Advanced Routing

P5 – BGP

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Introduction

Border Gateway Protocol (BGP) is a routing protocol that is used to exchange network layer reachability information between autonomous systems (AS) because different administrative authorities control their respective domains. The current Internet is a network of interconnected autonomous systems, where BGP version 4 (BGP4) is the de facto routing protocol.

BGP's status as the protocol of choice for the Internet is due to its unique features that promote reliability, stability, scalability, and flexibility. It allows for policy-based routing, ensuring that administrators have full control over the routes advertised and received. This flexibility is crucial for managing complex, large-scale networks that may span multiple autonomous systems.

In this practice we simulate the connection between autonomous systems OSPF65000 and EIGRP65002 exemplifying OSPF65001 such as the Internet and making this connection from an AS to the Internet using BGP. Within the simulated Internet, a **route reflector** router is employed to reduce the complexity of network topologies by minimizing the number of direct BGP peerings. Instead of requiring all routers in the AS to peer with each other, the route reflector handles the distribution of routing information among routers. In this case, the route reflector relays information between ISP1, ISP2, ISP4, and ISP5, allowing them to share their knowledge of network routes to reach the end clients (C2, C3).

The networks transmitted in this setup include the routers' knowledge of how to reach various client systems and their neighbor relationships. Notably, the routers in OSPF65001 use the Loopback interface as the reference IP address for inter-router communications. This practice exemplifies how BGP facilitates routing across multiple AS systems, ensuring that networks can share routing information efficiently, even as the Internet grows in scale and complexity.

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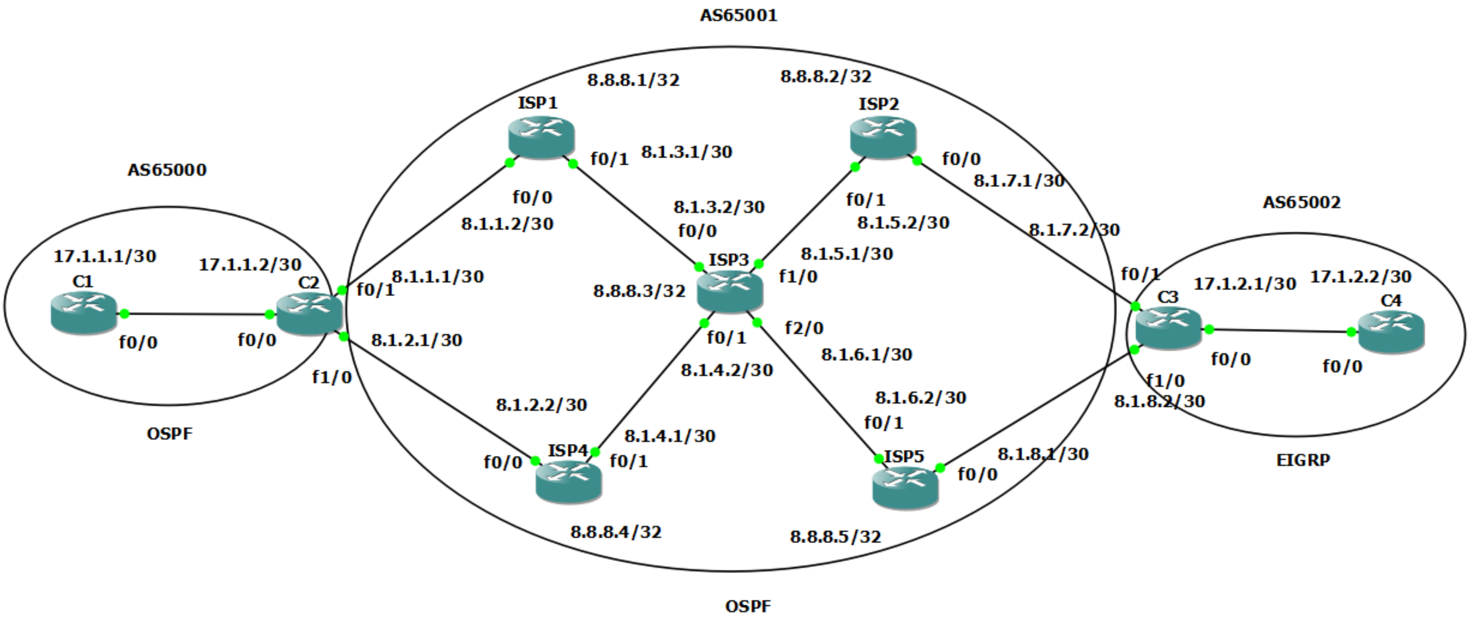

