



# Configuring ERSPAN

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## Information About ERSPAN

ERSPAN transports mirrored traffic over an IP network, which provides remote monitoring of multiple switches across your network. The traffic is encapsulated at the source router and is transferred across the network. The packet is decapsulated at the destination router and then sent to the destination interface.

ERSPAN consists of an ERSPAN source session, routable ERSPAN generic routing encapsulation (GRE)-encapsulated traffic, and an ERSPAN destination session. You can separately configure ERSPAN source sessions and destination sessions on different switches.

## ERSPAN Source Sessions

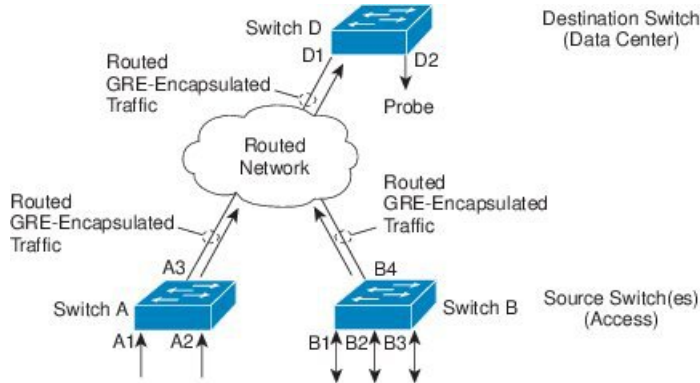
An ERSPAN source session is defined by the following:

- A session ID.
- A list of source ports, source VLANs, or source VSANs to be monitored by the session.
- An ERSPAN flow ID.
- Optional attributes related to the GRE envelope such as IP TOS and TTL.
- Destination IP address.
- Virtual Routing and Forwarding tables.

ERSPAN source sessions do not copy ERSPAN GRE-encapsulated traffic from source ports. Each ERSPAN source session can have ports, VLANs, or VSANs as sources. However, there are some limitations. For more information, see Guidelines and Limitations for ERSPAN.

The following figure shows an example ERSPAN configuration.

Figure 1: ERSPAN Configuration



## Monitored Traffic

By default, ERSPAN monitors all traffic, including multicast and bridge protocol data unit (BPDU) frames.

The direction of the traffic that ERSPAN monitors depends on the source, as follows:

- For a source port, the ERSPAN can monitor ingress, egress, or both ingress and egress traffic.
- For a source VLAN or source VSAN, the ERSPAN can monitor only ingress traffic.

## ERSPAN Types

Cisco NX-OS Release 7.1(1)N1(1) supports two types of ERSPAN—ERSPAN Type II (default) and ERSPAN Type III. All previous Cisco NX-OS releases support only ERSPAN Type II.

ERSPAN Type III supports all of the ERSPAN Type II features and functionality and adds these enhancements:

- Provides timestamp information in the ERSPAN Type III header that can be used to calculate packet latency among edge, aggregate, and core switches.
- Identifies possible traffic sources using the ERSPAN Type III header fields.
- ERSPAN Type III provides configurable switch IDs that can be used to identify traffic flows across multiple switches.

Table 1: Differences between ERSPAN Type II and ERSPAN Type III

Attribute	Type II	Type III
Timestamp	NA	Timestamp provided.

Attribute	Type II	Type III
Platform-specific info	NA	Platform-specific info is required for Nexus 5500, Nexus 5600 and Nexus 6000 platforms.
Source Port Identification at Termination Switch	Limited identification.	Detailed identification. Provision of switch IDs.

## ERSPAN Sources

The interfaces from which traffic can be monitored are called ERSPAN sources. Sources designate the traffic to monitor and whether to copy ingress, egress, or both directions of traffic. ERSPAN sources include the following:

- **Source Ports**—A source port is a port monitored for traffic analysis. You can configure source ports in any VLAN, and trunk ports can be configured as source ports and mixed with nontrunk source ports.
- **Source VLANs**—A source VLAN is a virtual local area network (VLAN) that is monitored for traffic analysis.
- **Source VSANs**—A source VSAN is a virtual storage area network (VSAN) that is monitored for traffic analysis.

## ERSPAN Destinations

ERSPAN destination sessions capture packets sent by ERSPAN source sessions on Ethernet ports or port channels and send them to the destination port. Destination ports receive the copied traffic from ERSPAN sources.

ERSPAN destination sessions are identified by the configured source IP address and ERSPAN ID. This allows multiple source sessions to send ERSPAN traffic to the same destination IP and ERSPAN ID and allows you to have multiple sources terminating at a single destination simultaneously.

ERSPAN destination ports have the following characteristics:

- A port configured as a destination port cannot also be configured as a source port.
- Destination ports do not participate in any spanning tree instance or any Layer 3 protocols.
- Ingress and ingress learning options are not supported on monitor destination ports.
- Host Interface (HIF) port channels and fabric port channel ports are not supported as SPAN destination ports.

## Truncated ERSPAN

Truncated ERSPAN can be used to reduce the amount of fabric or network bandwidth used in sending ERSPAN packets.

The default is no truncation so switches or routers receiving large ERSPAN packets might drop these oversized packets.



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**Note** Do not enable the truncated ERSPAN feature if the destination ERSPAN router is a Cisco Nexus 6001 or Cisco Nexus 6004 switch because the Cisco Nexus 6000 Series switch drops these truncated packets.

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## ERSPAN SPAN on Drop

The ERSPAN SPAN-on-drop feature enables the spanning of packets which would normally be dropped due to unavailable buffer or queue space on ingress. Instead of dropping a packet when congestion occurs, the system stores the packet in a separate SPAN-on-drop buffer and then sends the packet to the specified ERSPAN-on-drop destination IP address.

## ERSPAN SPAN-on-Latency

The ERSPAN-on-Latency feature allows the system to SPAN packets that exceed a pre-configured latency threshold.

For high-latency flows the system can be configured to send a copy to any pre-configured SPAN destination. This creates a data set for analytics that can be used to check which applications are impacted by increased latency in the network. This feature can also be used to identify traffic flows that experience congestion.



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**Note** SPAN copies can be transported to a local analyzer port, or remote analyzer using IPFIX/ERSPAN encapsulation. The SPAN copies can be truncated to save bandwidth.

