



# Managing Network Adapters

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## Overview of the Cisco UCS C-Series Network Adapters



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**Note** The procedures in this chapter are available only when a Cisco UCS C-Series network adapter is installed in the chassis.

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A Cisco UCS C-Series network adapter can be installed to provide options for I/O consolidation and virtualization support. The following adapters are available:

- Cisco UCS VIC 1225 Virtual Interface Card
- Cisco UCS VIC 1227T Virtual Interface Card
- Cisco UCS VIC 1385 Virtual Interface Card
- Cisco UCS VIC 1387 Virtual Interface Card
- Cisco UCS VIC 1455 Virtual Interface Card
- Cisco UCS VIC 1457 Virtual Interface Card
- Cisco UCS VIC 1495 Virtual Interface Card
- Cisco UCS VIC 1497 Virtual Interface Card



**Note** You must have same generation VIC cards on a server. For example, you cannot have a combination of 3rd generation and 4th generation VIC cards on a single server.

The interactive *UCS Hardware and Software Interoperability Utility* lets you view the supported components and configurations for a selected server model and software release. The utility is available at the following URL: <http://www.cisco.com/web/techdoc/ucs/interoperability/matrix/matrix.html>

### **Cisco UCS VIC 1225 Virtual Interface Card**

The Cisco UCS VIC 1225 Virtual Interface Card is a high-performance, converged network adapter that provides acceleration for the various new operational modes introduced by server virtualization. It brings superior flexibility, performance, and bandwidth to the new generation of Cisco UCS C-Series Rack-Mount Servers.

### **Cisco UCS VIC 1385 Virtual Interface Card**

The Cisco UCS VIC 1385 Virtual Interface Card is a dual-port Enhanced Quad Small Form-Factor Pluggable (QSFP) 40 Gigabit Ethernet and Fibre Channel over Ethernet (FCoE)-capable half-height PCI Express (PCIe) card designed exclusively for Cisco UCS C-Series Rack Servers. It incorporates Cisco's next-generation converged network adapter (CNA) technology, with a comprehensive feature set, providing investment protection for future feature software releases.

### **Cisco UCS VIC 1227T Virtual Interface Card**

The Cisco UCS VIC 1227T Virtual Interface Card is a dual-port 10GBASE-T (RJ-45) 10-Gbps Ethernet and Fibre Channel over Ethernet (FCoE)-capable PCI Express (PCIe) modular LAN-on-motherboard (mLOM) adapter designed exclusively for Cisco UCS C-Series Rack Servers. New to Cisco rack servers, the mLOM slot can be used to install a Cisco VIC without consuming a PCIe slot, which provides greater I/O expandability. It incorporates next-generation converged network adapter (CNA) technology from Cisco, providing Fibre Channel connectivity over low-cost twisted pair cabling with a bit error rate (BER) of 10 to 15 up to 30 meters and investment protection for future feature releases.

### **Cisco UCS VIC 1387 Virtual Interface Card**

The Cisco UCS VIC 1387 Virtual Interface Card is a dual-port Enhanced Quad Small Form-Factor Pluggable (QSFP) 40 Gigabit Ethernet and Fibre Channel over Ethernet (FCoE)-capable half-height PCI Express (PCIe) card designed exclusively for Cisco UCS C-Series Rack Servers. It incorporates Cisco's next-generation converged network adapter (CNA) technology, with a comprehensive feature set, providing investment protection for future feature software releases.

### **Cisco UCS VIC 1455 Virtual Interface Card**

The Cisco UCS VIC 1455 is a quad-port Small Form-Factor Pluggable (SFP28) half-height PCIe card designed for M5 generation of Cisco UCS C-Series rack servers. The card supports 10/25-Gbps Ethernet or FCoE. It incorporates Cisco's next-generation CNA technology and offers a comprehensive feature set, providing investment protection for future feature software releases. The card can present PCIe standards-compliant interfaces to the host, and these can be dynamically configured as NICs and HBAs.

### Cisco UCS VIC 1457 Virtual Interface Card

The Cisco UCS VIC 1457 is a quad-port Small Form-Factor Pluggable (SFP28) mLOM card designed for M5 generation of Cisco UCS C-Series rack servers. The card supports 10/25-Gbps Ethernet or FCoE. It incorporates Cisco's next-generation CNA technology and offers a comprehensive feature set, providing investment protection for future feature software releases. The card can present PCIe standards-compliant interfaces to the host, and these can be dynamically configured as NICs and HBAs.

### Cisco UCS VIC 1495 Virtual Interface Card

The Cisco UCS VIC 1495 is a dual-port Small Form-Factor (QSFP28) PCIe card designed for the M5 generation of Cisco UCS C-Series Rack Servers. The card supports 40/100-Gbps Ethernet and FCoE. The card can present PCIe standards-compliant interfaces to the host, and these can be dynamically configured as NICs and HBAs.

### Cisco UCS VIC 1497 Virtual Interface Card

The Cisco VIC 1497 is a dual-port Small Form-Factor (QSFP28) mLOM card designed for the M5 generation of Cisco UCS C-Series Rack Servers. The card supports 40/100-Gbps Ethernet and FCoE. The card can present PCIe standards-compliant interfaces to the host, and these can be dynamically configured as NICs and HBAs.

## Viewing Network Adapter Properties

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.
<b>Step 2</b>	Server /chassis # <b>show adapter</b> [ <i>index</i> ] [ <b>detail</b> ]	Displays adapter properties. To display the properties of a single adapter, specify the PCI slot number as the <i>index</i> argument.

### Example

- This example displays the properties of adapter:

```
Server# scope chassis
Server /chassis # show adapter
PCI Slot Product Name   Serial Number   Product ID      Vendor
-----
11      UCS VIC 1455      FCH233770S8    UCSC-PCIE-C... Cisco Systems Inc
Server /chassis # show adapter detail
PCI Slot 11:
  Product Name: UCS VIC 1455
  Serial Number: FCH233770S8
  Product ID: UCSC-PCIE-C25Q-04
  Adapter Hardware Revision: 5
  Current FW Version: 5.1(1.64)
  VNTAG: Disabled
  FIP: Enabled
  LLDP: Enabled
  PORT CHANNEL: Enabled
  Configuration Pending: no
  Cisco IMC Management Enabled: no
```

```

VID: V04
Vendor: Cisco Systems Inc
Description:
Bootloader Version: 5.0(3c)
FW Image 1 Version: 5.1(1.64)
FW Image 1 State: RUNNING ACTIVATED
FW Image 2 Version: 5.1(1.59)
FW Image 2 State: BACKUP INACTIVATED
FW Update Status: Fwupdate never issued
FW Update Error: No error
FW Update Stage: No operation (0%)
FW Update Overall Progress: 0%
Server /chassis #

```

## Configuring Network Adapter Properties

### Before you begin

- You must log in with admin privileges to perform this task.
- A supported Virtual Interface Card (VIC) must be installed in the chassis and the server must be powered on.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.
<b>Step 2</b>	Server /chassis # <b>show adapter</b>	(Optional) Displays the available adapter devices.
<b>Step 3</b>	Server /chassis # <b>scope adapter</b> <i>index</i>	Enters the command mode for the adapter card at the PCI slot number specified by <i>index</i> .  <b>Note</b> The server must be powered on before you can view or change adapter settings.
<b>Step 4</b>	Server /chassis/adapter # <b>set fip-mode</b> { <b>disable</b>   <b>enable</b> }	Enables or disables FCoE Initialization Protocol (FIP) on the adapter card. FIP is enabled by default.  <b>Note</b> <ul style="list-style-type: none"> <li>• We recommend that you disable this option only when explicitly directed to do so by a technical support representative.</li> <li>• FCoE over port channel is not supported with 1455 or 1457 adapters. FCoE is supported in the non port channel mode.</li> </ul>

	Command or Action	Purpose
<b>Step 5</b>	Server /chassis/adapter # <b>set lldp</b> { <b>disable</b>   <b>enable</b> }	<p><b>Note</b> For LLDP change to be effective, it is required that you reboot the server.</p> <p>In case of S3260 chassis with two nodes, ensure to reboot the secondary node after making LLDP changes in the primary node.</p> <p>Enables or disables Link Layer Discovery Protocol (LLDP) on the adapter card. LLDP is enabled by default.</p> <p><b>Note</b> We recommend that you do not disable LLDP option, as it disables all the Data Center Bridging Capability Exchange protocol (DCBX) functionality.</p>
<b>Step 6</b>	Server /chassis/adapter # <b>set vntag-mode</b> { <b>disabled</b>   <b>enabled</b> }	<p>Enables or disables VNTAG on the adapter card. VNTAG is disabled by default.</p> <p><b>Note</b></p> <p>If VNTAG mode is enabled:</p> <ul style="list-style-type: none"> <li>• vNICs and vHBAs can be assigned to a specific channel.</li> <li>• vNICs and vHBAs can be associated to a port profile.</li> <li>• vNICs can fail over to another vNIC if there are communication problems.</li> </ul>
<b>Step 7</b>	Server /chassis/adapter # <b>set portchannel</b> <i>disabled</i>	<p>Allows you to enable or disable the port channel. When you disable port channel, four vNICs and vHBAs are available for use on the adapter.</p> <p>When Port channel is enabled:</p> <ul style="list-style-type: none"> <li>• Only two vNICs and vHBAs are available for use.</li> <li>• Port 0 and 1 are bundled as one port channel and Port 2 and 3 are bundled as the other port channel.</li> </ul>

	Command or Action	Purpose
		<p><b>Note</b></p> <ul style="list-style-type: none"> <li>• This option is enabled by default on Cisco UCS VIC 1455 and 1457.</li> <li>• When you change the port channel configuration, all the previously created vNICs and vHBAs will be deleted and the configuration will be restored to factory defaults.</li> <li>• VNTAG mode is supported only in the port-channel mode.</li> </ul>
<b>Step 8</b>	Server /chassis/adapter* # <b>commit</b>	Commits the transaction to the system configuration.

### Example

This example configures the properties of adapter 1:

```

Server# scope chassis
Server /chassis # scope adapter 1
Server /chassis/adapter # set fip-mode enable
Server /chassis/adapter *# set vntag-mode enabled
Server /chassis/adapter* # set portchannel disabled
Server /chassis/adapter *# commit
Warning: Enabling VNTAG mode
All the vnic configuration will be reset to factory defaults
New vNIC adapter settings will take effect upon the next server reset
Server /chassis/adapter # show detail
PCI Slot 1:
  Product Name: UCS VIC xxxx
  Serial Number: FCHXXXXXZV4
  Product ID: UCSC-PCIE-xxx-04
  Adapter Hardware Revision: 3
  Current FW Version: x.0(0.345)
  VNTAG: Enabled
  FIP: Enabled
  LLDP: Enabled
  PORT CHANNEL: Disabled
  Configuration Pending: no
  Cisco IMC Management Enabled: no
  VID: V00
  Vendor: Cisco Systems Inc
  Description:
  Bootloader Version: xxx
  FW Image 1 Version: x.0(0.345)
  FW Image 1 State: RUNNING ACTIVATED
  FW Image 2 Version: gafskl-dev-170717-1500-orosz-ET
  FW Image 2 State: BACKUP INACTIVATED
  FW Update Status: Fwupdate never issued
  FW Update Error: No error
  FW Update Stage: No operation (0%)
  FW Update Overall Progress: 0%
Server /chassis/adapter #

```

# Managing vHBAs

## Guidelines for Managing vHBAs

When managing vHBAs, consider the following guidelines and restrictions:

- The Cisco UCS Virtual Interface Cards provide two vHBAs and two vNICs by default. You can create up to 14 additional vHBAs or vNICs on these adapter cards.

