



Configuring Private VLANs in a BGP EVPN VXLAN Fabric

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Restrictions for Private VLANs in a BGP EVPN VXLAN Fabric

Configuration of Private VLANs in a BGP EVPN VXLAN fabric must be done in the following order:

1. Configure VLAN with primary and secondary associations.
2. Enable EVPN separately in each of the primary, community, and isolated VLANs.

For more information, see [Configuring an EVPN Instance on the VLAN on a VTEP](#).

If there's an EVPN configuration already associated with a VLAN, you can't directly configure the PVLAN associations for this VLAN. First disassociate the EVPN configuration from the VLAN. Next, configure the PVLAN association. Then reconfigure EVPN in each of the newly configured primary, community, and isolated VLANs.

PVLAN is not supported on Cisco Catalyst 9500X Series Switches.

Information About Private VLANs in a BGP EVPN VXLAN Fabric

A private VLAN (PVLAN) divides a regular VLAN into logical partitions, allowing limited broadcast boundaries among selected port-groups on a single Layer 2 Ethernet switch. The single Ethernet switch's PVLAN capabilities can be extended over the BGP EVPN VXLAN enabled network to build partitioned bridge-domain between port-groups across multiple Ethernet switches in the BGP EVPN VXLAN VTEP mode. The integration of PVLAN with a BGP EVPN VXLAN network enables the following benefits:

- Microsegmented Layer 2 network segregation across one or more BGP EVPN VXLAN switches.
- Partitioned and secured user-group Layer 2 network that limits the communication with dynamic or static port configuration assignments.

- IP subnet pool conservation across BGP EVPN VXLAN network while extending segregated Layer 2 network across the fabric.
- Conservation of Layer 2 overlay tunnels and peer networks with a single virtual network identifier (VNI) mapped to Primary VLAN.

Primary and Secondary VLANs

Each subdomain in a PVLAN is represented by a pair of VLANs: a primary VLAN and a secondary VLAN. A PVLAN can have multiple VLAN pairs, one pair for each subdomain. All VLAN pairs in a PVLAN share the same primary VLAN. The secondary VLAN ID differentiates one subdomain from another. A secondary VLAN can either be an isolated VLAN or a community VLAN. Primary and secondary VLANs have the following characteristics:

- **Primary VLAN:** A PVLAN has only one primary VLAN. Every port in a PVLAN is a member of the primary VLAN. The primary VLAN carries unidirectional traffic downstream from the promiscuous ports to the host (isolated and community) ports and to other promiscuous ports.
- **Isolated VLAN:** A PVLAN has only one isolated VLAN. An isolated VLAN is a secondary VLAN that carries unidirectional traffic upstream from the hosts towards the promiscuous ports and the gateway.
- **Community VLAN:** A community VLAN is a secondary VLAN that carries upstream traffic from the community ports to the promiscuous port gateways and to other host ports in the same community. You can configure multiple community VLANs in a PVLAN.

Private VLAN Ports

PVLAN ports are access ports that are one of these types:

- **Promiscuous:** A promiscuous port belongs to the primary VLAN. It can communicate with all interfaces, including the community and isolated host ports that belong to the secondary VLANs associated with the primary VLAN.
- **Isolated:** An isolated port is a host port that belongs to an isolated secondary VLAN. It has complete Layer 2 separation from other ports within the same PVLAN, except for the promiscuous ports. PVLANS block all traffic to isolated ports except traffic from promiscuous ports. Likewise, PVLANS forward the traffic from an isolated port only to promiscuous ports.
- **Community:** A community port is a host port that belongs to a community secondary VLAN. Community ports communicate with other ports in the same community VLAN and with promiscuous ports. Community ports are isolated at Layer 2 from all other interfaces in external communities and also from isolated ports within their private VLAN.

For more information about PVLANS and the steps to configure PVLANS, see "Configuring Private VLANs" module in the *VLAN Configuration Guide* for the applicable release.

Extension of Private VLANs in a BGP EVPN VXLAN Fabric

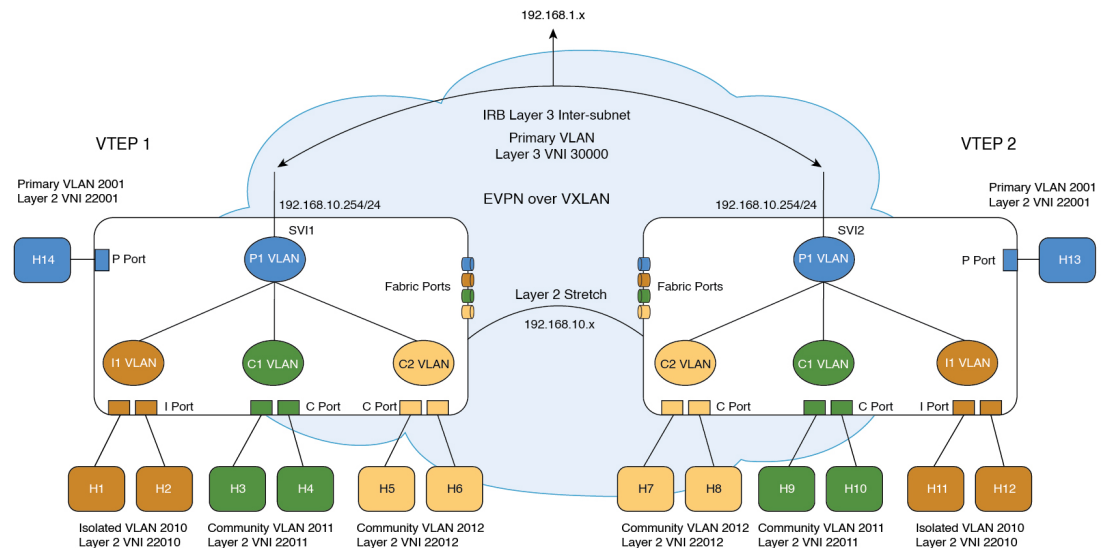
Private VLANs (PVLANS) partition a regular VLAN domain into subdomains and provide Layer 2 isolation between ports within the same PVLAN. Like a regular VLAN, a private VLAN can span multiple Layer 2 switches. In a private VLAN that spans across multiple devices, traffic from an isolated port in Switch A does

not reach an isolated port on Switch B. This is achieved by the trunk port carrying the primary VLAN and secondary VLANs to neighboring switches with dot1q tag in a traditional Layer 2 network. With BGP EVPN VXLAN enabled in the PVLANS on the VTEPs, the L2VNI segment preserves the PVLAN semantics and provides the Layer 2 isolation for the stretched PVLAN segment across the VTEPs in the overlay fabric. PVLAN extension with BGP EVPN VXLAN allows you to:

- Seamlessly migrate and join (or stretch) the PVLAN domain like any regular VLAN.
- Access to centralized common services such as printer or DHCP through the promiscuous port on any VTEP in the EVPN overlay.
- Maintain community and isolated VLAN semantics in the overlay fabric across all the VTEPs. The EVPN fabric provides a logical single switch view for the respective Layer 2 domain.

The following image shows PVLAN extension in a BGP EVPN VXLAN fabric with two VTEPs:

Figure 1: PVLAN Extension in a BGP EVPN VXLAN Fabric



Traffic Forwarding for Private VLANs in a BGP EVPN VXLAN Fabric

You can forward known unicast and broadcast, unknown unicast, and multicast (BUM) traffic between PVLANS in a BGP EVPN VXLAN fabric. On the Source VTEP, the forwarding process on the access PVLAN ports (promiscuous, isolated, community) adheres to the baseline PVLAN forwarding. With BGP EVPN VXLAN enabled in the PVLAN domain, the remote host routes are learned and programmed in the hardware of the respective PVLANS. The following sections illustrate the forwarding scenarios for unicast and BUM traffic between local and remote hosts for each of the secondary VLANs.

Known Unicast Traffic Forwarding

The sending VTEP bridges a known unicast packet with the corresponding secondary VLAN's virtual network identifier (VNI) ID. The packet arrives on the receiving VTEP. After decapsulation, receiving VTEP processes the packet in the same way as a packet from a local PVLAN host port. The packet gets mapped to the respective community, isolated, or primary VLAN.

The following images illustrate the known unicast traffic forwarding scenarios for PVLNs in a BGP EVPN VXLAN fabric:

Figure 2: Unicast Traffic from Promiscuous Port : H14 to H8

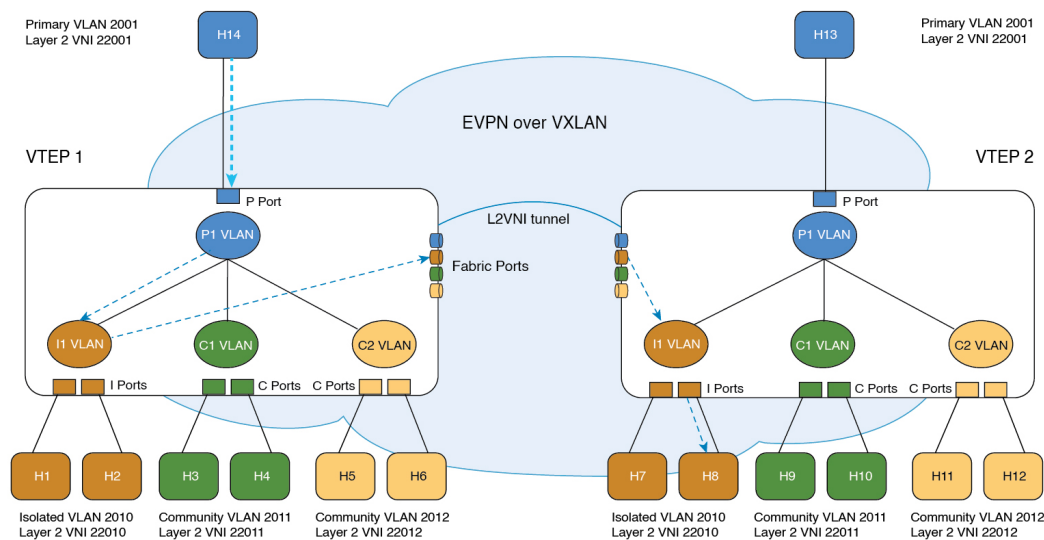


Figure 3: Unicast Traffic from Isolated Port: H1 to H13

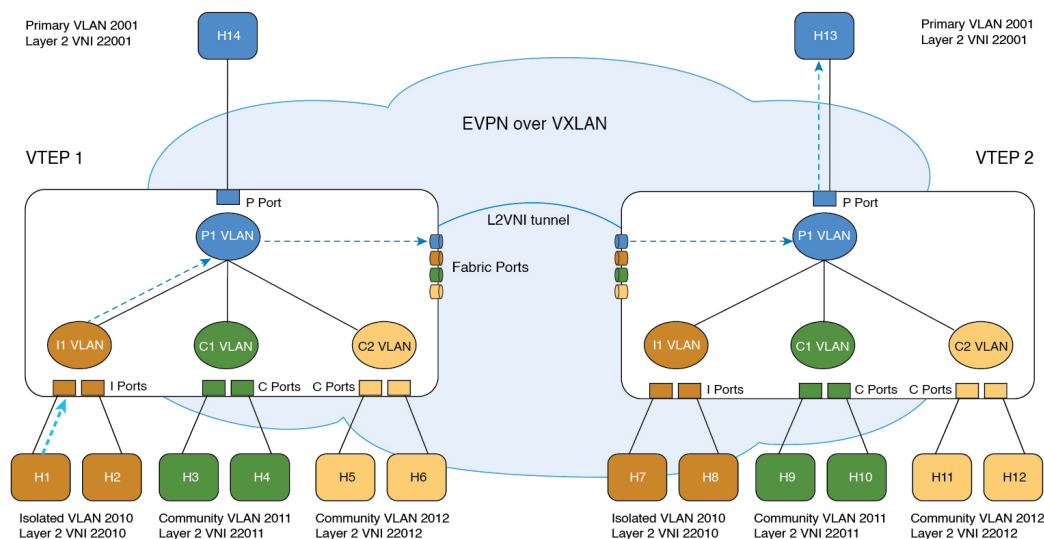
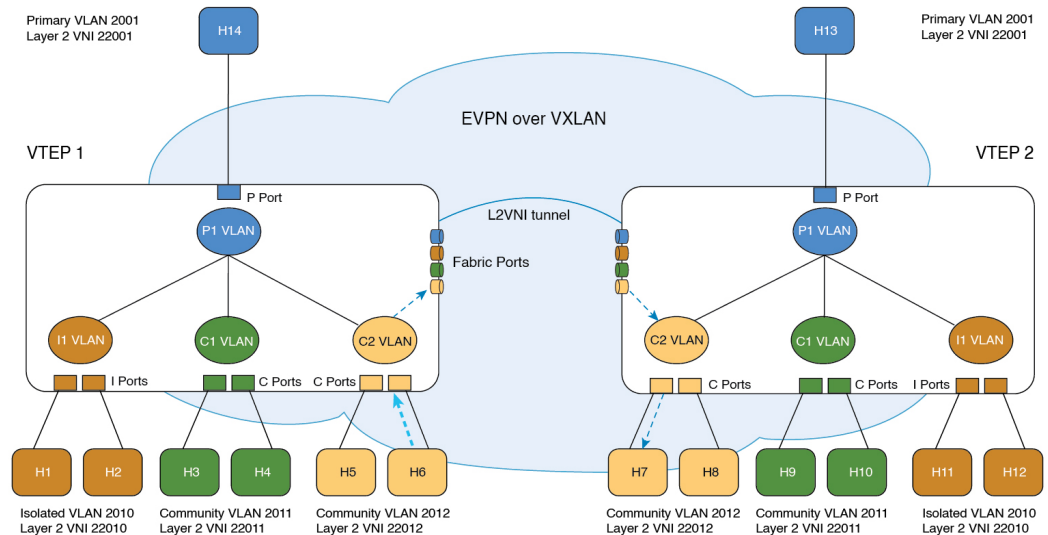


Figure 4: Unicast Traffic from Community Port: H6 to H7



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Broadcast, Unknown Unicast, and Multicast Traffic Forwarding

In a regular VLAN, broadcasts are forwarded to all ports in that VLAN. Private VLAN broadcast forwarding depends on the port sending the broadcast:

- An isolated port sends a broadcast only to the promiscuous ports or trunk ports.
- A community port sends a broadcast to all promiscuous ports, trunk ports, and ports in the same community VLAN.
- A promiscuous port sends a broadcast to all ports in the private VLAN (other promiscuous ports, trunk ports, isolated ports, and community ports).

