



Configuring EVPN VXLAN Layer 3 Overlay Network

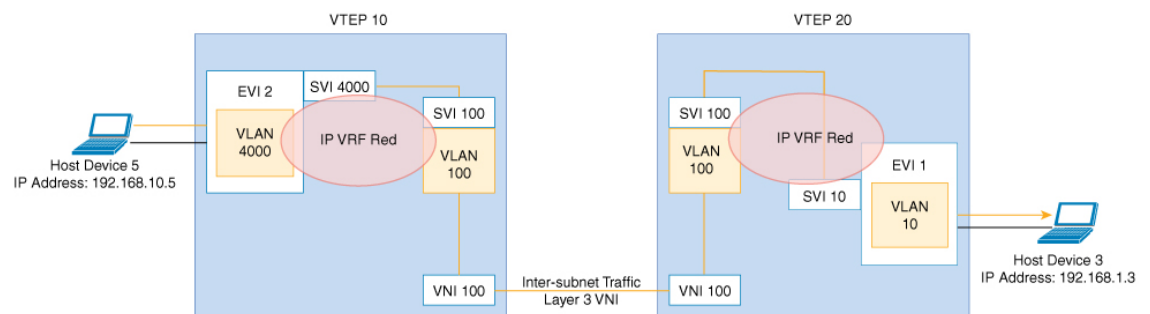
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Information About EVPN VXLAN Layer 3 Overlay Network

An EVPN VXLAN Layer 3 overlay network allows host devices in different Layer 2 networks to send Layer 3 or routed traffic to each other. The network forwards the routed traffic using a Layer 3 virtual network instance (VNI) and an IP VRF.

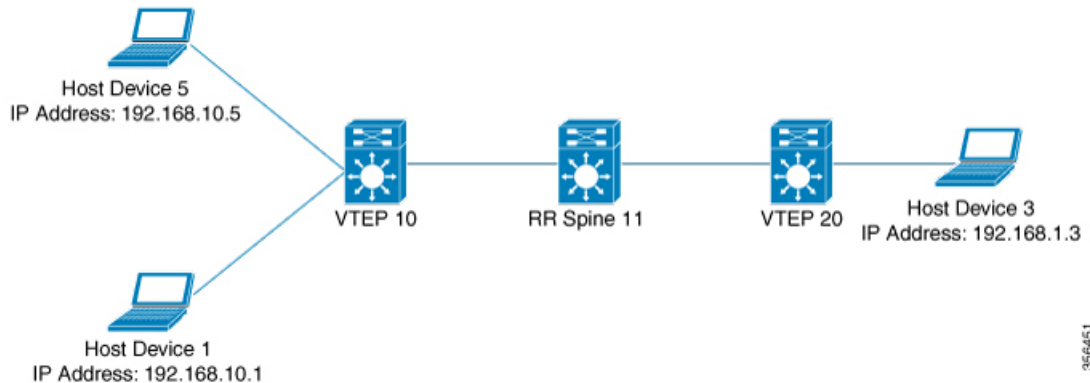
This module provides information only about how to configure a Layer 3 overlay network. You can also configure both Layer 2 and Layer 3 overlay networks together to enable integrated routing and bridging (IRB). For more information about IRB, see *Configuring EVPN VXLAN Integrated Routing and Bridging* module.

The following figure shows the movement of traffic in an EVPN VXLAN Layer 3 overlay network using a Layer 3 VNI:



How to Configure EVPN VXLAN Layer 3 Overlay Network

The following figure shows a sample topology of an EVPN VXLAN Network. Host device 3 and host device 5 are part of different subnets. The network forwards traffic from host device 1 to host device 3 using a Layer 3 VNI and an IP VRF.



Perform the following set of procedures to configure an EVPN VXLAN Layer 3 overlay network:

- Configure the IP VRF on the VTEPs.
- Configure the core-facing VLAN on the VTEPs.
- Configure the access-facing VLAN on the VTEPs.
- Configure the switch virtual interface (SVI) for the core-facing VLAN.
- Configure the SVI for the access-facing VLAN.
- Configure the loopback interface on the VTEPs.
- Configure the network virtualization endpoint (NVE) interface on the VTEPs.
- Configure BGP with either IPv4 or IPv6 or both address families on the VTEPs.

