配置EVPN Vxlan IPV6重叠配置示例

目录

简介

本文档介绍如何在Nexus 9000上部署L2以太网VPN(EVPN)虚拟可扩展局域网(VXLAN)IPv6重叠。

先决条件

要求

Cisco 建议您了解以下主题：

- 边界网关协议 (BGP)
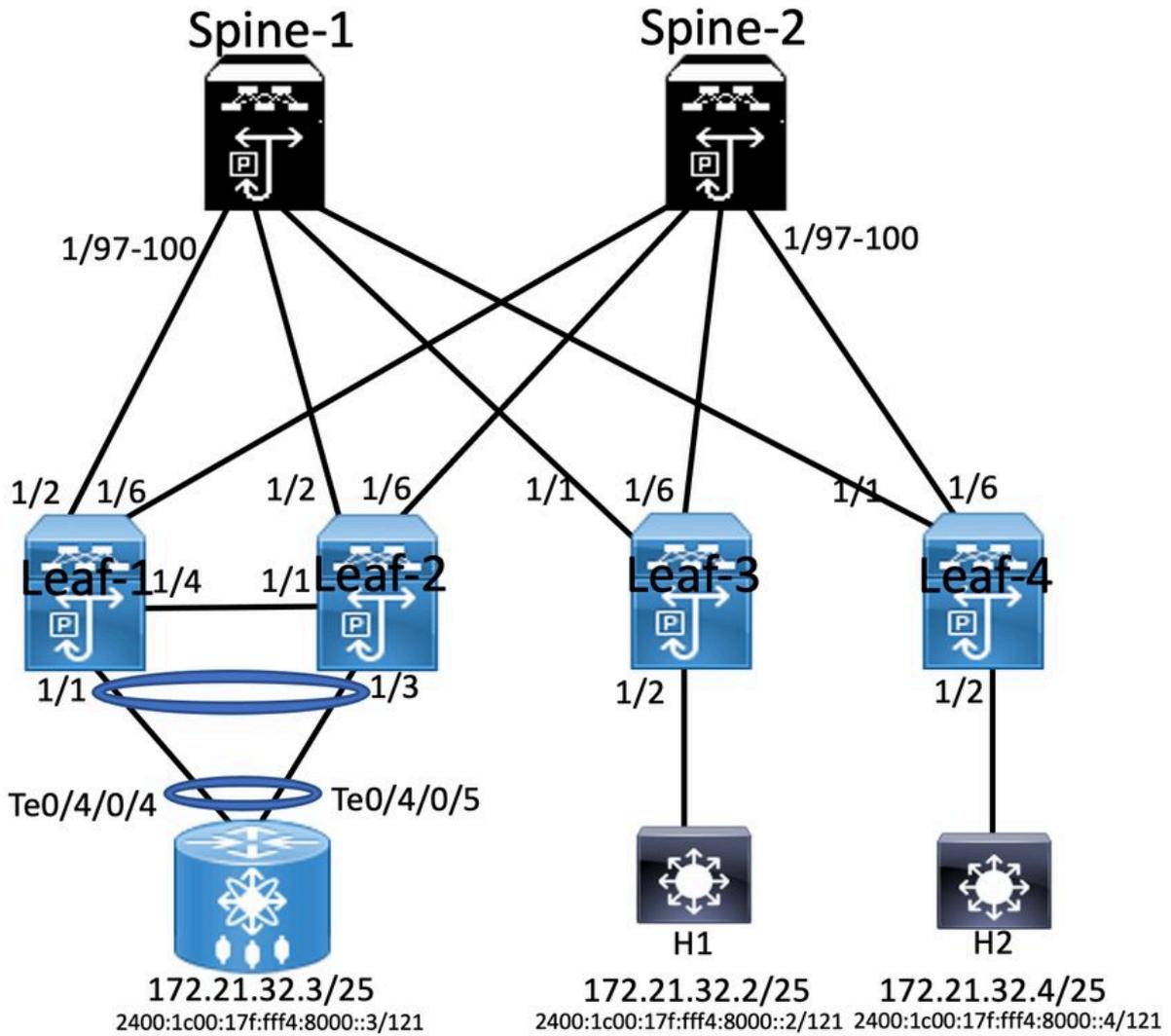- 开放最短路径优先(OSPF)
- EVPN
- IPV6

