Preface

This preface describes the audience, organization, and conventions of the *Cisco Nexus 5000 Series NX-OS Adapter FEX Operations Guide, Release 5.1(3)N1(1)*. It also provides information on how to obtain related documentation.

This chapter includes the following topics:

- Audience, page 3
- Document Conventions, page 3
- Related Documentation, page 5
- Obtaining Documentation and Submitting a Service Request, page 5

Audience

This publication is for experienced network administrators who configure and maintain Cisco NX-OS on Cisco Nexus 5000 Platform switches and Cisco Nexus 5500 Platform switches.

Document Conventions

Command descriptions use the following conventions:

Convention	Description
bold	Bold text indicates the commands and keywords that you enter literally as shown.
Italic	Italic text indicates arguments for which the user supplies the values.
[x]	Square brackets enclose an optional element(keyword or argument).
[x | y]	Square brackets enclosing keywords or arguments separated by a vertical bar indicate an optional choice.
{x | y}	Braces enclosing keywords or arguments separated by a vertical bar indicate a required choice.

[x {y	z}]	Nested set of square brackets or braces indicate optional or required choices within optional or required elements. Braces and a vertical bar within square brackets indicate a required choice within an optional element.
variable	Indicates a variable for which you supply values, in context where italics cannot be used.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.

Screen examples use the following conventions::

Convention	Description
screen font	Terminal sessions and information the switch displays are in screen font.
boldface screen font	Information you must enter is in boldface screen font.
italic screen font	Arguments for which you supply values are in italic screen font.
< >	Nonprinting characters, such as passwords, are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

Note   Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the manual.

Caution   Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

Send documentation comments to n5kdocfeedback@cisco.com

Related Documentation

Documentation for Cisco Nexus 5000 Series Switches and Cisco Nexus 2000 Series Fabric Extenders is available at the following URL:

http://www.cisco.com/en/US/products/ps9670/tsd_products_support_series_home.html

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, using the Cisco Bug Search Tool (BST), submitting a service request, and gathering additional information, see *What's New in Cisco Product Documentation* at: http://www.cisco.com/c/en/us/td/docs/general/whatsnew/whatsnew.html.

Subscribe to *What's New in Cisco Product Documentation*, which lists all new and revised Cisco technical documentation as an RSS feed and delivers content directly to your desktop using a reader application. The RSS feeds are a free service.

C H A P T E R **2**

Using the Adapter-FEX

This chapter describes how to configure and use the Cisco Nexus 5000 Series Adapter-FEX.

This chapter includes the following sections:

Information about the Adapter-FEX

The Cisco Nexus 5000 Series platform introduces virtualization of interfaces as part of the Fibre Channel over Ethernet (FCoE) deployment where a single Ethernet interface is virtualized into a Fibre Channel interface and an Ethernet interface. This consolidation allows both Ethernet and Fibre Channel traffic to use the same link.

The Cisco Fabric Extender Link (FEXLink) architecture enhanced this concept by virtualizing multiple Cisco Nexus 2000 Series Fabric Extender (FEX) host/server interfaces over a few fabric uplinks that connect to the parent device (Cisco Nexus 5000 Series device with or without a Cisco Nexus 2000 Series Fabric Extender).

The Cisco NX-OS Adapter-FEX provides the advantages of the FEXLink architecture with that of a server I/O virtualization to create multiple virtual interfaces over a single Ethernet interface to allow the deployment of a dual port NIC on the server and to configure more than two virtual interfaces that the server sees as a regular Ethernet interface. This approach reduces the power and cooling costs and number of network ports required in the data center.

Note Any IP addresses that are used in this guide are not intended to be actual addresses. Any examples, configuration sample output, and figures included in this guide are shown for illustrative purposes only.

Virtual Ethernet Interfaces, vNICs, and Channel Number

The Adapter-FEX uses a mechanism to divide a single physical link into multiple virtual links or channels see Figure 2-1. Each channel is identified by a unique channel number and its scope is limited to the physical link.

The physical link connects a port on a server network adapter with an Ethernet port on the device, which allows the channel to connect a virtual network interface card (vNIC) on the server with a virtual Ethernet interface on the device.

Packets on each channel are tagged with a virtual network tag (VNTag) with a specific source virtual interface identifier (VIF). The VIF allows the receiver to identify which channel that the source transmit is using, to the packet.

