

Nexus 9300에서 Layer3 EVPN over Segment Routing MPLS 구축

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소개

이 문서에서는 Nexus 9300 제품에서 SR(Segment Routing) MPLS(Multiprotocol Label Switching)를 통한 L3(Layer3) 이더넷 VPN(EVPN)을 구축/구성하는 방법에 대해 설명합니다.

사전 요구 사항

요구 사항

다음 주제에 대한 지식을 보유하고 있으면 유용합니다.

- BGP(Border Gateway Protocol)
- L3VPN
- EVPN
- SR

사용되는 구성 요소

이 문서의 정보는 다음 소프트웨어 및 하드웨어 버전을 기반으로 합니다.

- SPINE 하드웨어 - 릴리스 9.3을 실행하는 93360YC-FX2.(3)
- LEAF 하드웨어 - 릴리스 9.3을 실행하는 93240YC-FX2.(3)
- 클라이언트 - 93216TC-FX2

이 문서의 정보는 특정 랩 환경의 디바이스를 토대로 작성되었습니다. 이 문서에 사용된 모든 디바이스는 초기화된(기본) 컨피그레이션으로 시작되었습니다. 현재 네트워크가 작동 중인 경우, 모든

명령어의 잠재적인 영향을 미리 숙지하시기 바랍니다.

배경 정보

MPLS L3VPN 요약

VPN은 다음과 같습니다.

- 공용 인프라를 통해 사설 네트워크 서비스를 제공하는 IP 기반 네트워크.
- 인터넷 또는 기타 공용 또는 사설 네트워크를 통해 개별적으로 서로 통신할 수 있는 사이트 집합.

기존 VPN은 VPN의 모든 사이트에 터널 또는 영구 PVC(virtual circuit)의 풀 메쉬를 구성하여 생성됩니다. 새 사이트를 추가하려면 VPN의 각 에지 디바이스를 변경해야 하므로 이러한 유형의 VPN을 유지 관리하거나 확장하기가 쉽지 않습니다.

MPLS 기반 VPN은 L3에서 생성되며 피어 모델을 기반으로 합니다. 피어 모델을 통해 서비스 제공자와 고객은 L3 라우팅 정보를 교환할 수 있습니다. 통신 사업자는 고객 개입 없이 고객 사이트 간에 데이터를 릴레이합니다.

MPLS VPN은 기존 VPN보다 관리 및 확장이 용이합니다. 새 사이트가 MPLS VPN에 추가되면 고객 사이트에 서비스를 제공하는 서비스 공급자의 에지 라우터만 업데이트해야 합니다.

다음은 MPLS VPN의 구성 요소입니다.

- 공급자(P) 라우터 - 제공자 네트워크의 코어에 있는 라우터. P 라우터는 MPLS 스위칭을 실행하고 라우팅된 패킷에 VPN 레이블을 연결하지 않습니다. VPN 레이블은 데이터 패킷을 올바른 사설 네트워크 또는 고객 에지 라우터에 전달하는 데 사용됩니다.
- PE 라우터 - VPN 레이블을 수신하는 인터페이스 또는 하위 인터페이스에 따라 수신 패킷에 연결하고 MPLS 코어 레이블도 연결하는 라우터입니다. PE 라우터는 CE 라우터에 직접 연결됩니다.
- 고객(C) 라우터 - 인터넷 서비스 공급자(ISP) 또는 엔터프라이즈 네트워크의 라우터
- CE(Customer Edge) 라우터 - 네트워크의 PE 라우터에 연결되는 ISP 네트워크의 에지 라우터입니다. CE 라우터는 PE 라우터와 인터페이스해야 합니다.

L3VPN을 사용한 EVPN 개요(MPLS SR)

DC(Data Center) 구축에서는 EVPN 컨트롤 플레인 학습, 멀티테넌시, 원활한 모빌리티, 리던던시, 더 쉬운 POD 추가 등의 이점을 제공하기 위해 VXLAN EVPN 또는 MPLS EVPN을 채택했습니다. 마찬가지로, CORE는 LDP(Label Distribution Protocol) 기반 MPLS L3VPN 네트워크이거나 기존의 MPLS L3VPN LDP 기반 언더레이에서 SR과 같은 보다 정교한 솔루션으로 전환하고 있습니다.

SR은 다음과 같은 혜택을 위해 채택되었습니다.

