Managing Network Adapters

This chapter includes the following sections:

Overview of the Cisco UCS C-Series Network Adapters

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

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

- Cisco UCS P81E Virtual Interface Card

Cisco UCS P81E Virtual Interface Card

The Cisco UCS P81E Virtual Interface Card is optimized for virtualized environments, for organizations that seek increased mobility in their physical environments, and for data centers that want reduced costs through NIC, HBA, cabling, and switch reduction and reduced management overhead. This Fibre Channel over Ethernet (FCoE) PCIe card offers the following benefits:

- Allows up to 2 virtual Fibre Channel and 16 virtual Ethernet adapters to be provisioned in virtualized or nonvirtualized environments using just-in-time provisioning, providing tremendous system flexibility and allowing consolidation of multiple physical adapters.

- Delivers uncompromising virtualization support, including hardware-based implementation of Cisco VN-Link technology and pass-through switching.
- Improves system security and manageability by providing visibility and portability of network polices and security all the way to the virtual machine.

The virtual interface card makes Cisco VN-Link connections to the parent fabric interconnects, which allows virtual links to connect virtual NICs in virtual machines to virtual interfaces in the interconnect. In a Cisco Unified Computing System environment, virtual links then can be managed, network profiles applied, and interfaces dynamically reprovisioned as virtual machines move between servers in the system.

Viewing Network Adapter Properties

Procedure

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

This example displays the properties of adapter 1:

```
Server# scope chassis
Server /chassis # show adapter
PCI Slot Product Name   Serial Number  Product ID     Vendor
-------- -------------- -------------- -------------- --------------------
1        UCS VIC P81E   QCI1424A540    N2XX-ACPCI01   Cisco Systems Inc

Server /chassis # show adapter 1 detail
PCI Slot 1:
    Product Name: UCS VIC P81E
    Serial Number: QCI1424A540
    Product ID: N2XX-ACPCI01
    Adapter Hardware Revision: 4
    Current FW Version: 1.2(0.33)
    NIV: Disabled
    FIP: Enabled
    Configuration Pending: no
    CIMC Management Enabled : no
    VID: V00
    Vendor: Cisco Systems Inc
    Description:
    FW Image 1 Version: 1.2(0.33)
    FW Image 1 State: RUNNING ACTIVATED
    FW Image 2 Version: 1.4(0.290)
    FW Image 2 State: BACKUP INACTIVATED
    FW Update Status: Idle
    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 Cisco UCS P81E Virtual Interface Card must be installed in the chassis and the server must be powered on.

Procedure

	Command or Action	Purpose
Step 1	Server# **scope chassis**	Enters the chassis command mode.
Step 2	Server /chassis # **show adapter**	(Optional) Displays the available adapter devices.
Step 3	Server /chassis # **scope adapter** *index*	Enters the command mode for the adapter card at the PCI slot number specified by *index*. **Note** The server must be powered on before you can view or change adapter settings.
Step 4	Server /chassis/adapter # **set fip-mode** {**disable** | **enable**}	Enables or disables FCoE Initialization Protocol (FIP) on the adapter card. FIP is enabled by default. **Note** Note: We recommend that you disable this option only when explicitly directed to do so by a technical support representative.
Step 5	Server /chassis/adapter # **set niv-mode** {**disable** | **enable**}	Enables or disables Network Interface Virtualization (NIV) on the adapter card. NIV is disabled by default. If NIV mode is enabled, vNICs: • Can be assigned to a specific channel • Can be associated with a port profile • Can fail over to another vNIC if there are communication problems
Step 6	Server /chassis/adapter # **commit**	Commits the transaction to the system configuration.

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 *# commit
Server /chassis/adapter #
```

Managing vHBAs

Guidelines for Managing vHBAs

When managing vHBAs, consider the following guidelines and restrictions:

- The Cisco UCS P81E Virtual Interface Card provides two vHBAs (fc0 and fc1). You cannot create additional vHBAs on this adapter card.
- When using the Cisco UCS P81E Virtual Interface Card in an FCoE application, you must associate the vHBA with the FCoE VLAN. Follow the instructions in to assign the VLAN.
- You must reset the adapter card after making configuration changes.

