Configuring Traffic Mirroring

This module describes the configuration of the traffic mirroring feature. Traffic mirroring is sometimes called port mirroring, or switched port analyzer (SPAN).

Feature History for Traffic Mirroring

<table>
<thead>
<tr>
<th>Release 3.9.1</th>
<th>This feature was introduced.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.0.1</td>
<td>These traffic mirroring features were added:</td>
</tr>
<tr>
<td></td>
<td>• Traffic mirroring over a pseudowire</td>
</tr>
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<td></td>
<td>• Flow or ACL-based traffic mirroring</td>
</tr>
<tr>
<td></td>
<td>• Layer 3 interface support</td>
</tr>
<tr>
<td></td>
<td>• Partial packet mirroring</td>
</tr>
<tr>
<td>Release 5.1.0</td>
<td>The Sampled Traffic Mirroring feature was introduced.</td>
</tr>
</tbody>
</table>

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Introduction to Traffic Mirroring

Traffic mirroring, which is sometimes called port mirroring, or Switched Port Analyzer (SPAN) is a Cisco proprietary feature that enables you to monitor Layer 2 or Layer 3 network traffic passing in, or out of, a set of Ethernet interfaces. You can then pass this traffic to a network analyzer for analysis.

Traffic mirroring copies traffic from one or more Layer 3 or Layer 2 interfaces or sub-interfaces, including Layer 2 link bundle interfaces or sub-interfaces, and sends the copied traffic to one or more destinations for analysis by a network analyzer or other monitoring device. Traffic mirroring does not affect the switching of traffic on the source interfaces or sub-interfaces, and allows the mirrored traffic to be sent to a destination interface or sub-interface.
Traffic mirroring was introduced on switches because of a fundamental difference between switches and hubs. When a hub receives a packet on one port, the hub sends out a copy of that packet from all ports except from the one at which the hub received the packet. In the case of switches, after a switch boots, it starts to build up a Layer 2 forwarding table on the basis of the source MAC address of the different packets that the switch receives. After this forwarding table is built, the switch forwards traffic that is destined for a MAC address directly to the corresponding port.

For example, if you want to capture Ethernet traffic that is sent by host A to host B, and both are connected to a hub, just attach a traffic analyzer to this hub. All other ports see the traffic between hosts A and B.

Figure 1: Traffic Mirroring Operation on a Hub

On a switch or router, after the host B MAC address is learned, unicast traffic from A to B is only forwarded to the B port. Therefore, the traffic analyzer does not see this traffic.

In this configuration, the traffic analyzer captures only traffic that is flooded to all ports, such as:
- Broadcast traffic
- Multicast traffic with CGMP or Internet Group Management Protocol (IGMP) snooping disabled
- Unknown unicast traffic on a switch

An extra feature is necessary that artificially copies unicast packets that host A sends. This extra feature is traffic mirroring. When traffic mirroring is enabled, the traffic analyzer is attached to a port that is configured to receive a copy of every packet that host A sends. This port is called a traffic mirroring port. The other sections of this document describe how you can fine tune this feature.
Sampled Traffic Mirroring

SPAN is supported on all types of forwarding interfaces of the main interface (port level) such as, L2, L3 interfaces, sub-interface, bundle interface, and BNG interface. But Sampled SPAN is supported only at port level. Sampled SPAN is configurable in ingress direction only. SPAN and Sampled SPAN cannot be configured at the same time on main interface (at port level). When Sampled SPAN is enabled on main interface, SPAN is still configurable on rest of the forwarding interfaces on the port.

When Sampled SPAN is enabled on the underlying physical port and SPAN is configured on a forwarding interface, the packets are mirrored as follows:

- Sampled packet on the physical port is mirrored just to the destination port of the Sampled SPAN session.
- Non-sampled packet is mirrored for each of the regular SPAN session on the associated forwarding interface.

Sampled Traffic Mirroring allows you to:

1. Sample the packets based on a configured interval.
2. Apply Sampled SPAN on a physical port in order to include all forwarding interfaces on that port.
3. Configure the Sampling rate of monitoring that is configured for each source port. You can choose to configure one of these sampling rates; 1K, 2K, 4K, 8K, and 16K. For example, when 4K is configured as the sampling rate, for every 4K packets on the source port one packet is sampled and mirrored to the destination port.
4. Use Sampled SPAN along with Traffic Mirroring.
5. Enable Sampled SPAN on every bundle member, if the physical port is part of a link bundle.
6. Use all destination ports that were supported for SPAN.
7. Enable statistics support on each monitoring session.
8. Truncate and mirror a fixed portion of each mirrored packet (for example, the first 64 bytes of every packet received from the source port is mirrored to the destination port). You can configure the offset or the amount of fixed portion.

You can configure these source to destination combinations in sampled SPAN:

- Physical Port mirrored to Physical Port
- Physical Port mirrored to Pseudo-wire
- Bundle member port mirrored to Physical Port
- Bundle member port mirrored to Pseudo-wire

Implementing Traffic Mirroring on the Cisco ASR 9000 Series RouterCisco CRS Router

Traffic Mirroring Terminology

- Ingress traffic—Traffic that enters the switch.
**Characteristics of the Source Port**

A source port, also called a monitored port, is a switched or routed port that you monitor for network traffic analysis. In a single local or remote traffic mirroring session, you can monitor source port traffic, such as received (Rx) for ingress traffic, transmitted (Tx) for egress traffic, or bidirectional (for both ingress and egress traffic). Your router can support any number of source ports (up to a maximum number of 800).

A source port has these characteristics:

- It can be any port type, such as Bundle Interface, Gigabit Ethernet, 10-Gigabit Ethernet, or EFPs.
- Each source port can be monitored in only one traffic mirroring session.
- It cannot be a destination port.
- Partial Packet Mirroring. The first 64 to 256 bytes of the packet can be mirrored.
- Each source port can be configured with a direction (ingress, egress, or both) to monitor. For bundles, the monitored direction applies to all physical ports in the group.

![Figure 2: Network Analysis on a Cisco ASR 9000 Router With Traffic Mirroring](image)

In the figure above, the network analyzer is attached to a port that is configured to receive a copy of every packet that host A sends. This port is called a traffic mirroring port.

