测试VxLAN中虚拟隧道端点之间的交换矩阵连接

目录

简介

本文档介绍如何在虚拟可扩展局域网(VxLAN)中测试两个虚拟隧道终端(VTEP)之间的交换矩阵连接。

先决条件

要求

Cisco 建议您了解以下主题：

- Nexus NX-OS软件
- 边界网关协议 (BGP)
- VxLAN

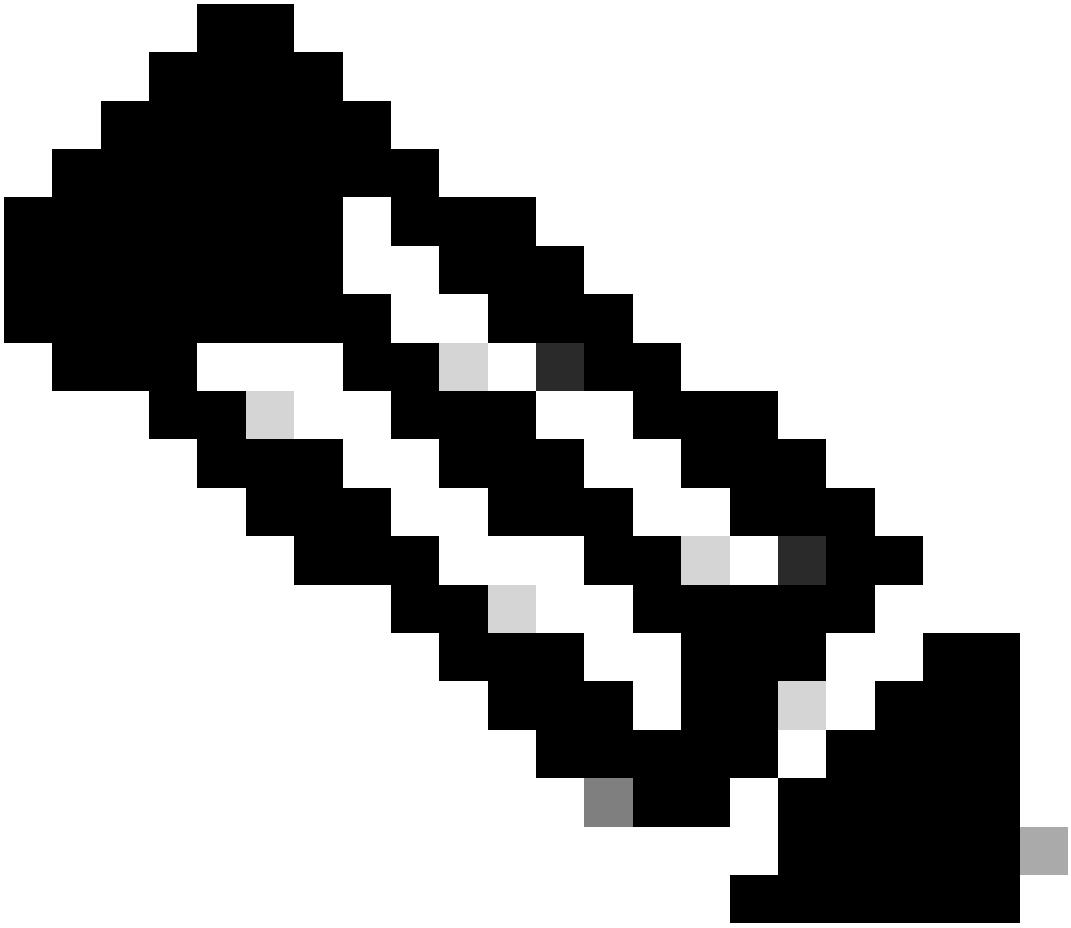
使用的组件

本文档中的信息基于Cisco Nexus N9K-C93180YC-EX和NXOS版本10.3(3)。

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。如果您的网络处于活动状态，请确保您了解所有命令的潜在影响。