Viewing vHBA Properties

Procedure

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

This example displays the brief properties of all vHBAs 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: 10:00:00:22:BD:D6:5C:35
    World Wide Port Name: 20:00:00:22:BD:D6:5C:35
    FC SAN Boot: Disabled
    Persistent LUN Binding: Disabled
    Uplink Port: 0
    MAC Address: 00:22:BD:D6:5C:35
    CoS: 3
    VLAN: NONE
    Rate Limiting: OFF
    PCIe Device Order: ANY
    EDTOV: 2000
    RATOV: 10000
    Maximum Data Field Size: 2112
```

```
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
Step 1	Server# **scope chassis**	Enters the chassis command mode.
Step 2	Server /chassis # **show adapter**	(Optional) Displays the available adapter devices.
Step 3	Server /chassis # **scope adapter** *index*	Enters the command mode for the adapter card at the PCI slot number specified by *index*. **Note** The server must be powered on before you can view or change adapter settings.
Step 4	Server /chassis/adapter # **scope host-fc-if** {**fc0** | **fc1** | *name*}	Enters the host Fibre Channel interface command mode for the specified vHBA.
Step 5	Server /chassis/adapter/host-fc-if # **set wwnn** *wwnn*	Specifies a unique World Wide Node Name (WWNN) for the adapter in the form hh:hh:hh:hh:hh:hh:hh:hh.
Step 6	Server /chassis/adapter/host-fc-if # **set wwpn** *wwpn*	Specifies a unique World Wide Port Name (WWPN) for the adapter in the form hh:hh:hh:hh:hh:hh:hh:hh.
Step 7	Server /chassis/adapter/host-fc-if # **set boot** {**disable** | **enable**}	Enables or disables FC SAN boot. The default is disable.
Step 8	Server /chassis/adapter/host-fc-if # **set persistent-lun-binding** {**disable** | **enable**}	Enables or disables persistent LUN binding. The default is disable.
Step 9	Server /chassis/adapter/host-fc-if # **set mac-addr** *mac-addr*	Specifies a MAC address for the vHBA.
Step 10	Server /chassis/adapter/host-fc-if # **set vlan** {**none** | *vlan-id*}	Specifies the default VLAN for this vHBA. Valid VLAN numbers are 1 to 4094; the default is none.
Step 11	Server /chassis/adapter/host-fc-if # **set cos** *cos-value*	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.
Step 12	Server /chassis/adapter/host-fc-if # **set rate-limit** {**off** | *rate*}	Specifies a maximum data rate for the vHBA. The range is 1 to 10000 Mbps; the default is off.

	Command or Action	Purpose
Step 13	Server /chassis/adapter/host-fc-if # **set order** {**any** | *0-99*}	Specifies the relative order of this device for PCIe bus device number assignment; the default is any.
Step 14	Server /chassis/adapter/host-fc-if # **set error-detect-timeout** *msec*	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.
Step 15	Server /chassis/adapter/host-fc-if # **set resource-allocation-timeout** *msec*	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.
Step 16	Server /chassis/adapter/host-fc-if # **set max-field-size** *size*	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.
Step 17	Server /chassis/adapter/host-fc-if # **scope error-recovery**	Enters the Fibre Channel error recovery command mode.
Step 18	Server /chassis/adapter/host-fc-if/error-recovery # **set fcp-error-recovery** {**disable** | **enable**}	Enables or disables FCP Error Recovery. The default is disable.
Step 19	Server /chassis/adapter/host-fc-if/error-recovery # **set link-down-timeout** *msec*	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.
Step 20	Server /chassis/adapter/host-fc-if/error-recovery # **set port-down-io-retry-count** *count*	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.
Step 21	Server /chassis/adapter/host-fc-if/error-recovery # **set port-down-timeout** *msec*	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.
Step 22	Server /chassis/adapter/host-fc-if/error-recovery # **exit**	Exits to the host Fibre Channel interface command mode.
Step 23	Server /chassis/adapter/host-fc-if # **scope interrupt**	Enters the interrupt command mode.