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## Multiple ERSPAN Sessions

Although you can create up to 18 ERSPAN sessions, you can run only four ERSPAN or SPAN sessions at one time. You can shut down any unused ERSPAN sessions.

For information about shutting down ERSPAN sessions, see [Shutting Down or Activating an ERSPAN Session, on page 20](#).

## High Availability

The ERSPAN feature supports stateless restarts. After a reboot, the running configuration is applied.

## Licensing Requirements for ERSPAN

The following table shows the licensing requirements for this feature:

Product	License Requirement
Cisco NX-OS	ERSPAN requires no license. Any feature not included in a license package is bundled with the Cisco NX-OS system images and is provided at no extra charge to you. For a complete explanation of the Cisco NX-OS licensing scheme, see the <i>License and Copyright Information for Cisco NX-OS Software</i> available at the following URL: <a href="http://www.cisco.com/US/products/switches/switches4/0/online_getinfo_sw_inf.html">http://www.cisco.com/US/products/switches/switches4/0/online_getinfo_sw_inf.html</a>

## Prerequisites for ERSPAN

ERSPAN has the following prerequisite:

- You must first configure the Ethernet interfaces for ports on each device to support the desired ERSPAN configuration. For more information, see the Interfaces configuration guide for your platform.

## Guidelines and Limitations for ERSPAN

ERSPAN has the following guidelines and limitations:

- A maximum of 16 active sessions are supported. They can be ERSPAN sessions only or a mixture of ERSPAN and SPAN sessions.
- The maximum number of ports for each ERSPAN session is 128.
- The maximum number of VLANs per session is 32.
- You can have source ports, source VLANs, and source VSANs in one ERSPAN session.
- ERSPAN can monitor ingress, egress, or both ingress and egress traffic on a source port and only ingress traffic on source VLANs or source VSANs as long as the VLAN is not mapped to a VSAN. ERSPAN cannot monitor egress traffic on source VLANs and VSANs.
- To bring up an ERSPAN monitor session, you must first configure a global origin address using the **monitor erspan origin ip-address ip-address global** command.
- Source ports and source VLANs can be in the same ERSPAN session.
- ERSPAN traffic can exit the switch through a Layer 2 interface, Layer 3 interface, port channel, or FabricPath core port.
- A destination IP address of a remote switch cannot be reached through a virtual Ethernet port or FEX port. This functionality is not supported.
- Configuring a FEX interface as a destination port for ERSPAN is not supported.
- ERSPAN traffic is not load balanced if the reachability to a destination IP address is a Layer 3 ECMP or a port channel. In the case of ECMP, the ERSPAN traffic is sent to only one next-hop router or one member of the port channel.

- ERSPAN supports Fast Ethernet, Gigabit Ethernet, TenGigabit Ethernet, and port channel interfaces as source ports for a source session.
- When a session is configured through the ERSPAN configuration commands, the session ID and the session type cannot be changed. In order to change them, you must first use the no version of the configuration command to remove the session and then reconfigure the session.
- ERSPAN traffic might compete with regular data traffic.
- ERSPAN traffic is assigned to the QoS class-default system class (qos-group 0).
- To ensure that data traffic is prioritized over ERSPAN traffic, you can create a QoS system class with prioritization above the class-default system class on the ERSPAN destination port.  
On Layer 3 networks, ERSPAN traffic can be marked with a the desired Differentiated Services Code Point (DSCP) value using the ip dscp command. By default, ERSPAN traffic is marked with a DSCP value of 0.
- The **rate limit** command is not supported.
- ERSPAN is not supported on a management interface.
- You cannot use the same source interface in multiple SPAN or ERSPAN sessions.

The following limitations apply to ERSPAN source sessions Access Control Lists (ACL) configurations:

- The SPAN session ignores any permit or deny actions specified in the access-list, and spans only the packets that match the access-list filter criteria.
- ACLs are supported on ERSPAN source sessions only. ACLs are not supported on ERSPAN destination sessions.
- Due to system limitations, the extent to which an ACL associated to ERSPAN session can scale depends on the how the SPAN source is configured. The following table shows different scenarios and the corresponding maximum ACL size supported.



**Note** These calculations assume that each ACE in the ACL results in one final TCAM entry.

Scenario	Maximum ACL Size
ERSPAN has single Switch Port as source with both Tx and Rx.	Current Available TCAM Entries/2
ERSPAN has multiple Switch Ports as source with both Tx and Rx.	Current Available TCAM Entries/3
ERSPAN has Port Channel (with one or more member switch ports) as source with both Tx and Rx.	Current Available TCAM Entries/3
ERSPAN has single HIF Ports as source with both Tx and Rx.	Current Available TCAM Entries/3

Scenario	Maximum ACL Size
ERSPAN has multiple HIF Ports as source with both Tx and Rx.	Current Available TCAM Entries/4
ERSPAN has HIF Port Channel (with one or more member HIF ports) as source with both Tx and Rx.	Current Available TCAM Entries/4

- Due to system limitations, the extent to which an ACL associated to ERSPAN session can scale depends on the how the SPAN source is configured. The following table shows different scenarios and the corresponding maximum ACL size supported.



**Note** These calculations assume that each ACE in the ACL results in one final TCAM entry.

Scenario	Maximum ACL Size
ERSPAN has single Switch Port as source with both Tx and Rx.	Current Available TCAM Entries/2
ERSPAN has multiple Switch Ports as source with both Tx and Rx.	Current Available TCAM Entries/3
ERSPAN has Port Channel (with one or more member switch ports) as source with both Tx and Rx.	Current Available TCAM Entries/3
ERSPAN has single HIF Ports as source with both Tx and Rx.	Current Available TCAM Entries/3
ERSPAN has multiple HIF Ports as source with both Tx and Rx.	Current Available TCAM Entries/4
ERSPAN has HIF Port Channel (with one or more member HIF ports) as source with both Tx and Rx.	Current Available TCAM Entries/4

- The following scenarios are unaffected by any system limitations for ACL and SPAN session scaling:
  - ERSPAN has single Switch Port as source with Tx only.
  - ERSPAN has multiple Switch Ports as source with Tx only.
  - ERSPAN has a Port Channel (with one or more member switch ports) as source with Tx only.
  - ERSPAN has a single Host Interface (HIF) Port as source with Tx only.
  - ERSPAN has multiple HIF Ports as source with Tx only.
  - ERSPAN has a single Port HIF Channel (with one or more member HIF ports) as source with Tx only.
  - ERSPAN has a single Switch Port as source with Rx only.
  - ERSPAN has multiple Switch Ports as source with Rx only.