**Characteristics of the Monitor Session**

A monitor session is a collection of traffic mirroring configurations consisting of a single destination and, potentially, many source interfaces. For any given monitor session, the traffic from the source interfaces (called source ports) is sent to the monitoring port (called the destination port). Some optional operations...
such as VLAN tag imposition and ACL filtering can be performed on the mirrored traffic streams. If there is more than one source port in a monitoring session, the traffic from the several mirrored traffic streams is combined at the destination port. The result is that the traffic that comes out of the destination port is a combination of the traffic from one or more source ports, and the traffic from each source port may or may not have VLAN push operations or ACLs applied to it.

Monitor sessions have these characteristics:

- A single Cisco ASR 9000 Router can have a maximum of eight monitor sessions.
- A single monitor session can have only one destination port.
- A single destination port can belong to only one monitor session.
- A single Cisco ASR 9000 Router can have a maximum of 800 source ports.
- A monitor session can have a maximum of 800 source ports, as long as the maximum number of source ports from all monitoring sessions does not exceed 800.

Characteristics of the Destination Port

Each local session or remote destination session must have a destination port (also called a monitoring port) that receives a copy of the traffic from the source ports.

A destination port has these characteristics:

- A destination port must reside on the same router as the source port.
- A destination port can be any Ethernet physical port, EFP, pseudowire, but not a bundle interface.
- A destination port can only be a Layer 2 transport interface. An L3 interface as a SPAN destination cannot be configured on the Cisco ASR 9000 Series Router.
- A destination port can be a trunk (main) interface or a subinterface.
- At any one time, a destination port can participate in only one traffic mirroring session. A destination port in one traffic mirroring session cannot be a destination port for a second traffic mirroring session. In other words, no two monitor sessions can have the same destination port.
- A destination port cannot also be a source port.

*Figure 3: Network Analysis on a Cisco ASR 9000 Router With Traffic Mirroring*
Supported Traffic Mirroring Types

These traffic mirroring types are supported:

- **Local traffic mirroring.** This is the most basic form of traffic mirroring. The network analyzer or sniffer is directly attached to the destination interface. In other words, all monitored ports are all located on the same switch as the destination port.

- **Remote traffic mirroring (known as R-SPAN).** In this case, the network analyzer is not attached directly to the destination interface, but is on a VLAN accessible to the switch. For example, the destination interface is a sub-interface with a VLAN encapsulation.

A restricted form of remote traffic mirroring can be implemented by sending traffic to a single destination port that pushes a VLAN tag, instead of switching through a bridge domain. Remote traffic mirroring:

  - Allows decoupling of the network analyzer and destination, but there is no on-the-box redundancy.
  - Allows multiple remote network analyzers as long as they can attach to the traffic mirroring VLAN.

  This is supported on Cisco IOS XR software because the destination port is an EFP that can push a VLAN tag.

- **Pseudowire traffic mirroring (known as PW-SPAN in Cisco IOS Software).** Instead of using a standard destination interface, traffic is mirrored to a remote site through an MPLS pseudowire.

- **ACL-based traffic mirroring.** Traffic is mirrored based on the configuration of the global interface ACL.

- **Partial Packet Mirroring.** The first 64 to 256 bytes of the packet can be mirrored.

- **Layer 2 or Layer 3 traffic mirroring is supported.** Both Layer 2 and Layer 3 source ports can be mirrored.

Pseudowire Traffic Mirroring

The traffic mirroring destination port can be configured to be a pseudowire rather than a physical port. In this case, the designated traffic on the source port is mirrored over the pseudowire to a central location. This allows the centralization of expensive network traffic analysis tools.

Because the pseudowire carries only mirrored traffic, this traffic is generally unidirectional. There should not be any traffic coming from the remote provider edge.

To protect the pseudowire traffic mirroring path against network failures, it is possible to configure a traffic engineering tunnel as the preferred path and enable fast reroute protection for the pseudowire.

Figure 4: Pseudowire Traffic Mirroring

ACL-Based Traffic Mirroring

You can mirror traffic based on the definition of a global interface access list (ACL). If you are mirroring Layer 2 traffic, the ACL is configured using the `ethernet-services access-list` command with the `capture` keyword. When you are mirroring Layer 3 traffic, the ACL is configured using the `ipv4 access-list` or `ipv6 access-list` command with the `capture` keyword. The `permit` and `deny` commands determine the behavior of regular traffic. The `capture` keyword designates that the packet is to be mirrored to the destination port.
Restrictions for Traffic Mirroring

A maximum of eight monitoring sessions are supported. You can configure 800 source ports on a single monitoring session or an aggregate of 800 source ports over eight monitoring sessions.

These forms of traffic mirroring are not supported:

• Mirroring traffic to a GRE tunnel (also known as Encapsulated Remote Switched Port Analyzer [ER-SPAN] in Cisco IOS Software).

• Mirroring traffic from a full bridge domain (also known as VLAN-based SPAN in Cisco IOS Software).

• Mirroring traffic from Cisco ASR 9000 SIP-700 based SPA interfaces, such as T1/E1, T3/E3, OC3, OC12, OC48, OC192, STM1, STM4, STM16, STM64, SONET/SDH, TDM, or serial interfaces.

• Mirroring traffic on an individual bundle member interface is not supported. SPAN must be configured only on a bundle interface and it is applied to all members.

• If the destination of traffic mirroring is an nV satellite port and ICL is configured with a bundle interface, then replicated packets are not forwarded to the destination.

• The system does not support MAP-T inline and SPAN on the same NPU.

Restrictions of Sampled Traffic Mirroring

These are the restrictions of Sampled Traffic Mirroring:

• Sampled SPAN can be applied to ingress traffic only.

• The source for sampled SPAN must be on Cisco ASR 9000 Enhanced Ethernet Line Cards.

• Sampled SPAN works only on physical interfaces.

• The source port cannot be on bundles; however it can be applied to bundle member links.

• Sampled SPAN does not work on sub-interfaces, however it can be applied to a physical port with sub-interfaces(main port).

• Only these intervals are accepted: 512, 1K, 2K, 4K, 8K, and 16K. The default interval is 16K.

• Sampled SPAN is configurable at physical port level only.

• Sampled SPAN rate is ingress port specific and not session specific. This means that a destination port can take multiple ingress sampled ports at different sampling rates.

• In the case of a bundle interface, you must configure Sampled SPAN on all the physical ports that are members of the bundle.

• ACL filtering is not supported for Sampled Mirrored Traffic.

Performance Impact with Traffic Mirroring

It is recommended that you do not mirror more than 15% of your total transit traffic. On the Cisco ASR 9000 Ethernet Line Card, that uses Ten Gigabit Ethernet interfaces or bundle interfaces there is a limit of 1.5G of
data on each of the ingress and egress traffic that can be mirrored. This limitation is not applicable on the Cisco ASR 9000 Enhanced Ethernet Line Card.

