在多站點設定中排除EVPN/VxLAN故障

目錄

簡介

本文說明在多站點設定中排除乙太網VPN/虛擬可擴展LAN(EVPN/VxLAN)故障的方法。

必要條件

需求

思科建議您瞭解以下主題：

- 多重協定標籤交換(MPLS)第3層VPN
- 多重通訊協定邊界閘道通訊協定(MP-BGP)
- EVPN

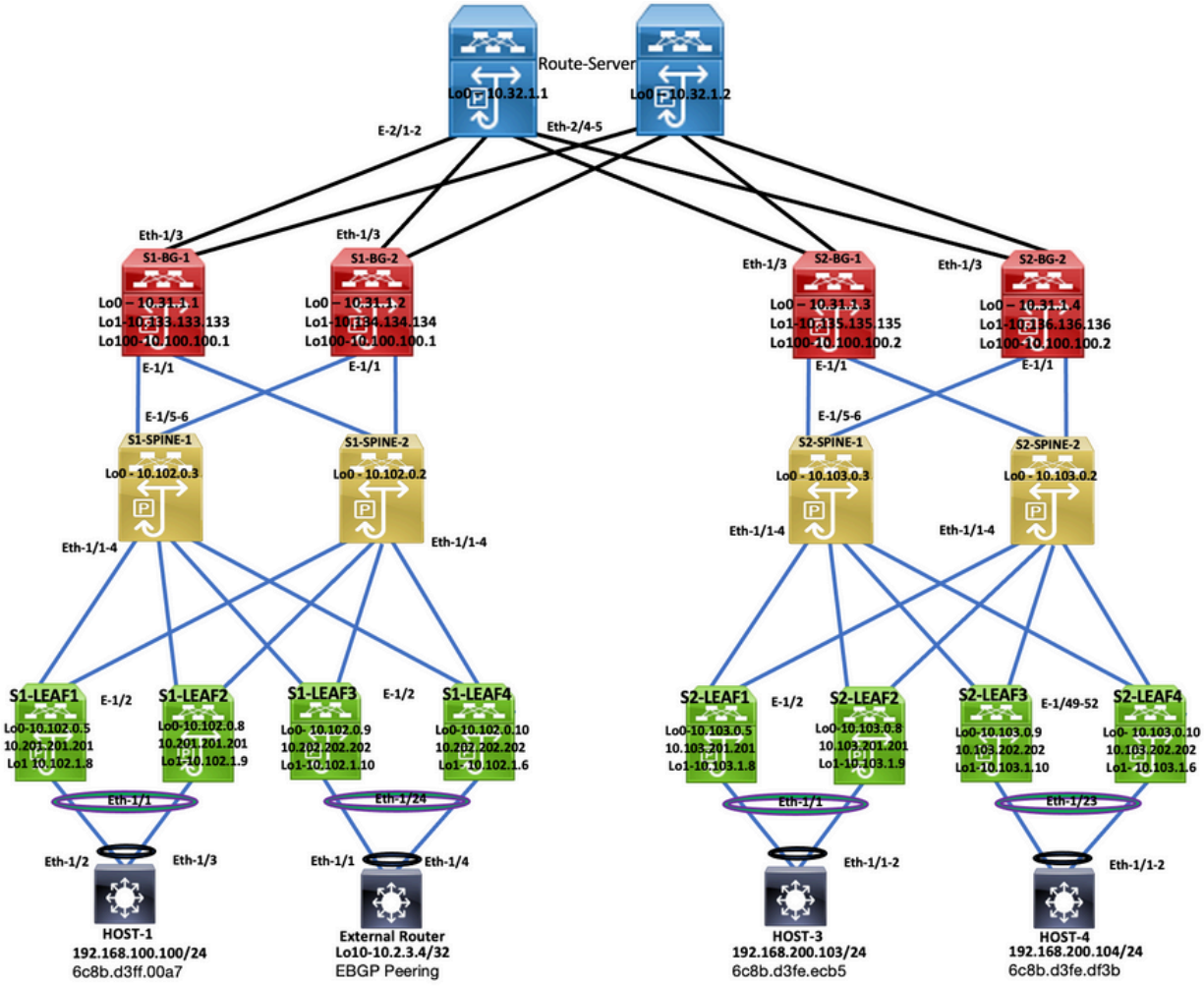
採用元件

本文中的資訊係根據以下軟體和硬體版本：

所有站點宣傳單	N9K-C9336C-FX2	NXOS:10.2(3)
S1_Spine1	N9K-C9364C	NXOS:10.2(4)
S1_Spine2	N9K-C9364C	NXOS:9.3(5)
S1_邊界網關1、S2_邊界網關2、S2_邊界網關1	N9K-C9332C	NXOS:9.3(9)
S1_邊界網關2	N9K-C9332C	NXOS:10.2(4)
路由伺服器	N9K-C9396PX	NXOS:9.2(2)
主機1	N3K-C3264C-E	NXOS:9.3(5)
主機2和主機3	N3K-C3264C-E	NXOS:9.2(2)

本文中的資訊是根據特定實驗室環境內的裝置所建立。文中使用到的所有裝置皆從已清除（預設）的組態來啟動。如果您的網路運作中，請確保您瞭解任何指令可能造成的影響。

拓撲



拓撲

本檔案介紹流量從DC-2 Host-3(192.168.200.104/24)產生的地方，然後使用封包將流量傳播到目的地DC-1 Host-2(10.2.3.4)。

驗證控制平面

若要驗證控制平面，請輸入以下命令：

<#root>

HOST_3#

show ip int brief

```
IP Interface Status for VRF "default"(1)
Interface IP Address Interface Status
```

Vlan100 192.168.100.103 protocol-up/link-up/admin-up

Vlan200 192.168.200.103 protocol-up/link-up/admin-up
HOST_3#

External_Router#
External_Router#

show ip int brie

IP Interface Status for VRF "default"(1)
Interface IP Address Interface Status
Vlan100 192.168.100.102 protocol-up/link-up/admin-up
Vlan200 192.168.200.102 protocol-up/link-up/admin-up

Lo10 10.2.3.4 protocol-up/link-up/admin-up

External_Router#

HOST_3#
HOST_3#

ping 10.2.3.4 source 192.168.100.103

PING 10.2.3.4 (10.2.3.4) from 192.168.100.103: 56 data bytes
64 bytes from 10.2.3.4: icmp_seq=0 ttl=250 time=1.153 ms
64 bytes from 10.2.3.4: icmp_seq=1 ttl=250 time=0.569 ms
64 bytes from 10.2.3.4: icmp_seq=2 ttl=250 time=0.562 ms
64 bytes from 10.2.3.4: icmp_seq=3 ttl=250 time=0.525 ms
64 bytes from 10.2.3.4: icmp_seq=4 ttl=250 time=0.527 ms
--- 10.2.3.4 ping statistics ---
5 packets transmitted, 5 packets received, 0.00% packet loss
round-trip min/avg/max = 0.525/0.667/1.153 ms
HOST_3#