- ERSPAN has a Port Channel (with one or more member switch ports) as source with Rx only.
  - ERSPAN has a single HIF Port as source with Rx only.
  - ERSPAN has multiple HIF Ports as source with Rx only.
  - ERSPAN has a HIF Port Channel (with one or more member HIF ports) as source with Rx only
- The following guidelines apply when configuring ERSPAN source sessions with ACLs:
    - When you associate an ACL with an ERSPAN session, you must ensure that its size is not greater than the calculations given in the table above. Otherwise the ERSPAN session fails and generate a "TCAM resource unavailable" error. If the ACL has Layer 4 Operations and TCAM resource expansion is enabled, you need to know the expected expanded size and you need to use the expanded size to calculate the maximum ACL size.
    - If you change the ACL that is attached to a ERSPAN session, the ACL size can exceed the maximum ACL size allowed. In this scenario, the SPAN session continues to work with the modified ACL. However, you should undo the ACEs added to the ACL to limit the size to maximum allowed ACL size.
    - If you add a ERSPAN session when one already exists, then to modify the first span session there should be free TCAM entries of size equal to number of ACEs in the associated ACL (Assuming that each ACE requires one TCAM entry. If it gets expanded, the expanded size should be considered). Therefore, TCAM entries consumed by the second ERSPAN session should be released.
    - To replace a large ACL with another large ACL (which could cause the ERSPAN session to enter a generic error state), you must first remove the existing filter access group (using the **no filter access-group *current acl name*** command), and then configure the new filter access group (using the **filter access-group *new acl name*** command).

## Guidelines and Limitations for ERSPAN Type III

ERSPAN Type III has the following guidelines and limitations:

- Only IPv4 networks are supported by ERSPAN Type III. IPv6 networks are not supported by ERSPAN Type III but IPv6 packets can be captured by ERSPAN.
- To calculate packet latency across ports, ERSPAN timestamp should be taken from the Precision Time Protocol (PTP) clock and the PTP feature must be enabled on the switch.

## Default Settings for ERSPAN

The following table lists the default settings for ERSPAN parameters.

*Table 2: Default ERSPAN Parameters*

Parameters	Default
ERSPAN sessions	Created in the shut state.



Parameters	Default
Truncated ERSPAN	Disabled.

# Configuring ERSPAN

## Configuring an ERSPAN Source Session

The ERSPAN source session defines the session configuration parameters and the ports or VLANs to be monitored. This section describes how to configure an ERSPAN source session.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>configuration terminal</b>  <b>Example:</b> <pre>switch# config t switch(config)#</pre>	Enters global configuration mode.
<b>Step 2</b>	<b>monitor session <i>span-session-number</i> type {erspan-source   local}</b>  <b>Example:</b> <pre>switch(config)# monitor session 1 type erspan-source switch(config-erspan-src)#</pre>	<p>Defines an ERSPAN source session using the session ID and the session type, and places the command in ERSPAN monitor source session configuration mode.</p> <p>The <i>span-session-number</i> argument range is from 1 to 1024. The same session number cannot be used more than once.</p> <p>The session IDs for source sessions are in the same global ID space, so each session ID is globally unique.</p> <p>The session ID (configured by the <i>span-session-number</i> argument) and the session type (configured by the <b>erspan-source</b> keyword) cannot be changed once entered. To change session ID or session type, use the <b>no</b> version of the command to remove the session and then recreate the session through the command with a new session ID or a new session type.</p>
<b>Step 3</b>	(Optional) <b>description</b> <i>erspan_session_description</i>  <b>Example:</b> <pre>switch(config-erspan-src)# description source1</pre>	<p>Describes the ERSPAN source session.</p> <p>The <i>erspan_session_description</i> argument can be up to 32 characters and cannot contain special characters or spaces.</p>

	Command or Action	Purpose
<b>Step 4</b>	<b>source interface</b> { <i>ethernet slot/chassis number</i>   <i>portchannel number</i> }  <b>Example:</b> <pre>switch(config-erspan-src)# source interface eth 1/1</pre>	Associates the ERSPAN source session number with the source ports (1-255).
<b>Step 5</b>	<b>source vlan</b> <i>number</i>  <b>Example:</b> <pre>switch(config-erspan-src)# source vlan 1</pre>	Associates the ERSPAN source session number with the VLANs (1-4096).
<b>Step 6</b>	<b>source vsan</b> <i>number</i>  <b>Example:</b> <pre>switch(config-erspan-src)# source vsan 1</pre>	Specifies the VSAN ID number. The range is 1 to 4093.
<b>Step 7</b>	<b>destination ip</b> <i>ip-address</i>  <b>Example:</b> <pre>switch(config-erspan-src)# destination ip 192.0.2.2</pre>	Configures the destination IP address in the ERSPAN session. Only one destination IP address is supported per ERSPAN source session.
<b>Step 8</b>	<b>erspan-id</b> <i>flow-id</i>  <b>Example:</b> <pre>switch(config-erspan-src)# erspan-id 5</pre>	Configures the flow ID to identify the ERSPAN flow. The range is from 1 to 1023.
<b>Step 9</b>	<b>vrf</b> { <i>vrf-name</i>   <b>default</b> }  <b>Example:</b> <pre>switch(config-erspan-src)# vrf default</pre>	Configures the VRF to use instead of the global routing table. You can use a VRF that you have specifically configured or the default VRF.
<b>Step 10</b>	<b>[no] filter access-group</b> <i>acl_filter</i>  <b>Example:</b> <pre>switch(config-erspan-src)# filter access-group erspan_acl_filter</pre>	Configures the ACL filter for packets in this ERSPAN session. The ACL filter can be a MAC or an IP access-list.
<b>Step 11</b>	(Optional) <b>ip ttl</b> <i>ttl-number</i>  <b>Example:</b> <pre>switch(config-erspan-src)# ip ttl 5</pre>	Configures the IP time-to-live (TTL) value of the packets in the ERSPAN traffic. Valid values are from 1 to 255. The default value is 255.
<b>Step 12</b>	(Optional) <b>ip dscp</b> <i>dscp_value</i>  <b>Example:</b> <pre>switch(config-erspan-src)# ip dscp 42</pre>	Configures the IP Differentiated Services Code Point (DSCP) value of the packets in the ERSPAN traffic. Valid values are from 0 to 63. The default value is 0.
<b>Step 13</b>	<b>no shut</b>  <b>Example:</b> <pre>switch(config-erspan-src)# no shut</pre>	Enables the ERSPAN source session. By default, the session is created in the shut state.