**Configuring Traffic Mirroring**

These tasks describe how to configure traffic mirroring:

### How to Configure Local Traffic Mirroring

**SUMMARY STEPS**

1. configure
2. monitor-session session-name
3. destination interface dest-interface
4. exit
5. interface source-interface
6. l2transport
7. monitor-session session-name [direction {rx-only | tx-only}]
8. end or commit
9. show monitor-session [session-name] status [detail] [error]

**DETAILED STEPS**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> configure</td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td>Example: RP/0/RSP0/CPU0:router# configure</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong> monitor-session session-name</td>
<td>Defines a monitor session and enters monitor session configuration mode.</td>
</tr>
<tr>
<td>Example: RP/0/RSP0/CPU0:router(config)# monitor-session mon1 RP/0/RSP0/CPU0:router(config-mon)#</td>
<td></td>
</tr>
<tr>
<td><strong>Step 3</strong> destination interface dest-interface</td>
<td>Specifies the destination interface to which traffic is replicated.</td>
</tr>
<tr>
<td>Example: RP/0/RSP0/CPU0:router(config-mon)# destination interface gigabitethernet0/0/0/15</td>
<td></td>
</tr>
<tr>
<td><strong>Step 4</strong> exit</td>
<td>Exits monitor session configuration mode and returns to global configuration mode.</td>
</tr>
<tr>
<td>Example: RP/0/RSP0/CPU0:router(config-mon)# exit RP/0/RSP0/CPU0:router(config)#</td>
<td></td>
</tr>
<tr>
<td>Command or Action</td>
<td>Purpose</td>
</tr>
<tr>
<td>-------------------</td>
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</tr>
<tr>
<td><strong>Step 5</strong></td>
<td>Enters interface configuration mode for the specified interface. The interface number is entered in rack/slot/module/port notation. For more information about the syntax for the router, use the question mark (?) online help function.</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>RP/0/RSP0/CPU0:router(config)# interface gigabitethernet0/0/0/11</td>
</tr>
<tr>
<td><strong>Step 6</strong></td>
<td>(Optional) Enables Layer 2 transport mode on the interface and enters Layer 2 transport configuration mode.</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>RP/0/RSP0/CPU0:router(config-if)# l2transport</td>
</tr>
<tr>
<td><strong>Note</strong></td>
<td>• Use the l2transport command to mirror all traffic types.</td>
</tr>
<tr>
<td><strong>Step 7</strong></td>
<td>Specifies the monitor session to be used on this interface. Use the direction keyword to specify that only ingress or only egress traffic is mirrored.</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>RP/0/RSP0/CPU0:router(config-if-l2)# monitor-session mon1</td>
</tr>
<tr>
<td><strong>Step 8</strong></td>
<td>Saves configuration changes.</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>• When you issue the end command, the system prompts you to commit changes:</td>
</tr>
<tr>
<td></td>
<td>Uncommitted changes found, commit them before exiting (yes/no/cancel)? [cancel]:</td>
</tr>
<tr>
<td></td>
<td>- Entering yes saves configuration changes to the running configuration file, exits the configuration session, and returns the router to EXEC mode.</td>
</tr>
<tr>
<td></td>
<td>- Entering no exits the configuration session and returns the router to EXEC mode without committing the configuration changes.</td>
</tr>
<tr>
<td></td>
<td>- Entering cancel leaves the router in the current configuration session without exiting or committing the configuration changes.</td>
</tr>
<tr>
<td></td>
<td>• Use the commit command to save the configuration changes to the running configuration file and remain within the configuration session.</td>
</tr>
<tr>
<td><strong>Step 9</strong></td>
<td>Displays information about the monitor session.</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>RP/0/RSP0/CPU0:router# show monitor-session</td>
</tr>
</tbody>
</table>
# How to Configure Remote Traffic Mirroring

## SUMMARY STEPS

1. configure
2. monitor-session session-name
3. destination interface dest-subinterface
4. exit
5. interface dest-subinterface l2transport
6. encapsulation dot1q vlan
7. rewrite ingress tag pop tag-to-remove
8. interface source-subinterface [l2transport]
9. monitor-session session-name [direction {rx-only | tx-only}]
10. end or commit
11. show monitor-session [session-name] status [detail] [error]

## DETAILED STEPS

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> configure</td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>RP/0/RSP0/CPU0:router# configure</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong> monitor-session session-name</td>
<td>Defines a monitor session and enters monitor session configuration mode.</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>RP/0/RSP0/CPU0:router(config)# monitor-session mon1</td>
<td></td>
</tr>
<tr>
<td>RP/0/RSP0/CPU0:router(config-mon)#</td>
<td></td>
</tr>
<tr>
<td><strong>Step 3</strong> destination interface dest-subinterface</td>
<td>Specifies the destination subinterface to which traffic is replicated.</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>RP/0/RSP0/CPU0:router(config-mon)# destination interface gigabitethernet0/0/0/15</td>
<td></td>
</tr>
<tr>
<td><strong>Step 4</strong> exit</td>
<td>Exits monitor session configuration mode and returns to global configuration mode.</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>RP/0/RSP0/CPU0:router(config-mon)# exit</td>
<td></td>
</tr>
<tr>
<td>RP/0/RSP0/CPU0:router(config)#</td>
<td></td>
</tr>
<tr>
<td><strong>Step 5</strong> interface dest-subinterface l2transport</td>
<td>Enters interface configuration mode for the specified sub-interface. The interface number is entered in rack/slot/module/port notation. For more information about the syntax for the router, use the question mark (?) online help function.</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>RP/0/RSP0/CPU0:router(config)# interface gigabitethernet0/0/0/11.10 l2transport</td>
<td></td>
</tr>
</tbody>
</table>
**Command or Action** | **Purpose**
---|---
| | The `l2transport` keyword is used to enable Layer 2 transport mode on the destination subinterface.

### Step 6
**encapsulation dot1q vlan**
**Example:**
```
RP/0/RSP0/CPU0:router(config-if)# encapsulation dot1q 1
```
Specifies 802.1Q encapsulation and the VLAN number that is used.

### Step 7
**rewrite ingress tag pop tag-to-remove**
**Example:**
```
RP/0/RSP0/CPU0:router(config-if)# rewrite ingress tag pop 1
```
Specifies to remove the outer tag only for the EFP.

