



## Configuring SPAN

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## Configuring SPAN

The Switched Port Analyzer (SPAN) feature (sometimes called port mirroring or port monitoring) selects network traffic for analysis by a network analyzer. The network analyzer can be a Cisco SwitchProbe, a Fibre Channel Analyzer, or other Remote Monitoring (RMON) probes.

### SPAN Sources

SPAN sources refer to the interfaces from which traffic can be monitored. The Cisco Nexus 5000 Series switch supports Ethernet, Fibre Channel, virtual Fibre Channel, port channels, SAN port channels, VLANs, and VSANs as SPAN sources. With VLANs or VSANs, all supported interfaces in the specified VLAN or VSAN are included as SPAN sources. You can choose the SPAN traffic in the ingress direction, the egress direction, or both directions for Ethernet, Fibre Channel, and virtual Fibre Channel source interfaces:

- Ingress source (Rx)—Traffic entering the switch through this source port is copied to the SPAN destination port.
- Egress source (Tx)—Traffic exiting the switch through this source port is copied to the SPAN destination port.

If the SPAN source interface sends more than 6-Gbps traffic or if traffic bursts too much, a Nexus 5020 switch or Nexus 5010 switch drops traffic on the source interface. You can use the **switchport monitor rate-limit 1G** command on the SPAN destination to reduce the dropping of actual traffic on the source interface; however, SPAN traffic is restricted to 1Gb.



#### Note

On the Cisco Nexus 5548 Switch, Fibre Channel ports and VSAN ports cannot be configured as ingress source ports in a SPAN session.

## Characteristics of Source Ports

A source port, also called a monitored port, is a switched interface that you monitor for network traffic analysis. The switch supports any number of ingress source ports (up to the maximum number of available ports on the switch) and any number of source VLANs or VSANs.

A source port has these characteristics:

- Can be of any port type: Ethernet, Fibre Channel, virtual Fibre Channel, port channel, SAN port channel, VLAN, and VSAN.
- Cannot be monitored in multiple SPAN sessions.
- Cannot be a destination port.
- Each source port can be configured with a direction (ingress, egress, or both) to monitor. For VLAN and VSAN sources, the monitored direction can only be ingress and applies to all physical ports in the group. The RX/TX option is not available for VLAN or VSAN SPAN sessions.
- Beginning with Cisco NX-OS Release 5.0(2)N1(1), Port Channel and SAN Port Channel interfaces can be configured as ingress or egress source ports.
- Source ports can be in the same or different VLANs or VSANs.
- For VLAN or VSAN SPAN sources, all active ports in the source VLAN or VSAN are included as source ports.
- For Cisco NX-OS Release 4.2(1)N2(1) and earlier, the Cisco Nexus 5010 Switch and the Cisco Nexus 5020 Switch supports a maximum of two egress SPAN source ports.
- Beginning with NX-OS Release 5.0(2)N1(1), there is no limit to the number of egress SPAN source ports.
- The limit on the number of egress (TX) sources in a monitor session has been lifted.
- On the Cisco Nexus 5548 Switch, Fibre Channel ports and VSAN ports cannot be configured as ingress source ports in a SPAN session.

## SPAN Destinations

SPAN destinations refer to the interfaces that monitors source ports. The Cisco Nexus 5000 Series switch supports Ethernet and Fibre Channel interfaces as SPAN destinations.

Source SPAN	Dest SPAN
Ethernet	Ethernet
Fibre Channel	Fibre Channel
Fibre Channel	Ethernet (FCoE)
Virtual Fibre Channel	Fibre Channel
Virtual Fibre Channel	Ethernet (FCoE)

## Characteristics of Destination Ports

Each local SPAN session must have a destination port (also called a monitoring port) that receives a copy of traffic from the source ports, VLANs, or VSANs. A destination port has these characteristics:

- Can be any physical port, Ethernet, Ethernet (FCoE), or Fibre Channel, and virtual Fibre Channel ports cannot be destination ports.
- Cannot be a source port.
- Cannot be a port channel or SAN port channel group.
- Does not participate in spanning tree while the SPAN session is active.
- Is excluded from the source list and is not monitored if it belongs to a source VLAN of any SPAN session.
- Receives copies of sent and received traffic for all monitored source ports. If a destination port is oversubscribed, it can become congested. This congestion can affect traffic forwarding on one or more of the source ports.