Configuring an IP VRF on a VTEP

To configure an IP VRF on a VTEP, perform the following steps:

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	configure terminal Example:	Enters global configuration mode.

	Command or Action	Purpose
	Device# configure terminal	
Step 3	vrf definition <i>vrf-name</i> Example: Device(config)# vrf definition Green	Enters the VRF configuration mode for the specified VRF instance.
Step 4	rd <i>vpn-route-distinguisher</i> Example: Device(config-vrf)# rd 100:1	Specifies the route distinguisher for the VRF instance.
Step 5	address-family ipv4 [multicast unicast] Example: Device(config-vrf)# address-family ipv4	Enters the IPv4 address family configuration mode.
Step 6	route-target { export import both } <i>route-target-ext-community</i> Example: Device(config-vrf-af)# route-target export 100:1 Example: Device(config-vrf-af)# route-target import 100:1	Creates a list of import, export, or both import and export route target communities for the specified VRF. Enter either an autonomous system number and an arbitrary number (xxx:y), or an IP address and an arbitrary number (A.B.C.D:y).
Step 7	route-target { export import both } <i>route-target-ext-community</i> stitching Example: Device(config-vrf-af)# route-target export 100:1 stitching Example: Device(config-vrf-af)# route-target import 100:1 stitching	Configures importing, exporting, or both importing and exporting of EVPN route target communities for the VRF.
Step 8	exit-address-family Example: Device(config-vrf-af)# exit-address-family	Exits VRF address family configuration mode and enters VRF configuration mode.
Step 9	address-family ipv6 [multicast unicast] Example: Device(config-vrf)# address-family ipv6	Enters the IPv6 address family configuration mode.
Step 10	route-target { export import both } <i>route-target-ext-community</i> Example:	Creates a list of import, export, or both import and export route target communities for the specified VRF.

	Command or Action	Purpose
	Device (config-vrf-af) # route-target export 100:1 Example: Device (config-vrf-af) # route-target import 100:1	Enter either an autonomous system number and an arbitrary number (xxx:y), or an IP address and an arbitrary number (A.B.C.D:y).
Step 11	route-target {export import both} route-target-ext-community stitching Example: Device (config-vrf-af) # route-target export 100:1 stitching Example: Device (config-vrf-af) # route-target import 100:1 stitching	Configures importing, exporting, or both importing and exporting of VXLAN route target communities for the VRF.
Step 12	exit-address-family Example: Device (config-vrf-af) # exit-address-family	Exits VRF address family configuration mode and enters VRF configuration mode.
Step 13	end Example: Device (config-vrf) # end	Returns to privileged EXEC mode.

Configuring the Core-facing VLAN on a VTEP

To configure the core-facing VLAN on a VTEP, perform the following steps:

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	vlan configuration <i>vlan-id</i> Example: Device (config) # vlan configuration 11	Enters VLAN feature configuration mode for the specified VLAN interface.

	Command or Action	Purpose
Step 4	member vni <i>l3-vni-number</i> Example: Device(config-vlan)# member vni 5000	Adds EVPN instance as a member of the VLAN configuration. The VNI here is used as a Layer 3 VNI.
Step 5	end Example: Device(config-vlan)# end	Returns to privileged EXEC mode.

Configuring Access-facing VLAN on a VTEP

To configure the access-facing VLAN on a VTEP, perform the following steps:

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	interface <i>interface-name</i> Example: Device(config)# interface GigabitEthernet1/0/1	Enters interface configuration mode for the specified interface.
Step 4	switchport access vlan <i>vlan-id</i> Example: Device(config-if)# switchport access vlan 40	Configures the interface as a static-access port of the specified VLAN. Interface can also be configured as a trunk interface, if required.
Step 5	end Example: Device(config-if)# end	Returns to privileged EXEC mode.

