Memòria Treball de Laboratori XC2

Tardor 2020-2021

Laboratori 6 – BGPv4 Manipulació dels atributs amb comunitats

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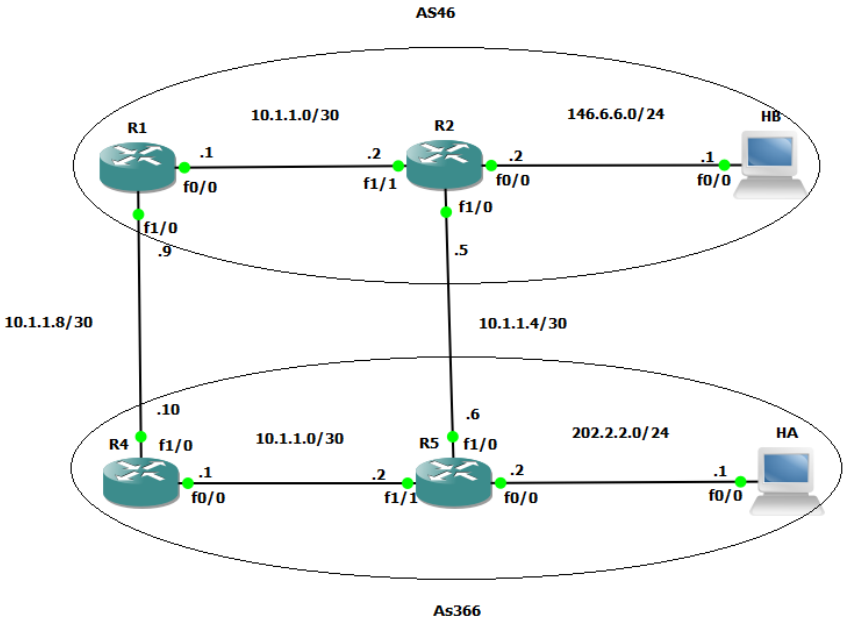
1. Esquema de la xarxa desenvolupada



2. Relació de les línies de programació

R5	R4
interface Loopback0 ip address 10.0.112.2 255.255.255.252 **interface FastEthernet0/0** ip address 202.2.2.2 255.255.255.0 **interface FastEthernet1/0** ip address 10.1.1.6 255.255.255.252 **interface FastEthernet1/1** ip address 10.1.1.2 255.255.255.252 **router ospf 1** passive-interface FastEthernet0/0 passive-interface FastEthernet1/0 network 10.0.112.0 0.0.0.3 area 0 network 10.1.1.0 0.0.0.3 area 0 network 10.1.1.4 0.0.0.3 area 0 network 202.2.2.0 0.0.0.255 area 0 **router bgp 366** bgp log-neighbor-changes network 202.2.2.0 neighbor 10.0.112.1 remote-as 366 neighbor 10.0.112.1 update-source Loopback0 neighbor 10.1.1.5 remote-as 46 neighbor 10.1.1.5 send-community neighbor 10.1.1.5 route-map Peer-R5-2 in neighbor 10.1.1.5 route-map Peer-R5-1 out **ip community-list 2** permit 3015156 **access-list 1** permit 202.2.2.0 0.0.0.255 route-map **Peer-R5-1** permit 10 match ip address 1 set community 23986676 route-map **Peer-R5-2** permit 20 match community 2 set metric 50	**interface Loopback0** ip address 10.0.112.1 255.255.255.252 **interface FastEthernet0/0** ip address 10.1.1.1 255.255.255.252 **interface FastEthernet1/0** ip address 10.1.1.10 255.255.255.252 **router ospf 2** passive-interface FastEthernet1/0 network 10.0.112.0 0.0.0.3 area 0 network 10.1.1.0 0.0.0.3 area 0 network 10.1.1.8 0.0.0.3 area 0 **router bgp 366** bgp log-neighbor-changes neighbor 10.0.112.2 remote-as 366 neighbor 10.0.112.2 update-source Loopback0 neighbor 10.1.1.9 remote-as 46

