

Überprüfen der End-to-End-Verbindung über einen Segment-Routing-SP

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Einleitung

In diesem Dokument wird der Prozess zur Verifizierung der End-to-End-Anbindung eines Segment Routing Service Providers (SP) mit der Cisco IOS®XR-Software beschrieben.

Voraussetzungen

Anforderungen

Cisco empfiehlt, dass Sie über Kenntnisse in folgenden Bereichen verfügen:

- Grundlegendes IP-Routing
- Kenntnisse der Cisco IOS- und Cisco IOS XR-Befehlszeile

Verwendete Komponenten

Die Informationen in diesem Dokument basierend auf folgenden Software- und Hardware-Versionen:

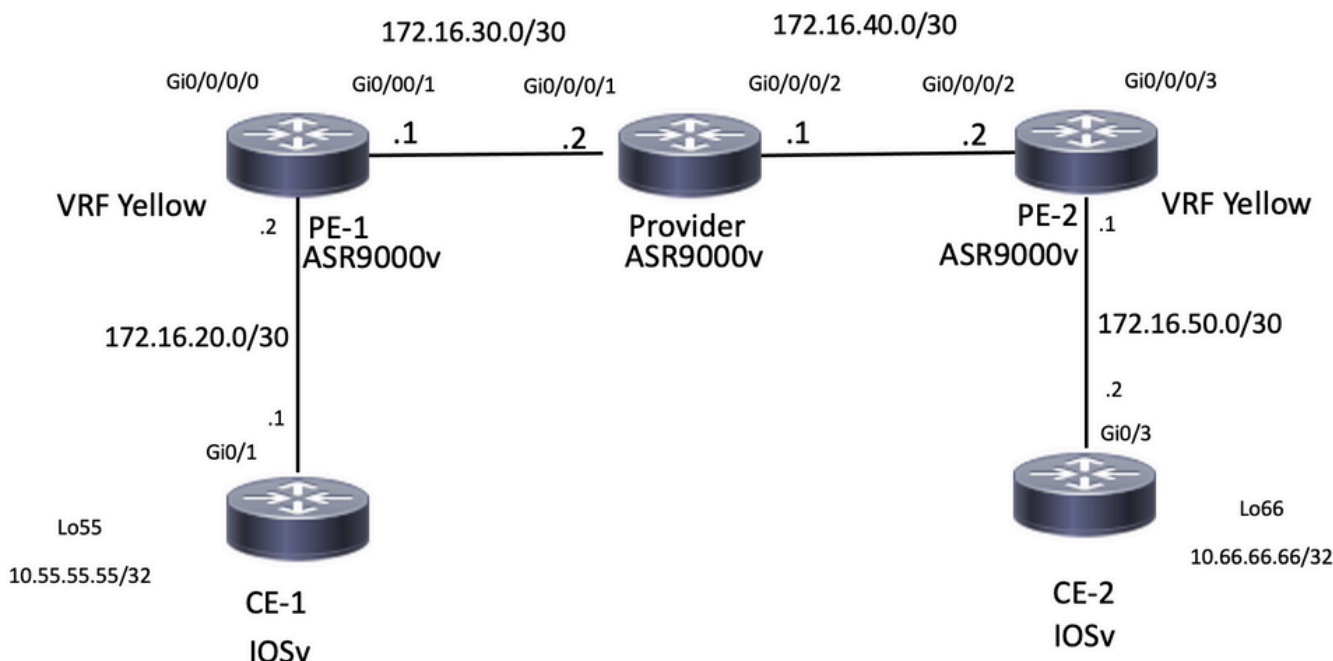
- Router mit Cisco IOS XR-Software
- Router mit Cisco IOS-Software

Die Informationen in diesem Dokument beziehen sich auf Geräte in einer speziell eingerichteten Testumgebung. Alle Geräte, die in diesem Dokument benutzt wurden, begannen mit einer gelöschten (Nichterfüllungs) Konfiguration. Wenn Ihr Netzwerk in Betrieb ist, stellen Sie sicher, dass Sie die möglichen Auswirkungen aller Befehle verstehen.

