

VPN MPLS via ATM configureren met Cisco 7500 routers en LightStream 1010 Switches

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Inleiding

Dit document toont hoe u Virtual Private Network (VPN) Multiprotocol Label Switching (MPLS) over ATM kunt configureren met Cisco 7500 routers als Label Edge Routers (LER's) en LightStream 1010-switches als Label Switch Routers (LSR's). Twee Ethernet-verbonden routers, elk op een externe klantenwebsite, maken deel uit van een VPN. In dit document bekijken we de end-to-end apparaatconfiguraties en behulpzame showopdrachten.

Voorwaarden

Vereisten

Er zijn geen specifieke vereisten van toepassing op dit document.

Conventies

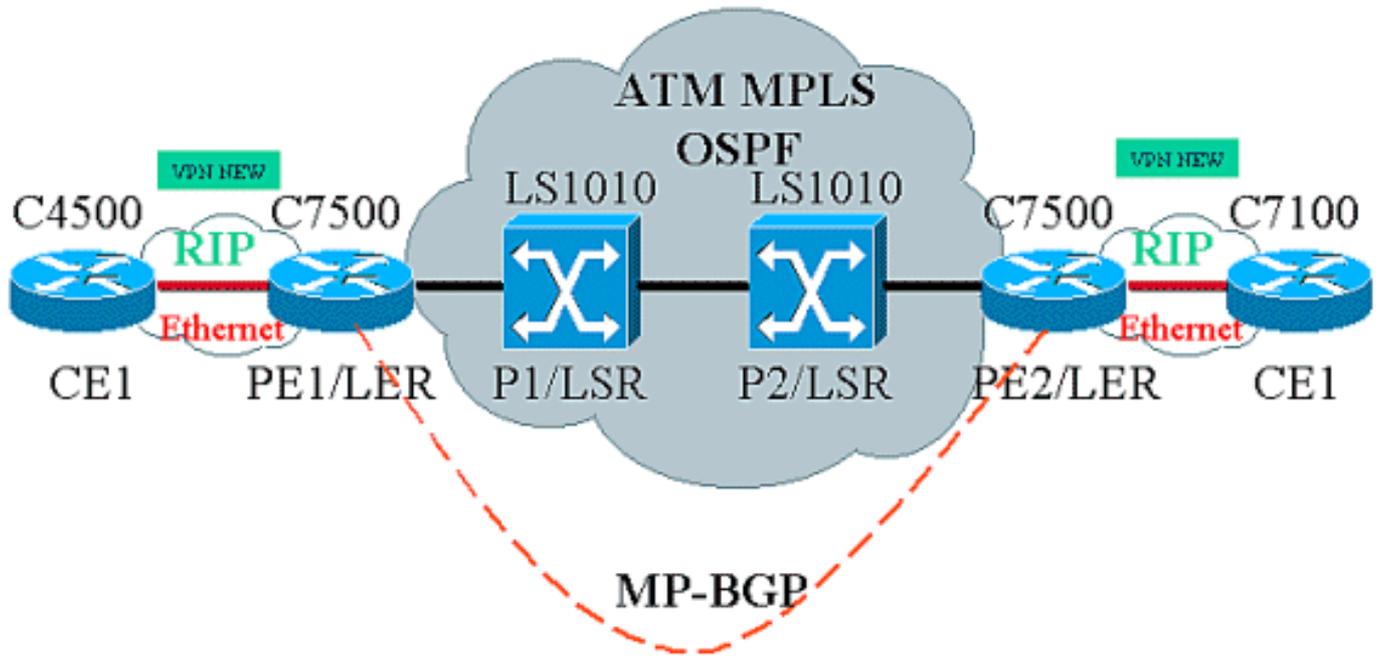
Raadpleeg [Cisco Technical Tips Conventions \(Conventies voor technische tips van Cisco\) voor meer informatie over documentconventies.](#)

Configureren

Deze sectie bevat informatie over het configureren van de functies die in dit document worden beschreven.