The Cisco UCS 1455 and 1457 Virtual Interface Cards, in non-port channel mode, provide four vHBAs and four vNICs by default. You can create up to 10 additional vHBAs or vNICs on these adapter cards in VNTAG mode.




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**Note** If VNTAG mode is enabled for the adapter, you must assign a channel number to a vHBA when you create it.

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- When using the Cisco UCS Virtual Interface Cards in an FCoE application, you must associate the vHBA with the FCoE VLAN. Follow the instructions in the **Modifying vHBA Properties** section to assign the VLAN.
- After making configuration changes, you must reboot the host for settings to take effect.

## Viewing vHBA Properties

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.
<b>Step 2</b>	Server /chassis # <b>scope adapter</b> <i>index</i>	Enters the command mode for the adapter card at the PCI slot number specified by <i>index</i> .  <b>Note</b> The server must be powered on before you can view or change adapter settings.
<b>Step 3</b>	Server /chassis/adapter # <b>show host-fc-if</b> [ <b>fc0</b>   <b>fc1</b>   <i>name</i> ] [ <b>detail</b> ]	Displays properties of a single vHBA, if specified, or all vHBAs.

### Example

This example displays all vHBAs on adapter card 1 and the detailed properties of fc0:

```
Server# scope chassis
Server /chassis # scope adapter 1
Server /chassis/adapter # show host-fc-if
```

```

Name          World Wide Port Name      FC SAN Boot Uplink Port
-----
fc0           20:00:00:22:BD:D6:5C:35   Disabled    0
fc1           20:00:00:22:BD:D6:5C:36   Disabled    1

```

```
Server /chassis/adapter # show host-fc-if fc0 detail
```

```

Name fc0:
  World Wide Node Name: 10:00:70:0F:6A:C0:97:43
  World Wide Port Name: 20:00:70:0F:6A:C0:97:43
  FC SAN Boot: disabled
  FC Type: fc-initiator
  Persistent LUN Binding: disabled
  Uplink Port: 0
  PCI Link: 0
  MAC Address: 70:0F:6A:C0:97:43
  CoS: 3
  VLAN: NONE
  Rate Limiting: OFF
  PCIe Device Order: 2
  EDTOV: 2000
  RATOV: 10000
  Maximum Data Field Size: 2112
  Channel Number: N/A
  Port Profile: N/A

```

```
Server /chassis/adapter #
```

## Modifying vHBA Properties

### Before you begin

You must log in with admin privileges to perform this task.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.
<b>Step 2</b>	Server /chassis # <b>show adapter</b>	(Optional) Displays the available adapter devices.
<b>Step 3</b>	Server /chassis # <b>scope adapter</b> <i>index</i>	Enters the command mode for the adapter card at the PCI slot number specified by <i>index</i> .  <b>Note</b> The server must be powered on before you can view or change adapter settings.
<b>Step 4</b>	Server /chassis/adapter # <b>scope host-fc-if</b> { <b>fc0</b>   <b>fc1</b>   <i>name</i> }	Enters the host Fibre Channel interface command mode for the specified vHBA.
<b>Step 5</b>	Server /chassis/adapter/host-fc-if # <b>set wwnn</b> <i>wwnn</i>	Specifies a unique World Wide Node Name (WWNN) for the adapter in the form hh:hh:hh:hh:hh:hh:hh:hh.



	Command or Action	Purpose
		Unless specified by this command, the WWNN is generated automatically by the system.
<b>Step 6</b>	Server /chassis/adapter/host-fc-if # <b>set wwpn</b> <i>wwpn</i>	Specifies a unique World Wide Port Name (WWPN) for the adapter in the form hh:hh:hh:hh:hh:hh:hh:hh.  Unless specified by this command, the WWPN is generated automatically by the system.
<b>Step 7</b>	Server /chassis/adapter/host-fc-if # <b>set boot</b> { <b>disable</b>   <b>enable</b> }	Enables or disables FC SAN boot. The default is disable.
<b>Step 8</b>	Server /chassis/adapter/host-fc-if # <b>set persistent-lun-binding</b> { <b>disable</b>   <b>enable</b> }	Enables or disables persistent LUN binding. The default is disable.
<b>Step 9</b>	Server /chassis/adapter/host-fc-if # <b>set mac-addr</b> <i>mac-addr</i>	Specifies a MAC address for the vHBA.
<b>Step 10</b>	Server /chassis/adapter/host-fc-if # <b>set vlan</b> { <b>none</b>   <i>vlan-id</i> }	Specifies the default VLAN for this vHBA. Valid VLAN numbers are 1 to 4094; the default is none.
<b>Step 11</b>	Server /chassis/adapter/host-fc-if # <b>set cos</b> <i>cos-value</i>	Specifies the class of service (CoS) value to be marked on received packets unless the vHBA is configured to trust host CoS. Valid CoS values are 0 to 6; the default is 0. Higher values indicate more important traffic.  This setting is not functional in NIV mode.
<b>Step 12</b>	Server /chassis/adapter/host-fc-if # <b>set rate-limit</b> { <b>off</b>   <i>rate</i> }	Specifies a maximum data rate for the vHBA. The range is 1 to 100000 Mbps; the default is off.  This setting is not functional in NIV mode.
<b>Step 13</b>	Server /chassis/adapter/host-fc-if # <b>set order</b> { <b>any</b>   <i>0-99</i> }	Specifies the relative order of this device for PCIe bus device number assignment; the default is any.
<b>Step 14</b>	Server /chassis/adapter/host-fc-if # <b>set error-detect-timeout</b> <i>msec</i>	Specifies the error detect timeout value (EDTOV), the number of milliseconds to wait before the system assumes that an error has occurred. The range is 1000 to 100000; the default is 2000 milliseconds.
<b>Step 15</b>	Server /chassis/adapter/host-fc-if # <b>set resource-allocation-timeout</b> <i>msec</i>	Specifies the resource allocation timeout value (RATOV), the number of milliseconds to wait before the system assumes that a resource cannot be properly allocated. The range is 5000 to 100000; the default is 10000 milliseconds.

	Command or Action	Purpose
<b>Step 16</b>	Server /chassis/adapter/host-fc-if # <b>set max-data-field-size</b> <i>size</i>	Specifies the maximum size of the Fibre Channel frame payload (in bytes) that the vHBA supports. The range is 1 to 2112; the default is 2112 bytes.
<b>Step 17</b>	Server /chassis/adapter/host-fc-if # <b>set channel-number</b> <i>channel number</i>	The channel number that will be assigned to this vHBA. Enter an integer between 1 and 1,000.  <b>Note</b> VNTAG mode is required for this option.
<b>Step 18</b>	Server /chassis/adapter/host-fc-if # <b>set pci-link</b> <i>0/1</i>	The link through which vNICs can be connected. These are the following values: <ul style="list-style-type: none"> <li>• 0 — The first cross-edged link where the vNIC is placed.</li> <li>• 1 — The second cross-edged link where the vNIC is placed.</li> </ul> <b>Note</b> This option is available only on some Cisco UCS C-Series servers.
<b>Step 19</b>	Server /chassis/adapter/host-fc-if # <b>set uplink</b> <i>Port number</i>	The uplink port associated with the vHBA.  <b>Note</b> This value cannot be changed for the system-defined vHBAs fc0 and fc1.
<b>Step 20</b>	Server /chassis/adapter/host-fc-if # <b>set vhba-type</b> <i>fc-initiator fc-target fc-nvme-initiator fc-nvme-target</i>	The vHBA type used in this policy. vHBAs supporting FC and FC-NVMe can now be created on the same adapter. The vHBA type used in this policy can be one of the following: <ul style="list-style-type: none"> <li>• fc-initiator—Legacy SCSI FC vHBA initiator</li> <li>• fc-target—vHBA that supports SCSI FC target functionality</li> </ul> <b>Note</b> This option is available as a Tech Preview. <ul style="list-style-type: none"> <li>• fc-nvme-initiator—vHBA that is an FC NVMe initiator, which discovers FC NVMe targets and connects to them.</li> <li>• fc-nvme-target—vHBA that acts as an FC NVMe target and provides connectivity to the NVMe storage.</li> </ul>

	Command or Action	Purpose
<b>Step 21</b>	Server /chassis/adapter/host-fc-if # <b>scope error-recovery</b>	Enters the Fibre Channel error recovery command mode.
<b>Step 22</b>	Server /chassis/adapter/host-fc-if/error-recovery # <b>set fcp-error-recovery {disable   enable}</b>	Enables or disables FCP Error Recovery. The default is disable.
<b>Step 23</b>	Server /chassis/adapter/host-fc-if/error-recovery # <b>set link-down-timeout msec</b>	Specifies the link down timeout value, the number of milliseconds the uplink port should be offline before it informs the system that the uplink port is down and fabric connectivity has been lost. The range is 0 to 240000; the default is 30000 milliseconds.
<b>Step 24</b>	Server /chassis/adapter/host-fc-if/error-recovery # <b>set port-down-io-retry-count count</b>	Specifies the port down I/O retries value, the number of times an I/O request to a port is returned because the port is busy before the system decides the port is unavailable. The range is 0 to 255; the default is 8 retries.
<b>Step 25</b>	Server /chassis/adapter/host-fc-if/error-recovery # <b>set port-down-timeout msec</b>	Specifies the port down timeout value, the number of milliseconds a remote Fibre Channel port should be offline before informing the SCSI upper layer that the port is unavailable. The range is 0 to 240000; the default is 10000 milliseconds.
<b>Step 26</b>	Server /chassis/adapter/host-fc-if/error-recovery # <b>exit</b>	Exits to the host Fibre Channel interface command mode.
<b>Step 27</b>	Server /chassis/adapter/host-fc-if # <b>scope interrupt</b>	Enters the interrupt command mode.
<b>Step 28</b>	Server /chassis/adapter/host-fc-if/interrupt # <b>set interrupt-mode {intx   msi   msix}</b>	Specifies the Fibre Channel interrupt mode. The modes are as follows: <ul style="list-style-type: none"> <li>• <b>intx</b> —Line-based interrupt (INTx)</li> <li>• <b>msi</b> —Message-Signaled Interrupt (MSI)</li> <li>• <b>msix</b> —Message Signaled Interrupts with the optional extension (MSIx). This is the recommended and default option.</li> </ul>
<b>Step 29</b>	Server /chassis/adapter/host-fc-if/interrupt # <b>exit</b>	Exits to the host Fibre Channel interface command mode.
<b>Step 30</b>	Server /chassis/adapter/host-fc-if # <b>scope port</b>	Enters the Fibre Channel port command mode.
<b>Step 31</b>	Server /chassis/adapter/host-fc-if/port # <b>set outstanding-io-count count</b>	Specifies the I/O throttle count, the number of I/O operations that can be pending in the vHBA at one time. The range is 1 to 1024; the default is 512 operations.

