Configurando VXLAN inunde e aprenda no nexo 7K

Índice

Introdução

Este documento descreve a configuração da inundação elástico virtual LAN (VXLAN) e aprende-a em 7000 Series Switch do nexo.

Pré-requisitos

Requisitos

A Cisco recomenda que você tenha conhecimento destes tópicos:

- Conceitos do roteamento de transmissão múltipla tais como o ponto de reunião (RP) e o Multicast da plataforma independente (PIM).
- Conceitos VXLAN

Note: Este documento supõe que Roteamento IP e o roteamento de transmissão múltipla estiveram estabelecidos antes da configuração VXLAN.

Componentes Utilizados

As informações neste documento são baseadas nestas versões de software e hardware:

- N77-C7710
- N77-F348XP-23

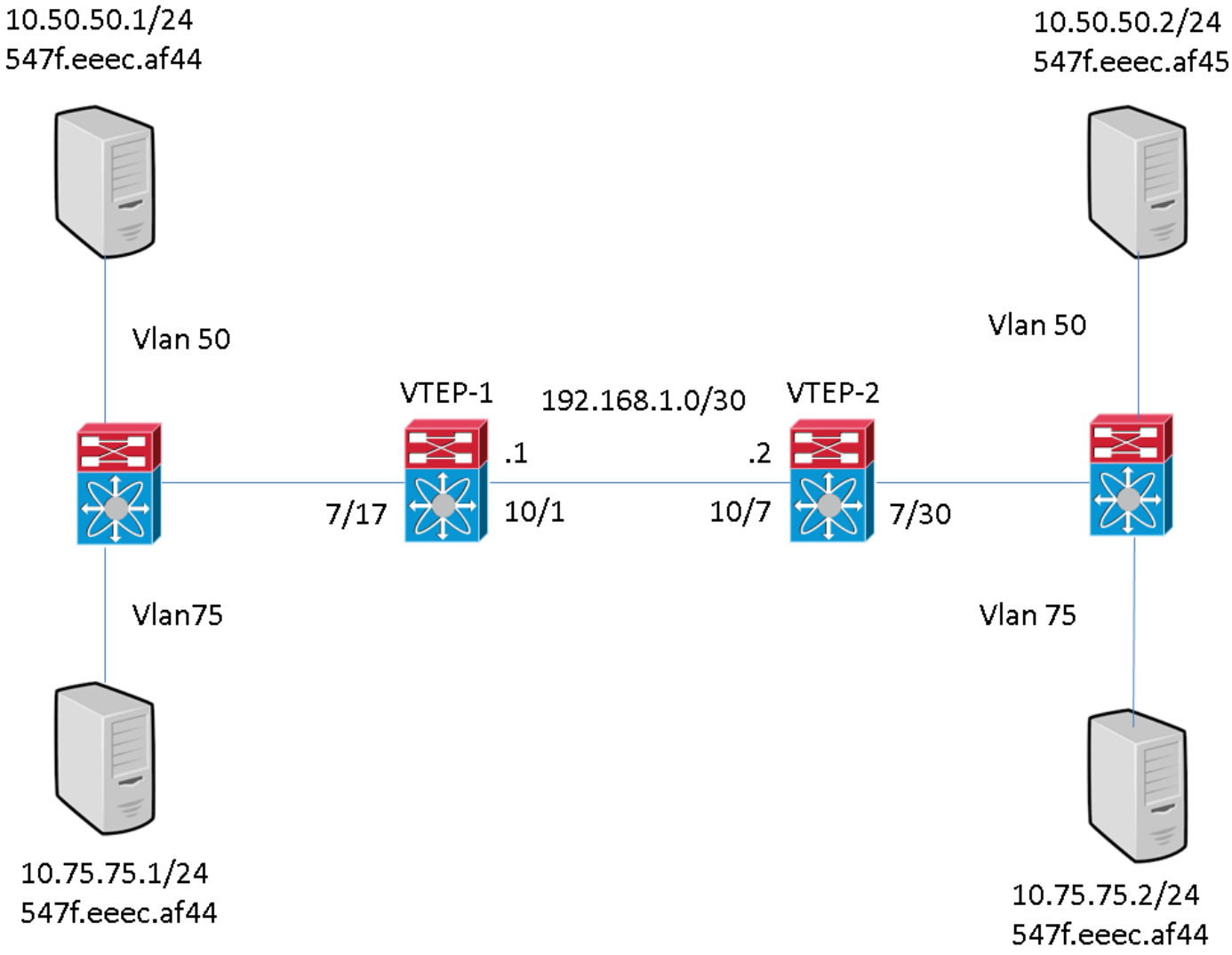
- N77-F324FQ-25

  Note: N77K é Software Release 7.2(0)D1(1) running.

