Configuring the Cisco Nexus 2000 Series Fabric Extender

This section describes how to configure the Fabric Extender.

Information About Cisco Nexus 2000 Series Fabric Extender

## FEX in Active-Active Mode

Beginning with Cisco NX-OS Release 7.2(0)D1(1) , a Fabric Extender can support connections to two Cisco Nexus 7000 Series switches in active-active mode using a vPC.

A Fabric Extender in active-active (FEX-AA) mode:

- Uses a vPC to provide a seamless fail-over and fast convergence when one of the switches fail.

- Supports traffic across both switches to maintain efficiency.

Figure 1: FEX Active-Active
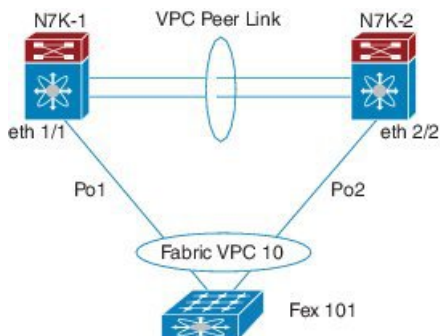
Configuration Synchronization and FEX-AA

The vPC configuration synchronization feature can be used for FEX-AA. Configuration synchronization allows you to synchronize the configuration between a pair of switches in a network. You use a switch profile to create a configuration file that is applied locally and used to synchronize the configuration to the peer.

Guidelines and Limitations for FEX-AA

The following are guidelines and limitations for FEX-AA:

- FEX-AA is not supported on vPC+ deployments.

-
- Configuring FEX-AA across two VDCs on the same chassis is not supported.

- FEXs configured in AA mode cannot have host interfaces configured in L3 mode.

- Straight-Through FEX and Active-Active FEX cannot exist on a same ASIC instance.

- Both Cisco Nexus 7000 Series switches can configure the FEX.

- Both Cisco Nexus 7000 Series switches must configure the FEX in the same way so that the fex-id is the same for each.

- The configuration of host ports and host port-channels behind the FEX in AA mode must be the same on both the Cisco Nexus 7000 switches .

- The FEX image can be downloaded from either Cisco Nexus 7000 Series switch.

Managing the Fabric Extender Feature Set

You can install and manage the Fabric Extender feature set.

SUMMARY STEPS

DETAILED STEPS

Installing the Fabric Extender Feature Set

Note You must enable the Fabric Extender feature set in the default virtual device context (VDC). Once enabled in the default VDC, the FEX can belong to any VDC and can be configured from those VDCs. A single Fabric Extender belongs exclusively to a single VDC.

Before you begin

Ensure that you are in the default VDC.

Ensure that you have disabled the Intrusion Detection System (IDS) reserved addresses check (it is disabled by default). Use the **show hardware ip verify** command and look for the string "address reserved" in the output. If the IDS reserved addresses check is enabled, disable it with the **no hardware ip verify address reserved** command.

SUMMARY STEPS

1. **configure terminal**
2. **install feature-set fex**
3. **exit**

DETAILED STEPS

	Command or Action	**Purpose**

Step 1	**configure terminal**
	
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters global configuration mode.

Step 2	**install feature-set fex** **Example:** `switch(config)# install feature-set fex`	Installs the Fabric Extender feature set in the default VDC. To uninstall the Fabric Extender feature set, use the **no install feature-set fex** command. Before you can uninstall the feature set, you must ensure the following: • The feature set must be installed in the default VDC. • The feature set must not be enabled in any VDC.

	Command or Action	Purpose

Step 3	**exit**
	
	Example:
	
	`switch(config)# exit`
	`switch#`
		Exits global configuration mode.

Enabling the Fabric Extender Feature Set

You can enable the installed Fabric Extender feature set in any VDC on the device.

Before you begin

Ensure that you have installed the Fabric Extender feature set in the default VDC.

Ensure that you are in the correct VDC or use the **switchto vdc** command.

SUMMARY STEPS

1. **configure terminal**
2. **feature-set fex**
3. **exit**

DETAILED STEPS

	Command or Action	Purpose

Step 1	**configure terminal**
	
	Example:
	
	`switch# configure terminal`
	`switch(config)#`
		Enters global configuration mode.

Step 2	**feature-set fex** **Example:** `switch(config)# feature-set fex`	Enables the Fabric Extender feature set. The feature set must be installed before it shows as an option to this command. To disable the Fabric Extender feature set, use the **no feature-set fex** command. Before you can disable a feature set, you must install the feature set in the default VDC. **Note** The **no feature-set fex** command might take some time to complete if the size of the configuration is very large. The command cleans up all of the configurations associated with the Fabric Extender feature set.

Step 3	**exit**
	
	Example:
	
	`switch(config)# exit`
	`switch#`
		Exits global configuration mode.