使用的组件

本文档中的信息基于以下软件和硬件版本：

- 运行版本9.93180.(9)的Cisco N9K-C-YC-FX
- 运行版本9.93216(7)的Cisco N9K-C-TC-FX2
- 思科聚合服务路由器(ASR)，终端主机支持IPv4和IPv6
- 运行版本9.3931808的思科N9K-C-YC-EX

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您的网络处于活动状态，请确保您了解所有命令的潜在影响。

网络图

Spine-1 Spine-2

1/97-100 1/97-100

1/2 1/6 1/2 1/6 1/1 1/6 1/1 1/6

Leaf-1 1/4 1/1 Leaf-2 Leaf-3 Leaf-4

1/1 1/3

1/2 1/2

Te0/4/0/4 Te0/4/0/5

H1 H2

172.21.32.3/25 172.21.32.2/25 172.21.32.4/25
2400:1c00:17f:fff4:8000::3/121 2400:1c00:17f:fff4:8000::2/121 2400:1c00:17f:fff4:8000::4/121

高级配置

1. 安装功能
2. 配置IP地址 — 基础
3. 配置IGP - OSPF
4. 配置MP - BGP
5. 配置VLAN和EVPN重叠
6. 在主机和枝叶之间配置e-BGP

配置

| Leaf-1 | | | | |
Enabling Features	Interface Configuration	BGP/EVPN Configuration	VPC Configuration	VTEP Configuration
			vpc domain 10	
			peer-switch	
			peer-keepalive destination 10.122.163.140 source 10.122.176.45	
nv overlay evpn	Interface loopback0	router bgp 6500	peer-gateway	interface vlan100
feature ospf	ip address 10.1.1.1/32	router-id 10.1.1.1	ipv6 nd synchronize	vrf member SGi_IAC
feature bgp	ip address 10.10.10.10/32 secondary	address-family ipv4 unicast	ip arp synchronize	no ip redirects
feature pim	ip router ospf 100 area 0.0.0.0	address-family ipv6 unicast	interface port-channel10	ip forward
feature fabric forwarding	ip pim spare-mode	address-family l2vpn evpn	switchport	no ipv6 redirects
feature interface-plan	icam monitor scale	advertise-pip	switchport mode trunk	interface vlan511
feature vn-segment-vlan-based		neighbour 10.3.1.1	spanning-tree port type network	vrf member SGi_IAC
feature lacp	interface ethernet1/2	remote-as 6500	vpc peer-link	no ip redirects
feature vpc	mtu 9216	update-source loopback0	interface ethernet 1/4	ip address 172.21.32.6/25
feature nv overlay	ip address 192.168.0.1/24	address-family l2vpn evpn	switchport	ipv6 address 2400:1c00:17f:fff4:8000::4/121
fabric forwarding anycast-gateway-mac 0000.2222.3333	ip router ospf 100 area 0.0.0.0	send-community	switchport mode trunk	no ipv6 redirects
ip pim rp-address 10.3.1.1 group-list 224.0.0.4	ip pim sparse-mode	send-community extended	channel-group 10 mode trunk	fabric forwarding mode any cast-gateway
ip pim ssm range 232.0.0.0/8			interface port-channel 20	
vlan 1,10,20,100,511-513,708-709,711,1179,1664-1665,1667-1668,1894	vrf context SGi_IAC	vrf SGi_IAC	switchport	
vlan 100	vni 10100	Address-family ipv4 unicast	switchport mode trunk	interface nve1
vn-segment 10100	rd auto		switchport trunk allowed vlan 511	advertise virtual-rmac
vlan 511	address-family ipv4 unicast	evpn	vpc 10	host-reachability protocol bgp
vn-segment 10511	route-target both auto	vni 10511 l2	interface ethernet1/1	source-interface loopback0
	route-target both auto evpn	rd auto	switchport	member vni 10100 associate-vhf
route-map PERMIT-ALL permit 10	address-family ipv6 unicast	route-target import auto	switchport mode trunk	member vni 10511
router ospf 100	route-target both auto	route-target export auto	switchport trunk allowed vlan 511	suppress-arp
router-id 10.1.1.1	route-target auto evpn		channel-group 20	mcast-group 239.1.1.1