As informações neste documento foram criadas a partir de dispositivos em um ambiente de laboratório específico. Todos os dispositivos utilizados neste documento foram iniciados com uma configuração (padrão) inicial. Se a sua rede estiver ativa, certifique-se de que entende o impacto potencial de qualquer comando.

Configurar

Diagrama de Rede



Configurações

Estas configurações são específicas à parcela VXLAN de configuração. Estas configurações supõem a alcançabilidade completa a todas as relações L3 na topologia com o protocolo de roteamento de sua escolha. O roteamento estático é usado neste exemplo. Igualmente supõe que o roteamento de transmissão múltipla esteve estabelecido sobre estas mesmas relações L3

VTEP-1

```
feature pim
system bridge-domain 50,75
feature nv overlay
feature interface-vlan feature vni vni 5000
vni 7500 ip route 10.10.10.2/32 Ethernet10/1 192.168.1.2 ip pim rp-address 192.168.1.1 group-
list 224.0.0.0/4 bridge-domain 50
bridge-domain 75 encapsulation profile vni VSI_50_TO_5000 dot1q 50 vni 5000
encapsulation profile vni VSI_75_TO_7500
   dot1q 75  vni 7500 bridge-domain 50 member vni 5000
bridge-domain 75
 member vni 7500 interface nve1 no shutdown source-interface loopback10 member vni 5000 mcast-
group 225.1.1.1
member vni 7500 mcast-group 227.1.1.1

interface Bdi50
  no shutdown
  ip address 10.50.50.50/24

interface Bdi75
  no shutdown
  ip address 10.75.75.75/24 interface Ethernet7/17
no switchport no shutdown service instance 1 vni no shutdown encapsulation profile
VSI_50_TO_5000 default
  service instance 2 vni
   no shutdown
   encapsulation profile VSI_75_TO_7500 default interface Ethernet10/1
no switchport ip address 192.168.1.1/30 ip pim sparse-mode no shutdown interface loopback10 ip
address 10.10.10.1/32 ip pim sparse-mode
```

Éimportante notar que a interface interna no VTEP (ponto final de túnel de Vxlan) está configurada como uma porta da camada 3 (nenhum switchport). Contudo, não há nenhum IP atribuído a ele. É igualmente importante notar que o valor BD definido no VTEP não tem que combinar o ID vlan que é usado para enviar o tráfego neste dispositivo. Contudo, o dot1q ao mapeamento VNI (identificador de rede de Vxlan) definido no perfil do encapsulamento, que é chamado sob o exemplo do serviço na interface interna, deve combinar o Vlan ID.

VTEP-2

```
feature pim
system bridge-domain 50,75
feature nv overlay
feature interface-vlan feature vni vni 5000
vni 7500 ip route 10.10.10.1/32 Ethernet10/7 192.168.1.1 ip pim rp-address 192.168.1.1 group-
list 224.0.0.0/4 bridge-domain 50
bridge-domain 75 encapsulation profile vni VSI_50_TO_5000 dot1q 50 vni 5000
encapsulation profile vni VSI_75_TO_7500
   dot1q 75  vni 7500 bridge-domain 50 member vni 5000
bridge-domain 75
 member vni 7500 interface nve1 no shutdown source-interface loopback10 member vni 5000 mcast-
group 225.1.1.1
member vni 7500 mcast-group 227.1.1.1

interface Bdi50
no shutdown
ip address 10.50.50.51/24

interface Bdi75
no shutdown
ip address 10.75.75.76/24 interface Ethernet7/30
no switchport no shutdown service instance 1 vni no shutdown encapsulation profile
```

```
VSI_50_TO_5000 default
  service instance 2 vni
   no shutdown
   encapsulation profile VSI_75_TO_7500 default interface Ethernet10/7
no switchport ip address 192.168.1.2/30 ip pim sparse-mode no shutdown interface loopback10 ip
address 10.10.10.2/32 ip pim sparse-mode
```