<#root>

S2-Leaf1#

show bgp l2vpn evp vrf vrf_2

BGP routing table information for VRF default, address family L2VPN EVPN
BGP table version is 4420, Local Router ID is 10.103.0.5
Status: s-suppressed, x-deleted, S-stale, d-dampened, h-history, *-valid, >-best
Path type: i-internal, e-external, c-confed, l-local, a-aggregate, r-redist, I-injected
Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath, & - backup, 2 - best2
   Network Next Hop Metric LocPrf Weight Path
Route Distinguisher: 10.103.0.5:5 (L3VNI 4000502)
*>i[5]:[0]:[0]:[24]:[192.168.100.0]/224
10.100.100.2 100 0 300 100 i

***>i[5]:[0]:[0]:[32]:[10.2.3.4]/224**
10.100.100.2 100 0 300 100 65111 i

*>i[5]:[0]:[0]:[32]:[10.100.100.1]/224
10.100.100.2 100 0 300 100 i
*>i[5]:[0]:[0]:[32]:[10.100.100.2]/224

```
                      10.100.100.2

S2-Leaf2#
```

show bgp l2vpn evp vrf vrf_2

```
BGP routing table information for VRF default, address family L2VPN EVPN
BGP table version is 4389, Local Router ID is 10.103.0.8
Status: s-suppressed, x-deleted, S-stale, d-dampened, h-history, *-valid, >-best
Path type: i-internal, e-external, c-confed, l-local, a-aggregate, r-redist, I-injected
Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath, & - backup, 2 - best2

   Network            Next Hop            Metric     LocPrf     Weight Path
Route Distinguisher: 10.103.0.8:5    (L3VNI 4000502)

*>i[5]:[0]:[0]:[24]:[192.168.100.0]/224
                      10.100.100.2                      100          0 300 100 i

*>i[5]:[0]:[0]:[32]:[10.2.3.4]/224
                      10.100.100.2                      100          0 300 100 65111 i


*>i[5]:[0]:[0]:[32]:[10.100.100.1]/224
                      10.100.100.2                      100          0 300 100 i
*>i[5]:[0]:[0]:[32]:[10.100.100.2]/224
                      10.100.100.2                      100          0 300 100 i
S2-Leaf2#

S2-leaf3#
```

show bgp l2vpn evpn vrf vrf_2

```
BGP routing table information for VRF default, address family L2VPN EVPN
BGP table version is 4196, Local Router ID is 10.103.0.9
Status: s-suppressed, x-deleted, S-stale, d-dampened, h-history, *-valid, >-best
Path type: i-internal, e-external, c-confed, l-local, a-aggregate, r-redist, I-injected
Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath, & - backup, 2 - best2

   Network            Next Hop            Metric     LocPrf     Weight Path
Route Distinguisher: 10.103.0.9:5    (L3VNI 4000502)
*>i[5]:[0]:[0]:[24]:[192.168.100.0]/224
                      10.100.100.2                      100          0 300 100 i

*>i[5]:[0]:[0]:[32]:[10.2.3.4]/224
                      10.100.100.2                      100          0 300 100 65111 i


*>i[5]:[0]:[0]:[32]:[10.100.100.1]/224
                      10.100.100.2                      100          0 300 100 i
*>i[5]:[0]:[0]:[32]:[10.100.100.2]/224
                      10.100.100.2                      100          0 300 100 i

S2-Leaf4#
S2-Leaf4#
```

show bgp l2vpn evpn vrf vrf_2

```
BGP routing table information for VRF default, address family L2VPN EVPN
BGP table version is 4381, Local Router ID is 10.102.0.10
Status: s-suppressed, x-deleted, S-stale, d-dampened, h-history, *-valid, >-best
Path type: i-internal, e-external, c-confed, l-local, a-aggregate, r-redist, I-injected
Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath, & - backup, 2 - best2
```

```
Network  Next Hop  Metric  LocPrf Weight Path
Route Distinguisher: 10.102.0.10:5 (L3VNI 4000502)
*>i[5]:[0]:[0]:[24]:[192.168.100.0]/224
           10.100.100.2 100 0 300 100 i

*>i[5]:[0]:[0]:[32]:[10.2.3.4]/224
           10.100.100.2 100 0 300 100 65111 i


*>i[5]:[0]:[0]:[32]:[10.100.100.1]/224
           10.100.100.2 100 0 300 100 i
*>i[5]:[0]:[0]:[32]:[10.100.100.2]/224
           10.100.100.2 100 0 300 100 i
S2-Leaf4#
S2-Leaf4#
```

<#root>

```
S2-Spine1#

show bgp  l2vpn evpn


BGP routing table information for VRF default, address family L2VPN EVPN
BGP table version is 1235, Local Router ID is 10.103.0.3
Status: s-suppressed, x-deleted, S-stale, d-dampened, h-history, *-valid, >-best
Path type: i-internal, e-external, c-confed, l-local, a-aggregate, r-redist, I-injected
Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath, & - backup, 2 - best2
   Network            Next Hop            Metric     LocPrf     Weight Path
Route Distinguisher: 200:4000502
* i[5]:[0]:[0]:[24]:[192.168.100.0]/224
                     10.100.100.2                       100          0 300 100
*>i                  10.100.100.2                       100          0 300 100 i

* i[5]:[0]:[0]:[32]:[10.2.3.4]/224
                     10.100.100.2                       100          0 300 100 65111 i
*>i                  10.100.100.2                       100          0 300 100 65111 i


* i[5]:[0]:[0]:[32]:[10.100.100.1]/224
                     10.100.100.2                       100          0 300 100 i
*>i                  10.100.100.2                       100          0 300 100 i
* i[5]:[0]:[0]:[32]:[10.100.100.2]/224
                     10.100.100.2                       100          0 300 100 i
*>i                  10.100.100.2                       100          0 300 100 i
```

