Configure and Verify Double-sided Virtual vPC

Contents

Introduction

This document describes how to deploy L2 Ethernet VPN (EVPN) Virtual Extensible LAN (VXLAN) double-sided virtual vPC on Nexus 9000.

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- Border Gateway Protocol (BGP)
- Open Shortest Path First (OSPF)
- EVPN
- Virtual vPC
- vPC

Components Used

The information in this document is based on these software and hardware versions:

- Cisco Nexus 93180YC-FX that runs Release 10.2(3)

- Cisco Nexus 93180YC-FX that runs Release 10.2(3)

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Configure

Network Diagram
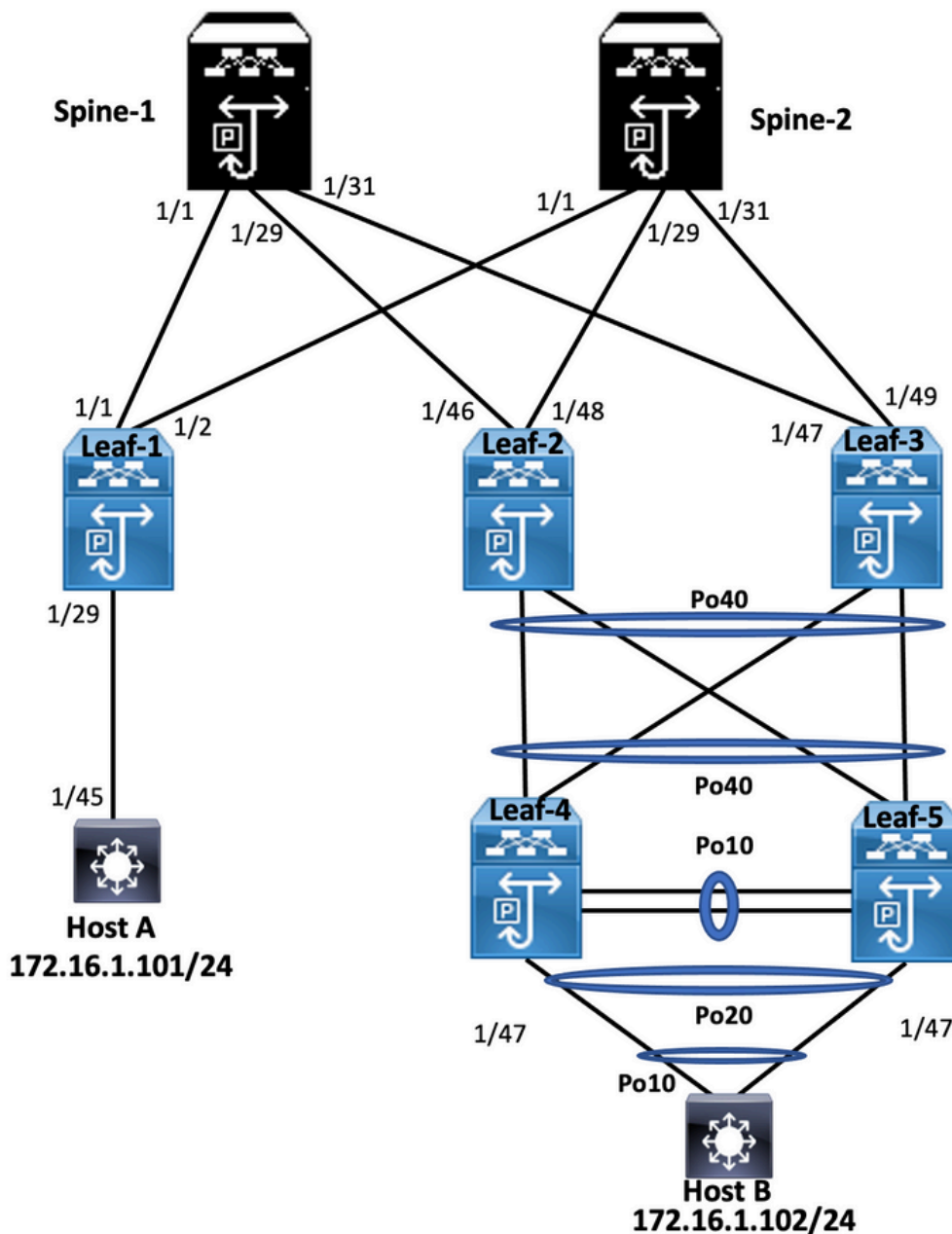
Leaf-1

```
Leaf-1# show run
hostname Leaf-1

cfs eth distribute
nv overlay evpn
feature ospf
```

```
feature bgp
feature pim
feature fabric forwarding
feature interface-vlan
feature vn-segment-vlan-based
feature lacp
feature nv overlay

fabric forwarding anycast-gateway-mac 0000.2222.3333
ip pim rp-address 10.10.10.10 group-list 224.0.0.0/4
ip pim ssm range 232.0.0.0/8

vlan 1-10
vlan 2
 vn-segment 10002
vlan 10
 vn-segment 10010

route-map PERMIT-ALL permit 10
vrf context test
 vni 10002
 rd auto
 address-family ipv4 unicast
   route-target both auto
   route-target both auto evpn

interface Vlan2
 no shutdown
 vrf member test
 no ip redirects
 ip forward
 no ipv6 redirects

interface Vlan10
 no shutdown
 vrf member test
 no ip redirects
 ip address 172.16.2.100/25
 fabric forwarding mode anycast-gateway

interface nve1
 no shutdown
 host-reachability protocol bgp
 source-interface loopback1
 member vni 10002 associate-vrf
 member vni 10010
   suppress-arp
   mcast-group 239.1.1.1

interface Ethernet1/1
 mtu 9216
 ip address 172.16.0.1/24
 ip ospf network point-to-point
 ip router ospf 100 area 0.0.0.0
 ip pim sparse-mode
 no shutdown

interface Ethernet1/29
 switchport
 switchport mode trunk
 no shutdown

interface loopback0
 ip address 10.1.1.1/32
```

```
 ip router ospf 100 area 0.0.0.0
 ip pim sparse-mode

interface loopback1
 ip address 10.2.1.1/32
 ip router ospf 100 area 0.0.0.0
 ip pim sparse-mode

router ospf 100
 router-id 10.1.1.1
router bgp 6500
 router-id 10.1.1.1
 address-family ipv4 unicast
 address-family l2vpn evpn
   advertise-pip
 neighbor 10.10.10.10
   remote-as 6500
   update-source loopback0
   address-family ipv4 unicast
   address-family l2vpn evpn
     send-community
     send-community extended
 vrf test
   address-family ipv4 unicast
evpn
 vni 10010 l2
   rd auto
   route-target import auto
   route-target export auto
```