Development

We perform the configuration of the entire topology starting with placing the necessary slots on the routers to have enough connections, we configure the IPs to the ports and activate them. We test the connection with ping to see that everything is correct in point-to-point connections between one router and another.

C1 and C2:

For routing in C1 we configure OSPF – 65000, in which we only indicate the network 17.1.1.0 within area 0 (since there is only one).

In C2 **w**e configured OSPF the same way as in C1 and added a default route using the command “default-information originate” inside OSPF – 65000.

For BGP, we indicated the network it already knows from the area it belongs to (17.1.1.0) and declared its neighbors by configuring the IP address of the interface connected to C2: 8.1.1.2 with remote-as 65001 (ISP1) and 8.1.2.2 with remote-as 65001 (ISP4). To assign priority to the ISP, we gave it a higher weight over ISP4 with a weight of 200 towards ISP1 and a weight of 100 towards ISP4.

C3 and C4:

In both we use routing with EIGRP-65002.

In C3 we defined the route 17.1.2.1, and set a default route on the interface to C4 using the command "ip summary-address eigrp 65002 0.0.0.0 0.0.0.0", setting the default route on the interface instead of in EIGRP.

In BGP - 65002, we announced the network we know (17.1.2.0) and its neighbors, 8.1.7.1 towards remote-as 65001 (ISP2) and 8.1.8.1 towards remote-as 65001 (ISP5). We set the weight to decide the priority path of 200 in ISP5 over 100 in ISP2.

In C4 we only configured EIGRP with the network 17.1.2.0, and that's all.

ISP1:

We created a loopback interface with IP 8.8.8.1. We then set up OSPF with the networks we know (8.1.3.0 and 8.8.8.1) in area 0.

For BGP, we declare the networks we know (8.1.1.0, 8.1.3.0, and the loopback 8.8.8.1), and their neighbors; 8.1.1.1 to remote-as 65000 and to ISP3 using its Loopback (ID) to remote-as 65001. We configured it to receive updates from ISP3 Loopback 0.

ISP2:

We also created a loopback interface with IP 8.8.8.2 and configured OSPF with the networks we know (8.1.5.0 and 8.8.8.2) in area 0.

In BGP we did the same as ISP1 but declaring the networks 8.1.5.0, 8.1.7.0 and loopback 8.8.8.2, along with their neighbors, 8.1.7.2 towards remote-as 65002. We told it to take the default route with the "default-originate" command. Then, using loopback 8.8.8.3 from ISP3 to remote-as 65001, we told it to receive updates from ISP3's loopback 0.

ISP3:

We created a loopback interface with IP 8.8.8.3. We then set up OSPF with the networks we know, which are 8.1.3.0, 8.1.4.0, 8.1.5.0, 8.1.6.0, and 8.8.8.3 in area 0.

In BGP, we declare the networks we know by the command "redistribute connected" and their neighbors ISP1, ISP2, ISP4, and ISP5. We set them up with 65001 remote autonomous system and configure updates from the loopback for each neighbor.

We also added the "route-reflector-client" command for each neighbor indicating that it will receive route updates from those specific neighbors and that it will act as a route reflector.

