Verificación de SPAN y ERSPAN en switches Catalyst 9000 Series

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Introducción

En este documento se describe cómo verificar SPAN y ERSPAN en los switches Catalyst 9000 Series.

Prerequisites

Requirements

No hay requisitos específicos para este documento.

Componentes Utilizados

La información que contiene este documento se basa en las siguientes versiones de software y hardware.

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

La información que contiene este documento se creó a partir de los dispositivos en un ambiente de laboratorio específico. Todos los dispositivos que se utilizan en este documento se pusieron en funcionamiento con una configuración verificada (predeterminada). Si tiene una red en vivo, asegúrese de entender el posible impacto de cualquier comando.

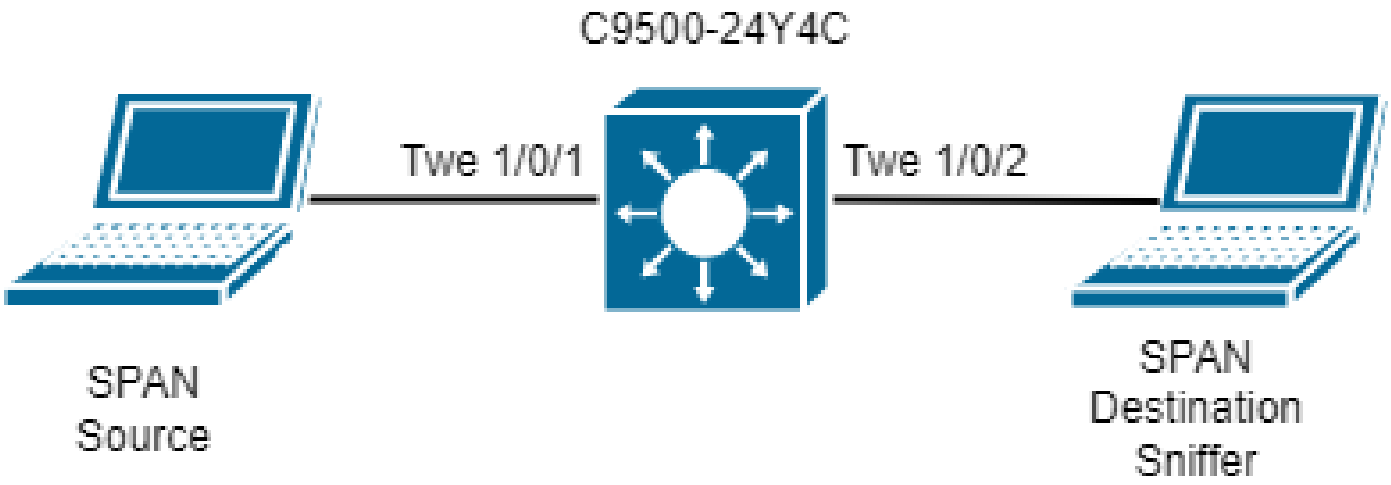
Productos Relacionados

Este documento también puede utilizarse con estas versiones de software y hardware:

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

Verificar SPAN

Diagrama de la red



Configuración de SPAN

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

Verifique la configuración del software SPAN. Tome nota de las interfaces SPAN de origen y destino y de la dirección de la captura SPAN.

<#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
```

Verifique la entrada de hardware SPAN. Utilice el ID de sesión de FED, que es único para cada configuración de SPAN. Puede haber hasta 8 sesiones FED configuradas al mismo tiempo (de sesiones FED 0 a 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
```

Recopile los números ASIC, Core y Port para los puertos SPAN de origen y destino configurados. El número de puerto es necesario para confirmar si la interfaz SPAN de origen está programada correctamente y si el SPAN apunta a la interfaz SPAN de destino correcta.