	Command or Action	Purpose
<b>Step 32</b>	Server /chassis/adapter/host-fc-if/port # <b>set max-target-luns</b> <i>count</i>	Specifies the maximum logical unit numbers (LUNs) per target, the maximum number of LUNs that the driver will discover. This is usually an operating system platform limitation. The range is 1 to 1024; the default is 256 LUNs.
<b>Step 33</b>	Server /chassis/adapter/host-fc-if/port # <b>exit</b>	Exits to the host Fibre Channel interface command mode.
<b>Step 34</b>	Server /chassis/adapter/host-fc-if # <b>scope port-f-logi</b>	Enters the Fibre Channel fabric login command mode.
<b>Step 35</b>	Server /chassis/adapter/host-fc-if/port-f-logi # <b>set flogi-retries</b> { <b>infinite</b>   <i>count</i> }	Specifies the fabric login (FLOGI) retries value, the number of times that the system tries to log in to the fabric after the first failure. Enter a number between 0 and 4294967295 or enter <b>infinite</b> ; the default is infinite retries.
<b>Step 36</b>	Server /chassis/adapter/host-fc-if/port-f-logi # <b>set flogi-timeout</b> <i>msec</i>	Specifies the fabric login (FLOGI) timeout value, the number of milliseconds that the system waits before it tries to log in again. The range is 1 to 255000; the default is 2000 milliseconds.
<b>Step 37</b>	Server /chassis/adapter/host-fc-if/port-f-logi # <b>exit</b>	Exits to the host Fibre Channel interface command mode.
<b>Step 38</b>	Server /chassis/adapter/host-fc-if # <b>scope port-p-logi</b>	Enters the Fibre Channel port login command mode.
<b>Step 39</b>	Server /chassis/adapter/host-fc-if/port-p-logi # <b>set plogi-retries</b> <i>count</i>	Specifies the port login (PLOGI) retries value, the number of times that the system tries to log in to the fabric after the first failure. The range is 0 and 255; the default is 8 retries.
<b>Step 40</b>	Server /chassis/adapter/host-fc-if/port-p-logi # <b>set plogi-timeout</b> <i>msec</i>	Specifies the port login (PLOGI) timeout value, the number of milliseconds that the system waits before it tries to log in again. The range is 1 to 255000; the default is 2000 milliseconds.
<b>Step 41</b>	Server /chassis/adapter/host-fc-if/port-p-logi # <b>exit</b>	Exits to the host Fibre Channel interface command mode.
<b>Step 42</b>	Server /chassis/adapter/host-fc-if # <b>scope scsi-io</b>	Enters the SCSI I/O command mode.
<b>Step 43</b>	Server /chassis/adapter/host-fc-if/scsi-io # <b>set cdb-wq-count</b> <i>count</i>	The number of command descriptor block (CDB) transmit queue resources to allocate. The range is 1 to 8; the default is 1.

	Command or Action	Purpose
<b>Step 44</b>	Server /chassis/adapter/host-fc-if/scsi-io # <b>set cdb-wq-ring-size</b> <i>size</i>	The number of descriptors in the command descriptor block (CDB) transmit queue. The range is 64 to 512; the default is 512.
<b>Step 45</b>	Server /chassis/adapter/host-fc-if/scsi-io # <b>exit</b>	Exits to the host Fibre Channel interface command mode.
<b>Step 46</b>	Server /chassis/adapter/host-fc-if # <b>scope trans-queue</b>	Enters the Fibre Channel transmit queue command mode.
<b>Step 47</b>	Server /chassis/adapter/host-fc-if/trans-queue # <b>set fc-wq-ring-size</b> <i>size</i>	The number of descriptors in the Fibre Channel transmit queue. The range is 64 to 128; the default is 64.
<b>Step 48</b>	Server /chassis/adapter/host-fc-if/trans-queue # <b>exit</b>	Exits to the host Fibre Channel interface command mode.
<b>Step 49</b>	Server /chassis/adapter/host-fc-if # <b>scope rcv-queue</b>	Enters the Fibre Channel receive queue command mode.
<b>Step 50</b>	Server /chassis/adapter/host-fc-if/rcv-queue # <b>set fc-rq-ring-size</b> <i>size</i>	The number of descriptors in the Fibre Channel receive queue. The range is 64 to 128; the default is 64.
<b>Step 51</b>		
<b>Step 52</b>	Server /chassis/adapter/host-fc-if/rcv-queue # <b>exit</b>	Exits to the host Fibre Channel interface command mode.
<b>Step 53</b>	Server /chassis/adapter/host-fc-if # <b>commit</b>	Commits the transaction to the system configuration.  <b>Note</b> The changes will take effect upon the next server reboot.

**Example**

This example configures the properties of a vHBA (only few options are shown):

```
Server# scope chassis
Server /chassis # show adapter
PCI Slot Product Name Serial Number Product ID Vendor
-----
1 UCS VIC P81E QCI1417A0QK N2XX-ACPCI01 Cisco Systems Inc

Server /chassis # scope adapter 1
Server /chassis/adapter # scope host-fc-if fc1
Server /chassis/adapter/host-fc-if # set boot enable
Server /chassis/adapter/host-fc-if *# scope scsi-io
Server /chassis/adapter/host-fc-if/scsi-io *# set cdb-wq-count 2
Server /chassis/adapter/host-fc-if/scsi-io *# exit
Server /chassis/adapter/host-fc-if *# commit
Server /chassis/adapter/host-fc-if #
```

**What to do next**

Reboot the server to apply the changes.

## Creating a vHBA

The adapter provides two permanent vHBAs. If NIV mode is enabled, you can create up to 16 additional vHBAs.



**Note** Additional vHBAs can be created only in **VNTAG** mode.

**Before you begin**

You must log in with user or admin privileges to perform this task.

**Procedure**

	<b>Command or Action</b>	<b>Purpose</b>
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.
<b>Step 2</b>	Server /chassis # <b>scope adapter</b> <i>index</i>	Enters the command mode for the adapter card at the PCI slot number specified by <i>index</i> .  <b>Note</b> The server must be powered on before you can view or change adapter settings.
<b>Step 3</b>	Server /chassis/adapter # <b>create host-fc-if</b> <i>name</i>	Creates a vHBA and enters the host Fibre Channel interface command mode. The <i>name</i> argument can be up to 32 ASCII characters.
<b>Step 4</b>	Server /chassis/adapter/host-fc-if # <b>set channel-number</b> <i>number</i>	Assign a channel number to this vHBA. The range is 1 to 1000.
<b>Step 5</b>	Server /chassis/adapter/host-fc-if # <b>commit</b>	Commits the transaction to the system configuration.  <b>Note</b> The changes will take effect upon the next server reboot.

**Example**

This example creates a vHBA on adapter 1:

```
Server# scope chassis
Server /chassis # scope adapter 1
Server /chassis/adapter # create host-fc-if Vhba5
Server /chassis/adapter/host-fc-if *# commit
New host-fc-if settings will take effect upon the next server reset
Server /chassis/adapter/host-fc-if #
```

**What to do next**

- Reboot the server to create the vHBA.
- If configuration changes are required, configure the new vHBA as described in [Modifying vHBA Properties, on page 8](#).

## Deleting a vHBA

**Before you begin**

You cannot delete the default vHBAs.

**Procedure**

	Command or Action	Purpose
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.
<b>Step 2</b>	Server /chassis # <b>scope adapter</b> <i>index</i>	Enters the command mode for the adapter card at the PCI slot number specified by <i>index</i> .  <b>Note</b> The server must be powered on before you can view or change adapter settings.
<b>Step 3</b>	Server /chassis/adapter # <b>delete host-fc-if</b> <i>name</i>	Deletes the specified vHBA.  <b>Note</b> You cannot delete either of the two default vHBAs, fc0 or fc1.
<b>Step 4</b>	Server /chassis/adapter # <b>commit</b>	Commits the transaction to the system configuration.  <b>Note</b> The changes will take effect upon the next server reboot.

**Example**

This example deletes a vHBA on adapter 1:

```
Server# scope chassis
Server /chassis # scope adapter 1
Server /chassis/adapter # delete host-fc-if Vhba5
Server /chassis/adapter *# commit
Server /chassis/adapter #
```

## vHBA Boot Table

In the vHBA boot table, you can specify up to four LUNs from which the server can boot.

## Viewing the Boot Table

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.
<b>Step 2</b>	Server /chassis # <b>scope adapter</b> <i>index</i>	Enters the command mode for the adapter card at the PCI slot number specified by <i>index</i> .  <b>Note</b> The server must be powered on before you can view or change adapter settings.
<b>Step 3</b>	Server /chassis/adapter # <b>scope host-fc-if</b> { <b>fc0</b>   <b>fc1</b>   <i>name</i> }	Enters the host Fibre Channel interface command mode for the specified vHBA.
<b>Step 4</b>	Server /chassis/adapter/host-fc-if # <b>show boot</b>	Displays the boot table of the Fibre Channel interface.

### Example

This example displays the boot table for a vHBA:

```
Server# scope chassis
Server /chassis # scope adapter 1
Server /chassis/adapter # scope host-fc-if fc1
Server /chassis/adapter/host-fc-if # show boot
Boot Table Entry  Boot Target WWPN          Boot LUN ID
-----
0                 20:00:00:11:22:33:44:55    3
1                 20:00:00:11:22:33:44:56    5

Server /chassis/adapter/host-fc-if #
```

## Creating a Boot Table Entry

You can create up to four boot table entries.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.
<b>Step 2</b>	Server /chassis # <b>scope adapter</b> <i>index</i>	Enters the command mode for the adapter card at the PCI slot number specified by <i>index</i> .  <b>Note</b> The server must be powered on before you can view or change adapter settings.



	Command or Action	Purpose
<b>Step 3</b>	Server /chassis/adapter # <b>scope host-fc-if</b> {fc0   fc1   name}	Enters the host Fibre Channel interface command mode for the specified vHBA.
<b>Step 4</b>	Server /chassis/adapter/host-fc-if # <b>create-boot-entry</b> <i>wwpn lun-id</i>	Creates a boot table entry. <ul style="list-style-type: none"> <li>• <i>wwpn</i> — The World Wide Port Name (WWPN) for the boot target in the form hh:hh:hh:hh:hh:hh:hh:hh.</li> <li>• <i>lun-id</i> — The LUN ID of the boot LUN. The range is 0 to 255.</li> </ul>
<b>Step 5</b>	Server /chassis/adapter/host-fc-if # <b>commit</b>	Commits the transaction to the system configuration. <p><b>Note</b> The changes will take effect upon the next server reboot.</p>

### Example

This example creates a boot table entry for vHBA fc1:

```
Server# scope chassis
Server /chassis # scope adapter 1
Server /chassis/adapter # scope host-fc-if fc1
Server /chassis/adapter/host-fc-if # create-boot-entry 20:00:00:11:22:33:44:55 3
Server /chassis/adapter/host-fc-if *# commit
New boot table entry will take effect upon the next server reset
Server /chassis/adapter/host-fc-if #
```

## Deleting a Boot Table Entry

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.
<b>Step 2</b>	Server /chassis # <b>scope adapter</b> <i>index</i>	Enters the command mode for the adapter card at the PCI slot number specified by <i>index</i> . <p><b>Note</b> The server must be powered on before you can view or change adapter settings.</p>
<b>Step 3</b>	Server /chassis/adapter # <b>scope host-fc-if</b> {fc0   fc1   name}	Enters the host Fibre Channel interface command mode for the specified vHBA.

	Command or Action	Purpose
<b>Step 4</b>	Server /chassis/adapter/host-fc-if # <b>show boot</b>	Displays the boot table. From the Boot Table Entry field, locate the number of the entry to be deleted.
<b>Step 5</b>	Server /chassis/adapter/host-fc-if # <b>delete boot entry</b>	Deletes the boot table entry at the specified position in the table. The range of <i>entry</i> is 0 to 3. The change will take effect upon the next server reset.
<b>Step 6</b>	Server /chassis/adapter/host-fc-if # <b>commit</b>	Commits the transaction to the system configuration.  <b>Note</b> The changes will take effect upon the next server reboot.

