Memòria Taller #4 Core Network MPLS

TXC

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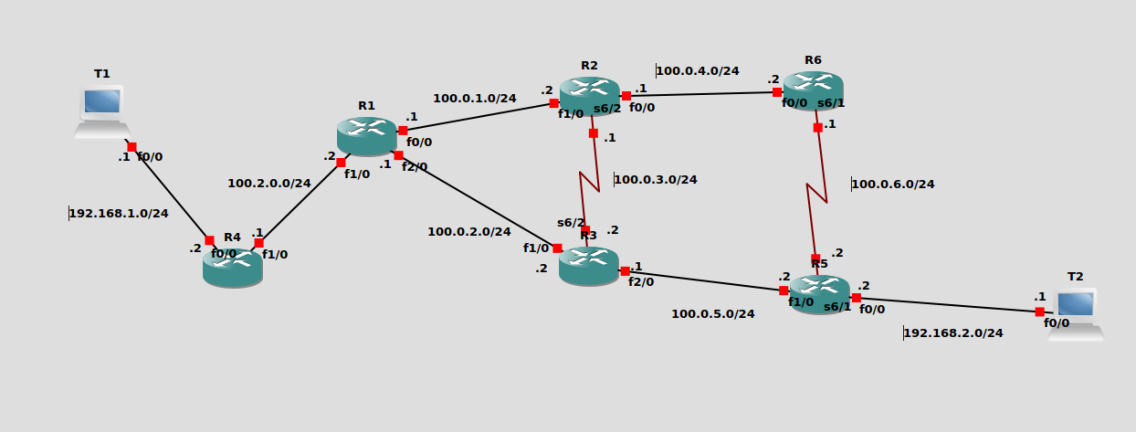
1. Esquema de la xarxa desenvolupada



Les IP de loopback de cada router són 10.10.0.x sent x el nńmero de router.

El tunnel 1 està configurat a R1 i passa per:

-100.0.1.1, 100.0.1.2, 100.0.4.1, 100.0.4.2, 100.0.6.1, 100.0.6.2, 10.10.0.5

El tunnel 2 està configurat a R5 i passa per:

-100.0.5.2, 100.0.5.1, 100.0.2.2. 100.0.2.1, 10.10.0.1

2. Relació de les línies de programació

R1:

```
interface Loopback0
 ip address 10.10.0.1 255.255.255.255
!
interface Tunnel10
 ip unnumbered Loopback0
 tunnel destination 10.10.0.5
 tunnel mode mpls traffic-eng
 tunnel mpls traffic-eng autoroute announce
 tunnel mpls traffic-eng priority 7 7
 tunnel mpls traffic-eng bandwidth 100
 tunnel mpls traffic-eng path-option 1 explicit name LP1
 no routing dynamic
!
interface FastEthernet0/0
 ip address 100.0.1.1 255.255.255.0
 duplex half
 mpls traffic-eng tunnels
 mpls ip
 ip rsvp bandwidth 100
!
interface FastEthernet1/0
 ip address 100.2.0.2 255.255.255.0
 duplex half
!
interface FastEthernet2/0
 ip address 100.0.2.1 255.255.255.0
 duplex auto
 speed auto
 mpls ip
!
```

```
router ospf 1
 mpls traffic-eng router-id Loopback0
 mpls traffic-eng area 0
 log-adjacency-changes
 network 10.10.0.1 0.0.0.0 area 0
 network 100.0.1.0 0.0.0.255 area 0
 network 100.0.2.0 0.0.0.255 area 0
 network 100.2.0.0 0.0.0.255 area 0
!
ip forward-protocol nd
no ip http server
no ip http secure-server
!
!
!
ip explicit-path name LP1 enable
 next-address 100.0.1.1
 next-address 100.0.1.2
 next-address 100.0.4.1
 next-address 100.0.4.2
 next-address 100.0.6.1
 next-address 100.0.6.2
 next-address 10.10.0.5
!
```