<#root>

```
S2-BG1#

show ip int brie


IP Interface Status for VRF "default"(1)
Interface            IP Address      Interface Status
Lo0                  10.31.1.3       protocol-up/link-up/admin-up
Lo1                  10.135.135.135  protocol-up/link-up/admin-up

Lo100                10.100.100.2    protocol-up/link-up/admin-up
```

```
Eth1/1               192.168.17.12   protocol-up/link-up/admin-up
Eth1/3               10.150.152.1    protocol-up/link-up/admin-up
S2-BG1#

S2-BG1#
```

show ip route 10.2.3.4 vrf vrf_2

```
IP Route Table for VRF "vrf_2"
'*' denotes best ucast next-hop
'**' denotes best mcast next-hop
'[x/y]' denotes [preference/metric]
'%<string>' in via output denotes VRF <string>
```

10.2.3.4/32, ubest/mbest: 1/0
***via 10.100.100.1%default, [20/0], 04:09:46, bgp-200, external, tag 300, segid: 4000502 tunnelid: 0xa646**

```
S2-BG1#

S2-BG1#
```

show bgp l2vpn evpn

```
BGP routing table information for VRF default, address family L2VPN EVPN
BGP table version is 6206, Local Router ID is 10.31.1.3
Status: s-suppressed, x-deleted, S-stale, d-dampened, h-history, *-valid, >-best
Path type: i-internal, e-external, c-confed, l-local, a-aggregate, r-redist, I-injected
Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath, & - backup, 2 - best2

   Network            Next Hop            Metric     LocPrf     Weight Path
Route Distinguisher: 100:4000502
*>e[5]:[0]:[0]:[24]:[192.168.100.0]/224
                      10.100.100.1                                    0 300 100 i

*>e[5]:[0]:[0]:[32]:[10.2.3.4]/224
                      10.100.100.1                                    0 300 100 65111 i


*>e[5]:[0]:[0]:[32]:[10.100.100.1]/224
                      10.100.100.1                                    0 300 100 i
*>e[5]:[0]:[0]:[32]:[10.100.100.2]/224
                      10.100.100.1                                    0 300 100 i
```

<#root>

```
S2-BG2#
```

show ip int brief

```
IP Interface Status for VRF "default"(1)
Interface            IP Address      Interface Status
Lo0                  10.31.1.4       protocol-up/link-up/admin-up
Lo1                  10.136.136.136  protocol-up/link-up/admin-up
```

Lo100   10.100.100.2   protocol-up/link-up/admin-up

```
Eth1/1               192.168.18.12   protocol-up/link-up/admin-up
Eth1/3               10.150.153.1    protocol-up/link-up/admin-up
S2-BG2#
S2-BG2#
S2-BG2#
```

show ip route 10.2.3.4 vrf vrf_2

```
IP Route Table for VRF "vrf_2"
'*' denotes best ucast next-hop
'**' denotes best mcast next-hop
'[x/y]' denotes [preference/metric]
'%<string>' in via output denotes VRF <string>

10.2.3.4/32, ubest/mbest: 1/0
    *via 10.100.100.1%default, [20/0], 04:15:13, bgp-200, external, tag 300, segid: 4000502 tunnelid: 0x

S2-BG2#
S2-BG2#
```

show bgp l2vpn evpn

```
BGP routing table information for VRF default, address family L2VPN EVPN
BGP table version is 5455, Local Router ID is 10.31.1.4
Status: s-suppressed, x-deleted, S-stale, d-dampened, h-history, *-valid, >-best
Path type: i-internal, e-external, c-confed, l-local, a-aggregate, r-redist, I-injected
Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath, & - backup, 2 - best2

        Network            Next Hop            Metric     LocPrf     Weight Path
Route Distinguisher: 100:4000502
*>e[5]:[0]:[0]:[24]:[192.168.100.0]/224
                      10.100.100.1                                      0 300 100 i

*>e[5]:[0]:[0]:[32]:[10.2.3.4]/224
                      10.100.100.1                                      0 300 100 65111 i

*>e[5]:[0]:[0]:[32]:[10.100.100.1]/224
                      10.100.100.1                                      0 300 100 i
*>e[5]:[0]:[0]:[32]:[10.100.100.2]/224
                      10.100.100.1                                      0 300 100 i
```

<#root>

```
Router_Server#
```

show ip int brief

```
IP Interface Status for VRF "default"(1)
Interface            IP Address      Interface Status
Lo0                  10.32.1.1       protocol-up/link-up/admin-up
Eth2/1               10.150.150.2    protocol-up/link-up/admin-up
Eth2/2               10.150.151.2    protocol-up/link-up/admin-up
Eth2/4               10.150.152.2    protocol-up/link-up/admin-up
Eth2/5               10.150.153.2    protocol-up/link-up/admin-up
Router_Server#
Router_Server#
```

show ip route 10.100.100.1

```
IP Route Table for VRF "default"
'*' denotes best ucast next-hop
'**' denotes best mcast next-hop
'[x/y]' denotes [preference/metric]
'%<string>' in via output denotes VRF <string>
```

10.100.100.1/32, ubest/mbest: 2/0
**   *via 10.150.150.1, [20/0], 4d22h, bgp-300, external, tag 100**
**   *via 10.150.151.1, [20/0], 4d22h, bgp-300, external, tag 100**

```
Router_Server#
Router_Server#
Router_Server#
```

show ip route 10.100.100.2

```
IP Route Table for VRF "default"
'*' denotes best ucast next-hop
'**' denotes best mcast next-hop
'[x/y]' denotes [preference/metric]
'%<string>' in via output denotes VRF <string>
```

10.100.100.2/32, ubest/mbest: 2/0
**   *via 10.150.152.1, [20/0], 3w5d, bgp-300, external, tag 200**
**   *via 10.150.153.1, [20/0], 3w5d, bgp-300, external, tag 200**

```
Router_Server#
Router_Server#
```

show bgp l2vpn evpn

```
BGP routing table information for VRF default, address family L2VPN EVPN
BGP table version is 4574, Local Router ID is 10.32.1.1
Status: s-suppressed, x-deleted, S-stale, d-dampened, h-history, *-valid, >-best
Path type: i-internal, e-external, c-confed, l-local, a-aggregate, r-redist, I-injected
Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath, & - backup, 2 - best2

    Network            Next Hop            Metric     LocPrf     Weight Path
Route Distinguisher: 200:4000100
* e[2]:[0]:[0]:[48]:[6c8b.d3fe.ecb5]:[32]:[192.168.100.103]/272
                  10.100.100.2          2000                     0 200 i
*>e                  10.100.100.2          2000                     0 200 i

Route Distinguisher: 100:4000502
*>e[5]:[0]:[0]:[24]:[192.168.100.0]/224
                     10.100.100.1          2000                     0 100 i
* e                   10.100.100.1          2000                     0 100 i
```