Netwerkdigram

Het netwerk in dit document is als volgt opgebouwd:



Netwerkb beschrijving

De huidige setup bevat deze elementen in VPN-terminologie:

- CE = router van klantEdge
- PE = Edge-router voor providers
- P=Provider router

De huidige setup bevat deze elementen in MPLS-terminologie:

- LER = Label Edge-router
- LSR = Label Switch Router
- TDP/LDP = Distributieprotocol/labeldistributieprotocol

Configuraties

Dit document gebruikt deze configuraties:

- PE1 en PE2 zijn de LER's in ons ATM-netwerk.
- P1 en P2 zijn de LSR's.
- CE1 en CE2 zijn Customer Edge-routers die niet bewust zijn en geen VPN of MPLS uitvoeren.
- CE1 en CE2 zijn Ethernet verbonden met respectievelijk PE1 en PE2, en voeren routinginformatieprotocol (RIP) uit.
- PE1, PE2, P1 en P2 Open Kortste Pad Eerst (OSPF) en zijn allemaal in Gebied 0. OSPF is het Protocol van de Gateway van het Binnenlandse Zaken (IGP) gebruikt in het ATM-netwerk. Label-Switching wordt op de ATM-interfaces op alle vier ATM-apparaten gebruikt. TDP-tags toewijzen protocol (TDP) aan OSPF-routes.
- PE1 en PE2 zijn Multiprotocol-Border Gateway Protocol (MP-BGP) peers.

- RIP-routes worden opnieuw verdeeld in MP-BGP. MP-BGP-routes herverdeeld in RIP op PE1- en PE2-routers.
- De instelling onderhoudt afzonderlijke VRF-routingtabellen in de PE1- en PE2-routers.
- De naam van VPN dat in dit voorbeeld wordt gebruikt is NEW.

CE1

```
!  
version 12.1  
service timestamps debug datetime msec  
service timestamps log datetime msec  
  
!  
boot system flashow c4500-js-mz.121-5  
!  
  
ip subnet-zero  
  
!  
interface Loopback0  
 ip address 10.1.1.1 255.255.255.0  
!  
interface Loopback1  
 ip address 10.2.2.2 255.255.255.0  
!  
interface Loopback2  
 ip address 10.3.3.3 255.255.255.0  
!  
interface Ethernet0  
 ip address 100.1.1.2 255.255.255.0  
 media-type 10BaseT  
  
!  
  
router rip  
 version 2  
 network 10.0.0.0  
 network 100.0.0.0  
 no auto-summary  
!  
ip classless  
!
```

PE1

```
!  
version 12.1  
  
service timestamps debug uptime  
service timestamps log uptime  
  
!  
boot system flashow slot1:rsp-jsv-mz.121-5a.bin  
!  
  
ip subnet-zero  
  
!  
ip vrf NEW  
 rd 200:1  
 route-target export 200:1  
 route-target import 200:1
```

```
ip cef distributed

!
interface Loopback0
 ip address 1.1.1.1 255.255.255.255
!
interface ATM2/0/0
 mtu 1500
 no ip address
!
interface ATM2/0/0.10 tag-switching
 ip unnumbered Loopback0
 tag-switching ip
!
interface Ethernet2/1/0
 ip vrf forwarding NEW
 ip address 100.1.1.1 255.255.255.0

!
router ospf 100
 no log-adjacency-changes
 network 1.0.0.0 0.255.255.255 area 0
 network 100.1.1.0 0.0.0.255 area 0
!
router rip
 version 2
 network 100.0.0.0
 no auto-summary
!
 address-family ipv4 vrf NEW
 version 2
 redistribute bgp 200 metric 0
 network 100.0.0.0
 no auto-summary
 exit-address-family
!
router bgp 200
 bgp log-neighbor-changes
 neighbor 2.2.2.2 remote-as 200

 neighbor 2.2.2.2 update-source Loopback0
 no auto-summary
!
 address-family ipv4 vrf NEW
 redistribute rip
 no auto-summary
 no synchronization
 exit-address-family
!
 address-family vpnv4
 neighbor 2.2.2.2 activate
 neighbor 2.2.2.2 send-community extended
 no auto-summary
 exit-address-family
!
ip classless
!
```