### Example

This example deletes boot table entry number 1 for the vHBA fc1:

```
Server# scope chassis
Server /chassis # scope adapter 1
Server /chassis/adapter # scope host-fc-if fc1
Server /chassis/adapter/host-fc-if # show boot
Boot Table Entry  Boot Target WWPN          Boot LUN ID
-----
0                  20:00:00:11:22:33:44:55    3
1                  20:00:00:11:22:33:44:56    5

Server /chassis/adapter/host-fc-if # delete boot 1
Server /chassis/adapter/host-fc-if *# commit
New host-fc-if settings will take effect upon the next server reset
Server /chassis/adapter/host-fc-if # show boot
Boot Table Entry  Boot Target WWPN          Boot LUN ID
-----
0                  20:00:00:11:22:33:44:55    3

Server /chassis/adapter/host-fc-if #
```

### What to do next

Reboot the server to apply the changes.

## vHBA Persistent Binding

Persistent binding ensures that the system-assigned mapping of Fibre Channel targets is maintained after a reboot.

## Enabling Persistent Binding

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.
<b>Step 2</b>	Server /chassis # <b>scope adapter</b> <i>index</i>	Enters the command mode for the adapter card at the PCI slot number specified by <i>index</i> .  <b>Note</b> The server must be powered on before you can view or change adapter settings.
<b>Step 3</b>	Server /chassis/adapter # <b>scope host-fc-if</b> { <b>fc0</b>   <b>fc1</b>   <i>name</i> }	Enters the host Fibre Channel interface command mode for the specified vHBA.
<b>Step 4</b>	Server /chassis/adapter/host-fc-if # <b>scope perbi</b>	Enters the persistent binding command mode for the vHBA.
<b>Step 5</b>	Server /chassis/adapter/host-fc-if/perbi # <b>set persistent-lun-binding enable</b>	Enables persistent binding for the vHBA.
<b>Step 6</b>	Server /chassis/adapter/host-fc-if/perbi # <b>commit</b>	Commits the transaction to the system configuration.

### Example

This example enables persistent binding for a vHBA:

```
Server# scope chassis
Server /chassis # scope adapter 4
Server /chassis/adapter # scope host-fc-if fc1
Server /chassis/adapter/host-fc-if # scope perbi
Server /chassis/adapter/host-fc-if/perbi # set persistent-lun-binding enable
Server /chassis/adapter/host-fc-if/perbi *# commit
Server /chassis/adapter/host-fc-if/perbi #
```

## Disabling Persistent Binding

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.
<b>Step 2</b>	Server /chassis # <b>scope adapter</b> <i>index</i>	Enters the command mode for the adapter card at the PCI slot number specified by <i>index</i> .

	Command or Action	Purpose
		<b>Note</b> The server must be powered on before you can view or change adapter settings.
<b>Step 3</b>	Server /chassis/adapter # <b>scope host-fc-if</b> { <b>fc0</b>   <b>fc1</b>   <i>name</i> }	Enters the host Fibre Channel interface command mode for the specified vHBA.
<b>Step 4</b>	Server /chassis/adapter/host-fc-if # <b>scope perbi</b>	Enters the persistent binding command mode for the vHBA.
<b>Step 5</b>	Server /chassis/adapter/host-fc-if/perbi # <b>set persistent-lun-binding disable</b>	Disables persistent binding for the vHBA.
<b>Step 6</b>	Server /chassis/adapter/host-fc-if/perbi # <b>commit</b>	Commits the transaction to the system configuration.

### Example

This example disables persistent binding for a vHBA:

```
Server# scope chassis
Server /chassis # scope adapter 4
Server /chassis/adapter # scope host-fc-if fc1
Server /chassis/adapter/host-fc-if # scope perbi
Server /chassis/adapter/host-fc-if/perbi # set persistent-lun-binding disable
Server /chassis/adapter/host-fc-if/perbi *# commit
Server /chassis/adapter/host-fc-if/perbi #
```

## Rebuilding Persistent Binding

### Before you begin

Persistent binding must be enabled in the vHBA properties.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.
<b>Step 2</b>	Server /chassis # <b>scope adapter</b> <i>index</i>	Enters the command mode for the adapter card at the PCI slot number specified by <i>index</i> .  <b>Note</b> The server must be powered on before you can view or change adapter settings.
<b>Step 3</b>	Server /chassis/adapter # <b>scope host-fc-if</b> { <b>fc0</b>   <b>fc1</b>   <i>name</i> }	Enters the host Fibre Channel interface command mode for the specified vHBA.

	Command or Action	Purpose
<b>Step 4</b>	Server /chassis/adapter/host-fc-if # <b>scope perbi</b>	Enters the persistent binding command mode for the vHBA.
<b>Step 5</b>	Server /chassis/adapter/host-fc-if/perbi # <b>rebuild</b>	Rebuilds the persistent binding table for the vHBA.

### Example

This example rebuilds the persistent binding table for a vHBA:

```
Server# scope chassis
Server /chassis # scope adapter 4
Server /chassis/adapter # scope host-fc-if fc1
Server /chassis/adapter/host-fc-if # scope perbi
Server /chassis/adapter/host-fc-if/perbi # rebuild

Server /chassis/adapter/host-fc-if/perbi #
```

## Managing vNICs

### Guidelines for Managing vNICs

When managing vNICs, consider the following guidelines and restrictions:

- The Cisco UCS Virtual Interface Cards provide two vHBAs and two vNICs by default. You can create up to 14 additional vHBAs or vNICs on these adapter cards.

Additional vHBAs can be created using VNTAG mode.

The Cisco UCS 1455 and 1457 Virtual Interface Cards, in non-port channel mode, provide four vHBAs and four vNICs by default. You can create up to 10 additional vHBAs or vNICs on these adapter cards.



**Note** If VNTAG mode is enabled for the adapter, you must assign a channel number to a vNIC when you create it.

- After making configuration changes, you must reboot the host for settings to take effect.

### Viewing vNIC Properties

#### Procedure

	Command or Action	Purpose
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.

	Command or Action	Purpose
<b>Step 2</b>	Server /chassis # <b>scope adapter</b> <i>index</i>	Enters the command mode for the adapter card at the PCI slot number specified by <i>index</i> .  <b>Note</b> The server must be powered on before you can view or change adapter settings.
<b>Step 3</b>	Server /chassis/adapter # <b>show host-eth-if</b> [ <b>eth0</b>   <b>eth1</b>   <i>name</i> ] [ <b>detail</b> ]	Displays properties of a single vNIC, if specified, or all vNICs.
<b>Step 4</b>	Server /chassis/adapter # <b>show ext-eth-if</b> [ <b>detail</b> ]	Displays the external ethernet interfaces' details.

### Example

Following examples display the brief properties of all vNICs and the detailed properties of eth0 and the external interfaces:



**Note** These examples may show features available only with certain releases.

```
Server# scope chassis
Server /chassis # scope adapter 1
Server /chassis/adapter # show host-eth-if
Name      MTU  Uplink Port  MAC Address      CoS VLAN PXE Boot iSCSI Boot usNIC
-----
eth0      1500 0           74:A2:E6:28:C6:AE N/A N/A disabled disabled 0
eth1      1500 1           74:A2:E6:28:C6:AF N/A N/A disabled disabled 0
srg       1500 0           74:A2:E6:28:C6:B2 N/A N/A disabled disabled 64
hhh       1500 0           74:A2:E6:28:C6:B3 N/A N/A disabled disabled 0
```

```
Server /chassis/adapter # show host-eth-if eth0 detail
```

```
Name eth0:
  MTU: 1500
  Uplink Port: 0
  MAC Address: B0:8B:CF:4C:ED:FF
  CoS: 0
  Trust Host CoS: disabled
  PCI Link: 0
  PCI Order: 0
  VLAN: NONE
  VLAN Mode: TRUNK
  Rate Limiting: OFF
  PXE Boot: disabled
  iSCSI Boot: disabled
  usNIC: 0
  Channel Number: N/A
  Port Profile: N/A
  Uplink Failover: N/A
  Uplink Failback Timeout: N/A
  aRFS: disabled
  VMQ: disabled
  NVGRE: disabled
  VXLAN: disabled
  CDN Name: VIC-MLOM-eth0
```

```

RoCE Version1: disabled
RoCE Version2: disabled
RDMA Queue Pairs: 0
RDMA Memory Regions: 0
RDMA Resource Groups: 0
RDMA COS: 0
Multi Queue: disabled
No of subVnics:
Multi Queue Transmit Queue Count:
Multi Queue Receive Queue Count:
Multi Que Completion Queue Count:
Multi Queue RoCE Version1:
Multi Queue RoCE Version2:
Multi Queue RDMA Queue Pairs:
Multi Queue RDMA Memory Regions:
Multi Queue RDMA Resource Groups:
Multi Queue RDMA COS:
Advanced Filters: disabled
Geneve Offload: disabled
    
```

```

Server# scope chassis
Server /chassis # scope adapter 1
Server /chassis/adapter # show ext-eth-if
Port MAC Address      Link State Encap.. Mode Admin Speed Oper..Speed  Link Training
Connector Present Connector Supported
-----
0      74:A2:E6:28:C6:A2 Link      CE          40Gbps      40Gbps      N/A
Yes
1      74:A2:E6:28:C6:A3 Link      CE          40Gbps      40Gbps      N/A
Yes
    
```

```

Server /chassis/adapter # show ext-eth-if detail
    
```

```

C220-FCH1834V23X /chassis/adapter # show ext-eth-if detail
    
```

```

Port 0:
MAC Address: 74:A2:E6:28:C6:A2
Link State: Link
Encapsulation Mode: CE
Admin Speed: 40Gbps
Operating Speed: 40Gbps
Link Training: N/A
Connector Present: Yes
Connector Supported: Yes
Connector Type: QSFP_XCVR_CR4
Connector Vendor: CISCO
Connector Part Number: 2231254-3
Connector Part Revision: B
    
```

```

Port 1:
MAC Address: 74:A2:E6:28:C6:A3
Link State: Link
Encapsulation Mode: CE
Admin Speed: 40Gbps
Operating Speed: 40Gbps
Link Training: N/A
Connector Present: Yes
Connector Supported: Yes
Connector Type: QSFP_XCVR_CR4
Connector Vendor: CISCO
Connector Part Number: 2231254-3
Connector Part Revision: B
    
```

```
Server /chassis/adapter #
```

## Modifying vNIC Properties

### Before you begin

You must log in with admin privileges to perform this task.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.
<b>Step 2</b>	Server /chassis # <b>show adapter</b>	(Optional) Displays the available adapter devices.
<b>Step 3</b>	Server /chassis # <b>scope adapter</b> <i>index</i>	Enters the command mode for the adapter card at the PCI slot number specified by <i>index</i> .  <b>Note</b> The server must be powered on before you can view or change adapter settings.
<b>Step 4</b>	Server /chassis/adapter # <b>scope host-eth-if</b> { <b>eth0</b>   <b>eth1</b>   <i>name</i> }	Enters the host Ethernet interface command mode for the specified vNIC.
<b>Step 5</b>	Server /chassis/adapter/host-eth-if # <b>set mtu</b> <i>mtu-value</i>	Specifies the maximum transmission unit (MTU) or packet size that the vNIC accepts. Valid MTU values are 1500 to 9000 bytes; the default is 1500.
<b>Step 6</b>	Server /chassis/adapter/host-eth-if # <b>set uplink</b> { <b>0</b>   <b>1</b> }	Specifies the uplink port associated with this vNIC. All traffic for this vNIC goes through this uplink port.
<b>Step 7</b>	Server /chassis/adapter/host-eth-if # <b>set mac-addr</b> <i>mac-addr</i>	Specifies a MAC address for the vNIC in the form hh:hh:hh:hh:hh:hh or hhhh:hhhh:hhhh.
<b>Step 8</b>	Server /chassis/adapter/host-eth-if # <b>set cos</b> <i>cos-value</i>	Specifies the class of service (CoS) value to be marked on received packets unless the vNIC is configured to trust host CoS. Valid CoS values are 0 to 6; the default is 0. Higher values indicate more important traffic.  <b>Note</b> <ul style="list-style-type: none"> <li>You must set the <b>COS</b> value to 5 for the RDMA enabled interfaces.</li> <li>If NIV is enabled, this setting is determined by the switch, and the command is ignored.</li> </ul>