*** e[5]:[0]:[0]:[32]:[10.2.3.4]/224**
**   10.100.100.1   2000   0 100 65111 i**
***>e   10.100.100.1   2000   0 100 65111 i**

```
*>e[5]:[0]:[0]:[32]:[10.100.100.1]/224
                    10.100.100.1          2000                     0 100 i
* e                   10.100.100.1          2000                     0 100 i
*>e[5]:[0]:[0]:[32]:[10.100.100.2]/224
```

```
>                    10.100.100.1          2000                    0 100 i
* e                  10.100.100.1          2000                    0 100 i
```

<#root>

```
S1_B2#
S1_B2#
```

show ip int brie

```
IP Interface Status for VRF "default"(1)
Interface            IP Address      Interface Status
Lo0                  10.31.1.2       protocol-up/link-up/admin-up
Lo1                  10.134.134.134  protocol-up/link-up/admin-up
Lo100                10.100.100.1    protocol-up/link-up/admin-up
Eth1/1               192.168.16.12   protocol-up/link-up/admin-up
Eth1/3               10.150.151.1    protocol-up/link-up/admin-up
S1_B2#
S1_B2#
```

sho ip route 192.168.100.103 vrf vrf_2

```
IP Route Table for VRF "vrf_2"
'*' denotes best ucast next-hop
'**' denotes best mcast next-hop
'[x/y]' denotes [preference/metric]
'%<string>' in via output denotes VRF <string>

192.168.100.103/32, ubest/mbest: 1/0
    *via 10.100.100.2%default, [20/0], 4d23h, bgp-100, external, tag 300, segid: 4000502 tunnelid: 0xa6
```

```
S1_B2#
S1_B2#
```

show ip route 10.2.3.4 vrf vrf_2

```
IP Route Table for VRF "vrf_2"
'*' denotes best ucast next-hop
'**' denotes best mcast next-hop
'[x/y]' denotes [preference/metric]
'%<string>' in via output denotes VRF <string>
```

10.2.3.4/32, ubest/mbest: 1/0
**   *via 10.102.1.10%default, [200/0], 05:04:19, bgp-100, internal, tag 65111, segid: 4000502 tunnelid:**

```
S1_B2#
S1_B2#
S1_B2#
```

show bgp l2vpn evpn

```
BGP routing table information for VRF default, address family L2VPN EVPN
BGP table version is 5449, Local Router ID is 10.31.1.2
Status: s-suppressed, x-deleted, S-stale, d-dampened, h-history, *-valid, >-best
Path type: i-internal, e-external, c-confed, l-local, a-aggregate, r-redist, I-injected
```

```
Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath, & - backup, 2 - best2

   Network            Next Hop            Metric     LocPrf     Weight Path
Route Distinguisher: 200:4000100

*>e[2]:[0]:[0]:[48]:[6c8b.d3fe.df3b]:[32]:[192.168.100.104]/272
                      10.100.100.2                                     0 300 200 i
*>e[2]:[0]:[0]:[48]:[6c8b.d3fe.ecb5]:[32]:[192.168.100.103]/272
                      10.100.100.2                                     0 300 200 i
```

<#root>

```
Route Distinguisher: 200:4000200
*>e[2]:[0]:[0]:[48]:[6c8b.d3fe.df3b]:[32]:[192.168.100.104]/272
                      10.100.100.2                                     0 300 200 i
*>e[2]:[0]:[0]:[48]:[6c8b.d3fe.ecb5]:[32]:[192.168.100.103]/272
                      10.100.100.2                                     0 300 200 i

Route Distinguisher: 10.102.0.9:5
*>i[2]:[0]:[0]:[48]:[cc7f.76fa.118f]:[0]:[0.0.0.0]/216
                      10.202.202.202                   100          0 i
*>i[5]:[0]:[0]:[24]:[192.168.100.0]/224
                      10.102.1.10                      100          0 i

*>i[5]:[0]:[0]:[32]:[10.2.3.4]/224
                      10.102.1.10                      100          0 65111 i


*>i[5]:[0]:[0]:[32]:[10.100.100.2]/224
                      10.102.1.10                      100          0 i

Route Distinguisher: 10.102.0.10:5
*>i[2]:[0]:[0]:[48]:[cc7f.76c6.a673]:[0]:[0.0.0.0]/216
                      10.202.202.202                   100          0 i
*>i[5]:[0]:[0]:[24]:[192.168.100.0]/224
                      10.102.1.6                       100          0 i
*>i[5]:[0]:[0]:[32]:[10.2.3.4]/224
                      10.102.1.6                       100          0 65111 i
*>i[5]:[0]:[0]:[32]:[10.100.100.1]/224
                      10.102.1.6                       100          0 i

Route Distinguisher: 10.31.1.2:5    (L3VNI 4000502)
*>l[5]:[0]:[0]:[24]:[192.168.100.0]/224
                      10.134.134.134                   100          0 i
*>l[5]:[0]:[0]:[32]:[10.2.3.4]/224
                      10.134.134.134                   100          0 65111 i
*>l[5]:[0]:[0]:[32]:[10.100.100.1]/224
                      10.134.134.134                   100          0 i
*>l[5]:[0]:[0]:[32]:[10.100.100.2]/224
                      10.134.134.134                   100          0 i

S1_B2#
```

<#root>

```
S1-Bg1#

show ip int brie
```

```
IP Interface Status for VRF "default"(1)
Interface            IP Address      Interface Status
Lo0                  10.31.1.1       protocol-up/link-up/admin-up
Lo1                  10.133.133.133  protocol-up/link-up/admin-up
Lo100                10.100.100.1    protocol-up/link-up/admin-up
Eth1/1               192.168.15.12   protocol-up/link-up/admin-up
Eth1/3               10.150.150.1    protocol-up/link-up/admin-up
S1-Bg1#

S1-Bg1#
```

show ip route 10.100.100.2 vrf vrf_2

```
IP Route Table for VRF "vrf_2"
'*' denotes best ucast next-hop
'**' denotes best mcast next-hop
'[x/y]' denotes [preference/metric]
'%<string>' in via output denotes VRF <string>
```

10.100.100.2/32, ubest/mbest: 1/0
**   *via 10.102.1.10%default, [200/0], 4d23h, bgp-100, internal, tag 100, segid: 4000502 tunnelid: 0xa66**

```
S1-Bg1#

S1-Bg1#
```

show ip route 192.168.100.103 vrf vrf_2

```
IP Route Table for VRF "vrf_2"
'*' denotes best ucast next-hop
'**' denotes best mcast next-hop
'[x/y]' denotes [preference/metric]
'%<string>' in via output denotes VRF <string>
```

