Configuring Layer 3 Interfaces

Finding Feature Information

Your software release might not support all the features documented in this module. For the latest caveats and feature information, see the Bug Search Tool at https://tools.cisco.com/bugsearch/ and the release notes for your software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the "New and Changed Information"chapter or the Feature History table in this chapter.

Feature History for Layer 3 Interfaces

This table includes only the updates for those releases that have resulted in additions or changes to the feature.

Table 1: Feature History for Layer 3 Interfaces

Feature Name	Release	Feature Information
Display errors during policy programming.	6.2(2)	Added the show interface status error policy command which displays the interfaces and VLANs that produce an error during policy programming.

Feature Name	Release	Feature Information
Clear SNMP counters from the interface	6.2(2)	Updated the **clear counters interface** command to include a keyword **snmp** that provides an option to clear SNMP values from the interface.
FEX	6.2(2)	Cisco Fabric Extenders support Layer 3 protocol adjacencies on host interfaces (HIFs) and DSCP to queue mapping. **Note** 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.
Enhanced show output for sub-interfaces	6.1(1)	Updated the **show interface eth** command output.
Three configurable sampling intervals for interface statistics	4.2(1)	Added the load-interval command.
Layer 3 interfaces	4.0(1)	This feature was introduced.

Information About Layer 3 Interfaces

Layer 3 interfaces forward IPv4 and IPv6 packets to another device using static or dynamic routing protocols. You can use Layer 3 interfaces for IP routing and inter-VLAN routing of Layer 2 traffic.

You cannot configure a shared interface as a Layer 3 interface. See the Cisco NX-OS FCoE Configuration Guide for Cisco Nexus 7000 and Cisco MDS 9000 for information about shared interfaces.

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. See the Cisco Nexus 2000 Series Fabric Extender Software Configuration Guide for Cisco Nexus 7000 Series Switches, Release 7.x for more information about fabric extenders.

Routed Interfaces

You can configure a port as a Layer 2 interface or a Layer 3 interface. A routed interface is a physical port that can route IP traffic to another device. A routed interface is a Layer 3 interface only and does not support Layer 2 protocols, such as the Spanning Tree Protocol (STP).

All Ethernet ports are routed interfaces by default. You can change this default behavior with the CLI setup script or through the **system default switchport** command.

You can assign an IP address to the port, enable routing, and assign routing protocol characteristics to this routed interface.

From Cisco Release 4.2(1), you can assign a static MAC address to a Layer 3 interface. By default, the MAC address for the Layer 3 interfaces is the MAC address of the virtual device context (VDC) it is assigned to. For information on configuring MAC addresses, see the Cisco Nexus 7000 Series NX-OS Layer 2 Switching Configuration Guide.

Routed interfaces and subinterfaces support exponentially decayed rate counters. Cisco NX-OS tracks the following statistics with these averaging counters:

- Input packets/sec

- Output packets/sec

- Input bytes/sec

- Output bytes/sec

Subinterfaces

You can create virtual subinterfaces on a parent interface configured as a Layer 3 interface. A parent interface can be a physical port or a port channel.

Subinterfaces divide the parent interface into two or more virtual interfaces on which you can assign unique Layer 3 parameters such as IP addresses and dynamic routing protocols. The IP address for each subinterface should be in a different subnet from any other subinterface on the parent interface.
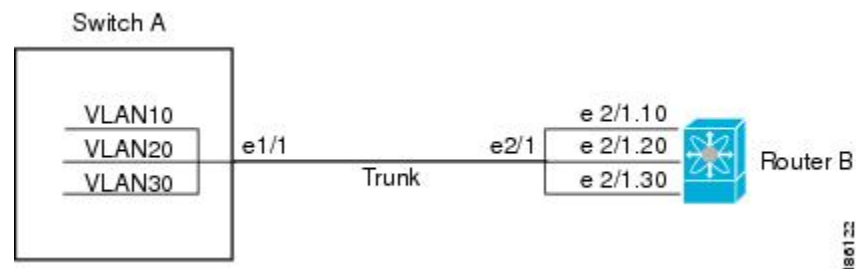
You create a subinterface with a name that consists of the parent interface name (for example, Ethernet 2/1) followed by a period and then by a number that is unique for that subinterface. For example, you could create a subinterface for Ethernet interface 2/1 named Ethernet 2/1.1 where .1 indicates the subinterface.