R2	R1
interface Loopback0 ip address 10.0.111.2 255.255.255.252 **interface FastEthernet0/0** ip address 146.6.6.2 255.255.255.0 **interface FastEthernet1/0** ip address 10.1.1.5 255.255.255.252 **interface FastEthernet1/1** ip address 10.1.1.2 255.255.255.252 **router ospf 1** passive-interface FastEthernet0/0 passive-interface FastEthernet1/0 network 10.0.111.0 0.0.0.3 area 0 network 10.1.1.0 0.0.0.3 area 0 network 10.1.1.4 0.0.0.3 area 0 network 146.6.6.0 0.0.0.255 area 0 **router bgp 46** bgp log-neighbor-changes network 146.6.6.0 mask 255.255.255.0 neighbor 10.0.111.1 remote-as 46 neighbor 10.0.111.1 update-source Loopback0 neighbor 10.1.1.6 remote-as 366 neighbor 10.1.1.6 send-community neighbor 10.1.1.6 route-map Peer-R2-1 in neighbor 10.1.1.6 route-map Peer-R2-2 out **ip community-list 2** permit 23986676 **access-list 1** permit 146.6.6.0 0.0.0.255 route-map **Peer-R2-2** permit 20 match ip address 1 set community 3015156 route-map **Peer-R2-1** permit 10 match community 2 set local-preference 50	**interface Loopback0** ip address 10.0.111.1 255.255.255.252 **interface FastEthernet0/0** ip address 10.1.1.1 255.255.255.252 **interface FastEthernet1/0** ip address 10.1.1.9 255.255.255.252 **router ospf 2** passive-interface FastEthernet1/0 network 10.0.111.0 0.0.0.3 area 0 network 10.1.1.0 0.0.0.3 area 0 network 10.1.1.8 0.0.0.3 area 0 **router bgp 46** bgp log-neighbor-changes neighbor 10.0.111.2 remote-as 46 neighbor 10.0.111.2 update-source Loopback0 neighbor 10.1.1.10 remote-as 366

HA	HB
interface FastEthernet0/0 ip address 202.2.2.1 255.255.255.0 ip route 0.0.0.0 0.0.0.0 202.2.2.2	**interface FastEthernet0/0** ip address 146.6.6.1 255.255.255.0 ip route 0.0.0.0 0.0.0.0 146.6.6.2

3. Comentaris

Per la pregunta 6, no hauria que tocar res en el AS46 al canviar el prefix de la xarxa 202.2.2.0/24 a 147.7.7.0/24. El canvi haurà de produir-se en el AS366, l'acces-list hauria de ser **access-list 1 permit 147.7.7.00.0.0.255** . A més, dels canvis en la IP, OSPF y BGP per a que el sistema segueixi funcionant correctament.

4. Resultats

4.1 Abans del canvi d'atributs

4.1.1 Taules d'enruntament (show ip bgp / show ip route)

R2

show ip bgp

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 146.6.6.0/24	0.0.0.0	0		32768	i
* i 202.2.2.0	10.1.1.10	0	100	0	366 i
*>	10.1.1.6	0		0	366 i

show ip route

```
     10.0.0.0/8 is variably subnetted, 8 subnets, 2 masks
C       10.0.111.0/30 is directly connected, Loopback0
O       10.0.111.1/32 [110/2] via 10.1.1.1, 00:05:41, FastEthernet1/1
L       10.0.111.2/32 is directly connected, Loopback0
C       10.1.1.0/30 is directly connected, FastEthernet1/1
L       10.1.1.2/32 is directly connected, FastEthernet1/1
C       10.1.1.4/30 is directly connected, FastEthernet1/0
L       10.1.1.5/32 is directly connected, FastEthernet1/0
O       10.1.1.8/30 [110/2] via 10.1.1.1, 00:05:51, FastEthernet1/1
     146.6.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       146.6.6.0/24 is directly connected, FastEthernet0/0
L       146.6.6.2/32 is directly connected, FastEthernet0/0
B    202.2.2.0/24 [20/0] via 10.1.1.6, 00:05:20
```

R1

show ip bgp

Network	Next Hop	Metric	LocPrf	Weight	Path
r>i 146.6.6.0/24	10.0.111.2	0	100	0	i
* i 202.2.2.0	10.1.1.6	0	100	0	366 i
*>	10.1.1.10			0	366 i

show ip route

```
     10.0.0.0/8 is variably subnetted, 8 subnets, 2 masks
C       10.0.111.0/30 is directly connected, Loopback0
L       10.0.111.1/32 is directly connected, Loopback0
O       10.0.111.2/32 [110/2] via 10.1.1.2, 00:07:36, FastEthernet0/0
C       10.1.1.0/30 is directly connected, FastEthernet0/0
L       10.1.1.1/32 is directly connected, FastEthernet0/0
O       10.1.1.4/30 [110/2] via 10.1.1.2, 00:07:36, FastEthernet0/0
C       10.1.1.8/30 is directly connected, FastEthernet1/0
L       10.1.1.9/32 is directly connected, FastEthernet1/0
     146.6.0.0/24 is subnetted, 1 subnets
O       146.6.6.0 [110/2] via 10.1.1.2, 00:07:36, FastEthernet0/0
B    202.2.2.0/24 [20/0] via 10.1.1.10, 00:07:10
```