192.168.100.103/32, ubest/mbest: 1/0
**   *via 10.100.100.2%default, [20/0], 4d23h, bgp-100, external, tag 300, segid: 4000502 tunnelid: 0xa64**

```
S1-Bg1#

S1-Bg1#
```

show ip route 10.2.3.4 vrf vrf_2

```
IP Route Table for VRF "vrf_2"
'*' denotes best ucast next-hop
'**' denotes best mcast next-hop
'[x/y]' denotes [preference/metric]
'%<string>' in via output denotes VRF <string>
```

10.2.3.4/32, ubest/mbest: 1/0

**   *via 10.102.1.10%default, [200/0], 05:21:41, bgp-100, internal, tag 65111, segid: 4000502 tunnelid:**

```
S1-Bg1#
S1-Bg1#
```

show bgp l2vpn evpn

```
BGP routing table information for VRF default, address family L2VPN EVPN
BGP table version is 6654, Local Router ID is 10.31.1.1
Status: s-suppressed, x-deleted, S-stale, d-dampened, h-history, *-valid, >-best
Path type: i-internal, e-external, c-confed, l-local, a-aggregate, r-redist, I-injected
Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath, & - backup, 2 - best2

   Network            Next Hop            Metric     LocPrf     Weight Path
Route Distinguisher: 200:4000100
*>e[2]:[0]:[0]:[48]:[6c8b.d3fe.df3b]:[32]:[192.168.100.104]/272
                      10.100.100.2                                    0 300 200 i
*>e[2]:[0]:[0]:[48]:[6c8b.d3fe.ecb5]:[32]:[192.168.100.103]/272
                     10.100.100.2                                    0 300 200 i

Route Distinguisher: 200:4000200
*>e[2]:[0]:[0]:[48]:[6c8b.d3fe.df3b]:[32]:[192.168.200.104]/272
                     10.100.100.2                                    0 300 200 i
*>e[2]:[0]:[0]:[48]:[6c8b.d3fe.ecb5]:[32]:[192.168.200.103]/272
                     10.100.100.2                                    0 300 200 i

Route Distinguisher: 10.31.1.1:32867    (L2VNI 4000100)
*>e[2]:[0]:[0]:[48]:[6c8b.d3fe.ecb5]:[32]:[192.168.100.103]/272
                     10.100.100.2                                    0 300 200 i
*>i[2]:[0]:[0]:[48]:[6c8b.d3fe.ff09]:[32]:[192.168.100.102]/272
                      10.202.202.202                    100          0 i
* i                   10.202.202.202                    100          0 i
*>i[2]:[0]:[0]:[48]:[6c8b.d3ff.00a7]:[32]:[192.168.100.100]/272
                      10.201.201.201                    100          0 i
* i                   10.201.201.201                    100          0 i
*>e[2]:[0]:[0]:[48]:[6c8b.d3fe.ecb5]:[32]:[192.168.200.103]/272
                      10.100.100.2                                    0 300 200 i
*>i[2]:[0]:[0]:[48]:[6c8b.d3fe.ff09]:[32]:[192.168.200.102]/272
                      10.202.202.202                    100          0 i
* i                   10.202.202.202                    100          0 i
*>i[2]:[0]:[0]:[48]:[6c8b.d3ff.00a7]:[32]:[192.168.200.100]/272
                      10.201.201.201                    100          0 i
* i                   10.201.201.201                    100          0 i

Route Distinguisher: 10.102.0.10:5
*>i[2]:[0]:[0]:[48]:[cc7f.76c6.a673]:[0]:[0.0.0.0]/216
                     10.202.202.202                   100          0 i
*>i[5]:[0]:[0]:[24]:[192.168.100.0]/224
                      10.102.1.6                        100          0 i
*>i[5]:[0]:[0]:[32]:[10.2.3.4]/224
                      10.102.1.6                        100          0 65111 i
*>i[5]:[0]:[0]:[32]:[10.100.100.1]/224
                      10.102.1.6                        100          0 i




Route Distinguisher: 10.31.1.1:5    (L3VNI 4000502)
*>l[5]:[0]:[0]:[24]:[192.168.100.0]/224
                      10.133.133.133                    100          0 i
*>l[5]:[0]:[0]:[32]:[10.2.3.4]/224
                      10.133.133.133                    100          0 65111 i
```

```
*>l[5]:[0]:[0]:[32]:[10.100.100.1]/224
                     10.133.133.133                     100          0 i
*>l[5]:[0]:[0]:[32]:[10.100.100.2]/224
                     10.133.133.133                     100          0 i
S1-Bg1#
```

<#root>

```
S1-Leaf1#
```

show ip int brief

```
IP Interface Status for VRF "default"(1)
Interface            IP Address      Interface Status
Lo0                  10.102.0.5      protocol-up/link-up/admin-up
Lo1                  10.102.1.8      protocol-up/link-up/admin-up
Eth1/2               192.168.17.12   protocol-up/link-up/admin-up
S1-Leaf1#

S1-Leaf1#
```

show bgp l2vpn evpn vrf vrf_2

```
BGP routing table information for VRF default, address family L2VPN EVPN
BGP table version is 918, Local Router ID is 10.102.0.5
Status: s-suppressed, x-deleted, S-stale, d-dampened, h-history, *-valid, >-best
Path type: i-internal, e-external, c-confed, l-local, a-aggregate, r-redist, I-injected
Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath, & - backup, 2 - best2

     Network            Next Hop            Metric     LocPrf     Weight Path
Route Distinguisher: 10.102.0.5:5    (L3VNI 4000502)
*>i[2]:[0]:[0]:[48]:[6c8b.d3fe.ecb5]:[32]:[192.168.100.103]/272
                    10.100.100.1                       100          0 300 200 i
*>i[2]:[0]:[0]:[48]:[6c8b.d3fe.ecb5]:[32]:[192.168.200.103]/272
                    10.100.100.1                       100          0 300 200 i
*>i[5]:[0]:[0]:[24]:[192.168.100.0]/224
                    10.102.1.10                        100          0 i
* i                    10.102.1.6                        100          0 i

*>i[5]:[0]:[0]:[32]:[10.2.3.4]/224
                    10.102.1.10                        100          0 65111 i
* i                  10.102.1.6                        100          0 65111 i


*>i[5]:[0]:[0]:[32]:[10.100.100.1]/224
                    10.102.1.6                         100          0 i
*>i[5]:[0]:[0]:[32]:[10.100.100.2]/224
                    10.102.1.10                        100          0 i
S1-Leaf1#

S1-Leaf2#
```

