

# Layer 3 EVPN via segment routing MPLS in Nexus 9300

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## Inleiding

Dit document beschrijft hoe u Layer 3 (L3) Ethernet VPN (EVPN) via Segment Routing (SR) Multiprotocol Label Switching (MPLS) [Open Shortest Path First (OSPF)/Interne Border Gateway Protocol (iBGP)] op Nexus 9300-producten kunt instellen.

## Voorwaarden

### Vereisten

Cisco raadt kennis van de volgende onderwerpen aan:

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

### Gebruikte componenten

De informatie in dit document is gebaseerd op de volgende software- en hardware-versies:

- SPINE-hardware - 93360YC-FX2 met release 9.3.2(3)
- LEAF-hardware - 93240YC-FX2 met release 9.3.2(3)
- CLIENT - 93216TC-FX2

De informatie in dit document is gebaseerd op de apparaten in een specifieke

laboratoriumomgeving. Alle apparaten die in dit document worden beschreven, hadden een opgeschoonde (standaard)configuratie. Als uw netwerk live is, moet u de potentiële impact van elke opdracht begrijpen.

## Achtergrondinformatie

### MPLS L3VPN-Recap

Een VPN is:

- Een op IP gebaseerd netwerk dat privé netwerkservices aanbiedt via een openbare infrastructuur.
- Een reeks sites die via het internet of andere openbare of particuliere netwerken met elkaar mogen communiceren.

Traditionele VPN's worden gecreëerd door een volledig netwerk van tunnels of permanente virtuele circuits (PVC's) te configureren naar alle locaties in een VPN. Dit type VPN is niet makkelijk te onderhouden of uit te breiden, omdat het toevoegen van een nieuwe site een wijziging vereist van elk scherpste apparaat in VPN.

Op MPLS gebaseerde VPN's worden gemaakt in L3 en zijn gebaseerd op het peer-model. Het peer-model stelt de serviceprovider en de klant in staat om L3-routeinformatie uit te wisselen. De dienstverlener verstrekt de gegevens tussen de locaties van de klant zonder betrokkenheid van de klant.

MPLS VPN's zijn gemakkelijker te beheren en uit te breiden dan conventionele VPN's. Wanneer een nieuwe site aan een MPLS VPN wordt toegevoegd, hoeft alleen de randrouter van de serviceprovider die services levert aan de klantensite te worden bijgewerkt.

Dit zijn de componenten van MPLS VPN:

- IP-router (Provider) - router in de kern van het providernetwerk. P-routers voeren MPLS-switching uit en koppelen VPN-labels niet aan Routed Packets. VPN-labels worden gebruikt om gegevenspakketten naar de juiste privé-netwerk- of clientrouter te sturen.
- PE router - router die het VPN-label aan inkomende pakketten bevestigt op basis van de interface of subinterface waarop ze worden ontvangen, en ook de MPLS kernlabels aanbrengt. Een PE router hecht rechtstreeks aan een CE router.
- Customer (C) router - router in het Internet Service Provider (ISP) of het ondernemingsnetwerk.
- Customer Edge-router (CE) - Edge-router op het netwerk van de ISP die verbonden is met de PE-router op het netwerk. Een CE router moet met een PE router een interface maken.

### Overzicht van EVPN met L3VPN (MPLS SR)

Data Center (DC)-implementaties hebben VXLAN EVPN of MPLS EVPN goedgekeurd voor de voordelen ervan, zoals EVPN-besturingsplane learning, multi-tenancy, naadloze mobiliteit, redundantie en makkelijke POD-toevoegingen. Op dezelfde manier is de CORE een op LDP gebaseerd MPLS L3VPN-netwerk (Label Distribution Protocol) of een transitie van de traditionele MPLS L3VPN LDP-gebaseerde basis naar een geavanceerdere oplossing zoals SR.

SR wordt aangenomen voor de voordelen ervan, zoals:

- Unified IGP- en MPLS-besturingsplanes
- Eenvoudige verkeerstechnische methoden
- Eenvoudige configuratie
- Softwaregedefinieerde netwerken (SDN) - adoptie

EVPN (RFC 7432) is een op BGP MPLS gebaseerde oplossing die is gebruikt voor Ethernet-services van de volgende generatie in een gevirtualiseerd datacenternetwerk. Hij gebruikt verschillende bouwstenen, zoals Route Distancier (RD), Route Target (RT) en Virtual Routing and Forwarding (VRF) van MPLS-technologieën die bestaan.

L3 EVPN over SR die werd geïntroduceerd in NXOS 7.0(3)I6(1) release gebruikt de EVPN Type-5 route met MPLS-insluiting. Het biedt multi-huurders, schaalbaarheid, en Hoge prestaties voor de diensten van het datacenter.