Configuring Switch Virtual Interface for the Core-facing VLAN

To configure an SVI for the core-facing VLAN on the VTEP:

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	interface vlan <i>vlan-id</i> Example: Device(config)# interface vlan 11	Enters interface configuration mode for the specified VLAN.
Step 4	vrf forwarding <i>vrf-name</i> Example: Device(config-if)# vrf forwarding Green	Configures the SVI for the VLAN.
Step 5	ip unnumbered <i>Loopback-interface</i> Example: Device(config-if)# ip unnumbered Loopback0	Enables IP processing on the Loopback interface without assigning an explicit IP address to the interface.
Step 6	no autostate Example: Device(config-if)# no autostate	Disables autostate on the interface. In EVPN deployments, once a VLAN is used for a core-facing SVI, it should not be allowed in any trunk. For a core-facing SVI to function properly, the no autostate command must be configured under the SVI.
Step 7	end Example: Device(config-if)# end	Returns to privileged EXEC mode.

Configuring the Switch Virtual Interface for the Access-facing VLANs

To configure the SVI for the access-facing VLAN on a VTEP, perform the following steps:

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. Enter your password, if prompted.

	Command or Action	Purpose
Step 2	configure terminal Example: Device# <code>configure terminal</code>	Enters global configuration mode.
Step 3	interface vlan <i>vlan-id</i> Example: Device(config)# <code>interface vlan 40</code>	Enters interface configuration mode for the specified VLAN.
Step 4	vrf forwarding <i>vrf-name</i> Example: Device(config-if)# <code>vrf forwarding Green</code>	Configures the SVI for the VLAN.
Step 5	ip address <i>ip-address</i> Example: Device(config-if)# <code>ip address 192.168.10.100 255.255.255.0</code>	Configures the IP address of the SVI.
Step 6	mac-address <i>mac-address-value</i> Example: Device(config-if)# <code>mac-address aabb.cc01.f100</code>	(Optional) Manually sets the MAC address for the VLAN interface.
Step 7	exit Example: Device(config-if)# <code>exit</code>	Returns to global configuration mode.
Step 8	end Example: Device(config-if)# <code>end</code>	Returns to privileged EXEC mode.

Configuring the Loopback Interface on a VTEP

To configure the loopback interface on a VTEP, perform the following steps:

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> <code>enable</code>	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	configure terminal Example: Device# <code>configure terminal</code>	Enters global configuration mode.

	Command or Action	Purpose
Step 3	interface <i>loopback-interface-id</i> Example: Device(config)# interface Loopback0	Enters interface configuration mode for the specified Loopback interface.
Step 4	ip address <i>ipv4-address</i> Example: Device(config-if)# ip address 10.12.11.11 255.255.255.255	Configures the IP address for the Loopback interface.
Step 5	ip pim sparse mode Example: Device(config-if)# ip pim sparse mode	(Optional) Enables Protocol Independent Multicast (PIM) sparse mode on the Loopback interface. Note Enable PIM sparse mode only if EVPN VXLAN Layer 2 overlay network is also configured on the VTEP with underlay multicast as the mechanism for forwarding BUM traffic.
Step 6	end Example: Device(config-vlan)# end	Returns to privileged EXEC mode.

Configuring the NVE Interface on a VTEP

To add a Layer 3 VNI member to the NVE interface on a VTEP, perform the following steps:

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	interface <i>nve-interface-id</i> Example: Device(config)# interface nve1	Defines the interface to be configured as a trunk, and enters interface configuration mode.
Step 4	no ip address Example:	Disables IP processing on the interface by removing its IP address.