show ip int brie

```
IP Interface Status for VRF "default"(1)
Interface            IP Address      Interface Status
Lo0                  10.102.0.8      protocol-up/link-up/admin-up
Lo1                  10.102.1.9      protocol-up/link-up/admin-up
Eth1/2               192.168.18.12   protocol-up/link-up/admin-up
```

```
S1-Leaf2#
S1-Leaf2#
S1-Leaf2#
```

show bgp l2vpn evpn vrf vrf_2

```
BGP routing table information for VRF default, address family L2VPN EVPN
BGP table version is 680, Local Router ID is 10.102.0.8
Status: s-suppressed, x-deleted, S-stale, d-dampened, h-history, *-valid, >-best
Path type: i-internal, e-external, c-confed, l-local, a-aggregate, r-redist, I-injected
Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath, & - backup, 2 - best2
   Network            Next Hop            Metric     LocPrf     Weight Path
Route Distinguisher: 10.102.0.8:5    (L3VNI 4000502)
*>i[2]:[0]:[0]:[48]:[6c8b.d3fe.ecb5]:[32]:[192.168.100.103]/272
                      10.100.100.1                           100          0 300 200 i
*>i[2]:[0]:[0]:[48]:[6c8b.d3fe.ecb5]:[32]:[192.168.200.103]/272
                     10.100.100.1                          100          0 300 200 i
*>i[5]:[0]:[0]:[24]:[192.168.100.0]/224
    10.102.1.10                          100          0 i
* i                   10.102.1.6                            100          0 i
```

*** i[5]:[0]:[0]:[32]:[10.2.3.4]/224**

10.102.1.6 100 0 65111 i

***>i 10.102.1.10 100 0 65111 i**

```
*>i[5]:[0]:[0]:[32]:[10.100.100.1]/224
                      10.102.1.6                            100          0 i
*>i[5]:[0]:[0]:[32]:[10.100.100.2]/224
                      10.102.1.10                           100          0 i
S1-Leaf3#
S1-Leaf3#
```

show ip int brie

```
IP Interface Status for VRF "default"(1)
Interface            IP Address      Interface Status
Lo0                  10.102.0.9      protocol-up/link-up/admin-up
Lo1                  10.102.1.10     protocol-up/link-up/admin-up
Eth1/2               192.168.19.12   protocol-up/link-up/admin-up
S1-Leaf3#
S1-Leaf3#
S1-Leaf3#
S1-Leaf3#
```

show bgp l2vpn evpn vrf vrf_2

```
BGP routing table information for VRF default, address family L2VPN EVPN
BGP table version is 5431, Local Router ID is 10.102.0.9
Status: s-suppressed, x-deleted, S-stale, d-dampened, h-history, *-valid, >-best
Path type: i-internal, e-external, c-confed, l-local, a-aggregate, r-redist, I-injected
Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath, & - backup, 2 - best2
   Network            Next Hop            Metric     LocPrf     Weight Path

Route Distinguisher: 10.102.0.9:5    (L3VNI 4000502)
*>i[2]:[0]:[0]:[48]:[6c8b.d3fe.ecb5]:[32]:[192.168.100.103]/272
```

```
                      10.100.100.1                       100          0 300 200 i
* i[5]:[0]:[0]:[24]:[192.168.100.0]/224
                      10.102.1.6                         100          0 i
*>l                   10.102.1.10                        100      32768 i
```

*** i[5]:[0]:[0]:[32]:[10.2.3.4]/224**

```
                      10.102.1.6                         100          0 65111 i
```

***>l   10.102.1.10   0 65111 i**

```
*>i[5]:[0]:[0]:[32]:[10.100.100.1]/224
                      10.102.1.6                         100          0 i
*>l[5]:[0]:[0]:[32]:[10.100.100.2]/224
                      10.102.1.10                        100      32768 i
S1-Leaf3#

S1_Leaf4#
S1_Leaf4#
```

show ip int brief

```
IP Interface Status for VRF "default"(1)
Interface            IP Address      Interface Status
Lo0                  10.102.0.10     protocol-up/link-up/admin-up
Lo1                  10.102.1.6      protocol-up/link-up/admin-up
Eth1/2               192.168.20.12   protocol-up/link-up/admin-up
S1_Leaf4#
S1_Leaf4#
S1_Leaf4#
```

show bgp l2vpn evpn vrf vrf_2

```
BGP routing table information for VRF default, address family L2VPN EVPN
BGP table version is 5118, Local Router ID is 10.102.0.10
Status: s-suppressed, x-deleted, S-stale, d-dampened, h-history, *-valid, >-best
Path type: i-internal, e-external, c-confed, l-local, a-aggregate, r-redist, I-injected
Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath, & - backup, 2 - best2

   Network            Next Hop            Metric     LocPrf     Weight Path
Route Distinguisher: 10.102.0.10:5    (L3VNI 4000502)
*>i[2]:[0]:[0]:[48]:[6c8b.d3fe.ecb5]:[32]:[192.168.100.103]/272
                      10.100.100.1                       100          0 300 200 i
*>i[2]:[0]:[0]:[48]:[6c8b.d3fe.ecb5]:[32]:[192.168.200.103]/272
                      10.100.100.1                       100          0 300 200 i
*>i[2]:[0]:[0]:[48]:[6c8b.d3ff.00a7]:[32]:[192.168.100.100]/272
                      10.201.201.201                     100          0 i
* i                   10.201.201.201                     100          0 i
* i[5]:[0]:[0]:[24]:[192.168.100.0]/224
                       10.102.1.10                        100          0 i
*>l                   10.102.1.6                         100      32768 i
```

***>l[5]:[0]:[0]:[32]:[10.2.3.4]/224**

```
                      10.102.1.6                                      0 65111 i
```

```
* i                    10.102.1.10                          100          0 65111 i


*>l[5]:[0]:[0]:[32]:[10.100.100.1]/224
                      10.102.1.6                           100      32768 i
*>i[5]:[0]:[0]:[32]:[10.100.100.2]/224
                      10.102.1.10                          100          0 i
S1_Leaf4#
```