Figure 2-1   Multiple Virtual Links
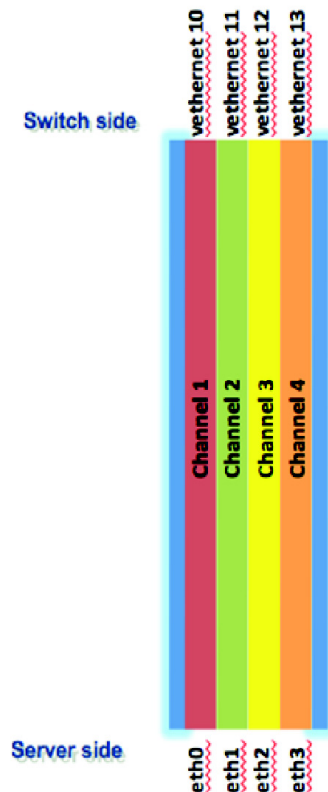
Supported Platforms

At the access layer, the Adapter-FEX requires a FEX-enabled adapter on a server that connects to a parent device that supports virtualization of interfaces. The Adapter-FEX is supported on the following platforms:

- The Cisco Unified Computing System (UCS) platform supports Adapter-FEX between UCS servers and the UCS Fabric Interconnect.

- The Adapter-FEX is supported on the Cisco Nexus 5500 Series platform and on the Cisco Nexus 2200 Fabric Extender that is connected to a Cisco Nexus 5500 Series parent device. This implementation works on a variety of FEX-capable adapters, including the Cisco UCS P81E virtual interface card (VIC) adapter for the UCS C-Series platform and third party adapters such as the Broadcom BCM57810 Convergence Network Interface Card, that implement the virtual network tag (VNTag) technology.

Note For information on the Cisco UCS P81E VIC, see to the Cisco UCS P81E VIC documentation in the *Cisco UCS C-Series Servers Integrated Management Controller CLI Configuration Guide*.

Note For information on the Broadcom BCM57810 Convergence NIC, see your source for Broadcom Corp. documentation.

Cisco Nexus 5500 Adapter-FEX Topologies

This section lists the topologies that are supported and used in the examples described in this document.

Switch with Adapter-FEX Topologies

Figure 2-2 shows the topology of a server network adapter that is connected to a Cisco Nexus 5500 Series device.

Figure 2-2   Adapter-FEX-Enabled Server Connected to a Cisco Nexus 5000 Series Device
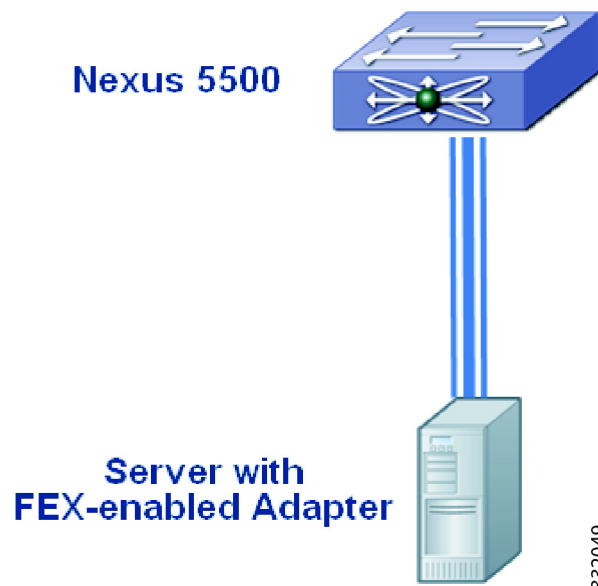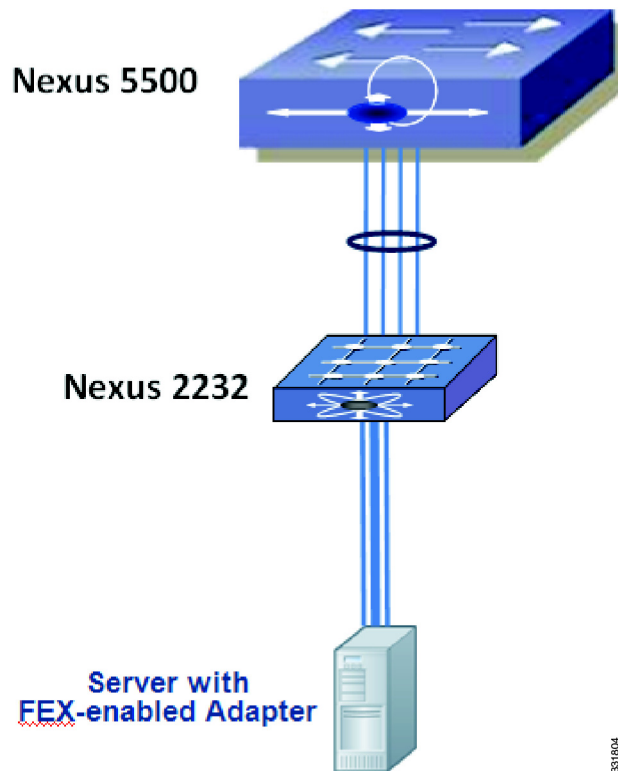

Figure 2-3 shows the topology of a server network adapter connected to a Cisco Nexus 2000 Series Fabric Extender that is connected to a parent Cisco Nexus 5500 Series device.