R5

show ip bgp

Network	Next Hop	Metric	LocPrf	Weight	Path
* i 146.6.6.0/24	10.1.1.9	0	100	0	46 i
*>	10.1.1.5	0		0	46 i
*> 202.2.2.0	0.0.0.0	0		32768	i

show ip route

```
     10.0.0.0/8 is variably subnetted, 8 subnets, 2 masks
C       10.0.112.0/30 is directly connected, Loopback0
O       10.0.112.1/32 [110/2] via 10.1.1.1, 00:13:44, FastEthernet1/1
L       10.0.112.2/32 is directly connected, Loopback0
C       10.1.1.0/30 is directly connected, FastEthernet1/1
L       10.1.1.2/32 is directly connected, FastEthernet1/1
C       10.1.1.4/30 is directly connected, FastEthernet1/0
L       10.1.1.6/32 is directly connected, FastEthernet1/0
O       10.1.1.8/30 [110/2] via 10.1.1.1, 00:13:54, FastEthernet1/1
     146.6.0.0/24 is subnetted, 1 subnets
B       146.6.6.0 [20/0] via 10.1.1.5, 00:10:26
     202.2.2.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.2.2.0/24 is directly connected, FastEthernet0/0
L       202.2.2.2/32 is directly connected, FastEthernet0/0
```

R4

show ip bgp

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 146.6.6.0/24	10.1.1.9	0			46 i
* i	10.1.1.5	0	100	0	46 i
r>i 202.2.2.0	10.0.112.2	0	100	0	i

show ip route

```
     10.0.0.0/8 is variably subnetted, 8 subnets, 2 masks
C       10.0.112.0/30 is directly connected, Loopback0
L       10.0.112.1/32 is directly connected, Loopback0
O       10.0.112.2/32 [110/2] via 10.1.1.2, 00:13:21, FastEthernet0/0
C       10.1.1.0/30 is directly connected, FastEthernet0/0
L       10.1.1.1/32 is directly connected, FastEthernet0/0
O       10.1.1.4/30 [110/2] via 10.1.1.2, 00:13:21, FastEthernet0/0
C       10.1.1.8/30 is directly connected, FastEthernet1/0
L       10.1.1.10/32 is directly connected, FastEthernet1/0
     146.6.0.0/24 is subnetted, 1 subnets
B       146.6.6.0 [20/0] via 10.1.1.9, 00:09:57
O    202.2.2.0/24 [110/2] via 10.1.1.2, 00:13:21, FastEthernet0/0
```

4.1.2 Traceroute de HB a HA

```
HB#traceroute 202.2.2.1

Type escape sequence to abort.

Tracing the route to 202.2.2.1

VRF info: (vrf in name/id, vrf out name/id)

  1 146.6.6.2 160 msec 72 msec 36 msec

  2 10.1.1.6 164 msec 140 msec 192 msec

  3 202.2.2.1 268 msec 268 msec 232 msec
```

4.2 Després del canvi d'atributs

4.2.1 Taules d'enruntament

R2

show ip bgp

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 146.6.6.0/24	0.0.0.0	0		32768	i
*>i 202.2.2.0	10.1.1.10	0	100	0	366 i
*	10.1.1.6	0	50	0	366 i

show ip route

```
C       10.0.111.0/30 is directly connected, Loopback0
O       10.0.111.1/32 [110/2] via 10.1.1.1, 00:02:47, FastEthernet1/1
L       10.0.111.2/32 is directly connected, Loopback0
C       10.1.1.0/30 is directly connected, FastEthernet1/1
L       10.1.1.2/32 is directly connected, FastEthernet1/1
C       10.1.1.4/30 is directly connected, FastEthernet1/0
L       10.1.1.5/32 is directly connected, FastEthernet1/0
O       10.1.1.8/30 [110/2] via 10.1.1.1, 00:02:47, FastEthernet1/1
    146.6.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       146.6.6.0/24 is directly connected, FastEthernet0/0
L       146.6.6.2/32 is directly connected, FastEthernet0/0
B    202.2.2.0/24 [200/0] via 10.1.1.10, 00:02:11
```