In addition to the above, a copy of the flood packet is sent to the remote VTEPs with the respective L2VNI. (See [BUM traffic handling in the L2VNI](#)). On the remote VTEP, the flood copy is again replicated towards the access as per the PVLAN broadcast rules mentioned above. Flood packets received from the fabric are not sent back to fabric with split-horizon check.

During forwarding, if a packet's MAC address isn't available in the lookup, the VTEP replicates the packet with the VNI ID of the forwarding (or incoming) VLAN. The VTEP forwards the BUM packets with the VNI ID of the corresponding VLAN. The receiving VTEP decapsulates the BUM packet and maps the VNI ID to the corresponding secondary VLAN. This mapping ensures that the flood rules remain local. The VTEP then processes the packet in the same way as a packet from a local host port.

For isolated VLANs, after the destination MAC address lookup results in an unknown unicast from the source port, it's not locally known whether the destination MAC address belongs to the remote isolated VLAN host or the remote primary VLAN host. Hence, the BUM packet copy is allowed to go the egress VTEPs with the isolated VLAN VNI ID. On egress VTEPs, this BUM copy gets flooded on local isolated ports and local promiscuous ports. As a result, BUM traffic from remote isolated ports to local isolated ports is unavoidable.



Note Forwarding of unknown unicast traffic from an isolated port to a remote promiscuous port isn't supported.

The following images illustrate the BUM traffic forwarding scenarios for PVLANS in a BGP EVPN VXLAN fabric:

Figure 5: BUM Traffic from Promiscuous Port (H14)

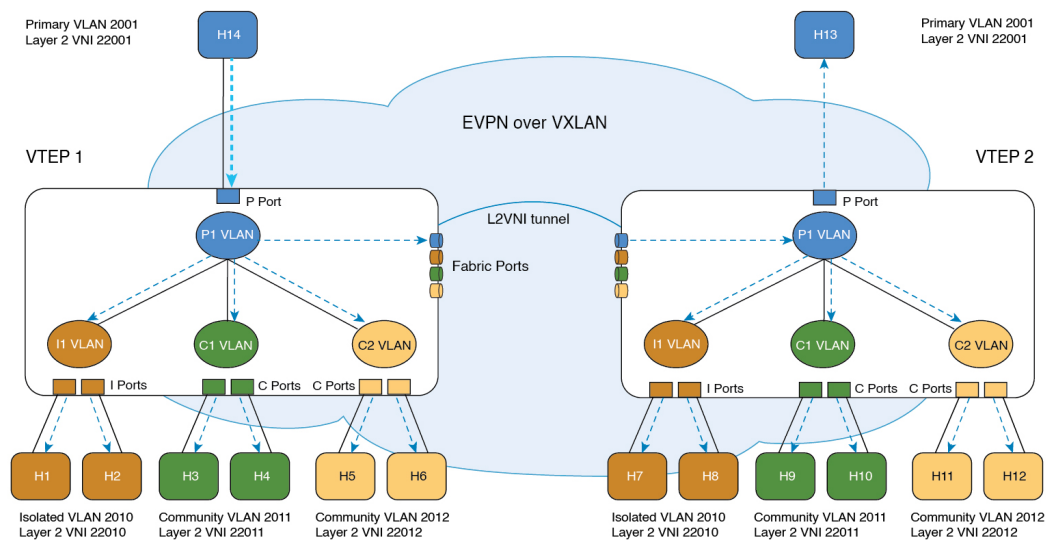


Figure 6: BUM Traffic from Isolated Port (H1)

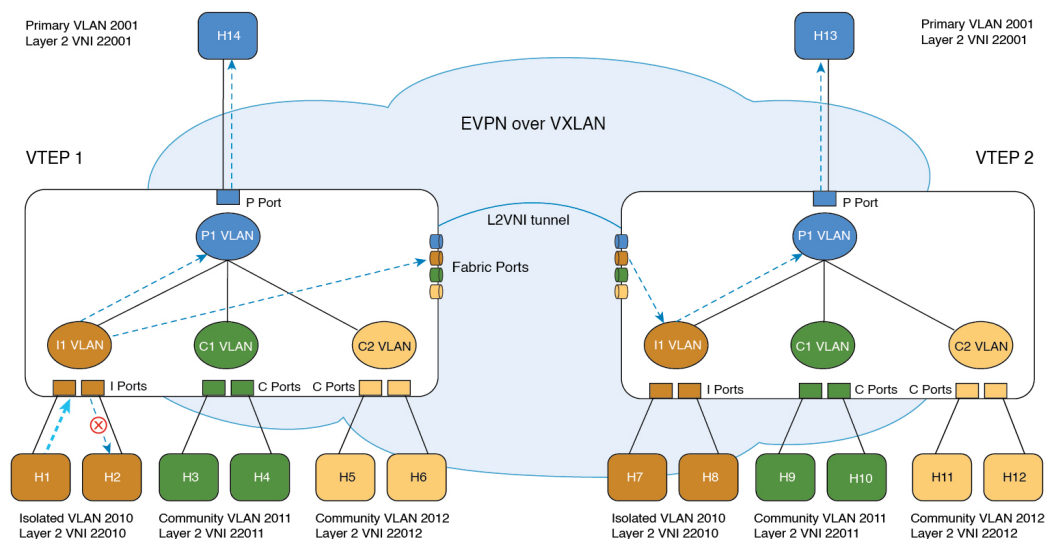
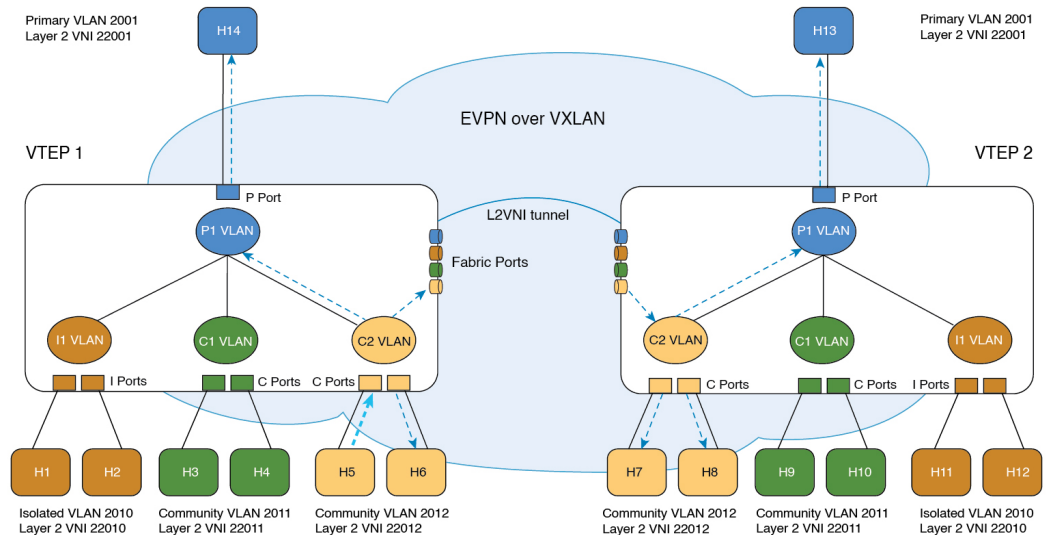


Figure 7: BUM Traffic from Community Port (H5)



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Routed Traffic Forwarding

Routed traffic between the hosts in a microsegmented VLAN is through the associated Primary VLAN SVI on the Local VTEP (For more information, see "Configuring Private VLANs" module in the *VLAN Configuration Guide* for the applicable release). When the source and destination hosts are across the EVPN VXLAN fabric, the routed traffic between the microsegmented VLAN hosts follows the Symmetric Integrated Routing and Bridging (IRB) method to cross the fabric (For more information, see [Configuring EVPN VXLAN Integrated Routing and Bridging](#)). On the destination VTEP, traffic is routed from the core VLAN SVI to the associated Primary VLAN SVI interface and then bridged in the microsegmented local destination Secondary VLAN.

How to Configure Private VLANs in a BGP EVPN VXLAN Fabric

When you configure PVLANS in a BGP EVPN VXLAN fabric, the existing PVLAN configuration is preserved and the Layer 2 VNI configuration is added to the PVLAN. By adding the Layer 2 VNI configuration, you expand the PVLAN and stretch it over the fabric across the VTEPs in the fabric.

In a BGP EVPN VXLAN fabric, the EVPN control plane distributes the MAC and MAC-IP routes. In addition, PVLANS handle BUM and unicast traffic forwarding differently compared to regular VLANs. Due to these two reasons, you can create and delete PVLANS strictly in the following ways:

- To create a PVLAN, first configure the VLAN with primary and secondary associations. Next, enable EVPN separately in each of the primary, community, and isolated VLANs.



Note If there's an EVPN configuration already associated with a VLAN, you can't directly configure the PVLAN associations for this VLAN. First, use the **member vni** command in VLAN configuration mode to disassociate the EVPN configuration from the VLAN. Next, configure the PVLAN association. Now reconfigure EVPN in each of the newly configured primary, community, and isolated VLANs.

- To delete a PVLAN, ensure that you unconfigure EVPN in the respective VLAN before you modify the PVLAN configuration.

Configuring the Primary and Secondary VLANs for a Private VLAN

To configure the primary and secondary VLANs for a private VLAN, perform the following steps:

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enters privileged EXEC mode. Enter password, if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	vlan <i>vlan-id</i> Example: Device(config)# vlan 101	Enters VLAN configuration mode for the specified VLAN ID.
Step 4	private-vlan {association [add remove] secondary-vlan-list community isolated primary} Example: Device(config-vlan)# private-vlan primary Device(config-vlan)# private-vlan association 102	Configures the VLAN as a PVLAN and configures the association between primary and secondary VLANs. Use the primary keyword to configure the VLAN as a PVLAN. Use the community keyword to designate the VLAN as a community VLAN. Use the isolated keyword to designate the VLAN as an isolated VLAN. Use the association [add remove] keyword to add or remove the association between a primary and secondary VLAN.

	Command or Action	Purpose
Step 5	exit Example: Device(config-vlan) # exit	Exits VLAN configuration mode and returns to global configuration mode.
Step 6	Repeat steps 3 to 5 for each primary and secondary VLAN, as needed.	--
Step 7	end Example: Device(config) # end	Exits global configuration mode and enters privileged EXEC mode.

Configuring the Port of a Private VLAN

To configure a port of a PVLAN, perform the following steps:

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enters privileged EXEC mode. Enter password, if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	interface interface-id Example: Device(config) # interface GigabitEthernet1/0/1	Enters interface configuration mode for the specified interface ID.
Step 4	switchport mode private-vlan {host promiscuous} Example: Device(config-if) # switchport mode private-vlan host	Configures the interface as either a host PVLAN port or a promiscuous PVLAN port.
Step 5	switchport private-vlan {host-association mapping primary-vlan-id secondary-vlan-id-list}	Associates a PVLAN host port or maps a PVLAN promiscuous port to a primary VLAN.

	Command or Action	Purpose
	Example: Device(config-if) # switchport private-vlan host-association 101 104	Note If you configure a port as a PVLAN host port and you do not configure a valid PVLAN association with the switchport private-vlan host-association command, the interface becomes inactive. Note If you configure a port as a PVLAN promiscuous port and you do not configure a valid PVLAN mapping with the switchport private-vlan mapping command, the interface becomes inactive.
Step 6	end Example: Device(config-if) # end	Exits interface configuration mode and enters privileged EXEC mode.

Enabling EVPN in a Private VLAN

To enable EVPN in a PVLAN, perform the following steps:



Note Enable EVPN separately in each of the primary, community, and isolated VLANs.