Leaf-2

Enabling Feature	Interface Configuration	BGP/EVPN Configuration	Vpc Configuration	VTEP Configuration
			vpc domain 10	
			peer-switch	
			peer-keepalive destination 10.122.176.45 source 10.122.163.140	
nv overlay evpn	interface loopback0		peer-gateway	interface vlan100
feature ospf	ip address 10.2.1.1/32	router bgp 6500	ipv6 nd synchronize	vrf member SGi_IAC
feature bgp	ip address 10.10.10.10/32 secondary	router-id 10.2.1.1	ip arp synchronize	no ip redirects
feature pim	ip router ospf 100 area 0.0.0.0	address-family ipv4 unicast	interface port-channel10	ip forward
feature fabric forwarding	ip pim spare-mode	address-family ipv6 unicast	switchport	no ipv6 redirects
feature interface-plan	icam monitor scale	address-family l2vpn evpn	switchport mode trunk	
feature vn-segment-vlan-based		advertise-pip	spanning-tree port type network	interface vlan511
feature lacp	interface ethernet1/2	neighbour 10.3.1.1	vpc peer-link	vrf member SGi_IAC
feature vpc	mtu 9216	remote-as 6500	interface ethernet 1/4	no ip redirects
feature nv overlay	ip address 192.168.3.2/24	update-source loopback0	switchport	ip address 172.21.32.6/25
fabric forwarding anycast-gateway-mac 0000.2222.3333	ip router ospf 100 area 0.0.0.0	address-family l2vpn evpn	switchport mode trunk	ipv6 address 2400:1c00:17f:fff4:8000::4/121
ip pim rp-address 1.1.1.1 group-list 224.0.0.0/4	ip pim sparse-mode	send-community	channel-group 10 mode trunk	no ipv6 redirects
ip pim ssm range 232.0.0.0/8		send-community extended	interface port-channel 20	fabric forwarding mode any cast-gateway
vlan 1,10,20,100,511-513,708-709,711,1179,1664-1665,1667-1668,1894	vrf context SGi_IAC		switchport	
vlan 100	vni 10100	vrf SGi_IAC	switchport mode trunk	interface nve1
vn-segment 10100	rd auto	Address-family ipv4 unicast	switchport trunk allowed vlan 511	advertise virtual-rmac
vlan 511	address-family ipv4 unicast		vpc 10	host-reachability protocol bgp
vn-segment 10511	route-target both auto	evpn	interface ethernet1/1	source-interface loopback0
	route-target both auto evpn	vni 10511 l2	switchport	member vni 10100 associate-vhf
route-map PERMIT-ALL permit 10	address-family ipv6 unicast	rd auto	switchport mode trunk	member vni 10511
router ospf 100	route-target both auto	route-target import auto	switchport trunk allowed vlan 511	suppress-arp
router-id 10.2.1.1	route-target auto evpn	route-target export auto	channel-group 20	mcast-group 239.1.1.1

Spine-1 Configuration

Enabling Features	Interface Configuration	BGP/EVPN Configuration
		router bgp 6500
nv overlay evpn	interface Ethernet1/97	address-family ipv4 unicast
feature ospf	mtu 9216	address-family ipv6 unicast
feature bgp	ip address 172.168.0.2/24	address-family l2vpn evpn
feature pim	ip router ospf 100 area 0.0.0.0	neighbour 10.1.1.1
feature fabric forwarding	ip pim sparse-mode	remote-as 6500
feature interface-plan		update-source loopback0
feature vn-segment-vlan-based	interface Ethernet1/98	address-family l2vpn evpn
feature lacp	mtu 9216	send-community
feature nv overlay	ip address 172.168.2.2/24	send-community extended
	ip router ospf 100 area 0.0.0.0	route-reflector-client
ip pim rp-address 10.3.1.1 group-list 224.0.0.0/4	ip pim sparse-mode	neighbour 10.2.1.1
ip pim ssm range 232.0.0.0/8		remote-as 6500
vlan 1,10,20,100,511-513,708-709,711,1179,1664-1665,1667-1668,1894	interface Ethernet1/99	update-source loopback0
	mtu 9216	address-family l2vpn evpn
Interface loopback0	ip address 192.168.1.2/24	send-community
IP address 1.1.1.1/32	ip router ospf 100 area 0.0.0.0	send-community extended
Ip router ospf 100 are 0.0.0.0	ip pim sparse-mode	route-reflector-client
Ip pim sparse-mode		neighbour 10.4.1.1
Icam monitor scale	interface Ethernet1/100	remote-as 6500
	mtu 9216	update-source loopback0
Router ospf 100	ip address 172.168.3.1/24	address-family l2vpn evpn
Router-id 10.3.1.1	ip router ospf 100 area 0.0.0.0	send-community
Router bgp 6500	ip pim sparse-mode	send-community extended
Router-id 10.3.1.1		route-reflector-client