Figure 2-3   Adapter-FEX-Enabled Server Connected to a Cisco Nexus 2000 Series Fabric Extender

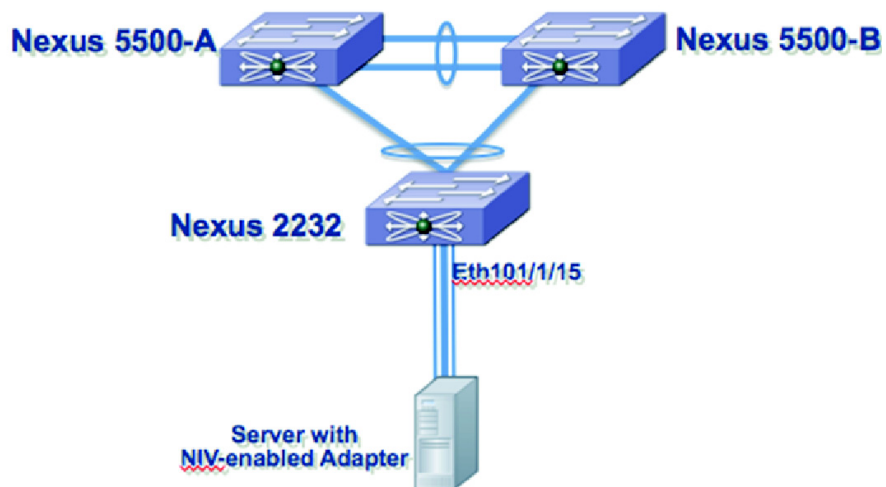## Dual-Homed FEX Topologies

Figure 2-4 shows a server network adapter connected to a Cisco Nexus 2000 Series Fabric Extender that is connected to two peer Cisco Nexus 5500 Series devices in a virtual port channel (vPC) topology.

Figure 2-4   Adapter-FEX-Enabled Server Connected to a Dual-Homed FEX in a vPC Topology

Active-Standby Adapter-FEX Topologies

Adapters that support active-standby uplinks support the following additional topologies.

Note   The Cisco UCS P81E Virtual Interface Card is the only adapter to currently support an active-standby uplink that allows each virtual NIC (vNIC) to choose one of the two uplinks as the active uplink. The other uplink can be configured as a standby uplink. For more information, see the Cisco UCS P81E Virtual Interface Card document at
http://www.cisco.com/en/US/prod/collateral/ps10265/ps10493/data_sheet_c78-558230.html

Note   We recommend that you use the active-standby topologies (one active uplink one standby uplink). With some adapters, you can choose the active and standby uplinks on a per-vNIC basis. Each uplink will be the active uplink for the specified vNIC and standby for the other vNICs.

Figure 2-5 shows a server network adapter connected to the Cisco Nexus 5500-A device by an active uplink interface and to the Cisco Nexus 5500-B device by a standby uplink interface.

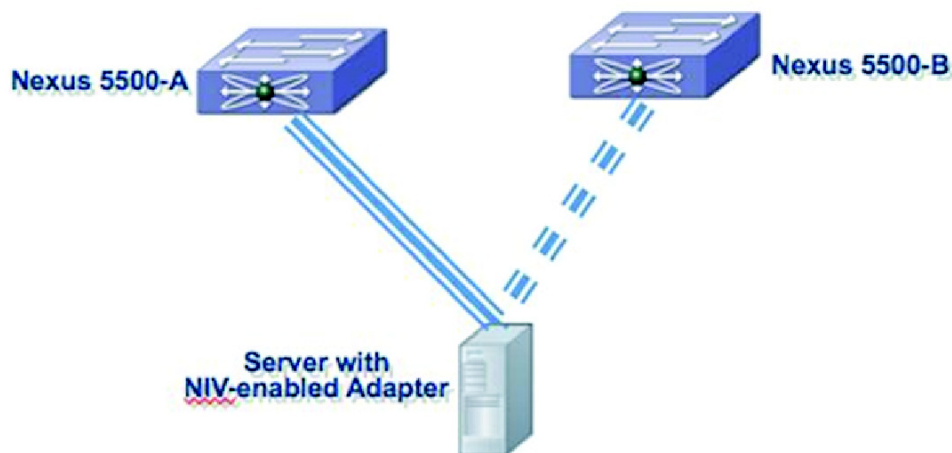*Figure 2-5   Adapter-FEX-Enabled Server with Active-standby Uplinks*


Figure 2-6 shows a server network adapter connected to dual-homed Cisco Nexus 2000 Series Fabric Extenders that are connected to two peer Cisco Nexus 5500 Series devices in a virtual port channel (vPC) topology. The active uplink interface of the adapter is connected to Ethernet 100/1/15 on the Fabric Extender and the standby uplink interface to Ethernet 101/1/15 on the second Fabric Extender.

