

# Verify SPAN and ERSPAN on Catalyst 9000 Series Switches

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## Introduction

This document describes how to verify SPAN and ERSPAN on Catalyst 9000 Series Switches.

## Prerequisites

### Requirements

There are no specific requirements for this document.

## Components Used

The information in this document is based on these software and hardware versions:

- Catalyst 9300 (Cisco IOS® XE 17.3.5)
- Catalyst 9500 (Cisco IOS® XE 17.3.5)

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

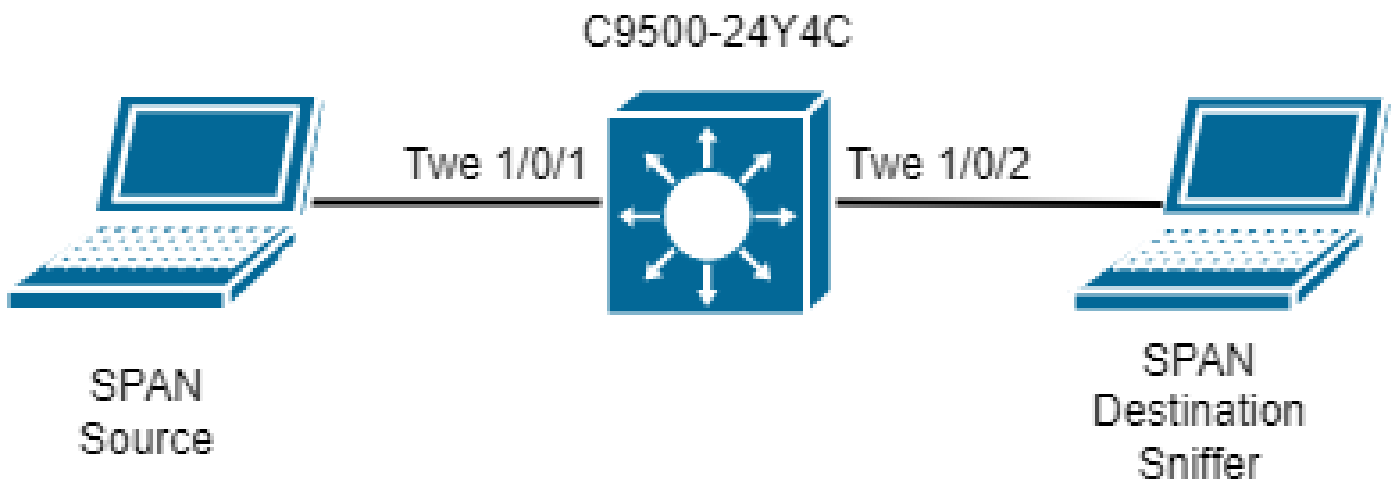
## Related Products

This document can also be used with these hardware and software versions:

- Catalyst 9200
- Catalyst 9300
- Catalyst 9500
- Catalyst 9400
- Catalyst 9600

## Verify SPAN

### Network Diagram



### SPAN Configuration

```
monitor session 1 source interface Twe1/0/1
monitor session 1 destination interface Twe1/0/2
```

Verify the SPAN software configuration. Take note of the Source and Destination SPAN interfaces and the direction of the SPAN capture.

<#root>

C9500-SPAN#

```
show monitor session all
```

Session 1

-----

```
Type                : Local Session
Source Ports        :
  Both              : Twe1/0/1
Destination Ports   : Twe1/0/2
Encapsulation       : Native
  Ingress           : Disabled
```

Verify the SPAN hardware entry. Use the FED Session ID which is unique per SPAN configuration. There can be up to 8 FED Sessions configured at the same time (from FED Sessions 0 to 7).

<#root>

C9500-SPAN#

```
show platform software monitor session 1
```

Span Session 1 (FED Session 0):

```
Type:      Local SPAN
Prev type: Local SPAN
Ingress Src Ports: Twe1/0/1
```

<-- Hardware entry for source interface.

```
Egress Src Ports: Twe1/0/1
```

<-- Hardware entry for source interface.

```
Ingress Local Src Ports: (null)
Egress Local Src Ports: (null)
Destination Ports: Twe1/0/2
```

<-- Hardware entry for destination interface.

```
Ingress Src Vlans:
Egress Src Vlans:
Ingress Up Src Vlans: (null)
Egress Up Src Vlans: (null)
Src Trunk filter Vlans:
RSPAN dst vlan: 0
RSPAN src vlan: 0
RSPAN src vlan sav: 0
Dest port encap = 0x0000
Dest port ingress encap = 0xFFFFFFFFFFFFFFFF
Dest port ingress vlan = 0x0
SrcSess: 1 DstSess: 0 DstPortCfgd: 1 RspnDstCfg: 0 RspnSrcVld: 0
DstCliCfg: 0 DstPrtInit: 1 PsLclCfgd: 0
Flags: 0x00000031 PSPAN
Remote dest port: 0 Dest port group: 0
FSPAN disabled
FSPAN not notified
```

Collect ASIC, Core, and Port numbers for the configured source and destination SPAN ports. The Port number is required to confirm if the Source SPAN interface is properly programmed and if the SPAN is

point to the right Destination SPAN interface.