Éimportante notar que a interface interna no VTEP está configurada como uma porta da camada 3 (nenhum switchport). Contudo, não há nenhum IP atribuído a ele. É igualmente importante notar que o valor BD definido no VTEP não tem que combinar o Vlan ID que é usado para enviar o tráfego neste dispositivo. Contudo, o dot1q ao mapeamento VNI definido no perfil do encapsulamento, que é chamado sob o exemplo do serviço na interface interna, deve combinar o Vlan ID.

Verificar

Use esta seção para confirmar se a sua configuração funciona corretamente.

Saídas de exemplo

Estas saídas estão em um estado steady. Os pares VTEP descobriram-se que e o tráfego passaram entre ambos no encap e sentidos do decap.

VTEP-1

```
VTEP-1# show nve vni
Codes: CP - Control Plane        DP - Data Plane
       UC - Unconfigured         SA - Suppress ARP

Interface VNI      Multicast-group   State Mode Type [BD/VRF]      Flags
--------- -------- ----------------- ----- ---- ------------------ -----
nve1      5000     225.1.1.1         Up    DP   L2 [50]
nve1      7500     227.1.1.1         Up    DP   L2 [75]

VTEP-1# show running-config interface nve 1

interface nve1
  no shutdown
  source-interface loopback10
  member vni 5000 mcast-group 225.1.1.1
  member vni 7500 mcast-group 227.1.1.1

VTEP-1# show service instance vni detail

VSI: VSI-Ethernet7/17.1
If-index: 0x35310001
Admin Status: Up
Oper Status: Up
Auto-configuration Mode: No
encapsulation profile vni VSI_50_TO_5000
  dot1q 50 vni 5000
Dot1q   VNI     BD
------------------
50      5000    50

VSI: VSI-Ethernet7/17.2
If-index: 0x35310002
```

```
Admin Status: Up
Oper Status: Up
Auto-configuration Mode: No
encapsulation profile vni TEST
  dot1q 100 vni 7500
Dot1q   VNI     BD
------------------
100     7500    75

VTEP-1# show bridge-domain

Bridge-domain 50  (2 ports in all)
Name:: Bridge-Domain50
 Administrative State: UP               Operational State: UP
        VSI-Eth7/17.1
        vni5000
        nve1

Bridge-domain 75  (2 ports in all)
Name:: Bridge-Domain75
 Administrative State: UP               Operational State: UP
        VSI-Eth7/17.2
        vni7500
        nve1

VTEP-1# show mac address-table dynamic
 Note: MAC table entries displayed are getting read from software.
 Use the 'hardware-age' keyword to get information related to 'Age'

 Legend:
        * - primary entry, G - Gateway MAC, (R) - Routed MAC, O - Overlay MAC
        age - seconds since last seen,+ - primary entry using vPC Peer-Link, E -
 EVPN entry
        (T) - True, (F) - False ,  ~~~ - use 'hardware-age' keyword to retrieve
age info
  VLAN/BD   MAC Address      Type      age     Secure NTFY Ports/SWID.SSID.LID ---------+-------