Hintergrundinformationen

In diesem Dokument wird die grundlegende Konfiguration zum Erstellen einer Segment Routing-Cloud und zum Überprüfen der End-to-End-Konnektivität auf Cisco IOS XR-Routern erläutert.

Topologie



Netzwerktopologie

Anfängliche Überprüfung

BGP-Konfiguration

CE-1

Loopback55 simuliert die LAN-Seite des Routers CE-1. Sie können dieses Präfix über eBGP dem PE-1-Nachbarn ankündigen:

```
CE-1#show run | section r b
router bgp 65535
  bgp router-id 10.1.1.1
  bgp log-neighbor-changes
  redistribute connected
  redistribute eigrp 10
  neighbor 172.16.20.2 remote-as 8181
```

```
CE-1#show ip bgp neighbors 172.16.20.2 advertised-routes
```

```
BGP table version is 25, local router ID is 10.1.1.1
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
               x best-external, a additional-path, c RIB-compressed,
               t secondary path,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found
```

Network	Next Hop	Metric	LocPrf	Weight	Path
---------	----------	--------	--------	--------	------

```

*> 10.1.1.1/32      0.0.0.0          0          32768 ?
*> 10.11.11.11/32  192.168.1.1     10880     32768 ?
*> 10.55.55.55/32  0.0.0.0 0 32768 ?
*> 172.16.20.0/30  0.0.0.0          0          32768 ?
*> 192.168.1.0     0.0.0.0          0          32768 ?

```

Total number of prefixes 5

PE-1

Dieser Router hat das Präfix 10.55.55.55/32 erhalten und verfügt über eine Konnektivität. Nun kann er dies der Service Provider-Cloud ankündigen:

```
RP/0/RP0/CPU0:PE-1#show run vrf
```

```

Fri Jan 27 15:07:10.465 UTC
vrf Yellow
address-family ipv4 unicast
import route-target
200:200
!
export route-target
200:200
!

```

```
RP/0/RP0/CPU0:PE-1#show run router bgp
```

```

Fri Jan 27 14:54:33.488 UTC
router bgp 8181
  bgp router-id 10.2.2.2
  address-family ipv4 unicast
  !
  address-family vpnv4 unicast
  !
  neighbor 10.3.3.3
    remote-as 8181
    update-source Loopback0
    address-family vpnv4 unicast
    route-policy PASS in
    route-policy PASS out
  !
  !
vrf Yellow
  rd 200:200
  address-family ipv4 unicast
  !
  neighbor 172.16.20.1
    remote-as 65535
    address-family ipv4 unicast
    route-policy PASS in
    route-policy PASS out
  as-override
  !

```

```
RP/0/RP0/CPU0:PE-1#show bgp vrf Yellow ipv4 unicast neighbors 172.16.20.1 routes
```

```

Fri Jan 27 14:54:48.433 UTC
BGP VRF Yellow, state: Active
BGP Route Distinguisher: 200:200
VRF ID: 0x60000001
BGP router identifier 10.2.2.2, local AS number 8181
Non-stop routing is enabled
BGP table state: Active
Table ID: 0xe0000001 RD version: 73
BGP main routing table version 73

```

```
BGP NSR Initial initsync version 2 (Reached)
BGP NSR/ISSU Sync-Group versions 0/0
```

```
Status codes: s suppressed, d damped, h history, * valid, > best
                i - internal, r RIB-failure, S stale, N Nexthop-discard
```

```
Origin codes: i - IGP, e - EGP, ? - incomplete
```

```
Network          Next Hop          Metric LocPrf Weight Path
Route Distinguisher: 200:200 (default for vrf Yellow)
*> 10.1.1.1/32    172.16.20.1      0                0 65535 ?
*> 10.11.11.11/32 172.16.20.1     10880            0 65535 ?
*> 10.55.55.55/32 172.16.20.1 0 0 65535 ?
*> 172.16.20.0/30 172.16.20.1      0                0 65535 ?
*> 192.168.1.0/24 172.16.20.1      0                0 65535 ?
Processed 5 prefixes, 5 paths
```

```
RP/0/RP0/CPU0:PE-1#ping vrf Yellow 10.55.55.55
```

```
Fri Jan 27 14:55:06.077 UTC
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 10.55.55.55, timeout is 2 seconds:
```

```
!!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 4/5/7 ms
```