	Command or Action	Purpose
	Device(config-if)# no ip address	
Step 5	source-interface <i>loopback-interface-id</i> Example: Device(config-if)# source-interface loopback0	Sets the IP address of the specified loopback interface as the source IP address.
Step 6	host-reachability protocol bgp Example: Device(config-if)# host-reachability protocol bgp	Configures BGP as the host-reachability protocol on the interface.
Step 7	member vni <i>vni-id</i> vrf <i>vrf-name</i> Example: Device(config-if)# member vni 5000 vrf Green	Associates the Layer 3 VNI id with the NVE interface. Note The Layer 3 VNI id must match with the VNI id configured in the core VLAN on the VTEP.
Step 8	end Example: Device(config-if)# end	Returns to privileged EXEC mode.

Configuring BGP with IPv4 or IPv6 or Both Address Families on VTEP

To configure BGP on a VTEP with IPv4 or IPv6 or both address families and a spine switch as the neighbor, perform the following steps:

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	router bgp <i>autonomous-system-number</i> Example: Device(config)# router bgp 1	Enables a BGP routing process, assigns it an autonomous system number, and enters router configuration mode.

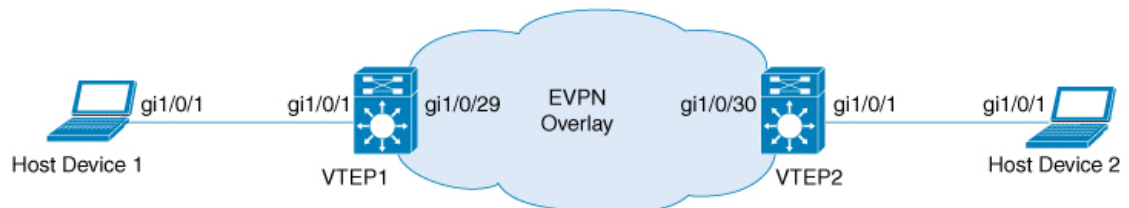
	Command or Action	Purpose
Step 4	bgp log-neighbor-changes Example: <pre>Device(config-router)# bgp log-neighbor-changes</pre>	(Optional) Enables the generation of logging messages when the status of a BGP neighbor changes. For more information, see <i>Configuring BGP</i> module of the <i>IP Routing Configuration Guide</i> .
Step 5	bgp update-delay time-period Example: <pre>Device(config-router)# bgp update-delay 1</pre>	(Optional) Sets the maximum initial delay period before sending the first update. For more information, see <i>Configuring BGP</i> module of the <i>IP Routing Configuration Guide</i> .
Step 6	bgp graceful-restart Example: <pre>Device(config-router)# bgp graceful-restart</pre>	(Optional) Enables the BGP graceful restart capability for all BGP neighbors. For more information, see <i>Configuring BGP</i> module of the <i>IP Routing Configuration Guide</i> .
Step 7	no bgp default ipv4-unicast Example: <pre>Device(config-router)# no bgp default ipv4-unicast</pre>	(Optional) Disables default IPv4 unicast address family for BGP peering session establishment. For more information, see <i>Configuring BGP</i> module of the <i>IP Routing Configuration Guide</i> .
Step 8	neighbor ip-address remote-as number Example: <pre>Device(config-router)# neighbor 10.11.11.11 remote-as 1</pre>	Defines multiprotocol-BGP neighbors. Under each neighbor, define the configuration. Use the IP address of the spine switch as the neighbor IP address.
Step 9	neighbor {ip-address group-name} update-source interface Example: <pre>Device(config-router)# neighbor 10.11.11.11 update-source Loopback0</pre>	Configures update source. Update source can be configured per neighbor or per peer-group. Use the IP address of the spine switch as the neighbor IP address.
Step 10	address-family l2vpn evpn Example: <pre>Device(config-router)# address-family l2vpn evpn</pre>	Specifies the L2VPN address family and enters address family configuration mode.
Step 11	neighbor ip-address activate Example: <pre>Device(config-router-af)# neighbor 10.11.11.11 activate</pre>	Enables the exchange information from a BGP neighbor. Use the IP address of the spine switch as the neighbor IP address.
Step 12	neighbor ip-address send-community [both extended standard] Example:	Specifies the communities attribute sent to a BGP neighbor. Use the IP address of the spine switch as the neighbor IP address.