----------+--------+---------+------+----+------------------ * 50 547f.eeec.af43 dynamic ~~~ F F
nve1/10.10.10.2 * 50 547f.eeec.af44 dynamic ~~~ F F VSI-Eth7/17.1 * 50 547f.eeec.af45 dynamic
~~~ F F nve1/10.10.10.2 * 75 547f.eeec.af44 dynamic ~~~ F F VSI-Eth7/17.2 * 75 547f.eeec.af45
dynamic ~~~ F F nve1/10.10.10.2 VTEP-1# show ip mroute detail IP Multicast Routing Table for VRF
"default" Total number of routes: 7 Total number of (*,G) routes: 2 Total number of (S,G)
routes: 4 Total number of (*,G-prefix) routes: 1 (*, 225.1.1.1/32), uptime: 19:51:28, nve(1)
ip(0) pim(1) Data Created: No VXLAN Flags VXLAN Encap Stats: 0/0 [Packets/Bytes], 0.000 bps
Incoming interface: Ethernet10/1, RPF nbr: 1.1.1.1 Outgoing interface list: (count: 2)
Ethernet10/1, uptime: 19:51:09, pim, (RPF) nve1, uptime: 19:51:28, nve (10.10.10.1/32,
225.1.1.1/32), uptime: 19:51:28, nve(0) mrib(0) ip(0) pim(1) Data Created: No Received Register
stop VXLAN Flags VXLAN Encap Stats: 19/2274 [Packets/Bytes], 0.000 bps Incoming interface:
loopback10, RPF nbr: 10.10.10.1, internal Outgoing interface list: (count: 1) Ethernet10/1,
uptime: 19:51:09, pim (10.10.10.2/32, 225.1.1.1/32), uptime: 18:10:06, pim(1) mrib(1) ip(0) Data
Created: Yes VXLAN Flags VXLAN Decap Stats: 9/846 [Packets/Bytes], 0.000 bps Incoming interface:
Ethernet10/1, RPF nbr: 1.1.1.2, internal Outgoing interface list: (count: 2) Ethernet10/1,
uptime: 01:00:32, pim, (RPF) nve1, uptime: 18:10:06, mrib (*, 227.1.1.1/32), uptime: 12:52:13,
nve(1) ip(0) pim(1) Data Created: No VXLAN Flags VXLAN Encap Stats: 0/0 [Packets/Bytes], 0.000
bps Incoming interface: Ethernet10/1, RPF nbr: 1.1.1.1 Outgoing interface list: (count: 2)
Ethernet10/1, uptime: 12:51:52, pim, (RPF) nve1, uptime: 12:52:13, nve (10.10.10.1/32,
227.1.1.1/32), uptime: 12:52:13, nve(0) mrib(0) ip(0) pim(1) Data Created: No Received Register
stop VXLAN Flags VXLAN Encap Stats: 300/39850 [Packets/Bytes], 0.000 bps Incoming interface:
loopback10, RPF nbr: 10.10.10.1, internal Outgoing interface list: (count: 1) Ethernet10/1,
uptime: 12:51:52, pim (10.10.10.2/32, 227.1.1.1/32), uptime: 12:51:34, pim(1) mrib(1) ip(0) Data
Created: Yes VXLAN Flags VXLAN Decap Stats: 22/1928 [Packets/Bytes], 0.000 bps Incoming
interface: Ethernet10/1, RPF nbr: 1.1.1.2, internal Outgoing interface list: (count: 2)
Ethernet10/1, uptime: 00:52:14, pim, (RPF) nve1, uptime: 12:51:34, mrib (*, 232.0.0.0/8),
uptime: 20:56:33, pim(0) ip(0) Data Created: No Stats: 0/0 [Packets/Bytes], 0.000 bps Incoming
interface: Null, RPF nbr: 0.0.0.0 Outgoing interface list: (count: 0) VTEP-1# show ip arp Flags:
```