CE-2

Loopback66 simuliert die LAN-Seite des CE-2-Routers. Ähnlich wie CE-1 kündigt dieser Router das Präfix über eBGP dem benachbarten Router PE-2 an.

```
CE-2#show run | section r b
```

```
router bgp 65535
  bgp router-id 10.5.5.5
  bgp log-neighbor-changes
  redistribute connected
  redistribute eigrp 10
  neighbor 172.16.50.1 remote-as 8181
```

```
CE-2#show ip bgp neighbors 172.16.50.1 advertised-routes
```

```
BGP table version is 15, local router ID is 10.5.5.5
```

```
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
                r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
                x best-external, a additional-path, c RIB-compressed,
                t secondary path,
```

```
Origin codes: i - IGP, e - EGP, ? - incomplete
```

```
RPKI validation codes: V valid, I invalid, N Not found
```

```
Network          Next Hop          Metric LocPrf Weight Path
*> 10.5.5.5/32    0.0.0.0           0                0 32768 ?
*> 10.22.22.22/32 192.168.4.1     10880            0 32768 ?
*> 10.66.66.66/32 0.0.0.0           0                0 32768 ?
*> 172.16.50.0/30 0.0.0.0           0                0 32768 ?
*> 192.168.4.0    0.0.0.0           0                0 32768 ?
```

```
Total number of prefixes 5
```

PE-2

Dieser Router hat das Präfix 10.66.66.66/32 erhalten und kann nun folgende Informationen an die Service Provider Cloud weitergeben:

```
RP/0/RP0/CPU0:PE-2#show run vrf
```

```
Fri Jan 27 15:07:51.117 UTC
```

```
vrf Yellow
```

```
address-family ipv4 unicast
import route-target
200:200
!
export route-target
200:200
!
```

RP/0/RP0/CPU0:PE-2#**show run router bgp**

```
Fri Jan 27 14:59:56.957 UTC
router bgp 8181
  bgp router-id 10.4.4.4
  address-family ipv4 unicast
  !
  address-family vpnv4 unicast
  !
  neighbor 10.3.3.3
    remote-as 8181
    update-source Loopback0
  address-family vpnv4 unicast
    route-policy PASS in
    route-policy PASS out
  !
  !
  vrf Yellow
    rd 200:200
    address-family ipv4 unicast
    !
    neighbor 172.16.50.2
      remote-as 65535
      address-family ipv4 unicast
        route-policy PASS in
        route-policy PASS out
        as-override
    !
```

RP/0/RP0/CPU0:PE-2#**show bgp vrf Yellow ipv4 unicast neighbors 172.16.50.2 routes**

```
Fri Jan 27 15:00:10.383 UTC
BGP VRF Yellow, state: Active
BGP Route Distinguisher: 200:200
VRF ID: 0x60000001
BGP router identifier 10.4.4.4, local AS number 8181
Non-stop routing is enabled
BGP table state: Active
Table ID: 0xe0000001  RD version: 64
BGP main routing table version 64
BGP NSR Initial initsync version 2 (Reached)
BGP NSR/ISSU Sync-Group versions 0/0
```

Status codes: s suppressed, d damped, h history, * valid, > best
i - internal, r RIB-failure, S stale, N Nexthop-discard
Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 200:200 (default for vrf Yellow)					
*> 10.5.5.5/32	172.16.50.2	0		0	65535 ?
*> 10.22.22.22/32	172.16.50.2	10880		0	65535 ?
*> 10.66.66.66/32	172.16.50.2	0		0	65535 ?
*> 172.16.50.0/30	172.16.50.2	0		0	65535 ?
*> 192.168.4.0/24	172.16.50.2	0		0	65535 ?