P1

```
!
service timestamps debug uptime
```

```
service timestamps log uptime
!
ip subnet-zero
!
interface Loopback0
 ip address 4.4.4.4 255.255.255.255
 no ip directed-broadcast
!
interface ATM12/0/0
 ip unnumbered Loopback0
 no ip directed-broadcast

 tag-switching ip
!
interface ATM12/0/1
 ip unnumbered Loopback0
 no ip directed-broadcast

 tag-switching ip

!
router ospf 100
 network 4.0.0.0 0.255.255.255 area 0
!
ip classless
!
```

P2

```
!
service timestamps debug uptime
service timestamps log uptime

!
ip subnet-zero

!
interface Loopback0
 ip address 3.3.3.3 255.255.255.255
 no ip directed-broadcast
!
interface ATM0/1/1
 ip unnumbered Loopback0
 no ip directed-broadcast

 tag-switching ip
!
interface ATM0/1/3
 ip unnumbered Loopback0
 no ip directed-broadcast

 tag-switching ip

!
router ospf 100
 network 3.0.0.0 0.255.255.255 area 0
!
ip classless
!
```

PE2

```
!  
version 12.1  
service timestamps debug datetime msec  
service timestamps log datetime msec  
  
!  
boot system flash slot0:rsp-jsv-mz.121-5a  
!  
  
ip subnet-zero  
  
!  
ip vrf NEW  
  rd 200:1  
  route-target export 200:1  
  route-target import 200:1  
ip cef distributed  
  
!  
interface Loopback0  
  ip address 2.2.2.2 255.255.255.255  
!  
  
interface FastEthernet3/0/0  
  ip vrf forwarding NEW  
  ip address 110.1.1.1 255.255.255.0  
  
  half-duplex  
!  
  
interface ATM3/1/0.1 tag-switching  
  ip unnumbered Loopback0  
  tag-switching ip  
!  
router ospf 100  
  log-adjacency-changes  
  network 2.0.0.0 0.255.255.255 area 0  
  
!  
router rip  
  version 2  
  network 110.0.0.0  
  no auto-summary  
  !  
  address-family ipv4 vrf NEW  
  version 2  
  redistribute bgp 200 metric 0  
  network 110.0.0.0  
  no auto-summary  
  exit-address-family  
  !  
router bgp 200  
  bgp log-neighbor-changes  
  neighbor 1.1.1.1 remote-as 200  
  
  neighbor 1.1.1.1 update-source Loopback0  
  
  no auto-summary  
  !  
  address-family ipv4 vrf NEW  
  redistribute rip  
  no auto-summary
```

```
no synchronization
exit-address-family
!
address-family vpv4
neighbor 1.1.1.1 activate
neighbor 1.1.1.1 send-community extended
no auto-summary
exit-address-family
!
ip classless
!
```

CE2

```
!
version 12.1

service timestamps debug uptime
service timestamps log uptime

!

boot system disk0:c7100-jo3s56i-mz.121-5.T.bin

!
ip subnet-zero

!
interface Loopback0
 ip address 30.1.1.1 255.255.255.0
!
interface Loopback1
 ip address 30.2.2.2 255.255.255.0
!
interface Loopback2
 ip address 30.3.3.3 255.255.255.0
!
interface FastEthernet0/0
 ip address 110.1.1.2 255.255.255.0

!
router rip
 version 2
 network 30.0.0.0
 network 110.0.0.0
 no auto-summary
!
```