Figure 2-6   Adapter-FEX-Enabled Server with Active-Standby Uplinks to Dual-Homed FEXs
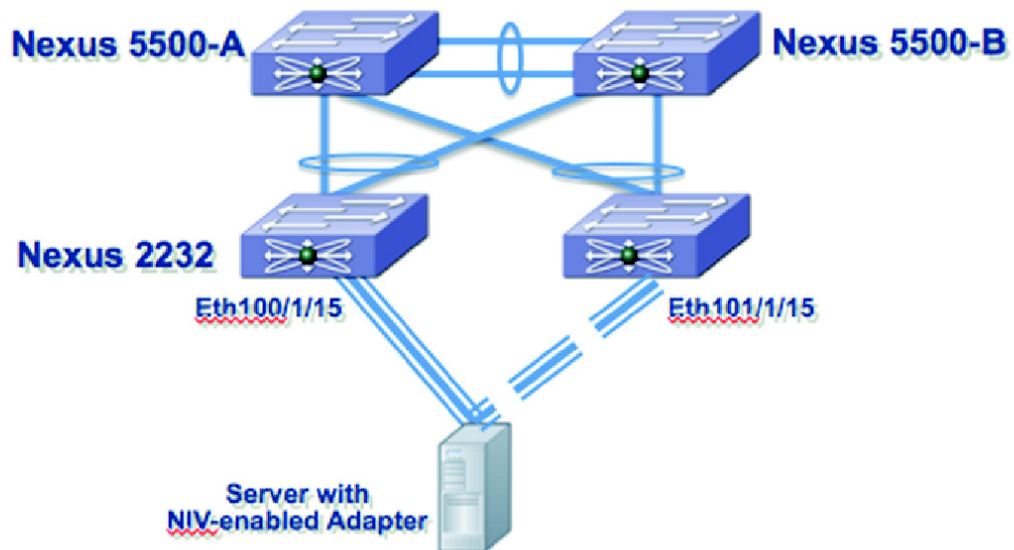
Troubleshooting

This section explains troubleshooting procedures.

Removing a Server with a Server Network Adapter

When a server that is connected to the server network adapter is connected to a Cisco Nexus 5500 Series device, virtual Ethernet interfaces are created to support the server network adapter. When you disconnect or power down the server, virtual Ethernet interfaces are set to the down state and remain on the device until they are manually deleted.

Before you permanently disconnect the server, make sure that you delete all virtual Ethernet interfaces from the device using the **no interface virtual Ethernet** command and save the running system configuration using the **copy running-config startup-config** command.

Relocating a Server to a Different Physical Interface

When a server that is connected to the server network adapter is relocated from one physical interface on a Cisco Nexus 5500 Series device to another interface on the same device, new virtual Ethernet interfaces are created and are bound to the new physical interface. The original virtual Ethernet interfaces that were bound to the original physical interface exist until they are deleted. Make sure that you delete the original virtual Ethernet interfaces from the device using the **no interface virtual Ethernet** command and save the running system configuration using the **copy running-config startup-config** command.

When a new server is connected to the physical interface that was originally connected to the relocated server that has a server network adapter (the original virtual Ethernet interfaces that were bound to this physical interface exist), the virtual Ethernet interfaces are reused. This topology leads to a configuration conflict on the device and server network adapter (see the "Configuration Conflicts Between the Switch and Server Network Adapter" section on page 2-16).

In a vPC topology, virtual Ethernet numbers for a vNIC must be identical on both vPC peers. Moving a server that has a server network adapter from one physical interface to another interface on one of the vPC peers without first deleting the virtual Ethernet interfaces on that peer device results in new virtual Ethernet interfaces with different numbers. This results in having the two vPC peers that are not synchronized and a virtual Ethernet interface not getting created. You should delete the original virtual Ethernet interfaces on the peer device before you connect the server to the new physical interface.

Procedure:

Step 1   Shut down the original physical interface on the device.

```
switch# configure terminal
switch(config)# interface ethernet 1
switch(config-if)# shutdown
switch(config-if)# exit
switch(config) #
```

Step 2   Delete all virtual Ethernet interfaces associated with the server.

```
switch(config)# no interface vethernet 1
switch(config)#
```

Repeat this step to delete all virtual Ethernet interfaces on the server.

Step 3   Remove the VNTag configuration from the physical interface on the vPC peer devices.

```
vPC Peer A:
switch# configure terminal
switch(config)# interface ethernet 1
switch(config-if)# no switchport mode vntag
switch(config-if)#

vPC Peer B:
switch# configure terminal
switch(config)# interface ethernet 1
switch(config-if)# no switchport mode vntag
switch(config-if)#
```

Step 4   Unplug the server from both vPC peer devices.

Step 5   Connect the server to the new physical interface.

