

Cisco 7500 라우터 및 LightStream 1010 스위치로 ATM을 통한 VPN MPLS 구성

목차

[소개](#)

[사전 요구 사항](#)

[요구 사항](#)

[표기 규칙](#)

[구성](#)

[네트워크 다이어그램](#)

[네트워크 설명](#)

[구성](#)

[관련 정보](#)

[소개](#)

이 문서에서는 Cisco 7500 라우터를 LER(Label Edge Routers)로, LightStream 1010 스위치를 LSR(Label Switch Router)으로 ATM에서 VPN(Virtual Private Network) MPLS(Multiprotocol Label Switching)를 구성하는 방법을 보여줍니다. 각각 원격 고객 사이트에 있는 이더넷 연결 라우터 2개는 VPN에 속합니다. 이 문서에서는 엔드 투 엔드 디바이스 컨피그레이션과 유용한 show 명령을 살펴봅니다.

[사전 요구 사항](#)

[요구 사항](#)

이 문서에 대한 특정 요건이 없습니다.

[표기 규칙](#)

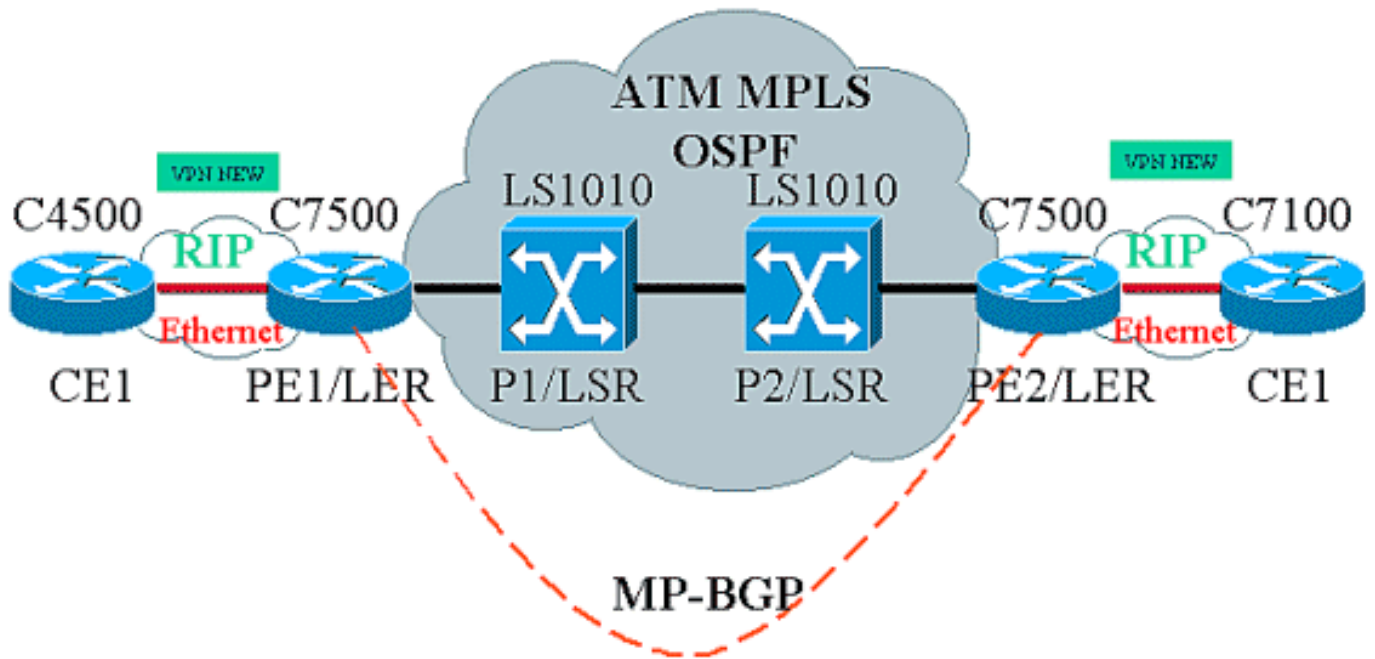
문서 규칙에 대한 자세한 내용은 [Cisco 기술 팁 표기 규칙을 참고하십시오.](#)

[구성](#)

이 섹션에는 이 문서에서 설명하는 기능을 구성하기 위한 정보가 표시됩니다.