Processed 5 prefixes, 5 paths

RP/0/RP0/CPU0:PE-2#**ping vrf Yellow 10.66.66.66**

```
Fri Jan 27 15:00:26.020 UTC
```

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.66.66.66, timeout is 2 seconds:

!!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 3/26/120 ms

Status der Routing-Informationen von PE-1, Provider und PE-2

Für diese Demonstration wird OSPF als IGP und iBGP konfiguriert.

PE-1

Der OSPF-Nachbar ist UP und die iBGP-Sitzung mit 10.3.3.3, also dem Routen-Reflektor.

```
RP/0/RP0/CPU0:PE-1#show run router ospf
```

```
Fri Jan 27 15:09:23.910 UTC
```

```
router ospf 1
```

```
router-id 10.2.2.2
```

```
area 0
```

```
!
```

```
interface GigabitEthernet0/0/0/1
```

```
!
```

```
!
```

```
!
```

```
RP/0/RP0/CPU0:PE-1#show ospf neighbor
```

```
Fri Jan 27 15:09:31.435 UTC
```

```
* Indicates MADJ interface
```

```
# Indicates Neighbor awaiting BFD session up
```

```
Neighbors for OSPF 1
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
10.3.3.3	1	FULL/BDR	00:00:37	172.16.30.2	GigabitEthernet0/0/0/1

```
Neighbor is up for 16:59:30
```

```
Total neighbor count: 1
```

```
RP/0/RP0/CPU0:PE-1#show bgp vpnv4 unicast summary
```

```
Fri Jan 27 15:09:37.760 UTC
```

```
BGP router identifier 10.2.2.2, local AS number 8181
```

```
BGP generic scan interval 60 secs
```

```
Non-stop routing is enabled
```

```
BGP table state: Active
```

```
Table ID: 0x0 RD version: 0
```

```
BGP main routing table version 73
```

```
BGP NSR Initial initsync version 2 (Reached)
```

```
BGP NSR/ISSU Sync-Group versions 0/0
```

```
BGP scan interval 60 secs
```

```
BGP is operating in STANDALONE mode.
```

Process	RcvTblVer	bRIB/RIB	LabelVer	ImportVer	SendTblVer	StandbyVer
Speaker	73	73	73	73	73	0

Neighbor	Spk	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	St/PfxRcd
10.3.3.3	0	8181	1010	997	73	0	0	16:24:45	5

Provider-Router

Auf diesem Gerät kann bestätigt werden, dass es als Routen-Reflektor fungiert und eine iBGP-Sitzung mit den Nachbarn 10.2.2.2 und 10.4.4.4 hergestellt wird.

```
RP/0/RP0/CPU0:Provider#show run router ospf
```

```

Fri Jan 27 15:19:33.250 UTC
router ospf 1
router-id 10.3.3.3
area 0
!
interface GigabitEthernet0/0/0/1
!
interface GigabitEthernet0/0/0/2
!

```

RP/0/RP0/CPU0:Provider#**show run router bgp**

```

Fri Jan 27 15:11:08.321 UTC
router bgp 8181
  bgp router-id 10.3.3.3
  address-family ipv4 unicast
  !
  address-family vpnv4 unicast
  !
  neighbor-group IBGP
    remote-as 8181
    update-source Loopback0
  !
  neighbor 10.2.2.2
    use neighbor-group IBGP
    address-family vpnv4 unicast
      route-policy PASS in
      route-reflector-client
      route-policy PASS out
      next-hop-self
    !
  !
  neighbor 10.4.4.4
    use neighbor-group IBGP
    address-family vpnv4 unicast
      route-policy PASS in
      route-reflector-client
      route-policy PASS out
      next-hop-self
    !
!

```

RP/0/RP0/CPU0:Provider#**show bgp vpnv4 unicast summary**