- Unified IGP 및 MPLS 컨트롤 플레인
- 더 간단한 트래픽 엔지니어링 방법
- 간편한 구성
- SDN(Software-Defined Networking) 도입

EVPN(RFC 7432)은 가상화된 데이터 센터 네트워크에서 차세대 이더넷 서비스에 사용된 BGP MPLS 기반 솔루션입니다. MPLS는 존재하는 RD(Route Distinguisher), RT(Route Target),

VRF(Virtual Routing and Forwarding) 등의 여러 구성 요소를 사용합니다.

NXOS 7.0(3)I6(1) 릴리스에서 도입된 L3 EVPN over SR은 MPLS 캡슐화와 함께 EVPN Type-5 경로를 사용합니다. 진화된 데이터 센터 서비스를 위한 멀티 테넌트, 확장성 및 고성능 기능을 제공합니다.

참고: DC에서 데이터 플레인은 VXLAN 또는 MPLS일 수 있습니다.

기존 MPLS L3 VPN

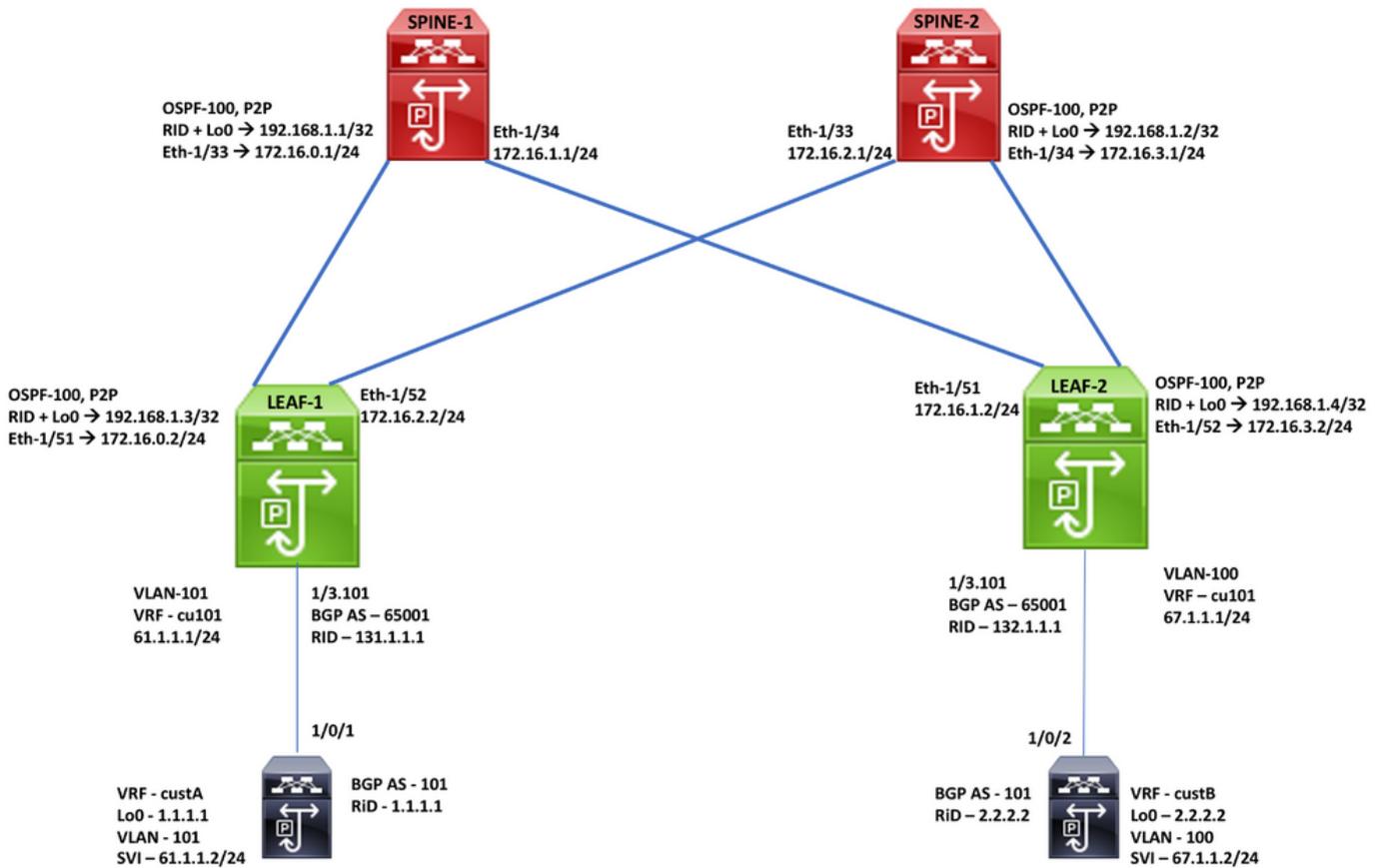
기본 빌드 블록: RD, RT 및 VRF
 전송용 언더레이 레이어: IGP, LDP 및 RSVP-TE
 서비스용 오버레이 레이어: VPNv4 및 VPNv6