ISP4:

We created a Loopback interface with IP 8.8.8.4. Then we configured OSPF with the networks we know, which are 8.1.4.0 and 8.8.8.4 in area 0.
In BGP, we declared the networks we know, which are 8.1.2.0, 8.1.4.0, and the Loopback 8.8.8.4, and its neighbors, 8.1.2.1 towards remote-as 65000. We told it

to take the default route with the “default-originate” command. Then, using Loopback 8.8.8.3 from ISP3 towards remote-as 65001, we told it to receive updates from Loopback 0 of ISP3.

ISP5:

We created a Loopback interface with IP 8.8.8.5. Then we configured OSPF with the networks we know, which are 8.1.6.0 and 8.8.8.5 in area 0. In BGP, we declared the networks we know, which are 8.1.6.0, 8.1.8.0, and the Loopback 8.8.8.5, and its neighbors, 8.1.8.2 towards remote-as 65002. We told it to take the default route with the “default-originate” command. Then, using Loopback 8.8.8.3 from ISP3 towards remote-as 65001, we told it to receive updates from Loopback 0 of ISP3.

Evidence

Ping from C1 to C4:

```
C1#ping 17.1.2.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 17.1.2.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 168/186/204 ms
C1#
```

Trace C1 to C4:

```
C1#trace 17.1.2.2

Type escape sequence to abort.
Tracing the route to 17.1.2.2

  1 17.1.1.2 20 msec 28 msec 32 msec
  2 8.1.1.2 48 msec 60 msec 60 msec
  3 8.1.3.2 108 msec 76 msec 104 msec
  4 8.1.5.2 96 msec 124 msec 120 msec
  5 8.1.7.2 168 msec 168 msec 140 msec
  6 17.1.2.2 200 msec 172 msec 196 msec
C1#
```

As we can see, it is going for ISP1 since we decided to put the greatest weight there, which is IP 8.1.1.2.

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Trace from C4 to C1:

```
C4#trace 17.1.1.1

Type escape sequence to abort.
Tracing the route to 17.1.1.1

  1 17.1.2.1 76 msec 72 msec 80 msec
  2 8.1.8.1 132 msec 128 msec 128 msec
  3 8.1.6.1 124 msec 160 msec 128 msec
  4 8.1.3.1 164 msec 172 msec 180 msec
  5 8.1.1.1 172 msec 208 msec 172 msec
  6 17.1.1.1 200 msec 228 msec 192 msec
C4#
```

As we can see, it goes for ISP5 since we put the weight on that router, which is IP 8.1.8.1.

C1 Routing Table:

```
C1#show ip route
Codes: C - connected, S - static, 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
       i - IS-IS, su - IS-IS summary, 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 17.1.1.2 to network 0.0.0.0

     17.0.0.0/30 is subnetted, 1 subnets
C       17.1.1.0 is directly connected, FastEthernet0/0
O*E2 0.0.0.0/0 [110/1] via 17.1.1.2, 00:05:51, FastEthernet0/0
```

C2 Routing Table:

```
C2#show ip route bgp
     17.0.0.0/30 is subnetted, 2 subnets
B       17.1.2.0 [20/0] via 8.1.1.2, 00:04:16
     8.0.0.0/8 is variably subnetted, 13 subnets, 2 masks
B       8.1.8.0/30 [20/0] via 8.1.1.2, 00:04:16
B       8.8.8.1/32 [20/0] via 8.1.1.2, 00:04:46
B       8.8.8.2/32 [20/0] via 8.1.1.2, 00:04:16
B       8.1.3.0/30 [20/0] via 8.1.1.2, 00:04:46
B       8.8.8.3/32 [20/0] via 8.1.1.2, 00:04:16
B       8.8.8.4/32 [20/0] via 8.1.1.2, 00:04:16
B       8.1.5.0/30 [20/0] via 8.1.1.2, 00:04:16
B       8.8.8.5/32 [20/0] via 8.1.1.2, 00:04:16
B       8.1.4.0/30 [20/0] via 8.1.1.2, 00:04:16
B       8.1.7.0/30 [20/0] via 8.1.1.2, 00:04:16
B       8.1.6.0/30 [20/0] via 8.1.1.2, 00:04:16
B*   0.0.0.0/0 [20/0] via 8.1.1.2, 00:04:46
```