	Command or Action	Purpose
<b>Step 14</b>	<b>exit</b> <b>Example:</b> <pre>switch(config-erspan-src)# exit switch(config)# exit</pre>	Updates the configuration and exits ERSPAN source session configuration mode.
<b>Step 15</b>	<b>(Optional) copy running-config startup-config</b> <b>Example:</b> <pre>switch(config-erspan-src)# copy running-config startup-config</pre>	Copies the running configuration to the startup configuration.

## Configuring an ERSPAN Type III Source Session

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>configuration terminal</b> <b>Example:</b> <pre>switch# config t switch(config)#</pre>	Enters global configuration mode.
<b>Step 2</b>	<b>monitor erspan switch-id <i>switch-id</i></b> <b>Example:</b> <pre>switch(config)# monitor erspan switch-id 1009</pre>	Configures the ERSPAN global switch ID. The switch ID is applicable for all ERSPAN Type III sessions. Default value is 0.
<b>Step 3</b>	<b>monitor erspan granularity 1588</b> <b>Example:</b> <pre>switch(config)# monitor erspan granularity 1588</pre>	Specifies granularity for all ERSPAN Type III sessions. 1588 (in seconds or nanoseconds) is the only option available and it is the default value.
<b>Step 4</b>	<b>monitor session <i>span-session-number</i> type {erspan-source   local}</b> <b>Example:</b> <pre>switch(config)# monitor session 1 type erspan-source switch(config-erspan-src)#</pre>	<p>Defines an ERSPAN source session using the session ID and the session type, and places the command in ERSPAN monitor source session configuration mode.</p> <p>The <i>span-session-number</i> argument range is from 1 to 1024. The same session number cannot be used more than once.</p> <p>The session IDs for source sessions are in the same global ID space, so each session ID is globally unique for both session types.</p> <p>The session ID (configured by the <i>span-session-number</i> argument) and the</p>

	Command or Action	Purpose
		session type (configured by the <b>erspan-source</b> keyword) cannot be changed once entered. To change session ID or session type, use the <b>no</b> version of the command to remove the session and then recreate the session through the command with a new session ID or a new session type.
<b>Step 5</b>	Required: <b>header-type</b> <i>version</i> <b>Example:</b> <pre>switch(config-erspan-src)# header-type 3</pre>	Changes the ERSPAN source session from Type II to Type III. <b>Note</b> You can use the <b>no</b> form of this command to change an ERSPAN source session from Type III to Type II.
<b>Step 6</b>	(Optional) <b>description</b> <i>erspan_session_description</i> <b>Example:</b> <pre>switch(config-erspan-src)# description source1</pre>	Describes the ERSPAN source session. The <i>erspan_session_description</i> argument can be up to 240 characters and cannot contain special characters or spaces.
<b>Step 7</b>	<b>source interface</b> { <b>ethernet</b> <i>slot/chassis number</i>   <b>portchannel</b> <i>number</i> } <b>Example:</b> <pre>switch(config-erspan-src)# source interface eth 1/1</pre>	Associates the ERSPAN source session number with the source ports (1-255).
<b>Step 8</b>	<b>source vlan</b> <i>number</i> <b>Example:</b> <pre>switch(config-erspan-src)# source vlan 1</pre>	Associates the ERSPAN source session number with the VLANs (1-4096).
<b>Step 9</b>	<b>source vsan</b> <i>number</i> <b>Example:</b> <pre>switch(config-erspan-src)# source vsan 1</pre>	On Cisco Nexus 5000 Series switches, specifies the VSAN ID number. The range is 1 to 4093. On Cisco Nexus 5500 Series switches, you cannot configure source VSANs.
<b>Step 10</b>	<b>destination ip</b> <i>ip-address</i> <b>Example:</b> <pre>switch(config-erspan-src)# destination ip 192.0.2.2</pre>	Configures the destination IP address in the ERSPAN session. Only one destination IP address is supported per ERSPAN source session.
<b>Step 11</b>	<b>erspan-id</b> <i>flow-id</i> <b>Example:</b> <pre>switch(config-erspan-src)# erspan-id 5</pre>	Configures the flow ID to identify the ERSPAN flow. The range is from 1 to 1023.

	Command or Action	Purpose
<b>Step 12</b>	<b>vrf</b> { <i>vrf-name</i>   <b>default</b> } <b>Example:</b> switch(config-erspan-src)# vrf default	Configures the VRF to use instead of the global routing table. You can use a VRF that you have specifically configured or the default VRF.
<b>Step 13</b>	[ <b>no</b> ] <b>filter access-group</b> <i>acl_filter</i> <b>Example:</b> switch(config-erspan-src)# filter access-group erspan_acl_filter	Configures the ACL filter for packets in this ERSPAN session. The ACL filter can be a MAC or an IP access-list.
<b>Step 14</b>	(Optional) <b>ip ttl</b> <i>ttl-number</i> <b>Example:</b> switch(config-erspan-src)# ip ttl 5	Configures the IP time-to-live (TTL) value of the packets in the ERSPAN traffic. Valid values are from 1 to 255. The default value is 255.
<b>Step 15</b>	(Optional) <b>ip dscp</b> <i>dscp_value</i> <b>Example:</b> switch(config-erspan-src)# ip dscp 42	Configures the IP Differentiated Services Code Point (DSCP) value of the packets in the ERSPAN traffic. Valid values are from 0 to 63. The default value is 0.
<b>Step 16</b>	<b>no shut</b> <b>Example:</b> switch(config-erspan-src)# no shut	Enables the ERSPAN source session. By default, the session is created in the shut state. <b>Note</b> On Cisco Nexus 5000 Series switches, only two ERSPAN source sessions can be running simultaneously. On Cisco Nexus 5500 Series switches, up to four source sessions can be running simultaneously.
<b>Step 17</b>	<b>exit</b> <b>Example:</b> switch(config-erspan-src)# exit switch(config)# exit	Updates the configuration and exits ERSPAN source session configuration mode.
<b>Step 18</b>	(Optional) <b>copy running-config startup-config</b> <b>Example:</b> switch(config-erspan-src)# copy running-config startup-config	Copies the running configuration to the startup configuration.