Procedure

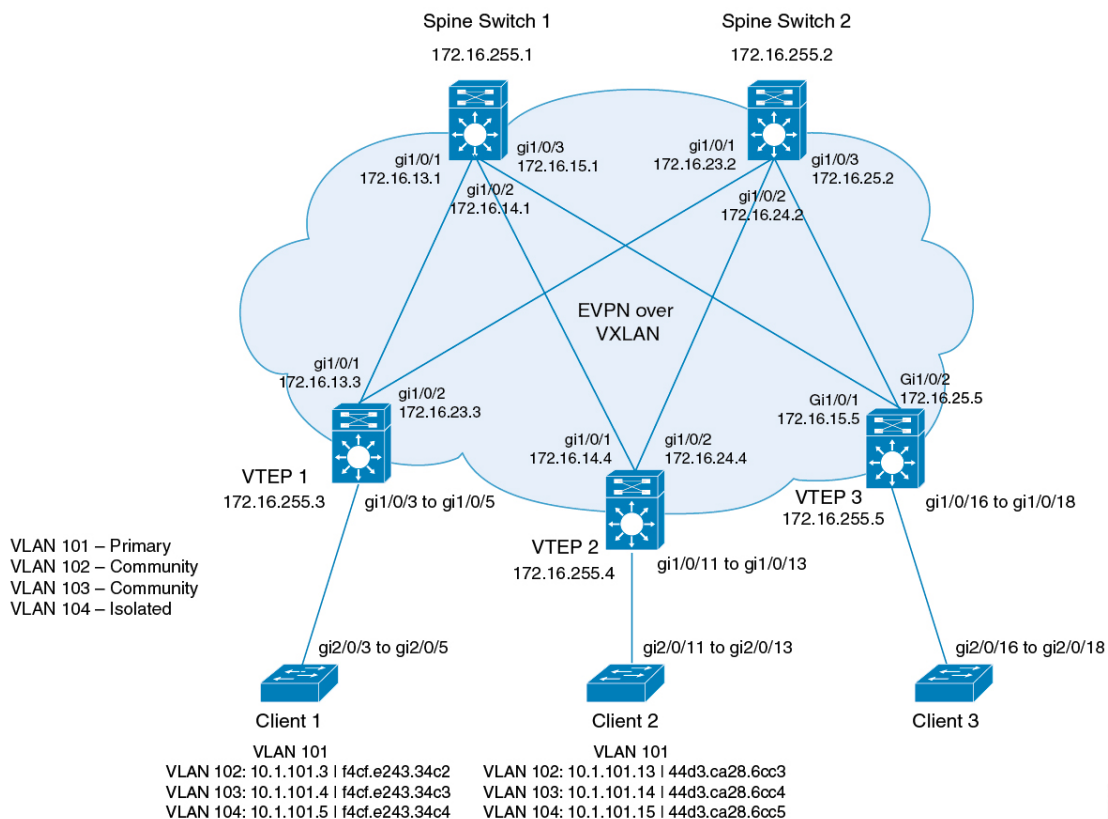
	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enters privileged EXEC mode. Enter password, if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	vlan configuration <i>vlan-id</i> Example: Device(config)# vlan configuration 101	Enters VLAN configuration mode for the specified PVLAN interface.
Step 4	member evpn-instance <i>evpn-instance-id</i> vni <i>layer2-vni-id</i>	Adds EVPN instance as a member of the PVLAN configuration.

	Command or Action	Purpose
	Example: Device(config-vlan)# member evpn-instance 1 vni 6000	The VNI here is used as a Layer 2 VNI.
Step 5	end Example: Device(config-vlan)# end	Exits VLAN configuration mode and enters privileged EXEC mode.

Configuration Examples for Private VLANs in a BGP EVPN VXLAN Fabric

This section provides a configuration example for PVLANs in a BGP EVPN VXLAN fabric using the following topology:

Figure 8: Private VLANs in a BGP EVPN VXLAN Fabric



The topology shows an EVPN VXLAN network with two spine switches (Spine Switch 1 and Spine Switch 2) and three VTEPs (VTEP 1, VTEP 2, and VTEP 3). The network has an extended PVLAN with VLAN 101 as the primary VLAN. VLAN 102, VLAN 103, and VLAN 104 are the secondary VLANs. The following tables provide the sample configurations for the devices in this topology:

Table 1: Configuring VTEP 1, VTEP 2, and VTEP 3 for PVLAN Extension in a BGP EVPN VXLAN Fabric

VTEP 1	VTEP 2	VTEP 3
<pre> Leaf-01# show running-config hostname Leaf-01 ! vrf definition green rd 1:1 ! address-family ipv4 route-target export 1:1 route-target import 1:1 route-target export 1:1 stitching route-target import 1:1 stitching exit-address-family ! address-family ipv6 route-target export 1:1 route-target import 1:1 route-target export 1:1 stitching route-target import 1:1 stitching exit-address-family ! ip routing ! ip multicast-routing ! vtp mode transparent ! l2vpn evpn replication-type static default-gateway advertise ! l2vpn evpn instance 101 vlan-based encapsulation vxlan ! l2vpn evpn instance 102 vlan-based encapsulation vxlan ! l2vpn evpn instance 103 vlan-based encapsulation vxlan ! l2vpn evpn instance 104 vlan-based encapsulation vxlan ! l2vpn evpn instance 201 vlan-based encapsulation vxlan ! l2vpn evpn instance 202 vlan-based encapsulation vxlan </pre>	<pre> Leaf-02# show running-config hostname Leaf-02 ! vrf definition green rd 1:1 ! address-family ipv4 route-target export 1:1 route-target import 1:1 route-target export 1:1 stitching route-target import 1:1 stitching exit-address-family ! address-family ipv6 route-target export 1:1 route-target import 1:1 route-target export 1:1 stitching route-target import 1:1 stitching exit-address-family ! ip routing ! ip multicast-routing ! vtp mode transparent ! l2vpn evpn replication-type static default-gateway advertise ! l2vpn evpn instance 101 vlan-based encapsulation vxlan ! l2vpn evpn instance 102 vlan-based encapsulation vxlan ! l2vpn evpn instance 103 vlan-based encapsulation vxlan ! l2vpn evpn instance 104 vlan-based encapsulation vxlan ! l2vpn evpn instance 201 vlan-based encapsulation vxlan ! l2vpn evpn instance 202 vlan-based encapsulation vxlan </pre>	<pre> Leaf-03# show running-config hostname Leaf-03 ! vrf definition green rd 1:1 ! address-family ipv4 route-target export 1:1 route-target import 1:1 route-target export 1:1 stitching route-target import 1:1 stitching exit-address-family ! address-family ipv6 route-target export 1:1 route-target import 1:1 route-target export 1:1 stitching route-target import 1:1 stitching exit-address-family ! ip routing ! ip multicast-routing ! vtp mode transparent ! l2vpn evpn replication-type static default-gateway advertise ! l2vpn evpn instance 101 vlan-based encapsulation vxlan ! l2vpn evpn instance 102 vlan-based encapsulation vxlan ! l2vpn evpn instance 103 vlan-based encapsulation vxlan ! l2vpn evpn instance 104 vlan-based encapsulation vxlan ! l2vpn evpn instance 201 vlan-based encapsulation vxlan ! l2vpn evpn instance 202 vlan-based encapsulation vxlan </pre>

VTEP 1	VTEP 2	VTEP 3
<pre> ! l2vpn evpn instance 203 vlan-based encapsulation vxlan ! l2vpn evpn instance 204 vlan-based encapsulation vxlan ! system mtu 9198 ! vlan configuration 101 member evpn-instance 101 vni 10101 vlan configuration 102 member evpn-instance 102 vni 10102 vlan configuration 103 member evpn-instance 103 vni 10103 vlan configuration 104 member evpn-instance 104 vni 10104 vlan configuration 201 member evpn-instance 201 vni 10201 vlan configuration 202 member evpn-instance 202 vni 10202 vlan configuration 203 member evpn-instance 203 vni 10203 vlan configuration 204 member evpn-instance 204 vni 10204 vlan configuration 901 member vni 50901 ! vlan 101 private-vlan primary private-vlan association 102-104 ! vlan 102 private-vlan community ! vlan 103 private-vlan community ! vlan 104 private-vlan isolated ! vlan 201 private-vlan primary private-vlan association 202-204 ! vlan 202 private-vlan community ! </pre>	<pre> ! l2vpn evpn instance 203 vlan-based encapsulation vxlan ! l2vpn evpn instance 204 vlan-based encapsulation vxlan ! system mtu 9198 ! vlan configuration 101 member evpn-instance 101 vni 10101 vlan configuration 102 member evpn-instance 102 vni 10102 vlan configuration 103 member evpn-instance 103 vni 10103 vlan configuration 104 member evpn-instance 104 vni 10104 vlan configuration 201 member evpn-instance 201 vni 10201 vlan configuration 202 member evpn-instance 202 vni 10202 vlan configuration 203 member evpn-instance 203 vni 10203 vlan configuration 204 member evpn-instance 204 vni 10204 vlan configuration 901 member vni 50901 ! vlan 101 private-vlan primary private-vlan association 102-104 ! vlan 102 private-vlan community ! vlan 103 private-vlan community ! vlan 104 private-vlan isolated ! vlan 201 private-vlan primary private-vlan association 202-204 ! vlan 202 private-vlan community ! </pre>	<pre> ! l2vpn evpn instance 203 vlan-based encapsulation vxlan ! l2vpn evpn instance 204 vlan-based encapsulation vxlan ! system mtu 9198 ! vlan configuration 101 member evpn-instance 101 vni 10101 vlan configuration 102 member evpn-instance 102 vni 10102 vlan configuration 103 member evpn-instance 103 vni 10103 vlan configuration 104 member evpn-instance 104 vni 10104 vlan configuration 201 member evpn-instance 201 vni 10201 vlan configuration 202 member evpn-instance 202 vni 10202 vlan configuration 203 member evpn-instance 203 vni 10203 vlan configuration 204 member evpn-instance 204 vni 10204 vlan configuration 901 member vni 50901 ! vlan 101 private-vlan primary private-vlan association 102-104 ! vlan 102 private-vlan community ! vlan 103 private-vlan community ! vlan 104 private-vlan isolated ! vlan 201 private-vlan primary private-vlan association 202-204 ! vlan 202 private-vlan community ! </pre>

VTEP 1	VTEP 2	VTEP 3
<pre> vlan 203 private-vlan community ! vlan 204 private-vlan isolated ! vlan 901 ! interface Loopback0 ip address 172.16.255.3 255.255.255.255 ip pim sparse-mode ip ospf 1 area 0 ! interface Loopback1 ip address 172.16.254.3 255.255.255.255 ip pim sparse-mode ip ospf 1 area 0 ! interface GigabitEthernet1/0/1 no switchport ip address 172.16.13.3 255.255.255.0 ip pim sparse-mode ip ospf network point-to-point ip ospf 1 area 0 ! interface GigabitEthernet1/0/2 no switchport ip address 172.16.23.3 255.255.255.0 ip pim sparse-mode ip ospf network point-to-point ip ospf 1 area 0 ! interface GigabitEthernet1/0/3 switchport access vlan 102 switchport private-vlan host-association 101 102 switchport mode private-vlan host spanning-tree portfast ! interface GigabitEthernet1/0/4 switchport access vlan 103 switchport private-vlan host-association 101 103 switchport mode private-vlan host spanning-tree portfast ! </pre>	<pre> vlan 203 private-vlan community ! vlan 204 private-vlan isolated ! vlan 901 ! interface Loopback0 ip address 172.16.255.4 255.255.255.255 ip pim sparse-mode ip ospf 1 area 0 ! interface Loopback1 ip address 172.16.254.4 255.255.255.255 ip pim sparse-mode ip ospf 1 area 0 ! interface GigabitEthernet1/0/1 no switchport ip address 172.16.14.4 255.255.255.0 ip pim sparse-mode ip ospf network point-to-point ip ospf 1 area 0 ! interface GigabitEthernet1/0/2 no switchport ip address 172.16.24.4 255.255.255.0 ip pim sparse-mode ip ospf network point-to-point ip ospf 1 area 0 ! interface GigabitEthernet1/0/11 switchport access vlan 102 switchport private-vlan host-association 101 102 switchport mode private-vlan host spanning-tree portfast ! interface GigabitEthernet1/0/12 switchport access vlan 103 switchport private-vlan host-association 101 103 switchport mode private-vlan host spanning-tree portfast ! </pre>	<pre> vlan 203 private-vlan community ! vlan 204 private-vlan isolated ! vlan 901 ! interface Loopback0 ip address 172.16.255.5 255.255.255.255 ip pim sparse-mode ip ospf 1 area 0 ! interface Loopback1 ip address 172.16.254.5 255.255.255.255 ip pim sparse-mode ip ospf 1 area 0 ! interface GigabitEthernet0/0 vrf forwarding Mgmt-vrf ip address 10.62.149.183 255.255.255.0 negotiation auto ! interface GigabitEthernet1/0/1 no switchport ip address 172.16.15.5 255.255.255.0 ip pim sparse-mode ip ospf network point-to-point ip ospf 1 area 0 ! interface GigabitEthernet1/0/2 no switchport ip address 172.16.25.5 255.255.255.0 ip pim sparse-mode ip ospf network point-to-point ip ospf 1 area 0 ! interface GigabitEthernet1/0/16 switchport access vlan 202 switchport private-vlan host-association 201 202 switchport mode private-vlan host spanning-tree portfast ! </pre>