Disallowing the Fabric Extender Feature Set

By default, when you install the Fabric Extender feature set, it is allowed in all VDCs. You can disallow the installed Fabric Extender feature set in a specific VDC on the device.

Before you begin

Ensure that you have installed the feature set in the default VDC.

Ensure that you have not enabled the feature set in the specified VDC.

SUMMARY STEPS

1. **configure terminal**
2. **vdc** *vdc_ID*
3. **no allow feature-set fex**
4. **end**

DETAILED STEPS

	Command or Action	Purpose

Step 1	**configure terminal**
	
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters global configuration mode.

Step 2	**vdc** *vdc_ID* **Example:** `switch(config)# vdc 1`	Specifies a VDC and enters VDC configuration mode.
Step 3	**no allow feature-set fex** **Example:** `switch(config-vdc)# no allow feature-set fex`	Disallows the feature set in the VDC. You cannot disallow a feature set that is enabled in the specified VDC. By default, the installed Fabric Extender feature set is allowed in all VDCs on the device. You can disallow a feature set in a specific VDC. Subsequently, you can change the status back to allowed with the **allow feature-set fex** command.

Step 4	**end**
	
	Example:
	`switch(config-vdc)# end`
	`switch#`
		Exits VDC configuration mode and returns to EXEC mode.

Associating a Fabric Extender to a Fabric Interface

Associating a Fabric Extender to a Port Channel

Before you begin

Ensure that you have enabled the Fabric Extender feature.

SUMMARY STEPS

1. **configure terminal**
2. **interface port-channel** *channel*
3. **switchport mode fex-fabric**
4. **fex associate** *FEX-number*
5. (Optional) **show interface port-channel** *channel* **fex-intf**

DETAILED STEPS

	Command or Action	Purpose

Step 1	**configure terminal**
	
	Example:
	
	`switch# configure terminal`
	`switch(config)#`
		Enters global configuration mode.

Step 2	**interface port-channel** *channel*
	
	Example:
	
	`switch(config)# interface port-channel 4`
	`switch(config-if)#`
		Specifies a port channel to configure.

Step 3	**switchport mode fex-fabric** **Example:** `switch(config-if)# switchport mode fex-fabric`	Sets the port channel to support an external Fabric Extender.
Step 4	**fex associate** *FEX-number* **Example:** `switch(config-if)# fex associate 101`	Associates a FEX number to the Fabric Extender unit attached to the interface. The range is from 100 to 199.
Step 5	(Optional) **show interface port-channel** *channel* **fex-intf** **Example:** `switch# show interface port-channel 4 fex-intf`	Displays the association of a Fabric Extender to a port channel interface.

Example

This example shows how to associate the Fabric Extender to a port channel interface on the parent device:

```
switch# configure terminal
switch(config)# interface ethernet 1/28
switch(config-if)# channel-group 4
switch(config-if)# no shutdown
switch(config-if)# exit
switch(config)# interface ethernet 1/29
switch(config-if)# channel-group 4
switch(config-if)# no shutdown
switch(config-if)# exit
switch(config)# interface ethernet 1/30
switch(config-if)# channel-group 4
switch(config-if)# no shutdown
switch(config-if)# exit
switch(config)# interface ethernet 1/31
switch(config-if)# channel-group 4
switch(config-if)# no shutdown
switch(config-if)# exit
switch(config)# interface port-channel 4
switch(config-if)# switchport
switch(config-if)# switchport mode fex-fabric
switch(config-if)# fex associate 101
```

Tip As a best practice, only enter the **fex associate** command from the port channel interface, not from the physical interface.

Note When adding physical interfaces to port channels, all configurations on the port channel and physical interface must match.

This example shows how to display the association of the Fabric Extender and the parent device:

```
switch# show interface port-channel 4 fex-intf
Fabric          FEX
Interface       Interfaces
---------------------------------------------------
Po4             Eth101/1/48  Eth101/1/47  Eth101/1/46  Eth101/1/45
                Eth101/1/44  Eth101/1/43  Eth101/1/42  Eth101/1/41
                Eth101/1/40  Eth101/1/39  Eth101/1/38  Eth101/1/37
                Eth101/1/36  Eth101/1/35  Eth101/1/34  Eth101/1/33
                Eth101/1/32  Eth101/1/31  Eth101/1/30  Eth101/1/29
                Eth101/1/28  Eth101/1/27  Eth101/1/26  Eth101/1/25
                Eth101/1/24  Eth101/1/23  Eth101/1/22  Eth101/1/21
                Eth101/1/20  Eth101/1/19  Eth101/1/18  Eth101/1/17
                Eth101/1/16  Eth101/1/15  Eth101/1/14  Eth101/1/13
                Eth101/1/12  Eth101/1/11  Eth101/1/10  Eth101/1/9
                Eth101/1/8   Eth101/1/7   Eth101/1/6   Eth101/1/5
                Eth101/1/4   Eth101/1/3   Eth101/1/2   Eth101/1/1
```

Disassociating a Fabric Extender from an Interface

Before you begin

Ensure that you have enabled the Fabric Extender feature.