```

Fri Jan 27 15:11:19.263 UTC
BGP router identifier 10.3.3.3, local AS number 8181
BGP generic scan interval 60 secs
Non-stop routing is enabled
BGP table state: Active
Table ID: 0x0 RD version: 0
BGP main routing table version 25
BGP NSR Initial initsync version 1 (Reached)
BGP NSR/ISSU Sync-Group versions 0/0
BGP scan interval 60 secs
BGP is operating in STANDALONE mode.

```

Process	RcvTblVer	bRIB/RIB	LabelVer	ImportVer	SendTblVer	StandbyVer
Speaker	25	25	25	25	25	0

Neighbor	Spk	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	St/PfxRcd
10.2.2.2	0	8181	998	1011	25	0	0	16:26:27	5
10.4.4.4	0	8181	997	1009	25	0	0	16:24:25	5

PE-2

Der OSPF-Nachbar ist aktiv, und die IBGP-Sitzung mit dem Routen-Reflektor 10.3.3.3 ist aktiv.

RP/0/RP0/CPU0:PE-2#show run router ospf

Fri Jan 27 15:12:47.741 UTC

```
router ospf 1
  router-id 10.4.4.4
  area 0
  !
  interface GigabitEthernet0/0/0/2
  !
```

RP/0/RP0/CPU0:PE-2#show ospf neighbor

Fri Jan 27 15:12:55.229 UTC

```
* Indicates MADJ interface
# Indicates Neighbor awaiting BFD session up
Neighbors for OSPF 1
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
10.3.3.3	1	FULL/DR	00:00:35	172.16.40.1	GigabitEthernet0/0/0/2

Neighbor is up for 17:01:21

Total neighbor count: 1

RP/0/RP0/CPU0:PE-2#show bgp vpnv4 unicast summary

Fri Jan 27 15:13:01.911 UTC

BGP router identifier 10.4.4.4, local AS number 8181

BGP generic scan interval 60 secs

Non-stop routing is enabled

BGP table state: Active

Table ID: 0x0 RD version: 0

BGP main routing table version 64

BGP NSR Initial initsync version 2 (Reached)

BGP NSR/ISSU Sync-Group versions 0/0

BGP scan interval 60 secs

BGP is operating in STANDALONE mode.

Process	RcvTblVer	bRIB/RIB	LabelVer	ImportVer	SendTblVer	StandbyVer
Speaker	64	64	64	64	64	0

Neighbor	Spk	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	St/PfxRcd
10.3.3.3	0	8181	1011	998	64	0	0	16:26:08	5

RP/0/RP0/CPU0:PE-2#ping 10.2.2.2 source loopback0

Fri Jan 27 15:13:09.728 UTC

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.2.2.2, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 9/21/67 ms

RP/0/RP0/CPU0:PE-2#ping 10.3.3.3 source loopback0

Fri Jan 27 15:13:16.696 UTC

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.3.3.3, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 5/6/7 ms

Segment-Routing-Konfiguration

PE-1

RP/0/RP0/CPU0:PE-1#show run router ospf

Fri Jan 27 16:15:56.479 UTC

```
router ospf 1
  router-id 10.2.2.2
  segment-routing mpls
  area 0
  segment-routing mpls
```



```
interface Loopback0
  prefix-sid index 15
!
```

Anbieter

```
RP/0/RP0/CPU0:Provider#show run router ospf
Fri Jan 27 16:17:09.471 UTC
router ospf 1
  router-id 10.3.3.3
  segment-routing mpls
  area 0
    segment-routing mpls
    interface Loopback0
      prefix-sid index 16
  !
```

PE-2

```
RP/0/RP0/CPU0:PE-2#show run router ospf
Fri Jan 27 16:18:11.090 UTC
router ospf 1
  router-id 10.4.4.4
  segment-routing mpls
  area 0
    segment-routing mpls
    interface Loopback0
      prefix-sid index 17
  !
```

Abschließende Überprüfungen

CE-1 kann den Schnittstellen-Loopback 66 auf dem CE-2-Router erreichen. Die nächste Ausgabe von Traceroute zeigt, dass das Paket den Label Switch-Pfad verwendet, wenn es an das Präfix 10.66.66.66 adressiert ist. Es ist auch zu beobachten, dass das Label die präfix-seitige 16017 verwendet, wenn es den Router PE-2 durchläuft:

```
CE-1#ping 10.66.66.66 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.66.66.66, timeout is 2 seconds:
Packet sent with a source address of 10.1.1.1
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 9/13/32 ms
```

```
CE-1#traceroute 10.66.66.66 source loopback0
Type escape sequence to abort.
Tracing the route to 10.66.66.66
VRF info: (vrf in name/id, vrf out name/id)
 1 172.16.20.2 6 msec 5 msec 5 msec
 2 172.16.30.2 [MPLS: Labels 16017/24003 Exp 0] 12 msec 13 msec 16 msec 3 172.16.40.2 [MPLS:
Label 24003 Exp 0] 15 msec 13 msec 12 msec
 4 172.16.50.2 [AS 8181] 13 msec 11 msec *
```