VTEP 1	VTEP 2	VTEP 3
<pre> interface GigabitEthernet1/0/5 switchport access vlan 104 switchport private-vlan host-association 101 104 switchport mode private-vlan host spanning-tree portfast ! interface Vlan101 vrf forwarding green ip address 10.1.101.1 255.255.255.0 private-vlan mapping 102-104 ! interface Vlan201 vrf forwarding green ip address 10.1.201.1 255.255.255.0 private-vlan mapping 202-204 ! interface Vlan901 vrf forwarding green ip unnumbered Loopback1 ipv6 enable no autostate ! interface nve1 no ip address source-interface Loopback1 host-reachability protocol bgp member vni 10101 mcast-group 225.1.1.1 member vni 10102 mcast-group 225.1.1.1 member vni 10103 mcast-group 225.1.1.1 member vni 10104 mcast-group 225.1.1.1 member vni 10201 mcast-group 225.1.1.1 member vni 10202 mcast-group 225.1.1.1 member vni 10203 mcast-group 225.1.1.1 member vni 10204 mcast-group 225.1.1.1 member vni 50901 vrf green ! router ospf 1 router-id 172.16.255.3 ! </pre>	<pre> interface GigabitEthernet1/0/13 switchport access vlan 104 switchport private-vlan host-association 101 104 switchport mode private-vlan host spanning-tree portfast ! interface Vlan101 vrf forwarding green ip address 10.1.101.1 255.255.255.0 private-vlan mapping 102-104 ! interface Vlan201 vrf forwarding green ip address 10.1.201.1 255.255.255.0 private-vlan mapping 202-204 ! interface Vlan901 vrf forwarding green ip unnumbered Loopback1 ipv6 enable no autostate ! interface nve1 no ip address source-interface Loopback1 host-reachability protocol bgp member vni 10101 mcast-group 225.1.1.1 member vni 10102 mcast-group 225.1.1.1 member vni 10103 mcast-group 225.1.1.1 member vni 10104 mcast-group 225.1.1.1 member vni 10201 mcast-group 225.1.1.1 member vni 10202 mcast-group 225.1.1.1 member vni 10203 mcast-group 225.1.1.1 member vni 10204 mcast-group 225.1.1.1 member vni 50901 vrf green ! router ospf 1 router-id 172.16.255.4 ! </pre>	<pre> interface GigabitEthernet1/0/17 switchport access vlan 203 switchport private-vlan host-association 201 203 switchport mode private-vlan host spanning-tree portfast ! interface GigabitEthernet1/0/18 switchport access vlan 204 switchport private-vlan host-association 201 204 switchport mode private-vlan host spanning-tree portfast ! interface Vlan101 vrf forwarding green ip address 10.1.101.1 255.255.255.0 private-vlan mapping 102-104 ! interface Vlan201 vrf forwarding green ip address 10.1.201.1 255.255.255.0 private-vlan mapping 202-204 ! interface Vlan901 vrf forwarding green ip unnumbered Loopback1 ipv6 enable no autostate ! interface nve1 no ip address source-interface Loopback1 host-reachability protocol bgp member vni 10101 mcast-group 225.1.1.1 member vni 10102 mcast-group 225.1.1.1 member vni 10103 mcast-group 225.1.1.1 member vni 10104 mcast-group 225.1.1.1 member vni 10201 mcast-group 225.1.1.1 member vni 10202 mcast-group 225.1.1.1 member vni 10203 mcast-group 225.1.1.1 member vni 10204 mcast-group 225.1.1.1 member vni 50901 vrf green ! </pre>

VTEP 1	VTEP 2	VTEP 3
<pre> router bgp 65001 bgp log-neighbor-changes no bgp default ipv4-unicast neighbor 172.16.255.1 remote-as 65001 neighbor 172.16.255.1 update-source Loopback0 neighbor 172.16.255.2 remote-as 65001 neighbor 172.16.255.2 update-source Loopback0 ! address-family ipv4 exit-address-family ! address-family l2vpn evpn neighbor 172.16.255.1 activate neighbor 172.16.255.1 send-community both neighbor 172.16.255.2 activate neighbor 172.16.255.2 send-community both exit-address-family ! address-family ipv4 vrf green advertise l2vpn evpn redistribute connected redistribute static exit-address-family ! ip pim rp-address 172.16.255.255 ! end Leaf-01# </pre>	<pre> router bgp 65001 bgp log-neighbor-changes no bgp default ipv4-unicast neighbor 172.16.255.1 remote-as 65001 neighbor 172.16.255.1 update-source Loopback0 neighbor 172.16.255.2 remote-as 65001 neighbor 172.16.255.2 update-source Loopback0 ! address-family ipv4 exit-address-family ! address-family l2vpn evpn neighbor 172.16.255.1 activate neighbor 172.16.255.1 send-community both neighbor 172.16.255.2 activate neighbor 172.16.255.2 send-community both exit-address-family ! address-family ipv4 vrf green advertise l2vpn evpn redistribute connected redistribute static exit-address-family ! ip pim rp-address 172.16.255.255 ! end Leaf-02# </pre>	<pre> router ospf 1 router-id 172.16.255.5 ! router bgp 65001 bgp log-neighbor-changes no bgp default ipv4-unicast neighbor 172.16.255.1 remote-as 65001 neighbor 172.16.255.1 update-source Loopback0 neighbor 172.16.255.2 remote-as 65001 neighbor 172.16.255.2 update-source Loopback0 ! address-family ipv4 exit-address-family ! address-family l2vpn evpn neighbor 172.16.255.1 activate neighbor 172.16.255.1 send-community both neighbor 172.16.255.2 activate neighbor 172.16.255.2 send-community both exit-address-family ! address-family ipv4 vrf green advertise l2vpn evpn redistribute connected redistribute static exit-address-family ! ip pim rp-address 172.16.255.255 ! end Leaf-03# </pre>

Table 2: Configuring Spine Switch 1 and Spine Switch 2 for PVLAN Extension in a BGP EVPN VXLAN Fabric

Spine Switch 1	Spine Switch 2
<pre> Spine-01# show running-config hostname Spine-01 ! ip routing ! ip multicast-routing ! system mtu 9198 ! interface Loopback0 ip address 172.16.255.1 255.255.255.255 ip ospf 1 area 0 ! interface Loopback1 ip address 172.16.254.1 255.255.255.255 ip ospf 1 area 0 ! interface Loopback2 ip address 172.16.255.255 255.255.255.255 ip pim sparse-mode ip ospf 1 area 0 ! interface GigabitEthernet1/0/1 no switchport ip address 172.16.13.1 255.255.255.0 ip pim sparse-mode ip ospf network point-to-point ip ospf 1 area 0 ! interface GigabitEthernet1/0/2 no switchport ip address 172.16.14.1 255.255.255.0 ip pim sparse-mode ip ospf network point-to-point ip ospf 1 area 0 ! interface GigabitEthernet1/0/3 no switchport ip address 172.16.15.1 255.255.255.0 ip pim sparse-mode ip ospf network point-to-point ip ospf 1 area 0 ! router ospf 1 router-id 172.16.255.1 ! router bgp 65001 bgp router-id 172.16.255.1 bgp log-neighbor-changes no bgp default ipv4-unicast neighbor 172.16.255.2 remote-as 65001 neighbor 172.16.255.2 update-source Loopback0 neighbor 172.16.255.3 remote-as 65001 neighbor 172.16.255.3 update-source Loopback0 neighbor 172.16.255.4 remote-as 65001 neighbor 172.16.255.4 update-source Loopback0 neighbor 172.16.255.5 remote-as 65001 neighbor 172.16.255.5 update-source Loopback0 ! </pre>	<pre> Spine-02# show running-config hostname Spine-02 ! ip routing ! ip multicast-routing ! system mtu 9198 ! interface Loopback0 ip address 172.16.255.2 255.255.255.255 ip ospf 1 area 0 ! interface Loopback1 ip address 172.16.254.2 255.255.255.255 ip ospf 1 area 0 ! interface Loopback2 ip address 172.16.255.255 255.255.255.255 ip pim sparse-mode ip ospf 1 area 0 ! interface GigabitEthernet1/0/1 no switchport ip address 172.16.23.2 255.255.255.0 ip pim sparse-mode ip ospf network point-to-point ip ospf 1 area 0 ! interface GigabitEthernet1/0/2 no switchport ip address 172.16.24.2 255.255.255.0 ip pim sparse-mode ip ospf network point-to-point ip ospf 1 area 0 ! interface GigabitEthernet1/0/3 no switchport ip address 172.16.25.2 255.255.255.0 ip pim sparse-mode ip ospf network point-to-point ip ospf 1 area 0 ! router ospf 1 router-id 172.16.255.2 ! router bgp 65001 bgp router-id 172.16.255.2 bgp log-neighbor-changes no bgp default ipv4-unicast neighbor 172.16.255.1 remote-as 65001 neighbor 172.16.255.1 update-source Loopback0 neighbor 172.16.255.3 remote-as 65001 neighbor 172.16.255.3 update-source Loopback0 neighbor 172.16.255.4 remote-as 65001 neighbor 172.16.255.4 update-source Loopback0 neighbor 172.16.255.5 remote-as 65001 neighbor 172.16.255.5 update-source Loopback0 ! </pre>

Spine Switch 1	Spine Switch 2
<pre> address-family ipv4 exit-address-family ! address-family l2vpn evpn neighbor 172.16.255.2 activate neighbor 172.16.255.2 send-community both neighbor 172.16.255.2 route-reflector-client neighbor 172.16.255.3 activate neighbor 172.16.255.3 send-community both neighbor 172.16.255.3 route-reflector-client neighbor 172.16.255.4 activate neighbor 172.16.255.4 send-community both neighbor 172.16.255.4 route-reflector-client neighbor 172.16.255.5 activate neighbor 172.16.255.5 send-community both neighbor 172.16.255.5 route-reflector-client exit-address-family ! ip pim rp-address 172.16.255.255 ip msdp peer 172.16.254.2 connect-source Loopback1 remote-as 65001 ip msdp cache-sa-state ! end Spine-01# </pre>	<pre> address-family ipv4 exit-address-family ! address-family l2vpn evpn neighbor 172.16.255.1 activate neighbor 172.16.255.1 send-community both neighbor 172.16.255.1 route-reflector-client neighbor 172.16.255.3 activate neighbor 172.16.255.3 send-community both neighbor 172.16.255.3 route-reflector-client neighbor 172.16.255.4 activate neighbor 172.16.255.4 send-community both neighbor 172.16.255.4 route-reflector-client neighbor 172.16.255.5 activate neighbor 172.16.255.5 send-community both neighbor 172.16.255.5 route-reflector-client exit-address-family ! ip pim rp-address 172.16.255.255 ip msdp peer 172.16.254.1 connect-source Loopback1 remote-as 65001 ip msdp cache-sa-state ! end Spine-02# </pre>

Verifying PVLAN Extension in a BGP EVPN VXLAN Fabric

The following sections provide sample outputs for **show** commands to verify the PVLAN extension on the devices in the topology configured above:

- [#unique_235 unique_235_Connect_42_section_ad2_bfg_dqb](#)
- [#unique_235 unique_235_Connect_42_section_b4h_bfg_dqb](#)
- [#unique_235 unique_235_Connect_42_section_p1l_bfg_dqb](#)
- [#unique_235 unique_235_Connect_42_section_cl4_bfg_dqb](#)
- [#unique_235 unique_235_Connect_42_section_mbs_bfg_dqb](#)

Outputs to Verify the Configuration on VTEP 1

The following example shows the output for the **show vlan private-vlan** command on VTEP 1:

```
Leaf-01# show vlan private-vlan
```

Primary	Secondary	Type	Ports
101	102	community	Gi1/0/3
101	103	community	Gi1/0/4
101	104	isolated	Gi1/0/5
201	202	community	
201	203	community	
201	204	isolated	

```
Leaf-01#
```

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

```
Leaf-01# show ip arp vrf green
Protocol Address Age (min) Hardware Addr Type Interface
Internet 10.1.101.1 - 10b3.d56a.8fc1 ARPA Vlan101
Internet 10.1.101.3 95 f4cf.e243.34c2 ARPA Vlan101 pv 102
Internet 10.1.101.4 95 f4cf.e243.34c3 ARPA Vlan101 pv 103
Internet 10.1.101.5 95 f4cf.e243.34c4 ARPA Vlan101 pv 104
Internet 10.1.201.1 - 10b3.d56a.8fcc ARPA Vlan201
Internet 172.16.254.3 - 10b3.d56a.8fc8 ARPA Vlan901

Leaf-01#
```

The following example shows the output for the **show mac address-table vlan vlan-id** command on VTEP 1:

```
Leaf-01# show mac address-table vlan 101
Mac Address Table
-----
Vlan Mac Address Type Ports
----
101 10b3.d56a.8fc1 STATIC V1101
101 7c21.0dbd.9541 STATIC V1101
101 f4cf.e243.34c2 DYNAMIC pv Gi1/0/3
101 f4cf.e243.34c3 DYNAMIC pv Gi1/0/4
101 f4cf.e243.34c4 DYNAMIC pv Gi1/0/5
Total Mac Addresses for this criterion: 5

Leaf-01#
```