Opdrachten tonen

Gebruik deze opdrachten om te testen of het netwerk correct werkt:

- **Toon ip route** - Hiermee wordt IP routing in tabelgedeelten weergegeven.
- **ip rip database vrf** - Geeft informatie in de RIP database voor een bepaalde VRF weer.
- **ip bgp vpv4 vrf** - hiermee wordt VPN-adresinformatie van de BGP-tabel weergegeven.
- **tonen tag-switching interfaces detail** - Hiermee geeft u informatie weer over een of meer interfaces die de MPLS optie hebben ingeschakeld.
- **tonen tag-switching tdp bindings** - Toont de gevraagde items van de ATM LDP labelbindende database.
- **show tag-switching expeditetable vrf** - Controleert de labelstack die voor een bepaalde route

wordt gebruikt.

De hieronder weergegeven uitvoer is een resultaat van deze ingevoerde opdrachten in de apparaten die in het netwerkdiagram worden weergegeven. Deze output toont dat het netwerk correct werkt.

CE1

```
Cisco4500#show ip route
```

```
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP  
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area  
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2  
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP  
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area  
* - candidate default, U - per-user static route, o - ODR  
P - periodic downloaded static route
```

```
Gateway of last resort is not set
```

```
100.0.0.0/24 is subnetted, 1 subnets  
C    100.1.1.0 is directly connected, Ethernet0  
110.0.0.0/24 is subnetted, 1 subnets  
R    110.1.1.0 [120/1] via 100.1.1.1, 00:00:14, Ethernet0  
10.0.0.0/24 is subnetted, 3 subnets  
C    10.3.3.0 is directly connected, Loopback2  
C    10.2.2.0 is directly connected, Loopback1  
C    10.1.1.0 is directly connected, Loopback0  
30.0.0.0/24 is subnetted, 3 subnets  
R    30.3.3.0 [120/1] via 100.1.1.1, 00:00:14, Ethernet0  
R    30.2.2.0 [120/1] via 100.1.1.1, 00:00:15, Ethernet0  
R    30.1.1.0 [120/1] via 100.1.1.1, 00:00:15, Ethernet0
```

PE1

```
Cisco7500a#show ip route
```

```
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP  
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area  
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2  
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP  
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area  
* - candidate default, U - per-user static route, o - ODR  
P - periodic downloaded static route
```

```
Gateway of last resort is not set
```

```
1.0.0.0/32 is subnetted, 1 subnets  
C    1.1.1.1 is directly connected, Loopback0  
2.0.0.0/32 is subnetted, 1 subnets  
O    2.2.2.2 [110/4] via 4.4.4.4, 18:17:37, ATM2/0/0.10  
3.0.0.0/32 is subnetted, 1 subnets  
O    3.3.3.3 [110/3] via 4.4.4.4, 18:17:37, ATM2/0/0.10  
4.0.0.0/32 is subnetted, 1 subnets  
O    4.4.4.4 [110/2] via 4.4.4.4, 18:17:37, ATM2/0/0.10
```

```
Cisco7500a#show ip route vrf NEW
```

```
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP  
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area  
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2  
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP  
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
```

* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

```
100.0.0.0/24 is subnetted, 1 subnets
C    100.1.1.0 is directly connected, Ethernet2/1/0
110.0.0.0/24 is subnetted, 1 subnets
B    110.1.1.0 [200/0] via 2.2.2.2, 00:26:11
10.0.0.0/24 is subnetted, 3 subnets
R    10.3.3.0 [120/1] via 100.1.1.2, 00:00:11, Ethernet2/1/0
R    10.2.2.0 [120/1] via 100.1.1.2, 00:00:11, Ethernet2/1/0
R    10.1.1.0 [120/1] via 100.1.1.2, 00:00:11, Ethernet2/1/0
30.0.0.0/24 is subnetted, 3 subnets
B    30.3.3.0 [200/1] via 2.2.2.2, 00:26:12
B    30.2.2.0 [200/1] via 2.2.2.2, 00:26:12
B    30.1.1.0 [200/1] via 2.2.2.2, 00:26:12
```