**Opmerking:** In DC kan het gegevensvliegtuig VXLAN of MPLS zijn.

### Traditionele MPLS L3 VPN

Hoofdbouwblokken: RD, RT en VRF

Onderlaag voor transport: IGP, LDP en RSVP-TE

Overlay Layer voor service: VPNv4 en VPNv6

### MPLS L3 VPN via SR

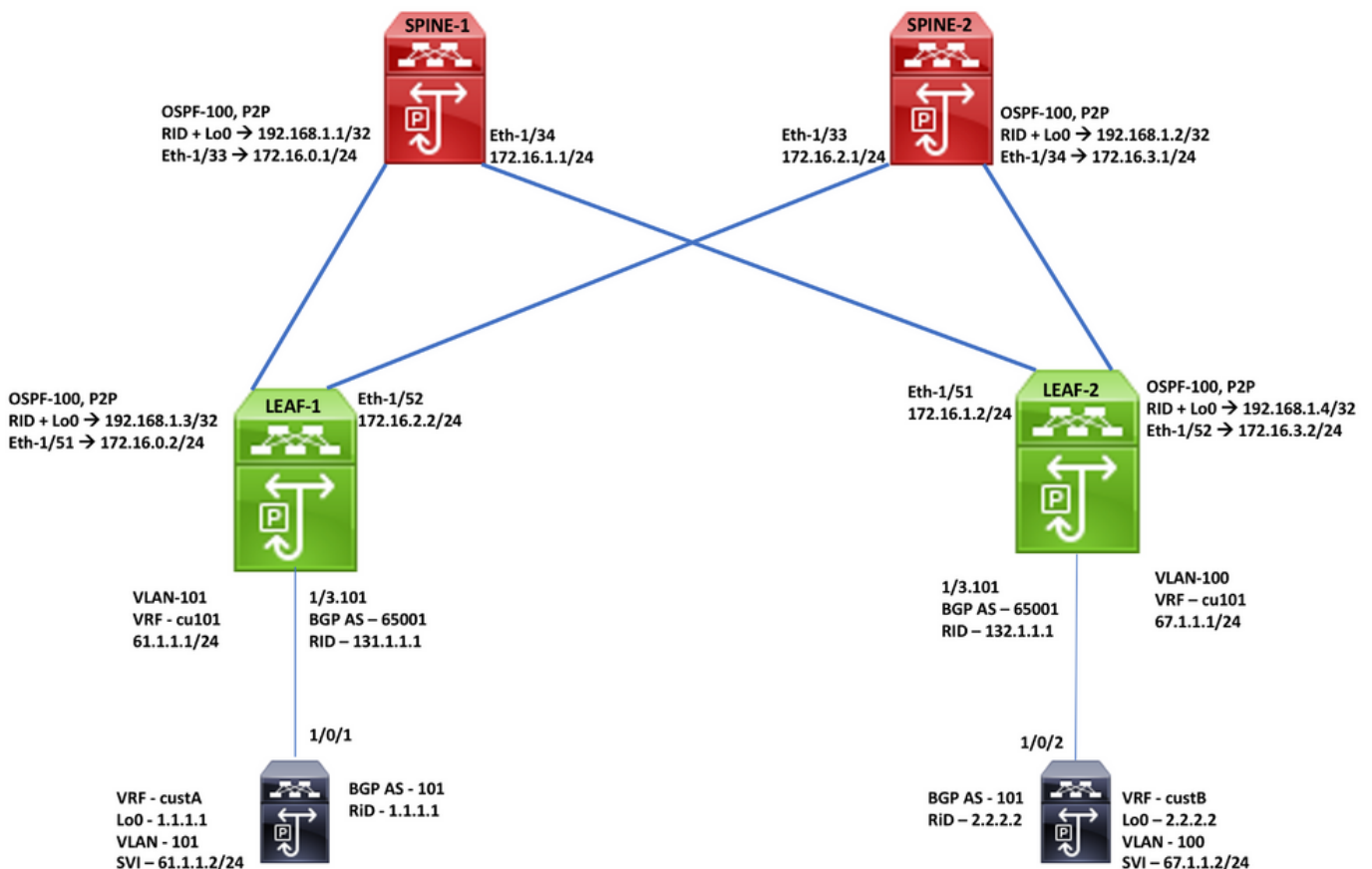
Hoofdbouwblokken: RD, RT en VRF

Onderlaag voor transport: IGP/BGP-LU en SR-TE

Overlay Layer voor service: EVPN

## Configureren

### Topologie



# Configuratie op hoog niveau

1. Installatiefuncties
2. IP-adres configureren - onderligging
3. IGP - OSPF configureren
4. MP - BGP configureren
5. VLAN- en EVPN-overlay configureren
6. E-BGP tussen hosts en LEAF configureren