Advanced Routing

BGP C2 Priority:

```
router bgp 65000
 no synchronization
 bgp log-neighbor-changes
 network 17.1.1.0 mask 255.255.255.252
 neighbor 8.1.1.2 remote-as 65001
 neighbor 8.1.1.2 weight 200
 neighbor 8.1.2.2 remote-as 65001
 neighbor 8.1.2.2 weight 100
 no auto-summary
```

C3 Routing Table:

```
C3#show ip route
Codes: C - connected, S - static, 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
       i - IS-IS, su - IS-IS summary, 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 0.0.0.0 to network 0.0.0.0

     17.0.0.0/30 is subnetted, 2 subnets
B       17.1.1.0 [20/0] via 8.1.8.1, 00:06:44
C       17.1.2.0 is directly connected, FastEthernet0/0
     8.0.0.0/8 is variably subnetted, 13 subnets, 2 masks
C       8.1.8.0/30 is directly connected, FastEthernet1/0
B       8.1.1.0/30 [20/0] via 8.1.8.1, 00:07:15
B       8.8.8.1/32 [20/0] via 8.1.8.1, 00:07:15
B       8.8.8.2/32 [20/0] via 8.1.8.1, 00:07:15
B       8.1.3.0/30 [20/0] via 8.1.8.1, 00:07:15
B       8.8.8.3/32 [20/0] via 8.1.8.1, 00:07:17
B       8.1.2.0/30 [20/0] via 8.1.8.1, 00:07:17
B       8.8.8.4/32 [20/0] via 8.1.8.1, 00:07:17
B       8.1.5.0/30 [20/0] via 8.1.8.1, 00:07:17
B       8.8.8.5/32 [20/0] via 8.1.8.1, 00:07:18
B       8.1.4.0/30 [20/0] via 8.1.8.1, 00:07:18
C       8.1.7.0/30 is directly connected, FastEthernet0/1
B       8.1.6.0/30 [20/0] via 8.1.8.1, 00:07:18
D*   0.0.0.0/0 is a summary, 00:08:37, Null0
```

BGP C3 Priority:

```
router bgp 65002
 no synchronization
 bgp log-neighbor-changes
 network 17.1.2.0 mask 255.255.255.252
 neighbor 8.1.7.1 remote-as 65001
 neighbor 8.1.7.1 weight 100
 neighbor 8.1.8.1 remote-as 65001
 neighbor 8.1.8.1 weight 200
 no auto-summary
!
```

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C4 Routing Table:

```
C4#show ip route
Codes: C - connected, S - static, 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
       i - IS-IS, su - IS-IS summary, 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 17.1.2.1 to network 0.0.0.0

     17.0.0.0/30 is subnetted, 1 subnets
C       17.1.2.0 is directly connected, FastEthernet0/0
D*   0.0.0.0/0 [90/307200] via 17.1.2.1, 00:04:04, FastEthernet0/0
```

ISP1 Routing Table:

```
ISP1#show ip route
Codes: C - connected, S - static, 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
       i - IS-IS, su - IS-IS summary, 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

     17.0.0.0/30 is subnetted, 2 subnets
B       17.1.1.0 [20/0] via 8.1.1.1, 00:08:35
B       17.1.2.0 [200/0] via 8.1.7.2, 00:08:30
     8.0.0.0/8 is variably subnetted, 13 subnets, 2 masks
B       8.1.8.0/30 [200/0] via 8.8.8.5, 00:08:35
C       8.1.1.0/30 is directly connected, FastEthernet0/0
C       8.8.8.1/32 is directly connected, Loopback0
O       8.8.8.2/32 [110/12] via 8.1.3.2, 00:09:06, FastEthernet0/1
C       8.1.3.0/30 is directly connected, FastEthernet0/1
O       8.8.8.3/32 [110/11] via 8.1.3.2, 00:09:08, FastEthernet0/1
B       8.1.2.0/30 [200/0] via 8.8.8.4, 00:08:37
O       8.8.8.4/32 [110/21] via 8.1.3.2, 00:09:08, FastEthernet0/1
O       8.1.5.0/30 [110/11] via 8.1.3.2, 00:09:08, FastEthernet0/1
O       8.8.8.5/32 [110/12] via 8.1.3.2, 00:09:09, FastEthernet0/1
O       8.1.4.0/30 [110/20] via 8.1.3.2, 00:09:09, FastEthernet0/1
B       8.1.7.0/30 [200/0] via 8.8.8.2, 00:08:38
O       8.1.6.0/30 [110/11] via 8.1.3.2, 00:09:09, FastEthernet0/1
```