SUMMARY STEPS

1. **configure terminal**
2. **interface** {**ethernet** *slot/port* | **port-channel** *channel*}
3. **no fex associate**

DETAILED STEPS

	Command or Action	Purpose

Step 1	**configure terminal**
	
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters global configuration mode.

Step 2	**interface** {**ethernet** *slot/port*	**port-channel** *channel*}
		
		Example:
		`switch(config)# interface port-channel 4`
		`switch(config-if)#`
			Specifies the interface to configure. The interface can be an Ethernet interface or a port channel.

Step 3	**no fex associate** **Example:** `switch(config-if)# no fex associate`	Disassociates the Fabric Extender unit attached to the interface.

Associating a Fabric Extender to an F-Series Module

Before you begin

Ensure that you have installed and enabled the Fabric Extender feature set.

- switch# **configure terminal**
- switch(config)# **install feature-set fex**
- switch(config)# **feature-set fex**

Note   F-Series modules (except F1 Series) are supported only by the following FEX devices:

- 2248TP

- 2248TP-E

- 2248PQ

- 2348UPQ

- 2348TQ

- 2232TP

- 2232PP

- 2232TM

- 2224TP

- B22-IBM

- B22-HP

Note   Restriction for F2-Series Linecards in an F2 VDC:

Each port in the ASIC has an index. Allow only ports with similar indices across ASICs to be added to a port channel.

For example, if port 1 has an index of 1 and port 2 has an index of 2, the following ports are supported and not supported:

- Supported: Port 1 of ASIC 1 and port 1 of ASIC 2 are added to a port channel.

- Not supported (For F2-series): Port 1 of ASIC 1 and port 2 of ASIC 2 to form a port channel.

A set of ports from an ASIC that has an index sub-set S, such as {1,2,4}, is allowed to be added to a port channel only if the port channel has an equivalent or an empty set.

SUMMARY STEPS

1. **vdc switch**
2. **limit-resource module-type** [**f2e** | **f3**]
3. **interface ethernet** *mod-number port-range*
4. **allocate interface ethernet** *slot-port*
5. **switchport mode fex -fabric**
6. **fex associate** *FEX chassis number*
7. **channel-group** *port-channel number*
8. **no shutdown**
9. **int port** *port-channel number*
10. **no shutdown**

DETAILED STEPS

	Command or Action	**Purpose**
Step 1	**vdc switch** **Example:** switch(config)# vdc switch	Specifies the VDC.
Step 2	**limit-resource module-type** [**f2e** | **f3**] **Example:** switch(config)# limit-resource module-type f2e	Specifies the module type.
Step 3	**interface ethernet** *mod-number port-range* **Example:** switch(config)# interface ethernet 1/1	Specifies the interface.
Step 4	**allocate interface ethernet** *slot-port* **Example:** switch(config)# allocate interface ethernet 1	Allocates the F2-Series interfaces to VDC.
Step 5	**switchport mode fex -fabric** **Example:** switch(config-if)# switchport mode fex -fabric	Specifies the FEX.
Step 6	**fex associate** *FEX chassis number* **Example:** switch(config-if)# fex associate 101	Specifies the chassis.
Step 7	**channel-group** *port-channel number* **Example:** switch(config-if)# channel-group 1	Specifies the port channel number.
Step 8	**no shutdown** **Example:** switch(config-if)# no shutdown	Brings up the port.
Step 9	**int port** *port-channel number* **Example:** switch(config-if)# int port 1	Specifies the port channel.
Step 10	**no shutdown** **Example:** switch(config-if)# no shutdown	Brings up the port channel.

Configuring Fabric Extender Global Features

You can configure global features on the Fabric Extender.

Before you begin

Ensure that you have enabled the Fabric Extender feature set.

SUMMARY STEPS

1. **configure terminal**
2. **fex** *FEX-number*
3. (Optional) **description** *desc*
4. (Optional) **no description**
5. (Optional) **no type**
6. (Optional) **serial** *serial*
7. (Optional) **no serial**

DETAILED STEPS

	Command or Action	Purpose

Step 1	**configure terminal**
	
	Example:
	<pre>switch# configure terminal
	switch(config)#</pre>
		Enters global configuration mode.

Step 2	**fex** *FEX-number*
	
	Example:
	<pre>switch(config)# fex 101
	switch(config-fex)#</pre>
		Enters FEX configuration mode for the specified Fabric Extender. The range of the *FEX-number* is from to 199.