Leaf-3

Enabling Features	Interface Configuration	BGP/EVPN Configuration	VTEP Configuration
			interface vlan100
nv overlay evpn	interface loopback0	router bgp 6500	vrf member SGi_IAC
feature ospf	ip address 10.4.1.1/32	router-id 10.4.1.1	no ip redirects
feature bgp	ip router ospf 100 area 0.0.0.0	address-family ipv4 unicast	ip forward
feature pim	ip pim spare-mode	address-family ipv6 unicast	no ipv6 redirects
feature fabric forwarding	icam monitor scale	address-family l2vpn evpn	
feature interface-plan		neighbour 10.3.1.1	interface vlan511
feature vn-segment-vlan-based	interface ethernet1/1	remote-as 6500	vrf member SGi_IAC
feature lacp	mtu 9216	update-source loopback0	no ip redirects
feature nv overlay	ip address 192.168.1.1/24	address-family l2vpn evpn	ip address 172.21.32.6/25
	ip router ospf 100 area 0.0.0.0	send-community	ipv6 address 2400:1c00:17f:fff4:8000::4/121
fabric forwarding anycast-gateway-mac 0000.2222.3333	ip pim sparse-mode	send-community extended	no ipv6 redirects
ip pim rp-address 10.3.1.1 group-list 224.0.0.0/4			fabric forwarding mode any cast-gateway
ip pim ssm range 232.0.0.0/8	vrf context SGi_IAC	vrf SGi_IAC	
vlan 1,10,20,100,511-513,708-709,711,1179,1664-1665,1667-1668,1894	vni 10100	address-family ipv4 unicast	interface nve1
vlan 100	rd auto	address-family ipv6 unicast	no shutdown
vn-segment 10100	address-family ipv4 unicast		host-reachability protocol bgp
vlan 511	route-target both auto		source-interface loopback0
vn-segment 10511	route-target both auto evpn	evpn	member vni 10100 associate-vhf
	address-family ipv6 unicast	vni 10511 l2	member vni 10511
route-map PERMIT-ALL permit 10	route-target both auto	rd auto	suppress-arp
router ospf 100	route-target auto evpn	route-target import auto	mcast-group 239.1.1.1
router-id 10.4.1.1		route-target export auto	

Host 1 Configuration	ASR Router	Host 2 Configuration
interface Bundle-Ether1.511	interface Bundle-Ether1.511	interface Bundle-Ether1.511
description JE-PCN01-PC-UP-SGi_IAC	description JE-PCN01-PC-UP-SGi_IAC	description JE-PCN01-PC-UP-SGi_IAC
vrf SGi_IAC	vrf SGi_IAC	vrf SGi_IAC
ipv4 address 172.21.32.2 255.255.255.128	ipv4 address 172.21.32.3 255.255.255.128	ipv4 address 172.21.32.4 255.255.255.128
ipv6 address 2400:1c00:17f:fff4:8000::2/121	ipv6 address 2400:1c00:17f:fff4:8000::3/121	ipv6 address 2400:1c00:17f:fff4:8000::5/121
encapsulation dot1q511	encapsulation dot1q511	encapsulation dot1q511

验证

使用本部分可确认配置能否正常运行。

```
RP/0/RSP1/CPU0:ASR-9906-A#ping vrf SGi_IAC 172.21.32.2
Tue Jul 12 03:35:33.528 UTC
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.21.32.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/3 ms
                                                        RP/0/RSP1/CPU0:ASR-9906-
A#ping vrf SGi_IAC 2400:1c00:17f:fff4:8000::2
Tue Jul 12 03:35:36.536 UTC
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2400:1c00:17f:fff4:8000::2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
```

```
H1#ping 172.21.32.3
Tue Jul 12 03:36:00.993 UTC
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.21.32.3, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms

H1#ping vrf SGi_IAC 2400:1c00:17f:fff4:8000::3
Tue Jul 12 03:36:03.789 UTC
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2400:1c00:17f:fff4:8000::3, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/3 ms
```

故障排除

本部分提供的信息可用于对配置进行故障排除。

使用以下命令排除配置故障：

#show bgp l2vpn evpn

#show nve peer

#show nve vni

 # show ip arp <> >> On host side