	Command or Action	Purpose
Step 24	Server /chassis/adapter/host-fc-if/interrupt # **set interrupt-mode** {**intx** | **msi** | **msix**}	Specifies the Fibre Channel interrupt mode. The modes are as follows: • **intx** —Line-based interrupt (INTx) • **msi** —Message-Signaled Interrupt (MSI) • **msix** —Message Signaled Interrupts with the optional extension (MSI-X). This is the recommended and default option.
Step 25	Server /chassis/adapter/host-fc-if/interrupt # **exit**	Exits to the host Fibre Channel interface command mode.
Step 26	Server /chassis/adapter/host-fc-if # **scope port**	Enters the Fibre Channel port command mode.
Step 27	Server /chassis/adapter/host-fc-if/port # **set outstanding-io-count** *count*	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.
Step 28	Server /chassis/adapter/host-fc-if/port # **set max-target-luns** *count*	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.
Step 29	Server /chassis/adapter/host-fc-if/port # **exit**	Exits to the host Fibre Channel interface command mode.
Step 30	Server /chassis/adapter/host-fc-if # **scope port-f-logi**	Enters the Fibre Channel fabric login command mode.
Step 31	Server /chassis/adapter/host-fc-if/port-f-logi # **set flogi-retries** {**infinite** | *count*}	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 **infinite** ; the default is infinite retries.
Step 32	Server /chassis/adapter/host-fc-if/port-f-logi # **set flogi-timeout** *msec*	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.
Step 33	Server /chassis/adapter/host-fc-if/port-f-logi # **exit**	Exits to the host Fibre Channel interface command mode.
Step 34	Server /chassis/adapter/host-fc-if # **scope port-p-logi**	Enters the Fibre Channel port login command mode.

	Command or Action	Purpose
Step 35	Server /chassis/adapter/host-fc-if/port-p-logi # **set plogi-retries** *count*	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.
Step 36	Server /chassis/adapter/host-fc-if/port-p-logi # **set plogi-timeout** *msec*	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.
Step 37	Server /chassis/adapter/host-fc-if/port-p-logi # **exit**	Exits to the host Fibre Channel interface command mode.
Step 38	Server /chassis/adapter/host-fc-if # **scope scsi-io**	Enters the SCSI I/O command mode.
Step 39	Server /chassis/adapter/host-fc-if/scsi-io # **set cdb-wq-count** *count*	The number of command descriptor block (CDB) transmit queue resources to allocate. The range is 1 to 8; the default is 1.
Step 40	Server /chassis/adapter/host-fc-if/scsi-io # **set cdb-wq-ring-size** *size*	The number of descriptors in the command descriptor block (CDB) transmit queue. The range is 64 to 512; the default is 512.
Step 41	Server /chassis/adapter/host-fc-if/scsi-io # **exit**	Exits to the host Fibre Channel interface command mode.
Step 42	Server /chassis/adapter/host-fc-if # **scope trans-queue**	Enters the Fibre Channel transmit queue command mode.
Step 43	Server /chassis/adapter/host-fc-if/trans-queue # **set fc-wq-ring-size** *size*	The number of descriptors in the Fibre Channel transmit queue. The range is 64 to 128; the default is 64.
Step 44	Server /chassis/adapter/host-fc-if/trans-queue # **exit**	Exits to the host Fibre Channel interface command mode.
Step 45	Server /chassis/adapter/host-fc-if # **scope recv-queue**	Enters the Fibre Channel receive queue command mode.
Step 46	Server /chassis/adapter/host-fc-if/recv-queue # **set fc-rq-ring-size** *size*	The number of descriptors in the Fibre Channel receive queue. The range is 64 to 128; the default is 64.
Step 47	Server /chassis/adapter/host-fc-if/recv-queue # **exit**	Exits to the host Fibre Channel interface command mode.
Step 48	Server /chassis/adapter/host-fc-if # **commit**	Commits the transaction to the system configuration. **Note** The changes will take effect upon the next server reboot.