R2:

```
!
interface Loopback0
 ip address 10.10.0.2 255.255.255.255
!
interface FastEthernet0/0
 ip address 100.0.4.1 255.255.255.0
 duplex half
 mpls traffic-eng tunnels
 mpls ip
 ip rsvp bandwidth 100
!
interface FastEthernet1/0
 ip address 100.0.1.2 255.255.255.0
 duplex half
 mpls traffic-eng tunnels
 mpls ip
 ip rsvp bandwidth 100
!
```

```
!
interface Serial6/2
 ip address 100.0.3.1 255.255.255.0
 mpls ip
 serial restart-delay 0
!
```

```
!
router ospf 1
 mpls traffic-eng router-id Loopback0
 mpls traffic-eng area 0
 log-adjacency-changes
 network 10.10.0.2 0.0.0.0 area 0
 network 100.0.1.0 0.0.0.255 area 0
 network 100.0.3.0 0.0.0.255 area 0
 network 100.0.4.0 0.0.0.255 area 0
!
```

R3:

```
!
interface Loopback0
 ip address 10.10.0.3 255.255.255.255
!
interface FastEthernet0/0
 no ip address
 shutdown
 duplex half
!
interface FastEthernet1/0
 ip address 100.0.2.2 255.255.255.0
 duplex half
 mpls ip
!
interface FastEthernet2/0
 ip address 100.0.5.1 255.255.255.0
 duplex auto
 speed auto
 mpls ip
```

```
!
interface Serial6/2
 ip address 100.0.3.2 255.255.255.0
 mpls ip
 serial restart-delay 0
!
interface Serial6/3
 no ip address
 shutdown
 serial restart-delay 0
!
router ospf 1
 log-adjacency-changes
 network 10.10.0.3 0.0.0.0 area 0
 network 100.0.2.0 0.0.0.255 area 0
 network 100.0.3.0 0.0.0.255 area 0
 network 100.0.5.0 0.0.0.255 area 0
!
```

R4:

```
!
interface FastEthernet0/0
 ip address 192.168.1.2 255.255.255.0
 duplex half
!
interface FastEthernet1/0
 ip address 100.2.0.1 255.255.255.0
 duplex half
```

```
!
router ospf 1
 log-adjacency-changes
 network 100.2.0.0 0.0.0.255 area 0
 network 192.168.1.0 0.0.0.255 area 0
!
```

R5:

```
interface Loopback0
 ip address 10.10.0.5 255.255.255.255
!
interface Tunnel20
 ip unnumbered Loopback0
 tunnel destination 10.10.0.1
 tunnel mode mpls traffic-eng
 tunnel mpls traffic-eng autoroute announce
 tunnel mpls traffic-eng priority 7 7
 tunnel mpls traffic-eng bandwidth 100
 tunnel mpls traffic-eng path-option 1 explicit name LP2
 no routing dynamic
!
interface FastEthernet0/0
 ip address 192.168.2.2 255.255.255.0
 duplex half
!
interface FastEthernet1/0
 ip address 100.0.5.2 255.255.255.0
 duplex half
 mpls ip
!
```

```
interface Serial6/1
 ip address 100.0.6.2 255.255.255.0
 mpls traffic-eng tunnels
 mpls ip
 serial restart-delay 0
 ip rsvp bandwidth 100
```

```
router ospf 1
 mpls traffic-eng router-id Loopback0
 mpls traffic-eng area 0
 log-adjacency-changes
 network 10.10.0.5 0.0.0.0 area 0
 network 100.0.5.0 0.0.0.255 area 0
 network 100.0.6.0 0.0.0.255 area 0
 network 192.168.2.0 0.0.0.255 area 0
```

R6:

```
interface Loopback0
 ip address 10.10.0.6 255.255.255.255
!
interface FastEthernet0/0
 ip address 100.0.4.2 255.255.255.0
 duplex half
 mpls traffic-eng tunnels
 mpls ip
 ip rsvp bandwidth 100
```

```
interface Serial6/1
 ip address 100.0.6.1 255.255.255.0
 mpls traffic-eng tunnels
 mpls ip
 serial restart-delay 0
 ip rsvp bandwidth 100
```

```
router ospf 1
 mpls traffic-eng router-id Loopback0
 mpls traffic-eng area 0
 log-adjacency-changes
 network 10.10.0.6 0.0.0.0 area 0
 network 100.0.4.0 0.0.0.255 area 0
 network 100.0.6.0 0.0.0.255 area 0
```