**Tip:** Use the proper nomenclature standalone device **show platform software/hardware fed active** or stack device **show platform software/hardware fed switch <number>**.

```
<#root>
```

```
C9500-SPAN#
```

```
show platform software fed active ifm mappings
```

Interface	IF_ID	Inst	Asic	Core	Port	SubPort	Mac	Cntx	LPN	GPN	Type	Active
TwentyFiveGigE1/0/1	0x8	1	0	1	20	0	16	4	1	101	NIF	Y
TwentyFiveGigE1/0/2	0x9	1	0	1	21	0	17	5	2	102	NIF	Y

The IlePortLeSpanBitMapTable Doppler register is used to define if a port is subject to SPAN in the ingress (RX) direction. To confirm the configured source SPAN port (ASIC port 20) is assigned to the right FED Session (Session 0):

```
<#root>
```

```
C9500-SPAN#
```

```
show platform hardware fed active fwd-asic register read register-name IlePortLeSpanBitMapTable-20 asic
```

```
For asic 0 core 1
```

```
Module 0 - IlePortLeSpanBitMapTable[0][20]
```

```
ssbm : 0x1
```

```
<-- Convert from Hexadecimal to Binary: 0b00000001. Bit 0 is set.
```

The SPAN Session Bit Map is an 8-bit register. Each bit corresponds to a FED Session: The least significant bit corresponds to FED Session 0, the most significant bit corresponds to FED Session 7. Thus, maximum number of SPAN Sessions supported are 8, as mentioned before.

If an interface is configured as SPAN source port for multiple SPAN sessions, all the FED Sessions must appear in the SSBM register. For example, SSBM with value of 0x5 (0b00000101) means the interface is a SPAN source for both FED Session 0 and FED session 2.

Similarly, Doppler register ElePortLeSpanBitMapTable register determines if a port is subject to SPAN in egress (TX) direction. The analysis is the same as IlePortLeSpanBitMapTable register. To confirm the configured source SPAN port (ASIC port 20) is assign to the right FED Session (Session 0):

```
<#root>
```

```
C9500-SPAN#
```

```
show platform hardware fed active fwd-asic register read register-name ElePortLeSpanBitMapTable-20 asic
```

For asic 0 core 1

Module 0 - ElePortLeSpanBitMapTable[0][20]

ssbm : 0x1

This confirms the source SPAN interface is mapped to the right FED session for both RX and TX direction.

With the FED session ID, you can find the destination port(s) for the SPAN within the AqmRepSpanPortMap Doppler register. To confirm the FED Session 0 points to the right SPAN destination port (ASIC port 21):

<#root>

C9500-SPAN#

```
show platform hardware fed active fwd-asic register read register-name AqmRepSpanPortMap-0 asic 0 core 1
```

For asic 0 core 1

Module 0 - AqmRepSpanPortMap[0][0]

cpuQueueNum : 0x0  
cpuSpanValid : 0x0  
indirectApPortMap : 0x0  
portMap0 : 0x200000

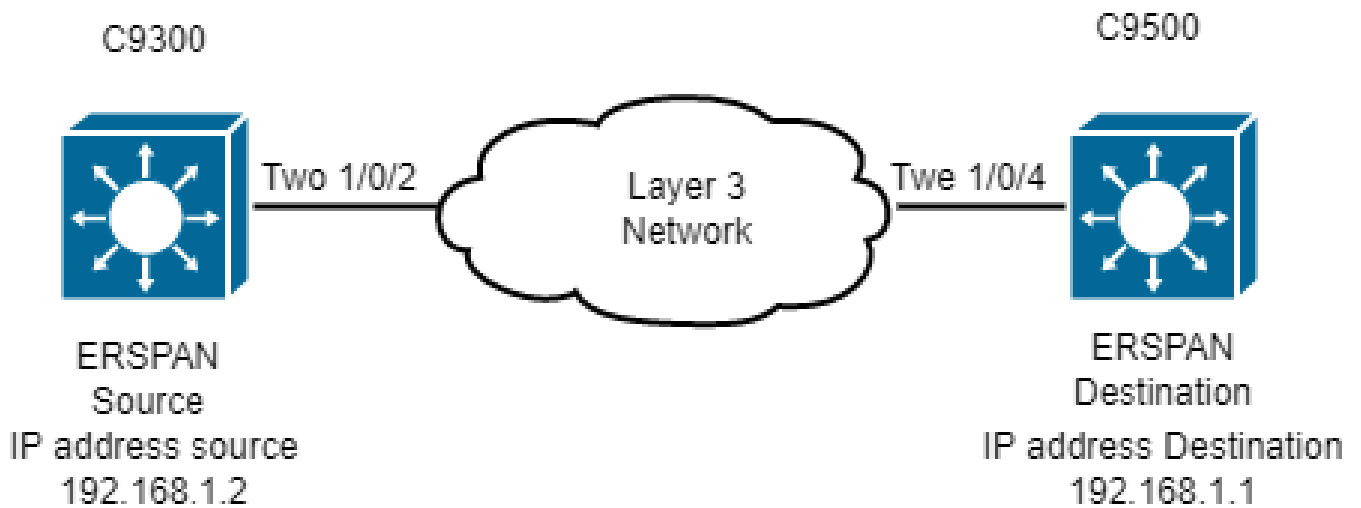
<-- Convert from Hexadecimal to Binary: 0b001000000000000000000000. Bit 21 is set.

rcpPortMap : 0x0  
spanCtiLo : 0x0


This confirms the packets captured with SPAN must be shown replicated out of interface Tw1/0/2 (ASIC port 21). If there are more SPAN destination ports configured, these are shown in the AqmRepSpanPortMap register.