	Command or Action	Purpose

This example configures the properties of a vHBA:

```
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.

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

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
Step 1	Server# **scope chassis**	Enters the chassis command mode.
Step 2	Server /chassis # **scope adapter** *index*	Enters the command mode for the adapter card at the PCI slot number specified by *index*. **Note** The server must be powered on before you can view or change adapter settings.
Step 3	Server /chassis/adapter # **scope host-fc-if** {**fc0** | **fc1** | *name*}	Enters the host Fibre Channel interface command mode for the specified vHBA.
Step 4	Server /chassis/adapter/host-fc-if # **create-boot-entry** *wwpn lun-id*	Creates a boot table entry. • *wwpn* — The World Wide Port Name (WWPN) for the boot target in the form hh:hh:hh:hh:hh:hh:hh:hh. • *lun-id* —The LUN ID of the boot LUN. The range is 0 to 255.
Step 5	Server /chassis/adapter/host-fc-if # **commit**	Commits the transaction to the system configuration. **Note** The changes will take effect upon the next server reboot.

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
Step 1	Server# **scope chassis**	Enters the chassis command mode.
Step 2	Server /chassis # **scope adapter** *index*	Enters the command mode for the adapter card at the PCI slot number specified by *index*.

	Command or Action	Purpose
		Note The server must be powered on before you can view or change adapter settings.
Step 3	Server /chassis/adapter # **scope host-fc-if** {**fc0** | **fc1** | *name*}	Enters the host Fibre Channel interface command mode for the specified vHBA.
Step 4	Server /chassis/adapter/host-fc-if # **show boot**	Displays the boot table. From the Boot Table Entry field, locate the number of the entry to be deleted.
Step 5	Server /chassis/adapter/host-fc-if # **delete boot** *entry*	Deletes the boot table entry at the specified position in the table. The range of *entry* is 0 to 3. The change will take effect upon the next server reset.
Step 6	Server /chassis/adapter/host-fc-if # **commit**	Commits the transaction to the system configuration. **Note** The changes will take effect upon the next server reboot.

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

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

	Command or Action	Purpose
Step 4	Server /chassis/adapter/host-fc-if # **scope perbi**	Enters the persistent binding command mode for the vHBA.
Step 5	Server /chassis/adapter/host-fc-if/perbi # **set persistent-lun-binding disable**	Disables persistent binding for the vHBA.
Step 6	Server /chassis/adapter/host-fc-if/perbi # **commit**	Commits the transaction to the system configuration.

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
Step 1	Server# **scope chassis**	Enters the chassis command mode.
Step 2	Server /chassis # **scope adapter** *index*	Enters the command mode for the adapter card at the PCI slot number specified by *index*. **Note** The server must be powered on before you can view or change adapter settings.
Step 3	Server /chassis/adapter # **scope host-fc-if** {**fc0** | **fc1** | *name*}	Enters the host Fibre Channel interface command mode for the specified vHBA.
Step 4	Server /chassis/adapter/host-fc-if # **scope perbi**	Enters the persistent binding command mode for the vHBA.
Step 5	Server /chassis/adapter/host-fc-if/perbi # **rebuild**	Rebuilds the persistent binding table for the vHBA.

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 P81E Virtual Interface Card provides two default vNICs (eth0 and eth1). You can create up to 16 additional vNICs on this adapter card.
- You must reset the adapter card after making configuration changes.

Viewing vNIC Properties

Procedure

	Command or Action	Purpose
Step 1	Server# **scope chassis**	Enters the chassis command mode.
Step 2	Server /chassis # **scope adapter** *index*	Enters the command mode for the adapter card at the PCI slot number specified by *index*. **Note** The server must be powered on before you can view or change adapter settings.
Step 3	Server /chassis/adapter # **show host-eth-if** [**eth0** | **eth1** | *name*] [**detail**]	Displays properties of a single vNIC, if specified, or all vNICs.

This example displays the brief properties of all vNICs and the detailed properties of eth0:

```
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
-------- ---- ----------- ----------------- --- ---- --------
eth0     1500 0           00:22:BD:D6:5C:33 0   NONE Enabled
eth1     1500 1           00:22:BD:D6:5C:34 0   NONE Enabled

Server /chassis/adapter # show host-eth-if eth0 detail
Name eth0:
    MTU: 1500
    Uplink Port: 0
    MAC Address: 00:22:BD:D6:5C:33
    CoS: 0
    Trust Host CoS: disabled
    PCI Order: ANY
    VLAN: NONE
    VLAN Mode: TRUNK
    Rate Limiting: OFF
    PXE Boot: enabled
    Channel Number: N/A
    Port Profile: N/A
    Uplink Failover: N/A
    Uplink Failback Timeout: N/A