SPINE-1 Configuration		
Enabling Features, Label-Range, Route-map, Label-Index	OSPF Configuration	BGP/EVPN Configuration
feature-set mpls	interface Ethernet1/33	router bgp 65001
feature ospf	ip address 172.16.0.1/24	router-id 192.168.1.1
feature bgp	ip ospf network point-to-point	address-family ipv4 unicast
feature mpls segment-routing	ip router ospf 100 area 0.0.0.0	network 192.168.1.1/32 route-map label-index-spine1
feature mpls evpn	mpls ip forwarding	allocate-label all
feature interface-vlan	no shutdown	address-family ipv4 labeled-unicast
feature mpls oam		address-family l2vpn evpn
	interface Ethernet1/34	template peer EVPN
	ip address 172.16.1.1/24	remote-as 65001
	ip ospf network point-to-point	update-source loopback0
mpls label range 5000 450000	ip router ospf 100 area 0.0.0.0	address-family l2vpn evpn
segment-routing	mpls ip forwarding	send-community extended
mpls	no shutdown	route-reflector-client
global-block 16000 25000		encapsulation mpls
connected-prefix-sid-map		template peer Labeled-unicast
address-family ipv4		remote-as 65001
192.168.1.1/32 index 211	interface loopback0	address-family ipv4 labeled-unicast
	ip address 192.168.1.1/32	send-community extended
	ip router ospf 100 area 0.0.0.0	route-reflector-client
		next-hop-self
route-map label-index-spine1 permit 10		soft-reconfiguration inbound always
set label-index 211	router ospf 100	neighbor 172.16.0.2
	segment-routing mpls	inherit peer Labeled-unicast
	router-id 192.168.1.1	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	interface Ethernet1/33	router bgp 65001
feature ospf	ip address 172.16.2.1/24	router-id 192.168.1.2
feature bgp	ip ospf network point-to-point	address-family ipv4 unicast
feature mpls segment-routing	ip router ospf 100 area 0.0.0.0	network 192.168.1.2/32 route-map label-index-spine2
feature mpls evpn	mpls ip forwarding	allocate-label all
feature interface-vlan	no shutdown	address-family ipv4 labeled-unicast
feature mpls oam		address-family l2vpn evpn
	interface Ethernet1/34	template peer EVPN
	ip address 172.16.3.1/24	remote-as 65001
mpls label range 5000 450000	ip ospf network point-to-point	update-source loopback0
	ip router ospf 100 area 0.0.0.0	address-family l2vpn evpn
segment-routing	mpls ip forwarding	send-community extended
mpls	no shutdown	route-reflector-client
global-block 16000 25000		encapsulation mpls
connected-prefix-sid-map		template peer Labeled-unicast
address-family ipv4		remote-as 65001
192.168.1.2/32 index 221	interface loopback0	address-family ipv4 labeled-unicast
	ip address 192.168.1.2/32	send-community extended
	ip router ospf 100 area 0.0.0.0	route-reflector-client
		next-hop-self
route-map label-index-spine2 permit 10		soft-reconfiguration inbound always
set label-index 221	router ospf 100	neighbor 172.16.2.2
	segment-routing mpls	inherit peer Labeled-unicast
	router-id 192.168.1.2	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 !	

## Verifiëren

Gebruik dit gedeelte om te bevestigen dat de configuratie correct werkt.

**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, (0x00000000100002) 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 | POH 14311 492288
172.16.1.1 | 172.16.3.1 | Ethernet1/52 | POH 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 | POH 14311
172.16.3.1 | Ethernet1/52 | POH 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
```

## End-Host Captures

```
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)  
 1 67.1.1.1 0 msec 8 msec 0 msec  
 2 172.16.3.1 0 msec 0 msec 0 msec  
 3 172.16.0.2 0 msec  
   172.16.2.2 0 msec  
   172.16.0.2 8 msec  
 4 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)  
 1 61.1.1.1 0 msec 17 msec 0 msec  
 2 172.16.2.1 17 msec  
   172.16.0.1 0 msec  
   172.16.2.1 9 msec  
 3 172.16.3.2 0 msec  
   172.16.1.2 0 msec  
   172.16.3.2 17 msec  
 4 67.1.1.2 8 msec * 0 msec  
endhost#
```

## Problemen oplossen

Er is momenteel geen specifieke troubleshooting-informatie beschikbaar voor deze configuratie.

## Gerelateerde informatie

- [Multiprotocol BGP MPLS VPN](#)
- [Segment-routing op Cisco Nexus 9500, 9300, 9200, 3200 en 3100 platform Switches - witboek](#)
- [Layer 3 EVPN en Layer 3 VPN configureren via segment routing MPLS](#)
- [Technische ondersteuning en documentatie – Cisco Systems](#)