	Command or Action	Purpose
	Device(config-router-af)# neighbor 10.11.11.11 send-community both	
Step 13	exit-address-family Example: Device(config-router-af)# exit-address-family	Exits address family configuration mode and returns to router configuration mode.
Step 14	address-family ipv4 vrf vrf-name Example: Device(config-router)# address-family ipv4 vrf Green	Specifies the IPv4 address family and enters address family configuration mode.
Step 15	advertise l2vpn evpn Example: Device(config-router-af)# advertise l2vpn evpn	Advertises Layer 2 VPN EVPN routes within a tenant VRF in an EVPN VXLAN fabric.
Step 16	redistribute connected Example: Device(config-router-af)# redistribute connected	(Optional) Redistributes connected routes to BGP.
Step 17	redistribute static Example: Device(config-router-af)# redistribute static	(Optional) Redistributes static routes to BGP.
Step 18	exit-address-family Example: Device(config-router-af)# exit-address-family	Exits address family configuration mode and returns to router configuration mode.
Step 19	address-family ipv6 vrf vrf-name Example: Device(config-router)# address-family ipv6 vrf green	Specifies the IPv6 address family and enters address family configuration mode.
Step 20	advertise l2vpn evpn Example: Device(config-router-af)# advertise l2vpn evpn	Advertises Layer 2 VPN EVPN routes within a tenant VRF in an EVPN VXLAN fabric.
Step 21	redistribute connected Example: Device(config-router-af)# redistribute connected	(Optional) Redistributes connected routes to BGP.

	Command or Action	Purpose
Step 22	redistribute static Example: Device (config-router-af) # redistribute static	(Optional) Redistributes static routes to BGP.
Step 23	exit-address-family Example: Device (config-router-af) # exit-address-family	Exits address family configuration mode and returns to router configuration mode.
Step 24	end Example: Device (config-router) # end	Returns to privileged EXEC mode.

Configuration Examples for EVPN VXLAN Layer 3 Overlay Network

This section provides an example for configuring an EVPN VXLAN Layer 3 overlay network. This example shows a sample configuration for a VXLAN network with 2 VTEPs, VTEP 1 and VTEP 2, connected to perform routing.



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Table 1: Configuration Example for a VXLAN Network with Two VTEPs Connected to Perform Routing

VTEP 1	VTEP 2
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VTEP 1	VTEP 2
<pre>VTEP1# show running-config ! hostname VTEP1 ! ! vrf definition green rd 103:2 ! address-family ipv4 route-target export 103:2 route-target import 104:2 route-target export 103:2 stitching route-target import 104:2 stitching exit-address-family ! address-family ipv6 route-target export 103:2 route-target import 104:2 route-target export 103:2 stitching route-target import 104:2 stitching exit-address-family ! ip multicast-routing ipv6 unicast-routing ! ! system mtu 9150 ! vlan configuration 200 member vni 5000 ! ! interface Loopback0 ip address 10.1.1.10 255.255.255.255 ip pim sparse-mode ! interface Loopback13 description demo only (for rt5 distribution) vrf forwarding green ip address 10.1.13.13 255.255.255.0 ! interface GigabitEthernet1/0/1 description access interface switchport access vlan 201 switchport mode access ! ! interface GigabitEthernet1/0/29 description core-underlay-interface no switchport ip address 172.16.1.29 255.255.255.0 ip pim sparse-mode ! ! interface Vlan200 description core svi for l3vni vrf forwarding green ip unnumbered Loopback0 ipv6 enable no autostate ! interface Vlan201</pre>	<pre>VTEP2# show running-config ! hostname VTEP2 ! ! vrf definition green rd 104:2 ! address-family ipv4 route-target export 104:2 route-target import 103:2 route-target export 104:2 stitching route-target import 103:2 stitching exit-address-family ! address-family ipv6 route-target export 104:2 route-target import 103:2 route-target export 104:2 stitching route-target import 103:2 stitching exit-address-family ! ip multicast-routing ipv6 unicast-routing ! ! system mtu 9150 ! vlan configuration 200 member vni 5000 ! ! interface Loopback0 ip address 10.2.2.20 255.255.255.255 ip pim sparse-mode ! interface Loopback14 description demo only (for rt5 distribution) vrf forwarding green ip address 10.1.14.14 255.255.255.0 ! interface GigabitEthernet1/0/1 description access interface switchport access vlan 202 switchport mode access ! ! interface GigabitEthernet1/0/30 description core-underlay-interface no switchport ip address 172.16.1.30 255.255.255.0 ip pim sparse-mode ! ! interface Vlan200 description core svi for l3vni vrf forwarding green ip unnumbered Loopback0 ipv6 enable no autostate ! interface Vlan202</pre>