Cisco7500a#**show ip rip database vrf NEW**

```
10.0.0.0/8    auto-summary
10.1.1.0/24
    [1] via 100.1.1.2, 00:00:18, Ethernet2/1/0
10.2.2.0/24
    [1] via 100.1.1.2, 00:00:18, Ethernet2/1/0
10.3.3.0/24
    [1] via 100.1.1.2, 00:00:18, Ethernet2/1/0
30.0.0.0/8    auto-summary
30.1.1.0/24    redistributed
    [1] via 2.2.2.2,
30.2.2.0/24    redistributed
    [1] via 2.2.2.2,
30.3.3.0/24    redistributed
    [1] via 2.2.2.2,
100.0.0.0/8    auto-summary
100.1.1.0/24    directly connected, Ethernet2/1/0
110.0.0.0/8    auto-summary
110.1.1.0/24    redistributed
    [1] via 2.2.2.2,
```

Cisco7500a#**show ip bgp vpnv4 vrf NEW**

BGP table version is 17, local router ID is 1.1.1.1
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete

| Network | Next Hop | Metric | LocPrf | Weight | Path |
|--|-----------|--------|--------|--------|------|
| Route Distinguisher: 200:1 (default for vrf NEW) | | | | | |
| *> 10.1.1.0/24 | 100.1.1.2 | 1 | | 32768 | ? |
| *> 10.2.2.0/24 | 100.1.1.2 | 1 | | 32768 | ? |
| *> 10.3.3.0/24 | 100.1.1.2 | 1 | | 32768 | ? |
| *>i30.1.1.0/24 | 2.2.2.2 | 1 | 100 | 0 | ? |
| *>i30.2.2.0/24 | 2.2.2.2 | 1 | 100 | 0 | ? |
| *>i30.3.3.0/24 | 2.2.2.2 | 1 | 100 | 0 | ? |
| *> 100.1.1.0/24 | 0.0.0.0 | 0 | | 32768 | ? |
| *>i110.1.1.0/24 | 2.2.2.2 | 0 | 100 | 0 | ? |

Cisco7500a#**show tag-switching interfaces**

| Interface | IP | Tunnel | Operational | |
|-------------|-----|--------|-------------|---------------|
| ATM2/0/0.10 | Yes | No | Yes | (ATM tagging) |

Cisco7500a#**show tag-switching interfaces detail**

```
Interface ATM2/0/0.10:
  IP tagging enabled
  TSP Tunnel tagging not enabled
  Tagging operational
```

```
Tagswitching turbo vector
MTU = 4470
ATM tagging:
    Tag VPI = 1
    Tag VCI range = 33 - 65535
    Control VC = 0/32
```

Cisco7500a#**show tag-switching ?**

```
atm-tdp          ATM Tagging Protocol information
cos-map          Show Tag CoS ATM Multi-VC CoS Map
forwarding-table Show the Tag Forwarding Information Base (TFIB)
interfaces       Show per-interface tag switching
prefix-map       Show Tag CoS Prefix Map
tdp              Tag Distribution Protocol information
```

Cisco7500a#**show tag-switching tdp bindings**

```
tib entry: 1.1.1.1/32, rev 2
    local binding: tag: imp-null
tib entry: 2.2.2.2/32, rev 23
    local binding: tag: 27
tib entry: 3.3.3.3/32, rev 21
    local binding: tag: 26
tib entry: 4.4.4.4/32, rev 10
    local binding: tag: 28
```