Step 3	(Optional) **description** *desc* **Example:** <pre>switch(config-fex)# description Rack7A-N2K</pre>	Specifies the description. The default is the string FEX*xxxx* where *xxxx* is the FEX number. If the FEX number is 123, the description is FEX0123.
Step 4	(Optional) **no description** **Example:** <pre>switch(config-fex)# no description</pre>	Deletes the description.
Step 5	(Optional) **no type** **Example:** <pre>switch(config-fex)# no type</pre>	Deletes the FEX type. When a Fabric Extender is connected to the fabric interfaces and does not match the configured type that is saved in the binary configuration on the parent switch, all configurations for all interfaces on the Fabric Extender are deleted.
Step 6	(Optional) **serial** *serial* **Example:**	Defines a serial number string. If this command is configured, a switch allows the corresponding chassis ID

Command or Action	Purpose
`switch(config-fex)# serial JAF1339BDSK`	to associate (using the **fex associate** command) only if the Fabric Extender reports a matching serial number string.
	Caution Configuring a serial number that does not match the specified Fabric Extender forces the Fabric Extender offline.
Step 7 (Optional) **no serial** **Example:** `switch(config-fex)# no serial`	Deletes the serial number string.

Enabling DSCP to Queue Mapping

For Cisco NX-OS Release 6.2(2) and later releases, the Cisco Fabric Extenders support Layer 3 protocol adjacencies on host interfaces (HIFs) and DSCP to queue mapping. Before Cisco NX-OS Release 6.2(2), you can configure a Fabric Extender (FEX) port as a Layer 3 interface for host connectivity, but not for routing. See the Configuring the Cisco Nexus 2000 Series Fabric Extender for more information about fabric extenders.

Before Cisco NX-OS 6.2(2), the Fabric Extender cannot participate in a routing protocol adjacency with a device attached to its port. Only a static direct route is supported. This restriction applies to both of the following supported connectivity cases:

- Switch virtual interfaces (SVI) with Fabric Extender single port or portchannel in Layer 2 mode.

- Fabric Extender port or portchannel in Layer 3 mode.

SUMMARY STEPS

1. **configure terminal**
2. **hardware qos dscp-to-queue ingress module type** {**all** | **f-series** | **m-series**}
3. (Optional) **show hardware qos dscp-to-queue ingress**
4. (Optional) **copy running-config startup-config**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `switch(config)# configure terminal`	Enters global configuration mode.
Step 2	**hardware qos dscp-to-queue ingress module type** {**all**	**f-series**	**m-series**} **Example:** `switch(config)# hardware qos dscp-to-queue ingress module type m-series`	Enables the dscp-to-queue mapping on the specified module(s).

	Command or Action	Purpose

Step 3	(Optional) **show hardware qos dscp-to-queue ingress**
	
	Example:
	
	`switch(config)# show hardware qos dscp-to-queue`
	`ingress`
		Displays information about the status of dscp-to-queue mapping in ingress direction.

Step 4	(Optional) **copy running-config startup-config** **Example:** `switch(config)# copy running-config startup-config`	Saves the running configuration to the startup configuration.

Configuration Examples

This section contains examples of FEX configurations.

Configuring a FEX with a Layer 3 Host Interface

This example shows how to configure a Fabric Extender with a Layer 3 host interface (at the interface level, subinterface level, port channel level, and port channel subinterface level):

Layer 3 Configuration	Layer 3 Subinterface Configuration

`config t`
`interface ethernet 101/1/1`
`no switchport`
`ip address 192.0.1.1/24`
`Mtu 9000`
`no shutdown`
	`config t`
	`interface ethernet 101/1/1.12`
	`ip address 192.0.2.1/24`
	`encapsulation dot1Q 12`
	`mtu 850`
	`no shutdown`

Layer 3 Host Interface Port Channel Configuration	Layer 3 Host Interface Port Channel Subinterface Configuration

`config t`
`interface ethernet 101/1/1-2`
`no switchport`
`channel-group 12`
`no shutdown`
 	
`interface port-channel 12`
`ip address 192.0.3.1/24`
`mtu 2000`
`no shutdown`
	`config t`
	`interface ethernet 101/1/1-2`
	`no switchport`
	`channel-group 12`
	`no shutdown`
	
	`interface port-channel 12.14`
	`ip address 192.0.4.1/24`
	`encapsulation dot1Q 14`
	`mtu 1700`
	`no shutdown`

Note The VLAN used in the Layer 3 host interface (HIF) or host interface port channel (HIFPC) subinterface has only local significance to its parent interface. The same VLAN ID can be reused between Layer 3 subinterfaces in the same switch or VDC.

Configuring a Host Interface in a vPC Topology Connected to Two FEXs

This example shows how to configure a host vPC with a FEX (host vPC attached to two different FEXs):

Note The **switchport trunk allowed vlan** *vlan-list* command is not supported on FEX fabric interfaces.

