

Objective

This tech note outlines the main differences in Port-Channel 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.

Port-Channel Overview

Port-Channels provide a mechanism for aggregating multiple physical Ethernet links into a single logical Ethernet link. Port-Channels are typically used to increase availability and bandwidth, while simplifying the network topology. Port-Channels can be configured using Static Mode (no protocol) or the Link Access Control Protocol (LaCP) defined in IEEE 802.3ad for dynamic negotiations and keep-alive detection for failover.

Important Cisco NX-OS and Cisco IOS Software Differences

In Cisco NX-OS:

- 528 Port-Channels are supported per chassis in Cisco NX-OS Software release 5.2(1). 256 Port-channels were supported prior to Cisco NX-OS Software release 5.2(1).
- A Port-Channel interface number can be configured to use numbers 1 - 4096 per VDC. The Cisco IOS Software uses numbers 1-256 per chassis.
- LaCP and Static Mode Port-Channels are supported (PaGP is not supported in Cisco NX-OS Software).
- LaCP command-line interface (CLI) configuration and verification commands are not available until you enable the LaCP feature with the **feature lacp** command.
- A Port-Channel configured on F series modules supports up to 16 active members. Cisco IOS Software supports 8 active members.
- The CLI syntax for specifying multiple interfaces is different in Cisco NX-OS Software. The **range** keyword has been omitted from the syntax (IE: **interface ethernet 1/1-2**)
- A Port-Channel can be converted between a layer-2 and layer-3 Port-Channel without removing the member ports.
- The **force** keyword can be used when adding an interface to an existing Port-Channel to force the new interface to inherit all of the existing Port-Channel compatibility parameters.
- Bidirectional Forwarding Detection (BFD) can be configured with supporting protocols (IE: BGP, OSPF, PIM, etc...) over a Port-Channel interface. Cisco IOS Software does not support BFD on Port-Channel interfaces.

Things You Should Know

The following list provides some additional facts about the Cisco NX-OS that should be helpful when designing, configuring, and maintaining a network using Port-Channels.

- A single Port-Channel cannot connect to two different VDCs in the same chassis.
- A single Port-Channel cannot connect to an M series and F series module simultaneously.

Cisco_NX-OS/IOS_Port-Channel_Comparison

- Do not mix dedicated and shared member ports when configuring a port channel using M series modules.
- You cannot disable LaCP with the **no feature lacp** command if LaCP is configured for a Port-Channel. LaCP must be disabled on all Port-Channels prior to disabling LaCP globally.
- The LaCP rate timer can be configured per physical interface using the **lacp rate** interface command (**normal** (default) = 30 seconds and **fast** = 1 second).
- The **lacp min-links** interface command can be configured to guarantee bandwidth by preventing a low-bandwidth port-channel from becoming active if the minimum numbers of links are not operational.
- By default, the load-balancing method for IP traffic is configured for **source-dest-ip** address and Non-IP traffic is configured for **source-dest-mac** address.
- The **show port-channel compatibility-parameters** command is very useful for verifying interface parameters when configuring Port-Channels.
- The **show port-channel load-balance forwarding-path** command can be used to determine the individual link a flow traverses over a specific Port-Channel.
- The **show running-config interface port-channel <#>** command can be used to verify the configuration for a specific port-channel interface.

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. Cisco NX-OS does not use the **range** keyword when specifying multiple interfaces. Cisco NX-OS also has the ability to force an interface to inherit existing Port-Channel compatibility parameters using the **force** keyword.

Cisco IOS CLI

Cisco NX-OS CLI

Enabling the LaCP Feature

```
feature lacp
```

Configuring LaCP Active Mode

```
interface ethernet 1/1-2
```

```
channel-group 1 mode active
```

Configuring LaCP Passive Mode

```
interface ethernet 1/1-2
```

```
channel-group 1 mode passive
```

Configuring the LaCP Rate Timer (Fast)

```
interface ethernet1/1
```

```
lacp rate fast
```

Configuring the LaCP Min/Max Links

```
interface port-channel 1
```

```
lacp min-links 2
```

```
lacp max-bundle 4
```

Configuring Static Mode (no protocol)

```
interface ethernet 1/1-2  
  
channel-group 1 mode on
```

Enabling a Port Channel

```
interface port-channel 1  
  
no shutdown
```

Layer-2 Port-Channel Example

```
interface ethernet 1/1-2  
  
switchport  
  
channel-group 1 mode active
```

```
interface port-channel 1  
  
no shutdown
```

Layer-3 Port-Channel Example

```
interface ethernet 1/1-2  
  
no switchport  
  
channel-group 1 mode active
```

```
interface port-channel 1  
  
ip address 192.168.1.1/32  
  
no shutdown
```

Adding an Interface to an Existing Port-Channel

```
interface ethernet 1/3  
  
channel-group 1 force mode active
```

Configuring the System Load-Balance Algorithm

```
port-channel load-balance ethernet  
destination-mac
```

Configuring the Load-Balance Algorithm per Module

**port-channel load-balance ethernet
destination-mac module 1**

Verification Command Comparison

The following table lists some useful **show** commands for verifying and troubleshooting a Port-Channel configuration.

Cisco NX-OS Port-Channels	Cisco IOS Software Port-Channels	Command Description
show interface	show interface	Displays statistics all interfaces or a specific interface
show interface port-channel <#>	show interface port-channel <#>	Displays statistics for a specific port-channel
show port-channel capacity	-	Displays port-channel resources (total, used, free)
show port-channel compatibility-parameters	-	Displays the compatibility-parameters (IE: speed, duplex, etc)
show port-channel database	-	Displays the aggregation state for one or more port-channels
show port-channel load-balance	show etherchannel load-balance	Displays the load-balancing algorithm (hash) configured
show port-channel load-balance forwarding-path	show etherchannel load-balance hash-result	Displays packet forwarding information
show port-channel summary	show etherchannel summary	Displays a summarized list of all port-channels
show port-channel traffic	-	Displays the load per link in a port-channel (Based in interface counters)
show port-channel usage	-	Displays the range of used and unused port-channel numbers
show lacp counters	show lacp counters	Displays the LaCP PDU and error counters
show lacp interface	-	Displays detailed LaCP information per interface
show lacp neighbors	show lacp neighbors	Displays detailed LaCP information per neighbor
show lacp port-channel	show lacp <port-channel-#>	Displays the port-channel LaCP configuration
show lacp system-identifier	show lacp sys-id	Displays the LaCP system ID (Priority / MAC address)