Configurazione del flusso VXLAN e informazioni su Nexus 7K

Sommario

Introduzione

Questo documento descrive la configurazione della VXLAN (Virtual Extensible LAN) Flood e fornisce informazioni sugli switch Nexus serie 7000.

Prerequisiti

Requisiti

Cisco raccomanda la conoscenza dei seguenti argomenti:

- Nozioni base sul routing multicast, ad esempio Rendezvous Point (RP) e Platform Independent Multicast (PIM).
- Nozioni base sulle VXLAN

Nota: in questo documento si presume che il routing IP e il routing multicast siano stati stabiliti prima della configurazione della VXLAN.

Componenti usati

Le informazioni fornite in questo documento si basano sulle seguenti versioni software e hardware:

- N77-C7710

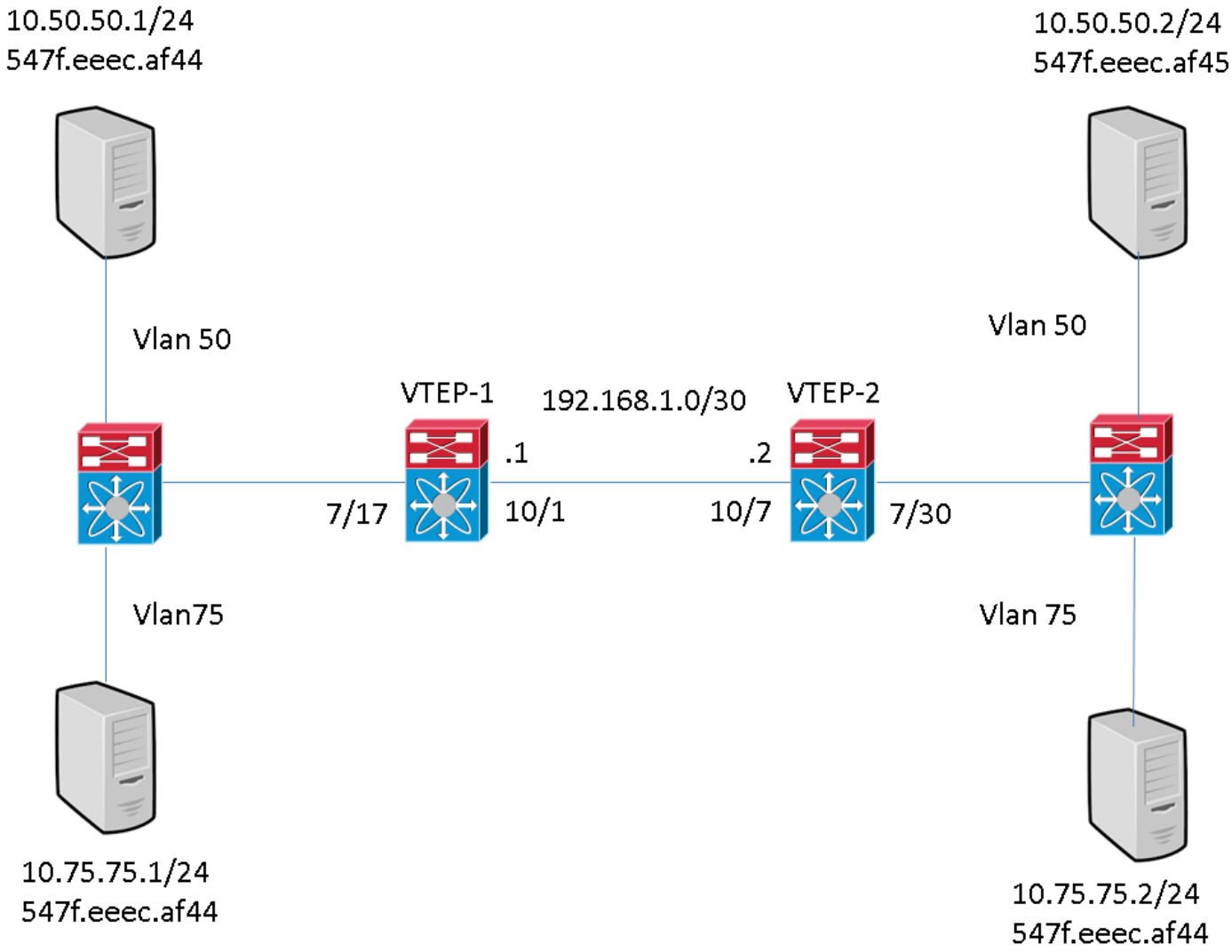
- N77-F348XP-23
- N77-F324FQ-25

Nota: N77K esegue la versione software 7.2(0)D1(1).

Le informazioni discusse in questo documento fanno riferimento a dispositivi usati in uno specifico ambiente di emulazione. Su tutti i dispositivi menzionati nel documento la configurazione è stata ripristinata ai valori predefiniti. Se la rete è operativa, valutare attentamente eventuali conseguenze derivanti dall'uso dei comandi.

Configurazione

Esempio di rete



Configurazioni

Queste configurazioni sono specifiche della parte VXLAN della configurazione. Queste configurazioni presuppongono la completa raggiungibilità di tutte le interfacce L3 nella topologia con il protocollo di routing scelto. Nell'esempio viene utilizzato il routing statico. Inoltre, si presume che il routing multicast sia stato stabilito sulle stesse interfacce 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
```

Èimportante notare che l'interfaccia interna sul VTEP (Vxlan Tunnel Endpoint) è configurata come porta di layer 3 (senza switchport). Tuttavia, non vi è alcun indirizzo IP assegnato. È anche importante notare che il valore BD definito sul VTEP non deve corrispondere all'ID vlan usato per inviare il traffico verso questo dispositivo. Tuttavia, il mapping da dot1q a VNI (Vxlan Network Identifier) definito nel profilo di incapsulamento, che viene chiamato nell'istanza del servizio sull'interfaccia interna, deve corrispondere all'ID Vlan.

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
```

Èimportante notare che l'interfaccia interna del VTEP è configurata come porta di layer 3 (senza switchport). Tuttavia, non vi è alcun indirizzo IP assegnato. È anche importante notare che il valore BD definito sul VTEP non deve corrispondere all'ID VLAN usato per inviare il traffico a questo dispositivo. Tuttavia, il mapping da dot1q a VNI definito nel profilo di incapsulamento, che viene chiamato nell'istanza del servizio sull'interfaccia interna, deve corrispondere all'ID Vlan.

Verifica

Fare riferimento a questa sezione per verificare che la configurazione funzioni correttamente.

Output di esempio

Questi output sono in stato stabile. I peer VTEP si sono scoperti a vicenda e il traffico è passato tra le due direzioni in Encrypt e Decapp.

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
```

Nota: Tutti questi output sono stati raccolti con una mesh completa del traffico che scorre tra tutti gli host nella 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
```

Nota: Tutti questi output sono stati raccolti con una mesh completa del traffico che scorre tra tutti gli host nella topologia.

Risoluzione dei problemi

Al momento non sono disponibili informazioni specifiche per la risoluzione dei problemi di questa configurazione.