



# Managing Network Adapters

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## 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 policies 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 Adapter Properties

### Before You Begin

### 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> ] [ <i>detail</i> ]	Displays adapter properties. To display the properties of a single adapter, specify the PCI slot number as the <i>index</i> argument.

This example displays the properties of adapter 4:

```
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 # show adapter 1 detail
PCI Slot 1:
  Product Name: UCS VIC P81E
  Serial Number: QCI1417A0QK
  Product ID: N2XX-ACPCI01
  Adapter Hardware Revision: 4
  Current FW Version: 1.2(0.16)
  FIP: Enabled
  CIMC Management Enabled : no
  VID: V00
  Vendor: Cisco Systems Inc
  FW Image 1 Version: 1.2(0.10)
  FW Image 1 State: BACKUP INACTIVATED
  FW Image 2 Version: 1.2(0.16)
  FW Image 2 State: RUNNING ACTIVATED
  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 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
<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</b> <b>fip-mode {disable   enable}</b>	Enables or disables FCoE Initialization Protocol (FIP) on the adapter card. FIP is enabled by default.  <b>Note</b> Note: We recommend that you disable this option only when explicitly directed to do so by a technical support representative.
<b>Step 5</b>	Server /chassis/adapter # <b>commit</b>	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 [Modifying vHBA Properties, page 4](#) to assign the VLAN.

- You must reset the adapter card after making configuration changes.

## 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 <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> 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 [fc0   fc1] [detail]</b>	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
<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> }	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.
<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.
<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.
<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 10000 Mbps; the default is off.
<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

	Command or Action	Purpose
		allocated. The range is 5000 to 100000; the default is 10000 milliseconds.
<b>Step 16</b>	Server /chassis/adapter/host-fc-if # <b>set max-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>scope error-recovery</b>	Enters the Fibre Channel error recovery command mode.
<b>Step 18</b>	Server /chassis/adapter/host-fc-if/error-recovery # <b>set fcp-error-recovery</b> { <b>disable</b>   <b>enable</b> }	Enables or disables FCP Error Recovery. The default is disable.
<b>Step 19</b>	Server /chassis/adapter/host-fc-if/error-recovery # <b>set link-down-timeout</b> <i>msec</i>	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 20</b>	Server /chassis/adapter/host-fc-if/error-recovery # <b>set port-down-io-retry-count</b> <i>count</i>	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 21</b>	Server /chassis/adapter/host-fc-if/error-recovery # <b>set port-down-timeout</b> <i>msec</i>	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 22</b>	Server /chassis/adapter/host-fc-if/error-recovery # <b>exit</b>	Exits to the host Fibre Channel interface command mode.
<b>Step 23</b>	Server /chassis/adapter/host-fc-if # <b>scope interrupt</b>	Enters the interrupt command mode.
<b>Step 24</b>	Server /chassis/adapter/host-fc-if/interrupt # <b>set interrupt-mode</b> { <b>intx</b>   <b>msi</b>   <b>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 (MSI-X). This is the recommended and default option.</li> </ul>

	Command or Action	Purpose
<b>Step 25</b>	Server /chassis/adapter/host-fc-if/interrupt # <b>exit</b>	Exits to the host Fibre Channel interface command mode.
<b>Step 26</b>	Server /chassis/adapter/host-fc-if # <b>scope port</b>	Enters the Fibre Channel port command mode.
<b>Step 27</b>	Server /chassis/adapter/host-fc-if/port # <b>set outstanding-io-count</b> <i>count</i>	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.
<b>Step 28</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 29</b>	Server /chassis/adapter/host-fc-if/port # <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-f-logs</b>	Enters the Fibre Channel fabric login command mode.
<b>Step 31</b>	Server /chassis/adapter/host-fc-if/port-f-logs # <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 32</b>	Server /chassis/adapter/host-fc-if/port-f-logs # <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 33</b>	Server /chassis/adapter/host-fc-if/port-f-logs # <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-p-logs</b>	Enters the Fibre Channel port login command mode.
<b>Step 35</b>	Server /chassis/adapter/host-fc-if/port-p-logs # <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 36</b>	Server /chassis/adapter/host-fc-if/port-p-logs # <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.

	Command or Action	Purpose
<b>Step 37</b>	Server /chassis/adapter/host-fc-if/port-p-logs # <b>exit</b>	Exits to the host Fibre Channel interface command mode.