Step 6   Configure the server network adapter for the new device.

Changes to Port Profiles

When a new port profile for a virtual Ethernet interface is added on the device, it is immediately passed to all connected server network adapters and becomes available on those adapters. Similarly, when a port profile is removed, its name is withdrawn from every connected server network adapter.

Since only port profile names are passed to the server network adapter, changing the configuration within a port profile does not pass the configuration changes to the server network adapter.

When you use a newly added port profile, such as associating it with a new or existing vNIC, you might need to reboot the server. For more information, see the documentation for your specific adapter.

When you delete a port profile, all virtual Ethernet interfaces associated with the port profile are set to the administratively down state.

Relocating a Server Network Adapter to a Different Server

When a server network adapter is moved from one server to another, the server network adapter configuration, such as the information about vNICs, moves with the server network adapter. The configuration is saved on the server network adapter.

Configuration Examples

This section describes the configuration examples:

Servers with Server Network Adapter Topology Configuration Examples

This section describes how to configure a server with a server network adapter for the Adapter-FEX.

Configuring the Adapter-FEX on the Device

You must enable the Adapter-FEX feature on each Cisco Nexus 5500 series device that is connected to the server with a server network adapter. You must also configure the device to support Adapter-FEX.

Procedure:

Step 1   Install the Cisco virtual machine feature set on the device.

```
switch# configure terminal
switch(config)# install feature-set virtualization
switch(config)#
```

Step 2   Enables the Cisco Virtual Machine features on the device.

```
switch(config)# feature-set virtualization
switch(config)#
```

Step 3   Enable the automatic creation of virtual Ethernet interfaces on the device.

```
switch(config)# virtual Ethernet auto-create
switch(config)#
```

The Adapter-FEX feature is enabled on the device.

Step 4   Create port profiles of type virtual Ethernet to be associated with the vNICs of the adapter. For example, if four vNICs (2 data, 1 management, 1 backup) are required on the server, create one port profile for each type of vNIC (user_data, user_management and user_backup). Configure relevant properties and policies in the port profile, such as the VLAN, bandwidth, QoS, and ACLs.

This example shows how to create and configure a port profile, user_data, on the device:

```
switch(config)# port profile type virtual Ethernet user_data
switch(config-port-prof)# switchport trunk allowed vlan 2-100
switch(config-port-prof)# switchport trunk native vlan 2
switch(config-port-prof)# switchport mode trunk
switch(config-port-prof)# state enabled
switch(config-port-prof)# exit
switch(config)#
```

This example shows how to create and configure a port profile, user_management, on the device:

```
switch(config)# port profile type virtual Ethernet user_management
switch(config-port-prof)# switchport access vlan 1
switch(config-port-prof)# state enabled
switch(config-port-prof)# exit
switch(config)#
```

This example shows how to create and configure a port profile, user_backup, on the device:

```
switch(config)# port profile type virtual Ethernet user_backup
switch(config-port-prof)# switchport mode trunk
switch(config-port-prof)# switchport trunk allowed vlan 2-100
switch(config-port-prof)# switchport trunk native vlan 2
switch(config-port-prof)# mac port access-group mac_acl1
switch(config-port-prof)# ip port access-group ip_acl1 in
switch(config-port-prof)# ipv6 port traffic-filter ipv6_acl1 in
switch(config-port-prof)# state enabled
switch(config-port-prof)# exit
switch(config)#
```

Step 5   On the Ethernet interfaces of the device that are connected to the uplink interfaces of the adapter, configure the port as a VNTag port.

```
switch(config)# interface ethernet1/5
switch(config-if)# description ucs_vic2/0
switch(config-if)# switchport mode vntag
switch(config-if)#
```

The device is configured to support Adapter-FEX. Connect the uplink interfaces of the adapter from the server to the device or Fabric Extender.

This example shows a Cisco Nexus 5500 series configuration:

```
install feature-set virtualization
feature-set virtualization
vethernet auto-create

port-profile type vethernet user_data
    switchport trunk allowed vlan 2-100
    switchport trunk native vlan 2
    switchport mode trunk
    state enabled

port-profile type vethernet user_management
    switchport access vlan 1
    state enabled

port-profile type vethernet user_backup
    switchport mode trunk
    switchport trunk allowed vlan 2-100
    switchport trunk native vlan 2
    mac port access-group mac_acl1
    ip port access-group ip_acl1 in
    ipv6 port traffic-filter ipv6_acl1 in
    state enabled
```

```
interface Ethernet1/5
    description ucs_vic2/0
    switchport mode vntag
```

Server Network Adapter Initial Handshake and Negotiation

When you connect the server network adapter to the VNTag-mode Ethernet port on the Cisco Nexus 5500 series device or a Fabric Extender that is connected to a Cisco Nexus 5500 series device, a handshake is initiated.