Cisco7500a#**show tag-switching atm-tdp bindings**

```
Destination: 4.4.4.4/32
    Headend Router ATM2/0/0.10 (1 hop) 1/33 Active, VCD=24
Destination: 3.3.3.3/32
    Headend Router ATM2/0/0.10 (2 hops) 1/43 Active, VCD=25
Destination: 2.2.2.2/32
    Headend Router ATM2/0/0.10 (3 hops) 1/42 Active, VCD=26
Destination: 1.1.1.1/32
    Tailend Router ATM2/0/0.10 1/33 Active, VCD=24
```

Cisco7500a#**show tag-switching forwarding-table vrf NEW**

| Local tag | Outgoing tag or VC | Prefix or Tunnel Id | Bytes tag switched | Outgoing interface | Next Hop |
|-----------|--------------------|---------------------|--------------------|--------------------|-----------|
| 29 | Aggregate | 100.1.1.0/24[V] | 2080 | | |
| 30 | Untagged | 10.3.3.0/24[V] | 0 | Et2/1/0 | 100.1.1.2 |
| 31 | Untagged | 10.2.2.0/24[V] | 0 | Et2/1/0 | 100.1.1.2 |
| 32 | Untagged | 10.1.1.0/24[V] | 0 | Et2/1/0 | 100.1.1.2 |

P1

LS1010#**show ip route**

```
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, * - candidate default
       U - per-user static route, o - ODR
       T - traffic engineered route
```

Gateway of last resort is not set

```
1.0.0.0/32 is subnetted, 1 subnets
O    1.1.1.1 [110/2] via 1.1.1.1, 19:00:12, ATM12/0/0
2.0.0.0/32 is subnetted, 1 subnets
O    2.2.2.2 [110/3] via 3.3.3.3, 19:00:12, ATM12/0/1
3.0.0.0/32 is subnetted, 1 subnets
```

```
O      3.3.3.3 [110/2] via 3.3.3.3, 19:00:12, ATM12/0/1
      4.0.0.0/32 is subnetted, 1 subnets
C      4.4.4.4 is directly connected, Loopback0
```

LS1010#show tag-switching atm-tdp bindings

```
Destination: 4.4.4.4/32
  Tailend Switch ATM12/0/0 1/33 Active -> Terminating Active
  Tailend Switch ATM12/0/1 1/34 Active -> Terminating Active
Destination: 2.2.2.2/32
  Transit ATM12/0/0 1/42 Active -> ATM12/0/1 1/35 Active
Destination: 1.1.1.1/32
  Transit ATM12/0/1 1/33 Active -> ATM12/0/0 1/33 Active
Destination: 3.3.3.3/32
  Transit ATM12/0/0 1/43 Active -> ATM12/0/1 1/34 Active
```

P2

LS1010#show ip route

```
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, * - candidate default
       U - per-user static route, o - ODR
```

Gateway of last resort is 10.118.1.21 to network 0.0.0.0

```
      1.0.0.0/32 is subnetted, 1 subnets
O      1.1.1.1 [110/3] via 4.4.4.4, 19:46:00, ATM0/1/1
      2.0.0.0/32 is subnetted, 1 subnets
O      2.2.2.2 [110/2] via 2.2.2.2, 19:46:00, ATM0/1/3
      3.0.0.0/32 is subnetted, 1 subnets
C      3.3.3.3 is directly connected, Loopback0
      4.0.0.0/32 is subnetted, 1 subnets
O      4.4.4.4 [110/2] via 4.4.4.4, 19:46:00, ATM0/1/1
      10.0.0.0/24 is subnetted, 1 subnets
C      10.118.1.0 is directly connected, Ethernet2/0/0
S*    0.0.0.0/0 [1/0] via 10.118.1.21
```