## Verify ERSPAN

### Network Diagram




---

 **Note:** Catalyst C9200 does not support ERSPAN.

---

 **Note:** DNA-Advantage license is required.

---

## ERSPAN Configuration

```
<#root>
```

```
### Source ESRPAN Device ###
```

```
C9300-ERSPAN#
```

```
show run | section monitor
```

```
monitor session 1 type erspan-source
  source vlan 10
  destination
  erspan-id 3
```

```
<-- ERSPAN id must be identical on source and destination.
```

```
  ip address 192.168.1.1
```

```
<-- GRE tunnel destination IP (IP addr configured on ERSPAN destination switch).
```

```
  origin ip address 192.168.1.2
```

```
<-- GRE tunnel source IP (IP addr configured on ERSPAN source switch).
```

```
C9300-ERSPAN#
```

```
show ip interface brief | exclude unassigned
```

Interface	IP-Address	OK?	Method	Status	Protocol
<snip>					
Loopback0	192.168.1.2	YES	NVRAM	up	up

```
### Destination ERSKAN Device ###
```

```
C9500-ERSPAN#
```

```
show run | section monitor
```

```
monitor session 1 type erspan-destination  
destination interface Twel/0/3  
source  
erspan-id 3
```

```
<-- ERSPAN id must be identical on source and destination.
```

```
ip address 192.168.1.1
```

```
<-- GRE tunnel destination IP (IP addr configured on ERSPAN destination switch).
```

```
C9500-ERSPAN#
```

```
show ip interface brief | exclude unassigned
```

Interface	IP-Address	OK?	Method	Status	Protocol
<snip>					
Loopback0	192.168.1.1	YES	NVRAM	up	up

## Source Device

Verify reachability between origin and destination IP.

```
<#root>
```

```
C9300-ERSPAN#
```

```
ping 192.168.1.1 source 192.168.1.2
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 192.168.1.1, timeout is 2 seconds:
```

```
Packet sent with a source address of 192.168.1.2
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/2 ms
```

## Cisco IOS Software Programming

Verify in Cisco IOS software the entry for ERSPAN session.

```
<#root>
```

```
C9300-ERSPAN#
```

```
show monitor session 1
```

```
Session 1
```

```
-----
```

Type : ERSPAN Source Session  
Status : Admin Enabled  
Source VLANs :  
    Both : 10  
Destination IP Address : 192.168.1.1  
Destination ERSPAN ID : 3  
Origin IP Address : 192.168.1.2

## SHIM Programming

Verify What software sends to program hardware (SHIM object).

<#root>

C9300-ERSPAN#

show platform software monitor session 1

Span Session 1 (FED Session 0):

Type: ERSPAN Source  
Prev type: Unknown  
Ingress Src Ports:  
Egress Src Ports:  
Ingress Local Src Ports: (null)  
Egress Local Src Ports: (null)  
Destination Ports:  
Ingress Src Vlans: 10

<-- Replicate Traffic.

Egress Src Vlans: 10

<-- Replicate Traffic.

Ingress Up Src Vlans: 10  
Egress Up Src Vlans: 10  
Src Trunk filter Vlans:  
RSPAN dst vlan: 0  
RSPAN src vlan: 0  
RSPAN src vlan sav: 0  
Dest port encap = 0x0000  
Dest port ingress encap = 0x0000  
Dest port ingress vlan = 0x0  
SrcSess: 1 DstPortCfgd: 0 RspnDstCfg: 0 RspnSrcVld: 0

<-- Monitor session number.

DstCliCfg: 0 DstPrtInit: 0 PsLclCfgd: 0  
Flags: 0x00000002 VSPAN  
Remote dest port: 0 Dest port group: 0  
FSPAN disabled  
FSPAN not notified  
ERSPAN Id : 3

<-- Value match with the software setting.

ERSPAN Org Ip: 192.168.1.2

<-- Value match with the software setting.



ERSPAN Dst Ip: 192.168.1.1

<-- Value match with the software setting.

ERSPAN Ip Ttl: 255  
ERSPAN State : Enabled  
ERSPAN Tun id: 77

## Forwarding Manager Route Processor

Verify what software sends to program hardware (FMAN RP Layer).

<#root>

C9300-ERSPAN#

show platform software swspan switch active R0 source

Showing SPAN source table summary info

Sess-id	IF-type	IF-id	Sess-type	Dir
0	VLAN	10	ERSPAN SRC	Ingress
0	VLAN	10	ERSPAN SRC	Egress

C9300-ERSPAN#

show platform software swspan switch active R0 source sess-id 0

Showing SPAN source detail info

Session ID : 0  
Intf Type : VLAN  
Vlan id : 10

<-- Vlan entry

PD Sess ID : 0  
Session Type : ERSPAN SRC  
Direction : Ingress  
Filter Enabled : No  
ACL Configured : No  
ERSPAN Enable : Yes

Session ID : 0  
Intf Type : VLAN  
Vlan id : 10

<-- Match with the Vlan/Interface SPAN.

PD Sess ID : 0  
Session Type : ERSPAN SRC  
Direction : Egress  
Filter Enabled : No  
ACL Configured : No  
ERSPAN Enable : Yes

## Forward Manager-Forwarding Processor

Verify what software sends to program hardware (FMAN FP Layer).