### Step 8
**interface source-subinterface [l2transport]**
**Example:**
```
RP/0/RSP0/CPU0:router(config)# interface gigabitethernet0/0/11.10 l2transport
```
Enters interface configuration mode for the specified subinterface. The interface number is entered in `rack/slot/module/port` notation. For more information about the syntax for the router, use the question mark (`?`) online help function.

To configure a Layer 2 subinterface to be the source interface, use the `l2transport` keyword to enable Layer 2 transport mode on the subinterface.

### Step 9
**monitor-session session-name [direction {rx-only | tx-only}]**
**Example:**
```
RP/0/RSP0/CPU0:router(config-if-l2)# monitor-session mon1
```
Specifies the monitor session to be used on this interface. Use the `direction` keyword to specify that only ingress or egress traffic is mirrored.

### Step 10
**end or commit**
**Example:**
```
RP/0/RSP0/CPU0:router(config-if)# end
```
Saves configuration changes.

- When you issue the `end` command, the system prompts you to commit changes:
  Uncommitted changes found, commit them before exiting (yes/no/cancel)? [cancel]:

- Entering `yes` saves configuration changes to the running configuration file, exits the configuration session, and returns the router to EXEC mode.

- Entering `no` exits the configuration session and returns the router to EXEC mode without committing the configuration changes.

- Entering `cancel` leaves the router in the current configuration session without exiting or committing the configuration changes.
<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Use the commit command to save the configuration changes to the running configuration file and remain within the configuration session.</em></td>
<td></td>
</tr>
</tbody>
</table>

Use the commit command to save the configuration changes to the running configuration file and remain within the configuration session.

### Step 11

**show monitor-session [session-name] status [detail] [error]**

**Example:**

RP/0/RSP0/CPU0:router# show monitor-session

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**How to Configure Traffic Mirroring over Pseudowire**

**SUMMARY STEPS**

1. configure
2. monitor-session session-name
3. destination psuedowire
4. exit
5. interface source-interface
6. 12transport
7. monitor-session session-name [direction {rx-only | tx-only}]
8. exit
9. exit
10. exit
11. 12vpn
12. pw-class class-name
13. encapsulation mpls
14. exit
15. exit
16. xconnect group group-name
17. p2p xconnect-name
18. monitor-session session-name
19. neighbor peer-ip pw-id pseudowire-id
20. pw-class class-name
21. end or commit
22. show monitor-session [session-name] status [detail] [error]
## DETAILED STEPS

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
</table>
| **Step 1**
configure  
Example:
```
RP/0/RSP0/CPU0:router# configure
``` | Enters global configuration mode. |
| **Step 2**
monitor-session *session-name*  
Example:
```
RP/0/RSP0/CPU0:router(config)# monitor-session mon1
RP/0/RSP0/CPU0:router(config-mon)#
``` | Defines a monitor session and enters monitor session configuration mode. |
| **Step 3**
destination psuedowire  
Example:
```
RP/0/RSP0/CPU0:router(config-mon)# destination psuedowire
``` | Specifies that the traffic is replicated to a pseudowire. |
| **Step 4**
exit  
Example:
```
RP/0/RSP0/CPU0:router(config-mon)# exit
``` | Exits monitor session configuration mode and returns to global configuration mode. |
| **Step 5**
interface *source-interface*  
Example:
```
RP/0/RSP0/CPU0:router(config)# interface gigabitethernet0/0/0/11.10
``` | Enters interface configuration mode for the specified interface. The interface number is entered in `rack/slot/module/port` notation. For more information about the syntax for the router, use the question mark (?) online help function. |
| **Step 6**
l2transport  
Example:
```
RP/0/RSP0/CPU0:router(config-if)# l2transport
``` | (Optional) Enables Layer 2 transport mode on the subinterface and enters Layer 2 transport configuration mode.  
**Note**  
- Use the `l2transport` command to mirror all traffic types. |
| **Step 7**
monitor-session *session-name* [direction {rx-only | tx-only}]  
Example:
```
RP/0/RSP0/CPU0:router(config-if-l2)# monitor-session mon1
``` | Specifies the monitor session to be used on this interface. Use the `direction` keyword to specify that only ingress or egress traffic is mirrored. |
| **Step 8**
exit  
Example:  
```
RP/0/RSP0/CPU0:router(config-mon)# exit
``` | Exits monitor session configuration mode and returns to l2transport configuration mode. |
### Command or Action

```text
RP/0/RSP0/CPU0:router(config-if-mon)# exit
RP/0/RSP0/CPU0:router(config-if-l2)#
```

### Purpose

Exits l2transport configuration mode and returns to interface configuration mode.

### Step 9

**exit**

**Example:**

```text
RP/0/RSP0/CPU0:router(config-if-l2)# exit
RP/0/RSP0/CPU0:router(config-if)#
```

### Step 10

**exit**

**Example:**

```text
RP/0/RSP0/CPU0:router(config-if)# exit
RP/0/RSP0/CPU0:router(config)#
```

### Step 11

**l2vpn**

**Example:**

```text
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)#
```

### Step 12

**pw-class class-name**

**Example:**

```text
RP/0/RSP0/CPU0:router(config-l2vpn)# pw-class pw1
```

### Step 13

**encapsulation mpls**

**Example:**

```text
RP/0/RSP0/CPU0:router(config-l2vpn-pwc)# encapsulation mpls
```

### Step 14

**exit**

**Example:**

```text
RP/0/RSP0/CPU0:router(config-l2vpn-pwc-mpls)# exit
RP/0/RSP0/CPU0:router(config-l2vpn-pwc)# exit
```

### Step 15

**exit**

**Example:**

```text
RP/0/RSP0/CPU0:router(config-l2vpn-pwc)# exit
RP/0/RSP0/CPU0:router(config-l2vpn-pwc-mpls)# exit
```

