

Implante o EVPN de Camada 3 sobre o MPLS de roteamento de segmento no Nexus 9300

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Introduction

Este documento descreve como implantar/configurar o VPN Ethernet de Camada 3 (L3) (EVPN - Layer 3 Ethernet) sobre Roteamento de Segmento (SR - Segment Routing) Multiprotocol Label Switching (MPLS - Multiprotocol Label Switching) [Open Shortest Path First (OSPF) / Internal Border Gateway Protocol (iBGP)] em produtos Nexus 9300.

Prerequisites

Requirements

A Cisco recomenda que você tenha conhecimento destes tópicos:

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

Componentes Utilizados

As informações neste documento são baseadas nestas versões de software e hardware:

- Hardware SPINE - 93360YC-FX2 que executa a versão 9.3.(3)
- Hardware LEAF - 93240YC-FX2 que executa a versão 9.3.(3)
- CLIENTE - 93216TC-FX2

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, make sure that you understand the potential impact of any command.

Informações de Apoio

Recapitulação L3VPN MPLS

Uma VPN é:

- Uma rede baseada em IP que fornece serviços de rede privada em uma infraestrutura pública.
- Um conjunto de sites que podem se comunicar privadamente pela Internet ou por outras redes públicas ou privadas.

As VPNs convencionais são criadas configurando-se uma malha completa de túneis ou PVCs (Permanent Virtual Circuits, circuitos virtuais permanentes) para todos os locais em uma VPN. Esse tipo de VPN não é fácil de manter ou expandir, pois a adição de um novo local exige uma alteração em cada dispositivo de borda na VPN.

As VPNs baseadas em MPLS são criadas em L3 e são baseadas no modelo de peer. O modelo de peer permite que o provedor de serviços e o cliente troquem informações de roteamento L3. O provedor de serviços retransmite os dados entre os locais do cliente sem o envolvimento do cliente.

As VPNs MPLS são mais fáceis de gerenciar e expandir do que as VPNs convencionais. Quando um novo local é adicionado a uma VPN MPLS, somente o roteador de borda do provedor de serviços que fornece serviços para o local do cliente precisa ser atualizado.

Estes são os componentes da VPN MPLS:

- Roteador do provedor (P) - Roteador no núcleo da rede do provedor. Os roteadores P executam a comutação MPLS e não conectam rótulos de VPN aos pacotes roteados. Os rótulos de VPN são usados para direcionar pacotes de dados para a rede privada ou roteador de borda do cliente corretos.
- Roteador PE - Roteador que conecta o rótulo VPN aos pacotes de entrada com base na interface ou subinterface na qual eles são recebidos e também conecta os rótulos do núcleo MPLS. Um roteador PE se conecta diretamente a um roteador CE.
- Roteador Cliente (C) - Roteador no Provedor de Serviços de Internet (ISP) ou na rede corporativa.
- Roteador de borda do cliente (CE) - Roteador de borda na rede do ISP que se conecta ao roteador PE na rede. Um roteador CE deve fazer interface com um roteador PE.

Visão geral do EVPN com L3VPN (MPLS SR)

As implantações de data center (DC) adotaram o VXLAN EVPN ou MPLS EVPN para obter os benefícios, como aprendizagem do plano de controle EVPN, multilocação, mobilidade contínua, redundância e acréscimos de POD mais fáceis. Da mesma forma, o CORE é uma rede MPLS L3VPN baseada em Protocolo de Distribuição de Rótulo (LDP - Label Distribution Protocol) ou está fazendo a transição da base tradicional baseada em LDP de L3VPN MPLS para uma

solução mais sofisticada como SR.

A SR é adotada por seus benefícios, como:

- Planos de controle de IGP e MPLS unificados
- Métodos de engenharia de tráfego mais simples
- Configuração mais fácil
- Adoção de redes definidas por software (SDN)

O EVPN (RFC 7432) é uma solução baseada em BGP MPLS que foi usada para serviços Ethernet de próxima geração em uma rede de data center virtualizado. Ele usa vários blocos componentes, como o Route Distinguisher (RD), Route Target (RT) e Virtual Routing and Forwarding (VRF), das tecnologias MPLS existentes.

O EVPN L3 sobre SR que foi introduzido na versão NXOS 7.0(3)I6(1) usa a rota EVPN Tipo 5 com encapsulamento MPLS. Ele oferece multilocação, escalabilidade e alto desempenho para serviços de data center em evolução.

Note: No DC, o plano de dados pode ser VXLAN ou MPLS.