VTEP 1	VTEP 2
<pre> description access-svi vrf forwarding green ip address 192.168.1.201 255.255.255.0 ipv6 address 2001:DB8:201::201/64 ipv6 enable ! interface nve10 no ip address source-interface Loopback0 host-reachability protocol bgp member vni 5000 vrf green ! router ospf 1 router-id 10.1.1.10 network 10.1.1.0 0.0.0.255 area 0 network 172.16.1.0 0.0.0.255 area 0 ! router bgp 10 bgp router-id interface Loopback0 bgp log-neighbor-changes bgp update-delay 1 no bgp default ipv4-unicast neighbor 10.2.2.20 remote-as 10 neighbor 10.2.2.20 update-source Loopback0 ! address-family ipv4 exit-address-family ! address-family l2vpn evpn neighbor 10.2.2.20 activate neighbor 10.2.2.20 send-community both exit-address-family ! address-family ipv4 vrf green advertise l2vpn evpn redistribute connected redistribute static exit-address-family ! address-family ipv6 vrf green redistribute connected redistribute static advertise l2vpn evpn exit-address-family ! ip pim rp-address 10.1.1.10 ! ! end </pre>	<pre> description access-svi vrf forwarding green ip address 192.168.2.202 255.255.255.0 ipv6 address 2001:DB8:202::202/64 ipv6 enable ! interface nve10 no ip address source-interface Loopback0 host-reachability protocol bgp member vni 5000 vrf green ! router ospf 1 router-id 10.2.2.20 network 10.2.2.0 0.0.0.255 area 0 network 172.16.1.0 0.0.0.255 area 0 ! router bgp 10 bgp router-id interface Loopback0 bgp log-neighbor-changes bgp update-delay 1 no bgp default ipv4-unicast neighbor 10.1.1.10 remote-as 10 neighbor 10.1.1.10 update-source Loopback0 ! address-family ipv4 exit-address-family ! address-family l2vpn evpn neighbor 10.1.1.10 activate neighbor 10.1.1.10 send-community both exit-address-family ! address-family ipv4 vrf green advertise l2vpn evpn redistribute connected redistribute static exit-address-family ! address-family ipv6 vrf green redistribute connected redistribute static advertise l2vpn evpn exit-address-family ! ip pim rp-address 10.1.1.10 ! ! end </pre>

The following examples provide outputs for **show** commands on VTEP 1 and VTEP 2 in the topology configured above.

- [show nve peers, on page 16](#)
- [show bgp l2vpn evpn all, on page 16](#)
- [show ip route vrf, on page 17](#)
- [show platform software fed switch active matm mactable vlan, on page 18](#)

show nve peers**VTEP 1**

The following example shows the output for the **show nve peers** command on VTEP 1:

```
VTEP1# show nve peers
Interface VNI      Type Peer-IP          RMAC/Num_RTs  eVNI      state flags UP time
nve10    5000    L3CP 10.2.2.20      380e.4d9b.6a4a 5000      UP  A/M/4 00:38:37
nve10    5000    L3CP 10.2.2.20      380e.4d9b.6a4a 5000      UP  A/-/6 00:03:16
```