SR을 통한 MPLS L3 VPN

기본 빌드 블록: RD, RT 및 VRF
 전송용 언더레이 레이어: IGP/BGP-LU 및 SR-TE
 서비스용 오버레이 레이어: EVPN

구성

토폴로지



고급 구성

1. 기능 설치
2. IP 주소 구성 - 언더레이
3. IGP 구성 - OSPF
4. MP 구성 - BGP
5. VLAN 및 EVPN 오버레이 구성
6. 호스트와 LEAF 간에 e-BGP 구성

SPINE-1 Configuration

Enabling Features, Label-Range, Route-map, Label-Index	OSPF Configuration	BGP/EVPN Configuration
feature-set mpls feature ospf feature bgp feature mpls segment-routing feature mpls evpn feature interface-vlan feature mpls oam	interface Ethernet1/33 ip address 172.16.0.1/24 ip ospf network point-to-point ip router ospf 100 area 0.0.0.0 mpls ip forwarding no shutdown	router bgp 65001 router-id 192.168.1.1 address-family ipv4 unicast network 192.168.1.1/32 route-map label-index-spine1 allocate-label all address-family ipv4 labeled-unicast address-family l2vpn evpn template peer EVPN remote-as 65001 update-source loopback0 address-family l2vpn evpn send-community extended route-reflector-client encapsulation mpls
mpls label range 5000 450000 segment-routing mpls global-block 16000 25000 connected-prefix-sid-map address-family ipv4 192.168.1.1/32 index 211	interface Ethernet1/34 ip address 172.16.1.1/24 ip ospf network point-to-point ip router ospf 100 area 0.0.0.0 mpls ip forwarding no shutdown	template peer Labeled-unicast remote-as 65001 address-family ipv4 labeled-unicast send-community extended route-reflector-client
route-map label-index-spine1 permit 10 set label-index 211	interface loopback0 ip address 192.168.1.1/32 ip router ospf 100 area 0.0.0.0	encapsulation mpls template peer Labeled-unicast remote-as 65001 address-family ipv4 labeled-unicast send-community extended route-reflector-client next-hop-self soft-reconfiguration inbound always
	router ospf 100 segment-routing mpls router-id 192.168.1.1	neighbor 172.16.0.2 inherit peer Labeled-unicast neighbor 172.16.1.2 inherit peer Labeled-unicast neighbor 192.168.1.3 inherit peer EVPN neighbor 192.168.1.4 inherit peer EVPN

SPINE-2 Configuration

Enabling Features, Label-Range, Route-map, Label-Index	OSPF Configuration	BGP/EVPN Configuration
feature-set mpls feature ospf feature bgp feature mpls segment-routing feature mpls evpn feature interface-vlan feature mpls oam	interface Ethernet1/33 ip address 172.16.2.1/24 ip ospf network point-to-point ip router ospf 100 area 0.0.0.0 mpls ip forwarding no shutdown	router bgp 65001 router-id 192.168.1.2 address-family ipv4 unicast network 192.168.1.2/32 route-map label-index-spine2 allocate-label all address-family ipv4 labeled-unicast address-family l2vpn evpn template peer EVPN remote-as 65001 update-source loopback0 address-family l2vpn evpn send-community extended route-reflector-client encapsulation mpls
mpls label range 5000 450000	interface Ethernet1/34 ip address 172.16.3.1/24 ip ospf network point-to-point ip router ospf 100 area 0.0.0.0 mpls ip forwarding no shutdown	template peer Labeled-unicast remote-as 65001 address-family ipv4 labeled-unicast send-community extended route-reflector-client
segment-routing mpls global-block 16000 25000 connected-prefix-sid-map address-family ipv4 192.168.1.2/32 index 221	interface loopback0 ip address 192.168.1.2/32 ip router ospf 100 area 0.0.0.0	encapsulation mpls template peer Labeled-unicast remote-as 65001 address-family ipv4 labeled-unicast send-community extended route-reflector-client next-hop-self soft-reconfiguration inbound always
route-map label-index-spine2 permit 10 set label-index 221	router ospf 100 segment-routing mpls router-id 192.168.1.2	neighbor 172.16.2.2 inherit peer Labeled-unicast neighbor 172.16.3.2 inherit peer Labeled-unicast neighbor 192.168.1.3 inherit peer EVPN neighbor 192.168.1.4 inherit peer EVPN