## Configuring Truncated ERSPAN

You can configure an MTU size for the ERSPAN traffic to reduce the amount of fabric or network bandwidth used in sending ERSPAN packets.

## Procedure

	Command or Action	Purpose
<b>Step 1</b>	enable <b>Example:</b> switch> enable	Enables privileged EXEC mode. Enter your password if prompted.
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> switch# configure terminal switch(config)#	Enters global configuration mode.
<b>Step 3</b>	<b>monitor session <i>erspan_session_number</i> type {erspan-source   local}</b> <b>Example:</b>  switch(config)# monitor session 1 type erspan-source switch(config-erspan-src)#	Defines an ERSPAN source session using the session ID and the session type, and places the command in ERSPAN monitor source session configuration mode.  The span-session-number argument range is from 1 to 1024. The same session number cannot be used more than once.  The session IDs for source sessions are in the same global ID space, so each session ID is globally unique for both session types.  The session ID (configured by the span-session number argument) and the session type (configured by the erspan-source keyword) cannot be changed once entered. To change session ID or session type, use the no version of the command to remove the session and then re-create the session through the command with a new session ID or a new session type.
<b>Step 4</b>	<b>mtu <i>mtu-value</i></b> <b>Example:</b> switch(config-erspan-src)# mtu 64	Defines the maximum transmission unit (MTU) truncation size for ERSPAN packets. Valid values are from 64 to 1518.  The default is no truncation enabled.
<b>Step 5</b>	<b>exit</b> <b>Example:</b> switch(config-mon-erspan-src)# exit	Updates the configuration and exits ERSPAN source session configuration mode.
<b>Step 6</b>	(Optional) <b>copy running-config startup-config</b> <b>Example:</b> switch(config)# copy running-config startup-config	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

## Configuring an ERSPAN Destination Session

You can configure an ERSPAN destination session to copy packets from a source IP address to destination ports on the local device. By default, ERSPAN destination sessions are created in the shut state.

### Before you begin

Ensure that you have already configured the destination ports in monitor mode.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>config t</b> <b>Example:</b> switch# config t switch(config)#	Enters global configuration mode.
<b>Step 2</b>	<b>interface ethernet slot/port[-port]</b> <b>Example:</b> switch(config)# interface ethernet 2/5 switch(config-if)#	Enters interface configuration mode on the selected slot and port or range of ports.
<b>Step 3</b>	<b>switchport</b> <b>Example:</b> switch(config-if)# switchport	Configures switchport parameters for the selected slot and port or range of ports.
<b>Step 4</b>	<b>switchport mode [access   trunk]</b> <b>Example:</b> switch(config-if)# switchport mode trunk	Configures the following switchport modes for the selected slot and port or range of ports: <ul style="list-style-type: none"> <li>• access</li> <li>• trunk</li> </ul>
<b>Step 5</b>	<b>switchport monitor</b> <b>Example:</b> switch(config-if)# switchport monitor	Configures the switch interface in monitor mode.  To configure an interface to be an ERSPAN or SPAN destination (using the <b>destination interface ethernet interface</b> command), it must first be configured in monitor mode.
<b>Step 6</b>	Repeat Steps 2 to 5 to configure monitoring on additional ERSPAN destinations.	—
<b>Step 7</b>	<b>no monitor session {session-number   all}</b> <b>Example:</b> switch(config-if)# no monitor session 3	Clears the configuration of the specified ERSPAN session. The new session configuration is added to the existing session configuration.
<b>Step 8</b>	<b>monitor session {session-number   all} type erspan-destination</b>	Configures an ERSPAN destination session.

	Command or Action	Purpose
	<b>Example:</b> <pre>switch(config-if)# monitor session 3 type erspan-destination switch(config-erspan-dst)#</pre>	
<b>Step 9</b>	<b>description</b> <i>description</i> <b>Example:</b> <pre>switch(config-erspan-dst)# description erspan_dst_session_3</pre>	Configures a description for the session. By default, no description is defined. The description can be up to 32 alphanumeric characters.
<b>Step 10</b>	<b>source ip</b> <i>ip-address</i> <b>Example:</b> <pre>switch(config-erspan-dst)# source ip 10.1.1.1</pre>	Configures the source IP address in the ERSPAN session. Only one source IP address is supported per ERSPAN destination session. This IP address must match the destination IP address configured in the corresponding ERSPAN source session.
<b>Step 11</b>	<b>destination</b> {[ <b>interface</b> [ <i>type slot/port[-port]</i> , [ <i>type slot/port [port]</i> ]]] [ <b>port-channel</b> <i>channel-number</i> ]} <b>Example:</b> <pre>switch(config-erspan-dst)# destination interface ethernet 2/5</pre>	Configures a destination for copied source packets. You can configure only interfaces as a destination.  <b>Note</b> You can configure destination ports as trunk ports.
<b>Step 12</b>	<b>vrf</b> <i>default</i> <b>Example:</b> <pre>switch(config-erspan-dst)# vrf default</pre>	Configures the VRF instance that the ERSPAN destination session uses for traffic forwarding. ERSPAN destination sessions support the default VRF only.
<b>Step 13</b>	<b>no shut</b> <b>Example:</b> <pre>switch(config)# no shut</pre>	Enables the ERSPAN destination session. By default, the session is created in the shut state.  <b>Note</b> Only 16 active ERSPAN destination sessions can be running simultaneously.
<b>Step 14</b>	(Optional) <b>show monitor session</b> { <b>all</b>   <i>session-number</i>   <b>range</b> <i>session-range</i> } <b>Example:</b> <pre>switch(config)# show monitor session 3</pre>	Displays the ERSPAN session configuration.
<b>Step 15</b>	(Optional) <b>show running-config monitor</b> <b>Example:</b> <pre>switch(config-erspan-src)# show running-config monitor</pre>	Displays the running ERSPAN configuration.
<b>Step 16</b>	(Optional) <b>show startup-config monitor</b> <b>Example:</b>	Displays the ERSPAN startup configuration.