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
Step 1	Server# **scope chassis**	Enters the chassis command mode.
Step 2	Server /chassis # **show adapter**	(Optional) Displays the available adapter devices.
Step 3	Server /chassis # **scope adapter** *index*	Enters the command mode for the adapter card at the PCI slot number specified by *index*. **Note** The server must be powered on before you can view or change adapter settings.
Step 4	Server /chassis/adapter # **scope host-eth-if** {**eth0** | **eth1** | *name*}	Enters the host Ethernet interface command mode for the specified vNIC.
Step 5	Server /chassis/adapter/host-eth-if # **set mtu** *mtu-value*	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.
Step 6	Server /chassis/adapter/host-eth-if # **set uplink** {**0** | **1**}	Specifies the uplink port associated with this vNIC. All traffic for this vNIC goes through this uplink port.
Step 7	Server /chassis/adapter/host-eth-if # **set mac-addr** *mac-addr*	Specifies a MAC address for the vNIC in the form hh:hh:hh:hh:hh:hh or hhhh:hhhh:hhhh.
Step 8	Server /chassis/adapter/host-eth-if # **set cos** *cos-value*	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. **Note** If NIV is enabled, this setting is determined by the switch, and the command is ignored.
Step 9	Server /chassis/adapter/host-eth-if # **set trust-host-cos** {**disable** | **enable**}	Specifies whether the vNIC will trust host CoS or will remark packets. The behavior is as follows: • **disable** —Received packets are remarked with the configured CoS. This is the default. • **enable** —The existing CoS value of received packets (host CoS) is preserved.
Step 10	Server /chassis/adapter/host-eth-if # **set order** {**any** | *0-99*}	Specifies the relative order of this device for PCI bus device number assignment; the default is any.
Step 11	Server /chassis/adapter/host-eth-if # **set vlan** {**none** | *vlan-id*}	Specifies the default VLAN for this vNIC. Valid VLAN numbers are 1 to 4094; the default is none.

	Command or Action	Purpose
		Note If NIV is enabled, this setting is determined by the switch, and the command is ignored.
Step 12	Server /chassis/adapter/host-eth-if # **set vlan-mode** {**access** | **trunk**}	Specifies the VLAN mode for the vNIC. The modes are as follows: • **access** —The vNIC belongs to only one VLAN. • **trunk** —The vNIC can belong to more than one VLAN. This is the default. **Note** If NIV is enabled, this setting is determined by the switch, and the command is ignored.
Step 13	Server /chassis/adapter/host-eth-if # **set rate-limit** {**off** | *rate*}	Specifies a maximum data rate for the vNIC. The range is 1 to 10000 Mbps; the default is off. **Note** If NIV is enabled, this setting is determined by the switch, and the command is ignored.
Step 14	Server /chassis/adapter/host-eth-if # **set boot** {**disable** | **enable**}	Specifies whether the vNIC can be used to perform a PXE boot. The default is enable for the two default vNICs, and disable for user-created vNICs.
Step 15	Server /chassis/adapter/host-eth-if # **set channel-number** *number*	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.
Step 16	Server /chassis/adapter/host-eth-if # **set port-profile** *name*	If NIV mode is enabled for the adapter, select the port profile that should be associated with the vNIC. **Note** The *name* must be a port profile defined on the switch to which this server is connected.
Step 17	Server /chassis/adapter/host-eth-if # **set uplink-failover** {**disable** | **enable**}	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.
Step 18	Server /chassis/adapter/host-eth-if # **set uplink-failback-timeout** *seconds*	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 *seconds* between 0 and 600.
Step 19	Server /chassis/adapter/host-eth-if # **scope interrupt**	Enters the interrupt command mode.
Step 20	Server /chassis/adapter/host-eth-if/interrupt # **set interrupt-count** *count*	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.