LEAF-1 Configuration

Enabling Features, Label-Range, Route-map, Label-Index	OSPF Configuration	BGP/EVPN Configuration
feature-set mpls	interface Ethernet1/3.101	router bgp 65001
feature ospf	encapsulation dot1q 101	router-id 192.168.1.3
feature bgp	vrf member cu101	address-family ipv4 unicast
feature mpls segment-routing	ip address 61.1.1.1/24	network 192.168.1.3/32 route-map label-index-leaf-1
feature mpls evpn	no shutdown	allocate-label all
feature interface-vlan		address-family ipv4 labeled-unicast
feature mpls oam	interface Ethernet1/51	address-family l2vpn evpn
	ip address 172.16.0.2/24	template peer EVPN
	ip ospf network point-to-point	remote-as 65001
mpls label range 5000 450000	ip router ospf 100 area 0.0.0.0	update-source loopback0
	mpls ip forwarding	address-family l2vpn evpn
	no shutdown	send-community extended
segment-routing		encapsulation mpls
mpls	interface Ethernet1/52	template peer Labeled-unicast
global-block 16000 25000	ip address 172.16.2.2/24	remote-as 65001
connected-prefix-sid-map	ip ospf network point-to-point	address-family ipv4 labeled-unicast
address-family ipv4	ip router ospf 100 area 0.0.0.0	send-community extended
192.168.1.3/32 index 311	mpls ip forwarding	soft-reconfiguration inbound always
	no shutdown	template peer cu1
route-map label-index-leaf-1 permit 10		address-family ipv4 unicast
set label-index 311		as-override
	interface loopback0	send-community
vrf context cu101	ip address 192.168.1.3/32	soft-reconfiguration inbound always
rd auto	ip router ospf 100 area 0.0.0.0	neighbor 172.16.0.1
address-family ipv4 unicast		inherit peer Labeled-unicast
route-target import 1:101	router ospf 100	neighbor 172.16.2.1
route-target import 1:101 evpn	segment-routing mpls	inherit peer Labeled-unicast
route-target export 1:101	router-id 192.168.1.3	neighbor 192.168.1.1
route-target export 1:101 evpn		inherit peer EVPN
		neighbor 192.168.1.2
		inherit peer EVPN
		vrf cu101
		router-id 131.1.1.1
		address-family ipv4 unicast
		advertise l2vpn evpn
		neighbor 61.1.1.2
		inherit peer cu1
		remote-as 101

LEAF-2 Configuration		
Enabling Features, Label-Range, Route-map, Label-Index	OSPF Configuration	BGP/EVPN Configuration
feature-set mpls feature ospf feature bgp feature mpls segment-routing feature mpls evpn feature interface-vlan feature mpls oam	interface Ethernet1/3.101 encapsulation dot1q 100 vrf member cu101 ip address 67.1.1.1/24 no shutdown	router bgp 65001 router-id 192.168.1.4 address-family ipv4 unicast network 192.168.1.4/32 route-map label-index-Leaf2 allocate-label all address-family ipv4 labeled-unicast address-family l2vpn evpn template peer EVPN remote-as 65001 update-source loopback0 address-family l2vpn evpn send-community extended encapsulation mpls
mpls label range 5000 450000	interface Ethernet1/51 ip address 172.16.1.2/24 ip ospf network point-to-point ip router ospf 100 area 0.0.0.0 mpls ip forwarding no shutdown	template peer Labeled-unicast remote-as 65001 address-family ipv4 labeled-unicast send-community extended soft-reconfiguration inbound always template peer cu1 address-family ipv4 unicast as-override send-community soft-reconfiguration inbound always
segment-routing mpls global-block 16000 25000 connected-prefix-sid-map address-family ipv4 192.168.1.4/32 index 321	interface Ethernet1/52 ip address 172.16.3.2/24 ip ospf network point-to-point ip router ospf 100 area 0.0.0.0 mpls ip forwarding no shutdown	neighbor 172.16.1.1 inherit peer Labeled-unicast neighbor 172.16.3.1 inherit peer Labeled-unicast neighbor 192.168.1.1 inherit peer EVPN neighbor 192.168.1.2 inherit peer EVPN
route-map label-index-Leaf2 permit 10 set label-index 321	interface loopback0 ip address 192.168.1.4/32 ip router ospf 100 area 0.0.0.0	vrf cu101 router-id 132.1.1.1 address-family ipv4 unicast advertise l2vpn evpn neighbor 67.1.1.2 inherit peer cu1 remote-as 101
vrf context cu101 rd auto address-family ipv4 unicast route-target import 1:101 route-target import 1:101 evpn route-target export 1:101 route-target export 1:101 evpn	router ospf 100 segment-routing mpls router-id 192.168.1.4	

