マルチサイト設定でのEVPN/VxLANのトラブルシューティング

内容

概要

このドキュメントでは、マルチサイト設定でイーサネットVPN/仮想拡張LAN(EVPN/VxLAN)をトラブルシューティングする方法について説明します。

前提条件

要件

次の項目に関する知識があることが推奨されます。

- マルチプロトコルラベルスイッチング(MPLS)レイヤ3 VPN
- マルチプロトコルボーダーゲートウェイプロトコル(MP-BGP)
- EVPN

使用するコンポーネント

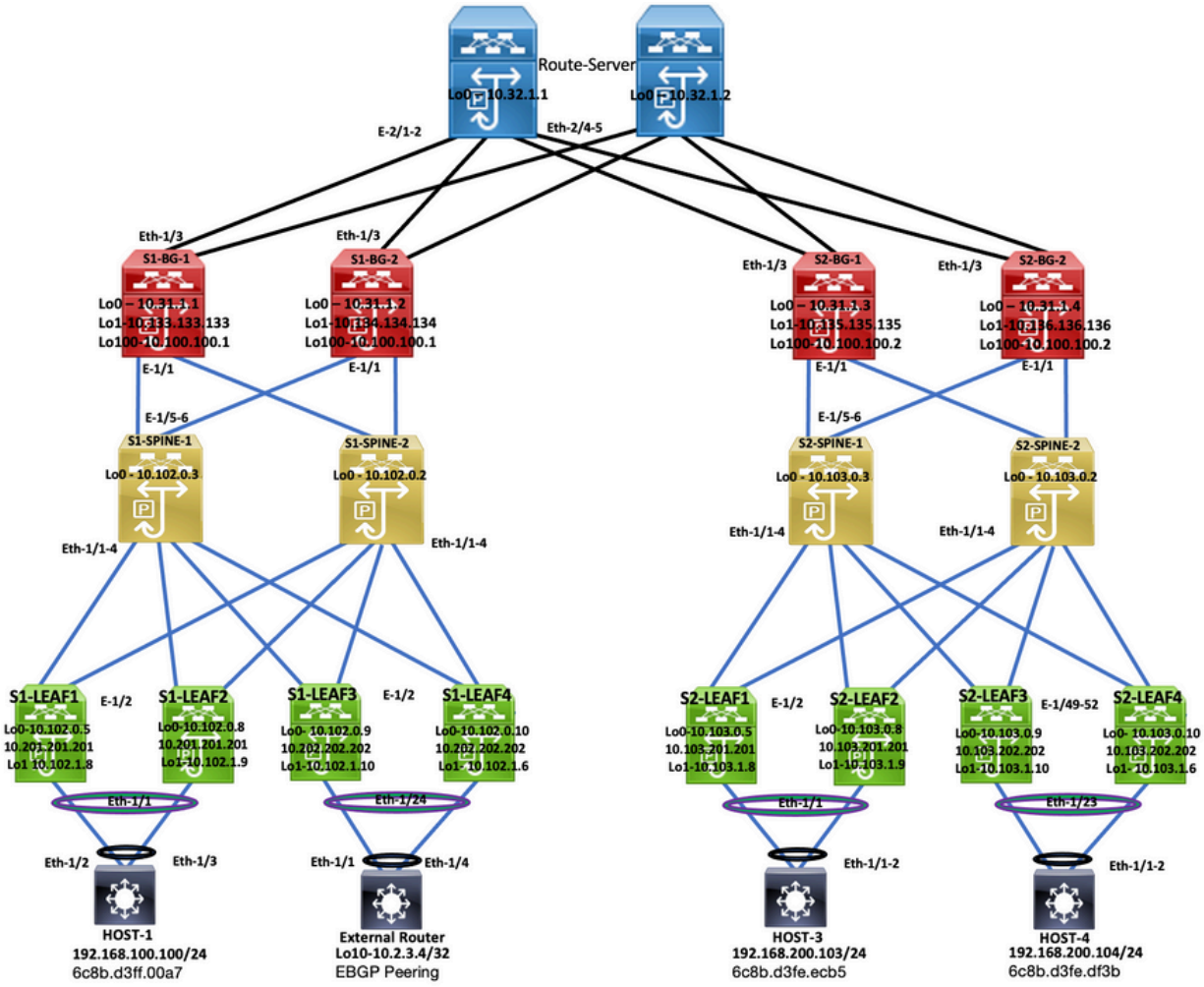
このドキュメントの情報は、次のソフトウェアとハードウェアのバージョンに基づいています。