An exchange of information about NIV capabilities takes place and communications begin in VNTag mode. The device passes the list of configured port profiles (type vEthernet) to the adapter. These port profile names are displayed in the configuration utility of the server network adapter as options for selection.

Note   Only port profile names are passed to the server network adapter. The configurations in the port profile are not passed to the server network adapter

If the server network adapter is not connected to the device, it is still possible to configure the vNICs on the server. However, the port profile names are not available on the adapter.

Configuring the Adapter-FEX on the Adapter

Using the server network adapter configuration utility on the server, enable Network Interface Virtualization (NIV) on the adapter. See the documentation of your specific server network adapter for details.

To complete the configuration, you might have to reboot the server to reset the network adapter.

Note   For information on the Cisco UCS P81E VIC, see the Cisco UCS P81E VIC documentation in the *Cisco UCS C-Series Servers Integrated Management Controller CLI Configuration Guide*.

Note   For information on the Broadcom BCM57810 Convergence NIC, see your source for Broadcom Corp. documentation.

Configuring vNICs on the Adapter

Using the network adapter configuration utility on the server, create the appropriate number of vNICs. Create each vNIC with the appropriate properties, such as the unique channel number, MAC address, uplink failover properties, or port profile names.

Note   After the initial handshake and negotiation, the list of port profiles configured on the device are automatically available on the server adapter. You can associate these port profile names to the vNICs.

Each vNIC has a unique channel number associated with it. A vNIC is identified on the device by the bind command that associates a physical port and the channel number of the vNIC to a virtual Ethernet interface. See the documentation of your specific server network adapter for details.

> **Note**   For information on the Cisco UCS P81E VIC, see the Cisco UCS P81E VIC documentation in the *Cisco UCS C-Series Servers Integrated Management Controller CLI Configuration Guide*.

> **Note**   For information on the Broadcom BCM57810 Convergence NIC, see your source for Broadcom Corp. documentation.

When the VNTag connectivity is established, only port profile names (type vEthernet) are passed to the server network adapter. The configurations in the port profile are not passed to the server network adapter.

The port profiles names are displayed in the network adapter configuration utility as options for selection.

Initializing the Server Network Adapter

Consider the topology as shown in Figure 2-2 and Figure 2-3.

After configuring vNICs on the server network adapter, you might have to reload the drivers or reboot the server and the adapter to complete the configuration. See the documentation for your specific server network adapter for details.

When the configuration is complete, the server network adapter and the device re establishes a link and performs the initial handshake and negotiation process. The server network adapter and the device also establishes higher level control plane connectivity using the Virtual Interface Configuration (VIC) protocol.

> **Note**   The VIC protocol provisions and manages virtual interfaces on a remote device. The VIC protocol is different from the Cisco UCS VIC adapter.

When the VIC protocol connectivity is established, the server network adapter requests that the device create a virtual Ethernet interface for each vNIC that is configured on the server network adapter. The server network adapter also passes the following attributes over the uplink interface in addition to the virtual Ethernet interface creation request:

- Maximum transmission unit (MTU)
- Port profile name
- Channel number
- Active/standby uplink

The device creates a virtual Ethernet interface for each vNIC on the server network adapter and associates the port profile and channel number to the virtual Ethernet interface.

The server boot up process might be suspended at the BIOS configuration phase until virtual Ethernet interfaces are created. When the virtual Ethernet interfaces creation completes, the boot up process resumes and the OS is loaded. See the documentation for your specific adapter for details.

> **Note**   For information on the Cisco UCS P81E VIC, see the Cisco UCS P81E VIC documentation in the *Cisco UCS C-Series Servers Integrated Management Controller CLI Configuration Guide*.

> **Note** For information on the Broadcom BCM57810 Convergence NIC, see your source for Broadcom Corp. documentation.

> **Note** The **no vethernet auto-create** command stops the virtual Ethernet interfaces from being automatically created. If the device is not configured with the **vethernet auto-create** command, you must configure the virtual Ethernet interfaces manually with the appropriate binding and port profile configurations.

> **Note** Virtual Ethernet interfaces created by the device are numbered automatically as they are created. These virtual Ethernet interface numbers start from 32769. The device picks the lowest unused number when creating a new virtual Ethernet interface.
> When you manually create virtual Ethernet interfaces, you can select any number for the virtual Ethernet interface. We recommend that you choose a number less that 32678, in the range from 1 to 2000.

This example shows the configuration that is associated with virtual Ethernet interfaces on the device:

```
interface vethernet 21
    bind interface ethernet 1/5 channel 1
    inherit port-profile user_data
interface vethernet 22
    bind interface ethernet 1/5 channel 2
    inherit port-profile user_data
interface vethernet 23
    bind interface ethernet 1/5 channel 3
    inherit port-profile user_management
interface vethernet 24
    bind interface ethernet 1/5 channel 4
    inherit port-profile user_backup
```

Dual-Homed FEX Topology Configuration Examples

Consider the topology shown in Figure 2-4. Server network adapter initialization can take place when an uplink interface is connected to a dual-homed Fabric Extender.