End-Host Configuration		
VRF, Loopback Configuration	Interface, SVI Configuration	BGP Configuration
vrf definition custA rd 101:1 ! address-family ipv4 exit-address-family ! vrf definition custB rd 101:2 ! address-family ipv4 exit-address-family	interface GigabitEthernet1/0/1 switchport trunk allowed vlan 101 switchport trunk encapsulation dot1q switchport mode trunk ! interface GigabitEthernet1/0/2 switchport trunk allowed vlan 100 switchport trunk encapsulation dot1q switchport mode trunk	router bgp 101 bgp log-neighbor-changes no bgp default ipv4-unicast ! address-family ipv4 vrf custA bgp router-id 1.1.1.1 network 1.1.1.1 mask 255.255.255.255 redistribute connected neighbor 61.1.1.1 remote-as 65001 neighbor 61.1.1.1 activate neighbor 61.1.1.1 send-community neighbor 61.1.1.1 soft-reconfiguration inbound exit-address-family ! address-family ipv4 vrf custB bgp router-id 2.2.2.2 network 2.2.2.2 mask 255.255.255.255 redistribute connected neighbor 67.0.0.1 soft-reconfiguration inbound neighbor 67.1.1.1 remote-as 65001 neighbor 67.1.1.1 activate neighbor 67.1.1.1 send-community neighbor 67.1.1.1 soft-reconfiguration inbound exit-address-family
interface Loopback0 vrf forwarding custA ip address 1.1.1.1 255.255.255.255 ! interface Loopback1 vrf forwarding custB ip address 2.2.2.2 255.255.255.255	interface Vlan100 vrf forwarding custB ip address 67.1.1.2 255.255.255.0 ! interface Vlan101 vrf forwarding custA ip address 61.1.1.2 255.255.255.0 !	

다음을 확인합니다.

이 섹션을 사용하여 컨피그레이션이 제대로 작동하는지 확인합니다.

Leaf 1 Captures : Control Plane and MPLS Data Plane:

Leaf1(config)# show ip bgp 1.1.1.1 vrf cu101

```
BGP routing table information for VRF cu101, address family IPv4 Unicast
BGP routing table entry for 1.1.1.1/32, version 4
Paths: (2 available, best #1)
Flags: (0x880c0014) (high32 0x000020) on xmit-list, is in urib, is best urib route, is in HW, exported, has label
vpn: version 3, (0x00000000100002) on xmit-list
local label: 492288

Advertised path-id 1, VFN AF advertised path-id 1
Path type: external, path is valid, is best path, no labeled nexthop, in rib
AS-Path: 101 , path sourced external to AS
61.1.1.2 (metric 0) from 61.1.1.2 (1.1.1.1)
Origin IGP, MED 0, localpref 100, weight 0
Extcommunity: RT:1:101

Path type: external, path is valid, received only, no labeled nexthop
AS-Path: 101 , path sourced external to AS
61.1.1.2 (metric 0) from 61.1.1.2 (1.1.1.1)
Origin IGP, MED 0, localpref 100, weight 0

VRF advertise information:
Path-id 1 not advertised to any peer

VFN AF advertise information:
Path-id 1 not advertised to any peer
```