VTEP 2

The following example shows the output for the **show nve peers** command on VTEP 2:

```
VTEP2# show nve peers
Interface VNI      Type Peer-IP          RMAC/Num_RTs  eVNI      state flags UP time
nve10    5000    L3CP 10.1.1.10      a0f8.4910.bce2 5000      UP  A/-/4 00:38:53
nve10    5000    L3CP 10.1.1.10      a0f8.4910.bce2 5000      UP  A/M/6 00:38:53
```

show bgp l2vpn evpn all**VTEP 1**

The following example shows the output for the **show bgp l2vpn evpn all** command on VTEP 1:

```
VTEP1# show bgp l2vpn evpn all
BGP table version is 26, local router ID is 10.1.1.10
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
               x best-external, a additional-path, c RIB-compressed,
               t secondary path, L long-lived-stale,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

      Network          Next Hop          Metric LocPrf Weight Path
Route Distinguisher: 103:2 (default for vrf green)
*> [5][103:2][0][24][10.1.13.0]/17
      0.0.0.0          0          32768 ?
*> [5][103:2][0][24][192.168.1.0]/17
      0.0.0.0          0          32768 ?
*> [5][103:2][0][64][2001:DB8:201::]/29
      ::              0          32768 ?
Route Distinguisher: 104:2
*>i [5][104:2][0][24][10.1.14.0]/17
      10.2.2.20        0    100    0 ?
*>i [5][104:2][0][24][192.168.2.0]/17
      10.2.2.20        0    100    0 ?
*>i [5][104:2][0][64][2001:DB8:202::]/29
      10.2.2.20        0    100    0 ?
```

VTEP 2

The following example shows the output for the **show bgp l2vpn evpn all** command on VTEP 2:


```

VTEP2# show bgp l2vpn evpn all
BGP table version is 12, local router ID is 10.2.2.20
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
               x best-external, a additional-path, c RIB-compressed,
               t secondary path, L long-lived-stale,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

      Network          Next Hop          Metric LocPrf Weight Path
Route Distinguisher: 103:2
*>i  [5][103:2][0][24][10.1.13.0]/17
      10.1.1.10              0      100      0 ?
*>i  [5][103:2][0][24][192.168.1.0]/17
      10.1.1.10              0      100      0 ?
*>i  [5][103:2][0][64][2001:DB8:201::]/29
      10.1.1.10              0      100      0 ?
Route Distinguisher: 104:2 (default for vrf green)
*>  [5][104:2][0][24][10.1.14.0]/17
      0.0.0.0                  0              32768 ?
*>  [5][104:2][0][24][192.168.2.0]/17
      0.0.0.0                  0              32768 ?
*>  [5][104:2][0][64][2001:DB8:202::]/29
      Network          Next Hop          Metric LocPrf Weight Path
      ::                ::                0              32768 ?

```

show ip route vrf

VTEP 1

The following example shows the output for the **show ip route vrf** command on VTEP 1:

```

VTEP1# show ip route vrf green
Routing Table: green
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, m - OMP
       n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       H - NHRP, G - NHRP registered, g - NHRP registration summary
       o - ODR, P - periodic downloaded static route, l - LISP
       a - application route
       + - replicated route, % - next hop override, p - overrides from PfR

Gateway of last resort is not set

      10.0.0.0/8 is variably subnetted, 3 subnets, 2 masks
C       10.1.13.0/24 is directly connected, Loopback13
L       10.1.13.13/32 is directly connected, Loopback13
B       10.1.14.0/24 [200/0] via 10.2.2.20, 00:42:01, Vlan200
      192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.1.0/24 is directly connected, Vlan201
L       192.168.1.201/32 is directly connected, Vlan201
B       192.168.2.0/24 [200/0] via 10.2.2.20, 00:06:00, Vlan200