Cisco NX-OS enables subinterfaces when the parent interface is enabled. You can shut down a subinterface independent of shutting down the parent interface. If you shut down the parent interface, Cisco NX-OS shuts down all associated subinterfaces as well.

One use of subinterfaces is to provide unique Layer 3 interfaces to each virtual local area network (VLAN) supported by the parent interface. In this scenario, the parent interface connects to a Layer 2 trunking port on another device. You configure a subinterface and associate the subinterface to a VLAN ID using 802.1Q trunking.

The figure below shows a trunking port from a switch that connects to router B on interface E 2/1. This interface contains three subinterfaces that are associated with each of the three VLANs carried by the trunking port.

Figure 1: Subinterfaces for VLANs

For more information about VLANs, see the Cisco Nexus 7000 Series NX-OS Layer 2 Switching Configuration Guide.

VLAN Interfaces

A VLAN interface, or switch virtual interface (SVI), is a virtual routed interface that connects a VLAN on the device to the Layer 3 router engine on the same device. Only one VLAN interface can be associated with a VLAN, but you need to configure a VLAN interface for a VLAN only when you want to route between VLANs or to provide IP host connectivity to the device through a virtual routing and forwarding (VRF) instance that is not the management VRF. When you enable VLAN interface creation, Cisco NX-OS creates a VLAN interface for the default VLAN (VLAN 1) to permit remote switch administration.

You must enable the VLAN network interface feature before you can see configure it. Beginning in Cisco NX-OS Release 4.2, the system automatically takes a checkpoint prior to disabling the feature, and you can roll back to this checkpoint. See the Cisco Nexus 7000 Series NX-OS System Management Configuration Guide for information on rollbacks and checkpoints.

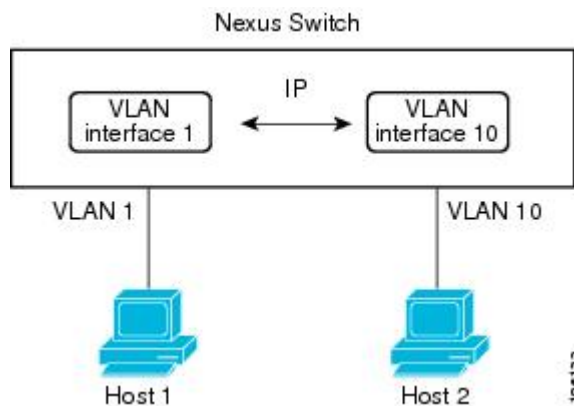You must configure the VLAN network interface in the same VDC as the VLAN.

Note   You cannot delete the VLAN interface for VLAN 1.

You can route across VLAN interfaces to provide Layer 3 inter-VLAN routing by configuring a VLAN interface for each VLAN that you want to route traffic to and assigning an IP address on the VLAN interface. For more information about IP addresses and IP routing, see the Cisco Nexus 7000 Series NX-OS Unicast Routing Configuration Guide.

The figure below shows two hosts connected to two VLANs on a device. You can configure VLAN interfaces for each VLAN that allows Host 1 to communicate with Host 2 using IP routing between the VLANs. VLAN 1 communicates at Layer 3 over VLAN interface 1 and VLAN 10 communicates at Layer 3 over VLAN interface 10.

Figure 2: Connecting Two VLANs with VLAN interfaces

Note   You can configure VLAN interface for an inband management in the Cisco Nexus 7000 Series devices with the F1 Series modules in the chassis.

Loopback Interfaces

A loopback interface is a virtual interface with a single endpoint that is always up. Any packet transmitted over a loopback interface is immediately received by this interface. Loopback interfaces emulate a physical interface. You can configure up to 1024 loopback interfaces per VDC, numbered 0 to 1023.

You can use loopback interfaces for performance analysis, testing, and local communications. Loopback interfaces can act as a termination address for routing protocol sessions. This loopback configuration allows routing protocol sessions to stay up even if some of the outbound interfaces are down.

Tunnel Interfaces

Cisco NX-OS supports tunnel interfaces as IP tunnels. IP tunnels can encapsulate a same-layer or higher layer protocol and transport the result over IP through a tunnel created between two routers.

High Availability for Layer 3 Interfaces

Layer 3 interfaces support stateful and stateless restarts. After the switchover, Cisco NX-OS applies the runtime configuration after the switchover.

See the Cisco Nexus 7000 Series NX-OS High Availability and Redundancy Guide for complete information on high availability.