<#root>

C9300-ERSPAN#

```
show platform software swspan switch active F0 source
```

Showing SPAN source table summary info

Sess-id	IF-type	IF-id	Sess-type	Dir
0	VLAN	10	ERSPAN SRC	Ingress
0	VLAN	10	ERSPAN SRC	Egress

<#root>

C9300-ERSPAN#

```
show platform software swspan switch active F0 source sess-id 0
```

Showing SPAN source detail info

Session ID : 0  
Intf Type : VLAN  
Vlan id : 10  
PD Sess ID : 0  
Session Type : ERSPAN SRC

<-- Source Interface.

Direction : Ingress  
Filter Enabled : No  
ACL Configured : No  
AOM Object id : 519  
AOM Object Status : Done  
Parent AOM object Id : 30  
Parent AOM object Status : Done

Session ID : 0  
Intf Type : VLAN  
Vlan id : 10  
PD Sess ID : 0  
Session Type : ERSPAN SRC

<-- Source Interface.

Direction : Egress  
Filter Enabled : No  
ACL Configured : No  
AOM Object id : 520  
AOM Object Status : Done  
Parent AOM object Id : 30  
Parent AOM object Status : Done

C9300-ERSPAN#

```
show platform software swspan switch active F0 counters <-- Check for any err counters that increment c
```

```
Dump Switch SPAN FP operation counters
```

```
<-- Operational Counters.
```

#### Source SPAN

##### Config Counters

```
PI: Create 2 (err 0), Modify 0 (err 0), Delete 0 (err 0)
```

```
<-- PI = platform independent (Software/IOS).
```

```
PD: Create 2 (err 0), Modify 0 (err 0), Delete 0 (err 0)
```

```
<-- PD = platform dependent (SHIM/FMAN/FED).
```

```
HW: Create 2 (err 0), Modify 0 (err 0), Delete 0 (err 0)
```

```
<-- HW = hardware (FED/ASIC).
```

#### Destination SPAN

##### Config Counters

```
PI: Create 1 (err 0), Modify 0 (err 0), Delete 0 (err 0)
```

```
PD: Create 1 (err 0), Modify 0 (err 0), Delete 0 (err 0)
```

```
HW: Create 1 (err 0), Modify 0 (err 0), Delete 0 (err 0)
```

#### Filter SPAN

##### Config Counters

```
PI: Create 0 (err 0), Modify 0 (err 0), Delete 0 (err 0)
```

```
PD: Create 0 (err 0), Modify 0 (err 0), Delete 0 (err 0)
```

```
HW: Create 0 (err 0), Modify 0 (err 0), Delete 0 (err 0)
```

## Forwarding Engine Driver

Verify the layer that programs the ASIC (FED).

```
<#root>
```

```
C9300-ERSPAN#
```

```
show platform software fed switch active monitor 0
```

```
Session 0
```

```
-----
```

```
Session Type      : ERSPAN Source Session
Source Ports      : RX: None TX: None
Destination Ports : None
Source VLANs      : VLAN-10
Destination VLANs : VLAN-10
Source RSPAN VLAN : 0
DST RSPAN VLAN    : 0
Encap             : Native
```

```
Ingress Forwarding : Disabled
Filter VLANs       : None
ERSPAN Enable      : 1
```

<-- 1 = On/Completed.

```
ERSPAN Hw Programmed : 1
```

<-- 1 = On/Completed.

```
ERSPAN Mandatory Cfg : 1
```

<-- 1 = On/Completed.

```
ERSPAN Id           : 3
Gre Prot             : 88be
MTU                  : 9000
Ip Tos               : 0
Ip Ttl               : 255
Cos                  : 0
Vrf Id               : 0
Dst Ip               : 192.168.1.1
Org Ip               : 192.168.1.2
Dst Ipv6             : ::
Org Ipv6             : ::
SGT count            : 0
SGT Tag(s)           :
```

Verify Hardware Tunnel Programming (FED).

<#root>

C9300-ERSPAN#

```
show platform software fed switch active ifm interfaces tunnel
```

Interface	IF_ID	State
-----		
Tunnel1000000000		
0x00000035		

READY

<-- 0x35 in Hex is 53 in Decimal (tunnel number 53).

<#root>

C9300-ERSPAN#

```
show platform software fed switch active ifm if-id 0x35 <-- Hardware tunnel number 0x35.
```

Interface IF\_ID : 0x0000000000000035  
Interface Name : Tunnel1000000000  
Interface Block Pointer : 0x55d0ff5b6c98  
Interface Block State : READY  
Interface State : Enabled  
Interface Status : ADD  
Interface Ref-Cnt : 4  
Interface Type : TUNNEL  
Unit : 0  
SNMP IF Index : 0  
Encap L3If LE Handle : 0x7f00e0a50a28

<-- Hardware handle info (used to check final Hardware program state).

Decap L3If LE Handle : 0x7f00e0a50bd8

<-- Hardware handle info (used to check final Hardware program state).

Tunnel Mode : 0 [gre]

<-- Tunnel Protocol Enable.

Tunnel Sub-mode: 0 [none]  
Hw Support : Yes  
Tunnel Vrf : 0  
IPv4 MTU : 0  
IPv6 MTU : 0  
IPv4 VRF ID : 0  
IPv6 VRF ID : 0  
Protocol flags : 0x0001 [ ipv4 ]  
Misc flags : 0x0000 [ None ]  
ICMPv4 flags : 0x03 [ unreachable redirect ]  
ICMPv6 flags : 0x03 [ unreachable redirect ]

Port Information

Handle ..... [0xcf000051]  
Type ..... [L3-Tunnel]  
Identifier ..... [0x35]  
Unit ..... [53]  
Port Logical Tunnel Subblock  
Encap-L3if1e.....[0x7f00e0a50a28]

<-- Same number as previous highlighted output.