驗證資料平面

資料計畫驗證在多個裝置上測試，以便瞭解不同的資料包捕獲方法和變體。

從Host-3上的源IP地址192.168.100.103 ping外部路由器環回100 "10.2.3.4"。

<#root>

```
HOST_3#
HOST_3#
```

ping 10.2.3.4 source 192.168.100.103

```
PING 10.2.3.4 (10.2.3.4) from 192.168.100.103: 56 data bytes
64 bytes from 10.2.3.4: icmp_seq=0 ttl=250 time=1.153 ms
64 bytes from 10.2.3.4: icmp_seq=1 ttl=250 time=0.569 ms
64 bytes from 10.2.3.4: icmp_seq=2 ttl=250 time=0.562 ms
64 bytes from 10.2.3.4: icmp_seq=3 ttl=250 time=0.525 ms
64 bytes from 10.2.3.4: icmp_seq=4 ttl=250 time=0.527 ms
--- 10.2.3.4 ping statistics ---
5 packets transmitted, 5 packets received, 0.00% packet loss
round-trip min/avg/max = 0.525/0.667/1.153 ms
HOST_3#
```

Ethanalyzer在站點2枝葉1和枝葉2上進行，以確認哪個枝葉接收/轉發外部路由器環回10.2.3.4可達性的流量。

<#root>

```
S2-Leaf1(config-monitor)#
```

sho clock

```
Warning: No NTP peer/server configured. Time may be out of sync.
07:11:37.455 UTC Tue Feb 21 2023
Time source is NTP
S2-Leaf1(config-monitor)#
S2-Leaf1(config-monitor)#
```

show run section monitor

```
show running-config | section monitor
icam monitor scale
```

```
monitor session 1
  source interface port-channel100 both
  destination interface sup-eth0
  no shut
S2-Leaf1(config-monitor)#
S2-Leaf2(config-monitor)#
S2-Leaf2(config-monitor)#
```

ethanalyzer local interface inband display-filter "ip.addr==10.2.3.4 && ip.addr==192.168.100.103 && icmp

```
Capturing on 'ps-inb'
1385 2023-02-21 07:10:46.424195144 192.168.100.103 → 10.2.3.4     ICMP 102 Echo (ping) request  id=0xdd1f, se
 1386 2023-02-21 07:10:46.424818423     10.2.3.4 → 192.168.100.103 ICMP 98 Echo (ping) reply    id=0xdd1f, se
 1387 2023-02-21 07:10:46.425263621 192.168.100.103 → 10.2.3.4     ICMP 102 Echo (ping) request  id=0xdd1f,
 1388 2023-02-21 07:10:46.425486046     10.2.3.4 → 192.168.100.103 ICMP 98 Echo (ping) reply    id=0xdd1f, se
 1389 2023-02-21 07:10:46.425856150 192.168.100.103 → 10.2.3.4     ICMP 102 Echo (ping) request  id=0xdd1f,
 1390 2023-02-21 07:10:46.426095692     10.2.3.4 → 192.168.100.103 ICMP 98 Echo (ping) reply    id=0xdd1f, se
 1391 2023-02-21 07:10:46.426438174 192.168.100.103 → 10.2.3.4     ICMP 102 Echo (ping) request  id=0xdd1f,
 1392 2023-02-21 07:10:46.426642605     10.2.3.4 → 192.168.100.103 ICMP 98 Echo (ping) reply    id=0xdd1f, se
 1393 2023-02-21 07:10:46.427004108 192.168.100.103 → 10.2.3.4     ICMP 102 Echo (ping) request  id=0xdd1f,
 1394 2023-02-21 07:10:46.427210984     10.2.3.4 → 192.168.100.103 ICMP 98 Echo (ping) reply    id=0xdd1f, se
10
S2-Leaf2(config-monitor)#
S2-Leaf2(config-monitor)#
```

sho clock

```
Warning: No NTP peer/server configured. Time may be out of sync.
07:12:31.069 UTC Tue Feb 21 2023
Time source is NTP
S2-Leaf2(config-monitor)#
```

CLI輸出確認Site 2 Leaf-2接收並轉發外部路由器10.2.3.4的網際網路控制消息協定(ICMP)請求。

下一個CLI示例確認站點1驗證哪些枝葉將資料包轉發到目標10.2.3.4。

<#root>

```
S1-Leaf3(config-monitor)#
S1-Leaf3(config-monitor)#
```

ethanalyzer local interface inband display-filter "ip.addr==10.2.3.4 && ip.addr==192.168.100.103 && icmp

```
Capturing on 'ps-inb'
  253 2023-02-21 07:10:50.379741403 192.168.100.103 → 10.2.3.4     ICMP 98 Echo (ping) request  id=0xdd1f, se
  254 2023-02-21 07:10:50.380357311     10.2.3.4 → 192.168.100.103 ICMP 102 Echo (ping) reply    id=0xdd1f, s
  255 2023-02-21 07:10:50.380810012 192.168.100.103 → 10.2.3.4     ICMP 98 Echo (ping) request  id=0xdd1f, se
  256 2023-02-21 07:10:50.381025676     10.2.3.4 → 192.168.100.103 ICMP 102 Echo (ping) reply    id=0xdd1f, s
  257 2023-02-21 07:10:50.381401968 192.168.100.103 → 10.2.3.4     ICMP 98 Echo (ping) request  id=0xdd1f, se
  258 2023-02-21 07:10:50.381631838     10.2.3.4 → 192.168.100.103 ICMP 102 Echo (ping) reply    id=0xdd1f, s
  259 2023-02-21 07:10:50.381984272 192.168.100.103 → 10.2.3.4     ICMP 98 Echo (ping) request  id=0xdd1f, se
  260 2023-02-21 07:10:50.382176820     10.2.3.4 → 192.168.100.103 ICMP 102 Echo (ping) reply    id=0xdd1f, s
  261 2023-02-21 07:10:50.382549820 192.168.100.103 → 10.2.3.4     ICMP 98 Echo (ping) request  id=0xdd1f, se
  262 2023-02-21 07:10:50.382746640     10.2.3.4 → 192.168.100.103 ICMP 102 Echo (ping) reply    id=0xdd1f, s

S1-Leaf3(config-monitor)#
```

sho clock

```
Warning: No NTP peer/server configured. Time may be out of sync.
07:11:22.514 UTC Tue Feb 21 2023
Time source is NTP
S1-Leaf3(config-monitor)#

S1-Leaf3(config-monitor)#
```

show run section monitor

```
show running-config | section monitor
monitor session 1
  source interface port-channel2 both
  destination interface sup-eth0
  no shut
S1-Leaf3(config-monitor)#
S1-Leaf3(config-monitor)#
```

show moni sess 1

```
   session 1
---------------
type              : local
state             : up
acl-name          : acl-name not specified
source intf       :
    rx            : Po2
    tx            : Po2
    both          : Po2
source VLANs      :
    rx            :
    tx            :
    both          :
filter VLANs      : filter not specified
source fwd drops  :
destination ports : sup-eth0
source VSANs      :
    rx            :

S1-Leaf3(config-monitor)#

S1_Leaf4(config-monitor)#
```

ethanalyzer local interface inband display-filter "ip.addr==192.168.100.103" limit-captured-frames 0

```
Capturing on 'ps-inb'
S1_Leaf4(config-monitor)#
S1_Leaf4(config-monitor)#
```

sho clock

```
Warning: No NTP peer/server configured. Time may be out of sync.
07:11:15.187 UTC Tue Feb 21 2023
Time source is NTP
S1_Leaf4(config-monitor)#
```