R1

show ip bgp

Network	Next Hop	Metric	LocPrf	Weight	Path
r>i 146.6.6.0/24	10.0.111.2	0	100	0	i
*> 202.2.2.0	10.1.1.10			0	366 i

show ip route

```
    10.0.0.0/8 is variably subnetted, 8 subnets, 2 masks
C       10.0.111.0/30 is directly connected, Loopback0
L       10.0.111.1/32 is directly connected, Loopback0
O       10.0.111.2/32 [110/2] via 10.1.1.2, 00:03:59, FastEthernet0/0
C       10.1.1.0/30 is directly connected, FastEthernet0/0
L       10.1.1.1/32 is directly connected, FastEthernet0/0
O       10.1.1.4/30 [110/2] via 10.1.1.2, 00:03:59, FastEthernet0/0
C       10.1.1.8/30 is directly connected, FastEthernet1/0
L       10.1.1.9/32 is directly connected, FastEthernet1/0
    146.6.0.0/24 is subnetted, 1 subnets
O       146.6.6.0 [110/2] via 10.1.1.2, 00:03:59, FastEthernet0/0
B    202.2.2.0/24 [20/0] via 10.1.1.10, 00:03:23
```

R5

show ip bgp

Network	Next Hop	Metric	LocPrf	Weight	Path
*>i 146.6.6.0/24	10.1.1.9	0	100	0	46 i
*	10.1.1.5	50		0	46 i
*> 202.2.2.0	0.0.0.0	0		32768	i

show ip route

```
    10.0.0.0/8 is variably subnetted, 8 subnets, 2 masks
C       10.0.112.0/30 is directly connected, Loopback0
O       10.0.112.1/32 [110/2] via 10.1.1.1, 00:04:39, FastEthernet1/1
L       10.0.112.2/32 is directly connected, Loopback0
C       10.1.1.0/30 is directly connected, FastEthernet1/1
L       10.1.1.2/32 is directly connected, FastEthernet1/1
C       10.1.1.4/30 is directly connected, FastEthernet1/0
L       10.1.1.6/32 is directly connected, FastEthernet1/0
O       10.1.1.8/30 [110/2] via 10.1.1.1, 00:04:39, FastEthernet1/1
    146.6.0.0/24 is subnetted, 1 subnets
B       146.6.6.0 [200/0] via 10.1.1.9, 00:04:07
    202.2.2.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.2.2.0/24 is directly connected, FastEthernet0/0
L       202.2.2.2/32 is directly connected, FastEthernet0/0
```

R4

show ip bgp

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 146.6.6.0/24	10.1.1.9			0	46 i
r>i 202.2.2.0	10.0.112.2	0	100	0	i

show ip route

```
    10.0.0.0/8 is variably subnetted, 8 subnets, 2 masks
C       10.0.112.0/30 is directly connected, Loopback0
L       10.0.112.1/32 is directly connected, Loopback0
O       10.0.112.2/32 [110/2] via 10.1.1.2, 00:05:18, FastEthernet0/0
C       10.1.1.0/30 is directly connected, FastEthernet0/0
L       10.1.1.1/32 is directly connected, FastEthernet0/0
O       10.1.1.4/30 [110/2] via 10.1.1.2, 00:05:18, FastEthernet0/0
C       10.1.1.8/30 is directly connected, FastEthernet1/0
L       10.1.1.10/32 is directly connected, FastEthernet1/0
    146.6.0.0/24 is subnetted, 1 subnets
B       146.6.6.0 [20/0] via 10.1.1.9, 00:04:46
O    202.2.2.0/24 [110/2] via 10.1.1.2, 00:05:18, FastEthernet0/0
```

4.2.2 Traceroute de HB a HA

```
HB#traceroute 202.2.2.1

Type escape sequence to abort.

Tracing the route to 202.2.2.1

VRF info: (vrf in name/id, vrf out name/id)

  1 146.6.6.2 96 msec 72 msec 152 msec

  2 10.1.1.1 128 msec 156 msec 124 msec

  3 10.1.1.10 236 msec 184 msec 236 msec

  4 10.1.1.2 236 msec 244 msec 280 msec

  5 202.2.2.1 240 msec 360 msec 292 msec
```