When the virtual Ethernet interface creation is complete, the virtual Ethernet interface configuration on the Cisco Nexus 5500-A device is as follows:

```
interface vethernet 21
    bind interface ethernet 101/1/15 channel 1
    inherit port-profile user_data
interface vethernet 22
    bind interface ethernet 101/1/15 channel 2
    inherit port-profile user_data
interface vethernet 23
    bind interface ethernet 101/1/15 channel 3
    inherit port-profile user_management
interface vethernet 24
    bind interface ethernet 101/1/15 channel 4
    inherit port-profile user_backup
```

The virtual Ethernet interface configuration on the Cisco Nexus 5500-B device is as follows:

```
interface vethernet 21
    bind interface ethernet 101/1/15 channel 1
    inherit port-profile user_data
```

```
interface vethernet 22
    bind interface ethernet 101/1/15 channel 2
    inherit port-profile user_data
interface vethernet 23
    bind interface ethernet 101/1/15 channel 3
    inherit port-profile user_management
interface vethernet 24
    bind interface ethernet 101/1/15 channel 4
    inherit port-profile user_backup
```

> **Note**   The configuration is identical on both the Cisco Nexus 5500-A device and Cisco Nexus 5500-B device.

Active-Standby Server Network Adapter Topology Configuration Examples

This section includes the following topics:

Adapter-FEX Initialization with Active-Standby Uplinks in vPC Topology

Consider the topology in Figure 2-5 that has one uplink interface as active and the other uplink interface as standby. Channel numbers for virtual Ethernet interfaces created on the standby uplink device are the same as the channel numbers on the active uplink interface.

In a vPC topology, the virtual Ethernet interfaces associated with a single vNIC will have the same interface number on the vPC primary and secondary device.

Assume that the server network adapter in this example has four vNICs (eth0, eth1, eth2, eth3) and two uplinks (uplink_0, uplink_1) with the following configuration:

Table 2-1   Example for Server Network Adapter with Active-Standby Uplinks in vPC Topology

vNIC	Uplink	Port Profile Name	Channel Number
eth0	Uplink_0	user_data	1
eth1	Uplink_1	user_management	2
eth2	Uplink_0	user_data	3
eth3	Uplink_1	user_backup	4

Also assume that uplink_0 is connected to Ethernet 1/5 on the Cisco Nexus 5500-A device and uplink_1 is connected to Ethernet 1/15 on the Cisco Nexus 5500-B device.

When the virtual Ethernet interface creation completes, the virtual Ethernet interface configuration on the Cisco Nexus 5500-A device is as follows:

```
interface vethernet 37
    bind interface ethernet 1/5 channel 1
    inherit port-profile user_data
interface vethernet 38
    bind interface ethernet 1/5 channel 2
    inherit port-profile user_data
interface vethernet 39
    bind interface ethernet 1/5 channel 3
    inherit port-profile user_management
```

```
interface vethernet 40
    bind interface ethernet 1/5 channel 4
    inherit port-profile user_backup
```

The virtual Ethernet interface configuration on the Cisco Nexus 5500-B device is as follows:

```
interface vethernet 37
    bind interface ethernet 1/5 channel 1
    inherit port-profile user_data
interface vethernet 38
    bind interface ethernet 1/5 channel 2
    inherit port-profile user_data
interface vethernet 39
    bind interface ethernet 1/5 channel 3
    inherit port-profile user_management
interface vethernet 40
    bind interface ethernet 1/5 channel 4
    inherit port-profile user_backup
```

Note   The configuration is identical on both the Cisco Nexus 5500-A device and the Cisco Nexus 5500-B device.

In a vPC active-standby topology, virtual Ethernet interface numbers are allocated only by the vPC primary device. When a virtual Ethernet interface create request is received, the vPC secondary device requests the primary device for an allocation. The **show vpc brief** command displays the vPC role of a device.

If a server that is connected to a server network adapter is moved from one physical interface to another on just one of the vPC peers, the server network adapter connectivity is not established until the old virtual Ethernet interfaces are deleted.

Adapter-FEX Initialization with Active-Standby Uplinks Dual-Homed FEXs

Consider the topology shown in Figure 2-6 that has one uplink interface as active and the other uplink interface as standby.

Assume that the network server adapter has four vNICs (eth0, eth1, eth2, eth3) and two uplinks (uplink_0, uplink_1) with the following configuration:

:

Table 2-2   Example for Server Network Adapter for Dual-Homed FEXs

vNIC	Uplink	Port Profile Name	Channel Number
eth0	Uplink_0	user_data	1
eth1	Uplink_1	user_management	2
eth2	Uplink_0	user_data	3
eth3	Uplink_1	user_backup	4

Also assume that uplink_0 is connected to Ethernet 100/1/15 on the Fabric Extender and uplink_1 is connected to Ethernet 101/1/15 on the Fabric Extender.

