



Configuring IPv6 Across a VXLAN EVPN Fabric

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Overview of IPv6 Across a VXLAN EVPN Fabric

This section provides an example configuration that enables IPv6 in the overlay of a VXLAN EVPN fabric.

Cisco Nexus 3500 Series switches do not support IPv6 Across VXLAN EVPN on Cisco NX-OS Release 7.0(3)I7(2) and the previous releases.

The VXLAN encapsulation mechanism encapsulates the IPv6 packets in the overlay as IPv4 UDP packets and uses IPv4 routing to transport the VXLAN encapsulated traffic.

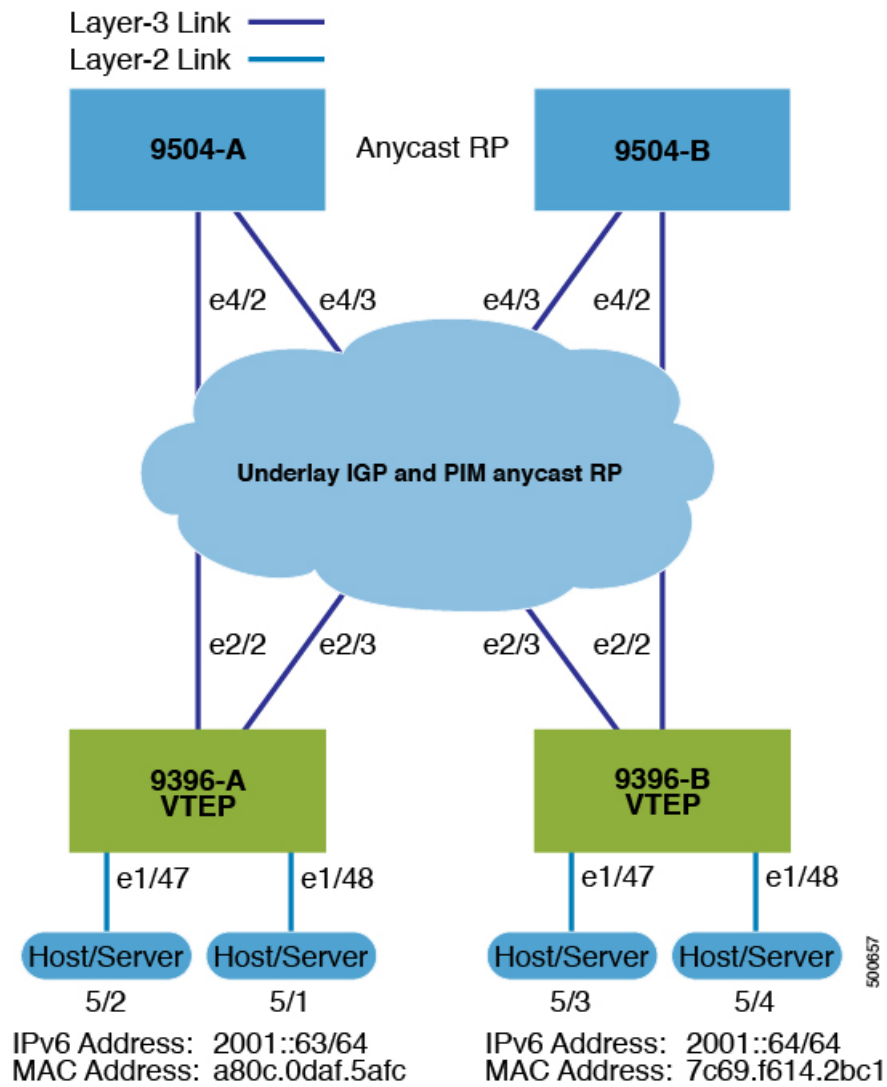
To enable IPv6 across a VXLAN EVPN fabric, the IPv6 address family is included in VRF, BGP, and EVPN. IPv6 routes are initiated in the tenant VRF IPv6 unicast address-family on a VTEP and are advertised in the VXLAN fabric through the L2VPN EVPN address family as EVPN route-type 2 or 5.



Note These routes are advertised as EVPN routes on the spine.

Configuring IPv6 Across a VXLAN EVPN Fabric Example

Topology for the example:

**Note**

In the example:

- Configuration for hosts in VLAN 10 is mapped to vn-segment 10010.
- VRF RED is the VRF associated with this VLAN.
- 20010 is the L3 VNI for VRF RED.
- VLAN 100 is mapped to L3 VNI 20010.

- Configure the Layer 2 VLAN.

```
vlan 10
 name RED
 vn-segment 10010
```

- Configure the VLAN for L3 VNI .

```
vlan 100
 name RED_L3_VNI_VLAN
 vn-segment 20010
```

- Define the anycast gateway MAC.

```
fabric forwarding anycast-gateway-mac 0000.2222.3333
```



Note You can choose either of the following two command procedures for creating the NVE interfaces. Use the first one for a small number of VNIs. Use the second procedure to configure a large number of VNIs.

Define the NVE interface.