### Step 16

**xconnect group group-name**

**Example:**

```text
RP/0/RSP0/CPU0:router(config-l2vpn-pwc)# xconnect group
```

### Configures a group cross connect.
### Configuring Traffic Mirroring over Pseudowire

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>xconnect</code> group g1</td>
<td>Configures a point-to-point cross connect.</td>
</tr>
<tr>
<td><strong>Step 17</strong> <code>p2p xconnect-name</code></td>
<td>Attaches a traffic mirroring session to the point-to-point cross connect.</td>
</tr>
<tr>
<td><strong>Example:</strong> RP/0/RSP0/CPU0:router(config-l2vpn-xc)# p2p xc1</td>
<td></td>
</tr>
<tr>
<td><strong>Step 18</strong> <code>monitor-session session-name</code></td>
<td>Configures the point-to-point cross connect.</td>
</tr>
<tr>
<td><strong>Example:</strong> RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p)# monitor-session mon1</td>
<td></td>
</tr>
<tr>
<td><strong>Step 19</strong> <code>neighbor peer-ip pw-id pseudowire-id</code></td>
<td>Saves configuration changes.</td>
</tr>
<tr>
<td><strong>Example:</strong> RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p)# neighbor 192.168.2.2 pw-id 3</td>
<td>- When you issue the <strong>end</strong> command, the system prompts you to commit changes:</td>
</tr>
<tr>
<td><strong>Step 20</strong> <code>pw-class class-name</code></td>
<td></td>
</tr>
<tr>
<td><strong>Example:</strong> RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p)# pw-class pw1</td>
<td>Uncommitted changes found, commit them before exiting (yes/no/cancel)? [cancel]:</td>
</tr>
<tr>
<td><strong>Step 21</strong> <code>end</code> or <code>commit</code></td>
<td>- Entering <strong>yes</strong> saves configuration changes to the running configuration file, exits the configuration session, and returns the router to EXEC mode.</td>
</tr>
<tr>
<td><strong>Example:</strong> RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p-pw)# end</td>
<td>- Entering <strong>no</strong> exits the configuration session and returns the router to EXEC mode without committing the configuration changes.</td>
</tr>
<tr>
<td>or</td>
<td>- Entering <strong>cancel</strong> leaves the router in the current configuration session without exiting or committing the configuration changes.</td>
</tr>
<tr>
<td>RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p-pw)# commit</td>
<td>- Use the <strong>commit</strong> command to save the configuration changes to the running configuration file and remain within the configuration session.</td>
</tr>
</tbody>
</table>
### How to Configure ACL-Based Traffic Mirroring

**Before you begin**

The global interface ACL should be configured using one of these commands with the `capture` keyword:

- `ipv4 access-list`
- `ipv6 access-list`
- `ethernet-services access-list`

For more information, refer to the *Cisco ASR 9000 Series Aggregation Services Router IP Addresses and Services Command Reference* or the *ASR 9000 Series Aggregation Services Router L2 VPN and Ethernet Services Command Reference*.

**SUMMARY STEPS**

1. `configure`
2. `monitor-session session-name`
3. `destination interface dest-interface`
4. `exit`
5. `interface source-interface`
6. `l2transport`
7. `exit`
8. `ethernet-services access-group access-list-name [ingress | egress]`
9. `monitor-session session-name [ipv4|ipv6] [direction {rx-only|tx-only}]`
10. `acl`
11. `end` or `commit`
12. `show monitor-session [session-name] status [detail] [error]`

**DETAILED STEPS**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>Enters global configuration mode.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>commit</code></td>
<td>Use the <code>commit</code> command to save the configuration changes to the running configuration file and remain within the configuration session.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 22</th>
<th>Display information about the traffic mirroring session.</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show monitor-session [session-name] status [detail] [error]</code></td>
<td><code>Example:</code> RP/0/RSP0/CP00:router# show monitor-session</td>
</tr>
<tr>
<td>Command or Action</td>
<td>Purpose</td>
</tr>
<tr>
<td>------------------</td>
<td>---------</td>
</tr>
<tr>
<td><code>RP/0/RSP0/CPU0:router# configure</code></td>
<td>Defines a monitor session and enters monitor session configuration mode.</td>
</tr>
</tbody>
</table>
| **Step 2** | **monitor-session** *session-name*  
*Example:*  
`RP/0/RSP0/CPU0:router(config)# monitor-session mon1  
RP/0/RSP0/CPU0:router(config-mon)#` | Specifies the destination interface to which traffic should be replicated. |
| **Step 3** | **destination interface** *dest-interface*  
*Example:*  
`RP/0/RSP0/CPU0:router(config-mon)# destination interface gigabitethernet0/0/0/15` | |
| **Step 4** | **exit**  
*Example:*  
`RP/0/RSP0/CPU0:router(config-mon)# exit  
RP/0/RSP0/CPU0:router(config)#` | Exits monitor session configuration mode and returns to global configuration mode. |
| **Step 5** | **interface** *source-interface*  
*Example:*  
`RP/0/RSP0/CPU0:router(config)# interface gigabitethernet0/0/0/11` | Enters interface configuration mode for the specified interface. The interface number is entered in rack/slot/module/port notation. For more information about the syntax for the router, use the question mark (?) online help function. |
| **Step 6** | **l2transport**  
*Example:*  
`RP/0/RSP0/CPU0:router(config-if)# l2transport` | (Optional) Enables Layer 2 transport mode on the subinterface and enters Layer 2 transport configuration mode.  
**Note**  
- Use the **l2transport** command to mirror all traffic types. |
| **Step 7** | **exit**  
*Example:*  
`RP/0/RSP0/CPU0:router(config-if-l2)# exit  
RP/0/RSP0/CPU0:router(config-if)#` | Exits Layer 2 transport configuration mode and returns to interface configuration mode. |
| **Step 8** | **ethernet-services access-group** *access-list-name* [ingress | egress]  
*Example:*  
`RP/0/RSP0/CPU0:router(config-if)# ethernet-services access-group acl1 ingress` | Associates the access list definition with the interface being mirrored. |
| **Step 9** | **monitor-session** *session-name* [ipv4] [ipv6] [direction {rx-only | tx-only}]  
*Example:*  
`RP/0/RSP0/CPU0:router(config-if)# monitor-session mon1` | Specifies the monitor session to be used on this interface. |
### Command or Action

**Example:**

```
RP/0/RSP0/CPU0:router(config-if)# monitor-session
  mon1 direction rx-only
```

**Purpose**

- Specifies that the traffic mirrored is according to the defined global interface ACL.

### Step 10

** acl**

**Example:**

```
RP/0/RSP0/CPU0:router(config-if-mon)# acl
```

**Purpose**

- Saves configuration changes.
- **end** or **commit**

**Example:**

```
RP/0/RSP0/CPU0:router(config-if)# end
```

- Entering **yes** saves configuration changes to the running configuration file, exits the configuration session, and returns the router to EXEC mode.
- Entering **no** exits the configuration session and returns the router to EXEC mode without committing the configuration changes.
- Entering **cancel** leaves the router in the current configuration session without exiting or committing the configuration changes.
- Use the **commit** command to save the configuration changes to the running configuration file and remain within the configuration session.