Da in der Konfiguration nicht die absolute Option verwendet wurde, begannen die Labels mit 16000 Werten und fügten die prefix-sid hinzu, die für Segment-Routing konfiguriert wurde.

RP/0/RP0/CPU0:PE-1#show cef 10.3.3.3/32

Fri Jan 27 21:32:42.813 UTC

10.3.3.3/32, version 43, labeled SR, internal 0x1000001 0x8110 (ptr 0xe3f6a00) [1], 0x600 (0xe593918), 0xa20 (0xee6e4b8)

Updated Jan 26 23:21:30.314

remote adjacency to GigabitEthernet0/0/0/1

Prefix Len 32, traffic index 0, precedence n/a, priority 1

gateway array (0xe3fbd8) reference count 3, flags 0x68, source rib (7), 0 backups
[3 type 4 flags 0x8401 (0xeeb1648) ext 0x0 (0x0)]

LW-LDI[type=1, refc=1, ptr=0xe593918, sh-ldi=0xeeb1648]

gateway array update type-time 1 Jan 26 23:21:30.314

LDI Update time Jan 26 23:21:30.315

LW-LDI-TS Jan 26 23:21:30.315

via 172.16.30.2/32, GigabitEthernet0/0/0/1, 8 dependencies, weight 0, class 0 [flags 0x0]

path-idx 0 NHID 0x0 [0xf427148 0xf4271e0]

next hop 172.16.30.2/32

remote adjacency

local label 16016 labels imposed {ImplNull}

Load distribution: 0 (refcount 3)

Hash	OK	Interface	Address
0	Y	GigabitEthernet0/0/0/1	remote

RP/0/RP0/CPU0:PE-1#show cef 10.4.4.4/32

Fri Jan 27 21:29:36.990 UTC

10.4.4.4/32, version 45, labeled SR, internal 0x1000001 0x8110 (ptr 0xe3f65c0) [1], 0x600 (0xe593e70), 0xa28 (0xee6e508)

Updated Jan 26 23:21:47.181

remote adjacency to GigabitEthernet0/0/0/1

Prefix Len 32, traffic index 0, precedence n/a, priority 1

gateway array (0xe3fbe90) reference count 3, flags 0x68, source rib (7), 0 backups
[2 type 5 flags 0x8401 (0xeeb16a8) ext 0x0 (0x0)]

LW-LDI[type=5, refc=3, ptr=0xe593e70, sh-ldi=0xeeb16a8]

gateway array update type-time 1 Jan 26 23:21:47.182

LDI Update time Jan 26 23:21:47.182

LW-LDI-TS Jan 26 23:21:47.182

via 172.16.30.2/32, GigabitEthernet0/0/0/1, 6 dependencies, weight 0, class 0 [flags 0x0]

path-idx 0 NHID 0x0 [0xf4271e0 0x0]

next hop 172.16.30.2/32

remote adjacency

local label 16017 labels imposed {16017}

Load distribution: 0 (refcount 2)

Hash	OK	Interface	Address
0	Y	GigabitEthernet0/0/0/1	remote

Andererseits kann CE-2 auch den Loopback 55 auf dem CE-1-Router erreichen:

CE-2#ping 10.55.55.55 source loopback66

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.55.55.55, timeout is 2 seconds:

Packet sent with a source address of 10.66.66.66

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 11/12/15 ms

CE-2#traceroute 10.55.55.55 source loopback66

Type escape sequence to abort.