```
* - Adjacencies learnt on non-active FHRP router + - Adjacencies synced via CFSoE # -
Adjacencies Throttled for Glean D - Static Adjacencies attached to down interface IP ARP Table
for context default Total number of entries: 4 Address Age MAC Address Interface 10.50.50.1
00:11:32 547f.eeec.af44 Bdi50
10.50.50.2 00:11:14 547f.eeec.af44 Bdi50 10.75.75.1 00:10:45 547f.eeec.af44 Bdi75 10.75.75.2
00:15:04 547f.eeec.af45 Bdi75 192.168.1.2 00:05:39 547f.eeec.af43 Ethernet10/1 VTEP-1# show ip
route 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>
192.168.1.0/30, ubest/mbest: 1/0, attached *via 1.1.1.1, Eth10/1, [0/0], 20:25:13, direct
192.168.1.1/32, ubest/mbest: 1/0, attached *via 1.1.1.1, Eth10/1, [0/0], 20:25:13, local
10.10.10.1/32, ubest/mbest: 2/0, attached *via 10.10.10.1, Lo10, [0/0], 20:25:45, local *via
10.10.10.1, Lo10, [0/0], 20:25:45, direct 10.10.10.2/32, ubest/mbest: 1/0 *via 1.1.1.2, Eth10/1,
[1/0], 20:23:42, static 50.50.50.0/24, ubest/mbest: 1/0, attached *via 50.50.50.50, Bdi50,
[0/0], 01:18:47, direct 50.50.50.50/32, ubest/mbest: 1/0, attached *via 50.50.50.50, Bdi50,
[0/0], 01:18:47, local 75.75.75.0/24, ubest/mbest: 1/0, attached *via 75.75.75.75, Bdi75, [0/0],
01:10:05, direct 75.75.75.75/32, ubest/mbest: 1/0, attached *via 75.75.75.75, Bdi75, [0/0],
01:10:05, local
```

Note: Todas estas saídas foram recolhidas com uma malha cheia do fluxo de tráfego entre todos os anfitriões na topologia.

VTEP-2

```
VTEP-2# show nve vni
Codes: CP - Control Plane        DP - Data Plane
       UC - Unconfigured         SA - Suppress ARP

Interface VNI      Multicast-group   State Mode Type [BD/VRF]      Flags
--------- -------- ----------------- ----- ---- ------------------ -----
nve1      5000     225.1.1.1         Up    DP   L2 [50]
nve1      7500     227.1.1.1         Up    DP   L2 [75]

VTEP-2# show running-config interface nve 1

interface nve1
  no shutdown
  source-interface loopback10
  member vni 5000 mcast-group 225.1.1.1
  member vni 7500 mcast-group 227.1.1.1

VTEP-2# show service instance vni detail

VSI: VSI-Ethernet7/30.1
If-index: 0x3531d001
Admin Status: Up
Oper Status: Up
Auto-configuration Mode: No
encapsulation profile vni VSI_50_TO_5000
  dot1q 50 vni 5000
Dot1q   VNI     BD
------------------
50      5000    50

VSI: VSI-Ethernet7/30.2
If-index: 0x3531d002
Admin Status: Up
Oper Status: Up
Auto-configuration Mode: No
encapsulation profile vni TEST
  dot1q 100 vni 7500
```

```
Dot1q   VNI     BD
-----------------
100     7500    75

VTEP-2# show bridge-domain

Bridge-domain 50  (2 ports in all)
Name:: Bridge-Domain50
 Administrative State: UP               Operational State: UP
        vni5000
        VSI-Eth7/30.1
        nve1

Bridge-domain 75  (2 ports in all)
Name:: Bridge-Domain75
 Administrative State: UP               Operational State: UP
        vni7500
        VSI-Eth7/30.2
        nve1

VTEP-2# show mac address-table dynamic
 Note: MAC table entries displayed are getting read from software.
 Use the 'hardware-age' keyword to get information related to 'Age'