LS1010#show tag-switching atm-tdp bindings

```
Destination: 1.1.1.1/32
  Transit ATM0/1/3 1/33 Active -> ATM0/1/1 1/33 Active
Destination: 3.3.3.3/32
  Tailend Switch ATM0/1/3 1/34 Active -> Terminating Active
  Tailend Switch ATM0/1/1 1/34 Active -> Terminating Active
Destination: 4.4.4.4/32
  Transit ATM0/1/3 1/35 Active -> ATM0/1/1 1/34 Active
Destination: 2.2.2.2/32
  Transit ATM0/1/1 1/35 Active -> ATM0/1/3 1/33 Active
```

PE2

Cisco7500#show ip route

```
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route
```

Gateway of last resort is not set

```
1.0.0.0/32 is subnetted, 1 subnets
O   1.1.1.1 [110/4] via 3.3.3.3, 02:58:46, ATM3/1/0.1
2.0.0.0/32 is subnetted, 1 subnets
C   2.2.2.2 is directly connected, Loopback0
3.0.0.0/32 is subnetted, 1 subnets
O   3.3.3.3 [110/2] via 3.3.3.3, 02:58:46, ATM3/1/0.1
4.0.0.0/32 is subnetted, 1 subnets
O   4.4.4.4 [110/3] via 3.3.3.3, 02:58:46, ATM3/1/0.1
```

Cisco7500#show ip route vrf NEW

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

```
100.0.0.0/24 is subnetted, 1 subnets
B   100.1.1.0 [200/0] via 1.1.1.1, 01:16:13
110.0.0.0/24 is subnetted, 1 subnets
C   110.1.1.0 is directly connected, FastEthernet3/0/0
10.0.0.0/24 is subnetted, 3 subnets
B   10.3.3.0 [200/1] via 1.1.1.1, 01:16:13
B   10.2.2.0 [200/1] via 1.1.1.1, 01:16:13
B   10.1.1.0 [200/1] via 1.1.1.1, 01:16:13
30.0.0.0/24 is subnetted, 3 subnets
R   30.3.3.0 [120/1] via 110.1.1.2, 00:00:16, FastEthernet3/0/0
R   30.2.2.0 [120/1] via 110.1.1.2, 00:00:17, FastEthernet3/0/0
R   30.1.1.0 [120/1] via 110.1.1.2, 00:00:17, FastEthernet3/0/0
```

Cisco7500#show ip rip database vrf NEW

```
10.0.0.0/8    auto-summary
10.1.1.0/24   redistributed
               [1] via 1.1.1.1,
10.2.2.0/24   redistributed
               [1] via 1.1.1.1,
10.3.3.0/24   redistributed
               [1] via 1.1.1.1,
30.0.0.0/8    auto-summary
30.1.1.0/24
               [1] via 110.1.1.2, 00:00:09, FastEthernet3/0/0
30.2.2.0/24
               [1] via 110.1.1.2, 00:00:09, FastEthernet3/0/0
30.3.3.0/24
               [1] via 110.1.1.2, 00:00:09, FastEthernet3/0/0
100.0.0.0/8   auto-summary
100.1.1.0/24  redistributed
               [1] via 1.1.1.1,
110.0.0.0/8   auto-summary
110.1.1.0/24  directly connected, FastEthernet3/0/0
```

Cisco7500#show ip bgp vpnv4 vrf NEW

BGP table version is 17, local router ID is 2.2.2.2
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete

| Network | Next Hop | Metric | LocPrf | Weight | Path |
|--|----------|--------|--------|--------|------|
| Route Distinguisher: 200:1 (default for vrf NEW) | | | | | |
| *>i10.1.1.0/24 | 1.1.1.1 | 1 | 100 | 0 | ? |

```

*>i10.2.2.0/24      1.1.1.1          1    100    0 ?
*>i10.3.3.0/24      1.1.1.1          1    100    0 ?
*> 30.1.1.0/24      110.1.1.2        1           32768 ?
*> 30.2.2.0/24      110.1.1.2        1           32768 ?
*> 30.3.3.0/24      110.1.1.2        1           32768 ?
*>i100.1.1.0/24     1.1.1.1          0    100    0 ?
*> 110.1.1.0/24     0.0.0.0          0           32768 ?

