# Description
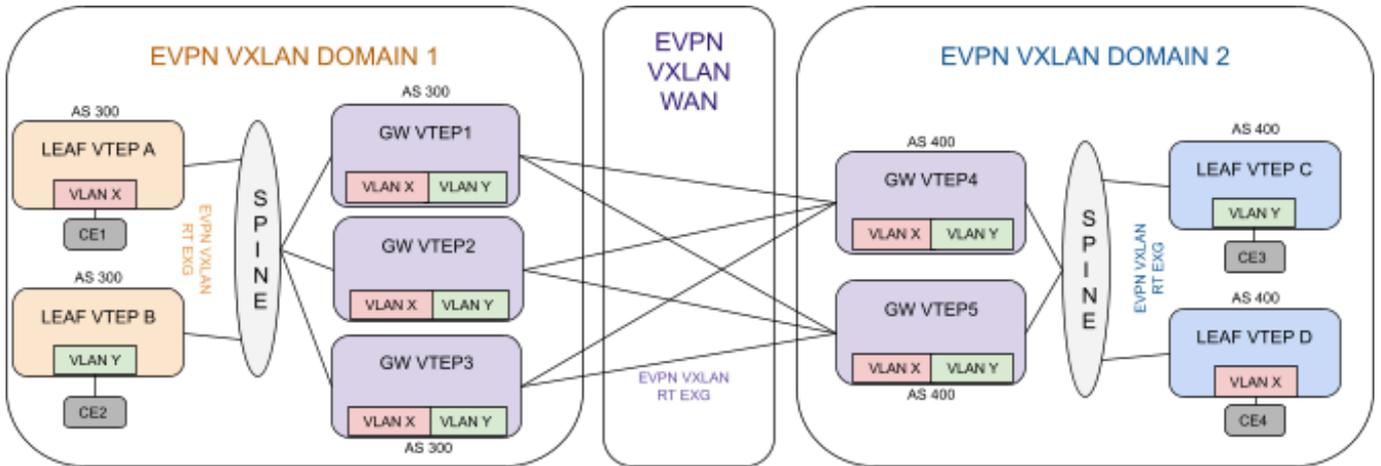
This feature expands Multi-Domain EVPN VXLAN to support an Anycast Gateway model as the mechanism for gateway redundancy. The following diagram shows a multi-domain deployment with anycast gateways using symmetric IRB. Note that any number of gateway VTEPs are supported in each domain.



Redundancy is achieved by configuring the same VTEP IP and VXLAN Shared Router MAC on all anycast gateways in an EVPN VXLAN domain. Underlay ECMP handles load balance for traffic.

## Centralized Gateways

EVPN Centralized Anycast Gateway deployment is supported, but it requires that "Bridged ARP and IPv6 Neighbor Proxy and IP/MAC Publish from L2 EVPN TORs" be configured on all L2 VTEPs. This allows for the distribution of ARP bindings through the EVPN control plane rather than relying on data-plane learning. This is required because an anycast gateway initiating an ARP request to an L2 VTEP is not guaranteed to see an ARP reply to the shared VTEP IP, as it will be hashed amongst the gateways.

# Configuration

The BGP configuration is unchanged from the Multi-Domain EVPN VXLAN model. The following sample shows the VXLAN configuration on one of the gateways in domain #1. An explicitly configured shared VXLAN virtual router MAC address is also required and must be the same for all the gateways in the same domain. All gateways in the same domain must be configured with the same VTEP IP. Note that a common physical IP ( using "*ip address*" ) is used instead of a secondary IP address ( using "*ip address <prefix> secondary*") which is typically used when configuring a virtual VTEP IP.

```
GW1# show active
vlan 10,20
```

```
!
interface Loopback1
   ! The use of a physical IP address is intentional, as
   ! ip address <prefix> secondary is not supported in this deployment
   ip address 10.255.1.1/32
!
interface Vlan10
   vrf red
   ip address virtual 10.10.0.254/24
!
interface Vlan20
   vrf red
   ip address virtual 10.20.0.254/24
!
interface Vxlan1
   vxlan source-interface Loopback1
   vxlan virtual-router encapsulation mac-address 00:00:01:0b:fe:03
   vxlan udp-port 4789
   vxlan vlan 10 vni 10010
   vxlan vlan 20 vni 10020
   vxlan vrf red vni 20000
!
ip virtual-router mac-address 00:00:80:00:00:00
```

If the leaf VTEP relies on the gateways for VXLAN routing, Bridged ARP and IPv6 Neighbor Proxy and IP/MAC Publish from L2 EVPN TORs configuration needs to be added into the BGP configuration section of L2 leaf VTEPs.