Switch 1 Configuration	Switch 2 Configuration
``` config t feature lacp int e101/1/1-2 channel-group 12 mode active no shutdown int port-channel12 switchport switchport mode trunk switchport trunk allowed vlan 1-20 vpc 10 ```	``` config t feature lacp int e101/1/1-2 channel-group 12 mode active no shutdown int port-channel12 switchport switchport mode trunk switchport trunk allowed vlan 1-20 vpc 10 ```

Dual-Homing of a Server to a FEX with FabricPath

Note Cisco Nexus 7000 Series switches do not support dual-homing.

To configure FabricPath interfaces for two switches that are connected with FabricPath, perform the following tasks on each switch:

- Enable FabricPath on each switch.

- Configure the interfaces that you want to designate as FabricPath interfaces.

- Set the STP priority device to 8192 on all FabricPath Layer 2 gateway devices.

- (Optional) Set the STP domain ID for each of the separate STP domains that are connected to the FabricPath network.

- (Optional) Configure a FEX switch ID.

To configure FabricPath interfaces, follow these steps:

1. (Optional) Enable FabricPath on each switch.

```
switch# config terminal
switch(config)# feature fabricpath
switch(config-lldp)# exit
switch(config)#
```

2. After you enable FabricPath on the switch, configure the specified interface as FabricPath interfaces.

```
switch(config)# interface ethernet 1/2
switch(config-if)# switchport mode fabricpath
switch(config-if)# exit
switch(config)#
```

3. Configure the STP priority for all Rapid PVST+ VLANs as 8192.

```
switch# config terminal
switch(config)# spanning-tree vlan 11-20 priority 8192
switch(config)#
```

4. Configure the STP priority for all MST instances as 8192.

```
switch# config terminal
switch(config)# spanning-tree mst 1-5 priority 8192
switch(config)#
```

5. (Optional) Configure the STP domain ID on each FabricPath Layer 2 gateway switch attached to the FabricPath network.

```
switch# config terminal
switch(config)# spanning-tree domain 5
switch(config)
```

6. (Optional) Configure the FEX switch ID.

> **Note** See the *Cisco Nexus 7000 Series NX-OS Interfaces Configuration Guide* for information on configuring FEX.

> **Note** FEX VPC+ configurations are supported only on F2-Series modules.

If you are setting up an initial FEX VPC+ configuration on an F2-Series module, follow these steps:

a. In the VPC domain configuration mode, enable partial DF mode with the **fabricpath multicast load-balance** command.

b. If disabled, enable TRILL style mac-address learning with the **mac address-table core-port-learning** command.

c. In the VPC domain configuration mode, configure the emulated switch ID with the **fabricpath switchid** *switchid#* command.

d. On each of the VPC/VPC+ peer link interfaces in interface configuration mode, enter the **switchport mode fabricpath** command.

e. On each VPC/VPC+ peer link port channel, enter the **VPC peer-link** command.

f. Configure the VPC ID with the **vpc vpcid** command.

If you are changing an existing FEX VPC configuration to a FEX VPC+ configuration on an F2-Series module, follow these steps:

a. In the VPC domain configuration mode, enable partial DF mode with the **fabricpath multicast load-balance** command.

b. If disabled, enable trill style mac-address learning with the **mac address-table core-port-learning** command.

c. In the VPC domain configuration mode, configure the emulated switch ID with the **fabricpath switchid** *switchid#* command.

7. Copy the configuration.

```
switch(config)# copy running-config startup-config
switch(config)#
```

Configuring a FEX in Active-Active Mode

This example shows how to configure a FEX in active-active (FEX-AA) mode:

Switch 1 Configuration	Switch 2 Configuration

```int eth 1/1```
```channel-group 1```
```int po1```
```switchport```
```switchport mode fex-fabric```
```fex associate 101```
```vpc 10```
	```int eth 2/2```
	```channel-group 2```
	```int po2```
	```switchport```
	```switchport mode fex-fabric```
	```fex associate 101```
	```vpc 10```

Note
- The chassis number (fex-id) for both switches must be the same.
- Configuring FEX-AA across two VDCs on the same chassis is not supported.
- FEX-AA does not support Layer 3 interfaces.

Verifying the Status of DSCP-to-queue Mapping

The following sample output from the **show hardware qos dscp-to-queue ingress** command displays the status of DSCP-to-queue mapping enabled in ingress direction on F-series modules:

```
Switch# show hardware qos dscp-to-queue ingress

status: Enabled
module_type : f-series
```

Verifying the Configuration

This section describes how to display the configuration of the Fabric Extender and verify the chassis hardware status.

Verifying the Fabric Extender Configuration

Use the following commands to display configuration information about the defined interfaces on a Fabric Extender:

Command or Action	Purpose
show fex [*FEX-number*] [**detail**]	Displays information about a specific Fabric Extender or all attached units.

Command or Action	Purpose
show interface *type number* **fex-intf**	Displays the Fabric Extender ports that are pinned to a specific switch interface.
show interface fex-fabric	Displays the switch interfaces that have detected a Fabric Extender uplink.
show interface ethernet *number* **transceiver** [**fex-fabric**]	Displays the SFP+ transceiver and diagnostic optical monitoring (DOM) information for the Fabric Extender uplinks.
show feature-set	Displays the status of the feature sets on the device.

Configuration Examples for the Fabric Extender

This example shows how to display all the attached Fabric Extender units:

This example shows how to display the detailed status of a specific Fabric Extender:

This example shows how to display the Fabric Extender interfaces pinned to a specific switch interface:

This example shows how to display the switch interfaces that are connected to a Fabric Extender uplink:

This example shows how to display the SFP+ transceiver and diagnostic optical monitoring (DOM) information for Fabric Extender uplinks for an SFP+ transceiver that is plugged into the parent switch interface:

```
switch# show interface ethernet 1/40 transceiver
Ethernet1/40
    sfp is present
    name is CISCO-MOLEX INC
    part number is 74752-9026
    revision is A0
    serial number is MOC13321057
    nominal bitrate is 12000 MBits/sec
    Link length supported for copper is 3 m(s)
    cisco id is --
    cisco extended id number is 4
```

This example shows how to display the SFP+ transceiver and DOM information for Fabric Extender uplinks for an SFP+ transceiver that is plugged into the uplink port on the Fabric Extender:

```
switch# show interface ethernet 1/40 transceiver fex-fabric
Ethernet1/40
    sfp is present
    name is CISCO-MOLEX INC
    part number is 74752-9026
    revision is A0
    serial number is MOC13321057
    nominal bitrate is 12000 MBits/sec
    Link length supported for 50/125mm fiber is 0 m(s)
    Link length supported for 62.5/125mm fiber is 0 m(s)
    cisco id is --
    cisco extended id number is 4
```

Verifying the Chassis Management Information

Use the following to display configuration information used on the switch supervisor to manage the Fabric Extender.

Command or Action	Purpose
show environment fex {**all** | *FEX-number*} [**temperature** | **power** | **fan**]	Displays the environmental sensor status.
show inventory fex *FEX-number*	Displays inventory information for a Fabric Extender.
show module fex [*FEX-number*]	Displays module information about a Fabric Extender.
show sprom fex *FEX-number* {**all** | **backplane** | **powersupply** *ps-num*} | **all**	Displays the contents of the serial PROM (SPROM) on the Fabric Extender. The unit of the power for the **show sprom** command is displayed in centi-amperes.

Configuration Examples for Chassis Management

This example shows how to display the module information about all connected Fabric Extender units:

This example shows how to display the inventory information about a specific Fabric Extender:

```
switch# show inventory fex 101
NAME: "FEX 101 CHASSIS", DESCR: "N2K-C2248TP-1GE  CHASSIS"
PID: N2K-C2248TP-1GE   , VID: V00 , SN: SSI13380FSM

NAME: "FEX 101 Module 1", DESCR: "Fabric Extender Module: 48x1GE, 4x10GE Supervisor"
PID: N2K-C2248TP-1GE   , VID: V00 , SN: JAF1339BDSK

NAME: "FEX 101 Fan 1", DESCR: "Fabric Extender Fan module"
PID: N2K-C2248-FAN     , VID: N/A , SN: N/A

NAME: "FEX 101 Power Supply 2", DESCR: "Fabric Extender AC power supply"
PID: NXK-PAC-400W       , VID:  000, SN:       LIT13370QD6
```

This example shows how to display the environment status for a specific Fabric Extender:

```
switch# show environment fex 101


Temperature Fex 101:
----------------------------------------------------------------
Module    Sensor       MajorThresh   MinorThres   CurTemp      Status
                       (Celsius)     (Celsius)    (Celsius)
----------------------------------------------------------------
1       Outlet-1   60           50           33          ok
1       Outlet-2   60           50           38          ok
1       Inlet-1    50           40           35          ok
1       Die-1      100          90           44          ok


Fan Fex: 101:
------------------------------------------------------
Fan             Model            Hw         Status
------------------------------------------------------
Chassis         N2K-C2148-FAN     --         ok
```

```
PS-1              --                 --         absent
PS-2              NXK-PAC-400W       --         ok


Power Supply Fex 101:
--------------------------------------------------------------------------------
Voltage: 12 Volts
---------------------------------------------------------
PS   Model               Power       Power      Status
                         (Watts)     (Amp)
---------------------------------------------------------
1    --                    --          --        --
2    NXK-PAC-400W         4.32        0.36       ok


Mod Model               Power      Power       Power     Power       Status
                        Requested  Requested   Allocated Allocated
                        (Watts)    (Amp)       (Watts)   (Amp)
--- ------------------  -------    ----------  --------- ----------  ----------
1    N2K-C2248TP-1GE    0.00       0.00        0.00      0.00        powered-up