```

VTEP 2

The following example shows the output for the **show ip route vrf** command on VTEP 2:

```

VTEP2# show ip route vrf green
Routing Table: green
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
        D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
        N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
        E1 - OSPF external type 1, E2 - OSPF external type 2, m - OMP
        n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
        i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
        ia - IS-IS inter area, * - candidate default, U - per-user static route
        H - NHRP, G - NHRP registered, g - NHRP registration summary
        o - ODR, P - periodic downloaded static route, l - LISP
        a - application route
        + - replicated route, % - next hop override, p - overrides from PFR

Gateway of last resort is not set

    10.0.0.0/8 is variably subnetted, 3 subnets, 2 masks
B       10.1.13.0/24 [200/0] via 10.1.1.10, 00:42:38, Vlan200
C       10.1.14.0/24 is directly connected, Loopback14
L       10.1.14.14/32 is directly connected, Loopback14
B       192.168.1.0/24 [200/0] via 10.1.1.10, 00:42:38, Vlan200
        192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.2.0/24 is directly connected, Vlan202
L       192.168.2.202/32 is directly connected, Vlan202

```

show platform software fed switch active matm mactable vlan

VTEP 1

The following example shows the output for the **show platform software fed switch active matm mactable vlan 200** command on VTEP 1:



Note The MAC address of the peer's core SVI interface must be present in the core VLAN.

```

VTEP1# show platform software fed switch active matm macTable vlan 200
VLAN  MAC                               Type Seq#  EC_Bi  Flags machandle      siHandle
      riHandle                           diHandle  *a_time *e_time  ports
-----
200   a0f8.4910.bce2                         0x8002   0 19880   64 0x7f5d8503fd48      0x7f5d852b6d28
      0x0                                  0x5234   0       0       0       0 Vlan200
200   380e.4d9b.6a4a                         0x1000001 0 0       64 0x7f5d85117598      0x7f5d85110f78
      0x7f5d851b9648                       0x0      0       0       0       0 RLOC 10.2.2.20 adj_id 22

```

Total Mac number of addresses:: 2

VTEP 2

The following example shows the output for the **show platform software fed switch active matm mactable vlan 200** command on VTEP 2:



Note The MAC address of the peer's core SVI interface must be present in the core VLAN.

```
VTEP2# show platform software fed switch active matm macTable vlan 200
VLAN  MAC                               Type  Seq#  EC_Bi  Flags  machandle          siHandle
      riHandle                          diHandle                *a_time  *e_time  ports

-----
200   380e.4d9b.6a4a                       0x8002  0  42949  64  0x7f40e15fd308    0x7f40e15f49d8
      0x0                                0x0
200   a0f8.4910.bce2                       0x1000001  0  0      64  0x7f40e193c478    0x7f40e1938168
      0x7f40e1937bf8                       0x0
                                           0      0  RLOC 10.1.1.10 adj_id 86

Total Mac number of addresses:: 2
```

Verifying EVPN VXLAN Layer 3 Overlay Network

The following table lists the **show** commands that are used to verify a Layer 3 VXLAN overlay network:

Table 2: Commands to Verify EVPN VXLAN Layer 3 Overlay Network

Command	Purpose
show nve vni	Displays information about VXLAN network identifier members associated with an NVE interface.
show nve vni vni-id detail	Displays detailed NVE interface state information for a VXLAN network identifier member.
show nve peers	Displays NVE interface state information for peer leaf switches.
show mac address-table vlan vlan-id	Displays MAC addresses for a VLAN.
show platform software fed switch active matm macTable vlan vlan-id	Displays MAC addresses for a VLAN from MAC address table manager database for Forwarding Engine Driver (FED).
show ip route vrf vrf-name	Displays the IP routing table associated with a specific VRF.
show ip cef vrf vrf-name	Displays entries in the Cisco Express Forwarding (CEF) table associated with a VRF.
show arp vrf vrf-name	Displays entries in the Address Resolution Protocol (ARP) table associated with a VRF.
show bgp l2vpn evpn route-type 5	Displays BGP information for route type 5 of Layer 2 VPN EVPN address family.

Command	Purpose
show bgp l2vpn evpn all	Displays all BGP information for L2VPN EVPN address family.