```

Cisco7500#show tag-switching interfaces

```

Interface          IP      Tunnel  Operational
ATM3/1/0.1         Yes     No      Yes      (ATM tagging)

```

Cisco7500#show tag-switching interfaces detail

```

Interface ATM3/1/0.1:
  IP tagging enabled
  TSP Tunnel tagging not enabled
  Tagging operational
  Tagswitching turbo vector
  MTU = 4470
  ATM tagging:
    Tag VPI = 1
    Tag VCI range = 33 - 65535
    Control VC = 0/32

```

Cisco7500#show tag-switching ?

```

atm-tdp           ATM Tagging Protocol information
cos-map           Show Tag CoS ATM Multi-VC CoS Map
forwarding-table  Show the Tag Forwarding Information Base (TFIB)
interfaces        Show per-interface tag switching
prefix-map        Show Tag CoS Prefix Map
tdp               Tag Distribution Protocol information

```

Cisco7500#show tag-switching tdp bindings

```

tib entry: 1.1.1.1/32, rev 25
  local binding: tag: 26
tib entry: 2.2.2.2/32, rev 2
  local binding: tag: imp-null
tib entry: 3.3.3.3/32, rev 27
  local binding: tag: 27
tib entry: 4.4.4.4/32, rev 29
  local binding: tag: 28

```

Cisco7500#show tag-switching atm-tdp bindings

```

Destination: 1.1.1.1/32
  Headend Router ATM3/1/0.1 (3 hops) 1/33 Active, VCD=8
Destination: 3.3.3.3/32
  Headend Router ATM3/1/0.1 (1 hop) 1/34 Active, VCD=6
Destination: 4.4.4.4/32
  Headend Router ATM3/1/0.1 (2 hops) 1/35 Active, VCD=7
Destination: 2.2.2.2/32
  Tailend Router ATM3/1/0.1 1/33 Active, VCD=8

```

Cisco7500#show tag-switching forwarding-table vrf NEW

| Local tag | Outgoing tag or VC | Prefix or Tunnel Id | Bytes tag switched | Outgoing interface | Next Hop |
|-----------|--------------------|---------------------|--------------------|--------------------|-----------|
| 33 | Aggregate | 110.1.1.0/24[V] | 0 | | |
| 34 | Untagged | 30.3.3.0/24[V] | 0 | Fa3/0/0 | 110.1.1.2 |
| 35 | Untagged | 30.2.2.0/24[V] | 0 | Fa3/0/0 | 110.1.1.2 |
| 36 | Untagged | 30.1.1.0/24[V] | 0 | Fa3/0/0 | 110.1.1.2 |

Cisco7100#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

```
100.0.0.0/24 is subnetted, 1 subnets
R    100.1.1.0 [120/1] via 110.1.1.1, 00:00:19, FastEthernet0/0
110.0.0.0/24 is subnetted, 1 subnets
C    110.1.1.0 is directly connected, FastEthernet0/0
10.0.0.0/24 is subnetted, 3 subnets
R    10.3.3.0 [120/1] via 110.1.1.1, 00:00:19, FastEthernet0/0
R    10.2.2.0 [120/1] via 110.1.1.1, 00:00:19, FastEthernet0/0
R    10.1.1.0 [120/1] via 110.1.1.1, 00:00:19, FastEthernet0/0
30.0.0.0/24 is subnetted, 3 subnets
C    30.3.3.0 is directly connected, Loopback2
C    30.2.2.0 is directly connected, Loopback1
C    30.1.1.0 is directly connected, Loopback0
```

[Gerelateerde informatie](#)

- [MPLS Virtual Private Networks](#)
- [Een basis-MPLS VPN configureren](#)
- [Packet Flow in een MPLS VPN-omgeving](#)
- [Technische ondersteuning en documentatie – Cisco Systems](#)