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.

This chapter includes the following sections:
- SPAN Sources, page 1-1
- SPAN Destinations, page 1-2
- Configuring SPAN, page 1-3

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.

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.
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.

<table>
<thead>
<tr>
<th>Source SPAN</th>
<th>Dest SPAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethernet</td>
<td>Ethernet</td>
</tr>
<tr>
<td>Fibre Channel</td>
<td>Fibre Channel</td>
</tr>
<tr>
<td>Fibre Channel</td>
<td>Ethernet (FCoE)</td>
</tr>
<tr>
<td>Virtual Fibre Channel</td>
<td>Fibre Channel</td>
</tr>
<tr>
<td>Virtual Fibre Channel</td>
<td>Ethernet (FCoE)</td>
</tr>
</tbody>
</table>

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

You can configure a SPAN session to duplicate packets from source ports to the specified destination ports on the switch. This section includes the following topics:

- Creating and Deleting a SPAN Session, page 1-3
- Configuring the Destination Port, page 1-4
- Configuring Source Ports, page 1-5
- Configuring Source Port Channels, VLANs, or VSANs, page 1-6
- Configuring the Description of a SPAN Session, page 1-6
- Suspending or Activating a SPAN Session, page 1-7
- Displaying SPAN Information, page 1-7

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.

To create a SPAN session, perform this task:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>switch# configure terminal</td>
</tr>
<tr>
<td></td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>switch(config)# monitor session session-number</td>
</tr>
<tr>
<td></td>
<td>Enters the monitor configuration mode. New session configuration is added to the existing session configuration.</td>
</tr>
<tr>
<td></td>
<td>The session-number can be from 1 to 18. You can configure up to 18 sessions; however you can have only 2 sessions active at a time.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
</tbody>
</table>

The following example shows creating a SPAN session:

switch# configure terminal
switch(config)# monitor session 2

To ensure that you are working with a completely new session, you can delete the desired session number or all SPAN sessions.
To delete SPAN sessions, perform this task:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>switch(config)# no monitor session {all</td>
<td>session-number}</td>
</tr>
</tbody>
</table>

### Configuring the Destination Port

The SPAN destination port can only be a physical port on the switch. There are minor differences between the configuration of Ethernet and Fibre Channel destination ports as detailed in the following topics.

### Configuring an Ethernet Destination Port

To configure an Ethernet interface as a SPAN destination port, perform this task:

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

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 Fibre Channel Destination Port

To configure a Fibre Channel port as a SPAN destination port, perform this task:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>switch# configure terminal</td>
</tr>
<tr>
<td>Step 2</td>
<td>switch(config)# interface fc slot/port</td>
</tr>
<tr>
<td>Step 3</td>
<td>switch(config-if)# switchport mode SD</td>
</tr>
<tr>
<td>Step 4</td>
<td>switch(config-if)# switchport speed 1000</td>
</tr>
<tr>
<td>Step 5</td>
<td>switch(config-if)# exit</td>
</tr>
<tr>
<td>Step 6</td>
<td>switch(config)# monitor session session-number</td>
</tr>
<tr>
<td>Step 7</td>
<td>switch(config-monitor)# destination interface fc slot/port</td>
</tr>
</tbody>
</table>

The following example shows configuring an Ethernet SPAN destination port:

```bash
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.

To configure the source ports for a SPAN session, perform this task:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>switch(config-monitor)# source interface type slot/port [rx</td>
<td>tx</td>
</tr>
</tbody>
</table>

The following example shows configuring an Ethernet SPAN source port:

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

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. The monitored direction can only be ingress and applies to all physical ports in the group.

To configure the source channels for a SPAN session, perform this task:

```
Command Purpose
switch(config-monitor)# source {interface [port-channel | san-port-channel] channel-number rx | vlan vlan-range | vsan vsan-range }
```

The following example shows configuring a port channel SPAN source:

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

The following example shows configuring a SAN port channel SPAN source:

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

The following example shows configuring a VLAN SPAN source:

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

- The following example shows configuring a VSAN SPAN source:

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

Configuring the Description of a SPAN Session

To provide a descriptive name of the SPAN session for ease of reference, perform this task:

```
Command Purpose
switch(config-monitor)# description description
```

Applies a descriptive name to the SPAN session.
Send feedback to nx5000-docfeedback@cisco.com

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
```

### Suspending or Activating a SPAN Session

The default is to keep the session state shut. To open a session that duplicates packets from sources to destinations, perform this task:

```
Command | Purpose
-------- | ------------------------
switch(config)# no monitor session {all | session-number} shut | Opens the specified SPAN session or all sessions.
```

The following example shows suspending a SPAN session:

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

To suspend a SPAN session, perform this task:

```
Command | Purpose
-------- | ------------------------
switch(config)# monitor session {all | session-number} shut | Suspends the specified SPAN session or all sessions.
```

**Note** The Cisco Nexus 5000 Series switch supports two 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:

```
Command | Purpose
-------- | ------------------------
switch# show monitor [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
```
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
```