Decap-L3if1e.....[0x7f00e0a50bd8]

<-- Same number as previous highlighted output.

decap-port1e.....[0x0]  
RI-decap.....[0x7f00e0a5a1a8]  
SI-decap.....[0x7f00e0a5a678]  
Decap-Tcam\_handle..[0x7f00e0a5a9a8]  
Tunnel\_capability..[0x3]  
Encap-RCP-PMAP.....[0x0]  
GPN.....[0]

C9300-ERSPAN#

show platform software fed switch active ifm mappings l3if-le | include L3IF|Tunnel

L3IF_LE	Interface	IF_ID	Type
0x00007f00e0a50a28	Tunnel1000000000	0x00000035	ENCAP_L3_LE

<-- L3IF + IF\_ID (ENCAP) match here.

0x00007f00e0a50bd8	Tunnel1000000000	0x00000035	DECAP_L3_LE
--------------------	------------------	------------	-------------

<-- L3IF + IF\_ID (DECAP) match here.

<#root>

#### Encapsulation LE

C9300-ERSPAN#

```
show platform hardware fed switch active fwd-asic abstraction print-resource-handle 0x00007f00e0a50a28
```

```
Handle:0x7f00e0a50a28 Res-Type:ASIC_RSC_L3IF_LE Res-Switch-Num:255 Asic-Num:255 Feature-ID:AL_FID_IFM L
priv_ri/priv_si Handle: (nil)Hardware Indices/Handles:
```

```
index0:0x27
```

```
mtu_index/13u_ri_index0:0x5 sm handle [ASIC 0]: 0x7f00e0a56d08 index1:0x27 mtu_index/13u_ri_index1:0x5
```

#### Decapsulation LE

C9300-ERSPAN#

```
show platform hardware fed switch active fwd-asic
```

```
abstraction print-resource-handle 0x00007f00e0a50a28 0 <-- DECAP.
```

```
Handle:0x7f00e0a50bd8 Res-Type:ASIC_RSC_L3IF_LE Res-Switch-Num:255 Asic-Num:255 Feature-ID:AL_FID_IFM L
priv_ri/priv_si Handle: (nil)Hardware Indices/Handles:
```

```
index0:0x28
```

```
mtu_index/13u_ri_index0:0x0 sm handle [ASIC 0]: 0x7f00e0a559c8 index1:0x28 mtu_index/13u_ri_index1:0x0
```

Run Embedded Packet Capture on the egress port towards the destination switch. A filter can be applied. Use the source and destination IP of the GRE tunnel. (The packet is an encapsulated packet.)

<#root>

Frame 1: 110 bytes on wire (880 bits), 110 bytes captured (880 bits) on interface 0

```

<snip>
Internet Protocol Version 4, Src: 192.168.1.2, Dst: 192.168.1.1

<-- ERSPAN IP HEADER.

0100 .... = Version: 4
.... 0101 = Header Length: 20 bytes (5)
Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
    0000 00.. = Differentiated Services Codepoint: Default (0)
        .... ..00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)
Total Length: 96
Identification: 0x1018 (4120)
Flags: 0x00
    0... .... = Reserved bit: Not set
    .0.. .... = Don't fragment: Not set
    ..0. .... = More fragments: Not set
Fragment offset: 0
Time to live: 255

Protocol: Generic Routing Encapsulation (47) <-- GRE tunnel encapsulation.

Header checksum: 0x9c56 [validation disabled]
    [Good: False]
    [Bad: False]
Source: 192.168.1.2

<-- Source GRE IP tunnel.

Destination: 192.168.1.1

<-- Destination GRE IP tunnel.

Generic Routing Encapsulation (ERSPAN)
Flags and Version: 0x1000
    0... .... = Checksum Bit: No
    .0.. .... = Routing Bit: No
    ..0. .... = Key Bit: No
    ...1 .... = Sequence Number Bit: Yes
    .... 0... = Strict Source Route Bit: No
    .... .000 = Recursion control: 0
    .... .... 0000 0... = Flags (Reserved): 0
    .... .... .000 = Version: GRE (0)
Protocol Type: ERSPAN (0x88be)

<--ERSPAN enable.

Sequence Number: 0

Encapsulated Remote Switch Packet Analysis

0001 .... = Version: Type II (1)
.... 0000 0001 1000 = Vlan: 10
000. .... = Priority: 0
...1 .... = Unknown2: 1
.... 1... = Direction: Outgoing (1)
.... .0.. = Truncated: Not truncated (0)
.... ..00 0000 0011 = SpanID: 3

<--ERSPAN ID.

Unknown7: 00000002
Ethernet II, Src: Xerox_00:02:00 (00:00:08:00:02:00), Dst: Cisco_eb:90:68 (00:9e:1e:eb:90:68)
<snip>

```

(Internal data packet comes here, output truncated)

## ERSPAN Destination Device

### Cisco IOS Software Programming

```
<#root>
```

```
C9500-ERSPAN#
```

```
show monitor session 1
```

```
Session 1
```

```
-----
```

```
Type           : ERSPAN Destination Session
Status          : Admin Enabled
Destination Ports : Twe1/0/3
Source IP Address : 192.168.1.1
Source ERSPAN ID : 3
```

