team:

```
vm-support dump
esxcfg-module -l
esxcfg-scsidevs -a
esxcfg-nics -l
lspci
```

In ESXi 5.0 and 5.1:

```
esxcli software vib list | grep -i be2
esxcli software vib list | grep -i lpfc
esxcli software vib list | grep -i emu
```

In ESX/ESXi 4.1:

```
esxupdate -vib-view query | grep -i be2
esxupdate -vib-view query | grep -i lpfc
```

```
esxupdate -vib-view query | grep -i emu
```

For ESX/ESXi 4.1 systems, send the “/var/log/messages” file for all of the above operations.

For ESXi 5.0 and 5.1 systems, send the “/var/log/syslog.log” file for all of the above operations.