Power Usage Summary:
--------------------
Power Supply redundancy mode:              redundant

Total Power Capacity                            4.32 W

Power reserved for Supervisor(s)                0.00 W
Power currently used by Modules                 0.00 W

                                           -------------
Total Power Available                           4.32 W
                                           -------------
```

This example shows how to display the SPROM for a specific Fabric Extender:

```
switch# show sprom fex 101 all
DISPLAY FEX 101 SUP sprom contents
Common block:
 Block Signature : 0xabab
 Block Version   : 3
 Block Length    : 160
 Block Checksum  : 0x1a1e
 EEPROM Size     : 65535
 Block Count     : 3
 FRU Major Type  : 0x6002
 FRU Minor Type  : 0x0
 OEM String      : Cisco Systems, Inc.
 Product Number  : N2K-C2248TP-1GE
 Serial Number   : JAF1339BDSK
 Part Number     : 73-12748-01
 Part Revision   : 11
 Mfg Deviation   : 0
 H/W Version     : 0.103
 Mfg Bits        : 0
 Engineer Use    : 0
 snmpOID         : 9.12.3.1.9.78.3.0
 Power Consump   : 1666
 RMA Code        : 0-0-0-0
 CLEI Code       : XXXXXXXXXTBDV00
 VID             : V00
Supervisor Module specific block:
 Block Signature : 0x6002
```

```
Block Version   : 2
Block Length    : 103
Block Checksum  : 0x2686
Feature Bits    : 0x0
HW Changes Bits : 0x0
Card Index      : 11016
MAC Addresses   : 00-00-00-00-00-00
Number of MACs  : 0
Number of EPLD  : 0
Port Type-Num   : 1-48;2-4
Sensor #1       : 60,50
Sensor #2       : 60,50
Sensor #3       : -128,-128
Sensor #4       : -128,-128
Sensor #5       : 50,40
Sensor #6       : -128,-128
Sensor #7       : -128,-128
Sensor #8       : -128,-128
Max Connector Power: 4000
Cooling Requirement: 65
Ambient Temperature: 40

DISPLAY FEX 101 backplane sprom contents:
Common block:
 Block Signature : 0xabab
 Block Version   : 3
 Block Length    : 160
 Block Checksum  : 0x1947
 EEPROM Size     : 65535
 Block Count     : 5
 FRU Major Type  : 0x6001
 FRU Minor Type  : 0x0
 OEM String      : Cisco Systems, Inc.
 Product Number  : N2K-C2248TP-1GE
 Serial Number   : SSI13380FSM
 Part Number     : 68-3601-01
 Part Revision   : 03
 Mfg Deviation   : 0
 H/W Version     : 1.0
 Mfg Bits        : 0
 Engineer Use    : 0
 snmpOID         : 9.12.3.1.3.914.0.0
 Power Consump   : 0
 RMA Code        : 0-0-0-0
 CLEI Code       : XXXXXXXXXTDBV00
 VID             : V00
Chassis specific block:
 Block Signature : 0x6001
 Block Version   : 3
 Block Length    : 39
 Block Checksum  : 0x2cf
 Feature Bits    : 0x0
 HW Changes Bits : 0x0
 Stackmib OID    : 0
 MAC Addresses   : 00-0d-ec-e3-28-00
 Number of MACs  : 64
 OEM Enterprise  : 0
 OEM MIB Offset  : 0
 MAX Connector Power: 0
WWN software-module specific block:
 Block Signature : 0x6005
 Block Version   : 1
 Block Length    : 0
 Block Checksum  : 0x66
```

```
wwn usage bits:
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00
 00 00
License software-module specific block:
 Block Signature : 0x6006
 Block Version   : 1
 Block Length    : 16
 Block Checksum  : 0x86f
lic usage bits:
 ff ff ff ff ff ff ff ff

DISPLAY FEX 101 power-supply 2 sprom contents:
Common block:
 Block Signature : 0xabab
 Block Version   : 3
 Block Length    : 160
 Block Checksum  : 0x1673
 EEPROM Size     : 65535
 Block Count     : 2
 FRU Major Type  : 0xab01
 FRU Minor Type  : 0x0
 OEM String      : Cisco Systems Inc   NXK-PAC-400W
 Product Number  : NXK-PAC-400W
 Serial Number   :     LIT13370QD6
 Part Number     :         341
 Part Revision   : -037
 CLEI Code       : 5-01    01   000
 VID             :  000
 snmpOID         : 12336.12336.12336.12336.12336.12336.12374.12336
 H/W Version     : 43777.2
 Current         : 36
 RMA Code        : 200-32-32-32
Power supply specific block:
 Block Signature : 0x0
```