Virtualization Support for Layer 3 Interfaces

Layer 3 interfaces support Virtual Routing and Forwarding instances (VRFs). VRFs exist within virtual device contexts (VDCs). By default, Cisco NX-OS places you in the default VDC and default VRF unless you specifically configure another VDC and VRF. A Layer 3 logical interface (VLAN interface, loopback) configured in one VDC is isolated from a Layer 3 logical interface with the same number configured in another VDC. For example, loopback 0 in VDC 1 is independent of loopback 0 in VDC 2.

You can configure up to 1024 loopback interfaces per VDC.

You can associate the interface with a VRF. For VLAN interfaces, you must configure the VLAN interface in the same VDC as the VLAN.

See the Cisco Nexus 7000 Series NX-OS Virtual Device Context Configuration Guide for information about VDCs and see the Cisco Nexus 7000 Series NX-OS Unicast Routing Configuration Guide for information about configuring an interface in a VRF.

Note   You must assign an interface to a VRF before you configure the IP address for that interface.

Prerequisites for Layer 3 Interfaces

Layer 3 interfaces have the following prerequisites:

- You have entered the desired VDC (see the Cisco Nexus 7000 Series NX-OS Virtual Device Context Configuration Guide, if you are configuring VDCs.

- You are familiar with IP addressing and basic configuration. See the Cisco Nexus 7000 Series NX-OS Unicast Routing Configuration Guide, for more information on IP addressing.

Guidelines and Limitations for Layer 3 Interfaces

Layer 3 interfaces have the following configuration guidelines and limitations:

- QSFP-100G-DR-S and QSFP-100G-FR-S transceivers does not support breakout.

- You can view a link-up time difference of few seconds for QSFP-100G-DR-S transceiver.

- If you change a Layer 3 interface to a Layer 2 interface, Cisco NX-OS shuts down the interface, reenables the interface, and removes all configuration specific to Layer 3.

- If you change a Layer 2 interface to a Layer 3 interface, Cisco NX-OS shuts down the interface, reenables the interface, and deletes all configuration specific to Layer 2.

- Configuring a subinterface on a physical interface that is configured to be a member of a port-channel is not supported. One must configure the subinterface under the port-channel interface itself.

- The Cisco Nexus 2000 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 supported connectivity cases:

  - SVI with Fabric Extender single port or portchannel in Layer 2 mode.

  - Fabric Extender port or portchannel in Layer 3 mode.

- Layer 3 router interfaces and subinterfaces cannot be configured on an F1 I/O module.

- When using an L3 interface on F-series modules (F2/F2e/F3) in Cisco Nexus 7000 series it is mandatory to configure QoS mapping on DSCP instead of CoS.

  Do not configure the QoS mapping on Cos because when the matching happens on CoS the L3 control traffic is placed into the default class and could be dropped due to normal congestion.

  The QoS mapping is configured in the Admin VDC using **hardware qos dscp-to-queue ingress module-type all** command or **hardware qos dscp-to-queue ingress module-type f-series** command.

- F2-series I/O modules do not support per-VLAN statistics. Therefore, the show interface command does not display per-VLAN Rx/Tx counters or statistics for switch virtual interfaces (SVIs).

Note If you are familiar with the Cisco IOS CLI, be aware that the Cisco NX-OS commands for this feature might differ from the Cisco IOS commands that you would use.

Default Settings for Layer 3 Interfaces

Table 2: Default Layer 3 Interface Parameters

Parameter	Default
Administrative state	Shut

Configuring Layer 3 Interfaces

Configuring a Routed Interface

You can configure any Ethernet port as a routed interface.

Before you begin

Before you configure this feature for the entire system, ensure that you are in the correct VDC. To change the VDC, use the **switchto vdc** command.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters the global configuration mode.
Step 2	switch(config)# **interface ethernet** *slot/port*	Enters interface configuration mode.
Step 3	switch(config-if)# **no switchport**	Configures the interface as a Layer 3 interface and deletes any configuration specific to Layer 2 on this interface.
Step 4	switch(config-if)# {**ip** | **ipv6**} **address** *ip-address/length*	Configures an IP address for this interface. See the Cisco Nexus 7000 Series NX-OS Unicast Routing Configuration Guide for more information about IP and IPv6 addresses.
Step 5	(Optional) switch(config-if)# **show interfaces**	Displays the Layer 3 interface statistics.
Step 6	(Optional) switch# **show interface status error policy** [**detail**]	Displays the interfaces and VLANs that produce errors during policy programming to ensure that policies are consistent with hardware policies. Use the **detail** command to display the details of the interfaces that produce an error.
Step 7	(Optional) switch# **no shutdown**	Clears the errors on the interfaces and VLANs where policies correspond with hardware policies. This command allows policy programming to continue and the port to come

	Command or Action	Purpose
		up. If policies do not correspond, the errors are placed in an error-disabled policy state.
Step 8	(Optional) switch(config)# **copy running-config startup-config**	Copies the running configuration to the startup configuration.