 Consejo: Utilice la nomenclatura adecuada show platform software/hardware fed active o 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
```

El registro Doppler IlePortLeSpanBitMapTable se utiliza para definir si un puerto está sujeto a SPAN en la dirección de ingreso (RX). Para confirmar que el puerto SPAN de origen configurado (puerto ASIC 20) está asignado a la sesión FED correcta (sesión 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.

El mapa de bits de sesión SPAN es un registro de 8 bits. Cada bit corresponde a una sesión FED: El bit menos significativo corresponde a la sesión FED 0, el bit más significativo corresponde a la sesión FED 7. Por lo tanto, el número máximo de sesiones SPAN admitidas es 8, como se mencionó anteriormente.

Si una interfaz se configura como puerto de origen SPAN para varias sesiones SPAN, todas las sesiones FED deben aparecer en el registro SSBM. Por ejemplo, SSBM con valor de 0x5 (0b00000101) significa que la interfaz es un origen SPAN tanto para la sesión FED 0 como para la sesión FED 2.

De manera similar, el registro Doppler ElePortLeSpanBitMapTable determina si un puerto está sujeto a SPAN en dirección de salida (TX). El análisis es el mismo que el registro IlePortLeSpanBitMapTable. Para confirmar que el puerto SPAN de origen configurado (puerto ASIC 20) se asigna a la sesión FED correcta (sesión 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
```

Esto confirma que la interfaz SPAN de origen está asignada a la sesión FED correcta para la dirección RX y TX.

Con el ID de sesión de FED, puede encontrar los puertos de destino para el SPAN dentro del registro Doppler AqmRepSpanPortMap. Para confirmar que la sesión FED 0 apunta al puerto de destino SPAN correcto (puerto ASIC 21):

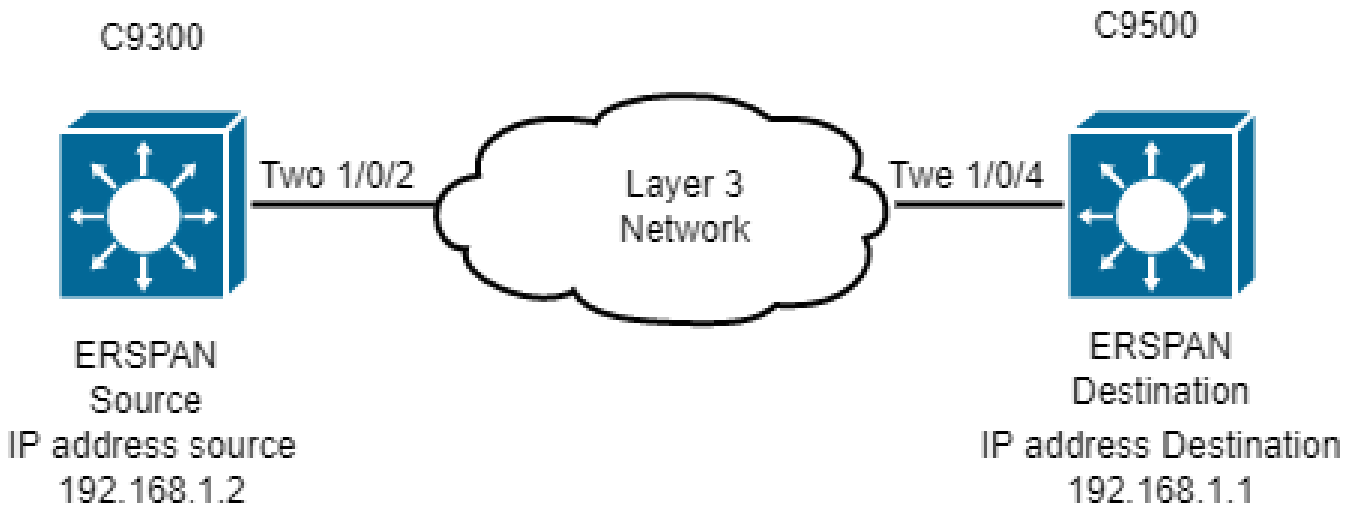
```
<#root>

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: 0b00100000000000000000000. Bit 21 is set.

rcpPortMap                : 0x0
spanCtiLo                 : 0x0
```

Esto confirma que los paquetes capturados con SPAN deben mostrarse replicados fuera de la

interfaz Tw1/0/2 (puerto ASIC 21). Si hay más puertos de destino SPAN configurados, éstos se muestran en el registro AqmRepSpanPortMap.