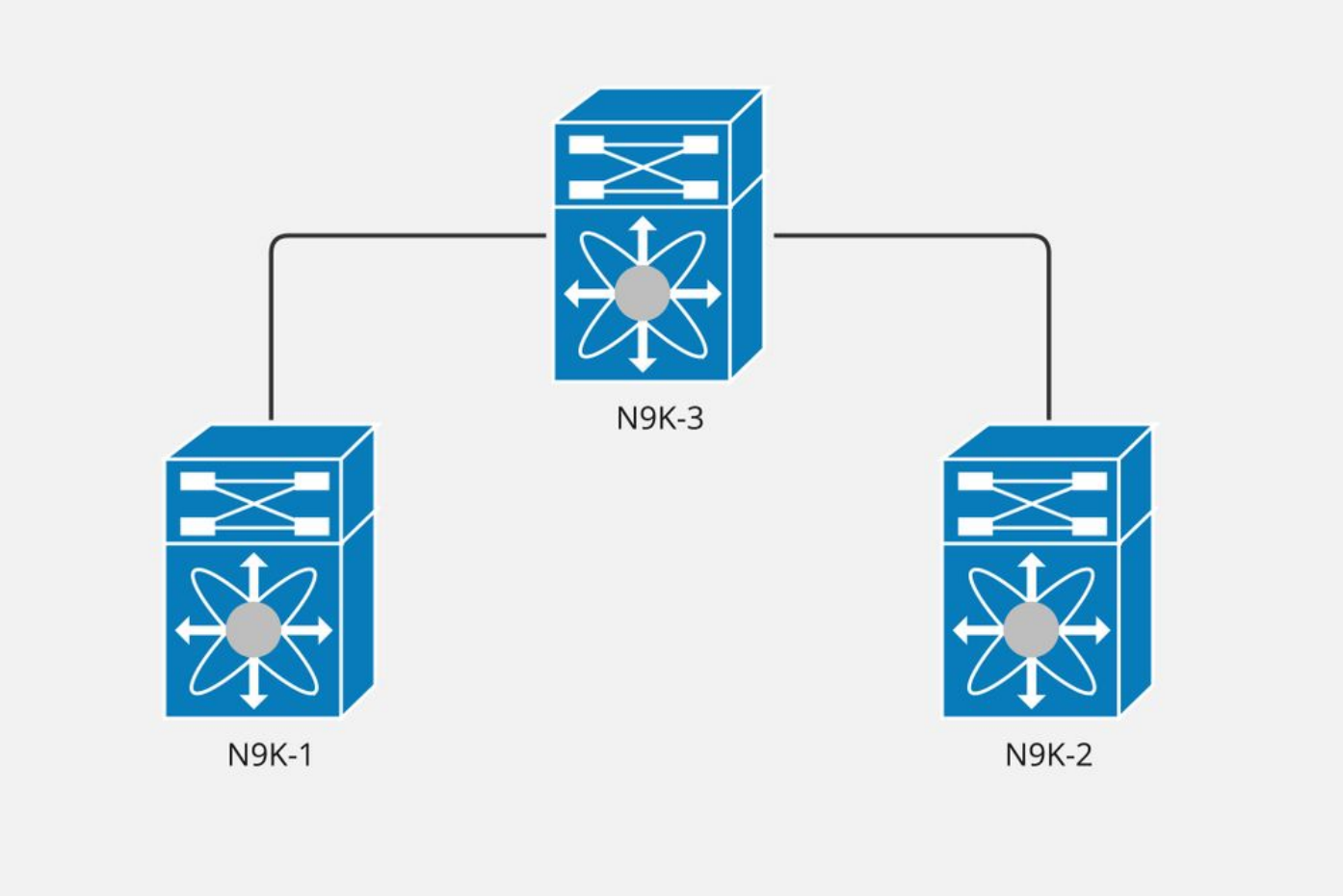
配置

设置VxLAN后，用户通常希望测试它是否能按预期工作。虽然建议的方法是在连接到不同VTEP的两台终端主机之间执行ping测试，但也可以使用VTEP上的环回接口测试交换矩阵连接。



