

# 用 Cisco 7500 路由器与 LightStream 1010 交换机配置 ATM 上的 VPN MPLS

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## 简介

本文显示如何配置虚拟专用网络(VPN) ATM上多协议标签交换(MPLS)用Cisco 7500路由器，当标签边缘路由器(LEs)和LightStream1010交换机作为标签交换路由器(LSRs)。两已连接以太网的路由器，中的每一远端用户客户地点的，是VPN的一部分。在本文中，我们查看端到端设备配置，并且有用请显示命令。

## 先决条件

### 要求

本文档没有任何特定的要求。

### 规则

有关文档规则的详细信息，请参阅 [Cisco 技术提示规则](#)。

## 配置

本部分提供有关如何配置本文档所述功能的信息。

### 网络图

本文档使用以下网络设置：

### 网络说明

当前设置在VPN术语方面包含这些元素：

- CE =用户边缘路由器
- PE =供应商边缘路由器
- P=Provider路由器

当前设置在MPLS术语方面包含这些元素：

- LER =标签边缘路由器
- LSR =标签交换路由器
- TDP/LDP =标记分布协议/标签转发协议

## 配置

本文档使用以下配置：

- PE1及PE2是在我们的ATM网络的LERs。
- P1和P2是LSRs。
- CE1与CE2是没有察觉的，并且不执行VPN或MPLS的用户边缘路由器。
- CE1与CE2分别为以太网连接对PE1及PE2，并且执行路由信息协议(RIP)。
- PE1、PE2、P1和P2执行开放最短路径优先(OSPF)并且是全部在Area 0。OSPF是用于ATM网络的内部网关路由协议(IGP)。标记交换在所有四个ATM设备的ATM接口使用。标签发行协议(TDP)分配标记到OSPF路由。
- PE1及PE2是多协议边界网关协议(MP-BGP)对等体。
- RIP路由再分布到MP-BGP。MP-BGP路由再分布到在PE1及PE2路由器的RIP。
- 设置维护在PE1及PE2路由器的独立的VRF路由表。
- 用于此示例的VPN的名称新建。

### 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 flash 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
!

```

## 显示命令

请使用这些命令测试您的网络正常运行：

- **show ip route** - 显示IP 路由表条目。
- **show ip rip database vrf** -显示在特定的VRF RIP数据库包含的信息。
- **show ip bgp vpnv4 vrf** -显示从BGP表的VPN地址信息。
- **show tag-switching interfaces detail** -显示关于有MPLS功能启用的一个或更多接口的信息。
- **show tag-switching tdp bindings** -显示从ATM LDP标签绑定数据库的请求的条目。
- **show tag-switching forwarding-table vrf** -检查用于特定路由的标签栈。

输出如下所示是这些的结果被输入的on命令在网络图中显示的设备。此输出显示网络正常运行。

## 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
```

## 相关信息

- [MPLS 虚拟专用网](#)
- [配置基本 MPLS VPN](#)
- [MPLS VPN 环境里中的信息包流](#)
- [技术支持和文档 - Cisco Systems](#)