When the virtual Ethernet interface creation completes, the virtual Ethernet interface configuration on the Cisco Nexus 5500-A device is as follows:

```
interface vethernet 37
```

```
    bind interface ethernet 100/1/15 channel 1
    bind interface ethernet 101/1/15 channel 1
    inherit port-profile user_data
interface vethernet 38
    bind interface ethernet 100/1/15 channel 2
    bind interface ethernet 101/1/15 channel 2
    inherit port-profile user_data
interface vethernet 39
    bind interface ethernet 100/1/15 channel 3
    bind interface ethernet 101/1/15 channel 3
    inherit port-profile user_management
interface vethernet 40
    bind interface ethernet 100/1/15 channel 4
    bind interface ethernet 101/1/15 channel 4
    inherit port-profile user_backup
```

The virtual Ethernet interface configuration on the Cisco Nexus 5500-B device is as follows:

```
interface vethernet 37
    bind interface ethernet 100/1/15 channel 1
    bind interface ethernet 101/1/15 channel 1
    inherit port-profile user_data
interface vethernet 38
    bind interface ethernet 100/1/15 channel 2
    bind interface ethernet 101/1/15 channel 2
    inherit port-profile user_data
interface vethernet 39
    bind interface ethernet 100/1/15 channel 3
    bind interface ethernet 101/1/15 channel 3
    inherit port-profile user_management
interface vethernet 40
    bind interface ethernet 100/1/15 channel 4
    bind interface ethernet 101/1/15 channel 4
    inherit port-profile user_backup
```

Note   The configuration is identical on both the Cisco Nexus 5500-A device and the Cisco Nexus 5500-B device.

Configuring Virtual Ethernet Interfaces

This section describes how to create and configure a virtual Ethernet interface.

Creating Virtual Ethernet Interfaces Automatically

This section describes how to create virtual Ethernet interfaces automatically when a server network adapter is connected to a VNTag-mode Ethernet interface on a Cisco Nexus 5500 series device.

The server network adapter requests the Cisco Nexus 5500 series device to create a virtual Ethernet interfaces one at a time.

Saving Virtual Ethernet Interface in a Startup Configuration File

Virtual Ethernet interfaces that are created with a request to create the VIC protocol interface are stored in the running configuration. If the running configuration is saved, the virtual Ethernet interfaces and their configurations are saved to the startup configuration file.

When you reload the device, the device loads the startup configuration file and the virtual Ethernet interface is created statically from the startup configuration. When the VNTag interface is initialized and the server network adapter makes a request to create a virtual Ethernet interface, the already existing virtual Ethernet interface is used. For more information, see the "Creating Virtual Ethernet Interfaces Manually" section on page 2-16.

A virtual Ethernet interface can be deleted from the system with the **no interface vethernet** command. Since virtual Ethernet interfaces are saved in the startup configuration, we recommend that you save the running configuration to the startup configuration file.

Creating Virtual Ethernet Interfaces Manually

You can manually create virtual Ethernet interfaces on a Cisco Nexus 5500 series device using the **interface vethernet** command. You can configure a maximum of 2000 virtual Ethernet interfaces on a Cisco Nexus 5500 series device.

> **Note** We recommend that you disable automatic creation of virtual Ethernet interfaces (using the **no vethernet auto-create** command) on the device before you manually create any virtual Ethernet interfaces.

When a device connected to a server network adapter receives a request to create a virtual Ethernet interface, the device checks for a manually configured virtual Ethernet interface that matches the channel number of the virtual Ethernet interface creation request. If the manually configured virtual Ethernet interface already exists, the manually configured virtual Ethernet interface is used and a new virtual Ethernet interface is not created. If the virtual Ethernet interface does not exist, a new virtual Ethernet interface is created.

> **Note** Make sure that you delete all virtual Ethernet interfaces from the device before you permanently disconnect the server that is connected to the server network adapter.

Configuration Conflicts Between the Switch and Server Network Adapter

Conflicts with port profile names may occur between the configuration of a virtual Ethernet interface that was manually configured or one that was saved in the start up configuration and the configuration on the server network adapter.

For example, the server network adapter might associate the vNIC with channel number 5 to the port profile user_backup, whereas the device might associate the virtual Ethernet interface bound to channel number 5 to the port profile user_data.

When a conflict of this kind occurs, the configuration from the server network adapter takes precedence and overwrites the configuration on the device.

When a port profile is associated to a vNIC, but the port profile does not exist on the device, the virtual Ethernet interface creation and initialization fails.

I N D E X

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