Objective

This tech note outlines the main differences in interface support between Cisco® NX-OS Software and Cisco IOS® Software. Sample configurations are included for Cisco NX-OS and Cisco IOS Software for some common features to demonstrate the similarities and differences. Please refer to the NX-OS documentation on Cisco.com for a complete list of supported features.

Interface Configuration Overview

The NX-OS supports different physical and virtual interface types to meet various network connectivity requirements. The different interface types include: layer-2 switched (access or trunk), layer-3 routed, layer-3 routed (sub-interface trunk), switched virtual interface (SVI), port-channel, loopback, and tunnel interfaces. Port-channel interfaces are documented in the Cisco NX-OS/IOS Port-Channel ComparisonTech-Note.

Important Cisco NX-OS and Cisco IOS Software Differences

In Cisco NX-OS:

- SVI command-line interface (CLI) configuration and verification commands are not available until you enable the SVI feature with the **feature interface-vlan** command.
- Tunnel interface command-line interface (CLI) configuration and verification commands are not available until you enable the Tunnel feature with the **feature tunnel** command.
- Interfaces support stateful and stateless restarts after a supervisor switchover for high availability.
- Only 802.1q trunks are supported, so the encapsulation command isn't necessary when configuring a layer-2 switched trunk interface. (Cisco ISL is not supported)
- An IP subnet mask can be applied using **/xx** or **xxx.xxx.xxx.xxx** notation when configuring an IP address on a layer-3 interface. The IP subnet mask is displayed as **/xx** in the configuration and **show interface** command output regardless which configuration method is used.
- The CLI syntax for specifying multiple interfaces is different in Cisco NX-OS Software. The **range** keyword required in Cisco IOS Software has been omitted from the syntax (IE: **interface ethernet 1/1-2**), and the interface range can be configured in ascending or descending order. Cisco IOS Software requires the interface range to be configured in ascending order.
- When monitoring interface statistics with the **show interface** CLI command, a configurable load-interval can be configured per interface with the **load-interval counters** command to specify sampling rates for bit-rate and packet-rate statistics. The Cisco IOS Software supports the **load-interval** interface command, but doesn't support multiple sampling rates.
- I/O modules have a locator-LED (beacon) that allows remote-hands-support personnel to easily identify a specific port. The beacon light can be enabled per interface in interface configuration mode with the **beacon** CLI command.
- An administrator can configure port profiles as templates that can be applied to a large number of interfaces to simplify the CLI configuration process. Port profiles are "live" configuration templates, so modifications to a port profile are automatically applied to the associated interfaces. Cisco IOS uses port macros to simplify the CLI configuration process, but unlike Port Profiles they are applied one time.
- The supervisor module out-of-band management ethernet port located on the supervisor module is configured with the **interface mgmt 0** CLI command.
- The supervisor module out-of-band Connectivity Management Processor (CMP) port is configured in the NX-OS with the **interface cmp module <#>** CLI command. The CMP port can also be configured by attaching to the CMP using the **attach cmp** CLI command.
- The NX-OS support Nexus 2000 (models 2224TP, 2248TP, 2232PP) Fabric Extender (FEX) connectivity. The parent Nexus 7000 manages Nexus 2000?s software and CLI configuration, so the

Nexus 7000 is a single managed entity for all connected Nexus 2000's. Nexus 2000 host ports are configured using the **interface ethernet <*chassis/module/port*>** CLI command. A Nexus 2000 can only be connected to the 10GE M1, M1-XL and F2 modules (Please read the documentation on cisco.com to understand port connectivity restrictions.)

- Proxy ARP is disabled on all interfaces by default.

Things You Should Know

The following list provides some additional facts about the Cisco NX-OS that should be helpful when configuring interfaces.

- An interface can only be configured in 1 VDC at a time.
- When assigning interfaces to a VDC on the 48 port SFP/UTP M1 series modules there are no restrictions.
- When assigning interfaces to a VDC on the 32 port 10GE M1 series modules, all four interfaces in a port group (IE. group 1 =1,3,5,7 group 2 =2,4,6,8, etc.) must be assigned to the same VDC.
- When assigning interfaces to a VDC on the 32 port 1/10GE F1 Series module, both ports in a port group (IE. 1-2, 3-4, etc.) must be assigned to the same VDC.
- When assigning interfaces to a VDC on the 48 port 1/10GE F2 Series module, all four ports in a port group (IE. 1-4, 5-8, etc.) must be assigned to the same VDC.
- When assigning interfaces to a VDC on a Nexus 2224TP, 2248TP, 2232PP all interfaces must belong to the same VDC.
- One 10 GE interface per port group can be configured in dedicated mode using the **rate-mode dedicated** interface CLI command on the M1 series modules (The remaining three ports are disabled).
- The mgmt 0 port is associated to all configured VDCs allowing TELNET/SSH and IP management applications such as SNMP to access the VDC directly. All mgmt 0 ports must be configured in the same IP subnet.
- The default port type is configurable for **L3** routed or **L2** switched in the **setup** startup script. (**L3** is the default port type prior to running the script)
- A layer-2 switched trunk port sends and receives traffic for all VLANs by default (This is the same as Cisco IOS Software). Use the **switchport trunk allowed vlan** interface CLI command to specify the VLANs allowed on the trunk.
- The **clear counters interface ethernet <*x/x*>** CLI command resets the counters for a specific interface.
- An interface configuration can be reset to its default values with the **default interface <*x/x*>** global configuration command.
- The 48 port UTP M1 series module supports Time Domain Reflectometry (TDR) cable diagnostics. All 12 ports in a port group must be shutdown prior to running the **test cable-diagnostics tdr interface ethernet <*x/x*>** CLI command. The results can be verified with the **show interface ethernet <*x/x*> cable-diagnostics-tdr** command.