	Command or Action	Purpose
<b>Step 9</b>	Server /chassis/adapter/host-eth-if # <b>set trust-host-cos</b> { <b>disable</b>   <b>enable</b> }	<p>Specifies whether the vNIC will trust host CoS or will remark packets. The behavior is as follows:</p> <ul style="list-style-type: none"> <li>• <b>disable</b> —Received packets are remarked with the configured CoS. This is the default.</li> <li>• <b>enable</b> —The existing CoS value of received packets (host CoS) is preserved.</li> </ul>
<b>Step 10</b>	Server /chassis/adapter/host-eth-if # <b>set order</b> { <b>any</b>   <i>0-99</i> }	Specifies the relative order of this device for PCI bus device number assignment; the default is any.
<b>Step 11</b>	Server /chassis/adapter/host-eth-if # <b>set vlan</b> { <b>none</b>   <i>vlan-id</i> }	<p>Specifies the default VLAN for this vNIC. Valid VLAN numbers are 1 to 4094; the default is none.</p> <p><b>Note</b> If NIV is enabled, this setting is determined by the switch, and the command is ignored.</p>
<b>Step 12</b>	Server /chassis/adapter/host-eth-if # <b>set vlan-mode</b> { <b>access</b>   <b>trunk</b> }	<p>Specifies the VLAN mode for the vNIC. The modes are as follows:</p> <ul style="list-style-type: none"> <li>• <b>access</b> —The vNIC belongs to only one VLAN. When the VLAN is set to access mode, any frame received from the specified default VLAN (1-4094) that is received from the switch with a TAG removes that TAG when it is sent to the host OS through the vNIC.</li> <li>• <b>trunk</b> —The vNIC can belong to more than one VLAN. This is the default.</li> </ul> <p><b>Note</b> If NIV is enabled, this setting is determined by the switch, and the command is ignored.</p>
<b>Step 13</b>	Server /chassis/adapter/host-eth-if # <b>set rate-limit</b> { <b>off</b>   <i>rate</i> }	<p>Specifies a maximum data rate for the vNIC. The range is 1 to 10000 Mbps; the default is off.</p> <p>For VIC 13xx controllers, you can enter an integer between 1 and 40,000.</p> <p>For VIC 1455 and 1457 controllers:</p> <ul style="list-style-type: none"> <li>• If the adapter is connected to 25 Gbps link on a switch, then you can enter an integer between 1 to 25,000 Mbps.</li> </ul>

	Command or Action	Purpose
		<ul style="list-style-type: none"> <li>If the adapter is connected to 10 Gbps link on a switch, then you can enter an integer between 1 to 10,000 Mbps.</li> </ul> <p>For VIC 1495 and 1497 controllers:</p> <ul style="list-style-type: none"> <li>If the adapter is connected to 40 Gbps link on a switch, then you can enter an integer between 1 to 40,000 Mbps.</li> <li>If the adapter is connected to 100 Gbps link on a switch, then you can enter an integer between 1 to 100,000 Mbps.</li> </ul> <p><b>Note</b> If NIV is enabled, this setting is determined by the switch, and the command is ignored.</p>
<b>Step 14</b>	Server /chassis/adapter/host-eth-if # <b>set boot</b> { <b>disable</b>   <b>enable</b> }	Specifies whether the vNIC can be used to perform a PXE boot. Default value is set to disable for the default vNICs and user-created vNICs.
<b>Step 15</b>	Server /chassis/adapter/host-eth-if # <b>set channel-number</b> <i>number</i>	If NIV mode is enabled for the adapter, select the channel number that will be assigned to this vNIC. The range is 1 to 1000.
<b>Step 16</b>	Server /chassis/adapter/host-eth-if # <b>set port-profile</b> <i>name</i>	If NIV mode is enabled for the adapter, select the port profile that should be associated with the vNIC.  <b>Note</b> The <i>name</i> must be a port profile defined on the switch to which this server is connected.
<b>Step 17</b>	Server /chassis/adapter/host-eth-if # <b>set uplink-failover</b> { <b>disable</b>   <b>enable</b> }	If NIV mode is enabled for the adapter, enable this setting if traffic on this vNIC should fail over to the secondary interface if there are communication problems.
<b>Step 18</b>	Server /chassis/adapter/host-eth-if # <b>set uplink-failback-timeout</b> <i>seconds</i>	After a vNIC has started using its secondary interface, this setting controls how long the primary interface must be available before the system resumes using the primary interface for the vNIC.  Enter a number of <i>seconds</i> between 0 and 600.
<b>Step 19</b>	Server /chassis/adapter/host-eth-if # <b>set vmq</b> { <b>disabled</b>   <b>enabled</b> }	Enables or disables Virtual Machine Queue (VMQ) for this adapter.

	Command or Action	Purpose
		<p><b>Note</b></p> <ul style="list-style-type: none"> <li>• Ensure that VMQ is not enabled when SR-IOV is enabled on the adapter.</li> <li>• This option is available only on some Cisco UCS C-Series servers with 1455 or 1457 adapters.</li> <li>•</li> </ul>
<b>Step 20</b>	<p>Server /chassis/adapter/host-eth-if # <b>set multi-queue {disabled   enabled}</b></p>	<p>Enables or disables the multi queue option for this adapter and allows you to set the following multi queue parameters:</p> <ul style="list-style-type: none"> <li>• <b>mq-rq-count</b>—The number of receive queue resources to allocate. Enter an integer between 1 and 1000.</li> <li>• <b>mq-wq-count</b>—The number of transmit queue resources to allocate. Enter an integer between 1 and 1000.</li> <li>• <b>mq-cq-count</b>—The number of completion queue resources to allocate. In general, the number of completion queue resources you should allocate is equal to the number of transmit queue resources plus the number of receive queue resources. Enter an integer between 1 and 2000.</li> </ul> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>• Multi queue is supported only on C-Series servers with 14xx adapters.</li> <li>• VMQ must be in enabled state to enable this option.</li> <li>• When you enable this option on one of the vNICs, configuring only VMQ (without choosing multi-queue) on other vNICs is not supported.</li> <li>• When this option is enabled usNIC configuration will be disabled.</li> </ul>
<b>Step 21</b>	<p>Server /chassis/adapter/host-eth-if # <b>set arfs {disable   enable}</b></p>	<p>Enables or disables Accelerated Receive Flow steering (aRFS) for this adapter.</p>

	Command or Action	Purpose
<b>Step 22</b>	Server /chassis/adapter/host-eth-if # <b>scope interrupt</b>	Enters the interrupt command mode.
<b>Step 23</b>	Server /chassis/adapter/host-eth-if/interrupt # <b>set interrupt-count</b> <i>count</i>	Specifies the number of interrupt resources. The range is 1 to 514; the default is 8. In general, you should allocate one interrupt resource for each completion queue.
<b>Step 24</b>	Server /chassis/adapter/host-eth-if/interrupt # <b>set coalescing-time</b> <i>usec</i>	The time to wait between interrupts or the idle period that must be encountered before an interrupt is sent.  The range is 1 to 65535 microseconds; the default is 125. To turn off coalescing, enter 0 (zero).
<b>Step 25</b>	Server /chassis/adapter/host-eth-if/interrupt # <b>set coalescing-type</b> { <i>idle</i>   <i>min</i> }	The coalescing types are as follows: <ul style="list-style-type: none"> <li>• <b>idle</b> —The system does not send an interrupt until there is a period of no activity lasting as least as long as the time specified in the coalescing time configuration.</li> <li>• <b>min</b> —The system waits for the time specified in the coalescing time configuration before sending another interrupt event. This is the default.</li> </ul>
<b>Step 26</b>	Server /chassis/adapter/host-eth-if/interrupt # <b>set interrupt-mode</b> { <i>intx</i>   <i>msi</i>   <i>msix</i> }	Specifies the Ethernet interrupt mode. The modes are as follows: <ul style="list-style-type: none"> <li>• <b>intx</b> —Line-based interrupt (PCI INTx)</li> <li>• <b>msi</b> —Message-Signaled Interrupt (MSI)</li> <li>• <b>msix</b> —Message Signaled Interrupts with the optional extension (MSI-X). This is the recommended and default option.</li> </ul>
<b>Step 27</b>	Server /chassis/adapter/host-eth-if/interrupt # <b>exit</b>	Exits to the host Ethernet interface command mode.
<b>Step 28</b>	Server /chassis/adapter/host-eth-if # <b>scope rcv-queue</b>	Enters receive queue command mode.
<b>Step 29</b>	Server /chassis/adapter/host-eth-if/rcv-queue # <b>set rq-count</b> <i>count</i>	The number of receive queue resources to allocate. The range is 1 to 256; the default is 4.
<b>Step 30</b>	Server /chassis/adapter/host-eth-if/rcv-queue # <b>set rq-ring-size</b> <i>size</i>	The number of descriptors in the receive queue. The range is 64 to 4094; the default is 512.

	Command or Action	Purpose
<b>Step 31</b>	Server /chassis/adapter/host-eth-if/recv-queue # <b>exit</b>	Exits to the host Ethernet interface command mode.
<b>Step 32</b>	Server /chassis/adapter/host-eth-if # <b>scope trans-queue</b>	Enters transmit queue command mode.
<b>Step 33</b>	Server /chassis/adapter/host-eth-if/trans-queue # <b>set wq-count count</b>	The number of transmit queue resources to allocate. The range is 1 to 256; the default is 1.
<b>Step 34</b>	Server /chassis/adapter/host-eth-if/trans-queue # <b>set wq-ring-size size</b>	The number of descriptors in the transmit queue. The range is 64 to 4094; the default is 256.
<b>Step 35</b>	Server /chassis/adapter/host-eth-if/trans-queue # <b>exit</b>	Exits to the host Ethernet interface command mode.
<b>Step 36</b>	Server /chassis/adapter/host-eth-if # <b>scope comp-queue</b>	Enters completion queue command mode.
<b>Step 37</b>	Server /chassis/adapter/host-eth-if/comp-queue # <b>set cq-count count</b>	The number of completion queue resources to allocate. The range is 1 to 512; the default is 5.  In general, the number of completion queues equals the number of transmit queues plus the number of receive queues.
<b>Step 38</b>	Server /chassis/adapter/host-eth-if/comp-queue # <b>exit</b>	Exits to the host Ethernet interface command mode.
<b>Step 39</b>	Server /chassis/adapter/host-eth-if/ # <b>set rdma_mr number</b>	Sets the number of memory regions to be used per adapter. The values range from 4096 to 524288.
<b>Step 40</b>	Server /chassis/adapter/host-eth-if/ # <b>set rdma_qp number</b>	Sets the number of queue pairs to be used per adapter. The values range from 1-8192 queue pairs.
<b>Step 41</b>	Server /chassis/adapter/host-eth-if/ # <b>set rdma_resgrp number</b>	Sets the number of resource groups to be used. The values range from 1-128 resource groups.  <b>Note</b> After committing the RoCE details, you are required to reboot the server for the changes to take place.
<b>Step 42</b>	Server /chassis/adapter/host-eth-if # <b>scope offload</b>	Enters TCP offload command mode.
<b>Step 43</b>	Server /chassis/adapter/host-eth-if/offload # <b>set tcp-segment-offload {disable   enable}</b>	Enables or disables TCP Segmentation Offload as follows:  • <b>disable</b> —The CPU segments large TCP packets.