Spine-1

```
Spine-1# show run
cfs eth distribute
nv overlay evpn
feature ospf
feature bgp
feature pim
feature fabric forwarding
feature interface-vlan
feature vn-segment-vlan-based
feature lacp
feature vpc
feature nv overlay

fabric forwarding anycast-gateway-mac 0000.2222.3333
ip pim rp-address 10.10.10.10 group-list 224.0.0.0/4
ip pim ssm range 232.0.0.0/8
vlan 1,100

route-map PERMIT-ALL permit 10
vrf context management

interface Ethernet1/1
 mtu 9216
 ip address 172.16.0.2/24
 ip ospf network point-to-point
 ip router ospf 100 area 0.0.0.0
 ip pim sparse-mode
 no shutdown

interface Ethernet1/29
```

```
 mtu 9216
 ip address 172.16.2.2/24
 ip ospf network point-to-point
 ip router ospf 100 area 0.0.0.0
 ip pim sparse-mode
 no shutdown

interface Ethernet1/31
 mtu 9216
 ip address 172.16.1.2/24
 ip ospf network point-to-point
 ip router ospf 100 area 0.0.0.0
 ip pim sparse-mode
 no shutdown

interface loopback0
 ip address 10.10.10.10/32
 ip router ospf 100 area 0.0.0.0
 ip pim sparse-mode

router ospf 100
 router-id 10.10.10.10
router bgp 6500
 router-id 10.10.10.10
 address-family ipv4 unicast
 address-family l2vpn evpn
 neighbor 10.1.1.1
   remote-as 6500
   update-source loopback0
   address-family l2vpn evpn
     send-community
     send-community extended
     route-reflector-client
 neighbor 10.1.1.3
   remote-as 6500
   update-source loopback0
   address-family l2vpn evpn
     send-community
     send-community extended
     route-reflector-client
 neighbor 10.1.1.4
   remote-as 6500
   update-source loopback0
   address-family l2vpn evpn
     send-community
     send-community extended
     route-reflector-client
```

Leaf-2

```
Leaf-2(config)# show run
hostname Leaf-2

cfs ipv4 distribute
nv overlay evpn
feature ospf
feature bgp
feature pim
feature fabric forwarding
feature interface-vlan
```

```
feature vn-segment-vlan-based
feature lacp
feature vpc
feature nv overlay

fabric forwarding anycast-gateway-mac 0000.2222.3333
ip pim rp-address 10.10.10.10 group-list 224.0.0.0/4
ip pim ssm range 232.0.0.0/8

vlan 1-2,10
vlan 2
 vn-segment 10002
vlan 10
 vn-segment 10010

route-map PERMIT-ALL permit 10
vrf context management
vrf context test
 vni 10002
  rd auto
 address-family ipv4 unicast
   route-target both auto
   route-target both auto evpn

vpc domain 1
 peer-switch
 peer-keepalive destination 10.201.182.26
 virtual peer-link destination 10.1.1.3 source 10.1.1.4 dscp 56
 peer-gateway
 ip arp synchronize

interface Vlan1
 no ip redirects
 no ipv6 redirects

interface Vlan2
 no shutdown
 vrf member test
 no ip redirects
 ip forward
 no ipv6 redirects

interface Vlan10
 no shutdown
 vrf member test
 no ip redirects
 ip address 172.16.2.100/25
 no ipv6 redirects
 fabric forwarding mode anycast-gateway

interface port-channel10
 switchport
 switchport mode trunk
 switchport trunk allowed vlan 10,20
 spanning-tree port type network
 vpc peer-link

interface port-channel20
 switchport
 switchport mode trunk
 switchport trunk allowed vlan 10,20
 vpc 20

interface port-channel40
```

```
  switchport
  switchport mode trunk
  switchport trunk allowed vlan 10,20
  vpc 40

interface nve1
 no shutdown
 host-reachability protocol bgp
 advertise virtual-rmac
 source-interface loopback1
 member vni 10002 associate-vrf
 member vni 10010
    suppress-arp
    mcast-group 239.1.1.1

interface Ethernet1/7
 switchport
 switchport mode trunk
 switchport trunk allowed vlan 10,20
 channel-group 40 mode active
 no shutdown

interface Ethernet1/8
 switchport
 switchport mode trunk
 switchport trunk allowed vlan 10,20
 channel-group 40 mode active
 no shutdown

interface Ethernet1/46
 mtu 9216
 port-type fabric
 ip address 172.16.2.1/24
 ip ospf network point-to-point
 ip router ospf 100 area 0.0.0.0
 ip pim sparse-mode
 no shutdown

interface loopback0
 ip address 10.1.1.4/32
 ip router ospf 100 area 0.0.0.0
 ip pim sparse-mode

interface loopback1
 ip address 10.2.1.4/32
 ip address 10.2.1.10/32 secondary
 ip router ospf 100 area 0.0.0.0
 ip pim sparse-mode
icam monitor scale

router ospf 100
 router-id 10.1.1.4
router bgp 6500
 router-id 10.1.1.4
 address-family ipv4 unicast
 address-family l2vpn evpn
    advertise-pip
 neighbor 10.10.10.10
    remote-as 6500
    update-source loopback0
    address-family l2vpn evpn
      send-community
      send-community extended
 vrf test
```

```
    address-family ipv4 unicast
evpn
 vni 10010 l2
   rd auto
   route-target import auto
   route-target export auto
```

Leaf-3

```
Leaf-3(config-if-range)# show run
hostname Leaf-3

cfs ipv4 distribute
nv overlay evpn
feature ospf
feature bgp
feature pim
feature fabric forwarding
feature interface-vlan
feature vn-segment-vlan-based
feature lacp
feature vpc
feature nv overlay

fabric forwarding anycast-gateway-mac 0000.2222.3333
ip pim rp-address 10.10.10.10 group-list 224.0.0.0/4
ip pim ssm range 232.0.0.0/8

vlan 1-2,10
vlan 2
 vn-segment 10002
vlan 10
 vn-segment 10010

route-map PERMIT-ALL permit 10
vrf context management
vrf context test
 vni 10002
 rd auto
 address-family ipv4 unicast
   route-target both auto
   route-target both auto evpn

vpc domain 1
 peer-switch
 peer-keepalive destination 10.201.182.25
 virtual peer-link destination 10.1.1.4 source 10.1.1.3 dscp 56
 peer-gateway
 ip arp synchronize

interface Vlan1
 no ip redirects
 no ipv6 redirects

interface Vlan2
 no shutdown
 vrf member test
 no ip redirects
 ip forward
 no ipv6 redirects

interface Vlan10
```

```
 no shutdown
 vrf member test
 no ip redirects
 ip address 172.16.2.100/25
 no ipv6 redirects
 fabric forwarding mode anycast-gateway

interface port-channel10
 switchport
 switchport mode trunk
 switchport trunk allowed vlan 10,20
 spanning-tree port type network
 vpc peer-link

interface port-channel20
 switchport
 switchport mode trunk
 switchport trunk allowed vlan 10,20
 vpc 20

interface port-channel40
 switchport
 switchport mode trunk
 switchport trunk allowed vlan 10,20
 vpc 40

interface nve1
 no shutdown
 host-reachability protocol bgp
 advertise virtual-rmac
 source-interface loopback1
 member vni 10002 associate-vrf
 member vni 10010
   suppress-arp
   mcast-group 239.1.1.1

interface Ethernet1/7
 switchport
 switchport mode trunk
 switchport trunk allowed vlan 10,20
 channel-group 40 mode active
 no shutdown

interface Ethernet1/8
 switchport
 switchport mode trunk
 switchport trunk allowed vlan 10,20
 channel-group 40 mode active
 no shutdown

interface Ethernet1/47
 mtu 9216
 port-type fabric
 ip address 172.16.1.1/24
 ip ospf network point-t-point
 ip router ospf 100 area 0.0.0.0
 ip pim sparse-mode
 no shutdown

interface Ethernet1/48
 switchport
 switchport mode trunk
 switchport trunk allowed vlan 10,20
 channel-group 20 mode active
```

```
 no shutdown

interface loopback0
 ip address 10.1.1.3/32
 ip router ospf 100 area 0.0.0.0
 ip pim sparse-mod

interface loopback1
 ip address 10.2.1.3/32
 ip address 10.2.1.10/32 secondary
 ip router ospf 100 area 0.0.0.0
 ip pim sparse-mode
icam monitor scale

router ospf 100
 router-id 10.1.1.3
router bgp 6500
 router-id 10.1.1.3
 address-family ipv4 unicast
 address-family l2vpn evpn
   advertise-pip
 neighbor 10.10.10.10
   remote-as 6500
   update-source loopback0
   address-family l2vpn evpn
     send-community
     send-community extended
 vrf test
   address-family ipv4 unicast
evpn
 vni 10010 l2
   rd auto
   route-target import auto
   route-target export auto
```

Leaf-4

```
Leaf-4(config-if)# show run
hostname Leaf-4

cfs eth distribute
feature lacp
feature vpc

vlan 1,10,20

vpc domain 2
 peer-switch
 peer-keepalive destination 10.201.182.29 source 10.201.182.28
 peer-gateway

interface port-channel10
 switchport
 switchport mode trunk
 switchport trunk allowed vlan 10,20
 spanning-tree port type network
 vpc peer-link

interface port-channel20
 switchport
 switchport mode trunk
 switchport trunk allowed vlan 10,20
```

```
 vpc 20

interface port-channel40
 switchport
 switchport mode trunk
 switchport trunk allowed vlan 10,20
 vpc 40

interface Ethernet1/7
 switchport
 switchport mode trunk
 switchport trunk allowed vlan 10,20
 channel-group 40 mode active
 no shutdown

interface Ethernet1/8
 switchport
 switchport mode trunk
 switchport trunk allowed vlan 10,20
 channel-group 40 mode active
 no shutdown

interface Ethernet1/45
 switchport
 switchport mode trunk
 switchport trunk allowed vlan 10,20
 channel-group 10 mode active
 no shutdown

interface Ethernet1/47
 switchport
 switchport mode trunk
 switchport trunk allowed vlan 10,20
 channel-group 20 mode active
 no shutdown
```

Leaf-5

```
Leaf-5(config-if)# show run
cfs eth distribute
feature lacp
feature vpc

vlan 1,10,20

vpc domain 2
 peer-switch
 peer-keepalive destination 10.201.182.28 source 10.201.182.29
 peer-gateway

interface port-channel10
 switchport
 switchport mode trunk
 switchport trunk allowed vlan 10,20
 spanning-tree port type network
 vpc peer-link

interface port-channel20
 switchport
 switchport mode trunk
 switchport trunk allowed vlan 10,20
 vpc 20
```

```
interface port-channel40
 switchport
 switchport mode trunk
 switchport trunk allowed vlan 10,20
 vpc 40

interface Ethernet1/7
 switchport
 switchport mode trunk
 switchport trunk allowed vlan 10,20
 channel-group 40 mode active
 no shutdown

interface Ethernet1/8
 switchport
 switchport mode trunk
 switchport trunk allowed vlan 10,20
 channel-group 40 mode active
 no shutdown

interface Ethernet1/45
 switchport
 switchport mode trunk
 switchport trunk allowed vlan 10,20
 channel-group 10 mode active
 no shutdown

interface Ethernet1/47
 switchport
 switchport mode trunk
 switchport trunk allowed vlan 10,20
 channel-group 20 mode active
 no shutdown
```

Host-A

```
 Host-A(config-if)# show run
hostname Host-A

nv overlay evpn
feature ospf
feature bgp
feature pim
feature fabric forwarding
feature interface-vlan
feature vn-segment-vlan-based
feature lacp
feature nv overlay

vlan 1-2,10,20

vrf context test

interface Vlan10
 no shutdown
 vrf member test
 ip address 172.16.1.101/25

interface Ethernet1/45
```

```
 switchport
 switchport mode trunk
 no shutdown
```

Host-B

```
HOST-B(config-if)# show run
hostname HOST-B

feature ospf
feature bgp
feature pim
feature interface-vlan
feature lacp

vlan 1-2,10,20

vrf context test

interface Vlan10
 no shutdown
 vrf member test
 ip address 172.16.1.102/25

interface port-channel10
 switchport
 switchport mode trunk

interface Ethernet1/3
 switchport
 switchport mode trunk
 channel-group 10 mode active
 no shutdown

interface Ethernet1/4
 switchport
 switchport mode trunk
 channel-group 10 mode active
 no shutdown
```

Verify

Use this section in order to confirm that your configuration works properly.

```
HOST-B(config-if)# ping 172.16.1.101 vrf test
PING 172.16.1.101 (172.16.1.101): 56 data bytes
64 bytes from 172.16.1.101: icmp_seq=0 ttl=254 time=1.007 ms
64 bytes from 172.16.1.101: icmp_seq=1 ttl=254 time=0.608 ms
64 bytes from 172.16.1.101: icmp_seq=2 ttl=254 time=0.539 ms
64 bytes from 172.16.1.101: icmp_seq=3 ttl=254 time=0.522 ms
64 bytes from 172.16.1.101: icmp_seq=4 ttl=254 time=0.514 ms

--- 172.16.1.101 ping statistics ---
5 packets transmitted, 5 packets received, 0.00% packet loss
round-trip min/avg/max = 0.514/0.638/1.007 ms

HOST-B(config-if)# show ip arp 172.16.1.101 vrf test
Flags: * - Adjacencies learnt on non-active FHRP router
       + - Adjacencies synced via CFSoE
       # - Adjacencies Throttled for Glean
```

```
      CP - Added via L2RIB, Control plane Adjacencies
      PS - Added via L2RIB, Peer Sync
      RO - Re-Originated Peer Sync Entry
      D - Static Adjacencies attached to down interface
IP ARP Table
Total number of entries: 1
Address          Age       MAC Address     Interface       Flags
172.16.1.101   00:00:04   4ce1.7638.2f37  Vlan10


Host-A(config-if)# ping 172.16.1.102 vrf tes
PING 172.16.1.102 (172.16.1.102): 56 data bytes
64 bytes from 172.16.1.102: icmp_seq=0 ttl=254 time=1.047 ms
64 bytes from 172.16.1.102: icmp_seq=1 ttl=254 time=0.86 ms
64 bytes from 172.16.1.102: icmp_seq=2 ttl=254 time=0.708 ms
64 bytes from 172.16.1.102: icmp_seq=3 ttl=254 time=0.509 ms
64 bytes from 172.16.1.102: icmp_seq=4 ttl=254 time=0.485 ms

--- 172.16.1.102 ping statistics ---
5 packets transmitted, 5 packets received, 0.00% packet loss
round-trip min/avg/max = 0.485/0.721/1.047 ms
Host-A(config-if)#

Host-A(config-if)# show ip arp 172.16.1.102 vrf test
Flags: * - Adjacencies learnt on non-active FHRP router
      + - Adjacencies synced via CFSoE
      # - Adjacencies Throttled for Glean
      CP - Added via L2RIB, Control plane Adjacencies
      PS - Added via L2RIB, Peer Sync
      RO - Re-Originated Peer Sync Entry
      D - Static Adjacencies attached to down interface
IP ARP Table
Total number of entries: 1
Address          Age       MAC Address     Interface       Flags
172.16.1.102   00:05:07   4ce1.7638.3257  Vlan10
Host-A(config-if)#
```

Troubleshoot

This section provides information you can use in order to troubleshoot your configuration.

```
Leaf-2(config-if-range)# show spanning-tree
VLAN0001
 Spanning tree enabled protocol rstp
 Root ID    Priority    32769
            Address     0023.04ee.be01
            Cost        0
            Port        0 ()
            Hello Time  2  sec  Max Age 20 sec  Forward Delay 15 sec

 Bridge ID  Priority    32769  (priority 32768 sys-id-ext 1)
            Address     003a.9c28.2cc7
            Hello Time  2  sec  Max Age 20 sec  Forward Delay 15 sec

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Eth1/47          Desg FWD 4         128.185  P2p

VLAN0002
 Spanning tree enabled protocol rstp
 Root ID    Priority    32770
```

```
            Address       0023.04ee.be01
            This bridge is the root
            Hello Time  2  sec  Max Age 20 sec  Forward Delay 15 sec

 Bridge ID  Priority     32770  (priority 32768 sys-id-ext 2)
            Address       0023.04ee.be01
            Hello Time  2  sec  Max Age 20 sec  Forward Delay 15 sec


Interface         Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Eth1/47           Desg FWD 4         128.185  P2p


VLAN0010
 Spanning tree enabled protocol rstp
 Root ID    Priority     32778
            Address       0023.04ee.be01
            This bridge is the root
            Hello Time  2  sec  Max Age 20 sec  Forward Delay 15 sec

 Bridge ID  Priority     32778  (priority 32768 sys-id-ext 10)
            Address       0023.04ee.be01
            Hello Time  2  sec  Max Age 20 sec  Forward Delay 15 sec


Interface         Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Po10              Desg FWD 4         128.4105 (vPC peer-link) Network P2p
Po40              Desg FWD 1         128.4135 (vPC) P2p
Eth1/47           Desg FWD 4         128.185  P2p


Leaf-2(config-if-range)# show port-channel summary
Flags:  D - Down        P - Up in port-channel (members)
        I - Individual  H - Hot-standby (LACP only)
        s - Suspended   r - Module-removed
        b - BFD Session Wait
        S - Switched    R - Routed
        U - Up (port-channel)
        p - Up in delay-lacp mode (member)
        M - Not in use. Min-links not met
--------------------------------------------------------------------------------
Group Port-       Type     Protocol  Member Ports
channel
--------------------------------------------------------------------------------
10    Po10(SU)    Eth      NONE      --
20    Po20(SD)    Eth      LACP      Eth1/5(D)
40    Po40(SU)    Eth      LACP      Eth1/7(P)    Eth1/8(P)


Leaf-2(config-if-range)# show vpc brief
Legend:
             (*) - local vPC is down, forwarding via vPC peer-link
vPC domain id                  : 1
Peer status                    : peer adjacency formed ok
vPC keep-alive status          : peer is alive
Configuration consistency status : success
Per-vlan consistency status    : success
Type-2 consistency status      : success
vPC role                       : primary
Number of vPCs configured      : 2
Peer Gateway                   : Enabled
Dual-active excluded VLANs      : -
Graceful Consistency Check     : Enabled
Auto-recovery status           : Disabled
Delay-restore status           : Timer is off.(timeout = 30s)
Delay-restore SVI status       : Timer is off.(timeout = 10s)
Delay-restore Orphan-port status  : Timer is off.(timeout = 0s)
```

```
Operational Layer3 Peer-router    : Disabled
Virtual-peerlink mode             : Enabled


vPC Peer-link status
---------------------------------------------------------------------
id    Port   Status Active vlans
--    ----   ------ --------------------------------------------------
1     Po10   up     10


vPC status
------------------------------------------------------------------------------
Id     Port         Status Consistency Reason           Active vlans
--     -----------  ------ ----------- ------           --------------
20     Po20         down*  success     success          -
40     Po40         up     success     success          10


Leaf-3(config-if-range)# show spanning-tree
VLAN0010
 Spanning tree enabled protocol rstp
 Root ID    Priority    32778
            Address     0023.04ee.be01
            This bridge is the root
            Hello Time  2  sec  Max Age 20 sec  Forward Delay 15 sec

 Bridge ID  Priority    32778  (priority 32768 sys-id-ext 10)
            Address     0023.04ee.be01
            Hello Time  2  sec  Max Age 20 sec  Forward Delay 15 sec


Interface         Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Po10              Root FWD 4         128.4105 (vPC peer-link) Network P2p
Po40              Desg FWD 1         128.4135 (vPC) P2p


Leaf-3(config-if-range)# show vpc brief
Legend:
              (*) - local vPC is down, forwarding via vPC peer-link
vPC domain id                    : 1
Peer status                      : peer adjacency formed ok
vPC keep-alive status            : peer is alive
Configuration consistency status : success
Per-vlan consistency status      : success
Type-2 consistency status        : success
vPC role                         : secondary
Number of vPCs configured        : 2
Peer Gateway                     : Enabled
Dual-active excluded VLANs        : -
Graceful Consistency Check       : Enabled
Auto-recovery status             : Disabled
Delay-restore status             : Timer is off.(timeout = 30s)
Delay-restore SVI status         : Timer is off.(timeout = 10s)
Delay-restore Orphan-port status : Timer is off.(timeout = 0s)
Operational Layer3 Peer-router    : Disabled
Virtual-peerlink mode             : Enabled


vPC Peer-link status
---------------------------------------------------------------------
id    Port   Status Active vlans
--    ----   ------ --------------------------------------------------
1     Po10   up     10


vPC status
------------------------------------------------------------------------------
Id     Port         Status Consistency Reason           Active vlans
```

```
--     ------------   ------ ----------- ------                    --------------
20     Po20           down*  success     success                   -
40     Po40           up     success     success                   10


Please check "show vpc consistency-parameters vpc <vpc-num>" for the
consistency reason of down vpc and for type-2 consistency reasons for
any vpc.


Leaf-4(config-if)# show spanning-tree
VLAN0010
 Spanning tree enabled protocol rstp
 Root ID    Priority    32778
            Address     0023.04ee.be01
            Cost        5
            Port        4105 (port-channel10)
            Hello Time  2  sec  Max Age 20 sec  Forward Delay 15 sec


 Bridge ID  Priority    32778  (priority 32768 sys-id-ext 10)
            Address     0023.04ee.be02
            Hello Time  2  sec  Max Age 20 sec  Forward Delay 15 sec


Interface         Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Po10              Root FWD 4         128.4105 (vPC peer-link) Network P2p
Po20              Desg FWD 1         128.4115 (vPC) P2p
Po40              Root FWD 1         128.4135 (vPC) P2p


VLAN0020
 Spanning tree enabled protocol rstp
 Root ID    Priority    32788
            Address     0023.04ee.be02
            This bridge is the root
            Hello Time  2  sec  Max Age 20 sec  Forward Delay 15 sec


 Bridge ID  Priority    32788  (priority 32768 sys-id-ext 20)
            Address     0023.04ee.be02
            Hello Time  2  sec  Max Age 20 sec  Forward Delay 15 sec


Interface         Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Po10              Root FWD 4         128.4105 (vPC peer-link) Network P2p
Po20              Desg FWD 1         128.4115 (vPC) P2p
Po40              Desg FWD 1         128.4135 (vPC) P2p


Leaf-4(config-if)# show vpc brief
Legend:
              (*) - local vPC is down, forwarding via vPC peer-link
vPC domain id                   : 2
Peer status                     : peer adjacency formed ok
vPC keep-alive status           : peer is alive
Configuration consistency status : success
Per-vlan consistency status     : success
Type-2 consistency status       : success
vPC role                        : secondary
Number of vPCs configured       : 2
Peer Gateway                    : Enabled
Dual-active excluded VLANs       : -
Graceful Consistency Check      : Enabled
Auto-recovery status            : Disabled
Delay-restore status            : Timer is off.(timeout = 30s)
Delay-restore SVI status        : Timer is off.(timeout = 10s)
Operational Layer3 Peer-router   : Disabled
Virtual-peerlink mode           : Disabled
```

```
vPC Peer-link status
-----------------------------------------------------------------------
id    Port    Status Active vlans
--    ----    ------ -----------------------------------------------
1     Po10    up     10,20


vPC status
----------------------------------------------------------------------------
Id     Port          Status Consistency Reason              Active vlans
--     -----------   ------ ----------- ------              --------------
20     Po20          up     success     success             10,20
40     Po40          up     success     success             10,20


Please check "show vpc consistency-parameters vpc <vpc-num>" for the
consistency reason of down vpc and for type-2 consistency reasons for
any vpc.


Leaf-4(config-if)# show port-channel summary
Flags:  D - Down        P - Up in port-channel (members)
        I - Individual  H - Hot-standby (LACP only)
        s - Suspended   r - Module-removed
        b - BFD Session Wait
        S - Switched    R - Routed
        U - Up (port-channel)
        p - Up in delay-lacp mode (member)
        M - Not in use. Min-links not met
--------------------------------------------------------------------------------
Group Port-       Type     Protocol  Member Ports
      Channel
--------------------------------------------------------------------------------
10    Po10(SU)    Eth      LACP      Eth1/45(P)
20    Po20(SU)    Eth      LACP      Eth1/47(P)
40    Po40(SU)    Eth      LACP      Eth1/7(P)    Eth1/8(P)


Leaf-5(config-if)# show spanning-tree
VLAN0010
 Spanning tree enabled protocol rstp
 Root ID    Priority    32778
            Address     0023.04ee.be01
            Cost        1
            Port        4135 (port-channel40)
            Hello Time  2  sec  Max Age 20 sec  Forward Delay 15 sec

 Bridge ID  Priority    32778  (priority 32768 sys-id-ext 10)
            Address     0023.04ee.be02
            Hello Time  2  sec  Max Age 20 sec  Forward Delay 15 sec

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- -------------------------------
Po10             Desg FWD 4         128.4105 (vPC peer-link) Network P2p