Configuration Comparison

The following sample code shows configuration similarities and differences between the Cisco NX-OS and Cisco IOS Software CLIs. The CLI is very similar between Cisco IOS and Cisco NX-OS Software.

Cisco IOS CLI	*Cisco NX-OS CLI*
Configuring a Routed Interface	
	interface ethernet 1/1
	ip address 192.168.1.1/24
	no shutdown
Configuring a Switched Interface (VLAN 10)	
	vlan 10
	interface ethernet 1/1
	switchport
	switchport mode access
	switchport access vlan 10
	no shutdown
Configuring a Switched Virtual Interface (SVI)	
	feature interface-vlan
	interface vlan 10
	ip address 192.168.1.1./24
	no shutdown
Configuring a Switched Trunk Interface	
	interface ethernet 1/1
	switchport mode trunk
	switchport trunk allowed vlan 10,20
	switchport trunk native vlan 2
	no shutdown
Configuring a Routed Trunk Sub-Interface	
	interface ethernet 1/1

no switchport

no shutdown

interface ethernet 1/1.10

encapsulation dot1q 10

ip address 192.168.1.1/24

no shutdown

Configuring a Loopback Interface

interface loopback 1

ip address 192.168.1.1/32

no shutdown

Configuring a Tunnel Interface

feature tunnel

interface tunnel 1

ip address 192.168.1.1/24

tunnel source 172.16.1.1

tunnel destination 172.16.2.1

no shutdown

Configuring an Interface Description

interface ethernet 1/1

description Test Interface

Configuring Jumbo Frames

interface ethernet 1/1

mtu 9216

Configuring Multiple Interfaces (Examples)

interface ethernet 1/1-2

or

interface ethernet 1/1, ethernet 2/1

Configuring Port Profiles

port-profile type ethernet Email-Template

switchport

switchport access vlan 10

spanning-tree port type edge

no shutdown

description Email Server Port

state enabled

interface ethernet 2/1-48

inherit port-profile Email-Template

TDR Cable Diagnostics

test cable-diagnostics tdr interface etherent 1/1

Configuring the Interface Locator-LED (Beacon)

interface ethernet 1/1

beacon

Configuring a Nexus 2000(FEX) Host Interface

interface ethernet 101/1/1

Verification Command Comparison

The following table lists some useful **show** commands for verifying the status and troubleshooting an interface.

Cisco NX-OS Interface	**Cisco IOS Software Interface**	**Command Description**
show interface	show interface	Displays the status and statistics for all interfaces or a specific interface
show interface ethernet <*x/x/x*>	-	Displays the status and statistics for a FEX host interface
show interface ethernet <*x/x*> **cable-diagnostics tdr**	show cable-diagnostics tdr interface *type* <*x/x*>	Displays TDR test results
show interface brief	-	Displays a brief list of the interfaces

		(type, mode, status, speed, MTU)
show interface capabilities	show interface capabilities	Displays interface capabilities
show interface counters	show interface counters	Displays interface counters (input/output unicast, multicast & broadcast)
show interface debounce	show interface debounce	Displays the de-bounce status and time in ms for all interfaces
show interface description	show interface description	Displays all interfaces with configured descriptions
show interface ethernet	show interface ethernet	Displays status and statistics for a specific interface
show interface fex-fabric	-	Displays FEX fabric interface status
show interface flowcontrol	show interface flowcontrol	Displays Flow Control (802.1p) status and state for all interfaces
show interface loopback	show interface loopback	Displays status and statistics for a specific loopback interface
show interface mac-address	-	Displays all interfaces and their associated MAC Addresses
show interface mgmt	-	Displays status and statistics for the management interface located on the supervisor
show interface port-channel	show interface port-channel	Displays status and statistics for a specific port-channel
show interface priority-flow-control	-	Displays PFC information
show interface pruning	show interface pruning	Displays trunk interfaces VTP pruning information
show interface snmp-ifindex	-	Displays SNMP interface index
show interface status	show interface status	Displays all interfaces and their current status
show interface switchport	show interface switchport	Displays a list of all interfaces that are configured as switchports
show interface transceiver	show interface transceiver	Displays a list of all interfaces and optic information (calibrations, details)
show interface trunk	show interface trunk	Displays a list of all interfaces configured as trunks
show interface tunnel <#>	show interface tunnel <#>	Displays status and statistics for a specific tunnel interface
show interface vlan <#>	show interface vlan <#>	Displays status and statistics for a specific VLAN interface
show port-profile	-	Displays all port profile information
show port-profile brief	-	Displays brief port profile information
show port-profile expand-interface	-	Displays active profile configuration applied to an interface

show port-profile name	-	Displays specific port profile
show port-profile sync-status	-	Displays interfaces out of sync with port profiles
show port-profile usage	-	Displays interfaces inherited to a port profile