	Command or Action	Purpose
	<code>switch(config-erspan-src) # show startup-config monitor</code>	
<b>Step 17</b>	(Optional) <b>copy running-config startup-config</b>  <b>Example:</b> <code>switch(config-erspan-src) # copy running-config startup-config</code>	Copies the running configuration to the startup configuration.

## Configuring an ERSPAN SPAN-on-Drop Session

Use the monitor session command to configure an ERSPAN SPAN-on-Drop session. Each session is identified by a unique session number.



**Note** There can only be one active SPAN-on-Drop or SPAN-on-Drop ERSPAN session at any time.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<code>switch# configure terminal</code>	Enters global configuration mode.
<b>Step 2</b>	<code>switch(config) # monitor session session-number type erspan-span-on-drop</code>	Enters SPAN-on-Drop monitor configuration mode for the specified SPAN-on-drop session.
<b>Step 3</b>	<code>switch(config-span-on-drop-erspan) # description description</code>	Creates descriptive name for the SPAN-on-Drop session.
<b>Step 4</b>	<code>switch(config-span-on-drop-erspan) # source interface ethernet slot/port rx</code>	Configures sources and the traffic direction in which to duplicate packets. You can enter a range of Ethernet ports. You can specify the traffic direction to duplicate as ingress (rx) only.
<b>Step 5</b>	<code>switch(config-span-on-drop-erspan) # destination ip ip-address</code>	Configures the destination IP address for the ERSPAN SPAN-on-Drop session.
<b>Step 6</b>	<code>switch(config-span-on-drop-erspan) # erspan-id erspan-id</code>	Configures the ERSPAN ID for the ERSPAN SPAN-on-Drop session. The range is from 1 to 1023. This ID uniquely identifies a source and destination ERSPAN session pair. The ERSPAN ID configured in the corresponding destination ERSPAN session must be same as the one configured in the source session.
<b>Step 7</b>	<code>switch(config-span-on-drop-erspan) # ip ttl ttl-value</code>	Configures the IP time-to-live (TTL) value of the ERSPAN traffic.

	Command or Action	Purpose
<b>Step 8</b>	switch(config-span-on-drop-erspan) # <b>ip dscp</b> <i>dscp-value</i>	Configures the differentiated services code point (DSCP) value of the packets in the ERSPAN traffic.
<b>Step 9</b>	(Optional) switch(config) # <b>show monitor session</b> <i>session-number</i>	Displays the status of ERSPAN SPAN-on-Drop sessions.
<b>Step 10</b>	(Optional) switch(config) # <b>copy running-config</b> startup-config	Copies the running configuration to the startup configuration.

## Configuring an ERSPAN SPAN-on-Latency Session

You can configure an MTU size for the ERSPAN traffic to reduce the amount of fabric or network bandwidth used in sending ERSPAN packets.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	enable  <b>Example:</b> switch> enable	Enables privileged EXEC mode. Enter your password if prompted.
<b>Step 2</b>	<b>configure terminal</b>  <b>Example:</b> switch# configure terminal switch(config)#	Enters global configuration mode.
<b>Step 3</b>	<b>interface ethernet</b> <i>slot/port</i>  <b>Example:</b> switch(config)# interface ethernet 1/1	Enters interface configuration mode.
<b>Step 4</b>	<b>packet latency threshold</b> <i>threshold</i>  <b>Example:</b> switch(config-if)# packet latency threshold 53000000	Configures the latency threshold value on an interface. Valid values are from 8 to 536870904 nano seconds.
<b>Step 5</b>	<b>monitor session</b> <i>session_number</i> <b>type span-on-latency-erspan</b>  <b>Example:</b>  switch(config)# monitor session 1 type span-on-latency-erspan switch(config-span-on-latency-erspan)#	Defines an ERSPAN source session using the session ID and the session type, and places the command in ERSPAN monitor source session configuration mode.  The <i>session_number</i> argument range is from 1 to 1024. The same session number cannot be used more than once.  The session ID (configured by the <i>span_session</i> number argument) and the session type (configured by the

	Command or Action	Purpose
		span-on-latency-erspan keyword) cannot be changed once entered. To change session ID or session type, use the no version of the command to remove the session and then re-create the session through the command with a new session ID or a new session type.
<b>Step 6</b>	<b>description</b> <i>description</i> <b>Example:</b> <pre>switch(config-span-on-latency-erspan)# description SPAN-on-Latency-ERSPAN-session</pre>	Adds a description to the session configuration.
<b>Step 7</b>	<b>source interface ethernet</b> <i>slot/port</i> <b>Example:</b> <pre>switch(config-span-on-latency-erspan)# source interface ethernet 1/3</pre>	Specifies the Ethernet interface to use as the source SPAN port. <b>Note</b> You can configure multiple SPAN source ports.
<b>Step 8</b>	<b>destination ip</b> <i>ip-address</i> <b>Example:</b> <pre>switch(config-span-on-latency-erspan)# destination ip 10.0.3.1</pre>	Configures the session destination IP address.
<b>Step 9</b>	<b>erspan-id</b> <i>flow-id</i> <b>Example:</b> <pre>switch(config-span-on-latency-erspan)# erspan-id 30</pre>	Configures the flow ID for the session. The range is from 1 to 1023.
<b>Step 10</b>	(Optional) <b>ip ttl</b> <i>flow-id</i> <b>Example:</b> <pre>switch(config-span-on-latency-erspan)# erspan-id 30</pre>	(Optional) Configures the IP time-to-live (TTL) value of the ERSPAN traffic The range is from 1 to 255.
<b>Step 11</b>	(Optional) <b>ip dscp</b> <i>flow-id</i> <b>Example:</b> <pre>switch(config-span-on-latency-erspan)# ip dscp 63</pre>	(Optional) Configures the differentiated services code point (DSCP) value of the packets in the ERSPAN traffic. The range is from 0 to 63.
<b>Step 12</b>	(Optional) <b>mtu</b> <i>mtu-value</i> <b>Example:</b> <pre>switch(config-span-on-latency-erspan)# mtu 1500</pre>	(Optional) Defines the maximum transmission unit (MTU) truncation size for ERSPAN packets. Valid values are from 64 to 1518. The default is no truncation enabled.
<b>Step 13</b>	<b>exit</b> <b>Example:</b> <pre>switch(config-span-on-latency-erspan)# exit</pre>	Updates the configuration and exits ERSPAN SPAN-on-Latency session configuration mode.