注意：使用交换机虚拟接口(SVI)作为ping测试的源或目标对于交换矩阵连接而言不是有效的测试。原因是由于任播网关功能，我们在交换矩阵SVI上拥有相同的IP。

网络图



配置

在此VxLAN部署中，Nexus N9K-2配置为SPINE，而N9K-1和N9K-2均配置为VTEP。

第3层是扩展的，因此我们在两个VTEP上为每个虚拟路由和转发(VRF)提供第3层虚拟网络接口(VNI)。

为VRF evpn_a配置的第3层VNI为50100。

N9K-1

步骤1.将环回配置为要测试的VRF的一部分。

```
N9K-1(config)# interface loopback50
N9K-1(config-if)# vrf member evpn_a
Message reported by command ::                  vrf member evpn_a
Warning: Deleted all L3 config on interface loopback50
N9K-1(config-if)# ip address 10.255.255.1/32
```

步骤2.将此环回通告到交换矩阵。否则，即使ICMP请求到达目标，目标本身也无法发回ICMP应答。

```
N9K-1(config)# router bgp 65522
N9K-1(config-router)# vrf evpn_a
N9K-1(config-router-vrf)# address-family ipv4 unicast
N9K-1(config-router-vrf-af)# network 10.255.255.1/32
```

N9K-2

步骤1.将环回配置为要测试的VRF的一部分。

```
N9K-2(config)# interface loopback50
N9K-2(config-if)# vrf member evpn_a
Message reported by command ::                  vrf member evpn_a
Warning: Deleted all L3 config on interface loopback50
N9K-2(config-if)# ip address 10.255.255.2/32
```

步骤2.将此环回通告到交换矩阵。否则，即使ICMP请求到达目标，目标本身也无法发回ICMP应答。

```
N9K-2(config)# router bgp 65522
N9K-2(config-router)# vrf evpn_a
N9K-2(config-router-vrf)# address-family ipv4 unicast
N9K-2(config-router-vrf-af)# network 10.255.255.2/32
```

验证

步骤1.确认地址系列IPv4单播的本地BGP表中存在环回。

```
N9K-1# show ip bgp 10.255.255.1/32 vrf evpn_a
BGP routing table information for VRF evpn_a, address family IPv4 Unicast
BGP routing table entry for 10.255.255.1/32, version 732
Paths: (1 available, best #1)
Flags: (0x80c0002) (high32 0x000020) on xmit-list, is not in urib, exported
  vpn: version 1053, (0x00000000100002) on xmit-list
Multipath: eBGP iBGP

  Advertised path-id 1, VPN AF advertised path-id 1
  Path type: local, path is valid, is best path, no labeled nexthop, is extd
  AS-Path: NONE, path locally originated
    0.0.0.0 (metric 0) from 0.0.0.0 (10.2.254.100)
      Origin IGP, MED not set, localpref 100, weight 32768
      Extcommunity: RT:65522:50100

  VRF advertise information:
  Path-id 1 not advertised to any peer

  VPN AF advertise information:
```

```
  Path-id 1 not advertised to any peer

N9K-2# show ip bgp 10.255.255.2/32 vrf evpn_a
BGP routing table information for VRF evpn_a, address family IPv4 Unicast
BGP routing table entry for 10.255.255.2/32, version 241
Paths: (1 available, best #1)
Flags: (0x80c0002) (high32 0x000020) on xmit-list, is not in urib, exported
  vpn: version 417, (0x00000000100002) on xmit-list
Multipath: eBGP iBGP

  Advertised path-id 1, VPN AF advertised path-id 1
  Path type: local, path is valid, is best path, no labeled nexthop, is extd
  AS-Path: NONE, path locally originated
    0.0.0.0 (metric 0) from 0.0.0.0 (10.2.254.100)
      Origin IGP, MED not set, localpref 100, weight 32768
      Extcommunity: RT:65522:50100

  VRF advertise information:
  Path-id 1 not advertised to any peer

  VPN AF advertise information:
  Path-id 1 not advertised to any peer
```