T1:

```
interface FastEthernet0/0
 ip address 192.168.1.1 255.255.255.0
 duplex half
!
ip forward-protocol nd
ip route 0.0.0.0 0.0.0.0 192.168.1.2
no ip http server
no ip http secure-server
```

T2:

```
interface FastEthernet0/0
 ip address 192.168.2.1 255.255.255.0
 duplex half
!
ip forward-protocol nd
ip route 0.0.0.0 0.0.0.0 192.168.2.2
no ip http server
no ip http secure-server
```

3. Comentaris

Només m'han sorgit dos problemes durant la resolució de la pràctica, aquests són:

-Mentre creava la topologia no em deixava enllaçar dos routers, degut a que no havia configurat correctament els slots. Per resoldre-ho vaig utilitzar un dels enllaços que hi ha a l'apartat 5.

-L'altre problema va ser que em vaig oblidar d'anunciar per ospf les adreces loopback dels routers i això feia que no funciones correctament la xarxa MPLS.

4. Resultats

Traceroute de T1 a T2:

```
T1#traceroute 192.168.2.1

Type escape sequence to abort.
Tracing the route to 192.168.2.1

  1 192.168.1.2 44 msec 12 msec 20 msec
  2 100.2.0.2 52 msec 16 msec 20 msec
  3 100.0.1.2 [MPLS: Label 25 Exp 0] 84 msec 76 msec 60 msec
  4 100.0.4.2 [MPLS: Label 26 Exp 0] 72 msec 48 msec 112 msec
  5 100.0.6.2 84 msec 68 msec 80 msec
  6 192.168.2.1 108 msec 96 msec 96 msec
```

Traceroute de T2 a T1:

```
T2#traceroute 192.168.1.1

Type escape sequence to abort.
Tracing the route to 192.168.1.1

  1 192.168.2.2 36 msec 20 msec 20 msec
  2 100.0.5.1 [MPLS: Label 21 Exp 0] 76 msec 60 msec 60 msec
  3 100.0.2.1 [MPLS: Label 21 Exp 0] 72 msec 68 msec 64 msec
  4 100.2.0.1 68 msec 76 msec 72 msec
  5 192.168.1.1 84 msec 80 msec 92 msec
```

TUNNEL 1 (configurat a R1):

```
R1#show mpls traffic-eng tunnels brief
Signalling Summary:
    LSP Tunnels Process:            running
    Passive LSP Listener:           running
    RSVP Process:                   running
    Forwarding:                     enabled
    Periodic reoptimization:        every 3600 seconds, next in 3491 seconds
    Periodic FRR Promotion:         Not Running
    Periodic auto-bw collection:    every 300 seconds, next in 191 seconds
TUNNEL NAME                     DESTINATION      UP IF     DOWN IF   STATE/PROT
R1_t10                          10.10.0.5        -         unknown   up/down
```

TUNNEL 2 (configurat a R5)

```
R5#show mpls traffic-eng tunnels brief
Signalling Summary:
    LSP Tunnels Process:            running
    Passive LSP Listener:           running
    RSVP Process:                   running
    Forwarding:                     enabled
    Periodic reoptimization:        every 3600 seconds, next in 3573 seconds
    Periodic FRR Promotion:         Not Running
    Periodic auto-bw collection:    every 300 seconds, next in 273 seconds
TUNNEL NAME                     DESTINATION      UP IF     DOWN IF   STATE/PROT
R5_t20                          10.10.0.1        -         unknown   up/down
```

:

5. Referències

https://www.youtube.com/watch?v=q2hDqGUvQhI (video introductori per a crear xarxes amb GNS3)

https://www.youtube.com/watch?v=ZAK_qPLIc_w (dubtes al saber configurar MPLS)

https://www.gns3.com/community/featured/gns3-server-2-0-0rc4-ubridge-is-(búsqueda per a solucionar un error causat per una mala configuració dels slots)