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

```
Leaf-01# show l2vpn evpn peers vxlan
Interface VNI Peer-IP Num routes eVNI UP time
-----
nve1 10101 172.16.254.4 8 10101 01:33:29
nve1 10102 172.16.254.4 1 10102 01:33:29
nve1 10103 172.16.254.4 1 10103 01:33:29
nve1 10104 172.16.254.4 1 10104 00:01:37

Leaf-01#
```

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

```
Leaf-01# show nve peer
Interface VNI Type Peer-IP RMAC/Num_RTs eVNI state flags UP time
nve1 50901 L3CP 172.16.254.5 7c21.0dbd.2748 50901 UP A/M/4 01:33:30
nve1 50901 L3CP 172.16.254.4 7c21.0dbd.9548 50901 UP A/M/4 01:33:29
nve1 10101 L2CP 172.16.254.4 8 10101 UP N/A 01:33:29
nve1 10102 L2CP 172.16.254.4 1 10102 UP N/A 01:33:29
nve1 10103 L2CP 172.16.254.4 1 10103 UP N/A 01:33:29
nve1 10104 L2CP 172.16.254.4 1 10104 UP N/A 00:01:37

Leaf-01#
```

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

```
Leaf-01# show l2vpn evpn mac local
MAC Address      EVI      VLAN      ESI                      Ether Tag  Next Hop(s)
-----
f4cf.e243.34c2  101      101      0000.0000.0000.0000.0000  0          Gi1/0/3:101
f4cf.e243.34c3  101      101      0000.0000.0000.0000.0000  0          Gi1/0/4:101
f4cf.e243.34c4  101      101      0000.0000.0000.0000.0000  0          Gi1/0/5:101
f4cf.e243.34c2  102      102      0000.0000.0000.0000.0000  0          Gi1/0/3:102
f4cf.e243.34c3  103      103      0000.0000.0000.0000.0000  0          Gi1/0/4:103
f4cf.e243.34c4  104      104      0000.0000.0000.0000.0000  0          Gi1/0/5:104
```

Leaf-01#

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

```
Leaf-01# show l2vpn evpn mac remote
MAC Address      EVI      VLAN      ESI                      Ether Tag  Next Hop(s)
-----
44d3.ca28.6cc3  101      101      0000.0000.0000.0000.0000  0          172.16.254.4
44d3.ca28.6cc4  101      101      0000.0000.0000.0000.0000  0          172.16.254.4
44d3.ca28.6cc5  101      101      0000.0000.0000.0000.0000  0          172.16.254.4
44d3.ca28.6cc3  102      102      0000.0000.0000.0000.0000  0          172.16.254.4
44d3.ca28.6cc4  103      103      0000.0000.0000.0000.0000  0          172.16.254.4
44d3.ca28.6cc5  104      104      0000.0000.0000.0000.0000  0          172.16.254.4
44d3.ca28.6cc6  201      201      0000.0000.0000.0000.0000  0          172.16.254.5
44d3.ca28.6cc7  201      201      0000.0000.0000.0000.0000  0          172.16.254.5
44d3.ca28.6cc8  201      201      0000.0000.0000.0000.0000  0          172.16.254.5
44d3.ca28.6cc6  202      202      0000.0000.0000.0000.0000  0          172.16.254.5
44d3.ca28.6cc7  203      203      0000.0000.0000.0000.0000  0          172.16.254.5
44d3.ca28.6cc8  204      204      0000.0000.0000.0000.0000  0          172.16.254.5
```

Leaf-01#

The following example shows the output for the **show l2route evpn mac ip** command on VTEP 1:

```
Leaf-01# show l2route evpn mac ip
EVI      ETag  Prod  Mac Address      Host IP      Next Hop(s)
-----
101      0     L2VPN 10b3.d56a.8fc1   10.1.101.1   V1101:0
101      0     BGP   44d3.ca28.6cc3   10.1.101.13   V:10101 172.16.254.4
101      0     BGP   44d3.ca28.6cc4   10.1.101.14   V:10101 172.16.254.4
101      0     BGP   44d3.ca28.6cc5   10.1.101.15   V:10101 172.16.254.4
101      0     BGP   7c21.0dbd.9541   10.1.101.1   V:10101 172.16.254.4
101      0     L2VPN f4cf.e243.34c2   10.1.101.3   Gi1/0/3:101
101      0     L2VPN f4cf.e243.34c3   10.1.101.4   Gi1/0/4:101
101      0     L2VPN f4cf.e243.34c4   10.1.101.5   Gi1/0/5:101
201      0     BGP   44d3.ca28.6cc6   10.1.102.3   V:10201 172.16.254.5
201      0     BGP   44d3.ca28.6cc7   10.1.102.4   V:10201 172.16.254.5
201      0     BGP   44d3.ca28.6cc8   10.1.102.5   V:10201 172.16.254.5
201      0     BGP   7c21.0dbd.274c   10.1.201.1   V:10201 172.16.254.5
```

Leaf-01#

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

```
Leaf-01# show bgp l2vpn evpn
BGP table version is 70, local router ID is 172.16.255.3
```

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: 172.16.255.3:101					
*> [2] [172.16.255.3:101] [0] [48] [10B3D56A8FC1] [32] [10.1.101.1]/24	::			32768	?
*>i [2] [172.16.255.3:101] [0] [48] [44D3CA286CC3] [32] [10.1.101.13]/24	172.16.254.4	0	100	0	?
*>i [2] [172.16.255.3:101] [0] [48] [44D3CA286CC4] [32] [10.1.101.14]/24	172.16.254.4	0	100	0	?
*>i [2] [172.16.255.3:101] [0] [48] [44D3CA286CC5] [32] [10.1.101.15]/24	172.16.254.4	0	100	0	?
*>i [2] [172.16.255.3:101] [0] [48] [7C210DBD9541] [32] [10.1.101.1]/24	172.16.254.4	0	100	0	?
*> [2] [172.16.255.3:101] [0] [48] [F4CFE24334C2] [32] [10.1.101.3]/24	::			32768	?
*> [2] [172.16.255.3:101] [0] [48] [F4CFE24334C3] [32] [10.1.101.4]/24	::			32768	?
*> [2] [172.16.255.3:101] [0] [48] [F4CFE24334C4] [32] [10.1.101.5]/24	::			32768	?
Route Distinguisher: 172.16.255.3:102					
>i [2] [172.16.255.3:102] [0] [48] [44D3CA286CC3] [0] []/20	172.16.254.4	0	100	0	?
> [2] [172.16.255.3:102] [0] [48] [F4CFE24334C2] [0] []/20	::			32768	?
Route Distinguisher: 172.16.255.3:103					
>i [2] [172.16.255.3:103] [0] [48] [44D3CA286CC4] [0] []/20	172.16.254.4	0	100	0	?
> [2] [172.16.255.3:103] [0] [48] [F4CFE24334C3] [0] []/20	::			32768	?
Route Distinguisher: 172.16.255.3:104					
>i [2] [172.16.255.3:104] [0] [48] [44D3CA286CC5] [0] []/20	172.16.254.4	0	100	0	?
> [2] [172.16.255.3:104] [0] [48] [F4CFE24334C4] [0] []/20	::			32768	?
Route Distinguisher: 172.16.255.3:201					
*>i [2] [172.16.255.3:201] [0] [48] [44D3CA286CC6] [32] [10.1.102.3]/24	172.16.254.5	0	100	0	?
*>i [2] [172.16.255.3:201] [0] [48] [44D3CA286CC7] [32] [10.1.102.4]/24	172.16.254.5	0	100	0	?
*>i [2] [172.16.255.3:201] [0] [48] [44D3CA286CC8] [32] [10.1.102.5]/24	172.16.254.5	0	100	0	?
*>i [2] [172.16.255.3:201] [0] [48] [7C210DBD274C] [32] [10.1.201.1]/24	172.16.254.5	0	100	0	?
Route Distinguisher: 172.16.255.3:202					
>i [2] [172.16.255.3:202] [0] [48] [44D3CA286CC6] [0] []/20	172.16.254.5	0	100	0	?
Route Distinguisher: 172.16.255.3:203					
>i [2] [172.16.255.3:203] [0] [48] [44D3CA286CC7] [0] []/20	172.16.254.5	0	100	0	?
Route Distinguisher: 172.16.255.3:204					
>i [2] [172.16.255.3:204] [0] [48] [44D3CA286CC8] [0] []/20	172.16.254.5	0	100	0	?
Route Distinguisher: 172.16.255.4:101					
*>i [2] [172.16.255.4:101] [0] [48] [44D3CA286CC3] [32] [10.1.101.13]/24	172.16.254.4	0	100	0	?
* i [2] [172.16.255.4:101] [0] [48] [44D3CA286CC4] [32] [10.1.101.14]/24	172.16.254.4	0	100	0	?

```

172.16.254.4          0    100    0 ?
* i                  172.16.254.4          0    100    0 ?
*>i [2] [172.16.255.4:101] [0] [48] [44D3CA286CC5] [32] [10.1.101.15]/24
172.16.254.4          0    100    0 ?
* i                  172.16.254.4          0    100    0 ?
*>i [2] [172.16.255.4:101] [0] [48] [7C210DBD9541] [32] [10.1.101.1]/24
172.16.254.4          0    100    0 ?
* i                  172.16.254.4          0    100    0 ?
Route Distinguisher: 172.16.255.4:102
*>i [2] [172.16.255.4:102] [0] [48] [44D3CA286CC3] [0] [*]/20
172.16.254.4          0    100    0 ?
* i                  172.16.254.4          0    100    0 ?
Route Distinguisher: 172.16.255.4:103
*>i [2] [172.16.255.4:103] [0] [48] [44D3CA286CC4] [0] [*]/20
172.16.254.4          0    100    0 ?
* i                  172.16.254.4          0    100    0 ?
Route Distinguisher: 172.16.255.4:104
* i [2] [172.16.255.4:104] [0] [48] [44D3CA286CC5] [0] [*]/20
172.16.254.4          0    100    0 ?
*>i                  172.16.254.4          0    100    0 ?
Route Distinguisher: 172.16.255.5:201
*>i [2] [172.16.255.5:201] [0] [48] [44D3CA286CC6] [32] [10.1.102.3]/24
172.16.254.5          0    100    0 ?
* i                  172.16.254.5          0    100    0 ?
*>i [2] [172.16.255.5:201] [0] [48] [44D3CA286CC7] [32] [10.1.102.4]/24
172.16.254.5          0    100    0 ?
* i                  172.16.254.5          0    100    0 ?
*>i [2] [172.16.255.5:201] [0] [48] [44D3CA286CC8] [32] [10.1.102.5]/24
172.16.254.5          0    100    0 ?
* i                  172.16.254.5          0    100    0 ?
*>i [2] [172.16.255.5:201] [0] [48] [7C210DBD274C] [32] [10.1.201.1]/24
172.16.254.5          0    100    0 ?
Network      Next Hop      Metric LocPrf Weight Path
* i          172.16.254.5          0    100    0 ?
Route Distinguisher: 172.16.255.5:202
*>i [2] [172.16.255.5:202] [0] [48] [44D3CA286CC6] [0] [*]/20
172.16.254.5          0    100    0 ?
* i          172.16.254.5          0    100    0 ?
Route Distinguisher: 172.16.255.5:203
*>i [2] [172.16.255.5:203] [0] [48] [44D3CA286CC7] [0] [*]/20
172.16.254.5          0    100    0 ?
* i          172.16.254.5          0    100    0 ?
Route Distinguisher: 172.16.255.5:204
*>i [2] [172.16.255.5:204] [0] [48] [44D3CA286CC8] [0] [*]/20
172.16.254.5          0    100    0 ?
* i          172.16.254.5          0    100    0 ?
Route Distinguisher: 1:1 (default for vrf green)
*> [5] [1:1] [0] [24] [10.1.101.0]/17
0.0.0.0          0          32768 ?
*>i [5] [1:1] [0] [24] [10.1.201.0]/17
172.16.254.5          0    100    0 ?
* i          172.16.254.5          0    100    0 ?

Leaf-01#

```

Outputs to Verify the Configuration on VTEP 2

The following example shows the output for the **show vlan private-vlan** command on VTEP 2:

```
Leaf-02# show vlan private-vlan
```

```
Primary Secondary Type Ports
```

```
-----
```

```

101      102      community      Gi1/0/11
101      103      community      Gi1/0/12
101      104      isolated       Gi1/0/13
201      202      community
201      203      community
201      204      isolated

```

Leaf-02#

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

```

Leaf-02# show ip arp vrf green
Protocol Address          Age (min)  Hardware Addr  Type   Interface
Internet 10.1.101.1             -          7c21.0dbd.9541 ARPA   Vlan101
Internet 10.1.101.13           95         44d3.ca28.6cc3 ARPA   Vlan101 pv 102
Internet 10.1.101.14           95         44d3.ca28.6cc4 ARPA   Vlan101 pv 103
Internet 10.1.101.15           95         44d3.ca28.6cc5 ARPA   Vlan101 pv 104
Internet 10.1.201.1            -          7c21.0dbd.954c ARPA   Vlan201
Internet 172.16.254.4          -          7c21.0dbd.9548 ARPA   Vlan901