## Configuring SPAN

### Creating and Deleting a SPAN Session

You create a SPAN session by assigning a session number using the monitor command. If the session already exists, any additional configuration is added to that session.

#### SUMMARY STEPS

1. switch# **configure terminal**
2. switch(config)# **monitor session** *session-number*

#### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	switch# <b>configure terminal</b>	Enters configuration mode.
<b>Step 2</b>	switch(config)# <b>monitor session</b> <i>session-number</i>	Enters the monitor configuration mode. New session configuration is added to the existing session configuration.

## Configuring the Destination Port

### Configuring an Ethernet Destination Port



**Note** The SPAN destination port can only be a physical port on the switch.

You can configure an Ethernet interface as a SPAN destination port.

### SUMMARY STEPS

1. switch# **configure terminal**
2. switch(config)# **interface ethernet** *slot/port*
3. switch(config-if)# **switchport monitor**
4. switch(config-if)# **exit**
5. switch(config)# **monitor session** *session-number*
6. switch(config-monitor)# **destination interface ethernet** *slot/port*

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	switch# <b>configure terminal</b>	Enters configuration mode.
<b>Step 2</b>	switch(config)# <b>interface ethernet</b> <i>slot/port</i>	Enters interface configuration mode for the specified Ethernet interface selected by the slot and port values.
<b>Step 3</b>	switch(config-if)# <b>switchport monitor</b>	Sets the interface to monitor mode. Priority flow control is disabled when the port is configured as a SPAN destination.
<b>Step 4</b>	switch(config-if)# <b>exit</b>	Reverts to global configuration mode.
<b>Step 5</b>	switch(config)# <b>monitor session</b> <i>session-number</i>	Enters the monitor configuration mode.
<b>Step 6</b>	switch(config-monitor)# <b>destination interface ethernet</b> <i>slot/port</i>	Configures the Ethernet destination port.

The following example shows configuring an Ethernet SPAN destination port:

```
switch# configure terminal
switch(config)# interface ethernet 1/3
switch(config-if)# switchport monitor
switch(config-if)# exit
switch(config)# monitor session 2
switch(config-monitor)# destination interface ethernet 1/3
```

### Configuring the Rate Limit for SPAN Traffic

Beginning with Cisco NX-OS Release 5.0(3)N1(1), on Cisco Nexus 5000 Platform switches, you can rate-limit the SPAN traffic to 1Gbps across the entire monitor session to avoid impacting the monitored production traffic. This feature is not necessary and not supported on the Nexus 5500 Platform.

## SUMMARY STEPS

1. switch# **configure terminal**
2. switch(config)# **interface ethernet slot/port**
3. switch(config-if)# **switchport monitor rate-limit 1G**
4. switch(config-if)# **exit**

## DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	switch# <b>configure terminal</b>	Enters configuration mode.
<b>Step 2</b>	switch(config)# <b>interface ethernet slot/port</b>	Enters interface configuration mode for the specified Ethernet interface selected by the slot and port values.
<b>Step 3</b>	switch(config-if)# <b>switchport monitor rate-limit 1G</b>	Specifies that the rate limit is 1 GB.
<b>Step 4</b>	switch(config-if)# <b>exit</b>	Reverts to global configuration mode.

This example shows how to limit the bandwidth on Ethernet interface 1/2 to 1 GB:

```
switch(config)# interface ethernet 1/2
switch(config-if)# switchport monitor rate-limit 1G
switch(config-if)#
```

## Configuring Fibre Channel Destination Port



### Note

The SPAN destination port can only be a physical port on the switch.