Leaf1(config)# show bgp l2vpn evpn 1.1.1.1

```
BGP routing table information for VRF default, address family L2VPN EVPN
Route Distinguisher: 192.168.1.3:3
BGP routing table entry for [5]:[0]:[0]:[32]:[1.1.1.1]/224, version 6
Paths: (1 available, best #1)
Flags: (0x000002) (high32 00000000) on xmit-list, is not in l2rib/evpn, has label
local label: 492288

Advertised path-id 1
Path type: local, path is valid, is best path, no labeled nexthop
Gateway IP: 0.0.0.0
AS-Path: 101 , path sourced external to AS
0.0.0.0 (metric 0) from 0.0.0.0 (192.168.1.3)
Origin IGP, MED 0, localpref 100, weight 0
Received label 0
Extcommunity: RT:1:101

Path-id 1 advertised to peers:
192.168.1.1 192.168.1.2
```

Leaf1(config)# show bgp ipv4 labeled-unicast 192.168.1.3

```
BGP routing table information for VRF default, address family IPv4 Label Unicast
BGP routing table entry for 192.168.1.3/32, version 8
Paths: (1 available, best #1)
Flags: (0x20c0002) (high32 00000000) on xmit-list, is not in urib, has label
label af: version 11, (0x0000000100002) on xmit-list
local label: 3

Advertised path-id 1, Label AF advertised path-id 1
Path type: local, path is valid, is best path, no labeled nexthop
AS-Path: NONE, path locally originated
0.0.0.0 (metric 0) from 0.0.0.0 (192.168.1.3)
Origin IGP, MED not set, localpref 100, weight 32768
Prefix-SID Attribute: Length: 10
Label Index TLV: Length 7, Flags 0x0 Label Index 311

Path-id 1 not advertised to any peer

Label AF advertisement
Path-id 1 advertised to peers:
172.16.0.1 172.16.2.1
```

Leaf1(config)# show forwarding mpls 192.168.1.4/32

```
slot 1
-----
Local |Prefix |FEC |Next-Hop |Interface |Out
Label |Table Id |(Prefix/Tunnel id) | | |Label
-----|-----|-----|-----|-----|-----
16321 |0x1 |192.168.1.4/32 |172.16.0.1 |Eth1/51 |16321 SWAP
" |0x1 |192.168.1.4/32 |172.16.2.1 |Eth1/52 |16321 SWAP
```

Leaf 2 Captures : Control Plane and MPLS Data Plane:

Leaf2# show forwarding 1.1.1.1/32 vrf cu101

```
slot 1
-----
IPv4 routes for table cu101/base
-----
Prefix | Next-hop | Interface | Labels | Partial Install
-----|-----|-----|-----|-----
1.1.1.1/32 | 172.16.1.1 | Ethernet1/51 | POSH 14311 492288
172.16.1.1 | 172.16.3.1 | Ethernet1/52 | POSH 14311 492288

Leaf2#
Leaf2#
```

Leaf2# show forwarding 172.16.1.1/24

```
slot 1
-----
IPv4 routes for table default/base
-----
Prefix | Next-hop | Interface | Labels | Partial Install
-----|-----|-----|-----|-----
172.16.1.0/24 | Attached | Ethernet1/51 | |
Leaf2#
Leaf2#
```

Leaf2# show forwarding mpls 192.168.1.3/32

```
slot 1
-----
Local |Prefix |FEC |Next-Hop |Interface |Out
Label |Table Id |(Prefix/Tunnel id) | | |Label
-----|-----|-----|-----|-----|-----
16311 |0x1 |192.168.1.3/32 |172.16.1.1 |Eth1/51 |16311 SWAP
" |0x1 |192.168.1.3/32 |172.16.3.1 |Eth1/52 |16311 SWAP
```

Leaf2# show forwarding 192.168.1.3/32

```
slot 1
-----
IPv4 routes for table default/base
-----
Prefix | Next-hop | Interface | Labels | Partial Install
-----|-----|-----|-----|-----
192.168.1.3/32 | 172.16.1.1 | Ethernet1/51 | POSH 14311
172.16.3.1 | Ethernet1/52 | POSH 14311

Leaf2#
```