```

Leaf-02#

The following example shows the output for the **show mac address-table vlan vlan-id** command on VTEP 2:

```

Leaf-02# show mac address-table vlan 101
Mac Address Table
-----
Vlan    Mac Address      Type        Ports
----    -
101     10b3.d56a.8fc1   STATIC     Vl101
101     44d3.ca28.6cc3   DYNAMIC pv Gi1/0/11
101     44d3.ca28.6cc4   DYNAMIC pv Gi1/0/12
101     44d3.ca28.6cc5   DYNAMIC pv Gi1/0/13
101     7c21.0dbd.9541   STATIC     Vl101
Total Mac Addresses for this criterion: 5

```

Leaf-02#

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

```

Leaf-02# show l2vpn evpn peers vxlan
Interface VNI      Peer-IP      Num routes eVNI      UP time
-----
nve1      10101     172.16.254.3 8          10101     01:34:10
nve1      10102     172.16.254.3 1          10102     01:34:10
nve1      10103     172.16.254.3 1          10103     01:34:10
nve1      10104     172.16.254.3 1          10104     00:02:13

```

Leaf-02#

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

```

Leaf-02# show nve peer
Interface VNI      Type Peer-IP      RMAC/Num_RTs  eVNI      state flags UP time
nve1      50901    L3CP 172.16.254.3 10b3.d56a.8fc8 50901      UP   A/M/4 01:34:10
nve1      50901    L3CP 172.16.254.5 7c21.0dbd.2748 50901      UP   A/M/4 01:34:10

```

Configuration Examples for Private VLANs in a BGP EVPN VXLAN Fabric

```

nve1      10101    L2CP 172.16.254.3    8          10101    UP    N/A    01:34:10
nve1      10102    L2CP 172.16.254.3    1          10102    UP    N/A    01:34:10
nve1      10103    L2CP 172.16.254.3    1          10103    UP    N/A    01:34:10
nve1      10104    L2CP 172.16.254.3    1          10104    UP    N/A    00:02:13

```

Leaf-02#

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

```

Leaf-02# show l2vpn evpn mac local
MAC Address      EVI      VLAN  ESI                                     Ether Tag  Next Hop(s)
-----
44d3.ca28.6cc3  101      101   0000.0000.0000.0000.0000  0          Gi1/0/11:101
44d3.ca28.6cc4  101      101   0000.0000.0000.0000.0000  0          Gi1/0/12:101
44d3.ca28.6cc5  101      101   0000.0000.0000.0000.0000  0          Gi1/0/13:101
44d3.ca28.6cc3  102      102   0000.0000.0000.0000.0000  0          Gi1/0/11:102
44d3.ca28.6cc4  103      103   0000.0000.0000.0000.0000  0          Gi1/0/12:103
44d3.ca28.6cc5  104      104   0000.0000.0000.0000.0000  0          Gi1/0/13:104

```

Leaf-02#

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

```

Leaf-02# show l2vpn evpn mac remote
MAC Address      EVI      VLAN  ESI                                     Ether Tag  Next Hop(s)
-----
f4cf.e243.34c2  101      101   0000.0000.0000.0000.0000  0          172.16.254.3
f4cf.e243.34c3  101      101   0000.0000.0000.0000.0000  0          172.16.254.3
f4cf.e243.34c4  101      101   0000.0000.0000.0000.0000  0          172.16.254.3
f4cf.e243.34c2  102      102   0000.0000.0000.0000.0000  0          172.16.254.3
f4cf.e243.34c3  103      103   0000.0000.0000.0000.0000  0          172.16.254.3
f4cf.e243.34c4  104      104   0000.0000.0000.0000.0000  0          172.16.254.3
44d3.ca28.6cc6  201      201   0000.0000.0000.0000.0000  0          172.16.254.5
44d3.ca28.6cc7  201      201   0000.0000.0000.0000.0000  0          172.16.254.5
44d3.ca28.6cc8  201      201   0000.0000.0000.0000.0000  0          172.16.254.5
44d3.ca28.6cc6  202      202   0000.0000.0000.0000.0000  0          172.16.254.5
44d3.ca28.6cc7  203      203   0000.0000.0000.0000.0000  0          172.16.254.5
44d3.ca28.6cc8  204      204   0000.0000.0000.0000.0000  0          172.16.254.5

```

Leaf-02#

The following example shows the output for the **show l2route evpn mac ip** command on VTEP 2:

```

Leaf-02# show l2route evpn mac ip
EVI      ETag  Prod  Mac Address      Host IP      Next Hop(s)
-----
101      0     BGP   10b3.d56a.8fc1   10.1.101.1   V:10101 172.16.254.3
101      0     L2VPN 44d3.ca28.6cc3   10.1.101.13   Gi1/0/11:101
101      0     L2VPN 44d3.ca28.6cc4   10.1.101.14   Gi1/0/12:101
101      0     L2VPN 44d3.ca28.6cc5   10.1.101.15   Gi1/0/13:101
101      0     L2VPN 7c21.0dbd.9541   10.1.101.1   V1101:0
101      0     BGP   f4cf.e243.34c2   10.1.101.3   V:10101 172.16.254.3
101      0     BGP   f4cf.e243.34c3   10.1.101.4   V:10101 172.16.254.3
101      0     BGP   f4cf.e243.34c4   10.1.101.5   V:10101 172.16.254.3
201      0     BGP   44d3.ca28.6cc6   10.1.102.3   V:10201 172.16.254.5
201      0     BGP   44d3.ca28.6cc7   10.1.102.4   V:10201 172.16.254.5
201      0     BGP   44d3.ca28.6cc8   10.1.102.5   V:10201 172.16.254.5
201      0     BGP   7c21.0dbd.274c   10.1.201.1   V:10201 172.16.254.5

```


Leaf-02#

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

```
Leaf-02# show bgp l2vpn evpn
BGP table version is 65, local router ID is 172.16.255.4
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: 172.16.255.3:101
* i   [2] [172.16.255.3:101] [0] [48] [10B3D56A8FC1] [32] [10.1.101.1]/24
      172.16.254.3          0      100      0 ?
*>i   172.16.254.3          0      100      0 ?
* i   [2] [172.16.255.3:101] [0] [48] [F4CFE24334C2] [32] [10.1.101.3]/24
      172.16.254.3          0      100      0 ?
*>i   172.16.254.3          0      100      0 ?
* i   [2] [172.16.255.3:101] [0] [48] [F4CFE24334C3] [32] [10.1.101.4]/24
      172.16.254.3          0      100      0 ?
*>i   172.16.254.3          0      100      0 ?
* i   [2] [172.16.255.3:101] [0] [48] [F4CFE24334C4] [32] [10.1.101.5]/24
      172.16.254.3          0      100      0 ?
*>i   172.16.254.3          0      100      0 ?
Route Distinguisher: 172.16.255.3:102
* i   [2] [172.16.255.3:102] [0] [48] [F4CFE24334C2] [0] [*]/20
      172.16.254.3          0      100      0 ?
*>i   172.16.254.3          0      100      0 ?
Route Distinguisher: 172.16.255.3:103
* i   [2] [172.16.255.3:103] [0] [48] [F4CFE24334C3] [0] [*]/20
      172.16.254.3          0      100      0 ?
*>i   172.16.254.3          0      100      0 ?
Route Distinguisher: 172.16.255.3:104
*>i   [2] [172.16.255.3:104] [0] [48] [F4CFE24334C4] [0] [*]/20
      172.16.254.3          0      100      0 ?
* i   172.16.254.3          0      100      0 ?
Route Distinguisher: 172.16.255.4:101
*>i   [2] [172.16.255.4:101] [0] [48] [10B3D56A8FC1] [32] [10.1.101.1]/24
      172.16.254.3          0      100      0 ?
*>   [2] [172.16.255.4:101] [0] [48] [44D3CA286CC3] [32] [10.1.101.13]/24
      ::                      32768 ?
*>   [2] [172.16.255.4:101] [0] [48] [44D3CA286CC4] [32] [10.1.101.14]/24
      ::                      32768 ?
*>   [2] [172.16.255.4:101] [0] [48] [44D3CA286CC5] [32] [10.1.101.15]/24
      ::                      32768 ?
*>   [2] [172.16.255.4:101] [0] [48] [7C210DBD9541] [32] [10.1.101.1]/24
      ::                      32768 ?
*>i   [2] [172.16.255.4:101] [0] [48] [F4CFE24334C2] [32] [10.1.101.3]/24
      172.16.254.3          0      100      0 ?
*>i   [2] [172.16.255.4:101] [0] [48] [F4CFE24334C3] [32] [10.1.101.4]/24
      Network          Next Hop          Metric LocPrf Weight Path
*>i   [2] [172.16.255.4:101] [0] [48] [F4CFE24334C4] [32] [10.1.101.5]/24
      172.16.254.3          0      100      0 ?
Route Distinguisher: 172.16.255.4:102
*>   [2] [172.16.255.4:102] [0] [48] [44D3CA286CC3] [0] [*]/20
      ::                      32768 ?
*>i   [2] [172.16.255.4:102] [0] [48] [F4CFE24334C2] [0] [*]/20
      172.16.254.3          0      100      0 ?
```

Configuration Examples for Private VLANs in a BGP EVPN VXLAN Fabric

```

Route Distinguisher: 172.16.255.4:103
*> [2][172.16.255.4:103][0][48][44D3CA286CC4][0][*]/20
:: 32768 ?
*>i [2][172.16.255.4:103][0][48][F4CFE24334C3][0][*]/20
172.16.254.3 0 100 0 ?
Route Distinguisher: 172.16.255.4:104
*> [2][172.16.255.4:104][0][48][44D3CA286CC5][0][*]/20
:: 32768 ?
*>i [2][172.16.255.4:104][0][48][F4CFE24334C4][0][*]/20
172.16.254.3 0 100 0 ?
Route Distinguisher: 172.16.255.4:201
*>i [2][172.16.255.4:201][0][48][44D3CA286CC6][32][10.1.102.3]/24
172.16.254.5 0 100 0 ?
*>i [2][172.16.255.4:201][0][48][44D3CA286CC7][32][10.1.102.4]/24
172.16.254.5 0 100 0 ?
*>i [2][172.16.255.4:201][0][48][44D3CA286CC8][32][10.1.102.5]/24
172.16.254.5 0 100 0 ?
*>i [2][172.16.255.4:201][0][48][7C210DBD274C][32][10.1.201.1]/24
172.16.254.5 0 100 0 ?
Route Distinguisher: 172.16.255.4:202
*>i [2][172.16.255.4:202][0][48][44D3CA286CC6][0][*]/20
172.16.254.5 0 100 0 ?
Route Distinguisher: 172.16.255.4:203
*>i [2][172.16.255.4:203][0][48][44D3CA286CC7][0][*]/20
172.16.254.5 0 100 0 ?
Route Distinguisher: 172.16.255.4:204
*>i [2][172.16.255.4:204][0][48][44D3CA286CC8][0][*]/20
172.16.254.5 0 100 0 ?
Route Distinguisher: 172.16.255.5:201
*>i [2][172.16.255.5:201][0][48][44D3CA286CC6][32][10.1.102.3]/24
172.16.254.5 0 100 0 ?
* i 172.16.254.5 0 100 0 ?
*>i [2][172.16.255.5:201][0][48][44D3CA286CC7][32][10.1.102.4]/24
172.16.254.5 0 100 0 ?
* i 172.16.254.5 0 100 0 ?
*>i [2][172.16.255.5:201][0][48][44D3CA286CC8][32][10.1.102.5]/24
172.16.254.5 0 100 0 ?
* i 172.16.254.5 0 100 0 ?
*>i [2][172.16.255.5:201][0][48][7C210DBD274C][32][10.1.201.1]/24
172.16.254.5 0 100 0 ?
Network Next Hop Metric LocPrf Weight Path
* i 172.16.254.5 0 100 0 ?
Route Distinguisher: 172.16.255.5:202
*>i [2][172.16.255.5:202][0][48][44D3CA286CC6][0][*]/20
172.16.254.5 0 100 0 ?
* i 172.16.254.5 0 100 0 ?
Route Distinguisher: 172.16.255.5:203
*>i [2][172.16.255.5:203][0][48][44D3CA286CC7][0][*]/20
172.16.254.5 0 100 0 ?
* i 172.16.254.5 0 100 0 ?
Route Distinguisher: 172.16.255.5:204
*>i [2][172.16.255.5:204][0][48][44D3CA286CC8][0][*]/20
172.16.254.5 0 100 0 ?
* i 172.16.254.5 0 100 0 ?
Route Distinguisher: 1:1 (default for vrf green)
* i [5][1:1][0][24][10.1.101.0]/17
172.16.254.3 0 100 0 ?
* i 172.16.254.3 0 100 0 ?
*> 0.0.0.0 0 32768 ?
*>i [5][1:1][0][24][10.1.201.0]/17
172.16.254.5 0 100 0 ?
* i 172.16.254.5 0 100 0 ?