Use the medium command to set the interface medium to either point to point or broadcast.

Command	Purpose
medium {**broadcast** | **p2p**}	Configures the interface medium as either point to point or broadcast.

The default setting is broadcast, and this setting does not appear in any of the show commands. However, if you do change the setting to **p2p**, you will see this setting when you enter the **show running confi**g command.

Use the **switchport** command to convert a Layer 3 interface into a Layer 2 interface.

Command	Purpose
switchport	Configures the interface as a Layer 2 interface and deletes any configuration specific to Layer 3 on this interface.

Example

This example shows how to configure a routed interface:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# no switchport
switch(config-if)# ip address 192.0.2.1/8
switch(config-if)# copy running-config startup-config
```

The default setting for interfaces is routed. If you want to configure an interface for Layer 2, enter the **switchport** command. Then, if you change a Layer 2 interface to a routed interface, enter the **no switchport** command.

Configuring a Subinterface

You can configure one or more subinterfaces on a routed interface or on a port channel made from routed interfaces.

Before you begin

- Configure the parent interface as a routed interface.

- See the "Configuring a Routed Interface" section.

- Create the port-channel interface if you want to create a subinterface on that port channel.

- Before you configure this feature for the entire system, ensure that you are in the correct VDC. To change the VDC, use the **switchto vdc** command.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters the global configuration mode.
Step 2	switch(config)# **interface ethernet** *slot/port*	Enters interface configuration mode.
Step 3	switch(config-if)# {**ip** | **ipv6**} **address** *ip-address/length*	Configures an IP address for this interface. See the Cisco Nexus 7000 Series NX-OS Unicast Routing Configuration Guide for more information about IP and IPv6 addresses.
Step 4	switch(config-if)# **encapsulation dot1q** *vlan-id*	Configures IEEE 802.1Q VLAN encapsulation on the subinterface. The range is from 2 to 4093.
Step 5	(Optional) switch(config-if)# **show interfaces**	Displays the Layer 3 interface statistics.
Step 6	(Optional) switch(config)# **copy running-config startup-config**	Copies the running configuration to the startup configuration.

Example

This example shows how to create a subinterface:

```
switch# configure terminal
switch(config)# interface ethernet 2/1.1
switch(config-if)# ip address 192.0.2.1/8
switch(config-if)# encapsulation dot1Q 33
switch(config-if)# copy running-config startup-config
```

This example shows the output of the **show interface eth** command that is enhanced for the subinterfaces from Cisco NX-OS Release 6.1:

```
switch# show interface ethernet 1/2.1
Ethernet1/2.1 is down (Parent Interface Admin down)
admin state is down, Dedicated Interface, [parent interface is Ethernet1/2]
Hardware: 40000 Ethernet, address: 0023.ac67.9bc1 (bia 4055.3926.61d4)
Internet Address is 10.10.10.1/24
MTU 1500 bytes, BW 40000000 Kbit, DLY 10 usec
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation 802.1Q Virtual LAN, Vlan ID 11, medium is broadcast
Auto-mdix is turned off
EtherType is 0x8100
L3 in Switched:
  ucast: 0 pkts, 0 bytes - mcast: 0 pkts, 0 bytes
L3 out Switched:
  ucast: 0 pkts, 0 bytes - mcast: 0 pkts, 0 bytes
```

Configuring the Bandwidth on an Interface

You can configure the bandwidth for a routed interface, port channel, or subinterface. Higher layer protocols use a bandwidth parameter to calculate path costs. You can configure the bandwidth on a subinterface with one of the following methods:

- Explicit—Sets the bandwidth value for the subinterface directly.

- Inherit—Sets the bandwidth that all subinterfaces inherit from the parent interface as either a specific value or as the bandwidth of the parent interface.

If you do not set the subinterface bandwidth or configure it to inherit the bandwidth from the parent interface, Cisco NX-OS determines the subinterface bandwidth as follows:

- If the parent interface is up, the bandwidth of the subinterface is the same as the operational speed of the parent interface. For ports, the subinterface bandwidth is the configured or negotiated link speed. For port channels, the subinterface bandwidth is the aggregate of the link speeds of individual members of the port channel.

- If the parent interface is down, the bandwidth of the subinterface depends on the type of parent interface:

    - Port-channel subinterfaces have 100-Mb/s bandwidth for subinterfaces.

    - 1-Gb/s Ethernet ports have 1-Gb/s bandwidth for subinterfaces.

    - 10-Gb/s Ethernet ports have 10-Gb/s bandwidth for subinterfaces.

To configure the bandwidth of an interface, use the following command in interface mode:

Command	Purpose
bandwidth	Configures the bandwidth parameter for a routed interface, port channel, or subinterface.

To configure subinterfaces to inherit the bandwidth from the parent interface, use the following command in interface mode:

Command	Purpose
bandwidth inherit [*value*]	Configures all subinterfaces of this interface to inherit the bandwidth value configured. If you do not configure the value, the subinterfaces inherit the bandwidth of the parent interface. The range is from 1 to 10000000, in kilobytes.

Configuring a VLAN interface

You can create VLAN interfaces to provide inter-VLAN routing.

Before you begin

Before you configure this feature for the entire system, ensure that you are in the correct VDC. To change the VDC, use the **switchto vdc** command.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters the global configuration mode.
Step 2	switch(config)#**feature interface-vlan**	Enables VLAN interface mode.
Step 3	switch(config)# **interface vlan** *number*	Creates a VLAN interface. The number range is from 1 to 4094.
Step 4	switch(config-if)# {**ip** | **ipv6**} **address** *ip-address/length*	Configures an IP address for this interface. See the Cisco Nexus 7000 Series NX-OS Unicast Routing Configuration Guide for more information about IP and IPv6 addresses.
Step 5	(Optional) switch(config-if)# **show interface vlan** *number*	Displays the Layer 3 interface statistics.
Step 6	(Optional) switch(config-if)# **show interface status error policy** [**detail**]	Displays the interfaces and VLANs that produce errors during policy programming to ensure that policies are consistent with hardware policies. Use the **detail** command to display the details of the interfaces that produce an error.
Step 7	(Optional) switch(config-if)# **no shutdown**	Clears the errors on the interfaces and VLANs where policies correspond with hardware policies. This command allows policy programming to continue and the port to come up. If policies do not correspond, the errors are placed in an error-disabled policy state.
Step 8	(Optional) switch(config-if)# **copy running-config startup-config**	Copies the running configuration to the startup configuration.

Example

This example shows how to create a VLAN interface:

```
switch# configure terminal
switch(config)# feature interface-vlan
switch(config)# interface vlan 10
switch(config-if)# ip address 192.0.2.1/8
switch(config-if)# copy running-config startup-config
```

Configuring Inband Management in the Nexus Chassis

You can create a VLAN interface for inband management in the Cisco Nexus 7000 Series devices when there are only F1 Series modules in the chassis.

> **Note**   We recommend that you use a dedicated VLAN for inband management on the F1 Series modules. Do not run data traffic on the VLAN that you are using for inband management.

Before you begin

Before you configure this feature for the entire system, ensure that you are in the correct VDC. To change the VDC, use the **switchto vdc** command.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters the global configuration mode.
Step 2	switch(config)#**feature interface-vlan**	Enables VLAN interface mode.
Step 3	switch(config)# **interface vlan** *number*	Creates a VLAN interface. The number range is from 1 to 4094.
Step 4	switch(config-if)# **no shutdown**	Brings an interface administratively up (enable/disable an interface).
Step 5	switch(config-if)# **management**	Allows in-band management access to a VLAN interface IP address.
Step 6	switch(config-if)# **ip address** *ip-address/length*	Configures an IP address for this interface. See the Cisco Nexus 7000 Series NX-OS Unicast Routing Configuration Guide for more information about IP addresses.
Step 7	(Optional) switch(config-if)# **show interface vlan** *number*	Displays the Layer 3 interface statistics.
Step 8	(Optional) switch(config-if)# **show interface status error policy** [**detail**]	Displays the interfaces and VLANs that produce errors during policy programming to ensure that policies are consistent with hardware policies. Use the **detail** command to display the details of the interfaces that produce an error.
Step 9	(Optional) switch(config-if)# **no shutdown**	Clears the errors on the interfaces and VLANs where policies correspond with hardware policies. This command allows policy programming to continue and the port to come up. If policies do not correspond, the errors are placed in an error-disabled policy state.
Step 10	(Optional) switch(config-if)# **copy running-config startup-config**	Copies the running configuration to the startup configuration.

Example

This example shows how to create an inband management in the Cisco Nexus 7000 chassis:

```
switch# configure terminal
switch(config)# feature interface-vlan
switch(config)# interface vlan 5
switch(config-if)# no shutdown
switch(config-if)# management
switch(config-if)# ip address 192.0.2.1/8
switch(config-if)# copy running-config startup-config
```

Configuring a Loopback Interface

You can configure a loopback interface to create a virtual interface that is always up.

Before you begin

- Ensure that the IP address of the loopback interface is unique across all routers on the network.

- Before you configure this feature for the entire system, ensure that you are in the correct VDC. To change the VDC, use the **switchto vdc** command.

Procedure

	Command or Action	**Purpose**
Step 1	switch# **configure terminal**	Enters the global configuration mode.
Step 2	switch(config)# **interface loopback** *instance*	Creates a loopback interface. The range is from 0 to 1023.
Step 3	switch(config-if)# {**ip** | **ipv6**} **address** *ip-address/length*	Configures an IP address for this interface. See the Cisco Nexus 7000 Series NX-OS Unicast Routing Configuration Guide for more information about IP and IPv6 addresses.
Step 4	switch(config-if)# **show interfaces loopback** *instance*	Displays the loopback interface statistics.
Step 5	(Optional) switch(config-if)# **copy running-config startup-config**	Copies the running configuration to the startup configuration.

Example

This example shows how to create a loopback interface:

```
switch# configure terminal
switch(config)# interface loopback 0
```

```
switch(config-if)# ip address 192.0.2.100/8
switch(config-if)# copy running-config startup-config
```

Assigning an Interface to a VRF

You can add a Layer 3 interface to a VRF.

Before you begin

- Before you configure this feature for the entire system, ensure that you are in the correct VDC. To change the VDC, use the **switchto vdc** command.

- Assign the IP address for a tunnel interface after you have configured the interface for a VRF.

Procedure

	Command or Action	**Purpose**
Step 1	switch# **configure terminal**	Enters the global configuration mode.
Step 2	switch(config)# **interface** *interface-type number*	Enters interface configuration mode.
Step 3	switch(config-if)# **vrf member** *vrf-name*	Adds this interface to a VRF.
Step 4	switch(config-if)# **ip address** *ip-address/length*	Configures an IP address for this interface. See the Cisco Nexus 7000 Series NX-OS Unicast Routing Configuration Guide for more information about IP addresses.
Step 5	(Optional) switch(config-if)# **show vrf** [*vrf-name*] **interface** *interface-type number*	Displays VRF information.
Step 6	(Optional) switch(config-if)# **copy running-config startup-config**	Copies the running configuration to the startup configuration.

Example

This example shows how to add a Layer 3 interface to the VRF:

```
switch# configure terminal
switch(config)# interface loopback 0
switch(config-if)# vrf member RemoteOfficeVRF
switch(config-if)# ip address 209.0.2.1/16
switch(config-if)# copy running-config startup-config
```

Verifying the Layer 3 Interfaces Configuration

Table 3: Verifying the Layer 3 Interfaces Configuration

Command	Purpose
show interface ethernet *slot/port*	Displays the Layer 3 interface configuration, status, and counters (including the 5-minute exponentially decayed moving average of inbound and outbound packet and byte rates).
show interface ethernet *slot/port* **brief**	Displays the Layer 3 interface operational status.
show interface ethernet *slot/port* **capabilities**	Displays the Layer 3 interface capabilities, including port type, speed, and duplex.
show interface ethernet *slot/port* **description**	Displays the Layer 3 interface description.
show interface ethernet *slot/port* **status**	Displays the Layer 3 interface administrative status, port mode, speed, and duplex.
show interface ethernet *slot/port.number*	Displays the subinterface configuration, status, and counters (including the f-minute exponentially decayed moving average of inbound and outbound packet and byte rates).
show interface port-channel *channel-id.number*	Displays the port-channel subinterface configuration, status, and counters (including the 5-minute exponentially decayed moving average of inbound and outbound packet and byte rates).
show interface loopback *number*	Displays the loopback interface configuration, status, and counters.
show interface loopback *number* **brief**	Displays the loopback interface operational status.
show interface loopback *number* **description**	Displays the loopback interface description.
show interface loopback *number* **status**	Displays the loopback interface administrative status and protocol status.
show interface vlan *number*	Displays the VLAN interface configuration, status, and counters.
show interface vlan *number* **brief**	Displays the VLAN interface operational status.
show interface vlan *number* **description**	Displays the VLAN interface description.
show interface vlan *number* **private-vlan mapping**	Displays the VLAN interface private VLAN information.
show interface vlan *number* **status**	Displays the VLAN interface administrative status and protocol status.

Command	Purpose
show interface status error policy [**detail**]	Displays errors on interfaces and VLANs that are inconsistent with hardware policies.
	The **detail** command displays the details of the interfaces and VLANs that receive an error.

Monitoring Layer 3 Interfaces

Use the following commands to display Layer 2 interfaces:

Table 4: Monitoring Layer 3 Interfaces

Command	Purpose
load- interval {**interval** *seconds* {**1** | **2** | **3**}}	From Cisco NX-OS Release 4.2(1) for the Cisco Nexus 7000 Series devices, sets three different sampling intervals to bit-rate and packet-rate statistics. The range for VLAN network interface is 60 to 300 seconds, and the range for Layer interfaces is 30 to 300 seconds.
show interface ethernet *slot/port* **counters**	Displays the Layer 3 interface statistics (unicast, multicast, and broadcast).
show interface ethernet *slot/port* **counters brief**	Displays the Layer 3 interface input and output counters.
show interface ethernet *slot/port* **counters detailed** [**all**]	Displays the Layer 3 interface statistics. You can optionally include all 32-bit and 64-bit packet and byte counters (including errors).
show interface ethernet *slot/port* **counters errors**	Displays the Layer 3 interface input and output errors.
show interface ethernet *slot/port* **counters snmp**	Displays the Layer 3 interface counters reported by SNMP MIBs.
show interface ethernet *slot/port.number* **counters**	Displays the subinterface statistics (unicast, multicast, and broadcast).
show interface port-channel *channel-id.number* **counters**	Displays the port-channel subinterface statistics (unicast, multicast, and broadcast).
show interface loopback *number* **counters**	Displays the loopback interface input and output counters (unicast, multicast, and broadcast).
show interface loopback *number* **counters detailed** [**all**]	Displays the loopback interface statistics. You can optionally include all 32-bit and 64-bit packet and byte counters (including errors).

Command	Purpose
show interface loopback *number* **counters errors**	Displays the loopback interface input and output errors.
show interface vlan *number* **counters**	Displays the VLAN interface input and output counters (unicast, multicast, and broadcast).
show interface vlan *number* **counters detailed** [**all**]	Displays the VLAN interface statistics. You can optionally include all Layer 3 packet and byte counters (unicast and multicast).
show interface vlan *number* **counters snmp**	Displays the VLAN interface counters reported by SNMP MIBs.

See the Cisco Nexus 7000 Series NX-OS Interfaces Command Reference for information on these commands.

Related Documents

Table 5: Related Documents

Related Topic
Cisco Nexus 7000 Series NX-OS Interfaces Command Reference
Cisco Nexus 7000 Series NX-OS System Management Configuration Guide
Cisco Nexus 7000 Series NX-OS High Availability and Redundancy Guide
Cisco Nexus 2000 Series NX-OS Fabric Extender Software Configuration Guide for Cisco Nexus 7000 Series Switches, Release 6.x
Cisco Nexus 7000 Series NX-OS Virtual Device Context Configuration Guide
Cisco NX-OS Licensing Guide
VLANs, MAC address tables, private VLANs, and the Spanning Tree Protocol. Cisco Nexus 7000 Series NX-OS Layer 2 Switching Configuration Guide
Cisco Nexus 7000 Series NX-OS FabricPath Command Reference
Cisco Nexus 7000 Series NX-OS FabricPath Configuration Guide
Cisco Nexus 7000 Series NX-OS Release Notes

MIBs

Table 6: MIBs

MIBs	MIBs Link
• IF-MIB • CISCO-IF-EXTENSION-MIB • ETHERLIKE-MIB	To locate and download MIBs: http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml