



VXLAN-MCLAG Active-Active High Availability Support

The VXLAN-MCLAG Active-Active High Availability Support feature implements dual-home device with pseudo Multichassis Link Aggregation Control Protocol (pMLACP) redundancy mode and layer 2 VxLAN on the Cisco ASR1000 Series Aggregation Services Routers.

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Restrictions for VXLAN-MCLAG Active-Active High Availability Support

- The loopback interface configured for this feature cannot be used for another feature.
- The loopback interface of NVE interface must be shut down before configuring pmLACP, VxLAN and routing protocol.
- Bridge domain supports one VXLAN Network Identifier (VNI) Ethernet flow point (EFP) member only.
- Shutting the bridge domain affects status of the NVE interface, not the pseudo mLACP status.

Information About VXLAN-MCLAG Active-Active High Availability Support

Virtual Extensible LAN

Virtual Extensible LAN (VXLAN) is a network virtualization overlay technology that provides Layer 2 connectivity for workloads residing at noncontiguous points in the data center network. VXLAN enables

flexibility by allowing workloads to be placed anywhere, along with the traffic separation required in a multitenant environment. VXLAN is an industry-standard protocol and uses underlay IP networks. It extends Layer 2 segments over a Layer 3 infrastructure to build Layer 2 overlay logical networks. It encapsulates Ethernet frames into IP User Data Protocol (UDP) headers and transports the encapsulated packets through the underlay network to the remote VXLAN tunnel endpoints (VTEPs) using the normal IP routing and forwarding mechanism.

Multichassis Link Aggregation Group

Multichassis Link Aggregation Group (MC-LAG) and Inter-chassis Communication Protocol (ICCP) enable a switch/router to use standard Ethernet Link Aggregation for device dual-homing, with active/standby redundancy. MC-LAG provides a mean to dual home a device (the dual homed device (DHD)) to two different peer devices (the Point of Attachment), allowing to have the benefits of node redundancy. Point of Attachment (PoA) nodes run Inter-chassis Communication Protocol (ICCP) to synchronize state & form a Redundancy Group (RG).

In VXLAN - MCLAG Active-Active High Availability support, both the PoA ports are placed in active/active mode with manual VLAN load balancing. It provides higher bandwidth utilization than Multichassis Link Aggregation Control Protocol (mLACP). It also allows maximum flexibility for the Provider Edge-Customer Edge (PE-CE) inter-operability for dual-homing redundancy and failover recovery. Active and standby PoA nodes are configured on the identical interfaces, that is, the same loopback IP address and interface as VTEP source interface, VLAN and VNI mapping, and so on.

How to Configure VXLAN-MCLAG Active-Active High Availability Support

Configuring Interchassis Redundancy Groups on PoA

To configure interchassis redundancy groups on PoA, perform the steps below.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **redundancy**
4. **interchassis group** *group-id*
5. **member ip** *peer ip address*
6. **monitor peer** [**bfd** | **track**]
7. **mlacp node-id** *node id*
8. **backbone interface** *backbone if*
9. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable	Enables privileged EXEC mode.

	Command or Action	Purpose
	Example: Device> enable	<ul style="list-style-type: none"> Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	redundancy Example: Device(config)# redundancy	Configures the redundancy group.
Step 4	interchassis group <i>group-id</i> Example: Device(config-red)# interchassis group 2	Configures interchassis group.
Step 5	member ip <i>peer ip address</i> Example: Device(config-r-ic)# member ip 172.168.40.24	Specifies IP address to be assigned to a remote peer dialing in to the interface.
Step 6	monitor peer [bfd track] Example: Device(config-r-ic)# monitor peer bfd	Specifies the the peer monitoring method.
Step 7	mlacp node-id <i>node id</i> Example: Device(config-r-ic)# mlacp node-id 2	Configures mLACP node ID.
Step 8	backbone interface <i>backbone if</i> Example: Device(config-r-ic)# backbone interface Gi0/0/2	Configures a backbone interface for the redundancy group.
Step 9	end Example: Device(config-if)# end	Exits interface configuration mode and returns to privileged EXEC mode.

Configuring Port Channel on PoA

To configure port channel on PoA, perform the steps below.

SUMMARY STEPS

- enable**
- configure terminal**
- interface Port-channel** *port channel number*
- negotiation**

5. **lACP fast-switchover**
6. **mLACP interchassis group** *rg id*
7. **mLACP mode active-active**
8. **mLACP load-balance primary vlan** *vlan-id*
9. **mLACP load-balance secondary vlan** *vlan-id*
10. **service instance** *id* **ethernet**
11. **encapsulation dot1q**
12. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none">• Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	interface Port-channel <i>port channel number</i> Example: Device(config-if)# interface Port-channel 2	Configures the interface for port channel.
Step 4	negotiation Example: Device(config-if)# negotiation	Configures auto negotiation mode.
Step 5	lACP fast-switchover Example: Device(config-if)# lACP fast-switchover	Specifies LACP Port Channel interface.
Step 6	mLACP interchassis group <i>rg id</i> Example: Device(config-if)# mLACP interchassis group 2	Configures mLACP peer PoA RG ID.
Step 7	mLACP mode active-active Example: Device(config-if)# mLACP mode active-active	Enables mLACP active-active POA redundancy.
Step 8	mLACP load-balance primary vlan <i>vlan-id</i> Example: Device(config-if)# mLACP load-balance primary vlan 40	Configures the list of primary VLANs that will be active and inactive on the given PoA.

	Command or Action	Purpose
Step 9	mlacp load-balance secondary vlan <i>vlan-id</i> Example: Device(config-if)# mlacp load-balance secondary vlan 20	Configures the list of secondary VLANs that will be active and inactive on the given PoA.
Step 10	service instance <i>id</i> ethernet Example: Device(config-if-srv)# service instance 20 ethernet	Configures service instance identifier.
Step 11	encapsulation dot1q Example: Device(config-if-srv)# encapsulation dot1q 20	Configures ethernet frame match criteria.
Step 12	end Example: Device(config-if)# end	Exits interface configuration mode and returns to privileged EXEC mode.

Configuring Vxlan Unicast Core Configuration on POA

To configure Vxlan Unicast Core Configuration on POA, perform the steps below.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **bridge-domain *id***
4. **member vni *number***
5. **member Port-channel *number* service-instance *id***
6. **exit**
7. **interface Loopback *number***
8. **ip address**
9. **exit**
10. **interface nve**
11. **member vni *number***
12. **ingress-replication *IPV4 address***
13. **exit**
14. **source-interface Loopback *id***
15. **no shutdown**
16. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none">• Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	bridge-domain <i>id</i> Example: Device(config)# bridge-domain 20	Configures the bridge domain ID.
Step 4	member vni <i>number</i> Example: Device(config-bdomain)# member vni 7777	Configures member virtual network identifier (VNI).
Step 5	member Port-channel <i>number</i> service-instance <i>id</i> Example: Device(config-bdomain)# member Port-channel1 service-instance 20	Configures port channel and service instance.
Step 6	exit Example: Device(config-bdomain)# exit	Exits bridge domain mode and returns to global configuration mode.
Step 7	interface Loopback <i>number</i> Example: Device(config-if)# interface Loopback10	Specifies a loopback interface.
Step 8	ip address Example: Device(config-if)# ip address 77.1.1.1 255.255.255.255	Configures IP address.
Step 9	exit Example: Device(config-if)# exit	Exits interface configuration mode and returns to global configuration mode.
Step 10	interface nve Example: Device(config)# interface nve1	Configures network virtualization endpoint interface.
Step 11	member vni <i>number</i> Example:	Configures VNI information.

	Command or Action	Purpose
	<code>Device(config-if)# member vni 7777</code>	
Step 12	ingress-replication <i>IPV4 address</i> Example: <code>Device(config-if-nve-vni)# ingress-replication 99.1.1.1</code>	Configures remote Peer IPV4 Address.
Step 13	exit Example: <code>Device(config-if-nve-vni)# exit</code>	Exits network virtualization endpoint interface configuration mode and returns to global configuration mode.
Step 14	source-interface <i>Loopback id</i> Example: <code>Device(config-if)# source-interface Loopback10</code>	Configures interface loopback.
Step 15	no shutdown Example: <code>Device(config-if)# no shutdown</code>	Restarts the interface.
Step 16	end Example: <code>Device(config-if)# end</code>	Exits interface configuration mode and returns to privileged EXEC mode.

Configuring Vxlan Multicast Core Configuration on POA

To configure Vxlan Multicast Core Configuration on POA, perform the steps below.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **bridge-domain** *id*
4. **member vni** *number*
5. **member Port-channel** *number service-instance id*
6. **exit**
7. **interface** *Loopback number*
8. **ip address**
9. **ip pim sparse-dense-mode**
10. **exit**
11. **interface nve**
12. **member vni** *number mcast-group address*
13. **source-interface** *Loopback*
14. **no shutdown**
15. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none">• Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	bridge-domain <i>id</i> Example: Device(config)# bridge-domain 20	Configures the bridge domain ID.
Step 4	member vni <i>number</i> Example: Device(config-bdomain)# member vni 7777	Configures member virtual network identifier (VNI).
Step 5	member Port-channel <i>number</i> service-instance <i>id</i> Example: Device(config-bdomain)# member Port-channell service-instance 20	Configures port channel and service instance.
Step 6	exit Example: Device(config-bdomain)# exit	Exits bridge domain mode and returns to global configuration mode.
Step 7	interface Loopback <i>number</i> Example: Device(config-if)# interface Loopback10	Specifies a loopback interface.
Step 8	ip address Example: Device(config-if)# ip address 77.1.1.1 255.255.255.255	Configures IP address.
Step 9	ip pim sparse-dense-mode Example: Device(config-if)# ip pim sparse-dense-mode	Enables PIM to operate in sparse or dense mode.
Step 10	exit Example: Device(config-if)# exit	Exits interface configuration mode and returns to global configuration mode.
Step 11	interface nve Example:	Configures network virtualization endpoint interface.

	Command or Action	Purpose
	Device(config)# interface nve1	
Step 12	member vni number mcast-group address Example: Device(config-if)# member vni 7777 mcast-group 232.1.1.1	Configures VNI information.
Step 13	source-interface Loopback Example: Device(config-if)# source-interface Loopback10	Configures interface loopback.
Step 14	no shutdown Example: Device(config-if)# no shutdown	Restarts the interface.
Step 15	end Example: Device(config-if)# end	Exits interface configuration mode and returns to privileged EXEC mode.

Configuring Dual-homed Device

To configure dual-homed device, perform the steps below:

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface Port-channel number**
4. **switchport group-id**
5. **switchport trunk encapsulation dot1q**
6. **switchport trunk allowed vlan 20-50**
7. **switchport mode trunk**
8. **exit**
9. **interface GigabitEthernet3/1**
10. **switchport**
11. **switchport trunk encapsulation dot1q**
12. **switchport trunk allowed vlan 20-50**
13. **switchport mode trunk**
14. **channel-group number mode**
15. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable	Enables privileged EXEC mode.

	Command or Action	Purpose
	Example: Device> enable	<ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	interface Port-channel <i>number</i> Example: Device(config)# interface Port-channel1	Configures ethernet channel of interfaces.
Step 4	switchport <i>group-id</i> Example: Device(config-if)# switchport	Sets the interface as an Ethernet interface.
Step 5	switchport trunk encapsulation dot1q Example: Device(config-r-ic)# switchport trunk encapsulation dot1q	Defines the encapsulation format as IEEE 802.1Q (dot1q) for the specified interface.
Step 6	switchport trunk allowed vlan 20-50 Example: Device(config-r-ic)# switchport trunk allowed vlan 20-50	Specifies that only certain VLANs are allowed on the specified trunk.
Step 7	switchport mode trunk Example: Device(config-r-ic)# switchport mode trunk	Sets the interface as an Ethernet trunk port.
Step 8	exit Example: Device(config-r-ic)# exit	Exits interface mode and returns to global configuration mode
Step 9	interface GigabitEthernet3/1 Example: Device(config-if)# interface GigabitEthernet3/1	Enters the interface configuration mode on the Gigabit Ethernet interface.
Step 10	switchport Example: Device(config-if)# switchport	Configures the interface port.
Step 11	switchport trunk encapsulation dot1q Example: Device(config-if)# switchport trunk encapsulation dot1q	Defines the encapsulation format as IEEE 802.1Q (dot1q) for the specified interface.

	Command or Action	Purpose
Step 12	switchport trunk allowed vlan 20-50 Example: Device(config-if)# switchport trunk allowed vlan 20-50	Specifies that only certain VLANs are allowed on the specified trunk.
Step 13	switchport mode trunk Example: Device(config-if)# switchport mode trunk	Sets the interface as an Ethernet trunk port.
Step 14	channel-group number mode Example: Device(config-if)# channel-group 1 mode active	Configures the port in a channel group and sets the mode.
Step 15	end Example: Device(config-if)# end	Exits interface configuration mode and returns to privileged EXEC mode.

Verifying VXLAN-MCLAG Active-Active High Availability Support

To verify, perform the steps below.

SUMMARY STEPS

1. **show lacp internal**
2. **show nve interface nve1**
3. **show nve peers**
4. **show platform software ethernet fp ac bridge-domain binding**
5. **show bridge-domain 20**
6. **show lacp multi-chassis load-balance port-channel**
7. **show nve vni 11111 detail**
8. **show lacp multi load group**

DETAILED STEPS

Step 1 show lacp internal

Example:

```
Flags: S - Device is requesting Slow LACPDUs
       F - Device is requesting Fast LACPDUs
       A - Device is in Active mode           P - Device is in Passive mode
```

```
Channel group 1
```

Port	Flags	State	LACP port Priority	Admin Key	Oper Key	Port Number	Port State
Gi0/0/0	SA	bndl	32768	0x1	0x1	0x1	0x3D

```
Channel group 2
```

Port	Flags	State	LACP port Priority	Admin Key	Oper Key	Port Number	Port State
Gi0/0/1	SA	susp	32768	0x2	0x2	0x2	0x7D

Step 2 show nve interface nve1

Example:

Interface: nve1, State: Admin Up, Oper Up Encapsulation: Vxlan
source-interface: Loopback10 (primary:77.1.1.1 vrf:0)

Step 3 show nve peers

Example:

Interface	Peer-IP	VNI	Peer state
nve1	99.1.1.1	7777	

Step 4 show platform software ethernet fp ac bridge-domain binding

Example:

Forwarding Manager Bridge Domain Bindings

BD	Interface	EFP DPIDB	SHG	STP	AOM id
20	Port-channell.EFP20	16908305	None	FRWD	182, (created)
20	nve1.VNI7777	16908307	None	FRWD	268, (created)
40	Port-channell.EFP40	16908306	None	BLCK	258, (created)
40	nve2.VNI8888	16908308	None	FRWD	285, (created)

Step 5 show bridge-domain 20

Example:

```
FBridge-domain 20 (2 ports in all)
State: UP                               Mac learning: Enabled
Aging-Timer: 300 second(s)
  Port-channell service instance 20
    vni 7777
  AED MAC address   Policy Tag      Age  Pseudoport
  0  0000.6177.0003 forward dynamic  300  nve1.VNI7777, VxLAN
                                src: 77.1.1.1 dst: 99.1.1.1
  0  0000.6177.0009 forward dynamic  300  nve1.VNI7777, VxLAN
                                src: 77.1.1.1 dst: 99.1.1.1
  0  0000.6177.0000 forward dynamic  300  nve1.VNI7777, VxLAN
                                src: 77.1.1.1 dst: 99.1.1.1
  0  0000.1577.0009 forward dynamic  300  Port-channell.EFP20
```

Step 6 show lacp multi-chassis load-balance port-channel

Example:

```
Interface Port-Channel 1
  Local Configuration:
    P-mLACP Enabled:      Yes
    Redundancy Group:    1
    Revertive Mode:      Revertive
    Primary VLANs:       20
    Secondary VLANs:     40
  Local Interface State:
    Interface ID: 1
    Port State:          Up
    Primary VLAN State:  Active
    Secondary VLAN State: Standby
  Peer Interface State:
```

```

Interface ID: 1
Primary VLAN State: Active
Secondary VLAN State: Standby

```

Step 7 show nve vni 11111 detail

Example:

```

IInterface VNI Multicast-group VNI state
nve1 11111 N/A Up
VNI Detailed statistics:
Pkts In Bytes In Pkts Out Bytes Out
1682112875 107655224000 1681321674 107604587136

```

Step 8 show lacp multi load group

Example:

```

Interchassis Redundancy Group 1

RG State: Synchronized
ICCP Version: 0
Backbone Uplink Status: Connected
Local Configuration:
Node-id: 0

Peer Information:
State: Up
Node-id: 1
ICCP Version: 0

States: Active - ACT Standby - SBY
Down - DN AdminDown - ADN
Unknown - UN Reverting - REV

P-mLACP Interfaces
Interface Port State Local VLAN State Peer VLAN State
ID Local Primary/Secondary Primary/Secondary
1 UP ACT/SBY ACT/SBY

```

Configuration Examples for VXLAN-MCLAG Active-Active High Availability Support

Example: Configuring VXLAN HA on Multicast Mode

The following example shows how to configure the VXLAN-MCLAG Active-Active High Availability Support feature on a multicast mode with two points of attachments (POA) connected to branch devices. The following is the configuration on the first POA—POA1.

```

ip multicast-routing distributed
ip pim bidir-enable
ip pim rp-address 4.4.4.4 bidir

redundancy
mode sso

```

Example: Configuring VXLAN HA on Multicast Mode

```

interchassis group 1
  monitor peer bfd
  member ip 9.9.9.9
  backbone interface GigabitEthernet0/1/0
  mlacp system-priority 200
  mlacp node-id 0

bridge-domain 20
  member vni 7777
  member Port-channell service-instance 20
  !

bridge-domain 40
  member vni 8888
  member Port-channell service-instance 40
  !

interface Loopback10
  ip address 77.1.1.1 255.255.255.255
  ip pim sparse-dense-mode
  !

interface Loopback11
  ip address 88.1.1.1 255.255.255.255
  ip pim sparse-dense-mode
  !

interface Port-channell
  no ip address
  negotiation auto
  lacp fast-switchover
  mlacp interchassis group 1
  mlacp mode active-active
  mlacp load-balance primary vlan 40
  mlacp load-balance secondary vlan 20
  service instance 20 ethernet
    encapsulation dot1q 20
  !
  service instance 40 ethernet
    encapsulation dot1q 40
  !
  !

interface nve1
  no ip address
  member vni 7777 mcast-group 225.1.1.1
  source-interface Loopback10
  !

interface nve2
  no ip address
  member vni 8888 mcast-group 226.1.1.1
  source-interface Loopback11
  !

interface GigabitEthernet0/1/0
  ip address 192.168.20.1 255.255.255.0
  ip pim sparse-dense-mode
  negotiation auto
  !

router ospf 10
  router-id 3.3.3.3
  network 0.0.0.0 255.255.255.255 area 10
  !

```

The following is the configuration on the second POA—POA2.

```

ip multicast-routing distributed
ip pim bidir-enable

```

```
ip pim rp-address 4.4.4.4 bidir

redundancy
mode sso
interchassis group 1
  monitor peer bfd
  member ip 3.3.3.3
  backbone interface GigabitEthernet0/0/1
  mlacp system-priority 200
  mlacp node-id 1

bridge-domain 20
  member vni 7777
  member Port-channel1 service-instance 20
!

bridge-domain 40
  member vni 8888
  member Port-channel1 service-instance 40
!

interface Loopback10
  ip address 77.1.1.1 255.255.255.255
  ip pim sparse-dense-mode
!
interface Loopback11
  ip address 88.1.1.1 255.255.255.255
  ip pim sparse-dense-mode
!
interface Port-channel1
  no ip address
  negotiation auto
  no keepalive
  lacp fast-switchover
  mlacp interchassis group 1
  mlacp mode active-active
  mlacp load-balance primary vlan 20
  mlacp load-balance secondary vlan 40
  service instance 20 ethernet
    encapsulation dot1q 20
  !
  service instance 40 ethernet
    encapsulation dot1q 40
  !
!
interface nve1
  no ip address
  member vni 7777 mcast-group 225.1.1.1
  source-interface Loopback10
!
interface nve2
  no ip address
  member vni 8888 mcast-group 226.1.1.1
  source-interface Loopback11
!

interface GigabitEthernet0/1/0
  ip address 192.168.20.1 255.255.255.0
  ip pim sparse-dense-mode
  negotiation auto
!

interface GigabitEthernet0/0/1
  ip address 192.168.4.1 255.255.255.0
```

Example: Configuring VXLAN HA on Multicast Mode

```

ip pim sparse-dense-mode
negotiation auto
end

router ospf 10
router-id 9.9.9.9
network 0.0.0.0 255.255.255.255 area 10
!

```

The following is the configuration on the first branch—Branch1.

```

ip multicast-routing distributed
ip pim bidir-enable
ip pim rp-address 4.4.4.4 bidir
!
bridge-domain 20
member vni 7777
member GigabitEthernet0/0/0 service-instance 20
!
interface Loopback10
ip address 99.1.1.1 255.255.255.255
ip pim sparse-dense-mode
!
interface nve1
no ip address
member vni 7777 mcast-group 225.1.1.1
source-interface Loopback10
!
interface GigabitEthernet0/0/0
no ip address
negotiation auto
service instance 20 ethernet
encapsulation dot1q 20
!
!
interface GigabitEthernet0/0/0
ip address 192.168.3.1 255.255.255.0
ip pim sparse-dense-mode
!
router ospf 10
network 0.0.0.0 255.255.255.255 area 10
!

```

The following is the configuration on the second branch—Branch2.

```

ip multicast-routing distributed
ip pim bidir-enable
ip pim rp-address 4.4.4.4 bidir
!
bridge-domain 40
member vni 8888
member GigabitEthernet0/0/0 service-instance 40
!
interface Loopback11
ip address 100.1.1.1 255.255.255.255
ip pim sparse-dense-mode
!
interface nve1
no ip address
member vni 8888 mcast-group 226.1.1.1
source-interface Loopback11
!
interface GigabitEthernet0/0/0
no ip address
negotiation auto

```



```

service instance 40 ethernet
  encapsulation dot1q 40
  !
!
interface GigabitEthernet0/0/1
  ip address 192.168.21.1 255.255.255.0
  ip pim sparse-dense-mode
  negotiation auto
!
router ospf 10
network 0.0.0.0 255.255.255.255 area 10
!

```

Example: Configuring VXLAN HA on Unicast Mode

The following example shows how to configure the VXLAN-MCLAG Active-Active High Availability Support feature on an unicast mode with two points of attachments (POA) connected to branch devices. The following is the configuration on the first POA—POA1.

```

redundancy
mode sso
interchassis group 1
  monitor peer bfd
  member ip 9.9.9.9
  backbone interface GigabitEthernet0/1/0
  mlacp system-priority 200
  mlacp node-id 0

bridge-domain 20
  member vni 7777
  member Port-channel1 service-instance 20
!

bridge-domain 40
  member vni 8888
  member Port-channel1 service-instance 40
!

interface Loopback10
  ip address 77.1.1.1 255.255.255.255
!

interface Loopback11
  ip address 88.1.1.1 255.255.255.255
!

interface Port-channel1
  no ip address
  negotiation auto
  lacp fast-switchover
  mlacp interchassis group 1
  mlacp mode active-active
  mlacp load-balance primary vlan 40
  mlacp load-balance secondary vlan 20
  service instance 20 ethernet
  encapsulation dot1q 20
!

service instance 40 ethernet
  encapsulation dot1q 40
!
!

interface nve1
  no ip address
  member vni 7777