```

Leaf-02#

Outputs to Verify the Configuration on VTEP 3

The following example shows the output for the **show vlan private-vlan** command on VTEP 3:

```
Leaf-03# show vlan private-vlan
```

Primary	Secondary	Type	Ports
101	102	community	
101	103	community	
101	104	isolated	
201	202	community	Gi1/0/16
201	203	community	Gi1/0/17
201	204	isolated	Gi1/0/18

```
Leaf-03#
```

The following example shows the output for the **show ip arp vrf green** command on VTEP 3:

```
Leaf-03# show ip arp vrf green
```

Protocol	Address	Age (min)	Hardware Addr	Type	Interface
Internet	10.1.101.1	-	7c21.0dbd.2741	ARPA	Vlan101
Internet	10.1.201.1	-	7c21.0dbd.274c	ARPA	Vlan201
Internet	172.16.254.5	-	7c21.0dbd.2748	ARPA	Vlan901

```
Leaf-03#
```

The following example shows the output for the **show mac address-table vlan *vlan-id*** command on VTEP 3:

```
Leaf-03# show mac address-table vlan 101
```

```
Mac Address Table
```

Vlan	Mac Address	Type	Ports
101	7c21.0dbd.2741	STATIC	Vl101

```
Total Mac Addresses for this criterion: 1
```

```
Leaf-03#
```

The following example shows the output for the **show l2vpn evpn peers vxlan** command on VTEP 3:

```
Leaf-03# show l2vpn evpn peers vxlan
```

```
Leaf-03#
```

The following example shows the output for the **show nve peer** command on VTEP 3:

```
Leaf-03# show nve peer
```

Interface	VNI	Type	Peer-IP	RMAC/Num_RTs	eVNI	state	flags	UP time
nve1	50901	L3CP	172.16.254.3	10b3.d56a.8fc8	50901	UP	A/M/4	01:34:51
nve1	50901	L3CP	172.16.254.4	7c21.0dbd.9548	50901	UP	A/M/4	01:34:51

```
Leaf-03#
```

The following example shows the output for the **show l2vpn evpn mac local** command on VTEP 3:

```
Leaf-03# show l2vpn evpn mac local
MAC Address      EVI      VLAN  ESI                                     Ether Tag  Next Hop(s)
-----
44d3.ca28.6cc6 201      201   0000.0000.0000.0000.0000 0             Gi1/0/16:201
44d3.ca28.6cc7 201      201   0000.0000.0000.0000.0000 0             Gi1/0/17:201
44d3.ca28.6cc8 201      201   0000.0000.0000.0000.0000 0             Gi1/0/18:201
44d3.ca28.6cc6 202      202   0000.0000.0000.0000.0000 0             Gi1/0/16:202
44d3.ca28.6cc7 203      203   0000.0000.0000.0000.0000 0             Gi1/0/17:203
44d3.ca28.6cc8 204      204   0000.0000.0000.0000.0000 0             Gi1/0/18:204
```

Leaf-03#

The following example shows the output for the **show l2vpn evpn mac remote** command on VTEP 3:

```
Leaf-03# show l2vpn evpn mac remote
MAC Address      EVI      VLAN  ESI                                     Ether Tag  Next Hop(s)
-----
44d3.ca28.6cc3 101      101   0000.0000.0000.0000.0000 0             172.16.254.4
44d3.ca28.6cc4 101      101   0000.0000.0000.0000.0000 0             172.16.254.4
44d3.ca28.6cc5 101      101   0000.0000.0000.0000.0000 0             172.16.254.4
f4cf.e243.34c2 101      101   0000.0000.0000.0000.0000 0             172.16.254.3
f4cf.e243.34c3 101      101   0000.0000.0000.0000.0000 0             172.16.254.3
f4cf.e243.34c4 101      101   0000.0000.0000.0000.0000 0             172.16.254.3
44d3.ca28.6cc3 102      102   0000.0000.0000.0000.0000 0             172.16.254.4
f4cf.e243.34c2 102      102   0000.0000.0000.0000.0000 0             172.16.254.3
44d3.ca28.6cc4 103      103   0000.0000.0000.0000.0000 0             172.16.254.4
f4cf.e243.34c3 103      103   0000.0000.0000.0000.0000 0             172.16.254.3
44d3.ca28.6cc5 104      104   0000.0000.0000.0000.0000 0             172.16.254.4
f4cf.e243.34c4 104      104   0000.0000.0000.0000.0000 0             172.16.254.3
```

Leaf-03#

The following example shows the output for the **show l2route evpn mac ip** command on VTEP 3:

```
Leaf-03# show l2route evpn mac ip
EVI      ETag  Prod  Mac Address      Host IP      Next Hop(s)
-----
101      0     BGP   10b3.d56a.8fc1   10.1.101.1   V:10101 172.16.254.3
101      0     BGP   44d3.ca28.6cc3   10.1.101.13  V:10101 172.16.254.4
101      0     BGP   44d3.ca28.6cc4   10.1.101.14  V:10101 172.16.254.4
101      0     BGP   44d3.ca28.6cc5   10.1.101.15  V:10101 172.16.254.4
101      0     BGP   7c21.0dbd.9541   10.1.101.1   V:10101 172.16.254.4
101      0     BGP   f4cf.e243.34c2   10.1.101.3   V:10101 172.16.254.3
101      0     BGP   f4cf.e243.34c3   10.1.101.4   V:10101 172.16.254.3
101      0     BGP   f4cf.e243.34c4   10.1.101.5   V:10101 172.16.254.3
201      0     L2VPN 44d3.ca28.6cc6   10.1.102.3   Gi1/0/16:201
201      0     L2VPN 44d3.ca28.6cc7   10.1.102.4   Gi1/0/17:201
201      0     L2VPN 44d3.ca28.6cc8   10.1.102.5   Gi1/0/18:201
201      0     L2VPN 7c21.0dbd.274c   10.1.201.1   V1201:0
```

Leaf-03#

The following example shows the output for the **show bgp l2vpn evpn** command on VTEP 3:

```
Leaf-03# show bgp l2vpn evpn
BGP table version is 82, local router ID is 172.16.255.5
```

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: 172.16.255.3:101					
* i [2] [172.16.255.3:101] [0] [48] [10B3D56A8FC1] [32] [10.1.101.1]/24	172.16.254.3	0	100	0 ?	
*>i	172.16.254.3	0	100	0 ?	
* i [2] [172.16.255.3:101] [0] [48] [F4CFE24334C2] [32] [10.1.101.3]/24	172.16.254.3	0	100	0 ?	
*>i	172.16.254.3	0	100	0 ?	
* i [2] [172.16.255.3:101] [0] [48] [F4CFE24334C3] [32] [10.1.101.4]/24	172.16.254.3	0	100	0 ?	
*>i	172.16.254.3	0	100	0 ?	
* i [2] [172.16.255.3:101] [0] [48] [F4CFE24334C4] [32] [10.1.101.5]/24	172.16.254.3	0	100	0 ?	
*>i	172.16.254.3	0	100	0 ?	
Route Distinguisher: 172.16.255.3:102					
* i [2] [172.16.255.3:102] [0] [48] [F4CFE24334C2] [0] [*]/20	172.16.254.3	0	100	0 ?	
*>i	172.16.254.3	0	100	0 ?	
Route Distinguisher: 172.16.255.3:103					
* i [2] [172.16.255.3:103] [0] [48] [F4CFE24334C3] [0] [*]/20	172.16.254.3	0	100	0 ?	
*>i	172.16.254.3	0	100	0 ?	
Route Distinguisher: 172.16.255.3:104					
>i [2] [172.16.255.3:104] [0] [48] [F4CFE24334C4] [0] []/20	172.16.254.3	0	100	0 ?	
* i	172.16.254.3	0	100	0 ?	
Route Distinguisher: 172.16.255.4:101					
*>i [2] [172.16.255.4:101] [0] [48] [44D3CA286CC3] [32] [10.1.101.13]/24	172.16.254.4	0	100	0 ?	
* i	172.16.254.4	0	100	0 ?	
*>i [2] [172.16.255.4:101] [0] [48] [44D3CA286CC4] [32] [10.1.101.14]/24	172.16.254.4	0	100	0 ?	
* i	172.16.254.4	0	100	0 ?	
*>i [2] [172.16.255.4:101] [0] [48] [44D3CA286CC5] [32] [10.1.101.15]/24	172.16.254.4	0	100	0 ?	
* i	172.16.254.4	0	100	0 ?	
*>i [2] [172.16.255.4:101] [0] [48] [7C210DBD9541] [32] [10.1.101.1]/24	172.16.254.4	0	100	0 ?	
* i	172.16.254.4	0	100	0 ?	
Route Distinguisher: 172.16.255.4:102					
>i [2] [172.16.255.4:102] [0] [48] [44D3CA286CC3] [0] []/20	172.16.254.4	0	100	0 ?	
* i	172.16.254.4	0	100	0 ?	
Route Distinguisher: 172.16.255.4:103					
>i [2] [172.16.255.4:103] [0] [48] [44D3CA286CC4] [0] []/20	172.16.254.4	0	100	0 ?	
* i	172.16.254.4	0	100	0 ?	
Route Distinguisher: 172.16.255.4:104					
* i [2] [172.16.255.4:104] [0] [48] [44D3CA286CC5] [0] [*]/20	172.16.254.4	0	100	0 ?	
*>i	172.16.254.4	0	100	0 ?	
Route Distinguisher: 172.16.255.5:101					
*>i [2] [172.16.255.5:101] [0] [48] [10B3D56A8FC1] [32] [10.1.101.1]/24	172.16.254.3	0	100	0 ?	
*>i [2] [172.16.255.5:101] [0] [48] [44D3CA286CC3] [32] [10.1.101.13]/24	172.16.254.4	0	100	0 ?	

```

*>i  [2] [172.16.255.5:101] [0] [48] [44D3CA286CC4] [32] [10.1.101.14]/24
      172.16.254.4          0      100      0 ?
*>i  [2] [172.16.255.5:101] [0] [48] [44D3CA286CC5] [32] [10.1.101.15]/24
      172.16.254.4          0      100      0 ?
*>i  [2] [172.16.255.5:101] [0] [48] [7C210DBD9541] [32] [10.1.101.1]/24
      172.16.254.4          0      100      0 ?
*>i  [2] [172.16.255.5:101] [0] [48] [F4CFE24334C2] [32] [10.1.101.3]/24
      172.16.254.3          0      100      0 ?
*>i  [2] [172.16.255.5:101] [0] [48] [F4CFE24334C3] [32] [10.1.101.4]/24
      172.16.254.3          0      100      0 ?
*>i  [2] [172.16.255.5:101] [0] [48] [F4CFE24334C4] [32] [10.1.101.5]/24
      172.16.254.3          0      100      0 ?
Route Distinguisher: 172.16.255.5:102
*>i  [2] [172.16.255.5:102] [0] [48] [44D3CA286CC3] [0] [*]/20
      172.16.254.4          0      100      0 ?
*>i  [2] [172.16.255.5:102] [0] [48] [F4CFE24334C2] [0] [*]/20
      172.16.254.3          0      100      0 ?
Route Distinguisher: 172.16.255.5:103
*>i  [2] [172.16.255.5:103] [0] [48] [44D3CA286CC4] [0] [*]/20
      172.16.254.4          0      100      0 ?
*>i  [2] [172.16.255.5:103] [0] [48] [F4CFE24334C3] [0] [*]/20
      172.16.254.3          0      100      0 ?
Route Distinguisher: 172.16.255.5:104
*>i  [2] [172.16.255.5:104] [0] [48] [44D3CA286CC5] [0] [*]/20
      172.16.254.4          0      100      0 ?
*>i  [2] [172.16.255.5:104] [0] [48] [F4CFE24334C4] [0] [*]/20
      172.16.254.3          0      100      0 ?
Route Distinguisher: 172.16.255.5:201
*>  [2] [172.16.255.5:201] [0] [48] [44D3CA286CC6] [32] [10.1.102.3]/24
      ::                      32768 ?
*>  [2] [172.16.255.5:201] [0] [48] [44D3CA286CC7] [32] [10.1.102.4]/24
      ::                      32768 ?
      Network      Next Hop      Metric LocPrf Weight Path
*>  [2] [172.16.255.5:201] [0] [48] [44D3CA286CC8] [32] [10.1.102.5]/24
      ::                      32768 ?
*>  [2] [172.16.255.5:201] [0] [48] [7C210DBD274C] [32] [10.1.201.1]/24
      ::                      32768 ?
Route Distinguisher: 172.16.255.5:202
*>  [2] [172.16.255.5:202] [0] [48] [44D3CA286CC6] [0] [*]/20
      ::                      32768 ?
Route Distinguisher: 172.16.255.5:203
*>  [2] [172.16.255.5:203] [0] [48] [44D3CA286CC7] [0] [*]/20
      ::                      32768 ?
Route Distinguisher: 172.16.255.5:204
*>  [2] [172.16.255.5:204] [0] [48] [44D3CA286CC8] [0] [*]/20
      ::                      32768 ?
Route Distinguisher: 1:1 (default for vrf green)
* i  [5] [1:1] [0] [24] [10.1.101.0]/17
      172.16.254.3          0      100      0 ?
*>i  [5] [1:1] [0] [24] [10.1.201.0]/17
      172.16.254.3          0      100      0 ?
*>  [5] [1:1] [0] [24] [10.1.201.0]/17
      0.0.0.0              0      32768 ?

