

在Nexus 7K上配置VXLAN泛洪和學習

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簡介

本檔案介紹在Nexus 7000系列交換器上設定虛擬可擴充區域網路(VXLAN)泛洪和學習。

必要條件

需求

思科建議您瞭解以下主題：

- 多點傳送路由概念，例如集結點 (RP) 和平台無關多點傳送 (PIM)。
- VXLAN概念

附註：本文件假設在設定 VXLAN 之前已建立 IP 路由和多點傳送路由。

採用元件

本文中的資訊係根據以下軟體和硬體版本：

- N77-C7710
- N77-F348XP-23
- N77-F324FQ-25

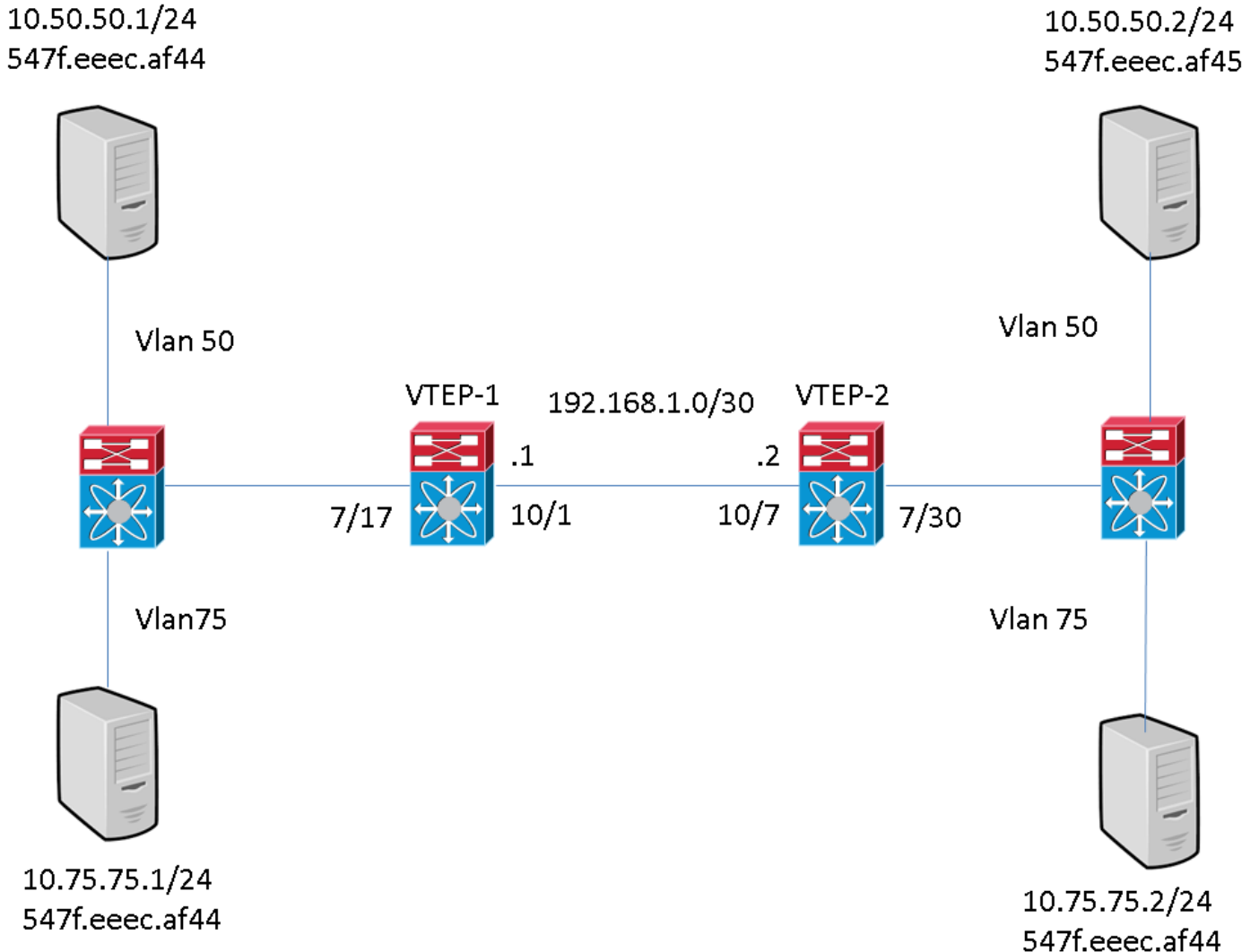
附註：N77K運行軟體版本7.2(0)D1(1)。

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。如果您的網路正在作用，請確保您已瞭解任何指令可能造成的影響。

設定

網路圖表



組態

這些是 VXLAN 組態的專屬組態。這些組態假設，使用您選擇的路由通訊協定，可充分連線至拓撲中的所有 L3 介面。本範例中使用的是靜態路由。另外還假設已透過這些相同的 L3 介面建立了多點傳送路由

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
```

必須注意的是，VTEP (VXLAN通道端點) 上的內部介面設定為第3層連線埠 (無交換器連線埠) 。但是，沒有為其分配IP。還必須注意的是，VTEP上定義的BD值不必與用於將流量傳送到此裝置的VLAN ID匹配。但是，封裝配置檔案中定義的dot1q到VNI (VXLAN網路識別符號) 對映 (在內部介面上的服務例項下呼叫) 應匹配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
```

必須注意的是，VTEP上的內部介面設定為第3層連線埠 (無交換器連線埠) 。但是，沒有為其分配IP。還必須注意的是，VTEP上定義的BD值不必與用於將流量傳送到此裝置的VLAN ID匹配。但是，封裝配置檔案中定義的dot1q到VNI對映 (在內部介面上的服務例項下呼叫) 應匹配Vlan ID。

驗證

使用本節內容，確認您的組態是否正常運作。

輸出範例

這些輸出處於穩定狀態。VTEP 對等點已發現彼此，且流量已經以封裝和解除封裝方向通過。

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	-----+-----
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
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

**附註：**所有這些輸出都是通過拓撲中所有主機之間流動的完整網狀流量收集的。

## 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 -----+-----
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----
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
```

附註：所有這些輸出都是通過拓撲中所有主機之間流動的完整網狀流量收集的。

## 疑難排解

目前尚無適用於此組態的具體疑難排解資訊。