

# 配置和验证VXLAN用MP-BGP EVPN控制层面。

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## 简介

使用MP-BGP EVPN控制面板，本文描述VXLAN配置。它显示一个示例网络方案和其配置与相关输出验证和更加好了解的。

## [先决条件](#)

### [要求](#)

Cisco 建议您了解以下主题：

- MPLS第3层VPN
- MP-BGP一定将帮助。

### 使用的组件

本文档不限于特定的软件和硬件版本。

本文档不限于特定的软件和硬件版本。本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您使用的是真实网络，请确保您已经了解所有命令的潜在影响。

## 背景信息

VXLAN设计提供网络虚拟化。它是在UDP封装的MAC。Layer2基础设施在第3层衬底网络被延伸提供不依靠服务器物理和地理位置于datacenters的一简化的服务。

本文描述VXLAN用MP-BGP EVPN控制层面。这意味着BGP协议用于覆盖基础设施发送和接收更新。

在STP使用的传统网络部署，这一些uplink端口阻塞状态永久导致。在VXLAN设计所有uplink端口是可操作的，并且ECMP被有效利用，因为衬底基础设施是IP网络。

在本文的范围之外，所有详细信息讨论是，然而一些重要术语如下所示。

VXLAN -虚拟可扩展LAN。

MP-BGP -多协议BGP。

EVPN -以太网VPN。

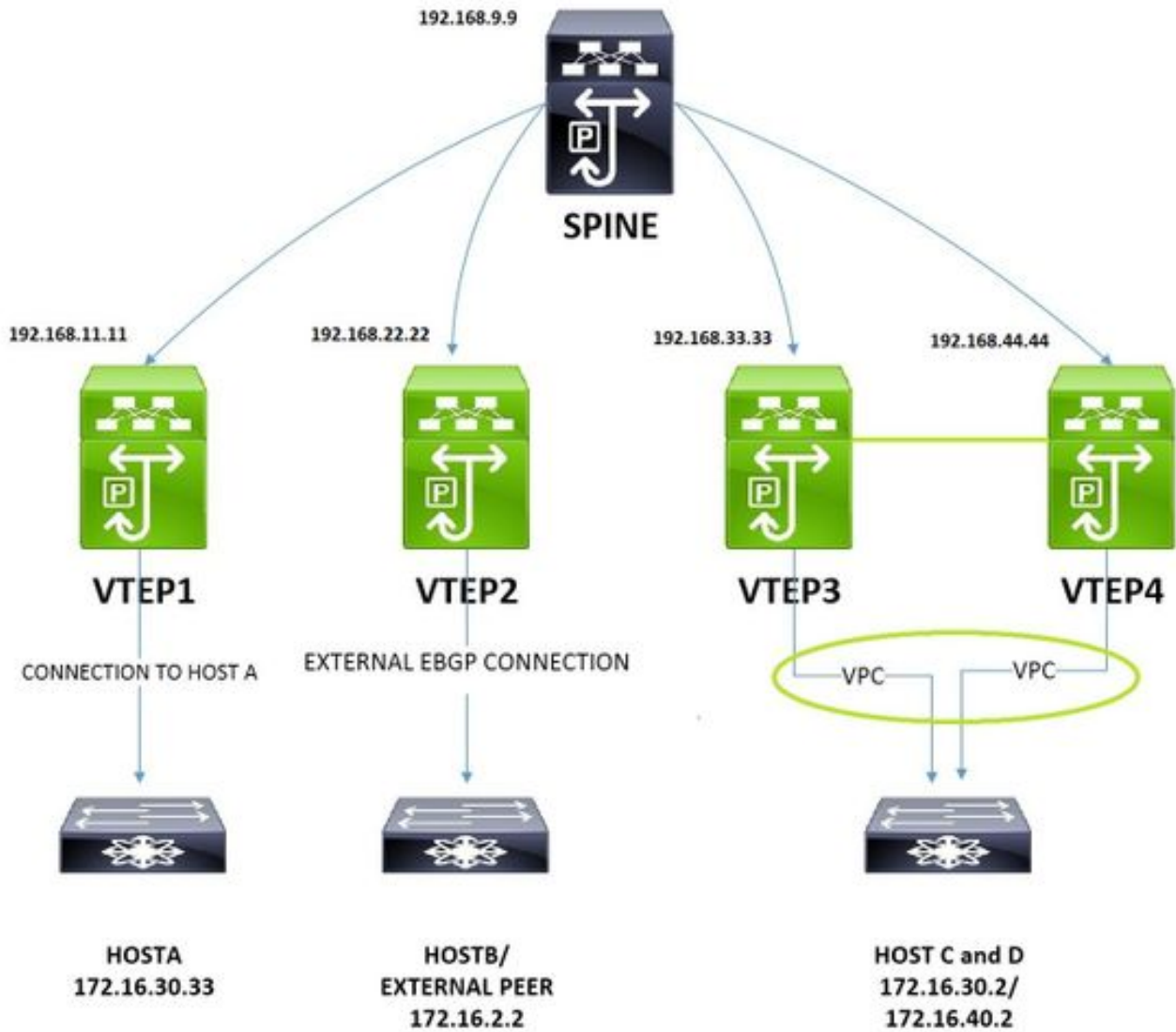
VTEP -虚拟通道端点。亦称分支。这数据包被封装和已解封的地方。

脊椎-这非常类似于在MPLS L3 VPN的路由反射器。此设备采取从一个VTEP的更新并且传递它到其他VTEP。

VNI - VXLAN网络标识。这主要用于为第2层限定范围提供隔离。此字段是24字节长，因此解决传统VLAN的范围限制。在VTEP的VNI '被映射'对一传统VLAN。这讨论以后。

## 配置

### 网络图



此处显示的图像使用配置和验证方面。这从VXLAN基础设施的角度报道非VPC， vpc， 内部vni， 相互vni和外部连通性配置。

## 配置

### VTEP1

#### ! Enabling features

```

nv overlay evpn
feature ospf
feature bgp
feature pim
feature interface-vlan
feature vn-segment-vlan-based
feature lacp
feature vpc
feature nv overlay
!
fabric forwarding anycast-gateway-mac 0001.0001.0001 ! This is needed for seamless VM mobility
across VTEPS,this configuration is same on all VTEPS.
ip pim rp-address 192.168.9.9 group-list 224.0.0.0/4 ! SPINE is the RP.
!
ip pim ssm range 232.0.0.0/8
!

```

```

vlan 1,10,30,40,100,200
!
vlan 10 ! VLAN 10 is used as layer3 VNI to route Inter-VNI traffic.
name L3-VNI-VLAN-10
vn-segment 10000010
vlan 30 ! The Host A resides on Vlan 30, The below command 'maps' vlan 30 with VNID 10000030.
vn-segment 10000030
!
vrf context EVPN-L3-VNI-VLAN-10 ! Defining layer3 vrf for Inter-VNI traffic.
vni 10000010
rd auto
address-family ipv4 unicast
route-target both auto
route-target both auto evpn
!
interface Vlan10 ! Layer3 VNI associated interface vlan does not have an ip address.
no shutdown
vrf member EVPN-L3-VNI-VLAN-10
ip forward
!
interface Vlan30 ! Associating the Host A Vlan with layer3 vrf.
no shutdown
vrf member EVPN-L3-VNI-VLAN-10
ip address 172.16.30.1/24
fabric forwarding mode anycast-gateway ! This is needed for seamless VM mobility across VTEPS, same on all VTEPS.
!
interface nve1 ! Nve is logical interface where VXLAN packets are encapsulated and decapsulated.
no shutdown
source-interface loopback2
host-reachability protocol bgp ! This means BGP control plane is used to exchange updates.
member vni 10000010 associate-vrf ! associate-vrf is used for for layer3 vni.
member vni 10000030
suppress-arp
mcast-group 239.1.1.10 ! A vlan or set of vlans mapped to VNI can be given identical multicast address, this is used for controlled flooding of arp requests.
!
interface Ethernet1/2 ! Ospf with PIM is used as Underlay.
description "Going to Spine"
no switchport
ip address 192.168.19.1/24
ip router ospf UNDERLAY area 0.0.0.0
ip pim sparse-mode
no shutdown
!
interface Ethernet1/11 ! Port to Host A.
switchport mode trunk
!
interface loopback2 ! Loopback for BGP Peering.
description "Loopback for "BGP"
ip address 192.168.11.11/32
ip router ospf UNDERLAY area 0.0.0.0
ip pim sparse-mode
!
router ospf UNDERLAY
!
router bgp 65000
address-family ipv4 unicast
address-family l2vpn evpn
neighbor 192.168.9.9 ! Peering with SPINE.
remote-as 65000
update-source loopback2
address-family ipv4 unicast
address-family l2vpn evpn

```

```
send-community extended
vrf EVPN-L3-VNI-VLAN-10
address-family ipv4 unicast
advertise l2vpn evpn
!
evpn
vni 10000030 12
rd auto ! RD is default calculated as VNI:BGP Router ID
route-target import auto ! RT is default calculated as BGP AS:VNI
route-target export auto
```

## VTEP2

```
!
nv overlay evpn
feature ospf
feature bgp
feature pim
feature interface-vlan
feature vn-segment-vlan-based
feature lacp
feature vpc
feature nv overlay
!
fabric forwarding anycast-gateway-mac 0001.0001.0001
!
ip pim rp-address 192.168.9.9 group-list 224.0.0.0/4
!
ip pim ssm range 232.0.0.0/8
vlan 1,10,30,40,100
!
vlan 10 ! This VTEP is dedicated for external connectivity, there is only layer3 VNI config.
name L3-VNI-VLAN-10
vn-segment 10000010
!
vrf context EVPN-L3-VNI-VLAN-10 ! Defining layer3 vrf for Inter-VNI traffic.
vni 10000010
rd auto
address-family ipv4 unicast
route-target both auto
route-target both auto evpn
!
interface Vlan10 ! Layer3 VNI associated interface vlan does not have an ip address.
no shutdown
vrf member EVPN-L3-VNI-VLAN-10
ip forward
!
interface Vlan100 ! This vlan is used to peer with external EBGp Peer.
no shutdown
vrf member EVPN-L3-VNI-VLAN-10
ip address 192.168.1.2/24
!
interface nve1
no shutdown
source-interface loopback2
host-reachability protocol bgp
member vni 10000010 associate-vrf
!
interface Ethernet1/2 ! Ospf and PIM are used in Underlay.
description "Going to Spine"
no switchport
ip address 192.168.29.2/24
ip router ospf UNDERLAY area 0.0.0.0
```

```

ip pim sparse-mode
no shutdown
!
interface Ethernet1/12 ! Port to External Peer.
switchport mode trunk
!
interface loopback2
ip address 192.168.22.22/32
ip router ospf UNDERLAY area 0.0.0.0
ip pim sparse-mode
!
router ospf UNDERLAY
!
router bgp 65000
address-family ipv4 unicast
address-family l2vpn evpn
neighbor 192.168.9.9 ! Peering with SPINE.
remote-as 65000
update-source loopback2
address-family ipv4 unicast
address-family l2vpn evpn
send-community extended
vrf EVPN-L3-VNI-VLAN-10
address-family ipv4 unicast
advertise l2vpn evpn
neighbor 192.168.1.1 ! Peering with External Peer, under vrf.
remote-as 65111
update-source Vlan100
address-family ipv4 unicast

```

### VTEP3

为VTEP3和VTEP1配置是几乎相同的。仅差异是VPC和其他VLAN的40 layer2 VNI。

```

!
nv overlay evpn
feature ospf
feature bgp
feature pim
feature interface-vlan
feature vn-segment-vlan-based
feature lacp
feature vpc
feature nv overlay
!
fabric forwarding anycast-gateway-mac 0001.0001.0001
!
ip pim rp-address 192.168.9.9 group-list 224.0.0.0/4
!
ip pim ssm range 232.0.0.0/8
!
vlan 1,10,20,30,40
!
vlan 10
name L3-VNI-VLAN-10
vn-segment 10000010
!
vlan 30
vn-segment 10000030
!
vlan 40 ! New host vlan 40.
vn-segment 10000040
!

```

```
vpc domain 2 ! Vpc Configs.
peer-keepalive destination 10.197.204.103 source 10.197.204.106
!
interface Vlan10
no shutdown
vrf member EVPN-L3-VNI-VLAN-10
ip forward
!
interface Vlan30
no shutdown
vrf member EVPN-L3-VNI-VLAN-10
ip address 172.16.30.1/24
!
fabric forwarding mode anycast-gateway
!
interface Vlan40
no shutdown
vrf member EVPN-L3-VNI-VLAN-10
ip address 172.16.40.1/24
!
fabric forwarding mode anycast-gateway
!
interface port-channel2
switchport mode trunk
vpc 2
!
interface port-channel34
switchport mode trunk
spanning-tree port type network
vpc peer-link
!
interface nve1
no shutdown
source-interface loopback2
host-reachability protocol bgp
member vni 10000010 associate-vrf
member vni 10000030
suppress-arp
mcast-group 239.1.1.10
member vni 10000040 !New layer2 VNI for Vlan 40.
suppress-arp
mcast-group 239.1.1.20
!
interface Ethernet1/1 ! Connected to VTEP4.
switchport mode trunk
channel-group 34 mode active
!
interface Ethernet1/2
description "going to Spine"
no switchport
ip address 192.168.39.3/24
ip router ospf UNDERLAY area 0.0.0.0
ip pim sparse-mode
no shutdown
!
interface Ethernet1/13 ! Connected to N5K, which simulates Host C and D.
switchport mode trunk
channel-group 2 mode active
!
interface loopback2
description "loopback for Bgp"
ip address 192.168.33.33/32
ip address 192.168.33.34/32 secondary! For other VTEPs VTEP3 and VTEP4 will look as single
entity.
```

```

ip router ospf UNDERLAY area 0.0.0.0!This secondary address is needed in Vpc designs.
!
router ospf UNDERLAY
!
router bgp 65000
address-family ipv4 unicast
address-family l2vpn evpn
neighbor 192.168.9.9 remote-as 100
remote-as 65000
update-source loopback2
address-family ipv4 unicast
address-family l2vpn evpn
send-community extended
vrf EVPN-L3-VNI-VLAN-10
address-family ipv4 unicast
advertise l2vpn evpn
!
evpn
vni 10000030 l2
rd auto
route-target import auto
route-target export auto
vni 10000040 l2
rd auto
route-target import auto
route-target export auto

```

## VTEP4

```

!
nv overlay evpn
feature ospf
feature bgp
feature pim
feature interface-vlan
feature vn-segment-vlan-based
feature lacp
feature vpc
feature nv overlay
!
fabric forwarding anycast-gateway-mac 0001.0001.0001
!
ip pim rp-address 192.168.9.9 group-list 224.0.0.0/4
!
ip pim ssm range 232.0.0.0/8
!
vlan 1,10,20,30,40
!
vlan 10
name L3-VNI-VLAN-10
vn-segment 10000010
!
vlan 30
vn-segment 10000030
!
vlan 40
vn-segment 10000040
!
vrf context EVPN-L3-VNI-VLAN-10
vni 10000010
rd auto
address-family ipv4 unicast
route-target both auto

```



```
route-target both auto evpn
!
interface Vlan10
no shutdown
vrf member EVPN-L3-VNI-VLAN-10
ip forward
!
interface Vlan30
no shutdown
vrf member EVPN-L3-VNI-VLAN-10
ip address 172.16.30.1/24
!
fabric forwarding mode anycast-gateway
!
interface Vlan40
no shutdown
vrf member EVPN-L3-VNI-VLAN-10
ip address 172.16.40.1/24
!
fabric forwarding mode anycast-gateway
!
interface port-channel2
switchport mode trunk
vpc 2
!
interface port-channel34
switchport mode trunk
spanning-tree port type network
vpc peer-link
!
interface nve1
no shutdown
source-interface loopback2
host-reachability protocol bgp
member vni 10000010 associate-vrf
member vni 10000030
suppress-arp
mcast-group 239.1.1.10
member vni 10000040
suppress-arp
mcast-group 239.1.1.20
!
interface Ethernet1/1 ! Connected to VTEP3.
switchport mode trunk
channel-group 34 mode active
!
interface Ethernet1/2
description "going to spine"
no switchport
ip address 192.168.49.4/24
ip router ospf UNDERLAY area 0.0.0.0
ip pim sparse-mode
no shutdown
!
interface Ethernet1/13 ! Connected to N5K, which simulates Host C and D.
switchport mode trunk
channel-group 2 mode active
!
router ospf UNDERLAY
!
router bgp 65000
address-family ipv4 unicast
address-family l2vpn evpn
neighbor 192.168.9.9 remote-as 100
```

```
remote-as 65000
update-source loopback2
address-family ipv4 unicast
address-family l2vpn evpn
send-community extended
vrf EVPN-L3-VNI-VLAN-10
address-family ipv4 unicast
advertise l2vpn evpn
!
evpn
vni 10000030 l2
rd auto
route-target import auto
route-target export auto
vni 10000040 l2
rd auto
route-target import auto
route-target export auto
```

## 脊椎

```
!
nv overlay evpn
feature ospf
feature bgp
feature pim
feature interface-vlan
feature vn-segment-vlan-based
feature lacp
feature vpc
feature nv overlay
!
ip pim rp-address 192.168.9.9 group-list 224.0.0.0/4
!
ip pim ssm range 232.0.0.0/8
!
interface Ethernet1/1 ! To VTEP1.
ip address 192.168.19.9/24
ip router ospf UNDERLAY area 0.0.0.0
ip pim sparse-mode
no shutdown
!
interface Ethernet1/2 ! To VTEP2.
ip address 192.168.29.9/24
ip router ospf UNDERLAY area 0.0.0.0
ip pim sparse-mode
no shutdown
!
interface Ethernet1/3 ! To VTEP3.
ip address 192.168.39.9/24
ip router ospf UNDERLAY area 0.0.0.0
ip pim sparse-mode
no shutdown
!
interface Ethernet1/4 ! To VTEP4.
ip address 192.168.49.9/24
ip router ospf UNDERLAY area 0.0.0.0
ip pim sparse-mode
no shutdown
!
interface loopback1 ! SPINE is RP(Rendezvous Point).
ip address 192.168.9.9/32
ip router ospf UNDERLAY area 0.0.0.0
```

```

ip pim sparse-mode
!
router ospf UNDERLAY
!
router bgp 65000
log-neighbor-changes
address-family ipv4 unicast
address-family l2vpn evpn
retain route-target all
template peer VTEP-PEERS
remote-as 65000
update-source loopback1
address-family ipv4 unicast
send-community both
route-reflector-client ! Spine treats VTEPs as Route-Reflector Clients.
address-family l2vpn evpn
send-community both
route-reflector-client
neighbor 192.168.11.11 ! VTEP1.
inherit peer VTEP-PEERS
neighbor 192.168.22.22 ! VTEP2.
inherit peer VTEP-PEERS
neighbor 192.168.33.33 ! VTEP3.
inherit peer VTEP-PEERS
neighbor 192.168.44.44 ! VTEP4.
inherit peer VTEP-PEERS

```

## 主机 A

主机A由3750交换机模拟。

```

! This port is the uplink to VTEP1.
interface GigabitEthernet1/0/1
switchport trunk encapsulation dot1q
switchport mode trunk
!
interface Vlan30
ip address 172.16.30.33 255.255.255.0
!
! Below the default route to VTEP1.
ip route 0.0.0.0 0.0.0.0 172.16.30.1

```

## 主机 B

主机B是外部对等体设备，N5K使用得这里。

```

!
router bgp 65111
address-family ipv4 unicast
!
network 172.16.2.2/32 ! Advertsing the external subnet to VXLAN infrastructure.
neighbor 192.168.1.2 remote-as 65000 ! EBGP Peering with VTEP2.
address-family ipv4 unicast
!
interface loopback1
ip address 172.16.2.2/32
!
interface Ethernet1/19 ! Uplink port to VTEP2.
switchport mode trunk
!
interface Vlan100
no shutdown

```

```
ip address 192.168.1.1/24
```

## 主机C和D

主机C和D由Nexus5k模拟，保留IP地址在明显的vrfs。

```
!  
vrf context vni30 ! This vrf simulates the HOST C.  
ip route 0.0.0.0/0 172.16.30.1  
vrf context vni40 ! This vrf simulates the HOST D.  
ip route 0.0.0.0/0 172.16.40.1  
!  
interface Vlan30 ! Addressing for HOST C.  
no shutdown  
vrf member vni30  
ip address 172.16.30.2/24  
!  
interface Vlan40 ! Addressing for HOST D.  
no shutdown  
vrf member vni40  
ip address 172.16.40.2/24  
!  
interface Ethernet1/20 ! Uplink port to VTEP3 in Port-Channel.  
switchport mode trunk  
channel-group 2 mode active  
!  
interface Ethernet1/21 ! Uplink port to VTEP4 in Port-Channel.  
switchport mode trunk  
channel-group 2 mode active< /pre>
```

## 验证

### 从主机A的连接外部主机B

```
HOST_A#ping 172.16.2.2  
Type escape sequence to abort.  
Sending 5, 100-byte ICMP Echos to 172.16.2.2, timeout is 2 seconds:  
!!!!  
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/4/9 ms
```

### 连接从主机A到主机C (内部VNI)

```
HOST_A#ping 172.16.30.2  
Type escape sequence to abort.  
Sending 5, 100-byte ICMP Echos to 172.16.30.2, timeout is 2 seconds:  
!!!!  
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/4/9 ms
```

### 连接从主机A到主机D (相互VNI)

```
HOST_A#ping 172.16.40.2  
Type escape sequence to abort.  
Sending 5, 100-byte ICMP Echos to 172.16.40.2, timeout is 2 seconds:  
!!!!  
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/9 ms
```

### 路由表主机B (外部对等体)

```
N5K-5672-1# show ip route bgp  
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>
172.16.30.2/32, ubest/mbest: 1/0, pending ! Host route for Host C.
*via 192.168.1.2, [20/0], 00:00:22, bgp-65100, external, tag 65000,
172.16.30.33/32, ubest/mbest: 1/0, pending ! Host route for Host A.
*via 192.168.1.2, [20/0], 00:00:22, bgp-65100, external, tag 65000,
172.16.40.2/32, ubest/mbest: 1/0, pending ! Host route for Host D.
*via 192.168.1.2, [20/0], 00:00:22, bgp-65100, external, tag 65000,
```

可以注意到主机路由顺利地通告给此外部BGP对等体。

## 控制面板的验证。

- 此命令显示“映射”与VNIDs的传统VLAN。

```
VTEP1# show vxlan
Vlan VN-Segment
====
10 10000010
30 10000030
40 10000040
```

- 下是检查mac在VTEP学习本地。

```
VTEP1# show mac address-table vlan 30
Legend:
* - primary entry, G - Gateway MAC, (R) - Routed MAC, O - Overlay MAC
age - seconds since last seen,+ - primary entry using vPC Peer-Link,
(T) - True, (F) - False
VLAN MAC Address Type age Secure NTFY Ports
-----+-----+-----+-----+-----+-----
* 30 0006.f63f.e3c1 dynamic 0 F F Eth1/11 ! Mac of HOST A
* 30 8c60.4ff2.f541 dynamic 0 F F nve1(192.168.33.34)! Mac of HOST C installed into mac
address table, it was learned from BGP.
G 30 e00e.da2a.2393 static - F F sup-eth1(R)
```

- 下一步是检查路由安装到I2rib。

```
VTEP1# show l2route evpn mac evi 30
Mac Address Prod Next Hop (s)
-----
0006.f63f.e3c1 Local Eth1/11 ! Mac of HOST A installed into l2rib.
8c60.4ff2.f541 BGP 192.168.33.34 ! Mac of HOST C installed into l2rib learnt via BGP. VTEP1#
show l2route evpn mac-ip evi 30
Mac Address Prod Host IP Next Hop (s)
-----
0006.f63f.e3c1 HMM 172.16.30.33 N/A
8c60.4ff2.f541 BGP 172.16.30.2 192.168.33.34 ! Mac+IP of Host C learnt across the Vxlan Fabric.
VTEP1# show l2route evpn mac-ip evi 40
Mac Address Prod Host IP Next Hop (s)
-----
8c60.4ff2.f541 BGP 172.16.40.2 192.168.33.34 ! Mac+IP of Host D learnt across the Vxlan Fabric.
```

- 下一步是检查I2rib导出更新对I2vpn evpn。

```
VTEP1# show bgp l2vpn evpn vni-id 10000030
BGP routing table information for VRF default, address family L2VPN EVPN
BGP table version is 31, local router ID is 192.168.11.11
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-i
njected
Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath, & - backup Network Next Hop Metric
```

LocPrf Weight Path

**Route Distinguisher: 192.168.11.11:32797 (L2VNI 10000030)**

\*>l[2]:[0]:[0]:[48]:[0006.f63f.e3c1]:[0]:[0.0.0.0]/216 ! Mac of Host A in update.

192.168.11.11 100 32768 i

\*>i[2]:[0]:[0]:[48]:[8c60.4ff2.f541]:[0]:[0.0.0.0]/216

192.168.33.34 100 0 i

\* i 192.168.33.34 100 0 i

\*>l[2]:[0]:[0]:[48]:[0006.f63f.e3c1]:[32]:[172.16.30.33]/272 ! Mac and IP of Host A in update.

192.168.11.11 100 32768 i

\* i[2]:[0]:[0]:[48]:[8c60.4ff2.f541]:[32]:[172.16.30.2]/272 ! Mac and IP of Host C in update from Spine.

192.168.33.34 100 0 i

\*>i 192.168.33.34 100 0 i

- 下一步是检查路由通告对脊椎。

VTEP1# show bgp l2vpn evpn nei 192.168.9.9 advertised-routes

Peer 192.168.9.9 routes for address family L2VPN EVPN:

BGP table version is 31, local router ID is 192.168.11.11

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-i njected

Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath, & - backup Network Next Hop

Metric LocPrf Weight Path

**Route Distinguisher: 192.168.11.11:32797 (L2VNI 10000030)**

\*>l[2]:[0]:[0]:[48]:[0006.f63f.e3c1]:[0]:[0.0.0.0]/216

192.168.11.11 100 32768 i

\*>l[2]:[0]:[0]:[48]:[0006.f63f.e3c1]:[32]:[172.16.30.33]/272 ! Mac and IP advertised to Spine.

192.168.11.11 100 32768 i

- 下一步是检查从脊椎接收的路由。

VTEP1# show bgp l2vpn evpn nei 192.168.9.9 routes

Peer 192.168.9.9 routes for address family L2VPN EVPN:

BGP table version is 31, local router ID is 192.168.11.11

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-i njected

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

Network Next Hop Metric LocPrf Weight Path

Route Distinguisher: 192.168.11.11:32797 (L2VNI 10000030)

\*>i[2]:[0]:[0]:[48]:[8c60.4ff2.f541]:[0]:[0.0.0.0]/216

192.168.33.34 100 0 i

\* i 192.168.33.34 100 0 i

\* i[2]:[0]:[0]:[48]:[8c60.4ff2.f541]:[32]:[172.16.30.2]/272 ! This is update from Host C in same VNID.

192.168.33.34 100 0 i

\*>i 192.168.33.34 100 0 i

Route Distinguisher: 192.168.11.11:32807 (L2VNI 10000040)

\*>i[2]:[0]:[0]:[48]:[8c60.4ff2.f541]:[0]:[0.0.0.0]/216

192.168.33.34 100 0 i

\* i 192.168.33.34 100 0 i

\* i[2]:[0]:[0]:[48]:[8c60.4ff2.f541]:[32]:[172.16.40.2]/272 ! This is update from Host D in different VNID.

192.168.33.34 100 0 i

\*>i 192.168.33.34 100 0 i

Route Distinguisher: 192.168.11.11:3 (L3VNI 10000010)

\*>i[2]:[0]:[0]:[48]:[8c60.4ff2.f541]:[32]:[172.16.30.2]/272

192.168.33.34 100 0 i

\* i 192.168.33.34 100 0 i

\*>i[2]:[0]:[0]:[48]:[8c60.4ff2.f541]:[32]:[172.16.40.2]/272

192.168.33.34 100 0 i

\* i 192.168.33.34 100 0 i

\*>i[5]:[0]:[0]:[32]:[172.16.2.2]:[0.0.0.0]/224 ! ! This is update from External Host.

```

192.168.22.22 100 0 65100 i VTEP1# show ip bgp vrf EVPN-L3-VNI-VLAN-10
BGP routing table information for VRF EVPN-L3-VNI-VLAN-10, address family IPv4 Unicast
BGP table version is 5, local router ID is 192.168.1.254
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
Network          Next Hop Metric LocPrf Weight Path
*>i172.16.2.2/32  192.168.22.22  100      0      65111 i
*>i172.16.30.2/32 192.168.33.34  100      0      i
* i              192.168.33.34  100      0      i
*>i172.16.40.2/32 192.168.33.34  100      0      i
* i              192.168.33.34  100      0      i

```

- 在VTEP1仅VNID 10000030中配置，并且验证主机A mac和ip学习本地并且通告作为evpn路由。也注意到从主机C的更新也接收并且安装此处。
- 在流量可以转发前，nve对等体应该也是UP。

```

VTEP1# show nve peers
Interface Peer-IP State LearnType Uptime Router-Mac
-----
nve1 192.168.22.22 Up CP 01:39:15 0062.ecbf.5325 ! VTEP2
nve1 192.168.33.34 Up CP 01:40:09 f8c2.8823.275f ! VTEP3 and VTEP4 appear as single entity
as both are in Vpc.

```

```

VTEP1# sh bgp internal nve-peer-vni
PeerAddress VNI VrfID GatewayMAC TunnelID Encap EgressVNI F
192.168.22.22 10000010 1 0062.ecbf.5325 0xc0a81616 1 0 0
192.168.33.34 10000010 1 0062.ecbf.4e4d 0xc0a82122 1 0 0
192.168.33.34 10000010 1 f8c2.8823.275f 0xc0a82122 1 0 0
192.168.33.34 10000030 1 0000.0000.0000 0x0 1 0 0
192.168.33.34 10000040 1 0000.0000.0000 0x0 1 0 0

```

## 故障排除

- 如果nve接口被检查，则增加封装的计数器，并且应该看到解封装。

```

VTEP1# show interface nve 1
nve1 is up
admin state is up, Hardware: NVE
MTU 9216 bytes
Encapsulation VXLAN
Auto-mdix is turned off
RX
ucast: 133 pkts, 22344 bytes - mcast: 0 pkts, 0 bytes
TX
ucast: 134 pkts, 22512 bytes - mcast: 0 pkts, 0 bytes

```

- 如果一透明防火墙使用过滤，请使肯定关联的端口允许。

```

VTEP1# show nve vxlan-params
VxLAN Dest. UDP Port: 4789

```

- 检查使用相互的VNI路由的本地VTEP MAC地址。当VTEP在一个vpc对，备用地址将被看到。

```

VTEP1# show nve interface
Interface: nve1, State: Up, encapsulation: VXLAN
VPC Capability: VPC-VIP-Only [not-notified]

```

Local Router MAC: e00e.da2a.2393

Host Learning Mode: Control-Plane

Source-Interface: loopback2 (primary: 192.168.11.11, secondary: 0.0.0.0)

- 检查同位体的远程VTEPS MAC地址和状态。

```
VTEP1# sh nve internal platform interface nve1 detail
Printing Interface ifindex 0x49000001 detail
|=====|=====|=====|=====|=====|=====|
|Intf |State |PriIP |SecIP |Vnis |Peers|
|=====|=====|=====|=====|=====|=====|
|nve1 |UP   |192.168.11.11 |0.0.0.0 |3 |2 | ! Secondary Ip is 0.0.0.0 because this VTEP is not in
vpc
|=====|=====|=====|=====|=====|=====|
SW_BD/VNIs of interface nve1:
=====
|=====|=====|=====|=====|=====|=====|=====|=====|
|Sw BD |Vni  |State |Intf |Type|Vrf-ID|Notified
|=====|=====|=====|=====|=====|=====|=====|=====|
|10 |10000010|UP   |nve1 |CP  |3  |Yes
|30 |10000030|UP   |nve1 |CP  |0  |Yes
|40 |10000040|UP   |nve1 |CP  |0  |Yes
|=====|=====|=====|=====|=====|=====|=====|=====|
Peers of interface nve1:
=====
Peer_ip: 192.168.22.22
Peer-ID : 1
State : UP
Learning : Disabled
TunnelID : 0xc0a81616
MAC : 0062.ecbf.5325
Table-ID : 0x1
Encap : 0x1
Peer_ip: 192.168.33.34 ! For both VTEP3 and VTEP4
Peer-ID : 2
State : UP
Learning : Disabled
TunnelID : 0xc0a82122
MAC : 0062.ecbf.4e4d
Table-ID : 0x1
Encap : 0x1
```

- 要检查同位体请计时和VTEPVNI

```
VTEP1# show nve peer detail
Details of nve Peers:
-----
Peer-Ip: 192.168.22.22
NVE Interface : nve1
Peer State : Up
Peer Uptime : 00:22:17
Router-Mac : 0062.ecbf.5325
Peer First VNI : 10000010
Time since Create : 00:22:17
Configured VNIs : 10000010,10000030,10000040
Provision State : add-complete ! Hardware ready for forwarding.
Route-Update : Yes
Peer Flags : RmacL2Rib, TunnelPD, DisableLearn
Learnt CP VNIs : 10000010
Peer-ifindex-resp : Yes
-----
Peer-Ip: 192.168.33.34
NVE Interface : nve1
Peer State : Up
```



Peer Uptime : 00:22:10  
Router-Mac : 0062.ecbf.4e4d  
Peer First VNI : 10000010  
Time since Create : 00:22:10  
Configured VNIs : 10000010,10000030,10000040  
Provision State : add-complete ! Hardware ready for forwarding.  
Route-Update : Yes  
Peer Flags : RmacL2Rib, TunnelPD, DisableLearn  
Learnt CP VNIs : 10000010,10000030,10000040  
Peer-ifindex-resp : Yes

- 要检查BGP如何与EVI和内部信息呼应被构件。VLAN 30示例被映射对VNI 10000030显示此处

```
VTEP1# sh bgp internal evi 10000030
*****
L2RIB bound / VNI Req to L2RIB : Yes / 1
L2VNI Adds / Dels / ALL Dels from L2RIB : 4 / 3 / 1
First L2VNI Add/Del : Dec 17 19:07:41.680736 / Dec 17 19:10:48.455562
Last L2VNI Add/Del : Dec 17 19:11:13.916893 / Dec 17 19:10:48.455792
L3VNI Adds / Dels from L2RIB : 2 / 0 / 1
First L3VNI Add/Del : Dec 17 19:07:41.681313 / never
Last L3VNI Add/Del : Dec 17 19:11:11.838315 / never
First/Last All VNI Del : Dec 17 19:10:48.455542 / Dec 17 19:10:48.455543
ALL VNI Del from L2RIB state (cleanup status) : All VNI Not Start (0x0000006)
All VNI down loop count : 0
L2RIB is up/registered/local-req: 1/1
L2RIB down: in-prg/up-defer: 0/0
L2RIB register/failures: 1/0
L2RIB deregister/failures: 0/0
L2RIB flow control (#enabled/#disabled): Disabled (0/0)
*****
BGP L2VPN/EVPN RD Information for 192.168.11.11:32797
L2VNI ID : 10000030 (evi_10000030)
#Prefixes Local/BRIB : 2 / 4
#Paths L3VPN->EVPN/EVPN->L3VPN : 129 / 0
*****
=====
BGP Configured VNI Information:
evi_cfg : 0xd87786c8
VNI ID (Index) : 10000030 (1)
RD : 192.168.11.11:32797
Export RTs : 1
ExportRT cfg list:
65000:10000030 (auto)
Import RTs : 1
ImportRT cfg list:
65000:10000030 (auto)
Topo Id : 30
VTEP IP : 192.168.11.11
VTEP VPC IP : 0.0.0.0
Encap Type : 8
Refcount : #00000003
Enabled : Yes ! If this is no then check the NVE interface config for this VNID
Delete Pending : No
Creation Req : No
Future RD : NULL
evi_ctx : 0xd86e554c
RD/Import RT/Export RT : Yes(Auto)/Yes/Yes
MAC First Add/Del : Dec 17 19:11:12.45086 / never
MAC Last Add/Del : Dec 17 19:11:12.45086 / never
MAC IP First Add/Del : Dec 17 19:11:12.54976 / never
MAC IP Last Add/Del : Dec 17 19:11:12.54977 / never
```

```

IMET First Add/Del : never / never
IMET Last Add/Del : never / never
=====
+++++
BGP VNI Information for evi_10000030 (0xd86e554c)
L2VNI ID : 10000030 (evi_10000030)
RD (rdinfo) : 192.168.11.11:32797 (0xd8811eb0)
Prefixes (local/total) : 2/4
Created : Dec 17 19:11:12.37640
Last Oper Up/Down : Dec 17 19:11:12.37827 / never
Enabled : Yes
Delete pending : 0
Stale : No
Import pending : 0
Import in progress : 0
Encap : VxLAN
Topo Id : 30
VTEP IP : 192.168.11.11
VTEP VPC IP : 0.0.0.0
Router-MAC : 0000.0000.0000
Active Export RTs : 1
Active Export RT list : 65000:10000030
Config Export RTs : 1
ExportRT cfg list:
65000:10000030 (auto)
Export RT chg/chg-pending : 0/0
Active Import RTs : 1
Active Import RT list : 65000:10000030
Config Import RTs : 1
ImportRT cfg list:
65000:10000030 (auto)
Import RT chg/chg-pending : 0/0
IMET Reg/Unreg from L2RIB : 2/0
MAC Reg/Unreg from L2RIB : 2/0
MAC IP Reg/Unreg from L2RIB : 2/0
IMET Add/Del from L2RIB : 0/0
MAC Add/Del from L2RIB : 1/0
MAC IP Add/Del from L2RIB : 1/0
IMET Dnld/Wdraw to L2RIB : 0/0
MAC Dnld/Wdraw to L2RIB : 1/0
MAC IP Dnld/Wdraw to L2RIB : 1/0

```

- 当更新接收时，不顾事实它是一次相互VNI或内部VNI更新，请确保正确RT (路由目标)接收，并且接收更新的VTEP有相关配置。从来通过脊椎的VTEP3的一次更新对于RT一致性将分析此处。RT和RD的本地状态VTEP1的上面输出显示。SPINE# show bgp l2vpn evpn 172.16.30.2 !

**Update from Spine**

```

BGP routing table information for VRF default, address family L2VPN EVPN
Route Distinguisher: 3.3.3.3:32797
BGP routing table entry for [2]:[0]:[0]:[48]:[8c60.4ff2.f541]:[32]:[172.16.30.2]
/272, version 25
Paths: (1 available, best #1)
Flags: (0x000202) on xmit-list, is not in l2rib/evpn, is not in HW,
Advertised path-id 1
Path type: internal, path is valid, is best path, remote nh not installed, no
labeled nexthop
AS-Path: NONE, path sourced internal to AS
192.168.33.34 (metric 5) from 192.168.33.33 (3.3.3.3)
Origin IGP, MED not set, localpref 100, weight 0
Received label 10000030 1000001
Extcommunity: RT:65000:10000010 RT:65000:10000030 SOO:192.168.33.34:0 ENC
AP:8 Router MAC:0062.ecbf.4e4d
Path-id 1 advertised to peers:
192.168.11.11 192.168.22.22 192.168.44.44

```