Po20             Desg FWD 1         128.4115 (vPC) P2p
Po40             Root FWD 1         128.4135 (vPC) P2p


VLAN0020
 Spanning tree enabled protocol rstp
 Root ID    Priority    32788
            Address     0023.04ee.be02
            This bridge is the root
            Hello Time  2  sec  Max Age 20 sec  Forward Delay 15 sec

 Bridge ID  Priority    32788  (priority 32768 sys-id-ext 20)
            Address     0023.04ee.be02
```

```
          Hello Time  2  sec  Max Age 20 sec  Forward Delay 15 sec
Interface         Role Sts Cost         Prio.Nbr Type
---------------- ---- --- --------- -------- -------------------------------
Po10              Desg FWD 4            128.4105 (vPC peer-link) Network P2p
Po20              Desg FWD 1            128.4115 (vPC) P2p
Po40              Desg FWD 1            128.4135 (vPC) P2p


Leaf-5(config-if)# show vpc brief
Legend:
              (*) - local vPC is down, forwarding via vPC peer-link
vPC domain id                     : 2
Peer status                       : peer adjacency formed ok
vPC keep-alive status             : peer is alive
Configuration consistency status  : success
Per-vlan consistency status       : success
Type-2 consistency status         : success
vPC role                          : primary
Number of vPCs configured         : 2
Peer Gateway                      : Enabled
Dual-active excluded VLANs        : -
Graceful Consistency Check        : Enabled
Auto-recovery status              : Disabled
Delay-restore status              : Timer is off.(timeout = 30s)
Delay-restore SVI status          : Timer is off.(timeout = 10s)
Operational Layer3 Peer-router    : Disabled
Virtual-peerlink mode             : Disabled


vPC Peer-link status
---------------------------------------------------------------------
id    Port   Status Active vlans
--    ----   ------ -------------------------------------------------
1     Po10   up     10,20


vPC status
----------------------------------------------------------------------------
Id    Port         Status Consistency Reason              Active vlans
--    ------------ ------ ----------- ------              --------------
20    Po20         up     success     success             10,20
40    Po40         up     success     success             10,20


Please check "show vpc consistency-parameters vpc <vpc-num>" for the
consistency reason of down vpc and for type-2 consistency reasons for
any vpc.




Leaf-1# show bgp l2vpn evpn
BGP routing table information for VRF default, address family L2VPN EVPN
BGP table version is 558, Local Router ID is 10.1.1.1
Status: s-suppressed, x-deleted, S-stale, d-dampened, h-history, *-valid, >-best
Path type: i-internal, e-external, c-confed, l-local, a-aggregate, r-redist, I-injected
Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath, & - backup, 2 - best2


   Network          Next Hop           Metric    LocPrf    Weight Path
Route Distinguisher: 10.1.1.1:32777    (L2VNI 10010)
*>i[2]:[0]:[0]:[48]:[003a.9c28.2cc7]:[0]:[0.0.0.0]/216
                10.2.1.10                        100        0 i
*>i[2]:[0]:[0]:[48]:[003a.9c28.2f67]:[0]:[0.0.0.0]/216
                10.2.1.10                        100        0 i
*>l[2]:[0]:[0]:[48]:[4ce1.7638.2f37]:[0]:[0.0.0.0]/216
                10.2.1.1                         100        32768 i
*>i[2]:[0]:[0]:[48]:[4ce1.7638.3257]:[0]:[0.0.0.0]/216
```

```
                        10.2.1.10                         100        0 i
* i                     10.2.1.10                         100        0 i
*>l[2]:[0]:[0]:[48]:[4ce1.7638.2f37]:[32]:[172.16.1.101]/272
                        10.2.1.1                          100    32768 i
* i[2]:[0]:[0]:[48]:[4ce1.7638.3257]:[32]:[172.16.1.102]/272
                        10.2.1.10                         100        0 i
*>i                     10.2.1.10                         100        0 i


Route Distinguisher: 10.1.1.3:3
*>i[2]:[0]:[0]:[48]:[003a.9c28.2f67]:[0]:[0.0.0.0]/216
                        10.2.1.10                         100        0 i


Route Distinguisher: 10.1.1.3:32777
*>i[2]:[0]:[0]:[48]:[003a.9c28.2f67]:[0]:[0.0.0.0]/216
                        10.2.1.10                         100        0 i
*>i[2]:[0]:[0]:[48]:[4ce1.7638.3257]:[0]:[0.0.0.0]/216
                        10.2.1.10                         100        0 i
*>i[2]:[0]:[0]:[48]:[4ce1.7638.3257]:[32]:[172.16.1.102]/272
                        10.2.1.10                         100        0 i


Route Distinguisher: 10.1.1.4:3
*>i[2]:[0]:[0]:[48]:[003a.9c28.2cc7]:[0]:[0.0.0.0]/216
                        10.2.1.10                         100        0 i


Route Distinguisher: 10.1.1.4:32777
*>i[2]:[0]:[0]:[48]:[003a.9c28.2cc7]:[0]:[0.0.0.0]/216
                        10.2.1.10                         100        0 i
*>i[2]:[0]:[0]:[48]:[4ce1.7638.3257]:[0]:[0.0.0.0]/216
                        10.2.1.10                         100        0 i
*>i[2]:[0]:[0]:[48]:[4ce1.7638.3257]:[32]:[172.16.1.102]/272
                        10.2.1.10                         100        0 i


Route Distinguisher: 10.1.1.1:3    (L3VNI 10002)
*>i[2]:[0]:[0]:[48]:[003a.9c28.2cc7]:[0]:[0.0.0.0]/216
                        10.2.1.10                         100        0 i
*>i[2]:[0]:[0]:[48]:[003a.9c28.2f67]:[0]:[0.0.0.0]/216
                        10.2.1.10                         100        0 i