	Command or Action	Purpose
<b>Step 14</b>	(Optional) <b>copy running-config startup-config</b>  <b>Example:</b> <pre>switch(config)# copy running-config startup-config</pre>	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

## Shutting Down or Activating an ERSPAN Session

You can shut down ERSPAN sessions to discontinue the copying of packets from sources to destinations. Because only a specific number of ERSPAN sessions can be running simultaneously, you can shut down a session to free hardware resources to enable another session. By default, ERSPAN sessions are created in the shut state.

You can enable ERSPAN sessions to activate the copying of packets from sources to destinations. To enable an ERSPAN session that is already enabled but operationally down, you must first shut it down and then enable it. You can shut down and enable the ERSPAN session states with either a global or monitor configuration mode command.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>configuration terminal</b>  <b>Example:</b> <pre>switch# configuration terminal switch(config)#</pre>	Enters global configuration mode.
<b>Step 2</b>	<b>monitor session {session-range   all} shut</b>  <b>Example:</b> <pre>switch(config)# monitor session 3 shut</pre>	Shuts down the specified ERSPAN sessions. The session range is from 1 to 48. By default, sessions are created in the shut state.  <b>Note</b> <ul style="list-style-type: none"> <li>• In Cisco Nexus 5000 and 5500 platforms, two sessions can run simultaneously.</li> <li>• In Cisco Nexus 5600 and 6000 platforms, 16 sessions can run simultaneously.</li> </ul>
<b>Step 3</b>	<b>no monitor session {session-range   all} shut</b>  <b>Example:</b>	Resumes (enables) the specified ERSPAN sessions. The session range is from 1 to 48. By default, sessions are created in the shut state. Only two sessions can be running at a time.

	Command or Action	Purpose
	<pre>switch(config)# no monitor session 3 shut</pre>	<p><b>Note</b> If a monitor session is enabled but its operational status is down, then to enable the session, you must first specify the <b>monitor session shut</b> command followed by the <b>no monitor session shut</b> command.</p>
<b>Step 4</b>	<p><b>monitor session <i>session-number</i> type erspan-source</b></p> <p><b>Example:</b></p> <pre>switch(config)# monitor session 3 type erspan-source switch(config-erspan-src)#</pre>	Enters the monitor configuration mode for the ERSPAN source type. The new session configuration is added to the existing session configuration.
<b>Step 5</b>	<p><b>monitor session <i>session-number</i> type erspan-destination</b></p> <p><b>Example:</b></p> <pre>switch(config-erspan-src)# monitor session 3 type erspan-destination</pre>	Enters the monitor configuration mode for the ERSPAN destination type.
<b>Step 6</b>	<p><b>shut</b></p> <p><b>Example:</b></p> <pre>switch(config-erspan-src)# shut</pre>	Shuts down the ERSPAN session. By default, the session is created in the shut state.
<b>Step 7</b>	<p><b>no shut</b></p> <p><b>Example:</b></p> <pre>switch(config-erspan-src)# no shut</pre>	Enables the ERSPAN session. By default, the session is created in the shut state.
<b>Step 8</b>	<p>(Optional) <b>show monitor session all</b></p> <p><b>Example:</b></p> <pre>switch(config-erspan-src)# show monitor session all</pre>	Displays the status of ERSPAN sessions.
<b>Step 9</b>	<p>(Optional) <b>show running-config monitor</b></p> <p><b>Example:</b></p> <pre>switch(config-erspan-src)# show running-config monitor</pre>	Displays the running ERSPAN configuration.
<b>Step 10</b>	<p>(Optional) <b>show startup-config monitor</b></p> <p><b>Example:</b></p> <pre>switch(config-erspan-src)# show startup-config monitor</pre>	Displays the ERSPAN startup configuration.
<b>Step 11</b>	<p>(Optional) <b>copy running-config startup-config</b></p> <p><b>Example:</b></p>	Copies the running configuration to the startup configuration.

	Command or Action	Purpose
	switch(config-erspan-src)# copy running-config startup-config	

## Verifying the ERSPAN Configuration

Use the following command to verify the ERSPAN configuration information:

Command	Purpose
<b>show monitor session</b> {all   <i>session-number</i>   range <i>session-range</i> }	Displays the ERSPAN session configuration.
<b>show running-config monitor</b>	Displays the running ERSPAN configuration.
<b>show startup-config monitor</b>	Displays the ERSPAN startup configuration.

## Configuration Examples for ERSPAN

### Configuration Example for an ERSPAN Source Session

The following example shows how to configure an ERSPAN source session:

```
switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# monitor session 1 type erspan-source
switch(config-erspan-src)# description source1
switch(config-erspan-src)# source interface ethernet 1/1
switch(config-erspan-src)# source vlan 1
switch(config-erspan-src)# source vsan 1
switch(config-erspan-src)# destination ip 192.0.2.2
switch(config-erspan-src)# erspan-id 1
switch(config-erspan-src)# vrf default
switch(config-erspan-src)# ip ttl 5
switch(config-erspan-src)# ip dscp 5
switch(config-erspan-src)# no shut
switch(config-erspan-src)# exit
switch(config)# copy running-config startup config

switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# monitor session 1 type erspan-source
switch(config-erspan-src)# description source1
switch(config-erspan-src)# source interface ethernet 1/1
switch(config-erspan-src)# source vlan 1
switch(config-erspan-src)# source vsan 1
switch(config-erspan-src)# destination ip 192.0.2.2
switch(config-erspan-src)# erspan-id 1
switch(config-erspan-src)# vrf default
switch(config-erspan-src)# ip ttl 5
switch(config-erspan-src)# ip dscp 5
switch(config-erspan-src)# no shut
switch(config-erspan-src)# exit
switch(config)# copy running-config startup config
```