### SHIM Programming

Verify what software sends to program hardware (SHIM object).

```
<#root>
```

```
C9500-ERSPAN#
```

```
show platform software monitor session 1
```

```
Span Session 1 (FED Session 0):
```

```
Type:          ERSPAN Destination
Prev type: Unknown
Ingress Src Ports:
Egress Src Ports:
Ingress Local Src Ports: (null)
Egress Local Src Ports: (null)
Destination Ports: Twe1/0/3
Ingress Src Vlans:
Egress Src Vlans:
Ingress Up Src Vlans: (null)
Egress Up Src Vlans: (null)
Src Trunk filter Vlans:
RSPAN dst vlan: 0
RSPAN src vlan: 0
RSPAN src vlan sav: 0
Dest port encap = 0x0004
Dest port ingress encap = 0x0000
Dest port ingress vlan = 0x0
SrcSess: 0 DstSess: 1 DstPortCfgd: 1 RspnDstCfg: 0 RspnSrcVld: 0
DstCliCfg: 0 DstPrtInit: 1 PsLclCfgd: 0
Flags: 0x00000000
Remote dest port: 0 Dest port group: 0
FSPAN disabled
```



```
FSPAN not notified
ERSPAN Id      : 3
ERSPAN Dst Ip: 192.168.1.1
ERSPAN Vrf     : 0
```

## Forward Manager-Forwarding Processor

Verify what software sends to program hardware (FMAN FP Layer).

```
<#root>
```

```
C9500-ERSPAN#
```

```
show platform software swspan switch active r0 destination
```

```
Showing SPAN destination table summary info
```

```
Sess-id  IF-type  IF-id  Sess-type
```

```
-----
```

```
0        PORT    11
```

```
Local
```

```
<-- IF-if 0xb maps to Twel/0/3 (Check under 'show platform software fed active ifm mapping').
```

```
0        ERSPAN
```

```
ERSPAN  DST
```

```
C9500-ERSPAN#
```

```
show platform software swspan R0 destination sess-id 0
```

```
Showing SPAN destination detail info
```

```
Session ID : 0
```

```
Intf Type : PORT
```

```
Port dpidx :11
```

```
<--Match with IF-id
```

```
PD Sess Id : 0
```

```
Session Type : Local
```

```
<-- Type of monitor session
```

```
Ingress Fwd : No
```

```
Ingress Escape : Disabled
```

Ingress Vlan : 0  
Encap Value : Replicate  
RSPAN Vlan : 0

Session ID : 0

Intf Type : ERSPAN

Vlan id :  
PD Sess Id : 0

Session Type : ERSPAN DST

ERSPAN Id : 3

ERSPAN Dst Ip: 192.168.1.1

ERSPAN Src Ip: 0.0.0.0

GRE Prot : 35006

MTU : 0

IP Tos : 0

IP Ttl : 255

Cos : 0

Vrf Id : 0

Tunnel Ifid: 38 <-- 38 in Decimal is 0x26 in Hex which is the IF\_ID of Tunnel1

ERSPAN En : TDL\_TRUE

## Forward Manager-Forwarding Processor

Verify what software sends to program hardware (FMAN FP Layer).

<#root>

C9500-ERSPAN#

show platform software swspan switch active F0 counters

<-- (check for any error counters on PI/PD/HW).

Dump Switch SPAN FP operation counters

Source SPAN Config Counters

PI: Create 0 (err 0), Modify 0 (err 0), Delete 0 (err 0)

<-- PI = platform independent (Software/IOS).

PD: Create 0 (err 0), Modify 0 (err 0), Delete 0 (err 0)

<-- PD = platform dependent (SHIM/FMAN/FED).

HW: Create 0 (err 0), Modify 0 (err 0), Delete 0 (err 0)

<-- HW = hardware (FED/ASIC).

Destination SPAN Config Counters

PI: Create 10 (err 0), Modify 6 (err 0), Delete 4 (err 0)

PD: Create 4 (err 0), Modify 0 (err 0), Delete 2 (err 0)

HW: Create 4 (err 0), Modify 0 (err 0), Delete 2 (err 0)

Filter SPAN Config Counters

PI: Create 0 (err 0), Modify 0 (err 0), Delete 0 (err 0)

PD: Create 0 (err 0), Modify 0 (err 0), Delete 0 (err 0)

HW: Create 0 (err 0), Modify 0 (err 0), Delete 0 (err 0)

<#root>

C9500-ERSPAN#

show platform software swspan switch active F0 destination

Showing SPAN destination table summary info

Sess-id IF-type

IF-id

Sess-type

-----  
0 PORT

11

Local

0 VLAN 0

ERSPAN DST

## Forwarding Engine Driver

Verify the layer that programs the ASIC (FED).

<#root>

C9500-ERSPAN#

show platform software fed switch active monitor 0

Session 0

-----

Session Type :

ERSPAN Destination Session

Source Ports : RX: None TX: Tunnel1000000000

Destination Ports : TwentyFiveGigE1/0/3

Source VLANs : None

Destination VLANs : None  
Source RSPAN VLAN : 0  
DST RSPAN VLAN : 0  
Encap : Replicate  
Ingress Forwarding : Disabled  
Filter VLANs : None

ERSPAN Enable : 1  
ERSPAN Hw Programmed : 1

ERSPAN Mandatory Cfg : 1

ERSPAN Id : 3

Ip Tos : 0 (DSCP:0)

Ip Ttl : 0

Cos : 0

Vrf Id : 0

Tunnel IfId : 38 <-- 38 in Decicmal is 0x26 in Hex which is the IF\_ID of Tunnel

Dst Ip : 192.168.1.1

Org Ip : 0.0.0.0

SGT count : 0

SGT Tag(s) :

Verify Hardware Tunnel Programming (FED).