步骤2.确认环回存在于地址系列L2VPN EVPN的本地BGP表中，并已通告到预期的网络虚拟接口(NVE)对等体。

```
N9K-1# show bgp l2vpn evpn 10.255.255.1 vrf evpn_a
BGP routing table information for VRF default, address family L2VPN EVPN
Route Distinguisher: 10.2.0.49:4    (L3VNI 50100)
BGP routing table entry for [5]:[0]:[0]:[32]:[10.255.255.1]/224, version 36993
Paths: (1 available, best #1)
Flags: (0x000002) (high32 00000000) on xmit-list, is not in l2rib/evpn

  Advertised path-id 1
  Path type: local, path is valid, is best path, no labeled nexthop
  Gateway IP: 0.0.0.0
  AS-Path: NONE, path locally originated
    10.2.1.49 (metric 0) from 0.0.0.0 (10.2.0.49)
      Origin IGP, MED not set, localpref 100, weight 32768
      Received label 50100
      Extcommunity: RT:65522:50100 ENCAP:8 Router MAC:a0e0.af67.511d

  Path-id 1 advertised to peers:
    10.2.0.33          10.2.0.34

N9K-2#
LEAF48# show bgp l2vpn evpn 10.255.255.2 vrf evpn_a
BGP routing table information for VRF default, address family L2VPN EVPN
Route Distinguisher: 10.2.0.48:4    (L3VNI 50100)
BGP routing table entry for [5]:[0]:[0]:[32]:[10.255.255.2]/224, version 13373
Paths: (1 available, best #1)
Flags: (0x000002) (high32 00000000) on xmit-list, is not in l2rib/evpn

  Advertised path-id 1
  Path type: local, path is valid, is best path, no labeled nexthop
  Gateway IP: 0.0.0.0
  AS-Path: NONE, path locally originated
```

```
    10.2.1.48 (metric 0) from 0.0.0.0 (10.2.0.48)
      Origin IGP, MED not set, localpref 100, weight 32768
      Received label 50100
      Extcommunity: RT:65522:50100 ENCAP:8 Router MAC:6cb2.aeee.5a97

  Path-id 1 advertised to peers:
    10.2.0.33          10.2.0.34
```

步骤3.确认已从远程NVE对等体收到更新。

```
N9K-1# show bgp l2vpn evpn 10.255.255.2 vrf evpn_a
BGP routing table information for VRF default, address family L2VPN EVPN
Route Distinguisher: 10.2.0.49:4    (L3VNI 50100)
BGP routing table entry for [5]:[0]:[0]:[32]:[10.255.255.2]/224, version 36995
Paths: (1 available, best #1)
Flags: (0x000002) (high32 00000000) 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, no labeled nexthop
             Imported from 10.2.0.48:4:[5]:[0]:[0]:[32]:[10.255.255.2]/224
  Gateway IP: 0.0.0.0
  AS-Path: NONE, path sourced internal to AS
    10.2.1.48 (metric 6) from 10.2.0.33 (10.2.0.33)
      Origin IGP, MED not set, localpref 100, weight 0
      Received label 50100
      Extcommunity: RT:65522:50100 Route-Import:10.2.1.147:3100 Source AS:65522:0
          ENCAP:8 Router MAC:6cb2.aeee.5a97
      Originator: 10.2.0.48 Cluster list: 0.0.255.242

  Path-id 1 not advertised to any peer

N9K-2# show bgp l2vpn evpn 10.255.255.1 vrf evpn_a
BGP routing table information for VRF default, address family L2VPN EVPN
Route Distinguisher: 10.2.0.48:4    (L3VNI 50100)
BGP routing table entry for [5]:[0]:[0]:[32]:[10.255.255.1]/224, version 13372
Paths: (1 available, best #1)
Flags: (0x000002) (high32 00000000) 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, no labeled nexthop
             Imported from 10.2.0.49:4:[5]:[0]:[0]:[32]:[10.255.255.1]/224
  Gateway IP: 0.0.0.0
  AS-Path: NONE, path sourced internal to AS
    10.2.1.49 (metric 6) from 10.2.0.33 (10.2.0.33)
      Origin IGP, MED not set, localpref 100, weight 0
      Received label 50100
      Extcommunity: RT:65522:50100 Route-Import:10.2.1.49:3100 Source AS:65522:0
          ENCAP:8 Router MAC:a0e0.af67.511d
      Originator: 10.2.0.49 Cluster list: 0.0.255.242

  Path-id 1 not advertised to any peer
```