## Configuration Example for an ERSPAN Type III Source Session

The following example shows how to configure an ERSPAN Type III source session:

```
switch# configuration terminal
switch(config)# monitor erspan switch-id 1009
switch(config)# monitor erspan granularity 1588
switch(config)# monitor session 1 type erspan-source
switch(config-erspan-src)# header-type 3
switch(config-erspan-src)# description source1
switch(config-erspan-src)# source interface ethernet 1/1
switch(config-erspan-src)# source vlan 1
switch(config-erspan-src)# source vsan 1
switch(config-erspan-src)# destination ip 192.0.2.2
switch(config-erspan-src)# erspan-id 5
switch(config-erspan-src)# vrf default
switch(config-erspan-src)# filter access-group erspan_acl_filter
switch(config-erspan-src)# ip ttl 5
switch(config-erspan-src)# ip dscp 42
switch(config-erspan-src)# no shut
switch(config-erspan-src)# exit
switch(config)# exit
```

```
switch# configuration terminal
switch(config)# monitor erspan switch-id 1009
switch(config)# monitor erspan granularity 1588
switch(config)# monitor session 1 type erspan-source
switch(config-erspan-src)# header-type 3
switch(config-erspan-src)# description source1
switch(config-erspan-src)# source interface ethernet 1/1
switch(config-erspan-src)# source vlan 1
switch(config-erspan-src)# source vsan 1
switch(config-erspan-src)# destination ip 192.0.2.2
switch(config-erspan-src)# erspan-id 5
switch(config-erspan-src)# vrf default
switch(config-erspan-src)# ip ttl 5
switch(config-erspan-src)# ip dscp 42
switch(config-erspan-src)# no shut
switch(config-erspan-src)# exit
switch(config)# exit
```

## Configuration Example for an IP Address as the Source for an ERSPAN Session

This example shows how to configure an IP address as the source for an ERSPAN session:

```
switch# configure terminal
switch(config)# monitor erspan origin ip-address 192.0.2.1
switch(config)# exit
switch(config)# copy running-config startup config
```

## Configuration Example for Truncated ERSPAN

This example shows how to configure truncated ERSPAN:

```
switch# configure terminal
switch(config)# monitor session 1 type erspan-source
switch(config-erspan-src)# mtu 64
```

```
switch(config-mon-erspan-src)# exit
switch(config)# copy running-config startup config
```

## Configuration Example for an ERSPAN Destination Session

The following example shows how to configure an ERSPAN destination session:

```
switch# config t
switch(config)# interface e14/29
switch(config-if)# no shut
switch(config-if)# switchport
switch(config-if)# switchport monitor
switch(config-if)# exit
switch(config)# monitor session 2 type erspan-destination
switch(config-erspan-dst)# source ip 9.1.1.2
switch(config-erspan-dst)# destination interface e14/29
switch(config-erspan-dst)# erspan-id 1
switch(config-erspan-dst)# vrf default
switch(config-erspan-dst)# no shut
switch(config-erspan-dst)# exit
switch(config)# show monitor session 2
```

## Configuration Example for an ERSPAN ACL

This example shows how to configure an ERSPAN ACL:

```
switch# configure terminal
switch(config)# ip access-list match_11_pkts
switch(config-acl)# permit ip 11.0.0.0 0.255.255.255 any
switch(config-acl)# exit
switch(config)# ip access-list match_12_pkts
switch(config-acl)# permit ip 12.0.0.0 0.255.255.255 any
switch(config-acl)# exit
switch(config)# vlan access-map erspan_filter 5
switch(config-access-map)# match ip address match_11_pkts
switch(config-access-map)# action forward
switch(config-access-map)# exit
switch(config)# vlan access-map erspan_filter 10
switch(config-access-map)# match ip address match_12_pkts
switch(config-access-map)# action forward
switch(config-access-map)# exit
switch(config)# monitor session 1 type erspan-source
switch(config-erspan-src)# filter access_group erspan_filter
```

## Configuration Example for an ERSPAN SPAN-on-Drop Session

This example shows how to configure an ERSPAN SPAN-on-Drop session:

```
switch# configure terminal
switch(config)# monitor session 47 type span-on-drop-erspan
switch(config-span-on-drop-erspan)# description span-on-drop-erspan-session_47
switch(config-span-on-drop-erspan)# source interface ethernet 1/3
switch(config-span-on-drop-erspan)# destination ip 10.1.1.1
switch(config-span-on-drop-erspan)# erspan-id 30
switch(config-span-on-drop-erspan)# ip ttl 245
switch(config-span-on-drop-erspan)# ip dscp 36
switch(config)# copy running-config startup-config
switch(config)#
```



## Configuration Example for ERSPAN SPAN-on-Latency Session

This example shows how to configure an ERSPAN SPAN-on-Latency session:

```
switch# configure terminal
switch(config) # interface ethernet 1/1
switch(config-if) # packet latency threshold 530000000
switch(config) # monitor session 10 type span-on-latency-erspan
switch(config-span-on-latency-erspan) # description span-on-latency-erspan-session_10
switch(config-span-on-latency-erspan) # source interface ethernet 1/3
switch(config-span-on-latency-erspan) # destination ip 192.0.3.1
switch(config-span-on-latency-erspan) # erspan-id 30
switch(config-span-on-latency-erspan) # ip ttl 245
switch(config-span-on-latency-erspan) # ip dscp 36
switch(config-span-on-latency-erspan) # mtu 1500
switch(config-span-on-latency-erspan) # vrf default
switch(config) # copy running-config startup-config
switch(config) #
```

## Additional References

### Related Documents

Related Topic	Document Title
ERSPAN commands: complete command syntax, command modes, command history, defaults, usage guidelines, and examples	<i>Cisco Nexus NX-OS System Management Command Reference</i> for your platform.