VPN L3 MPLS tradicional

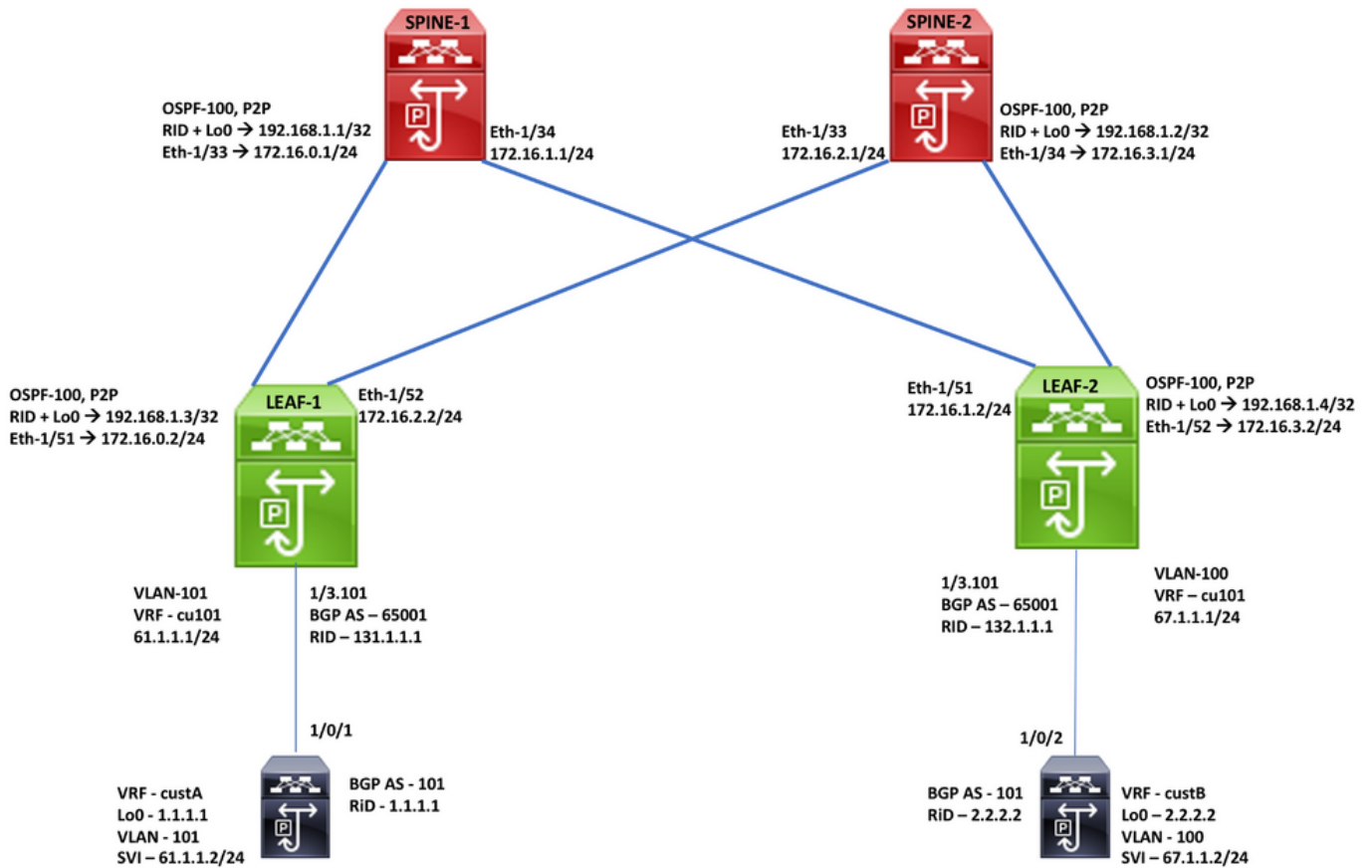
Principais blocos de construção: RD, RT e VRF
Camada de sobreposição para transporte: IGP, LDP e RSVP-TE
Camada de sobreposição para serviço: VPNv4 e VPNv6

VPN L3 MPLS sobre SR

Principais blocos de construção: RD, RT e VRF
Camada de sobreposição para transporte: IGP/B
LU e SR-TE
Camada de sobreposição para serviço: EVPN

Configurar

Topologia



Configuração de alto nível

1. Instalar recursos
2. Configurar endereço IP - Subcamada
3. Configurar IGP - OSPF
4. Configurar MP - BGP
5. Configurar VLAN e sobreposição EVPN
6. Configurar o e-BGP entre hosts e LEAFs

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 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 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
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	
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	
	router ospf 100 segment-routing mpls router-id 192.168.1.1	

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 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 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
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	
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	
route-map label-index-spine2 permit 10 set label-index 221	router ospf 100 segment-routing mpls router-id 192.168.1.2	

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 !	interface GigabitEthernet1/0/1 switchport trunk allowed vlan 101 switchport trunk encapsulation dot1q switchport mode trunk !	router bgp 101 bgp log-neighbor-changes no bgp default ipv4-unicast !
vrf definition custB rd 101:2 ! address-family ipv4 exit-address-family	interface GigabitEthernet1/0/2 switchport trunk allowed vlan 100 switchport trunk encapsulation dot1q switchport mode trunk	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
interface Loopback0 vrf forwarding custA ip address 1.1.1.1 255.255.255.255 !	interface Vlan100 vrf forwarding custB ip address 67.1.1.2 255.255.255.0 !	address-family ipv4 vrf custB bgp router-id 2.2.2.2 network 2.2.2.2 mask 255.255.255.255 redistribute connected
interface Loopback1 vrf forwarding custB ip address 2.2.2.2 255.255.255.255	interface Vlan101 vrf forwarding custA ip address 61.1.1.2 255.255.255.0 !	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

Verificar

Use esta seção para confirmar se a sua configuração funciona corretamente.

Leaf 1 Captures : Control Plane and MPLS Data Plane:

Leaf1(config)# show ip bgp 1.1.1.1 vrf cul01

```
BGP routing table information for VRF cul01, 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, VRF 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

VRF 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 cul01

```
slot 1
-----
IPv4 routes for table cul01/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# 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
```

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 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
```

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
```


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#
```

Troubleshoot

Atualmente, não existem informações disponíveis específicas sobre Troubleshooting para esta configuração.

Informações Relacionadas

- [VPN MPLS de BGP multiprotocolo](#)
- [Segmento de roteamento nos switches de plataforma Cisco Nexus 9500, 9300, 9200, 3200 e 3100 White paper](#)
- [Configurando o EVPN de Camada 3 e VPN de Camada 3 sobre MPLS de Roteamento de Segmento](#)
- [Suporte Técnico e Documentação - Cisco Systems](#)