<#root>

C9500-ERSPAN#

show platform software fed switch active ifm interfaces tunnel

Interface	IF_ID	State
-----		
Tunnel1000000000		
0x00000026		
READY		

<#root>

C9500-ERSPAN#

show platform software fed switch active ifm if-id 0x00000026

Interface IF\_ID : 0x0000000000000026  
Interface Name : Tunnel1000000000  
Interface Block Pointer : 0x7f2cd48e9958  
Interface Block State :

READY

Interface State :

Enabled

Interface Status : ADD  
Interface Ref-Cnt : 5  
Interface Type : TUNNEL

Unit : 0  
SNMP IF Index : 0

Encap L3If LE Handle : 0x7f2cd4904e08 <-- Hardware handle info (used to check final Hardware prog  
Decap L3If LE Handle : 0x7f2cd48dabc8 <-- Hardware handle info (used to check final Hardware prog

Tunnel Mode : 0 [gre]

<-- Tunnel Protocol Enable.

Hw Support : Yes  
Tunnel Vrf : 0  
IPv4 MTU : 0  
IPv6 MTU : 0  
IPv4 VRF ID : 0  
IPv6 VRF ID : 0  
Protocol flags : 0x0001 [ ipv4 ]  
Misc flags : 0x0000 [ None ]  
ICMPv4 flags : 0x03 [ unreachable redirect ]  
ICMPv6 flags : 0x03 [ unreachable redirect ]

Port Information

Handle ..... [0xd4000043]  
Type ..... [L3-Tunnel]  
Identifier ..... [0x26]  
Unit ..... [38]  
Port Logical Tunnel Subblock

Encap-L3ifile.....[0x7f2cd4904e08] <-- Same number as previous highlighted output.  
Decap-L3ifile.....[0x7f2cd48dabc8] <-- Same number as previous highlighted output.

decap-portle.....[0x0]

RI-decap.....[0x7f2cd49615d8] <-- Same number as previous highlighted output.  
SI-decap.....[0x7f2cd4958dd8] <-- Same number as previous highlighted output.  
Decap-Tcam\_handle..[0x7f2cd46eee08] <-- Same number as previous highlighted output.

Tunnel\_capability..[0x3]  
Encap-RCP-PMAP.....[0x0]  
GPN.....[0]

<snip>

<#root>

C9500-ERSPAN#

show platform software fed switch active ifm mappings l3if-le | include L3IF|Tunnel

L3IF_LE	Interface	IF_ID	Type
0x00007f2cd48dabc8	Tunnel1000000000	0x00000026	DECAP_L3_LE

<-- L3IF + IF\_ID (DECAP) match here.



ASIC#:0 RI:22 Rewrite\_type:AL\_RRM\_REWRITE\_IPV4\_ERSPAN2\_DECAP(61) Mapped\_rii:TUNNEL\_IPv4Erspan\_DECAP(83)

L3IF LE Index: 40 <-- 64 in Decimal is 0x40 in Hex which matches Decap LE index seen above

Detailed Resource Information (ASIC# 1)

-----

Rewrite Data Table Entry,

ASIC#:1 RI:22 Rewrite\_type:AL\_RRM\_REWRITE\_IPV4\_ERSPAN2\_DECAP(61) Mapped\_rii:TUNNEL\_IPv4Erspan\_DECAP(83)

L3IF LE Index: 40

=====

<#root>

### Station Index (decapsulation)

###

C9500-ERSPAN#

show platform hardware fed switch active fwd-asic abstraction print-resource-handle 0x7f2cd4958dd8 1 <

Handle:0x7f2cd4958dd8 Res-Type:ASIC\_RSC\_SI Res-Switch-Num:255 Asic-Num:255 Feature-ID:AL\_FID\_GRE Lkp-ft  
priv\_ri/priv\_si Handle: 0x7f2cd49615d8Hardware Indices/Handles: index0:0xae mtu\_index/13u\_ri\_index0:0x0  
Features sharing this resource:107 (1)]

Cookie length: 56

00 00 00 00 00 00 00 00 28 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 6b 36 00 00 00 00

Detailed Resource Information (ASIC# 0)

-----

Station Index (SI) [0xae]

RI = 0x16

DI = 0x5012

stationTableGenericLabel = 0

stationFdConstructionLabel = 0x7

lookupSkipIdIndex = 0x15

rcpServiceId = 0

dejaVuPreCheckEn = 0

Replication Bitmap: LD

Detailed Resource Information (ASIC# 1)

-----

Station Index (SI) [0xae]

RI = 0x16

DI = 0x5012

stationTableGenericLabel = 0

stationFdConstructionLabel = 0x7

lookupSkipIdIndex = 0x15

rcpServiceId = 0

dejaVuPreCheckEn = 0

Replication Bitmap: CD

=====

<#root>

### Tunnel Decap (TCAM) ###

C9500-ERSPAN#

show platform hardware fed switch active fwd-asic abstraction print-resource-handle 0x7f2cd46eee08 1 <

Handle:0x7f2cd46eee08 Res-Type:ASIC\_RSC\_HASH\_TCAM Res-Switch-Num:0 Asic-Num:255 Feature-ID:AL\_FID\_GRE L
priv\_ri/priv\_si Handle: (nil)Hardware Indices/Handles: handle [ASIC: 0]: 0x7f2cd48db018