Tracing the route to 10.55.55.55

VRF info: (vrf in name/id, vrf out name/id)

1 172.16.50.1 6 msec 5 msec 4 msec

```

2 172.16.40.1 [MPLS: Labels 16015/24003 Exp 0] 9 msec 16 msec 10 msec
3 172.16.30.1 [MPLS: Label 24003 Exp 0] 10 msec 13 msec 8 msec
4 172.16.20.1 [AS 8181] 11 msec 7 msec *

```

MPLS-Labels

Auf der nächsten Ausgabe können wir bestätigen, dass Segment-Routing-Labels zum End-to-End-Switching des Datenverkehrs verwendet werden.

RP/0/RP0/CPU0:PE-1#show mpls forwarding

Fri Jan 27 20:32:13.697 UTC

Local Label	Outgoing Label	Prefix or ID	Outgoing Interface	Next Hop	Bytes Switched
16016	Pop	SR Pfx (idx 16)	Gi0/0/0/1	172.16.30.2	126880
16017	16017	SR Pfx (idx 17)	Gi0/0/0/1	172.16.30.2	17292
24000	Pop	SR Adj (idx 0)	Gi0/0/0/1	172.16.30.2	0
24001	Aggregate	172.16.20.0/30[V]	Yellow		11384
24002	Unlabelled	192.168.1.0/24[V]	Gi0/0/0/0	172.16.20.1	0
24003	Unlabelled	10.55.55.55/32[V]	Gi0/0/0/0	172.16.20.1	0
24004	Unlabelled	10.11.11.11/32[V]	Gi0/0/0/0	172.16.20.1	0
24005	Unlabelled	10.1.1.1/32[V]	Gi0/0/0/0	172.16.20.1	0

RP/0/RP0/CPU0:Provider#show mpls forwarding

Fri Jan 27 20:33:14.878 UTC

Local Label	Outgoing Label	Prefix or ID	Outgoing Interface	Next Hop	Bytes Switched
16015	Pop	SR Pfx (idx 15)	Gi0/0/0/1	172.16.30.1	151687
16017	Pop	SR Pfx (idx 17)	Gi0/0/0/2	172.16.40.2	147701
24000	Pop	SR Adj (idx 0)	Gi0/0/0/1	172.16.30.1	0
24001	Pop	SR Adj (idx 0)	Gi0/0/0/2	172.16.40.2	0

RP/0/RP0/CPU0:PE-2#show mpls forwarding

Fri Jan 27 20:33:49.201 UTC

Local Label	Outgoing Label	Prefix or ID	Outgoing Interface	Next Hop	Bytes Switched
16015	16015	SR Pfx (idx 15)	Gi0/0/0/2	172.16.40.1	25304
16016	Pop	SR Pfx (idx 16)	Gi0/0/0/2	172.16.40.1	128619
24000	Pop	SR Adj (idx 0)	Gi0/0/0/2	172.16.40.1	0
24001	Aggregate	172.16.50.0/30[V]	Yellow		1200
24002	Unlabelled	192.168.4.0/24[V]	Gi0/0/0/3	172.16.50.2	0
24003	Unlabelled	10.66.66.66/32[V]	Gi0/0/0/3	172.16.50.2	0
24004	Unlabelled	10.5.5.5/32[V]	Gi0/0/0/3	172.16.50.2	0
24005	Unlabelled	10.22.22.22/32[V]	Gi0/0/0/3	172.16.50.2	0

```

CE-2#show ip bgp neighbors 172.16.50.1 advertised-routes BGP table version is 5, local router ID
is 5.5.5.5 Status codes: s suppressed, d damped, h history, * valid, > best, i - internal, r
RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter, x best-external, a additional-
path, c RIB-compressed, t secondary path, Origin codes: i - IGP, e - EGP, ? - incomplete RPKI
validation codes: V valid, I invalid, N Not found Network Next Hop Metric LocPrf Weight Path *>
5.5.5.5/32 0.0.0.0 0 32768 ? *> 22.22.22.22/32 192.168.4.1 10880 32768 ? *> 172.16.50.0/30
0.0.0.0 0 32768 ? *> 192.168.4.0 0.0.0.0 0 32768 ? Total number of prefixes 4

```

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