Configuration de MPLS VPN sur ATM avec les routeurs Cisco 7500 et les commutateurs LightStream 1010

Contenu

Introduction

Ce document explique comment configurer la commutation multiprotocole par étiquette de réseau privé virtuel (VPN) sur ATM avec les routeurs Cisco 7500 en tant que routeurs de périphérie étiquetés (LER) et les commutateurs LightStream 1010 en tant que routeurs de commutation étiquetés (LSR). Deux routeurs connectés par Ethernet, chacun sur un site client distant, font partie d'un VPN. Dans ce document, nous examinons les configurations de bout en bout des périphériques et les commandes show utiles.

Conditions préalables

Conditions requises

Aucune spécification déterminée n'est requise pour ce document.

Conventions

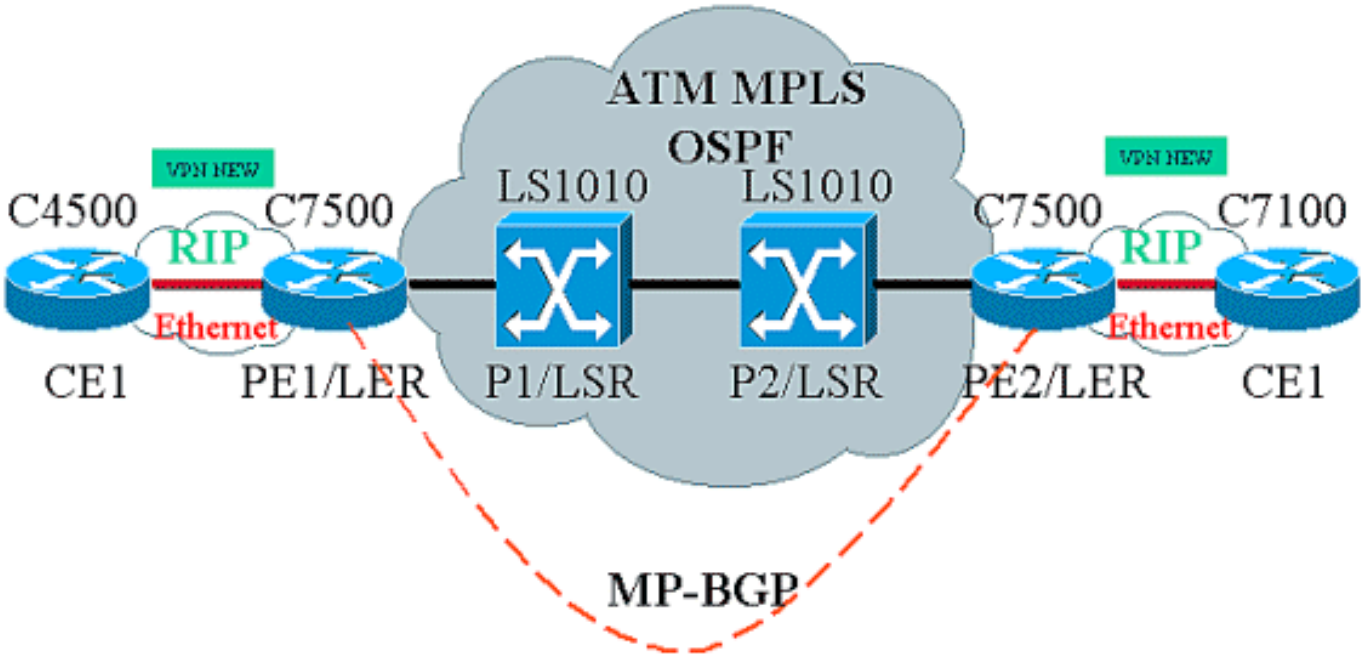
Pour plus d'informations sur les conventions utilisées dans ce document, reportez-vous à Conventions relatives aux conseils techniques Cisco.

Configuration

Cette section vous fournit des informations pour configurer les fonctionnalités décrites dans ce document.

Diagramme du réseau

Ce document utilise la configuration réseau suivante :



Description du réseau

La configuration actuelle contient ces éléments dans la terminologie VPN :

- CE = routeur de périphérie client
- PE = Routeur de périphérie du fournisseur
- P=Routeur du fournisseur

La configuration actuelle contient ces éléments dans la terminologie MPLS :

- LER = Routeur Edge d'étiquette
- LSR = routeur de commutation d'étiquette
- TDP/LDP = Tag Distribution Protocol/Label Distribution Protocol

Configurations

Ce document utilise les configurations suivantes :

- PE1 et PE2 sont les LER de notre réseau ATM.
- P1 et P2 sont les LSR.
- CE1 et CE2 sont des routeurs de périphérie du client qui ne sont pas conscients et qui n'exécutent pas de VPN ou de MPLS.
- CE1 et CE2 sont respectivement connectés à PE1 et PE2 et exécutent le protocole RIP (Routing Information Protocol).
- PE1, PE2, P1 et P2 effectuent le protocole OSPF (Open Shortest Path First) et se trouvent tous dans la zone 0. OSPF est le protocole IGP (Interior Gateway Protocol) utilisé dans le réseau ATM. La commutation Tag-Switching est utilisée sur les interfaces ATM sur les quatre

périphériques ATM. Le protocole TDP (Tag Distribution Protocol) attribue des balises aux routes OSPF.

- PE1 et PE2 sont des homologues MP-BGP (Multiprotocol Border Gateway Protocol).
- Les routes RIP sont redistribuées dans MP-BGP. Routes MP-BGP redistribuées dans RIP sur les routeurs PE1 et PE2.
- La configuration gère des tables de routage VRF distinctes dans les routeurs PE1 et PE2.
- Le nom du VPN utilisé dans cet exemple est NOUVEAU.

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 flashow 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
!
```

Commandes show

Utilisez ces commandes pour vérifier que votre réseau fonctionne correctement :

- **show ip route** - Affiche les entrées de la table de routage IP.
- **show ip rip database vrf** - Affiche les informations contenues dans la base de données RIP pour un VRF particulier.
- **show ip bgp vpnv4 vrf** - Affiche les informations d'adresse VPN de la table BGP.
- **show tag-switching interfaces detail** - Affiche des informations sur une ou plusieurs interfaces

pour lesquelles la fonctionnalité MPLS est activée.

- **show tag-switching tdp bindings** : affiche les entrées demandées dans la base de données de liaison d'étiquette LDP ATM.
- **show tag-switching forwarding-table vrf** - Vérifie la pile d'étiquettes utilisée pour une route particulière.

Le résultat ci-dessous est le résultat de ces commandes entrées sur les périphériques représentés dans le schéma de réseau. Ce résultat montre que le réseau fonctionne correctement.

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

```
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
```

Informations connexes

- Réseaux privés virtuels MPLS
- Configuration d'un VPN MPLS de base
- Flux de paquets dans un environnement MPLS VPN
- Support et documentation techniques - Cisco Systems