## Platform Compatibility

- DCS-7020R
- DCS-7280R/R2/R3
- DCS-7500R/R2/R3
- vEOS-lab

## Troubleshooting

- A valid route reexported by gateways looks like this:

```
gateway#show bgp evpn route-type mac-ip ee89.9f06.fca3 detail
BGP routing table information for VRF default
Router identifier 0.0.5.1, local AS number 300
BGP routing table entry for mac-ip ee89.9f06.fca3, Route Distinguisher: 1.1.1.100:20
```

```
Paths: 1 available
  301
    1.1.1.100 from 10.101.4.1 (0.0.6.1)
      Origin IGP, metric -, localpref 100, weight 0, valid, internal, best

Extended Com
munity: Route-Target-
AS:64500:20 TunnelEncap:tunnelTypeVxlan EvpnRouterMac:00:1c:71:00:00:01
      VNI: 10020 L3 VNI: 20000 ESI: 0000:0000:0000:0000:0000
BGP routing table entry for mac-ip ee89.9f06.fca3, Route Distinguisher: 1.1.1.101:20
 Paths: 1 available
  301
    1.1.1.100 from 10.101.6.1 (0.0.3.1)
      Origin IGP, metric -, localpref 100, weight 0, valid, internal, best

Extended Com
munity: Route-Target-
AS:64500:20 TunnelEncap:tunnelTypeVxlan EvpnRouterMac:00:1c:71:00:00:01
      VNI: 10020 L3 VNI: 20000 ESI: 0000:0000:0000:0000:0000
BGP routing table entry for mac-
ip ee89.9f06.fca3 10.20.0.4, Route Distinguisher: 1.1.1.100:20
 Paths: 1 available
  301
    1.1.1.100 from 10.101.4.1 (0.0.6.1)
      Origin IGP, metric -, localpref 100, weight 0, valid, internal, best
      Extended Community: Route-Target-AS:64500:20 Route-Target-
AS:64500:20000 TunnelEncap:tunnelTypeVxlan EvpnRouterMac:00:1c:71:00:00:01
      VNI: 10020 L3 VNI: 20000 ESI: 0000:0000:0000:0000:0000
BGP routing table entry for mac-
ip ee89.9f06.fca3 10.20.0.4, Route Distinguisher: 1.1.1.101:20
 Paths: 1 available
  301
    1.1.1.100 from 10.101.6.1 (0.0.3.1)
      Origin IGP, metric -, localpref 100, weight 0, valid, internal, best
      Extended Community: Route-Target-AS:64500:20 Route-Target-
AS:64500:20000 TunnelEncap:tunnelTypeVxlan EvpnRouterMac:00:1c:71:00:00:01
      VNI: 10020 L3 VNI: 20000 ESI: 0000:0000:0000:0000:0000
```

In the above example, two gateways are configured as anycast gateways in the domain, so every route has one duplicate. They should share the same EVPN router MAC.

- Verify that the shared VTEP IP and VXLAN shared router MAC are consistent amongst gateways in the same domain and different between domains. The system-id keyword

cannot be used as the shared router MAC.
- In a centralized gateway deployment, verify that the ARP and ND binding are learned on the L2 VTEPs and refer to Bridged ARP and IPv6 Neighbor Proxy and IP/MAC Publish from L2 EVPN TORs TOI troubleshooting guide as needed.
- Please refer to Multi-Domain EVPN VXLAN TOI for troubleshooting the base feature.

## Limitations

- Anycast Gateways do not support front-panel hosts.
- Anycast VTEP IP must be configured as the primary VTEP IP on gateways, and VARP VTEP IP is not supported.

## References

- Multi-Domain EVPN VXLAN TOI
- EVPN Centralized Anycast Gateway