### Step 11

** show monitor-session [session-name] status [detail] [error]**

**Example:**

```
RP/0/RSP0/CPU0:router# show monitor-session
```

**Purpose**

- Displays information about the monitor session.

---

### Troubleshooting ACL-Based Traffic Mirroring

Take note of these configuration issues:

- Even when the **acl** command is configured on the source mirroring port, if the ACL configuration command does not use the **capture** keyword, no traffic gets mirrored.

- If the ACL configuration uses the **capture** keyword, but the **acl** command is not configured on the source port, traffic is mirrored, but no access list configuration is applied.

- All ingress traffic is mirrored, regardless of the ACL definition; only egress traffic permitted in the ACL definition is mirrored.
This example shows both the **capture** keyword in the ACL definition and the **acl** command configured on the interface:

```
monitor-session tm_example
  !
  ethernet-services access-list tm_filter
  10 deny 0000.1234.5678 0000.abcd.abcd any capture
  !
interface GigabitEthernet0/2/0/0
  monitor-session tm_example direction rx-only
  acl
    !
    12transport
    !
  ethernet-services access-group tm_filter ingress
end
```

### How to Configure Partial Packet Mirroring

#### SUMMARY STEPS

1. **configure**
2. **monitor-session** *session-name*
3. **destination interface** *dest-interface*
4. **exit**
5. **interface** *source-interface*
6. **monitor-session** *session-name*[direction {rx-only | tx-only}]
7. **mirror first** *bytes*
8. **end** or **commit**
9. **show monitor-session** [*session-name*] **status**

#### DETAILED STEPS

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td><strong>Example:</strong> RP/0/RSP0/CP00:router# configure</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>Defines a monitor session and enters monitor session configuration mode.</td>
</tr>
<tr>
<td><strong>Example:</strong> RP/0/RSP0/CP00:router(config)# monitor-session mon1 RP/0/RSP0/CP00:router(config-mon)#</td>
<td></td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>Specifies the destination interface to which traffic should be replicated.</td>
</tr>
<tr>
<td><strong>Example:</strong> RP/0/RSP0/CP00:router(config-mon)# destination interface gigabitethernet0/0/0/15</td>
<td></td>
</tr>
</tbody>
</table>
### Command or Action

<table>
<thead>
<tr>
<th>Step 4</th>
<th>exit</th>
<th>Exits monitor session configuration mode and returns to global configuration mode.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example:</td>
<td><code>exit</code></td>
<td><code>exit</code></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 5</th>
<th>interface source-interface</th>
<th>Enters interface configuration mode for the specified interface. The interface number is entered in <code>rack/slot/module/port</code> notation. For more information about the syntax for the router, use the question mark (?) online help function.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example:</td>
<td><code>interface gigabitethernet0/0/11.10</code></td>
<td><code>interface gigabitethernet0/0/11.10</code></td>
</tr>
</tbody>
</table>

| Step 6 | monitor-session session-name [direction {rx-only | tx-only}] | Specifies the monitor session to be used on this interface. Use the `direction` keyword to specify that only ingress or egress traffic is mirrored. |
|--------|-----------------------------|-----------------------------------------------------------------------------------------------|
| Example: | `monitor-session mon1` | `monitor-session mon1` |

<table>
<thead>
<tr>
<th>Step 7</th>
<th>mirror first bytes</th>
<th>Specifies the number of bytes of the packet to mirror. Values can range from 64 to 256.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example:</td>
<td><code>mirror first bytes</code></td>
<td><code>mirror first bytes</code></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 8</th>
<th>end or commit</th>
<th>Saves configuration changes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example:</td>
<td><code>commit</code></td>
<td><code>commit</code></td>
</tr>
</tbody>
</table>

- When you issue the `end` command, the system prompts you to commit changes:
  - Uncommitted changes found, commit them before exiting (yes/no/cancel)? [cancel]:
    - Entering **yes** saves configuration changes to the running configuration file, exits the configuration session, and returns the router to EXEC mode.
    - Entering **no** exits the configuration session and returns the router to EXEC mode without committing the configuration changes.
    - Entering **cancel** leaves the router in the current configuration session without exiting or committing the configuration changes.

- Use the `commit` command to save the configuration changes to the running configuration file and remain within the configuration session.

<table>
<thead>
<tr>
<th>Step 9</th>
<th>show monitor-session [session-name] status</th>
<th>Displays information about the traffic mirroring session.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example:</td>
<td><code>show monitor-session status</code></td>
<td><code>show monitor-session status</code></td>
</tr>
</tbody>
</table>
Traffic Mirroring Configuration Examples

This section contains examples of how to configure traffic mirroring:

Traffic Mirroring with Physical Interfaces (Local): Example

This example shows a basic configuration for traffic mirroring with physical interfaces. When traffic flows over the point-to-point cross connect between gig0/2/0/19 and gig0/2/0/11, packets received and transmitted on gig0/2/0/19 are also mirrored to gig0/2/0/15.

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# monitor-session ms1
RP/0/RSP0/CPU0:router(config-mon)# destination interface gig0/2/0/15
RP/0/RSP0/CPU0:router(config-mon)# commit

RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface gig0/2/0/11
RP/0/RSP0/CPU0:router(config-subif)# l2transport
RP/0/RSP0/CPU0:router(config-if-l2)# commit

RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface gig0/2/0/15
RP/0/RSP0/CPU0:router(config-subif)# l2transport
RP/0/RSP0/CPU0:router(config-if-l2)# commit

RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface gig0/2/0/19
RP/0/RSP0/CPU0:router(config-subif)# l2transport
RP/0/RSP0/CPU0:router(config-subif-l2)# monitor-session ms1
RP/0/RSP0/CPU0:router(config-if-l2)# commit

RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# xconnect group xg1
RP/0/RSP0/CPU0:router(config-l2vpn-xc)# p2p xg1_p1
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p)# interface gig0/2/0/11
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p)# interface gig0/2/0/19
RP/0/RSP0/CPU0:router(config-if-l2)# commit
```

Traffic Mirroring with EFPs (Remote): Example

This example shows a basic configuration for remote traffic mirroring with EFP interfaces. When traffic flows over the point-to-point cross connect between gig0/2/0/19.10 and gig0/2/0/11.10, packets received and transmitted on gig0/2/0/19.10 are also mirrored to gig0/2/0/10.1.