*>l[2]:[0]:[0]:[48]:[005d.73b2.9647]:[0]:[0.0.0.0]/216
                        10.2.1.1                          100    32768 i
* i[2]:[0]:[0]:[48]:[4ce1.7638.3257]:[32]:[172.16.1.102]/272
                        10.2.1.10                         100        0 i
*>i                     10.2.1.10                         100        0 i


Leaf-1#
Leaf-1# show mac address-table
Legend:
        * - primary entry, G - Gateway MAC, (R) - Routed MAC, O - Overlay MAC
        age - seconds since last seen,+ - primary entry using vPC Peer-Link,
        (T) - True, (F) - False, C - ControlPlane MAC, ~ - vsan,
        (NA)- Not Applicable
   VLAN     MAC Address      Type      age     Secure NTFY Ports
---------+-----------------+--------+---------+------+----+------------------
*   10     4ce1.7638.2f37   dynamic  NA        F      F    Eth1/29
C   10     4ce1.7638.3257   dynamic  NA        F      F    nve1(10.2.1.10)
G   -      0000.2222.3333   static   -         F      F    sup-eth1(R)
G   -      005d.73b2.9647   static   -         F      F    sup-eth1(R)
G   2      005d.73b2.9647   static   -         F      F    sup-eth1(R)
G   10     005d.73b2.9647   static   -         F      F    sup-eth1(R)
Leaf-1#


Leaf-2(config-if-range)#
Leaf-2(config-if-range)# show bgp l2vpn evpn
BGP routing table information for VRF default, address family L2VPN EVPN
BGP table version is 45, Local Router ID is 10.1.1.4
```

```
Status: s-suppressed, x-deleted, S-stale, d-dampened, h-history, *-valid, >-best
Path type: i-internal, e-external, c-confed, l-local, a-aggregate, r-redist, I-injected
Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath, & - backup, 2 - best2

   Network          Next Hop          Metric     LocPrf     Weight Path
Route Distinguisher: 10.1.1.1:3
*>i[2]:[0]:[0]:[48]:[005d.73b2.9647]:[0]:[0.0.0.0]/216
                     10.2.1.1                     100        0 i

Route Distinguisher: 10.1.1.1:32777
*>i[2]:[0]:[0]:[48]:[4ce1.7638.2f37]:[0]:[0.0.0.0]/216
                     10.2.1.1                     100        0 i
*>i[2]:[0]:[0]:[48]:[4ce1.7638.2f37]:[32]:[172.16.1.101]/272
                     10.2.1.1                     100         0 i

Route Distinguisher: 10.1.1.4:32777    (L2VNI 10010)
*>l[2]:[0]:[0]:[48]:[003a.9c28.2cc7]:[0]:[0.0.0.0]/216
                     10.2.1.10                    100     32768 i
*>i[2]:[0]:[0]:[48]:[4ce1.7638.2f37]:[0]:[0.0.0.0]/216
                     10.2.1.1                     100        0 i
*>l[2]:[0]:[0]:[48]:[4ce1.7638.3257]:[0]:[0.0.0.0]/216
                     10.2.1.10                    100     32768 i
*>i[2]:[0]:[0]:[48]:[4ce1.7638.2f37]:[32]:[172.16.1.101]/272
                     10.2.1.1                     100        0 i
*>l[2]:[0]:[0]:[48]:[4ce1.7638.3257]:[32]:[172.16.1.102]/272
                     10.2.1.10                    100     32768 i

Route Distinguisher: 10.1.1.4:3    (L3VNI 10002)
*>l[2]:[0]:[0]:[48]:[003a.9c28.2cc7]:[0]:[0.0.0.0]/216
                     10.2.1.10                    100     32768 i
*>i[2]:[0]:[0]:[48]:[005d.73b2.9647]:[0]:[0.0.0.0]/216
                     10.2.1.1                     100        0 i
*>i[2]:[0]:[0]:[48]:[4ce1.7638.2f37]:[32]:[172.16.1.101]/272
                     10.2.1.1                     100        0 i
Leaf-2(config-if-range)#

Leaf-3(config-if-range)# show bgp l2vpn evpn
BGP routing table information for VRF default, address family L2VPN EVPN
BGP table version is 89, Local Router ID is 10.1.1.3
Status: s-suppressed, x-deleted, S-stale, d-dampened, h-history, *-valid, >-best
Path type: i-internal, e-external, c-confed, l-local, a-aggregate, r-redist, I-injected
Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath, & - backup, 2 - best2

   Network          Next Hop          Metric     LocPrf     Weight Path
Route Distinguisher: 10.1.1.1:3
*>i[2]:[0]:[0]:[48]:[005d.73b2.9647]:[0]:[0.0.0.0]/216
                     10.2.1.1                     100         0 i

Route Distinguisher: 10.1.1.1:32777
*>i[2]:[0]:[0]:[48]:[4ce1.7638.2f37]:[0]:[0.0.0.0]/216
                     10.2.1.1                     100         0 i
*>i[2]:[0]:[0]:[48]:[4ce1.7638.2f37]:[32]:[172.16.1.101]/272
                     10.2.1.1                     100         0 i

Route Distinguisher: 10.1.1.3:32777    (L2VNI 10010)
*>l[2]:[0]:[0]:[48]:[003a.9c28.2f67]:[0]:[0.0.0.0]/216
                     10.2.1.10                    100     32768 i
*>i[2]:[0]:[0]:[48]:[4ce1.7638.2f37]:[0]:[0.0.0.0]/216
                     10.2.1.1                     100         0 i
*>l[2]:[0]:[0]:[48]:[4ce1.7638.3257]:[0]:[0.0.0.0]/216
                     10.2.1.10                    100     32768 i
*>i[2]:[0]:[0]:[48]:[4ce1.7638.2f37]:[32]:[172.16.1.101]/272
                     10.2.1.1                     100         0 i
*>l[2]:[0]:[0]:[48]:[4ce1.7638.3257]:[32]:[172.16.1.102]/272
```

```
                      10.2.1.10                            100      32768 i

Route Distinguisher: 10.1.1.3:3    (L3VNI 10002)
*>l[2]:[0]:[0]:[48]:[003a.9c28.2f67]:[0]:[0.0.0.0]/216
                      10.2.1.10                            100      32768 i
*>i[2]:[0]:[0]:[48]:[005d.73b2.9647]:[0]:[0.0.0.0]/216
                      10.2.1.1                             100          0 i
*>i[2]:[0]:[0]:[48]:[4ce1.7638.2f37]:[32]:[172.16.1.101]/272
                      10.2.1.1                             100          0 i
```