Detailed Resource Information (ASIC# 0)

-----
Number of HTM Entries: 3

Entry 0: (handle 0x7f2cd48db018)

Labels Port Vlan L3If Group
M: 0000 0000 0000 0000 0000
V: 0000 0000 0000 0000 0000

M: ffffffff 00000000 00000000 000003ff 00000000 00000100 01000000 00000fff
3f000000

V:

c0a80101

00000000 00000000 00000003 00000000 00000100 01000000 00000000

<-- c0a80101 in Hex maps to 192.168.1.1

00000000

GREv4 Dst Src Key C S R D E F VRF F1 L3P GreP Misc RCPSVCId

M: ffffffff 00000000 00000000 0 0 0 0 0

1

000 0 00 0000 00 3f

<-- F=1 Forwarding

V:

c0a80101

00000000 00000000 0 0 0 0 0

1

000 0 00 0000 00 00

Action: 00000100 06000000 00000000 00000000 00000000 00000000 00000000

ad

00000000

00000000 00000000

RL2 RL3 ACF SPK CLPC LKV PRI STL LPC ADC LKI

SI

0 1 0 0 0 0 6 0 0 0 0

ad





c0a80101

00000000 00000000 0 0 0 0 0 0 000 0 00 0000 00 00  
Action: 00000100 06000000 00000000 00000000 00000000 00000000 00000000

ae

00000000  
00000000 00000000  
RL2 RL3 ACF SPK CLPC LKV PRI STL LPC ADC LKI SI  
0 1 0 0 0 0 6 0 0 0 0

ae

<-- Hexadecimal value for Station Index.

Start/Skip Word: 0x00000000  
No Start, Terminate

=====

<#root>

C9500-ERSPAN#

show platform hardware fed switch active fwd-asic resource asic 0 station-index range 0xab 0xab

ASIC#0:  
Station Index (SI) [0xad]  
RI = 0x14  
DI =

0x505a <-- Destination Index

stationTableGenericLabel = 0  
stationFdConstructionLabel = 0x7  
lookupSkipIdIndex = 0x15  
rcpServiceId = 0xd  
dejaVuPreCheckEn = 0  
Replication Bitmap: LD

C9500-ERSPAN#

show platform hardware fed switch active fwd-asic resource asic 0 station-index range 0xae 0xae

Station Index (SI) [0xae]  
RI = 0x16

DI = 0x5012 <-- Destination Index

stationTableGenericLabel = 0  
stationFdConstructionLabel = 0x7  
lookupSkipIdIndex = 0x15  
rcpServiceId = 0  
dejaVuPreCheckEn = 0  
Replication Bitmap: LD

```
<#root>
```

```
C9500-ERSPAN#
```

```
show platform hardware fed switch active fwd-asic resource asic 0 destination-index range 0x505a 0x505a
```

```
Destination index = 0x505a DI_RCP_PORT2
```

```
pmap = 0x00000000 0x00000000
```

```
cmi = 0x0
```

```
rcp_pmap = 0x2
```

```
al_rsc_cmi
```

```
CPU Map Index (CMI) [0]
```

```
ctiLo0 = 0
```

```
ctiLo1 = 0
```

```
ctiLo2 = 0
```

```
cpuQNum0 = 0
```

```
cpuQNum1 = 0
```

```
cpuQNum2 = 0
```

```
npuIndex = 0
```

```
stripSeg = 0
```

```
copySeg = 0
```

```
C9500-ERSPAN#
```

```
show platform hardware fed switch active fwd-asic resource asic 0 destination-index range 0x5012 0x5012
```

```
ASIC#0:
```

```
Destination Index (DI) [0x5012]
```

```
portMap = 0x00000000 00000000
```

```
cmi1 = 0
```

```
rcpPortMap = 0x1
```

```
CPU Map Index (CMI) [0]
```

```
ctiLo0 = 0
```

```
ctiLo1 = 0
```

```
ctiLo2 = 0
```

```
cpuQNum0 = 0
```

```
cpuQNum1 = 0
```

```
cpuQNum2 = 0
```

```
npuIndex = 0
```

```
stripSeg = 0
```

```
copySeg = 0
```

## Relevant Debugs and Traces

### Cisco IOS XE

```
<#root>
```

```
debug
```

```
monitor all
```

**debug**

platform monitor

## **FMAN-RP**

<#root>

**set**

platform software trace forwarding-manager switch <> R0 switch-span verbose

**show**

platform software trace message forwarding-manager switch <> R0

## **FMAN-FP**

<#root>

**set**

platform software trace forwarding-manager switch <> F0 switch-span verbose

**show**

platform software trace message forwarding-manager switch <> F0

## **FED**

<#root>

**set**

platform software trace fed switch <> swspan verbose

**set**

platform software trace fed switch <> asic\_spn verbose

**set**

platform software trace fed switch <> acl verbose (Useful when ip/ipv6 filter is configured)

**show**

platform software trace message fed switch <>

## Related Information

- [Technical Support & Documentation - Cisco Systems](#)
- [Network Management Configuration Guide, Cisco IOS XE Amsterdam 17.3.x \(Catalyst 9500 Switches\) ERSPAN](#)
- [Network Management Configuration Guide, Cisco IOS XE Amsterdam 17.3.x \(Catalyst 9500 Switches\) SPAN](#)
- [Blog: How Cisco TAC is transforming documentation and simplifying self-service](#)