	Command or Action	Purpose
Step 21	Server /chassis/adapter/host-eth-if/interrupt # **set coalescing-time** *usec*	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).
Step 22	Server /chassis/adapter/host-eth-if/interrupt # **set coalescing-type** {**idle** | **min**}	The coalescing types are as follows: • **idle** —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. • **min** —The system waits for the time specified in the coalescing time configuration before sending another interrupt event. This is the default.
Step 23	Server /chassis/adapter/host-eth-if/interrupt # **set interrupt-mode** {**intx** | **msi** | **msix**}	Specifies the Ethernet interrupt mode. The modes are as follows: • **intx** —Line-based interrupt (PCI INTx) • **msi** —Message-Signaled Interrupt (MSI) • **msix** —Message Signaled Interrupts with the optional extension (MSI-X). This is the recommended and default option.
Step 24	Server /chassis/adapter/host-eth-if/interrupt # **exit**	Exits to the host Ethernet interface command mode.
Step 25	Server /chassis/adapter/host-eth-if # **scope recv-queue**	Enters receive queue command mode.
Step 26	Server /chassis/adapter/host-eth-if/recv-queue # **set rq-count** *count*	The number of receive queue resources to allocate. The range is 1 to 256; the default is 4.
Step 27	Server /chassis/adapter/host-eth-if/recv-queue # **set rq-ring-size** *size*	The number of descriptors in the receive queue. The range is 64 to 4094; the default is 512.
Step 28	Server /chassis/adapter/host-eth-if/recv-queue # **exit**	Exits to the host Ethernet interface command mode.
Step 29	Server /chassis/adapter/host-eth-if # **scope trans-queue**	Enters transmit queue command mode.
Step 30	Server /chassis/adapter/host-eth-if/trans-queue # **set wq-count** *count*	The number of transmit queue resources to allocate. The range is 1 to 256; the default is 1.

	Command or Action	Purpose
Step 31	Server /chassis/adapter/host-eth-if/trans-queue # **set wq-ring-size** *size*	The number of descriptors in the transmit queue. The range is 64 to 4094; the default is 256.
Step 32	Server /chassis/adapter/host-eth-if/trans-queue # **exit**	Exits to the host Ethernet interface command mode.
Step 33	Server /chassis/adapter/host-eth-if # **scope comp-queue**	Enters completion queue command mode.
Step 34	Server /chassis/adapter/host-eth-if/comp-queue # **set cq-count** *count*	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.
Step 35	Server /chassis/adapter/host-eth-if/comp-queue # **exit**	Exits to the host Ethernet interface command mode.
Step 36	Server /chassis/adapter/host-eth-if # **scope offload**	Enters TCP offload command mode.
Step 37	Server /chassis/adapter/host-eth-if/offload # **set tcp-segment-offload** {**disable** | **enable**}	Enables or disables TCP Segmentation Offload as follows: • **disable** —The CPU segments large TCP packets. • **enable** —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. **Note** This option is also known as Large Send Offload (LSO).
Step 38	Server /chassis/adapter/host-eth-if/offload # **set tcp-rx-checksum-offload** {**disable** | **enable**}	Enables or disables TCP Receive Offload Checksum Validation as follows: • **disable** —The CPU validates all packet checksums. • **enable** —The CPU sends all packet checksums to the hardware for validation. This option may reduce CPU overhead. This is the default.
Step 39	Server /chassis/adapter/host-eth-if/offload # **set tcp-tx-checksum-offload** {**disable** | **enable**}	Enables or disables TCP Transmit Offload Checksum Validation as follows: • **disable** —The CPU validates all packet checksums.

	Command or Action	Purpose
		• **enable** —The CPU sends all packet checksums to the hardware for validation. This option may reduce CPU overhead. This is the default.
Step 40	Server /chassis/adapter/host-eth-if/offload # **set tcp-large-receive-offload** {**disable** | **enable**}	Enables or disables TCP Large Packet Receive Offload as follows: • **disable** —The CPU processes all large packets. • **enable** —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.
Step 41	Server /chassis/adapter/host-eth-if/offload # **exit**	Exits to the host Ethernet interface command mode.
Step 42	Server /chassis/adapter/host-eth-if # **scope rss**	Enters Receive-side Scaling (RSS) command mode.
Step 43	Server /chassis/adapter/host-eth-if/rss # **set rss** {**disable** | **enable**}	Enables or disables RSS, which allows the efficient distribution of network receive processing across multiple CPUs in multiprocessor systems. The default is enable for the two default vNICs, and disable for user-created vNICs.
Step 44	Server /chassis/adapter/host-eth-if/rss # **set rss-hash-ipv4** {**disable** | **enable**}	Enables or disables IPv4 RSS. The default is enable.
Step 45	Server /chassis/adapter/host-eth-if/rss # **set rss-hash-tcp-ipv4** {**disable** | **enable**}	Enables or disables TCP/IPv4 RSS. The default is enable.
Step 46	Server /chassis/adapter/host-eth-if/rss # **set rss-hash-ipv6** {**disable** | **enable**}	Enables or disables IPv6 RSS. The default is enable.
Step 47	Server /chassis/adapter/host-eth-if/rss # **set rss-hash-tcp-ipv6** {**disable** | **enable**}	Enables or disables TCP/IPv6 RSS. The default is enable.
Step 48	Server /chassis/adapter/host-eth-if/rss # **set rss-hash-ipv6-ex** {**disable** | **enable**}	Enables or disables IPv6 Extension RSS. The default is disable.
Step 49	Server /chassis/adapter/host-eth-if/rss # **set rss-hash-tcp-ipv6-ex** {**disable** | **enable**}	Enables or disables TCP/IPv6 Extension RSS. The default is disable.
Step 50	Server /chassis/adapter/host-eth-if/rss # **exit**	Exits to the host Ethernet interface command mode.
Step 51	Server /chassis/adapter/host-eth-if # **commit**	Commits the transaction to the system configuration. **Note** The changes will take effect upon the next server reboot.