```
Block Version   : 0
Block Length    : 0
Block Checksum  : 0x0
Feature Bits    : 0x0
Current 110v    : 36
Current 220v    : 36
Stackmib OID    : 0
```

Minimizing the Impact of a Disruptive Upgrade in an A-A FEX setup

You can upgrade Cisco Nexus 7000 Series Switches using two upgrade methods:

- In-Service Software Upgrade (ISSU)

- Non-ISSU/ Cold-Boot Upgrade

For more information on ISSU upgrades, refer to Cisco Nexus 7000 Series NX-OS Software Upgrade and Downgrade Guide. In some case, switch may require cold-boot upgrade methods for the upgrade.

This section provides the cold-boot upgrade procedure in an A-A FEX setup. This is recommended to minimize the disruption and reduce the issues caused after the upgrade.

A Non-ISSU upgrade for Cisco Nexus 7000 Series switches Peer 1 and Peer 2 in vPC with FEXs in active-active mode are involved in a disruptive upgrade.

Follow the below procedure to upgrade the vPC peers from one software image to a higher version minimize the disruption:

Step 1 Ensure that both vPC peer 1 and peer 2 have same software image and running.

The FEX-AA has the same software image.

Step 2 Shut FEX Port Channel to bring down NIF (FEX uplink) on vPC peer 2.

The FEX remains online on vPC peer 1.

Step 3 Upgrade the vPC peer 2 switch with a new software image.

The FEX-AA has the old software image.

Step 4 Shut FEX Port Channel to bring down NIF (FEX uplink) on vPC peer 1.

Step 5 Bring up FEX Port Channel to up the NIF (FEX uplink) on vPC peer 2.

The FEX-AA is upgraded with the new software image.

Step 6 Ensure that the FEX-AA is upgraded with new software image and all AA FEX HIF interfaces are populated on vPC peer 2. Now upgrade the vPC peer 1 switch with the new software image.

FEX is down on vPC peer 1, FEX is online vPC peer 2, and FEX-AA is booted with the new software image.

Step 7 Bring up FEX Port Channel to up the NIF (FEX uplink) on vPC peer 1.

Step 8 Verify that the upgrade on vPC peer 1 and vPC peer 2 is completed successfully.

After the upgrade, both the vPC peer are online and start forwarding traffic and the FEX-AA version with the new software image.

Additional References

This section includes additional information that is related to configuring the Cisco Nexus 2000 Series Fabric Extender.

Related Documents

Related Topic	Document Title
Cisco NX-OS Licensing	*Cisco NX-OS Licensing Guide*
Virtual device contexts (VDC)	*Cisco Nexus 7000 Series NX-OS Virtual Device Context Configuration Guide*
Interface configuration	*Cisco Nexus 7000 Series NX-OS Interfaces Configuration Guide*
Command reference	*Cisco Nexus 7000 Series Command References* available at the following URL: http://www.cisco.com/en/US/products/ps9402/prod_command_reference_list.html

Feature History

This table lists the release history for this feature.

Table 1: Feature History for the Cisco Nexus 2000 Series Fabric Extender

Feature Name	Releases	Feature Information
vPC configuration synchronization	7.2(0)D1(1)	Added support for vPC configuration synchronization for FEX
Cisco Nexus 7000 Series FEX Fabric Active-Active	7.2(0)D1(1)	Added support for FEX Active-Active.
Feature set commands	5.1(1)	The Fabric Extender is enabled on the Cisco Nexus 7000 Series device with the **install feature-set** and **feature-set** commands.
Port channel and vPC support	5.2(1)	Support was added for port channels and the integration of vPC on the host interfaces.

Feature Name	Releases	Feature Information
Layer 3 support	5.2(1)	Layer 3 capability was added to the Fabric Extender host interface ports including IPv4 and IPv6 and IGMP snooping.

This table lists the supported line cards and FEXs.

Table 2: Supported Line cards and FEXs History

FEX and Line card	Releases
Cisco Nexus B22 Fabric Extender for IBM Cisco Nexus 2348UPQ Fabric Extender Cisco Nexus 2348TQ Fabric Extender	7.2(0)D1(1)
Cisco Nexus B22 Fabric Extender for HP Cisco Nexus 2248PQ Fabric Extender	6.2(2)
48-port, 100/1000 BASE-T (100-Mb/1-Gigabit) N2248TP-E 32-port 10-Gigabit SFP+ N2248TP-E Support for M2 series modules Cisco Nexus 2224TP Fabric Extender Cisco Nexus 2232TM Fabric Extender	6.1(1)
48-port, 1/10-Gigabit F2-Series module (N7K-F248XP-25).	6.0(1)
Cisco Nexus 2248TP Fabric Extender Cisco Nexus 2232PP Fabric Extender	5.2(1)
32-port, 10-Gigabit M1 module (N7K-M132XP-12) 32-port, 10-Gigabit M1 XL module (N7K-M132XP-12L).	5.1(1)