 Legend:
        * - primary entry, G - Gateway MAC, (R) - Routed MAC, O - Overlay MAC
        age - seconds since last seen,+ - primary entry using vPC Peer-Link, E -
 EVPN entry
        (T) - True, (F) - False ,  ~~~ - use 'hardware-age' keyword to retrieve
age info
  VLAN/BD   MAC Address      Type      age     Secure NTFY Ports/SWID.SSID.LID ---------+-------
----------+--------+---------+------+----+------------------ * 50 547f.eeec.af44 dynamic ~~~ F F
nve1/10.10.10.1 * 50 547f.eeec.af45 dynamic ~~~ F F VSI-Eth7/30.1 * 75 547f.eeec.af45 dynamic
~~~ F F VSI-Eth7/30.2 * 75 547f.eeec.af48 dynamic ~~~ F F nve1/10.10.10.1 VTEP-2# show ip mroute
detail IP Multicast Routing Table for VRF "default" Total number of routes: 5 Total number of
(*,G) routes: 2 Total number of (S,G) routes: 2 Total number of (*,G-prefix) routes: 1 (*,
225.1.1.1/32), uptime: 19:56:19, nve(1) ip(0) pim(0) Data Created: No VXLAN Flags VXLAN Encap
Stats: 8/748 [Packets/Bytes], 0.000 bps Incoming interface: Ethernet10/7, RPF nbr: 1.1.1.1
Outgoing interface list: (count: 1) nve1, uptime: 19:56:19, nve (10.10.10.2/32, 225.1.1.1/32),
uptime: 19:56:19, nve(0) mrib(0) pim(1) ip(0) Data Created: No Received Register stop VXLAN
Flags VXLAN Encap Stats: 9/834 [Packets/Bytes], 0.000 bps Incoming interface: loopback10, RPF
nbr: 10.10.10.2 Outgoing interface list: (count: 1) Ethernet10/7, uptime: 18:15:17, pim (*,
227.1.1.1/32), uptime: 12:57:03, nve(1) ip(0) pim(0) Data Created: No VXLAN Flags VXLAN Encap
Stats: 10/864 [Packets/Bytes], 0.000 bps Incoming interface: Ethernet10/7, RPF nbr: 1.1.1.1
Outgoing interface list: (count: 1) nve1, uptime: 12:57:03, nve (10.10.10.2/32, 227.1.1.1/32),
uptime: 12:57:03, nve(0) mrib(0) ip(0) pim(1) Data Created: No Received Register stop VXLAN
Flags VXLAN Encap Stats: 30/2648 [Packets/Bytes], 0.000 bps Incoming interface: loopback10, RPF
nbr: 10.10.10.2 Outgoing interface list: (count: 1) Ethernet10/7, uptime: 12:56:45, pim (*,
232.0.0.0/8), uptime: 18:20:36, pim(0) ip(0) Data Created: No Stats: 0/0 [Packets/Bytes], 0.000
bps Incoming interface: Null, RPF nbr: 0.0.0.0 Outgoing interface list: (count: 0) VTEP-2# show
ip arp Flags: * - Adjacencies learnt on non-active FHRP router + - Adjacencies synced via CFSoE
# - Adjacencies Throttled for Glean D - Static Adjacencies attached to down interface IP ARP
Table for context default Total number of entries: 4 Address Age MAC Address Interface
10.50.50.1 00:11:30 547f.eeec.af44 Bdi50 10.50.50.2 00:17:07 547f.eeec.af45 Bdi50
10.75.75.1 00:04:14 547f.eeec.af45 Bdi75 10.75.75.2 00:03:24 547f.eeec.af45 Bdi75 192.168.1.1
00:10:52 547f.eeec.af48 Ethernet10/7 VTEP-2# show ip route 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> 192.168.1.0/30, ubest/mbest: 1/0, attached *via
1.1.1.2, Eth10/7, [0/0], 20:30:24, direct 192.168.1.2/32, ubest/mbest: 1/0, attached *via
1.1.1.2, Eth10/7, [0/0], 20:30:24, local 10.10.10.1/32, ubest/mbest: 1/0 *via 1.1.1.1, Eth10/7,
[1/0], 20:29:48, static 10.10.10.2/32, ubest/mbest: 2/0, attached *via 10.10.10.2, Lo10, [0/0],
20:29:39, local *via 10.10.10.2, Lo10, [0/0], 20:29:39, direct 50.50.50.0/24, ubest/mbest: 1/0,
attached *via 50.50.50.51, Bdi50, [0/0], 01:22:50, direct 50.50.50.51/32, ubest/mbest: 1/0,
attached *via 50.50.50.51, Bdi50, [0/0], 01:22:50, local 75.75.75.0/24, ubest/mbest: 1/0,
```

```
attached *via 75.75.75.76, Bdi75, [0/0], 01:14:50, direct 75.75.75.76/32, ubest/mbest: 1/0,
attached *via 75.75.75.76, Bdi75, [0/0], 01:14:50, local
```

> **Note**: Todas estas saídas foram recolhidas com uma malha cheia do fluxo de tráfego entre todos os anfitriões na topologia.

Troubleshooting

Atualmente, não existem informações disponíveis específicas sobre Troubleshooting para esta configuração.