Verificar ERSPAN

Diagrama de la red



Nota: Catalyst C9200 no admite ERSPAN.

Nota: Se necesita la licencia DNA de Cisco.

Configuración de ERSPAN

<#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 ERSPAN Device ###



C9500-ERSPAN#
show run | section monitor


monitor session 1 type erspan-destination
destination interface Twe1/0/3
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
```

Dispositivo de origen

Verifique la disponibilidad entre la IP de origen y de destino.

```
<#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
```

Programación del software Cisco IOS

Verifique en el software Cisco IOS la entrada para la sesión ERSPAN.

```
<#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
```

Programación de SHIM

Comprobar qué software envía al hardware del programa (objeto SHIM).

```
<#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
```

Procesador de ruta del administrador de reenvío

Verifique qué software envía al hardware del programa (capa FMAN RP).

<#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
```

Procesador de reenvío del administrador

Verifique qué software envía al hardware del programa (capa FMAN FP).

<#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)
```

Controlador de motor de reenvío

Verifique la capa que programa el 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)           :
```

Verifique la programación de túneles de hardware (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-L3ifle.......[0x7f00e0a50a28]
```

<-- Same number as previous highlighted output.

```
    Decap-L3ifle.......[0x7f00e0a50bd8]
```

<-- Same number as previous highlighted output.

```
    decap-portle.......[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 hardwware 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/l3u_ri_index0:0x5 sm handle [ASIC 0]: 0x7f00e0a56d08 index1:0x27 mtu_index/l3u_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/l3u_ri_index0:0x0 sm handle [ASIC 0]: 0x7f00e0a559c8 index1:0x28 mtu_index/l3u_ri_index1:0x0

============================================================
```

Ejecute Embedded Packet Capture en el puerto de salida hacia el switch de destino. Se puede aplicar un filtro. Utilice la IP de origen y de destino del túnel GRE. (El paquete es un paquete encapsulado.)

<#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)

Dispositivo de destino ERSPAN

Programación del software Cisco IOS

<#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
```

Programación de SHIM

Compruebe qué software envía al hardware del programa (objeto SHIM).

<#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
```

Procesador de reenvío del administrador

Verifique qué software envía al hardware del programa (capa FMAN FP).

<#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 Twe1/0/3 (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 Encape : 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
```

Procesador de reenvío del administrador

Verifique qué software envía al hardware del programa (capa FMAN FP).

<#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
```

Controlador de motor de reenvío

Verifique la capa que programa el 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 Tunn


Dst Ip               : 192.168.1.1


  Org Ip               : 0.0.0.0
  SGT count            : 0
  SGT Tag(s)           :
```

Verifique la programación de túneles de hardware (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-L3ifle.......[0x7f2cd4904e08]     <-- Same number as previous highlighted output.
        Decap-L3ifle.......[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.


0x00007f2cd4904e08       Tunnel1000000000               0x00000026         ENCAP_L3_LE

<-- L3IF + IF_ID (ENCAP) match here.
```

<#root>

```
### Encapsulation LE ###


C9500-ERSPAN#

show platform hardware fed switch active fwd-asic abstraction print-resource-handle 0x7f2cd4904e08 0 <--