すべてのサイトリーフ	N9K-C9336C-FX2	NXOS:10.2(3)
S1_スパイン1	N9K-C9364C	NXOS:10.2(4)
S1_スパイン2	N9K-C9364C	NXOS:9.3(5)
S1_Border Gateway1、S2_Border Gateway2、S2_Border Gateway1	N9K-C9332C	NXOS:9.3(9)
S1_ボーダーゲートウェイ2	N9K-C9332C	NXOS:10.2(4)

ルートサーバ	N9K-C9396PX	NXOS:9.2(2)
HOST-1	N3K-C3264C-E	NXOS:9.3(5)
Host-2およびHost-3	N3K-C3264C-E	NXOS:9.2(2)

このドキュメントの情報は、特定のラボ環境にあるデバイスに基づいて作成されました。このドキュメントで使用するすべてのデバイスは、クリアな（デフォルト）設定で作業を開始しています。本稼働中のネットワークでは、各コマンドによって起こる可能性がある影響を十分確認してください。

トポロジ



トポロジ

このドキュメントでは、トラフィックがDC-2 Host-3(192.168.200.104/24)から発信される場所について説明し、宛先DC-1 Host-2(10.2.3.4)までパケットとともに移動します。

コントロールプレーンの確認

コントロールプレーンを確認するには、次のコマンドを入力します。

<#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#
```

データプレーンの確認

データプランの検証は、さまざまなパケットキャプチャ方式とバリアントを理解するために、複数のデバイスでテストされます。

Host-3の送信元IPアドレス192.168.100.103から外部ルータループバック100「10.2.3.4」にpingを実行します。

<#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は、外部ルータループバック10.2.3.4到達可能性に対するトラフィックを送受信するリーフを確認するために、サイト2のリーフ1とリーフ2で実行されます。

<#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出力で、サイト2 Leaf-2が外部ルータ10.2.3.4に対するインターネット制御メッセージプロトコル(ICMP)要求を受信し、転送していることが確認されました。

次のCLIの例では、サイト1が宛先10.2.3.4にパケットを転送するリーフを確認します。

<#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, s
  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, s
  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, s
  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)#
```

お客様から、Host-3から外部ルータへの接続の問題が発生しているという応答がありました。顧客は、VXLANファブリックがすべて正常であることを確認し、リーフがトラフィックを外部ルータに転送することを確認する必要があります。この問題をトラブルシューティングする手順は次のとおりです。

1. 外部ルータに対してpingを実行し、IPアドレス10.2.3.4が到達可能かどうかを確認します。
2. S1-Leaf3とS1-Leaf4の両方でEmbedded Logic Analyzer Module(ELAM)キャプチャを取得し、（トポロジとトラフィックフローに基づいて）トリガーされるかどうかを確認します。
3. ELAMキャプチャを使用して、パケットがインターフェイスから転送され、外部ルータをポイントしていることを確認します。
4. サイト2:ethanalyzerを使用して、ICMP要求と応答を確認できます。応答がない場合、問題はリモート側にあります（応答がない場合は、リモート側に問題があります）。
5. 10.2.3.4がホスト4から到達可能で、ホスト3に問題がある場合は、ホスト固有の問題である可能性があります。アクセスコントロールリスト(ACL)、巡回冗長検査(CRC)エラー、およびハッシュリンクを確認します。

<#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
```

データプレーンの確認

ポートASIC、スライス、およびSrcIdを確認するためのELAMキャプチャ

<#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出力の結論は、リーフは外部ルータにトラフィックを転送しますが、外部ルータからの応答がないことです。そのため、ICMP応答について外部ルータチームに確認してください。

翻訳について
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