[네트워크 다이어그램](#)

이 문서에서는 다음 네트워크 설정을 사용합니다.



네트워크 설명

현재 설정에는 VPN 용어에서 다음 요소가 포함되어 있습니다.

- CE = 고객 에지 라우터
- PE = 공급자 에지 라우터
- P=공급자 라우터

현재 설정에는 MPLS 용어에서 다음 요소가 포함됩니다.

- LER = 레이블 에지 라우터
- LSR = 레이블 스위치 라우터
- TDP/LDP = Tag Distribution Protocol/Label Distribution Protocol

구성

이 문서에서는 다음 구성을 사용합니다.

- PE1과 PE2는 ATM 네트워크의 LER입니다.
- P1과 P2는 LSR입니다.
- CE1 및 CE2는 VPN 또는 MPLS를 모르고 수행하지 않는 Customer Edge 라우터입니다.
- CE1 및 CE2는 각각 PE1 및 PE2에 연결된 이더넷이며 RIP(Routing Information Protocol)를 수행합니다.
- PE1, PE2, P1 및 P2는 OSPF(Open Shortest Path First)를 수행하며 모두 영역 0에 있습니다. OSPF는 ATM 네트워크에서 사용되는 IGP(Interior Gateway Protocol)입니다. 태그 스위칭은 4개의 ATM 디바이스 모두에서 ATM 인터페이스에서 사용됩니다. TDP(Tag Distribution Protocol)는 OSPF 경로에 태그를 할당합니다.
- PE1 및 PE2는 MP-BGP(Multiprotocol-Border Gateway Protocol) 피어입니다.
- RIP 경로는 MP-BGP로 재배포됩니다. MP-BGP 경로는 PE1 및 PE2 라우터의 RIP로 재배포됩니다.
- PE1 및 PE2 라우터에서 별도의 VRF 라우팅 테이블을 유지합니다.

- 이 예에서 사용되는 VPN의 이름은 NEW입니다.

CE1

```
!  
version 12.1  
service timestamps debug datetime msec  
service timestamps log datetime msec  
  
!  
boot system flashw 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 flashw 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 flashw 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 vpnv4
  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
!
```

show 명령

다음 명령을 사용하여 네트워크가 제대로 작동하는지 테스트합니다.

- **show ip route** - IP 라우팅 테이블 항목을 표시합니다.
- **show ip rip database vrf** - 특정 VRF에 대한 RIP 데이터베이스에 포함된 정보를 표시합니다.
- **show ip bgp vpnv4 vrf** - BGP 테이블의 VPN 주소 정보를 표시합니다.
- **show tag-switching interfaces detail** - MPLS 기능이 활성화된 하나 이상의 인터페이스에 대한 정보를 표시합니다.
- **show tag-switching tdp bindings** - ATM LDP 레이블 바인딩 데이터베이스에서 요청한 항목을 표시합니다.
- **show tag-switching forwarding-table vrf** - 특정 경로에 사용되는 레이블 스택을 확인합니다.

아래 표시된 출력은 네트워크 다이어그램에 표시된 디바이스에서 입력된 명령 결과입니다. 이 출력은 네트워크가 제대로 작동하고 있음을 보여줍니다.

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 |

CE2

```
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
```

관련 정보

- [MPLS 가상 사설 네트워크](#)
- [기본 MPLS VPN 구성](#)
- [MPLS VPN 환경의 패킷 흐름](#)
- [기술 지원 및 문서 - Cisco Systems](#)