	Command or Action	Purpose
		<ul style="list-style-type: none"> <li>• <b>enable</b> —The CPU sends large TCP packets to the hardware to be segmented. This option may reduce CPU overhead and increase throughput rate. This is the default.</li> </ul> <p><b>Note</b> This option is also known as Large Send Offload (LSO).</p>
<b>Step 44</b>	Server /chassis/adapter/host-eth-if/offload # <b>set tcp-rx-checksum-offload {disable   enable}</b>	<p>Enables or disables TCP Receive Offload Checksum Validation as follows:</p> <ul style="list-style-type: none"> <li>• <b>disable</b> —The CPU validates all packet checksums.</li> <li>• <b>enable</b> —The CPU sends all packet checksums to the hardware for validation. This option may reduce CPU overhead. This is the default.</li> </ul>
<b>Step 45</b>	Server /chassis/adapter/host-eth-if/offload # <b>set tcp-tx-checksum-offload {disable   enable}</b>	<p>Enables or disables TCP Transmit Offload Checksum Validation as follows:</p> <ul style="list-style-type: none"> <li>• <b>disable</b> —The CPU validates all packet checksums.</li> <li>• <b>enable</b> —The CPU sends all packet checksums to the hardware for validation. This option may reduce CPU overhead. This is the default.</li> </ul>
<b>Step 46</b>	Server /chassis/adapter/host-eth-if/offload # <b>set tcp-large-receive-offload {disable   enable}</b>	<p>Enables or disables TCP Large Packet Receive Offload as follows:</p> <ul style="list-style-type: none"> <li>• <b>disable</b> —The CPU processes all large packets.</li> <li>• <b>enable</b> —The hardware reassembles all segmented packets before sending them to the CPU. This option may reduce CPU utilization and increase inbound throughput. This is the default.</li> </ul>
<b>Step 47</b>	Server /chassis/adapter/host-eth-if/offload # <b>exit</b>	Exits to the host Ethernet interface command mode.
<b>Step 48</b>	Server /chassis/adapter/host-eth-if # <b>scope rss</b>	Enters Receive-side Scaling (RSS) command mode.
<b>Step 49</b>	Server /chassis/adapter/host-eth-if/rss # <b>set rss {disable   enable}</b>	Enables or disables RSS, which allows the efficient distribution of network receive processing across multiple CPUs in

	Command or Action	Purpose
		multiprocessor systems. The default is enable for the two default vNICs, and disable for user-created vNICs.
<b>Step 50</b>	Server /chassis/adapter/host-eth-if/rss # <b>set rss-hash-ipv4 {disable   enable}</b>	Enables or disables IPv4 RSS. The default is enable.
<b>Step 51</b>	Server /chassis/adapter/host-eth-if/rss # <b>set rss-hash-tcp-ipv4 {disable   enable}</b>	Enables or disables TCP/IPv4 RSS. The default is enable.
<b>Step 52</b>	Server /chassis/adapter/host-eth-if/rss # <b>set rss-hash-ipv6 {disable   enable}</b>	Enables or disables IPv6 RSS. The default is enable.
<b>Step 53</b>	Server /chassis/adapter/host-eth-if/rss # <b>set rss-hash-tcp-ipv6 {disable   enable}</b>	Enables or disables TCP/IPv6 RSS. The default is enable.
<b>Step 54</b>	Server /chassis/adapter/host-eth-if/rss # <b>set rss-hash-ipv6-ex {disable   enable}</b>	Enables or disables IPv6 Extension RSS. The default is disable.
<b>Step 55</b>	Server /chassis/adapter/host-eth-if/rss # <b>set rss-hash-tcp-ipv6-ex {disable   enable}</b>	Enables or disables TCP/IPv6 Extension RSS. The default is disable.
<b>Step 56</b>	Server /chassis/adapter/host-eth-if/rss # <b>exit</b>	Exits to the host Ethernet interface command mode.
<b>Step 57</b>	Server /chassis/adapter/host-eth-if # <b>commit</b>	Commits the transaction to the system configuration.  <b>Note</b> The changes will take effect upon the next server reboot.

**Example**

This example configures the properties of a vNIC:

```

Server# scope chassis
Server /chassis # show adapter
PCI Slot Product Name Serial Number Product ID Vendor
-----
1 UCS VIC P81E QCI1417A0QK N2XX-ACPCI01 Cisco Systems Inc

Server /chassis # scope adapter 1
Server /chassis/adapter # scope host-eth-if Test1
Server /chassis/adapter/host-eth-if # set uplink 1
Server /chassis/adapter/host-eth-if # set vmq enabled
Server /chassis/adapter/host-eth-if # set multi-queue enabled
Server /chassis/adapter/host-eth-if # enable arfs
Server /chassis/adapter/host-eth-if *# scope offload
Server /chassis/adapter/host-eth-if/offload *# set tcp-segment-offload enable
Server /chassis/adapter/host-eth-if/offload *# exit
Server /chassis/adapter/host-eth-if *# commit
Server /chassis/adapter/host-eth-if #
    
```

**What to do next**

Reboot the server to apply the changes.

## Enabling or Disabling Link Training on External Ethernet Interfaces

Link training for the port profile on the external ethernet interfaces of the specified vNIC can be enabled or disabled.

**Before you begin**

You must log in with admin privileges to perform this task.

**Procedure**

	Command or Action	Purpose
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.
<b>Step 2</b>	Server /chassis # <b>show adapter</b>	(Optional) Displays the available adapter devices.
<b>Step 3</b>	Server /chassis # <b>scope adapter</b> <i>index</i>	Enters the command mode for the adapter card at the PCI slot number specified by <i>index</i> .  <b>Note</b> The server must be powered on before you can view or change adapter settings.
<b>Step 4</b>	Server /chassis / adapter # <b>scope ext-eth-if 0   1 name</b>	Enters the external ethernet interface command mode for the specified vNIC.
<b>Step 5</b>	Server /chassis / adapter / ext-eth-if # <b>set link-training on   off</b>	Enables or disables the link training for the specified vNIC.
<b>Step 6</b>	Server /chassis / adapter / ext-eth-if* # <b>commit</b>	Commits the transaction to the system configuration.

**Example**

This example shows how to enable or disable link training on the external ethernet interface.

```
Server# scope chassis
Server /chassis # scope adapter 1
Server /chassis/adapter # scope ext-eth-if 1
Server /chassis/adapter/ext-eth-if # set link-training on
Server /chassis/adapter/ext-eth-if* # commit
You may lose connectivity to the Cisco IMC and may have to log in again.
Do you wish to continue? [y/N] y
Port 1:
  MAC Address: 74:A2:E6:28:C6:A3
  Link State: Link
  Encapsulation Mode: CE
  Admin Speed: 40Gbps
  Operating Speed: -
```



```

Link Training: N/A
Connector Present: Yes
Connector Supported: Yes
Connector Type: QSFP_XCVR_CR4
Connector Vendor: CISCO
Connector Part Number: 2231254-3
Connector Part Revision: B
Server /chassis/adapter/ext-eth-if

```

## Setting Admin FEC Mode on External Ethernet Interfaces

### Before you begin

You must log in with admin privileges to perform this task.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.
<b>Step 2</b>	Server /chassis # <b>show adapter</b>	(Optional) Displays the available adapter devices.
<b>Step 3</b>	Server /chassis # <b>scope adapter</b> <i>index</i>	Enters the command mode for the adapter card at the PCI slot number specified by <i>index</i> .  <b>Note</b> The server must be powered on before you can view or change adapter settings.
<b>Step 4</b>	Server /chassis / adapter # <b>scope ext-eth-if</b> { <b>0</b>   <b>1 name</b> }	Enters the external ethernet interface command mode for the specified vNIC.
<b>Step 5</b>	Server /chassis / adapter / ext-eth-if # <b>set admin-fec-mode</b> { <b>Auto</b>   <b>cl74</b>   <b>cl91</b>   <b>off</b> }	Sets the admin FEC mode. The default value is <b>Auto</b> .  <b>Note</b> FEC mode is applicable only for 25G link speed. On the 14xx adapters, FEC mode set on the adapter must match the FEC mode of the switch. Otherwise the link does not work.
<b>Step 6</b>	Server /chassis / adapter / ext-eth-if* # <b>commit</b>	At the prompt, select <b>y</b> . Commits the transaction to the system configuration.

### Example

This example shows how to set the admin FEC mode on the external ethernet interface.

```

Server# scope chassis
Server /chassis # scope adapter 1
Server /chassis/adapter # scope ext-eth-if 1

```

```

Server /chassis/adapter/ext-eth-if # set admin-fec-mode c174
Server /chassis/adapter/ext-eth-if* # commit
Changes to the network settings will be applied immediately.
You may lose connectivity to the Cisco IMC and may have to log in again.
Do you wish to continue? [y/N] y
Port 1:
  MAC Address: 00:5D:73:1C:6C:58
  Link State: LinkDown
  Encapsulation Mode: CE
  Admin Speed: Auto
  Operating Speed: -
  Link Training: N/A
  Admin FEC Mode: c174
  Operating FEC Mode: Off
  Connector Present: NO
  Connector Supported: N/A
  Connector Type: N/A
  Connector Vendor: N/A
  Connector Part Number: N/A
  Connector Part Revision: N/A
Server /chassis/adapter/ext-eth-if #

```

## Creating a vNIC

The adapter provides two permanent vNICs. You can create up to 16 additional vNICs.

### Before you begin

You must log in with user or admin privileges to perform this task.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.
<b>Step 2</b>	Server /chassis # <b>scope adapter</b> <i>index</i>	Enters the command mode for the adapter card at the PCI slot number specified by <i>index</i> .  <b>Note</b> The server must be powered on before you can view or change adapter settings.
<b>Step 3</b>	Server /chassis/adapter # <b>create host-eth-if</b> <i>name</i>	Creates a vNIC and enters the host Ethernet interface command mode. The <i>name</i> argument can be up to 32 ASCII characters.
<b>Step 4</b>	(Optional) Server /chassis/adapter/host-eth-if # <b>set channel-number</b> <i>number</i>	If NIV mode is enabled for the adapter, you must assign a channel number to this vNIC. The range is 1 to 1000.
<b>Step 5</b>	Server /chassis/adapter/host-eth-if # <b>commit</b>	Commits the transaction to the system configuration.  <b>Note</b> The changes will take effect upon the next server reboot.

### Example

This example creates a vNIC on adapter 1:

```
Server# scope chassis
Server /chassis # scope adapter 1
Server /chassis/adapter # create host-eth-if Vnic5
Server /chassis/adapter/host-eth-if *# commit
New host-eth-if settings will take effect upon the next server reset
Server /chassis/adapter/host-eth-if #
```

## Deleting a vNIC

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.
<b>Step 2</b>	Server /chassis # <b>scope adapter</b> <i>index</i>	Enters the command mode for the adapter card at the PCI slot number specified by <i>index</i> .  <b>Note</b> The server must be powered on before you can view or change adapter settings.
<b>Step 3</b>	Server /chassis/adapter # <b>delete host-eth-if</b> <i>name</i>	Deletes the specified vNIC.  <b>Note</b> You cannot delete either of the two default vNICs, eth0 or eth1.
<b>Step 4</b>	Server /chassis/adapter # <b>commit</b>	Commits the transaction to the system configuration.  <b>Note</b> The changes will take effect upon the next server reboot.

### Example

This example deletes a vNIC on adapter 1:

```
Server# scope chassis
Server /chassis # scope adapter 1
Server /chassis/adapter # delete host-eth-if Vnic5
Server /chassis/adapter *# commit
Server /chassis/adapter #
```

# Creating Cisco usNIC Using the Cisco IMC CLI



**Note** Even though several properties are listed for Cisco usNIC in the usNIC properties dialog box, you must configure only the following properties because the other properties are not currently being used.