Option 1

```
interface nve1
 no shutdown
 source-interface loopback1
 host-reachability protocol bgp
 member vni 20010 associate-vrf
 member vni 10010
 suppress-arp
 mcast-group 225.4.0.1
```

Option 2

```
interface nve1
 no shutdown
 source-interface loopback1
 host-reachability protocol bgp
 global mcast-group 255.4.0.1
 member vni 20010 associate-vrf
 member vni 10010
 suppress-arp
```

```
evpn
 vni 10010 12
```



Note The following commands are optional, but may be entered as overrides.

```
rd auto
 route-target import auto
 route-target export auto
```

- Add configuration the to SVI definition on VLAN 10 and on L3 VNI VLAN 100.

```
interface Vlan10
 description RED
```

```

no shutdown
vrf member RED
no ip redirects
ip address 10.1.1.1/24
ipv6 address 2001::1/64
fabric forwarding mode anycast-gateway

```

- Configure SVI definition for VLAN 100.

```

interface Vlan100
description RED_L3_VNI_VLAN
no shutdown
vrf member RED
ip forward
ipv6 address use-link-local-only

```



Note The IPv6 address use-link-local-only serves the same purpose as IP FORWARD for IPv4. It enables the switch to perform an IP based lookup even when the interface VLAN has no IP address defined under it.

- Add configuration to the VRF definition.

```

vrf context RED
vni 20010
rd auto

```



Note The following commands are automatically configured unless one or more are entered as overrides.

```

rd auto
address-family ipv4 unicast
route-target both auto
route-target both auto evpn
address-family ipv6 unicast
route-target both auto
route-target both auto evpn

```

```

evpn
vni 10010 12

```



Note The following commands are automatically configured unless one or more are entered as overrides.

```

rd auto
route-target import auto
route-target export auto

```

- Add configuration to the VRF definition under BGP.

```
router bgp 65000
 vrf RED
  address-family ipv4 unicast
  advertise l2vpn evpn
  address-family ipv6 unicast
  advertise l2vpn evpn
```



Note If VTEPs are configured to operate as VPC peers, the following configuration is a best practice that should be included under the VPC domain on both switches.

```
vpc domain 1
 ipv6 nd synchronize
```

Show Command Examples

The following are examples of verifying IPv6 advertisement over VXLAN EVPN:

- Display ND information for the connected server.

```
9396-B_VTEP# show ipv6 neighbor vrf RED

Flags: # - Adjacencies Throttled for Glean
       G - Adjacencies of vPC peer with G/W bit
       R - Adjacencies learnt remotely

IPv6 Adjacency Table for VRF RED
Total number of entries: 2
Address      Age      MAC Address  Pref Source  Interface
2001::64     00:00:26  7c69.f614.2bc1  50  icmpv6     Vlan10
fe80::7e69:f6ff:fe14:2bc1
              00:01:13  7c69.f614.2bc1  50  icmpv6     Vlan10
```

- Check the L2ROUTE and ensure the MAC-IP was learned.

```
9396-B_VTEP# show l2route evpn mac-ip evi 10 host-ip 2001::64
Mac Address   Prod Host IP                               Next Hop (s)
-----
7c69.f614.2bc1 HMM   2001::64                                   N/A
```



Note MAC-IP table is populated only when the end server sends a neighbor solicitation message (ARP in case of IPv4).

- Verify the route is present locally in the BGP table.

```
9396-B_VTEP# show bgp l2vpn evpn 2001::64
BGP routing table information for VRF default, address family L2VPN EVPN
Route Distinguisher: 198.19.0.15:34180 (L2VNI 10010)
BGP routing table entry for [2]:[0]:[0]:[48]:[7c69.f614.2bc1]:[128]:[2001::64]/368,
version 678
```

Show Command Examples

```

Paths: (1 available, best #1)
Flags: (0x00010a) on xmit-list, is not in l2rib/evpn

Advertised path-id 1
Path type: local, path is valid, is best path, no labeled nexthop
AS-Path: NONE, path locally originated
198.19.0.15 (metric 0) from 0.0.0.0 (198.19.0.15)
  Origin IGP, MED not set, localpref 100, weight 32768
  Received label 10010 20010
  Extcommunity: RT:64567:10010 RT:64567:20010

Path-id 1 advertised to peers:
198.19.0.3
198.19.0.4

```

- Verify the route is present in the remote VTEP 9396-A-VTEP BGP table.

```

9396-A-VTEP# show bgp l2vpn evpn 2001::64
BGP routing table information for VRF default, address family L2VPN EVPN
Route Distinguisher: 198.19.0.14:34180 (L2VNI 10010)
BGP routing table entry for [2]:[0]:[0]:[48]:[7c69.f614.2bc1]:[128]:[2001::64]/368,
version 305
Paths: (1 available, best #1)
Flags: (0x00021a) on xmit-list, is in l2rib/evpn, is not in HW,

Advertised path-id 1
Path type: internal, path is valid, is best path, no labeled nexthop
  Imported from
198.19.0.15:34180:[2]:[0]:[0]:[48]:[7c69.f614.2bc1]:[128]:[2001::64]/240
AS-Path: NONE, path sourced internal to AS
  198.19.0.15 (metric 81) from 198.19.0.3 (198.19.0.3)
    Origin IGP, MED not set, localpref 100, weight 0
    Received label 10010 20010
    Extcommunity: RT:64567:10010 RT:64567:20010 ENCAP:8 Router MAC:5087.89a1.a52f
    Originator: 198.19.0.15 Cluster list: 198.19.0.3

```

- Check the L2ROUTE and ensure that the MAC-IP was learned on the remote VTEP - 9396-A-VTEP.

```

rswV1leaf14# show l2route evpn mac-ip evi 1413 host-ip 2001::64
Mac Address      Prod Host IP                               Next Hop (s)
-----
7c69.f614.2bc1 BGP  2001::64                                198.19.0.15

```