Handle:0x7f2cd4904e08 Res-Type:ASIC_RSC_L3IF_LE Res-Switch-Num:255 Asic-Num:255 Feature-ID:AL_FID_IFM LE
priv_ri/priv_si Handle: (nil)Hardware Indices/Handles:

index0:0x27

  mtu_index/l3u_ri_index0:0x2  sm handle [ASIC 0]: 0x7f2cd46ece38 index1:0x27 mtu_index/l3u_ri_index1:0x

============================================================


### Decapsulation LE ###


C9500-ERSPAN#

show platform hardware fed switch active fwd-asic abstraction print-resource-handle 0x7f2cd48dabc8 0 <--

Handle:0x7f2cd48dabc8 Res-Type:ASIC_RSC_L3IF_LE Res-Switch-Num:255 Asic-Num:255 Feature-ID:AL_FID_IFM LE
priv_ri/priv_si Handle: (nil)Hardware Indices/Handles:

index0:0x28
```

```
 mtu_index/l3u_ri_index0:0x0 sm handle [ASIC 0]: 0x7f2cd46d91c8 index1:0x28 mtu_index/l3u_ri_index1:0x0
```

<#root>

Rewrite Index (decapsulation)

```
C9500-ERSPAN#
```

show platform hardware fed switch active fwd-asic abstraction print-resource-handle 0x7f2cd49615d8 1 <

```
Handle:0x7f2cd49615d8 Res-Type:ASIC_RSC_RI Res-Switch-Num:255 Asic-Num:255 Feature-ID:AL_FID_GRE Lkp-ft
priv_ri/priv_si Handle: 0x7f2cd48daf28Hardware Indices/Handles: index0:0x16 mtu_index/l3u_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 01 6b 33 00 00 00 0

Detailed Resource Information (ASIC# 0)
----------------------------------------

Rewrite Data Table Entry,
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/l3u_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 01 6b 36 00 00 00 0

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
V: 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 Fl 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 000000
```

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

<-- Hexadecimal value for Station Index.

```
Start/Skip Word: 0x00000003
Start Feature, Terminate
```

Entry 1: (handle 0x7f2cd495c3f8)

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

M: ffffffff 00000000 00000000 000003ff 00000000 00000100 00000000 000a0000
        3f000000
V:
```

c0a80101

```
 00000000 00000000 00000003 00000000 00000100 00000000 00080000
        00000000

GREv4 Dst       Src     Key     C S R D E F VRF Fl L3P GreP Misc RCPSVCId
  M: ffffffff 00000000 00000000 0 0 0 0 0 0 000 a  00  0000 00 3f
  V:
```

c0a80101

```
 00000000 00000000 0 0 0 0 0 0 000 8  00  0000 00 00
Action: 00000100 06000000 00000000 00000000 00000000 00000000 000000
```

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

```
Start/Skip Word: 0x00000000
No Start, Terminate
```

Entry 2: (handle 0x7f2cd46ef568)

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

M: ffffffff 00000000 00000000 000003ff 00000000 00000100 00000000 00020fff
        00000000
V:
```

c0a80101

```
 00000000 00000000 00000003 00000000 00000100 00000000 00000000
        00000000

GREv4 Dst       Src     Key     C S R D E F VRF Fl L3P GreP Misc RCPSVCId
  M: ffffffff 00000000 00000000 0 0 0 0 0 0 000 2  00  0000 00 00
  V:
```

c0a80101

```
 00000000 00000000 0 0 0 0 0 0 000 0  00  0000 00 00
Action: 00000100 06000000 00000000 00000000 00000000 00000000 000000
```

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
```

Depuraciones y seguimientos relevantes

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 <>
```

Información Relacionada

- Soporte Técnico y Documentación - Cisco Systems
- Guía de configuración de administración de redes, Cisco IOS XE Amsterdam 17.3.x (switches Catalyst 9500) ERSPAN
- Guía de configuración de administración de redes, Cisco IOS XE Amsterdam 17.3.x (switches Catalyst 9500) SPAN
- Blog: Cómo Cisco TAC está transformando la documentación y simplificando el autoservicio

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