Spine 1 Captures

spine1# show bgp ipv4 labeled-unicast 1.1.1.1

```
spine1# show bgp l2vpn evpn 1.1.1.1
BGP routing table information for VRF default, address family L2VPN EVPN
Route Distinguisher: 192.168.1.3:3
BGP routing table entry for [5]:[0]:[0]:[32]:[1.1.1.1]/224, version 5
Paths: (1 available, best #1)
Flags: (0x000002) (high32 00000000) on xmit-list, is not in l2rib/evpn, is not in HW

Advertised path-id 1
Path type: internal, path is valid, is best path
Gateway IP: 0.0.0.0
AS-Path: 101 , path sourced external to AS
192.168.1.3 (metric 0) from 192.168.1.3 (192.168.1.3)
Origin IGP, MED 0, localpref 100, weight 0
Received label 492288
Extcommunity: RT:1:101

Path-id 1 advertised to peers:
192.168.1.4
```

spine1# show forwarding mpls 192.168.1.4/32

```
slot 1
-----
Local |Prefix |FEC |Next-Hop |Interface |Out
Label |Table Id |(Prefix/Tunnel id) | | |Label
-----|-----|-----|-----|-----|-----
16321 |0x1 |192.168.1.4/32 |172.16.1.2 |Eth1/34 |0 SWAP
```

spine1# show bgp ipv4 labeled-unicast 192.168.1.3

```
BGP routing table information for VRF default, address family IPv4 Label Unicast
BGP routing table entry for 192.168.1.3/32, version 5
Paths: (1 available, best #1)
Flags: (0x820c0012) (high32 00000000) on xmit-list, is in urib, is backup urib route, is in HW, has label
label af: version 7, (0x00000000100002) on xmit-list
local label: 16311

Advertised path-id 1, Label AF advertised path-id 1
Path type: internal, path is valid, received and used, is best path, no labeled nexthop, in rib
AS-Path: NONE, path sourced internal to AS
172.16.0.2 (metric 0) from 172.16.0.2 (192.168.1.3)
Origin IGP, MED not set, localpref 100, weight 0
Received label 3
Prefix-SID Attribute: Length: 10
Label Index TLV: Length 7, Flags 0x0 Label Index 311

Path-id 1 not advertised to any peer

Label AF advertisement
Path-id 1 advertised to peers:
172.16.1.2
```

```
endhost#show ip int brief
```

Interface	IP-Address	OK?	Method	Status	Protocol
Vlan1	unassigned	YES	NVRAM	up	up
Vlan100	67.1.1.2	YES	manual	up	up
Vlan101	61.1.1.2	YES	manual	up	up
Loopback0	1.1.1.1	YES	manual	up	up
Loopback1	2.2.2.2	YES	manual	up	up

```
endhost#ping vrf custB 1.1.1.1
```

```
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 1.1.1.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/7/17 ms
```

```
endhost#ping vrf custA 2.2.2.2
```

```
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2.2.2.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/8/17 ms
```

```
endhost#traceroute vrf custB 1.1.1.1
```

```
Type escape sequence to abort.
Tracing the route to 1.1.1.1
VRF info: (vrf in name/id, vrf out name/id)
 0 67.1.1.1 0 msec 8 msec 0 msec
 1 172.16.3.1 0 msec 0 msec 0 msec
 2 172.16.0.2 0 msec
   172.16.2.2 0 msec
   172.16.0.2 8 msec
 3 61.1.1.2 0 msec * 0 msec
```

```
endhost#traceroute vrf custA 2.2.2.2
```

```
Type escape sequence to abort.
Tracing the route to 2.2.2.2
VRF info: (vrf in name/id, vrf out name/id)
 0 61.1.1.1 0 msec 17 msec 0 msec
 1 172.16.2.1 17 msec
   172.16.0.1 0 msec
   172.16.2.1 9 msec
 2 172.16.3.2 0 msec
   172.16.1.2 0 msec
   172.16.3.2 17 msec
 3 67.1.1.2 8 msec * 0 msec
endhost#
```

문제 해결

현재 이 컨피그레이션에 사용할 수 있는 특정 문제 해결 정보가 없습니다.

관련 정보

- [다중 프로토콜 BGP MPLS VPN](#)
- [Cisco Nexus 9500, 9300, 9200, 3200 및 3100 플랫폼 스위치의 세그먼트 라우팅 백서](#)
- [세그먼트 라우팅 MPLS를 통한 레이어 3 EVPN 및 레이어 3 VPN 구성](#)
- [기술 지원 및 문서 - Cisco Systems](#)