```
RP/0/RSP0/CPU0:router# monitor-session ms1
RP/0/RSP0/CPU0:router(config)# destination interface gig0/2/0/10.1

RP/0/RSP0/CPU0:router(config)# interface gig0/2/0/10.1 l2transport
```
Viewing Monitor Session Status: Example

This example shows sample output of the `show monitor-session` command with the `status` keyword:

```
RP/0/RSP0/CPU0:router# show monitor-session status

Monitor-session cisco-rtp1
Destination interface GigabitEthernet0/5/0/38
Source Interface  Dir  Status
---------------  ----  ----------------------------------------------------
Gi0/5/0/4        Both  Operational
Gi0/5/0/17       Both  Operational

RP/0/RSP0/CPU0:router# show monitor-session status detail

Monitor-session sess1
Destination interface is not configured
Source Interfaces
-----------------
GigabitEthernet0/0/0/0
Direction: Both
ACL match: Enabled
Portion: Full packet
Status: Not operational (destination interface not known).
GigabitEthernet0/0/0/2
Direction: Both
ACL match: Disabled
Portion: First 100 bytes

RP/0/RSP0/CPU0:router# show monitor-session status error

Monitor-session ms1
Destination interface GigabitEthernet0/2/0/15 is not configured
Source Interface  Dir  Status
---------------  ----  ----------------------------------------------------

Monitor-session ms2
Destination interface is not configured
Source Interface  Dir  Status
---------------  ----  ----------------------------------------------------
```
Monitor Session Statistics: Example

Use the `show monitor-session` command with the `counters` keyword to show the statistics/counters (received/transmitted/dropped) of different source ports. For each monitor session, this command displays a list of all source interfaces and the replicated packet statistics for that interface.

The full set of statistics displayed for each interface is:

- RX replicated packets and octets
- TX replicated packets and octets
- Non-replicated packet and octets

```
RP/0/RSP0/CPU0:router# show monitor-session counters
Monitor-session ms1
GigabitEthernet0/2/0/19.10
  Rx replicated: 1000 packets, 68000 octets
  Tx replicated: 1000 packets, 68000 octets
  Non-replicated: 0 packets, 0 octets
```

Use the `clear monitor-session counters` command to clear any collected statistics. By default this command clears all stored statistics; however, an optional interface filter can be supplied.

```
RP/0/RSP0/CPU0:router# clear monitor-session counters
```

Traffic Mirroring over Pseudowire: Example

This example shows how to configure traffic mirroring over a pseudowire:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface GigabitEthernet0/11/0/1
RP/0/RSP0/CPU0:router(config-if)# l2transport
RP/0/RSP0/CPU0:router(config-if-l2)# monitor-session pw-span-test
RP/0/RSP0/CPU0:router(config)# monitor-session pw-span-test
RP/0/RSP0/CPU0:router(config-mon)# destination pseudowire
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# pw-class class1
RP/0/RSP0/CPU0:router(config-l2vpn-pwc)# encapsulation mpls
RP/0/RSP0/CPU0:router(config-l2vpn)# xconnect group g1
RP/0/RSP0/CPU0:router(config-l2vpn-xc)# p2p x1
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p)# monitor-session pw-span-test
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p)# neighbor 2.2.2.2 pw-id 1
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p-pw)# pw-class class1
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p-pw)# commit
```

Layer 3 ACL-Based Traffic Mirroring: Example

This example shows how to configure Layer 3 ACL-based traffic mirroring:

```
RP/0/RSP0/CPU0:router# configure
```
Layer 2 ACL-Based Traffic Mirroring: Example

This example shows how to configure Layer 2 ACL-based traffic mirroring:

```
RP/0/RSP0/CPU0:router(config)# monitor-session msl
RP/0/RSP0/CPU0:router(config-mon)# destination interface gig0/2/0/11
RP/0/RSP0/CPU0:router(config-mon)# commit

RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface gig0/2/0/11
RP/0/RSP0/CPU0:router(config-if)# ipv4 access-group span ingress
RP/0/RSP0/CPU0:router(config-if)# monitor-session msl
RP/0/RSP0/CPU0:router(config-if-mon)# commit

RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# ipv4 access-list span
RP/0/RSP0/CPU0:router(config-ipv4-acl)# permit ipv4 any any dscp 5 capture
RP/0/RSP0/CPU0:router(config-ipv4-acl)# commit
```

Partial Packet Mirroring: Example

This example shows how to configure mirroring of the first 100 bytes of the packet:

```
RP/0/RP0/CPU0:router(config)# interface gigabitethernet0/0/0/11
RP/0/RP0/CPU0:router(config-if-l2)# monitor-session mon1
RP/0/RP0/CPU0:router(config-if-mon)# mirror first 100
```

Sampled Traffic Mirroring: Example

This example shows how to configure Sampled Traffic Mirroring:

```
Destination Port

RP/0/RSP0/CPU0:router(config)# interface TenGigE 0/3/1/3
```
RP/0/RSP0/CPU0:(config-if)# l2transport
RP/0/RSP0/CPU0:(config-if-l2)# commit
RP/0/RSP0/CPU0:(config)# monitor-session sampled-span1
RP/0/RSP0/CPU0:(config-mon)# destination interface TenGigE 0/3/1/3
RP/0/RSP0/CPU0:(config-mon)# commit

Source Port
RP/0/RSP0/CPU0:(config)# interface TenGigE 0/3/0/0
RP/0/RSP0/CPU0:(config-if)# l2transport
RP/0/RSP0/CPU0:(config-if-l2)# monitor-session sampled-span1 direction rx-only port-level
RP/0/RSP0/CPU0:(config-if-mon)# mirror interval 512
RP/0/RSP0/CPU0:(config-if-mon)# commit

In order to display the session status with the Sampled SPAN information, use the **show monitor-session status detail** command.

```
RP/0/RSP0/CPU0 # show monitor-session status detail
Monitor-session sampled-span1
    Destination interface TenGigE0/3/1/3
    Source Interfaces
    -----------------
    TenGigE0/3/0/0
        Direction: Rx-only
        Port level: True
        ACL match: Disabled
        Portion: Full packet
        Interval: 512
        Status: Operational
```

In order to display the session statistics, use the **show monitor-session counters** command.

```
RP/0/RSP0/CPU0:router# show monitor-session counters
Monitor-session sampled-span1
    TenGigE0/3/0/0
        Rx replicated: 1952 packets, 390400 octets
        Tx replicated: 0 packets, 0 octets
        Non-replicated: 0 packets, 0 octets
```