	Command or Action	Purpose

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 *# 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.

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

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

This example deletes a vNIC on adapter 4:

```
Server# scope chassis
Server /chassis # scope adapter 4
Server /chassis/adapter # delete host-eth-if Vnic5
Server /chassis/adapter *# commit
Server /chassis/adapter #
```

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.

Before You Begin

A Cisco UCS P81E Virtual Interface Card must be installed in the chassis and the server must be powered on.

Obtain the TFTP server IP address.

Procedure

	Command or Action	Purpose
Step 1	Server# **scope chassis**	Enters the chassis command mode.
Step 2	Server /chassis # **scope adapter** *index*	Enters the command mode for the adapter card at the PCI slot number specified by *index*. **Note** The server must be powered on before you can view or change adapter settings.
Step 3	Server /chassis/adapter # **export-vnic** *tftp-ip-address path-and-filename*	Starts the export operation. The adapter configuration file will be stored at the specified path and filename on the TFTP server at the specified IP address.

This example exports the configuration of adapter 1:

```
Server# scope chassis
Server /chassis # scope adapter 1
Server /chassis/adapter # export-vnic 192.0.2.34 /ucs/backups/adapter4.dat
Server /chassis/adapter #
```

Importing the Adapter Configuration

Before You Begin

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

Procedure

	Command or Action	Purpose
Step 1	Server# **scope chassis**	Enters the chassis command mode.
Step 2	Server /chassis # **scope adapter** *index*	Enters the command mode for the adapter card at the PCI slot number specified by *index*. **Note** The server must be powered on before you can view or change adapter settings.
Step 3	Server /chassis/adapter # **import-vnic** *tftp-ip-address path-and-filename*	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.

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
Step 1	Server# **scope chassis**	Enters the chassis command mode.
Step 2	Server /chassis/adapter # **adapter-reset-defaults** *index*	Restores factory default settings for the adapter at the PCI slot number specified by the *index* argument. **Note** The changes will take effect upon the next server reboot.

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

```
Server# scope chassis
Server /chassis # adapter-reset-defaults 1
Factory default has been successfully restored.
Server /chassis #
```

What to Do Next

Reboot the server to apply the changes.

Managing Adapter Firmware

Installing Adapter Firmware

Before You Begin

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

Procedure

	Command or Action	Purpose
Step 1	Server# **scope chassis**	Enters the chassis command mode.
Step 2	Server /chassis # **update-adapter-fw** *tftp-ip-address path-and-filename* {**activate** | **no-activate**} [*pci-slot*] [*pci-slot*]	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

	Command or Action	Purpose
		is specified, on all adapters. If the **activate** keyword is specified, the new firmware is activated after installation.
Step 3	Server /chassis # **recover-adapter-update** [*pci-slot*] [*pci-slot*]	(Optional) Clears an incomplete firmware update condition on one or two specified adapters or, if no adapter is specified, on all adapters.

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 24.

Activating Adapter Firmware

Before You Begin

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

Procedure

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

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 suceeded
Please reset the server to run the activated image
Server /chassis #
```

What to Do Next

Reboot the server to apply the changes.