

Objective

This tech note outlines the main differences in the Switched Port Analyzer (SPAN) 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.

SPAN Overview

The SPAN feature allows traffic to be mirrored from within a switch from a specified source to a specified destination. This feature is typically used when detailed packet information is required for troubleshooting, traffic analysis, and security-threat prevention.

Important Cisco NX-OS and Cisco IOS Software Differences

In Cisco NX-OS:

- Local SPAN and Encapsulated Remote SPAN (ERSPAN) are supported.
- Remote SPAN (RSPAN) VLANs can be configured only as SPAN sources.
- 48 monitor sessions can be configured. Only 2 SPAN sessions (SPAN, ERSPAN source) sessions can be active simultaneously (23 ERSPAN destination sessions can be active simultaneously).
- Cisco NX-OS uses a hierarchical configuration based on the **monitor session <#>** command, whereas Cisco IOS Software has the option for flat for hierarchical configuration in Cisco IOS Software release 12.2SXH and later.
- A single SPAN session can include mixed sources (Ethernet ports, Ethernet Port-Channels, RSPAN sources, VLANs, and the CPU control-plane interface).
- Destination SPAN interfaces must be configured as a layer-2 interface with the **switchport** and the **switchport monitor** interface commands.
- The SPAN feature supports stateless and stateful process restarts.

Things You Should Know

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

- Two active sessions are supported for all virtual device contexts (VDCs).
- 128 source interfaces can be configured per session.
- 32 source VLANs can be configured per session.
- 32 destination interfaces can be configured per session.
- Monitor sessions are disabled by default. They can be enabled with the **no shut** command.
- An active SPAN session uses hardware resources and should always be disabled with the **shut** command when monitoring is not required.
- The supervisor module management interface (**mgmt0**) cannot be configured as a SPAN source or destination interface.
- An interface cannot be configured as both a source and destination interface.
- Ethernet and Port-Channel sub-interfaces cannot be configured as source or destination interfaces. When configuring a source interface, specify the primary interface as the source interface and use the **filter-vlan** command to specify the 802.1q tag associated to the sub-interface.

Cisco_NX-OS/IOS_SPAN_Comparison

- The in-band control-plane interface to the CPU can be monitored only from the default VDC. (All traffic to and from the CPU for all VDC's is visible.)
- The source traffic direction can be configured as **rx**, **tx**, or **both**. The default is **both**.
- When a VLAN is specified as a source, traffic to and from the layer-2 physical interfaces associated to the specified VLAN are sent to the SPAN destination (Ingress and egress traffic between SVI/VLANs are not captured if the traffic does not go in or out a physical interface).
- By default, SPAN does not copy the IEEE 802.1q tag from trunk source interfaces.
- A destination interface can be configured in **switchport access** or **switchport trunk** mode. (Trunk mode allows you to tag traffic toward a destination or to perform destination VLAN filtering.)
- A destination interface does not participate in a spanning-tree instance.
- A destination interface can be configured with the **switchport monitor ingress** interface command to allow the destination device (IE: IDS) to disrupt packet flows.
- A destination port can be configured in only one SPAN session at a time.
- ERSPAN is VRF aware. The **vrf** command can be configured under the monitor session to specify which VRF instance the source and destination addresses belong too.
- ERSPAN uses the **erspan-id <#>** monitor session command to associate the source and destination ERSPAN monitors sessions.
- An ERSPAN source can be configured with an extended ACL to preserve bandwidth by filtering unwanted traffic prior to sending the interesting traffic to the remote destination.

Configuration Comparison

The following sample code shows the configuration similarities and differences between the Cisco NX-OS and Cisco IOS Software command-line interfaces (CLIs). The Cisco IOS Software syntax shown here is from Cisco IOS Software release 12.2SXH, so its hierarchy is similar to the Cisco NX-OS Software. Older versions of Cisco IOS Software only support a flat configuration.

Cisco IOS CLI

Cisco NX-OS CLI

Configuring the Destination Switchport Mode

```
interface ethernet 2/2
```

```
switchport
```

```
switchport monitor
```

Configuring Destination Port Ingress Forwarding and Learning

```
interface ethernet 2/2
```

```
switchport
```

```
switchport monitor ingress learning
```

Configuring a SPAN Monitor (Ethernet Source and Destination)

```
monitor session 1
```

```
source interface ethernet 2/1 both
```

```
destination interface ethernet 2/2
```

Configuring a SPAN Monitor (VLAN Source)

no shut

monitor session 1

source vlan 10,20 both

destination interface ethernet 2/2

no shut

Filtering VLANs for IEEE 802.1q Trunk Sources

interface ethernet 2/1

switchport

switchport mode trunk

switchport trunk allowed vlan 10-20

monitor session 1

source interface ethernet 2/1 both

destination interface ethernet 2/2

filter vlan 15-20

no shut

Configuring a SPAN Monitor (CPU Source)

monitor session 1

source interface sup-eth0 rx

destination interface ethernet 2/2

no shut

Configuring an ERSPAN Monitor (Source)

**monitor erspan origin ip-address 192.168.1.1
global**

monitor session 1 type erspan-source

destination ip 192.168.2.1

erspan-id 1

vrf default

Cisco_NX-OS/IOS_SPAN_Comparison

source interface ethernet 1/26 both

no shut

Configuring an ERSPAN Monitor (Destination)

interface ethernet 1/26

switchport

switchport monitor

monitor session 1 type erspan-destination

source ip 192.168.2.1

destination interface ethernet 1/26

erspan-id 1

vrf default

no shut

Verification Command Comparison

The following table compares some useful **show** commands for verifying and troubleshooting the SPAN feature.

Cisco NX-OS SPAN	Cisco IOS Software SPAN	Command Description
show interface	show interface	Displays interface status and characteristics
show monitor session <#>	show monitor session <#>	Displays a specific monitor session
show monitor session <#> brief	-	Displays brief information for a specific monitor session
show monitor session all	show monitor session all	Displays all SPAN and monitor sessions
show monitor session all brief	-	Displays brief information for all monitor sessions
show monitor range <#-#>	show monitor range <#-#>	Displays a range of specific monitor sessions
show monitor range <#-#> brief	-	Displays brief information for a range of specific monitor sessions