步骤4.确认路由表中存在远程环回路由，下一跳是预期的NVE对等体。

```
N9K-1# show ip route 10.255.255.2 vrf evpn_a
IP Route Table for VRF "evpn_a"
'*' denotes best ucast next-hop
'**' denotes best mcast next-hop
'[x/y]' denotes [preference/metric]
'%


       ' in via output denotes VRF




10.255.255.2/32, ubest/mbest: 1/0
    *via 10.2.1.48%default, [200/0], 00:12:39, bgp-65522, internal, tag 65522, segid: 50100 tunnelid: 0

N9K-2# show ip route 10.255.255.1 vrf evpn_a
IP Route Table for VRF "evpn_a"
'*' denotes best ucast next-hop
'**' denotes best mcast next-hop
'[x/y]' denotes [preference/metric]
'%


         ' in via output denotes VRF




10.255.255.1/32, ubest/mbest: 1/0
    *via 10.2.1.49%default, [200/0], 00:15:36, bgp-65522, internal, tag 65522, segid: 50100 tunnelid: 0
```

步骤5.将ICMP请求发送到远程环回，使用本地环回作为源。

```
N9K-1# ping 10.255.255.2 source-interface loopback 50
PING 10.255.255.2 (10.255.255.2): 56 data bytes
64 bytes from 10.255.255.2: icmp_seq=0 ttl=254 time=2.009 ms
64 bytes from 10.255.255.2: icmp_seq=1 ttl=254 time=1.26 ms
64 bytes from 10.255.255.2: icmp_seq=2 ttl=254 time=1.231 ms
64 bytes from 10.255.255.2: icmp_seq=3 ttl=254 time=1.142 ms
64 bytes from 10.255.255.2: icmp_seq=4 ttl=254 time=1.127 ms

--- 10.255.255.2 ping statistics ---
5 packets transmitted, 5 packets received, 0.00% packet loss
round-trip min/avg/max = 1.127/1.353/2.009 ms
```

```
N9K-2# ping 10.255.255.1 source-interface loopback 50
PING 10.255.255.1 (10.255.255.1): 56 data bytes
64 bytes from 10.255.255.1: icmp_seq=0 ttl=254 time=1.47 ms
64 bytes from 10.255.255.1: icmp_seq=1 ttl=254 time=1.396 ms
64 bytes from 10.255.255.1: icmp_seq=2 ttl=254 time=1.327 ms
64 bytes from 10.255.255.1: icmp_seq=3 ttl=254 time=1.451 ms
64 bytes from 10.255.255.1: icmp_seq=4 ttl=254 time=1.366 ms

--- 10.255.255.1 ping statistics ---
5 packets transmitted, 5 packets received, 0.00% packet loss
round-trip min/avg/max = 1.327/1.402/1.47 ms
```

相关信息

配置VXLAN BGP EVPN

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