客戶回應說他們面臨著從Host-3到外部路由器的連線問題。客戶希望確認VXLAN交換矩陣中的所有情況都正常，並需要確認我們的枝葉將流量轉發到外部路由器。解決此問題的步驟如下：

1. 向外部路由器發起ping命令，並確認IP地址10.2.3.4是否可以訪問。
2. 在S1-Leaf3和S1-Leaf4上執行嵌入式邏輯分析器模組(ELAM)捕獲，以檢視它是否被觸發（基於拓撲和流量）。
3. 使用ELAM捕獲時，確認資料包已從介面轉發出去，並指向外部路由器。
4. 站點2 — 使用ethanalyzer可以看到ICMP請求和回覆。如果沒有應答，則問題出在遠端端。
5. 如果10.2.3.4可以從Host-4訪問，而Host-3出現問題，則可能是主機特定的問題。檢查訪問控制清單(ACL)、循環冗餘檢查(CRC)錯誤和雜湊鏈路。

<#root>

```
HOST_3#
```

ping 10.2.3.4 source 192.168.100.103

```
PING 10.2.3.4 (10.2.3.4) from 192.168.100.103: 56 data bytes
Request 0 timed out
Request 1 timed out
Request 2 timed out
Request 3 timed out
Request 4 timed out
--- 10.2.3.4 ping statistics ---
5 packets transmitted, 0 packets received, 100.00% packet loss
HOST_3#
```

```
Host4#
```

ping 10.2.3.4 source 192.168.100.104

```
PING 10.2.3.4 (10.2.3.4) from 192.168.100.104: 56 data bytes
64 bytes from 10.2.3.4: icmp_seq=0 ttl=250 time=1.266 ms
64 bytes from 10.2.3.4: icmp_seq=1 ttl=250 time=0.62 m
64 bytes from 10.2.3.4: icmp_seq=2 ttl=250 time=0.603 ms
64 bytes from 10.2.3.4: icmp_seq=3 ttl=250 time=0.474 ms
64 bytes from 10.2.3.4: icmp_seq=4 ttl=250 time=0.457 ms
--- 10.2.3.4 ping statistics ---
5 packets transmitted, 5 packets received, 0.00% packet loss
round-trip min/avg/max = 0.457/0.684/1.266 ms
```

驗證資料平面

獲取ELAM捕獲以驗證埠ASIC、切片和SrcId

<#root>

show hardware internal tah interface

show system internal ethpm info interface

| i i src

<#root>

S1-Leaf3(TAH-elam)#

debug platform internal tah elam asic 0

S1-Leaf3(TAH-elam)#

trigger init asic 0 slice 1 in-select 7 out-select 0 use-src-id 8

Slot 1: param values: asic 0, slice 1, lu-a2d 1, in-select 7, out-select 0, src_id 8
S1-Leaf3(TAH-elam-insel7)#

set inner ipv4 src_ip 192.168.100.103

S1-Leaf3(TAH-elam-insel7)#

start

S1-Leaf3(TAH-elam-insel7)#

report

HEAVENLY ELAM REPORT SUMMARY
slot - 1, asic - 0, slice - 1
==========
Incoming Interface: Eth1/2
Src Idx : 0x5, Src BD : 2001
Outgoing Interface Info: dmod 1, dpid 52>>>>>>>>>>>>Pointing to Eth 1/24 towards external Router
Dst Idx : 0x601, Dst BD : 100
Packet Type: IPv4

```
Dst MAC address: CC:7F:76:FA:11:8F
Src MAC address: 4C:E1:75:F7:38:C7
Dst IPv4 address: 10.2.3.4
Src IPv4 address: 192.168.100.103
Ver     =  4, DSCP    =   0, Don't Fragment = 0
Proto   =  1, TTL     =  252, More Fragments = 0
Hdr len = 20, Pkt len =   84, Checksum       = 0xb712
L4 Protocol  : 1
ICMP type    : 8
ICMP code    : 0
Drop Info:
----------
LUA:
LUB:
LUC:
LUD:
Final Drops:
vntag:
vntag_valid    : 0
vntag_vir      : 0
vntag_svif     : 0

S1-Leaf3(TAH-elam-insel7)#

S1_Leaf4#
```

show system internal ethpm info interface ethernet 1/2 | grep slice

```
  IF_STATIC_INFO: port_name=Ethernet1/2,if_index:0x1a000200,ltl=6140,slot=0, nxos_port=4,
dmod=1,dpid=76,unit=0,queue=65535,xbar_unitbmp=0x0,ns_pid=255,slice_num=1,port_on_slice=4,src_id=8


S1_Leaf4(TAH-elam)#
```

debug platform internal tah elam asic 0

```
S1_Leaf4(TAH-elam)#
```

trigger init asic 0 slice 1 in-select 7 out-select 0 use-src-id 8

```
Slot 1: param values: asic 0, slice 1, lu-a2d 1, in-select 7, out-select 0, src_id 8
S1_Leaf4(TAH-elam-insel7)#
```

set inner ipv4 src_ip 192.168.100.103

```
S1_Leaf4(TAH-elam-insel7)#
```

start

```
S1_Leaf4(TAH-elam-insel7)#
```

report

```
ELAM not triggered yet on slot - 1, asic - 0, slice - 1
S1_Leaf4(TAH-elam-insel7)#
```

ELAM輸出的結論是枝葉將流量轉發到外部路由器，但是沒有來自外部路由器的響應。因此，請向外部路由器團隊檢查ICMP響應。

關於此翻譯

思科已使用電腦和人工技術翻譯本文件，讓全世界的使用者能夠以自己的語言理解支援內容。請注意，即使是最佳機器翻譯，也不如專業譯者翻譯的內容準確。Cisco Systems, Inc. 對這些翻譯的準確度概不負責，並建議一律查看原始英文文件（提供連結）。