- **cq-count**
- **rq-count**
- **tq-count**
- **usnic-count**

### Before you begin

You must log in to the Cisco IMC CLI with administrator privileges to perform this task.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	server# <b>scope chassis</b>	Enters chassis command mode.
<b>Step 2</b>	server/chassis# <b>scope adapter <i>index</i></b>	Enters the command mode for the adapter card at the PCI slot number specified by <i>index</i> .  <b>Note</b> Make sure that the server is powered on before you attempt to view or change adapter settings. To view the index of the adapters configured on your server, use the <b>show adapter</b> command.
<b>Step 3</b>	server/chassis/adapter# <b>scope host-eth-if {eth0   eth1}</b>	Enters the command mode for the vNIC. Specify the Ethernet ID based on the number of vNICs that you have configured in your environment. For example, specify <b>eth0</b> if you configured only one vNIC.
<b>Step 4</b>	server/chassis/adapter/host-eth-if# <b>create usnic-config 0</b>	Creates a usNIC config and enters its command mode. Make sure that you always set the index value to 0.

	Command or Action	Purpose
		<p><b>Note</b> To create a Cisco usNIC for the first time for a given vNIC using the Cisco IMC CLI, you must first create a <b>usnic-config</b>. Subsequently, you only need to scope into the <b>usnic-config</b> and modify the properties for Cisco usNIC. For more information about modifying Cisco usNIC properties, see <a href="#">Modifying a Cisco usNIC value using the Cisco IMC CLI, on page 39</a>.</p>
<b>Step 5</b>	server/chassis/adapter/host-eth-if/usnic-config# <b>set cq-count</b> <i>count</i>	<p>Specifies the number of completion queue resources to allocate. We recommend that you set this value to 6.</p> <p>The number of completion queues equals the number of transmit queues plus the number of receive queues.</p>
<b>Step 6</b>	server/chassis/adapter/host-eth-if/usnic-config# <b>set rq-count</b> <i>count</i>	<p>Specifies the number of receive queue resources to allocate. We recommend that you set this value to 6.</p>
<b>Step 7</b>	server/chassis/adapter/host-eth-if/usnic-config# <b>set tq-count</b> <i>count</i>	<p>Specifies the number of transmit queue resources to allocate. We recommend that you set this value to 6.</p>
<b>Step 8</b>	server/chassis/adapter/host-eth-if/usnic-config# <b>set usnic-count</b> <i>number of usNICs</i> .	<p>Specifies the number of Cisco usNICs to create. Each MPI process that is running on the server requires a dedicated Cisco usNIC. Therefore, you might need to create up to 64 Cisco usNICs to sustain 64 MPI processes running simultaneously. We recommend that you create at least as many Cisco usNICs, per Cisco usNIC-enabled vNIC, as the number of physical cores on your server. For example, if you have 8 physical cores on your server, create 8 Cisco usNICs.</p>
<b>Step 9</b>	server/chassis/adapter/host-eth-if /usnic-config# <b>commit</b>	<p>Commits the transaction to the system configuration.</p> <p><b>Note</b> The changes take effect when the server is rebooted.</p>
<b>Step 10</b>	server/chassis/adapter/host-eth-if/usnic-config# <b>exit</b>	<p>Exits to host Ethernet interface command mode.</p>
<b>Step 11</b>	server/chassis/adapter/host-eth-if# <b>exit</b>	<p>Exits to adapter interface command mode.</p>

	Command or Action	Purpose
<b>Step 12</b>	server/chassis/adapter# <b>exit</b>	Exits to chassis interface command mode.
<b>Step 13</b>	server/chassis# <b>exit</b>	Exits to server interface command mode.
<b>Step 14</b>	server# <b>scope bios</b>	Enters Bios command mode.
<b>Step 15</b>	server/bios# <b>scope advanced</b>	Enters the advanced settings of BIOS command mode.
<b>Step 16</b>	server/bios/advanced# <b>set IntelVTD Enabled</b>	Enables the Intel Virtualization Technology.
<b>Step 17</b>	server/bios/advanced# <b>set ATS Enabled</b>	Enables the Intel VT-d Address Translation Services (ATS) support for the processor.
<b>Step 18</b>	server/bios/advanced# <b>set CoherencySupport Enabled</b>	Enables Intel VT-d coherency support for the processor.
<b>Step 19</b>	server /bios/advanced# <b>commit</b>	Commits the transaction to the system configuration.  <b>Note</b> The changes take effect when the server is rebooted.

## Example

This example shows how to configure Cisco usNIC properties:

```
Server # scope chassis
server /chassis # show adapter
server /chassis # scope adapter 2
server /chassis/adapter # scope host-eth-if eth0
server /chassis/adapter/host-eth-if # create usnic-config 0
server /chassis/adapter/host-eth-if/usnic-config *# set usnic-count 64
server /chassis/adapter/host-eth-if/usnic-config *# set cq-count 6
server /chassis/adapter/host-eth-if/usnic-config *# set rq-count 6
server /chassis/adapter/host-eth-if/usnic-config *# set tq-count 6
server /chassis/adapter/host-eth-if/usnic-config *# commit
Committed settings will take effect upon the next server reset
server /chassis/adapter/host-eth-if/usnic-config # exit
server /chassis/adapter/host-eth-if # exit
server /chassis/adapter # exit
server /chassis # exit
server # exit
server# scope bios
server /bios # scope advanced
server /bios/advanced # set IntelVTD Enabled
server /bios/advanced *# set ATS Enabled*
server /bios/advanced *# set CoherencySupport Enabled
server /bios/advanced *# commit
Changes to BIOS set-up parameters will require a reboot.
Do you want to reboot the system?[y|N]y
A system reboot has been initiated.
```

## Modifying a Cisco usNIC value using the Cisco IMC CLI

### Before you begin

You must log in to the Cisco IMC GUI with administrator privileges to perform this task.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	server# <b>scope chassis</b>	Enters chassis command mode.
<b>Step 2</b>	server/chassis# <b>scope adapter</b> <i>index</i>	Enters the command mode for the adapter card at the PCI slot number specified by <i>index</i> .  <b>Note</b> Make sure that the server is powered on before you attempt to view or change adapter settings. To view the index of the adapters configured on your server, use the <b>show adapter</b> command.
<b>Step 3</b>	server/chassis/adapter# <b>scope host-eth-if</b> { <b>eth0</b>   <b>eth1</b> }	Enters the command mode for the vNIC. Specify the Ethernet ID based on the number of vNICs that you have configured in your environment. For example, specify <b>eth0</b> if you configured only one vNIC.
<b>Step 4</b>	server/chassis/adapter/host-eth-if# <b>scope usnic-config</b> <b>0</b>	Enters the command mode for the usNIC. Make sure that you always set the index value as 0 to configure a Cisco usNIC.
<b>Step 5</b>	server/chassis/adapter/host-eth-if/usnic-config# <b>set usnic-count</b> <i>number of usNICs</i> .	Specifies the number of Cisco usNICs to create. Each MPI process running on the server requires a dedicated Cisco usNIC. Therefore, you might need to create up to 64 Cisco usNIC to sustain 64 MPI processes running simultaneously. We recommend that you create at least as many Cisco usNIC, per Cisco usNIC-enabled vNIC, as the number of physical cores on your server. For example, if you have 8 physical cores on your server, create 8 usNICs.
<b>Step 6</b>	server /chassis/adapter/host-eth-if /usnic-config# <b>commit</b>	Commits the transaction to the system configuration.  <b>Note</b> The changes take effect when the server is rebooted.
<b>Step 7</b>	server/chassis/adapter/host-eth-if/usnic-config# <b>exit</b>	Exits to host Ethernet interface command mode.

	Command or Action	Purpose
<b>Step 8</b>	server/chassis/adapter/host-eth-if# <b>exit</b>	Exits to adapter interface command mode.
<b>Step 9</b>	server/chassis/adapter# <b>exit</b>	Exits to chassis interface command mode.
<b>Step 10</b>	server/chassis# <b>exit</b>	Exits to server interface command mode.

### Example

This example shows how to configure Cisco usNIC properties:

```
server # scope chassis
server /chassis # show adapter
server /chassis # scope adapter 2
server /chassis/adapter # scope host-eth-if eth0
server /chassis/adapter/host-eth-if # scope usnic-config 0
server /chassis/adapter/host-eth-if/usnic-config # set usnic-count 32
server /chassis/adapter/host-eth-if/usnic-config # commit
Committed settings will take effect upon the next server reset
server /chassis/adapter/host-eth-if/usnic-config # exit
server /chassis/adapter/host-eth-if # exit
server /chassis/adapter # exit
server /chassis # exit
server # exit
```

## Viewing usNIC Properties

### Before you begin

You must log in with admin privileges to perform this task.

usNIC must be configured on a vNIC.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.
<b>Step 2</b>	Server /chassis # <b>scope adapter</b> <i>index</i>	Enters the command mode for the adapter card at the PCI slot number specified by <i>index</i> .  <b>Note</b> The server must be powered on before you can view or change adapter settings.
<b>Step 3</b>	Server /chassis/adapter # <b>scope host-eth-if</b> { <b>eth0</b>   <b>eth1</b>   <i>name</i> }	Enters the host Ethernet interface command mode for the specified vNIC.
<b>Step 4</b>	Server /chassis/adapter/host-eth-if # <b>show usnic-config</b> <i>index</i>	Displays the usNIC properties for a vNIC.



**Example**

This example displays the usNIC properties for a vNIC:

```
Server # scope chassis
Server /chassis # scope adapter 1
Server /chassis/adapter # scope host-eth-if eth0
Server /chassis/adapter/host-eth-if # show usnic-config 0
-----
Idx usNIC Count TQ Count RQ Count CQ Count TQ Ring Size RQ Ring Size Interrupt Count
-----
0 113 2 2 4 256 512 4
Server /chassis/adapter/host-eth-if #
```

## Deleting Cisco usNIC from a vNIC

**Before you begin**

You must log in to Cisco IMC CLI with admin privileges to perform this task.

**Procedure**

	Command or Action	Purpose
<b>Step 1</b>	server# <b>scope chassis</b>	Enters chassis command mode.
<b>Step 2</b>	server/chassis# <b>scope adapter</b> <i>index</i>	Enters the command mode for the adapter card at the PCI slot number specified by <i>index</i> .  <b>Note</b> Make sure that the server is powered on before you attempt to view or change adapter settings. To view the index of the adapters configured on you server, use the <b>show adapter</b> command.
<b>Step 3</b>	server/chassis/adapter# <b>scope host-eth-if</b> { <b>eth0</b>   <b>eth1</b> }	Enters the command mode for the vNIC. Specify the Ethernet ID based on the number of vNICs that you have configured in your environment. For example, specify <b>eth0</b> if you configured only one vNIC.
<b>Step 4</b>	Server/chassis/adapter/host-eth-if# <b>delete usnic-config 0</b>	Deletes the Cisco usNIC configuration for the vNIC.
<b>Step 5</b>	Server/chassis/adapter/host-eth-if# <b>commit</b>	Commits the transaction to the system configuration  <b>Note</b> The changes take effect when the server is rebooted.

**Example**

This example shows how to delete the Cisco usNIC configuration for a vNIC:

```
server # scope chassis
server/chassis # show adapter
server/chassis # scope adapter 1
server/chassis/adapter # scope host-eth-if eth0
server/chassis/adapter/host-eth-if # delete usnic-config 0
server/chassis/host-eth-if/iscsi-boot *# commit
New host-eth-if settings will take effect upon the next adapter reboot

server/chassis/host-eth-if/usnic-config #
```

## Configuring iSCSI Boot Capability

### Configuring iSCSI Boot Capability for vNICs

To configure the iSCSI boot capability on a vNIC:

- You must log in with admin privileges to perform this task.
- To configure a vNIC to boot a server remotely from an iSCSI storage target, you must enable the PXE boot option on the vNIC.