You can configure a Fibre Channel port as a SPAN destination port.

## SUMMARY STEPS

1. switch# **configure terminal**
2. switch(config)# **interface fc slot/port**
3. switch(config-if)# **switchport mode SD**
4. switch(config-if)# **switchport speed 1000**
5. switch(config-if)# **exit**
6. switch(config)# **monitor session session-number**
7. switch(config-monitor)# **destination interface fc slot/port**

## DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	switch# <b>configure terminal</b>	Enters configuration mode.
<b>Step 2</b>	switch(config)# <b>interface fc slot/port</b>	Enters interface configuration mode for the specified Fibre Channel interface selected by the slot and port values.
<b>Step 3</b>	switch(config-if)# <b>switchport mode SD</b>	Sets the interface to SPAN destination (SD) mode.
<b>Step 4</b>	switch(config-if)# <b>switchport speed 1000</b>	Sets the interface speed to 1000. The auto speed option is not allowed.
<b>Step 5</b>	switch(config-if)# <b>exit</b>	Reverts to global configuration mode.
<b>Step 6</b>	switch(config)# <b>monitor session session-number</b>	Enters the monitor configuration mode.
<b>Step 7</b>	switch(config-monitor)# <b>destination interface fc slot/port</b>	Configures the Fibre Channel destination port.

The following example shows configuring an Ethernet SPAN destination port:

```
switch# configure terminal
switch(config)# interface fc 2/4
switch(config-if)# switchport mode SD
switch(config-if)# switchport speed 1000
switch(config-if)# exit
switch(config)# monitor session 2
switch(config-monitor)# destination interface fc 2/4
```

## Configuring Source Ports

You can configure the source ports for a SPAN session. The source ports can be Ethernet, Fibre Channel, or virtual Fibre Channel ports.

## SUMMARY STEPS

1. switch(config-monitor)# **source interface type slot/port [rx | tx | both]**

## DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	switch(config-monitor)# <b>source interface type slot/port [rx   tx   both]</b>	Configures sources and the traffic direction in which to duplicate packets. You can enter a range of Ethernet, Fibre Channel, or virtual Fibre Channel ports. You can specify the traffic direction to duplicate as ingress (rx), egress (tx), or both. By default, the direction is both.

The following example shows configuring an Ethernet SPAN source port:

```
switch# configure terminal
switch(config)# monitor session 2
switch(config-monitor)# source interface ethernet 1/16
```

The following example shows configuring a Fibre Channel SPAN source port:

```
switch(config-monitor)# source interface fc 2/1
```

The following example shows configuring a virtual Fibre Channel SPAN source port:

```
switch(config-monitor)# source interface vfc 129
```

## Configuring Source Port Channels, VLANs, or VSANs

You can configure the source channels for a SPAN session. These ports can be port channels, SAN port channels, VLANs, and VSANs. Beginning with Cisco NX-OS Release 5.0(2)N2(1), the monitored direction can be ingress, egress, or both and applies to all physical ports in the group; the direction can only be ingress for NX-OS Release 5.0(2)N1(1) and earlier releases.



### Note

The Cisco Nexus 5000 Series switch supports two active SPAN sessions. The Cisco Nexus 5548 Switch supports four active SPAN sessions. When you configure more than two SPAN sessions, the first two sessions are active. During startup, the order of active sessions is reversed; the last two sessions are active. For example, if you configured ten sessions 1 to 10 where 1 and 2 are active, after a reboot, sessions 9 and 10 will be active. To enable deterministic behavior, explicitly suspend the sessions 3 to 10 with the **monitor session session-number shut** command. See *Suspending a SPAN Session*.

## SUMMARY STEPS

1. switch(config-monitor)# **source {interface {port-channel | san-port-channel} channel-number [rx | tx | both] | vlan vlan-range | vsan vsan-range }**

## DETAILED STEPS

	Command or Action	Purpose
Step 1	switch(config-monitor)# <b>source {interface {port-channel   san-port-channel} channel-number [rx   tx   both]   vlan vlan-range   vsan vsan-range }</b>	Configures port channel, SAN port channel, VLAN, or VSAN sources. For VLAN or VSAN sources, the monitored direction is implicit.