```

Example: Configuring VXLAN HA on Unicast Mode

```

    ingress-replication 99.1.1.1
    !
    source-interface Loopback10
    !
interface nve2
no ip address
member vni 8888
    ingress-replication 100.1.1.1
    !
    source-interface Loopback11
    !

router ospf 10
router-id 3.3.3.3
network 0.0.0.0 255.255.255.255 area 10
!
```

The following is the configuration on the second POA—POA2.

```

redundancy
mode sso
interchassis group 1
    monitor peer bfd
    member ip 3.3.3.3
    backbone interface GigabitEthernet0/0/1
    mlacp system-priority 200
    mlacp node-id 1

bridge-domain 20
member vni 7777
member Port-channel1 service-instance 20
!

bridge-domain 40
member vni 8888
member Port-channel1 service-instance 40
!

interface Loopback10
ip address 77.1.1.1 255.255.255.255
!
interface Loopback11
ip address 88.1.1.1 255.255.255.255
!
interface Port-channel1
no ip address
negotiation auto
no keepalive
lacp fast-switchover
mlacp interchassis group 1
mlacp mode active-active
mlacp load-balance primary vlan 20
mlacp load-balance secondary vlan 40
service instance 20 ethernet
    encapsulation dot1q 20
    !
service instance 40 ethernet
    encapsulation dot1q 40
    !
!
interface nve1
no ip address
member vni 7777
    ingress-replication 99.1.1.1
    !
```

```

    source-interface Loopback10
    !
interface nve2
  no ip address
  member vni 8888
    ingress-replication 100.1.1.1
  !
  source-interface Loopback11
  !

router ospf 10
  router-id 9.9.9.9
  network 0.0.0.0 255.255.255.255 area 10
  !

```

The following is the configuration on the first branch—Branch1.

```

bridge-domain 20
  member vni 7777
  member GigabitEthernet0/0/0 service-instance 20
  !
interface Loopback10
  ip address 99.1.1.1 255.255.255.255
  !
interface nve1
  no ip address
  member vni 7777
    ingress-replication 77.1.1.1
  source-interface Loopback10
  !
interface GigabitEthernet0/0/0
  no ip address
  negotiation auto
  service instance 20 ethernet
    encapsulation dot1q 20
  !
  !
router ospf 10
  network 0.0.0.0 255.255.255.255 area 10
  !

```

The following is the configuration on the second branch—Branch2.

```

bridge-domain 40
  member vni 8888
  member GigabitEthernet0/0/0 service-instance 40
  !
interface Loopback11
  ip address 100.1.1.1 255.255.255.255
  !
interface nve1
  no ip address
  member vni 8888
    ingress-replication 88.1.1.1
  source-interface Loopback11
  !
interface GigabitEthernet0/0/0
  no ip address
  negotiation auto
  service instance 40 ethernet
    encapsulation dot1q 40
  !
  !
router ospf 10

```

```
network 0.0.0.0 255.255.255.255 area 10
!
```

Additional References for VXLAN-MCLAG Active-Active High Availability Support

Related Documents

Related Topic	Document Title
Carrier Ethernet commands	Cisco IOS Carrier Ethernet Command Reference

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for VXLAN-MCLAG Active-Active High Availability Support

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 1: Feature Information for VXLAN-MCLAG Active-Active High Availability Support

Feature Name	Releases	Feature Information
VXLAN-MCLAG Active-Active High Availability Support	Cisco IOS XE 3.16S	<p>The VXLAN-MCLAG Active-Active High Availability Support feature implements dual-home device with pseudo Multichassis Link Aggregation Control Protocol (pMLACP) redundancy mode and layer 2 VXLAN on the Cisco ASR 1000 Series Aggregation Services Routers.</p> <p>The following commands were introduced by this feature: show lacp internal, show nve interface nve1, show nve peers, show platform software ethernet fp ac bridge-domain binding, show bridge-domain 20, show lacp multi-chassis load-balance port-channel, show nve vni 11111 detail, show lacp multi load group</p>