<b>Step 38</b>	Server /chassis/adapter/host-fc-if # <b>scope scsi-io</b>	Enters the SCSI I/O command mode.
<b>Step 39</b>	Server /chassis/adapter/host-fc-if/scsi-io # <b>set cdb-wq-count count</b>	The number of command descriptor block (CDB) transmit queue resources to allocate. The range is 1 to 8; the default is 1.
<b>Step 40</b>	Server /chassis/adapter/host-fc-if/scsi-io # <b>set cdb-wq-ring-size size</b>	The number of descriptors in the command descriptor block (CDB) transmit queue. The range is 64 to 512; the default is 512.
<b>Step 41</b>	Server /chassis/adapter/host-fc-if/scsi-io # <b>exit</b>	Exits to the host Fibre Channel interface command mode.
<b>Step 42</b>	Server /chassis/adapter/host-fc-if # <b>scope trans-queue</b>	Enters the Fibre Channel transmit queue command mode.
<b>Step 43</b>	Server /chassis/adapter/host-fc-if/trans-queue # <b>set fc-wq-ring-size size</b>	The number of descriptors in the Fibre Channel transmit queue. The range is 64 to 128; the default is 64.
<b>Step 44</b>	Server /chassis/adapter/host-fc-if/trans-queue # <b>exit</b>	Exits to the host Fibre Channel interface command mode.
<b>Step 45</b>	Server /chassis/adapter/host-fc-if # <b>scope rcv-queue</b>	Enters the Fibre Channel receive queue command mode.
<b>Step 46</b>	Server /chassis/adapter/host-fc-if/rcv-queue # <b>set fc-rq-ring-size size</b>	The number of descriptors in the Fibre Channel receive queue. The range is 64 to 128; the default is 64.
<b>Step 47</b>	Server /chassis/adapter/host-fc-if/rcv-queue # <b>exit</b>	Exits to the host Fibre Channel interface command mode.
<b>Step 48</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.

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 fcl
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
<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> }	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.

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.
<b>Step 3</b>	Server /chassis/adapter # <b>scope host-fc-if</b> { <b>fc0</b>   <b>fc1</b> }	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.  <b>Note</b> 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
<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> }	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.

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 index</b>	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}	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.

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 index</b>	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> {fc0   fc1}	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.

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 index</b>	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 {fc0   fc1}</b>	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>rebuild</b>	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
<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-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.

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:
    PCI Order: ANY
    VLAN: NONE
    VLAN Mode: TRUNK
    Rate Limiting: OFF
    PXE Boot: Enabled

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> .

	Command or Action	Purpose
		<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> {eth0   eth1   name}	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> 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.
<b>Step 6</b>	Server /chassis/adapter/host-eth-if # <b>set uplink</b> {0   1}	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> mac-addr	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> 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.
<b>Step 9</b>	Server /chassis/adapter/host-eth-if # <b>set trust-host-cos</b> {disable   enable}	Specifies whether the vNIC will trust host CoS or will remark packets. The behavior is as follows: <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> {any   0-99}	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> {none   vlan-id}	Specifies the default VLAN for this vNIC. Valid VLAN numbers are 1 to 4094; the default is none.
<b>Step 12</b>	Server /chassis/adapter/host-eth-if # <b>set vlan-mode</b> {access   trunk}	Specifies the VLAN mode for the vNIC. The modes are as follows: <ul style="list-style-type: none"> <li>• <b>access</b>—The vNIC belongs to only one VLAN.</li> <li>• <b>trunk</b>—The vNIC can belong to more than one VLAN. This is the default.</li> </ul>
<b>Step 13</b>	Server /chassis/adapter/host-eth-if # <b>set rate-limit</b> {off   rate}	Specifies a maximum data rate for the vNIC. The range is 1 to 10000 Mbps; the default is off.
<b>Step 14</b>	Server /chassis/adapter/host-eth-if # <b>set boot</b> {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.
<b>Step 15</b>	Server /chassis/adapter/host-eth-if # <b>scope interrupt</b>	Enters the interrupt command mode.

	Command or Action	Purpose
<b>Step 16</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 17</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 18</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 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 19</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 20</b>	Server /chassis/adapter/host-eth-if/interrupt # <b>exit</b>	Exits to the host Ethernet interface command mode.
<b>Step 21</b>	Server /chassis/adapter/host-eth-if # <b>scope rcv-queue</b>	Enters receive queue command mode.
<b>Step 22</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 23</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.
<b>Step 24</b>	Server /chassis/adapter/host-eth-if/rcv-queue # <b>exit</b>	Exits to the host Ethernet interface command mode.
<b>Step 25</b>	Server /chassis/adapter/host-eth-if # <b>scope trans-queue</b>	Enters transmit queue command mode.



	Command or Action	Purpose
<b>Step 26</b>	Server /chassis/adapter/host-eth-if/trans-queue # <b>set wq-count</b> <i>count</i>	The number of transmit queue resources to allocate. The range is 1 to 256; the default is 1.
<b>Step 27</b>	Server /chassis/adapter/host-eth-if/trans-queue # <b>set wq-ring-size</b> <i>size</i>	The number of descriptors in the transmit queue. The range is 64 to 4094; the default is 256.
<b>Step 28</b>	Server /chassis/adapter/host-eth-if/trans-queue # <b>exit</b>	Exits to the host Ethernet interface command mode.
<b>Step 29</b>	Server /chassis/adapter/host-eth-if # <b>scope comp-queue</b>	Enters completion queue command mode.
<b>Step 30</b>	Server /chassis/adapter/host-eth-if/comp-queue # <b>set cq-count</b> <i>count</i>	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 31</b>	Server /chassis/adapter/host-eth-if/comp-queue # <b>exit</b>	Exits to the host Ethernet interface command mode.
<b>Step 32</b>	Server /chassis/adapter/host-eth-if # <b>scope offload</b>	Enters TCP offload command mode.
<b>Step 33</b>	Server /chassis/adapter/host-eth-if/offload # <b>set tcp-segment-offload</b> { <b>disable</b>   <b>enable</b> }	Enables or disables TCP Segmentation Offload as follows: <ul style="list-style-type: none"> <li>• <b>disable</b>—The CPU segments large TCP packets.</li> <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 34</b>	Server /chassis/adapter/host-eth-if/offload # <b>set tcp-rx-checksum-offload</b> { <b>disable</b>   <b>enable</b> }	Enables or disables TCP Receive Offload Checksum Validation as follows: <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>

	Command or Action	Purpose
<b>Step 35</b>	Server /chassis/adapter/host-eth-if/offload # <b>set tcp-tx-checksum-offload {disable   enable}</b>	Enables or disables TCP Transmit Offload Checksum Validation as follows: <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 36</b>	Server /chassis/adapter/host-eth-if/offload # <b>set tcp-large-receive-offload {disable   enable}</b>	Enables or disables TCP Large Packet Receive Offload as follows: <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 37</b>	Server /chassis/adapter/host-eth-if/offload # <b>exit</b>	Exits to the host Ethernet interface command mode.
<b>Step 38</b>	Server /chassis/adapter/host-eth-if # <b>scope rss</b>	Enters Receive-side Scaling (RSS) command mode.
<b>Step 39</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 multiprocessor systems. The default is enable for the two default vNICs, and disable for user-created vNICs.
<b>Step 40</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 41</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 42</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 43</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 44</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 45</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.

	Command or Action	Purpose
<b>Step 46</b>	Server /chassis/adapter/host-eth-if/rss # <b>exit</b>	Exits to the host Ethernet interface command mode.
<b>Step 47</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.

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
<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</b> <b>host-eth-if name</b>	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>	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.

	Command or Action	Purpose
--	-------------------	---------

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</b> <b>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.

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
<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</b> <i>tftp-ip-address</i> <i>path-and-filename</i>	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
<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>tftp-ip-address</i> <i>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.

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/adapter # <b>adapter-reset-defaults</b> <i>index</i>	Restores factory default settings for the adapter at the PCI slot number specified by the <i>index</i> argument.  <b>Note</b> 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
<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.

	Command or Action	Purpose
<b>Step 3</b>	Server /chassis # <b>recover-adapter-update</b> [ <i>pci-slot</i> ] [ <i>pci-slot</i> ]	(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*.

## Activating Adapter Firmware

**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</b> <i>pci-slot</i> { <b>1</b>   <b>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.

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.