This example shows how to configure a port channel SPAN source:

```
switch# configure terminal
switch(config)# monitor session 2
switch(config-monitor)# source interface port-channel 1 rx
switch(config-monitor)# source interface port-channel 3 tx
switch(config-monitor)# source interface port-channel 5 both
```

This example shows how to configure a SAN port channel SPAN source:

```
switch(config-monitor)# source interface san-port-channel 3 rx
```

This example shows how to configure a VLAN SPAN source:

```
switch(config-monitor)# source vlan 1
```

This example shows how to configure a VSAN SPAN source:

```
switch(config-monitor)# source vsan 1
```

## Configuring the Description of a SPAN Session

You can provide a descriptive name of the SPAN session for ease of reference.

**SUMMARY STEPS**

1. switch(config-monitor)# **description** *description*

**DETAILED STEPS**

	Command or Action	Purpose
<b>Step 1</b>	switch(config-monitor)# <b>description</b> <i>description</i>	Applies a descriptive name to the SPAN session.

The following example shows configuring a description of a SPAN session:

```
switch# configure terminal
switch(config)# monitor session 2
switch(config-monitor)# description monitoring ports fc2/2-fc2/4
```

**Activating a SPAN Session**

The default is to keep the session state shut. You can open a session that duplicates packets from sources to destinations.

**SUMMARY STEPS**

1. switch(config)# **no monitor session** {**all** | *session-number*} **shut**

**DETAILED STEPS**

	Command or Action	Purpose
<b>Step 1</b>	switch(config)# <b>no monitor session</b> { <b>all</b>   <i>session-number</i> } <b>shut</b>	Opens the specified SPAN session or all sessions.

The following example shows activating a SPAN session:

```
switch(config)# no monitor session 3 shut
```

**Suspending a SPAN Session**

The default is to keep the session state shut. You can suspend a SPAN session.

**SUMMARY STEPS**

1. switch(config)# **monitor session** {**all** | *session-number*} **shut**

**DETAILED STEPS**

	Command or Action	Purpose
<b>Step 1</b>	switch(config)# <b>monitor session</b> { <b>all</b>   <i>session-number</i> } <b>shut</b>	Suspends the specified SPAN session or all sessions.



The following example shows suspending a SPAN session:

```
switch(config)# monitor session 3 shut
```



**Note**

The Cisco Nexus 5000 Series switch supports two active SPAN sessions. The Cisco Nexus 5548 Switch supports four active SPAN sessions. When you configure more than two SPAN sessions, the first two sessions are active. During startup, the order of active sessions is reversed; the last two sessions are active. For example, if you configured ten sessions 1 to 10 where 1 and 2 are active, after a reboot, sessions 9 and 10 will be active. To enable deterministic behavior, explicitly suspend the sessions 3 to 10 with the `monitor session session-number shut` command.

## Displaying SPAN Information

To display SPAN information, perform this task:

### SUMMARY STEPS

1. switch# **show monitor** [session {all | session-number | range session-range} [brief]]

### DETAILED STEPS

	Command or Action	Purpose
Step 1	switch# <b>show monitor</b> [session {all   session-number   range session-range} [brief]]	Displays the SPAN configuration.

This example shows how to display SPAN session information:

```
switch# show monitor
SESSION STATE REASON DESCRIPTION
-----
2 up The session is up
3 down Session suspended
4 down No hardware resource
```

This example shows how to display SPAN session details:

```
switch# show monitor session 2
session 2
-----
type : local
state : up
source intf :
  rx : fc3/1
  tx : fc3/1
  both : fc3/1
source VLANs :
  rx :
source VSANs :
  rx : 1
destination ports : Eth3/1
```