```

Leaf-03#

Outputs to Verify the Configuration on Spine Switch 1

The following example shows the output for the **show bgp l2vpn evpn summary** command on Spine Switch 1:

```

Spine-01# show bgp l2vpn evpn summary
BGP router identifier 172.16.255.1, local AS number 65001

```

```

BGP table version is 113, main routing table version 113
23 network entries using 8832 bytes of memory
47 path entries using 10528 bytes of memory
15/14 BGP path/bestpath attribute entries using 4440 bytes of memory
3 BGP rrinfo entries using 120 bytes of memory
15 BGP extended community entries using 720 bytes of memory
0 BGP route-map cache entries using 0 bytes of memory
0 BGP filter-list cache entries using 0 bytes of memory
BGP using 24640 total bytes of memory
BGP activity 47/24 prefixes, 107/60 paths, scan interval 60 secs
25 networks peaked at 13:03:03 Feb 19 2021 UTC (03:26:23.575 ago)

```

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
172.16.255.2	4	65001	259	261	113	0	0	03:27:45	23
172.16.255.3	4	65001	240	250	113	0	0	03:27:49	8
172.16.255.4	4	65001	238	258	113	0	0	03:27:25	8
172.16.255.5	4	65001	236	258	113	0	0	03:27:19	8

Spine-01#

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

```

Spine-01# show bgp l2vpn evpn
BGP table version is 113, local router ID is 172.16.255.1
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: 172.16.255.3:101					
* i [2] [172.16.255.3:101] [0] [48] [10B3D56A8FC1] [32] [10.1.101.1]/24	172.16.254.3	0	100	0 ?	
*>i	172.16.254.3	0	100	0 ?	
* i [2] [172.16.255.3:101] [0] [48] [F4CFE24334C2] [32] [10.1.101.3]/24	172.16.254.3	0	100	0 ?	
*>i	172.16.254.3	0	100	0 ?	
* i [2] [172.16.255.3:101] [0] [48] [F4CFE24334C3] [32] [10.1.101.4]/24	172.16.254.3	0	100	0 ?	
*>i	172.16.254.3	0	100	0 ?	
* i [2] [172.16.255.3:101] [0] [48] [F4CFE24334C4] [32] [10.1.101.5]/24	172.16.254.3	0	100	0 ?	
*>i	172.16.254.3	0	100	0 ?	
Route Distinguisher: 172.16.255.3:102					
* i [2] [172.16.255.3:102] [0] [48] [F4CFE24334C2] [0] [*]/20	172.16.254.3	0	100	0 ?	
*>i	172.16.254.3	0	100	0 ?	
Route Distinguisher: 172.16.255.3:103					
* i [2] [172.16.255.3:103] [0] [48] [F4CFE24334C3] [0] [*]/20	172.16.254.3	0	100	0 ?	
*>i	172.16.254.3	0	100	0 ?	
Route Distinguisher: 172.16.255.3:104					
* i [2] [172.16.255.3:104] [0] [48] [F4CFE24334C4] [0] [*]/20	172.16.254.3	0	100	0 ?	
*>i	172.16.254.3	0	100	0 ?	
Route Distinguisher: 172.16.255.4:101					
* i [2] [172.16.255.4:101] [0] [48] [44D3CA286CC3] [32] [10.1.101.13]/24	172.16.254.4	0	100	0 ?	
*>i	172.16.254.4	0	100	0 ?	
* i [2] [172.16.255.4:101] [0] [48] [44D3CA286CC4] [32] [10.1.101.14]/24					

```

172.16.254.4          0    100    0 ?
*>i          172.16.254.4          0    100    0 ?
* i [2] [172.16.255.4:101] [0] [48] [44D3CA286CC5] [32] [10.1.101.15]/24
172.16.254.4          0    100    0 ?
*>i          172.16.254.4          0    100    0 ?
* i [2] [172.16.255.4:101] [0] [48] [7C210DBD9541] [32] [10.1.101.1]/24
172.16.254.4          0    100    0 ?
*>i          172.16.254.4          0    100    0 ?
Route Distinguisher: 172.16.255.4:102
  Network      Next Hop      Metric LocPrf Weight Path
* i [2] [172.16.255.4:102] [0] [48] [44D3CA286CC3] [0] [*]/20
172.16.254.4          0    100    0 ?
*>i          172.16.254.4          0    100    0 ?
Route Distinguisher: 172.16.255.4:103
* i [2] [172.16.255.4:103] [0] [48] [44D3CA286CC4] [0] [*]/20
172.16.254.4          0    100    0 ?
*>i          172.16.254.4          0    100    0 ?
Route Distinguisher: 172.16.255.4:104
* i [2] [172.16.255.4:104] [0] [48] [44D3CA286CC5] [0] [*]/20
172.16.254.4          0    100    0 ?
*>i          172.16.254.4          0    100    0 ?
Route Distinguisher: 172.16.255.5:201
* i [2] [172.16.255.5:201] [0] [48] [44D3CA286CC6] [32] [10.1.102.3]/24
172.16.254.5          0    100    0 ?
*>i          172.16.254.5          0    100    0 ?
* i [2] [172.16.255.5:201] [0] [48] [44D3CA286CC7] [32] [10.1.102.4]/24
172.16.254.5          0    100    0 ?
*>i          172.16.254.5          0    100    0 ?
* i [2] [172.16.255.5:201] [0] [48] [44D3CA286CC8] [32] [10.1.102.5]/24
172.16.254.5          0    100    0 ?
*>i          172.16.254.5          0    100    0 ?
* i [2] [172.16.255.5:201] [0] [48] [7C210DBD274C] [32] [10.1.201.1]/24
172.16.254.5          0    100    0 ?
*>i          172.16.254.5          0    100    0 ?
Route Distinguisher: 172.16.255.5:202
* i [2] [172.16.255.5:202] [0] [48] [44D3CA286CC6] [0] [*]/20
172.16.254.5          0    100    0 ?
*>i          172.16.254.5          0    100    0 ?
Route Distinguisher: 172.16.255.5:203
* i [2] [172.16.255.5:203] [0] [48] [44D3CA286CC7] [0] [*]/20
172.16.254.5          0    100    0 ?
*>i          172.16.254.5          0    100    0 ?
Route Distinguisher: 172.16.255.5:204
* i [2] [172.16.255.5:204] [0] [48] [44D3CA286CC8] [0] [*]/20
172.16.254.5          0    100    0 ?
*>i          172.16.254.5          0    100    0 ?
Route Distinguisher: 1:1
* i [5] [1:1] [0] [24] [10.1.101.0]/17
172.16.254.4          0    100    0 ?
* i          172.16.254.3          0    100    0 ?
*>i          172.16.254.3          0    100    0 ?
* i [5] [1:1] [0] [24] [10.1.201.0]/17
172.16.254.5          0    100    0 ?
*>i          172.16.254.5          0    100    0 ?

Spine-01#

```

Outputs to Verify the Configuration on Spine Switch 2

The following example shows the output for the **show bgp l2vpn evpn summary** command on Spine Switch 2:

Spine-02# **show bgp l2vpn evpn summary**

BGP router identifier 172.16.255.2, local AS number 65001
 BGP table version is 113, main routing table version 113
 23 network entries using 8832 bytes of memory
 47 path entries using 10528 bytes of memory
 15/14 BGP path/bestpath attribute entries using 4440 bytes of memory
 3 BGP rrinfo entries using 120 bytes of memory
 15 BGP extended community entries using 720 bytes of memory
 0 BGP route-map cache entries using 0 bytes of memory
 0 BGP filter-list cache entries using 0 bytes of memory
 BGP using 24640 total bytes of memory
 BGP activity 46/23 prefixes, 107/60 paths, scan interval 60 secs
 25 networks peaked at 13:03:07 Feb 19 2021 UTC (03:27:53.810 ago)

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
172.16.255.1	4	65001	263	261	113	0	0	03:29:16	23
172.16.255.3	4	65001	243	251	113	0	0	03:29:17	8
172.16.255.4	4	65001	240	259	113	0	0	03:28:48	8
172.16.255.5	4	65001	240	257	113	0	0	03:28:45	8

Spine-02#

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

Spine-02# **show bgp l2vpn evpn**

BGP table version is 113, local router ID is 172.16.255.2
 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: 172.16.255.3:101					
* i [2] [172.16.255.3:101] [0] [48] [10B3D56A8FC1] [32] [10.1.101.1]/24	172.16.254.3	0	100	0 ?	
*>i	172.16.254.3	0	100	0 ?	
* i [2] [172.16.255.3:101] [0] [48] [F4CFE24334C2] [32] [10.1.101.3]/24	172.16.254.3	0	100	0 ?	
*>i	172.16.254.3	0	100	0 ?	
* i [2] [172.16.255.3:101] [0] [48] [F4CFE24334C3] [32] [10.1.101.4]/24	172.16.254.3	0	100	0 ?	
*>i	172.16.254.3	0	100	0 ?	
* i [2] [172.16.255.3:101] [0] [48] [F4CFE24334C4] [32] [10.1.101.5]/24	172.16.254.3	0	100	0 ?	
*>i	172.16.254.3	0	100	0 ?	
Route Distinguisher: 172.16.255.3:102					
* i [2] [172.16.255.3:102] [0] [48] [F4CFE24334C2] [0] [*]/20	172.16.254.3	0	100	0 ?	
*>i	172.16.254.3	0	100	0 ?	
Route Distinguisher: 172.16.255.3:103					
* i [2] [172.16.255.3:103] [0] [48] [F4CFE24334C3] [0] [*]/20	172.16.254.3	0	100	0 ?	
*>i	172.16.254.3	0	100	0 ?	
Route Distinguisher: 172.16.255.3:104					
* i [2] [172.16.255.3:104] [0] [48] [F4CFE24334C4] [0] [*]/20	172.16.254.3	0	100	0 ?	
*>i	172.16.254.3	0	100	0 ?	
Route Distinguisher: 172.16.255.4:101					
* i [2] [172.16.255.4:101] [0] [48] [44D3CA286CC3] [32] [10.1.101.13]/24	172.16.254.4	0	100	0 ?	

Configuration Examples for Private VLANs in a BGP EVPN VXLAN Fabric

```

*>i          172.16.254.4          0    100    0 ?
* i  [2] [172.16.255.4:101] [0] [48] [44D3CA286CC4] [32] [10.1.101.14]/24
          172.16.254.4          0    100    0 ?
*>i          172.16.254.4          0    100    0 ?
* i  [2] [172.16.255.4:101] [0] [48] [44D3CA286CC5] [32] [10.1.101.15]/24
          172.16.254.4          0    100    0 ?
*>i          172.16.254.4          0    100    0 ?
* i  [2] [172.16.255.4:101] [0] [48] [7C210DBD9541] [32] [10.1.101.1]/24
          172.16.254.4          0    100    0 ?
*>i          172.16.254.4          0    100    0 ?
Route Distinguisher: 172.16.255.4:102
  Network      Next Hop      Metric LocPrf Weight Path
* i  [2] [172.16.255.4:102] [0] [48] [44D3CA286CC3] [0] [*]/20
          172.16.254.4          0    100          0 ?
*>i          172.16.254.4          0    100          0 ?
Route Distinguisher: 172.16.255.4:103
* i  [2] [172.16.255.4:103] [0] [48] [44D3CA286CC4] [0] [*]/20
          172.16.254.4          0    100          0 ?
*>i          172.16.254.4          0    100          0 ?
Route Distinguisher: 172.16.255.4:104
* i  [2] [172.16.255.4:104] [0] [48] [44D3CA286CC5] [0] [*]/20
          172.16.254.4          0    100          0 ?
*>i          172.16.254.4          0    100          0 ?
Route Distinguisher: 172.16.255.5:201
* i  [2] [172.16.255.5:201] [0] [48] [44D3CA286CC6] [32] [10.1.102.3]/24
          172.16.254.5          0    100          0 ?
*>i          172.16.254.5          0    100          0 ?
* i  [2] [172.16.255.5:201] [0] [48] [44D3CA286CC7] [32] [10.1.102.4]/24
          172.16.254.5          0    100          0 ?
*>i          172.16.254.5          0    100          0 ?
* i  [2] [172.16.255.5:201] [0] [48] [44D3CA286CC8] [32] [10.1.102.5]/24
          172.16.254.5          0    100          0 ?
*>i          172.16.254.5          0    100          0 ?
* i  [2] [172.16.255.5:201] [0] [48] [7C210DBD274C] [32] [10.1.201.1]/24
          172.16.254.5          0    100          0 ?
*>i          172.16.254.5          0    100          0 ?
Route Distinguisher: 172.16.255.5:202
* i  [2] [172.16.255.5:202] [0] [48] [44D3CA286CC6] [0] [*]/20
          172.16.254.5          0    100          0 ?
*>i          172.16.254.5          0    100          0 ?
Route Distinguisher: 172.16.255.5:203
* i  [2] [172.16.255.5:203] [0] [48] [44D3CA286CC7] [0] [*]/20
          172.16.254.5          0    100          0 ?
*>i          172.16.254.5          0    100          0 ?
Route Distinguisher: 172.16.255.5:204
* i  [2] [172.16.255.5:204] [0] [48] [44D3CA286CC8] [0] [*]/20
          172.16.254.5          0    100          0 ?
*>i          172.16.254.5          0    100          0 ?
Route Distinguisher: 1:1
* i  [5] [1:1] [0] [24] [10.1.101.0]/17
          172.16.254.4          0    100          0 ?
* i          172.16.254.3          0    100          0 ?
*>i          172.16.254.3          0    100          0 ?
* i  [5] [1:1] [0] [24] [10.1.201.0]/17
          172.16.254.5          0    100          0 ?
*>i          172.16.254.5          0    100          0 ?

```

Spine-02#