

Configurando VPN MPLS sobre o ATM com Cisco 7500 Router e Switches do LightStream 1010

Índice

[Introdução](#)

[Pré-requisitos](#)

[Requisitos](#)

[Convenções](#)

[Configurar](#)

[Diagrama de Rede](#)

[Descrição da rede](#)

[Configurações](#)

[Informações Relacionadas](#)

[Introdução](#)

Este documento mostra como configurar o Multiprotocol Label Switching (MPLS) da Virtual Private Network (VPN) em Modo de Transferência Assíncrona (Asynchronous Transfer Mode) com roteadores Cisco 7500 como Label Edge Routers (LERs) e roteadores LightStream 1010 como Label Switch Routers (LSRs). Dois roteadores conectados por Ethernet, cada um em um site de cliente remoto, são parte de uma VPN. Neste documento, nós olhamos as configurações de dispositivo de ponta a ponta e os comandos show úteis.

[Pré-requisitos](#)

[Requisitos](#)

Não existem requisitos específicos para este documento.

[Convenções](#)

Consulte as [Convenções de Dicas Técnicas da Cisco](#) para obter mais informações sobre convenções de documentos.

[Configurar](#)

Nesta seção, você encontrará informações para configurar os recursos descritos neste documento.

Diagrama de Rede

Este documento utiliza a seguinte configuração de rede:

Descrição da rede

A instalação atual contém estes elementos na terminologia VPN:

- CE = roteador de ponta do cliente
- PE = roteador de extremidade do provedor
- Roteador de P=Provider

A instalação atual contém estes elementos na terminologia de MPLS:

- LER = roteador de borda de rótulo
- LSR = Label Switch Router
- TDP/LDP = protocolo de distribuição da etiqueta/protocolo da distribuição de rótulo

Configurações

Este documento utiliza as seguintes configurações:

- O PE1 e o PE2 são os LER em nossa rede ATM.
- O P1 e o P2 são os LSR.
- O CE1 e o CE2 são os roteadores de ponta do cliente que são inconscientes e não realizam o VPN ou o MPLS.
- O CE1 e o CE2 são Ethernet conectado ao PE1 e ao PE2 respectivamente, e realizam o Routing Information Protocol (RIP).
- O PE1, o PE2, o P1 e o P2 fazem o Open Shortest Path First (OSPF) e são todos na área 0. OSPF são o Interior Gateway Protocol (IGP) usado na rede ATM. O tag-switching é usado nas interfaces ATM em todos os quatro dispositivos ATM. O protocolo de distribuição de etiquetas (TDP) atribui etiquetas às rotas de OSPF.
- O PE1 e o PE2 são pares do protocolo de gateway de borda multiprotocolo (MP-BGP).
- As rotas RIP são redistribuídas no MP-BGP. Rotas MP-BGP redistribuídas no RASGO no Roteadores PE1 e PE2.
- A instalação mantém tabelas de roteamento separadas VRF no Roteadores PE1 e PE2.
- O nome do VPN usado neste exemplo é NOVO.

CE1

```
!  
version 12.1  
service timestamps debug datetime msec  
service timestamps log datetime msec  
  
!  
boot system flash 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 flash0: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
!

```

[comandos show](#)

Use esses comandos para testar se a rede funciona adequadamente:

- **show ip route** - Exibe entradas de tabela de IP Routing.
- **exibir vrf de banco de dados ip rip** – Exibe informações contidas no banco de dados RIP para um determinado VRF.
- **show ip bgp vpnv4 vrf** – Exibe informações do endereço VPN da tabela BGP.
- **show tag-switching interfaces detail** - Indica a informação sobre umas ou várias relações que têm a característica MPLS permitida.
- **mostre emperramentos do tdp do tag-switching** - Indica as entradas pedidas do base de dados de ligação de rótulo ATM LDP.
- **show tag-switching forwarding-table vrf** - Verifica a pilha de rótulo usada para uma rota particular.

A saída mostrada abaixo é um resultado destes comandos entered nos dispositivos mostrados no diagrama da rede. Esta saída mostra que a rede está funcionando adequadamente.

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
```

Informações Relacionadas

- [Virtual Private Networks de MPLS](#)
- [Configurando uma VPN MPLS básica](#)
- [Fluxo de pacote em um ambiente de MPLS VPN](#)
- [Suporte Técnico e Documentação - Cisco Systems](#)