---

**Note** You can configure a maximum of 2 iSCSI vNICs for each host.

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### Configuring iSCSI Boot Capability on a vNIC

You can configure a maximum of 2 iSCSI vNICs for each host.

**Before you begin**

- To configure a vNIC to boot a server remotely from an iSCSI storage target, you must enable the PXE boot option on the vNIC.
- You must log in with admin privileges to perform this task.

**Procedure**

	Command or Action	Purpose
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.
<b>Step 2</b>	Server /chassis # <b>scope adapter</b> <i>index</i>	Enters the command mode for the adapter card at the PCI slot number specified by <i>index</i> .  <b>Note</b> The server must be powered on before you can view or change adapter settings.

	Command or Action	Purpose
<b>Step 3</b>	Server /chassis/adapter # <b>scope host-eth-if</b> {eth0   eth1   name}	Enters the host Ethernet interface command mode for the specified vNIC.
<b>Step 4</b>	Server /chassis/adapter/host-eth-if # <b>create iscsi-boot index</b>	Creates the iSCSI boot index for the vNIC. At this moment, only 0 is allowed as the index.
<b>Step 5</b>	Server /chassis/adapter/host-eth-if/iscsi-boot* # <b>create iscsi-target index</b>	Creates an iSCSI target for the vNIC. The value can either be 0 or 1.
<b>Step 6</b>	Server /chassis/adapter/host-eth-if/iscsi-boot* # <b>set dhcp-net-settings enabled</b>	Enables the DHCP network settings for the iSCSI boot.
<b>Step 7</b>	Server /chassis/adapter/host-eth-if/iscsi-boot* # <b>set initiator-name string</b>	Sets the initiator name. It cannot be more than 223 characters.
<b>Step 8</b>	Server /chassis/adapter/host-eth-if/iscsi-boot* # <b>set dhcp-iscsi-settings enabled</b>	Enables the DHCP iSCSI settings.
<b>Step 9</b>	Server /chassis/adapter/host-eth-if/iscsi-boot* # <b>commit</b>	Commits the transaction to the system configuration.  <b>Note</b> The changes will take effect upon the next server reboot.

### Example

This example shows how to configure the iSCSI boot capability for a vNIC:

```
Server # scope chassis
Server /chassis # scope adapter 1
Server /chassis/adapter # scope host-eth-if eth0
Server /chassis/adapter/host-eth-if # create iscsi-boot 0
Server /adapter/host-eth-if/iscsi-boot *# set dhcp-net-settings enabled
Server /adapter/host-eth-if/iscsi-boot *# set initiator-name iqn.2012-01.com.adser:abcde
Server /adapter/host-eth-if/iscsi-boot *# set dhcp-iscsi-settings enabled
Server /adapter/host-eth-if/iscsi-boot *# commit
```

New host-eth-if settings will take effect upon the next server reset  
Server /adapter/host-eth-if/iscsi-boot #

## Deleting an iSCSI Boot Configuration for a vNIC

### Before you begin

You must log in with admin privileges to perform this task.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.

	Command or Action	Purpose
<b>Step 2</b>	Server /chassis # <b>scope adapter</b> <i>index</i>	Enters the command mode for the adapter card at the PCI slot number specified by <i>index</i> .  <b>Note</b> The server must be powered on before you can view or change adapter settings.
<b>Step 3</b>	Server /chassis/adapter # <b>scope host-eth-if</b> { <b>eth0</b>   <b>eth1</b>   <i>name</i> }	Enters the host Ethernet interface command mode for the specified vNIC.
<b>Step 4</b>	Server /chassis/adapter/host-eth-if # <b>delete iscsi-boot 0</b>	Deletes the iSCSI boot capability for the vNIC.
<b>Step 5</b>	Server /chassis/adapter/host-eth-if* # <b>commit</b>	Commits the transaction to the system configuration  <b>Note</b> The changes will take effect upon the next server reboot.

### Example

This example shows how to delete the iSCSI boot capability for a vNIC:

```
Server # scope chassis
Server /chassis # scope adapter 1
Server /chassis/adapter # scope host-eth-if eth0
Server /chassis/adapter/host-eth-if # delete iscsi-boot 0
Server /adapter/host-eth-if/iscsi-boot *# commit
New host-eth-if settings will take effect upon the next server reset

Server /adapter/host-eth-if/iscsi-boot #
```

## Backing Up and Restoring the Adapter Configuration

### Exporting the Adapter Configuration

The adapter configuration can be exported as an XML file to a TFTP server.



#### Important

If any firmware or BIOS updates are in progress, do not export the adapter configuration until those tasks are complete.

#### Before you begin

A supported Virtual Interface Card (VIC) must be installed in the chassis and the server must be powered on. Obtain the TFTP server IP address.

**Procedure**

	<b>Command or Action</b>	<b>Purpose</b>
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.
<b>Step 2</b>	Server /chassis # <b>scope adapter</b> <i>index</i>	Enters the command mode for the adapter card at the PCI slot number specified by <i>index</i> .  <b>Note</b> The server must be powered on before you can view or change adapter settings.
<b>Step 3</b>	Server /chassis/adapter # <b>export-vnic protocol</b> <i>remote server IP address</i>	Starts the export operation. The adapter configuration file will be stored at the specified path and filename on the remote server at the specified IP address. The protocol can be one of the following:  <ul style="list-style-type: none"> <li>• TFTP</li> <li>• FTP</li> <li>• SFTP</li> <li>• SCP</li> <li>• HTTP</li> </ul> <b>Note</b> The Cisco UCS C-Series server now supports fingerprint confirmation of the server when you update firmware through a remote server. This option is available only if you choose SCP or SFTP as the remote server type.  If you chose SCP or SFTP as the remote server type while performing this action, a prompt with the message Server (RSA) key fingerprint is <server_finger_print_ID> Do you wish to continue? Click y or n depending on the authenticity of the server fingerprint.  The fingerprint is based on the host's public key and helps you to identify or verify the host you are connecting to.

**Example**

This example exports the configuration of adapter 1:

```

Server# scope chassis
Server /chassis # scope adapter 1
Server /chassis/adapter # export-vnic ftp 192.0.20.34 //test/dnld-ucs-k9-bundle.1.0.2h.bin
Server /chassis/adapter #

```

## Importing the Adapter Configuration



### Important

If any firmware or BIOS updates are in progress, do not import the adapter configuration until those tasks are complete.

### Before you begin

You must log in with admin privileges to perform this task.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.
<b>Step 2</b>	Server /chassis # <b>scope adapter</b> <i>index</i>	Enters the command mode for the adapter card at the PCI slot number specified by <i>index</i> .  <b>Note</b> The server must be powered on before you can view or change adapter settings.
<b>Step 3</b>	Server /chassis/adapter # <b>import-vnic</b> <i>ftp-ip-address path-and-filename</i>	Starts the import operation. The adapter downloads the configuration file from the specified path on the TFTP server at the specified IP address. The configuration will be installed during the next server reboot.

### Example

This example imports a configuration for the adapter in PCI slot 1:

```

Server# scope chassis
Server /chassis # scope adapter 1
Server /chassis/adapter # import-vnic 192.0.2.34 /ucs/backups/adapter4.xml
Import succeeded.
New VNIC adapter settings will take effect upon the next server reset.
Server /chassis/adapter #

```

### What to do next

Reboot the server to apply the imported configuration.

## Restoring Adapter Defaults

### Before you begin

You must log in with admin privileges to perform this task.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.
<b>Step 2</b>	Server /chassis # <b>adapter-reset-defaults index</b>	Restores factory default settings for the adapter at the PCI slot number specified by the <i>index</i> argument.  <b>Note</b> Resetting the adapter to default settings sets the port speed to 4 X 10 Gbps. Choose 40 Gbps as the port speed only if you are using a 40 Gbps switch.

### Example

This example restores the default configuration of the adapter in PCI slot 1:

```
Server# scope chassis
Server /chassis # adapter-reset-defaults 1
This operation will reset the adapter to factory default.
All your configuration will be lost.
Continue?[y|N] y
Server /chassis #
```

## Managing Adapter Firmware

### Adapter Firmware

A Cisco UCS C-Series network adapter contains the following firmware components:

- Adapter firmware —The main operating firmware, consisting of an active and a backup image, can be installed from the Cisco IMC GUI or CLI interface or from the Host Upgrade Utility (HUU). You can upload a firmware image from either a local file system or a TFTP server.
- Bootloader firmware—The bootloader firmware cannot be installed from the Cisco IMC. You can install this firmware using the Host Upgrade Utility.

# Installing Adapter Firmware



**Important** If any firmware or BIOS updates are in progress, do not install the adapter firmware until those tasks are complete.

## Before you begin

You must log in with admin privileges to perform this task.

## Procedure

	Command or Action	Purpose
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.
<b>Step 2</b>	Server /chassis # <b>update-adapter-fw</b> <i>tftp-ip-address path-and-filename</i> { <b>activate</b>   <b>no-activate</b> } [ <i>pci-slot</i> ] [ <i>pci-slot</i> ]	Downloads the specified adapter firmware file from the TFTP server, then installs the firmware as the backup image on one or two specified adapters or, if no adapter is specified, on all adapters. If the <b>activate</b> keyword is specified, the new firmware is activated after installation.
<b>Step 3</b>	(Optional) Server /chassis # <b>recover-adapter-update</b> [ <i>pci-slot</i> ] [ <i>pci-slot</i> ]	Clears an incomplete firmware update condition on one or two specified adapters or, if no adapter is specified, on all adapters.

## Example

This example begins an adapter firmware upgrade on the adapter in PCI slot 1:

```
Server# scope chassis
Server /chassis # update-adapter-fw 192.0.2.34 /ucs/adapters/adapter4.bin activate 1
Server /chassis #
```

## What to do next

To activate the new firmware, see [Activating Adapter Firmware, on page 49](#).



## Activating Adapter Firmware



- Important** While the activation is in progress, do not:
- Reset, power off, or shut down the server.
  - Reboot or reset Cisco IMC.
  - Activate any other firmware.
  - Export technical support or configuration data.

### Before you begin

You must log in with admin privileges to perform this task.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.
<b>Step 2</b>	Server /chassis # <b>activate-adapter-fw pci-slot {1   2}</b>	Activates adapter firmware image 1 or 2 on the adapter in the specified PCI slot.  <b>Note</b> The changes will take effect upon the next server reboot.

### Example

This example activates adapter firmware image 2 on the adapter in PCI slot 1:

```
Server# scope chassis
Server /chassis # activate-adapter-fw 1 2
Firmware image activation succeeded
Please reset the server to run the activated image
Server /chassis #
```

### What to do next

Reboot the server to apply the changes.

## Resetting the Adapter

### Before you begin

You must log in with admin privileges to perform this task.

**Procedure**

	<b>Command or Action</b>	<b>Purpose</b>
<b>Step 1</b>	Server# <b>scope chassis</b>	Enters the chassis command mode.
<b>Step 2</b>	Server/chassis # <b>adapter-reset <i>index</i></b>	Resets the adapter at the PCI slot number specified by the <i>index</i> argument.  <b>Note</b> Resetting the adapter also resets the host.

**Example**

This example resets the adapter in PCI slot 1:

```
Server# scope chassis
Server /chassis # adapter-reset 1
This operation will reset the adapter and the host if it is on.
You may lose connectivity to the CIMC and may have to log in again.
Continue?[y|N] y
Server /chassis #
```