### Troubleshooting Traffic Mirroring

When you encounter any issue with traffic mirroring, begin troubleshooting by checking the output of the **show monitor-session status** command. This command displays the recorded state of all sessions and source interfaces:

```
Monitor-session sess1
    <Session status>
    Source Interface   Dir  Status
    --------------------- ---- ----------------------------------
    G10/0/0/0           Both <Source interface status>
    G10/0/0/2           Both <Source interface status>
```

---

**Configuring Traffic Mirroring**

**Troubleshooting Traffic Mirroring**
In the preceding example, the line marked as `<Session status>` can indicate one of these configuration errors:

<table>
<thead>
<tr>
<th>Session Status</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session is not configured globally</td>
<td>The session does not exist in global configuration. Check <code>show run</code> command output to ensure that a session with a correct name has been configured.</td>
</tr>
<tr>
<td>Destination interface <code>&lt;intf&gt;</code> is not configured</td>
<td>The interface that has been configured as the destination does not exist. For example, the destination interface may be configured to be a VLAN subinterface, but the VLAN subinterface may not have been yet created.</td>
</tr>
<tr>
<td>Destination interface <code>&lt;intf&gt;</code> (&lt;down-state&gt;)</td>
<td>The destination interface is not in Up state in the Interface Manager. You can verify the state using the <code>show interfaces</code> command. Check the configuration to see what might be keeping the interface from coming up (for example, a sub-interface needs to have an appropriate encapsulation configured).</td>
</tr>
<tr>
<td>Destination pseudowire is not configured</td>
<td>The L2VPN configuration that is to set up the pseudowire is missing. Configure the traffic mirroring session name as one segment of the xconnect p2p.</td>
</tr>
<tr>
<td>Destination pseudowire <code>&lt;name&gt;</code> (down)</td>
<td>The pseudowire is configured, but is down. Check the L2VPN configuration to identify why the pseudowire is not coming up.</td>
</tr>
</tbody>
</table>

The `<Source interface status>` can report these messages:

<table>
<thead>
<tr>
<th>Source Interface Status</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational</td>
<td>Everything appears to be working correctly in traffic mirroring PI. Please follow up with the platform teams in the first instance, if mirroring is not operating as expected.</td>
</tr>
<tr>
<td>Not operational (Session is not configured globally)</td>
<td>The session does not exist in global configuration. Check the <code>show run</code> command output to ensure that a session with the right name has been configured.</td>
</tr>
<tr>
<td>Not operational (destination interface not known)</td>
<td>The session exists, but it either does not have a destination interface specified, or the destination interface named for the session does not exist (for example, if the destination is a sub-interface that has not been created).</td>
</tr>
<tr>
<td>Not operational (source same as destination)</td>
<td>The session exists, but the destination and source are the same interface, so traffic mirroring does not work.</td>
</tr>
<tr>
<td>Not operational (destination not active)</td>
<td>The destination interface or pseudowire is not in the Up state. See the corresponding Session status error messages for suggested resolution.</td>
</tr>
</tbody>
</table>
The source interface is not in the Up state. You can verify the state using the `show interfaces` command. Check the configuration to see what might be keeping the interface from coming up (for example, a sub-interface needs to have an appropriate encapsulation configured).

<table>
<thead>
<tr>
<th>Source Interface Status</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not operational (source state &lt;down-state&gt;)</td>
<td>The source interface is not in the Up state. You can verify the state using the <code>show interfaces</code> command. Check the configuration to see what might be keeping the interface from coming up (for example, a sub-interface needs to have an appropriate encapsulation configured).</td>
</tr>
<tr>
<td>Error: see detailed output for explanation</td>
<td>Traffic mirroring has encountered an error. Run the <code>show monitor-session status detail</code> command to display more information.</td>
</tr>
</tbody>
</table>

The `show monitor-session status detail` command displays full details of the configuration parameters, and of any errors encountered. For example:

```
Monitor-session sess1
Destination interface is not configured
Source Interfaces
--------------------
GigabitEthernet0/0/0/0
  Direction: Both
  ACL match: Enabled
  Portion: Full packet
  Status: Not operational (destination interface not known)
GigabitEthernet0/0/0/2
  Direction: Both
  ACL match: Disabled
  Portion: First 100 bytes
  Status: Not operational (destination interface not known). Error: 'Viking SPAN PD' detected the 'warning' condition 'PRM connection creation failure'.
Monitor-session foo
Destination next-hop GigabitEthernet 0/0/0/0
Source Interfaces
--------------------
GigabitEthernet 0/1/0/0.100:
  Direction: Both
  Status: Operating
GigabitEthernet 0/2/0/0.200:
  Direction: Tx
  Status: Error: <blah>

Monitor session bar
No destination configured
Source Interfaces
--------------------
GigabitEthernet 0/3/0/0.100:
  Direction: Rx
  Status: Not operational(no destination)
```

Here are additional trace and debug commands:

```
RP/0/RSP0/CPU0:router# show monitor-session platform trace ?
   all   Turn on all the trace
   errors Display errors
   events Display interesting events
```
RP/0/RSP0/CPU0:router# show monitor-session trace ?

process Filter debug by process

RP/0/RSP0/CPU0:router# debug monitor-session platform ?

all Turn on all the debugs
errors VKG SPAN EA errors
event VKG SPAN EA event
info VKG SPAN EA info

RP/0/RSP0/CPU0:router# debug monitor-session platform all
RP/0/RSP0/CPU0:router# debug monitor-session platform event
RP/0/RSP0/CPU0:router# debug monitor-session platform info

RP/0/RSP0/CPU0:router# show monitor-session status ?

detail Display detailed output
errors Display only attachments which have errors
internal Display internal monitor-session information

| Output Modifiers

RP/0/RSP0/CPU0:router# show monitor-session status
RP/0/RSP0/CPU0:router# show monitor-session status errors
RP/0/RSP0/CPU0:router# show monitor-session status internal

Where to Go Next

When you have configured an Ethernet interface, you can configure individual VLAN subinterfaces on that Ethernet interface.

For information about modifying Ethernet management interfaces for the shelf controller (SC), route processor (RP), and distributed RP, see the Advanced Configuration and Modification of the Management Ethernet Interface on the Cisco ASR 9000 Series Router module later in this document.

For information about IPv6 see the Implementing Access Lists and Prefix Lists on Cisco IOS XR Software module in the Cisco IOS XR IP Addresses and Services Configuration Guide.