

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

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[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 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 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 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.
- **show ip 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.
- **show mpls ldp neighbors** - 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 Outgoing Prefix Bytes tag Outgoing
Next Hop tag tag or VC or Tunnel Id switched interface 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 Outgoing Prefix Bytes tag Outgoing Next Hop tag tag or VC or Tunnel Id switched interface 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

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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
```

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