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ISP2 routing table:

```
ISP2#show ip route
Codes: C - connected, S - static, 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
       i - IS-IS, su - IS-IS summary, 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

     17.0.0.0/30 is subnetted, 2 subnets
B       17.1.1.0 [200/0] via 8.1.1.1, 00:08:52
B       17.1.2.0 [20/0] via 8.1.7.2, 00:09:18
     8.0.0.0/8 is variably subnetted, 13 subnets, 2 masks
B       8.1.8.0/30 [200/0] via 8.8.8.5, 00:08:57
B       8.1.1.0/30 [200/0] via 8.8.8.1, 00:08:57
O       8.8.8.1/32 [110/21] via 8.1.5.1, 00:09:28, FastEthernet0/1
C       8.8.8.2/32 is directly connected, Loopback0
O       8.1.3.0/30 [110/20] via 8.1.5.1, 00:09:28, FastEthernet0/1
O       8.8.8.3/32 [110/11] via 8.1.5.1, 00:09:30, FastEthernet0/1
B       8.1.2.0/30 [200/0] via 8.8.8.4, 00:08:59
O       8.8.8.4/32 [110/21] via 8.1.5.1, 00:09:30, FastEthernet0/1
C       8.1.5.0/30 is directly connected, FastEthernet0/1
O       8.8.8.5/32 [110/12] via 8.1.5.1, 00:09:31, FastEthernet0/1
O       8.1.4.0/30 [110/20] via 8.1.5.1, 00:09:31, FastEthernet0/1
C       8.1.7.0/30 is directly connected, FastEthernet0/0
O       8.1.6.0/30 [110/11] via 8.1.5.1, 00:09:31, FastEthernet0/1
ISP2#
```

ISP3 routing table:

```
ISP3#sho ip route
Codes: C - connected, S - static, 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
       i - IS-IS, su - IS-IS summary, 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

     17.0.0.0/30 is subnetted, 2 subnets
B       17.1.1.0 [200/0] via 8.1.1.1, 00:09:13
B       17.1.2.0 [200/0] via 8.1.7.2, 00:09:13
     8.0.0.0/8 is variably subnetted, 13 subnets, 2 masks
B       8.1.8.0/30 [200/0] via 8.8.8.5, 00:09:19
B       8.1.1.0/30 [200/0] via 8.8.8.1, 00:09:19
O       8.8.8.1/32 [110/11] via 8.1.3.1, 00:10:00, FastEthernet0/0
O       8.8.8.2/32 [110/2] via 8.1.5.2, 00:10:00, FastEthernet1/0
C       8.1.3.0/30 is directly connected, FastEthernet0/0
C       8.8.8.3/32 is directly connected, Loopback0
B       8.1.2.0/30 [200/0] via 8.8.8.4, 00:09:20
O       8.8.8.4/32 [110/11] via 8.1.4.1, 00:10:02, FastEthernet0/1
C       8.1.5.0/30 is directly connected, FastEthernet1/0
O       8.8.8.5/32 [110/2] via 8.1.6.2, 00:10:03, FastEthernet2/0
C       8.1.4.0/30 is directly connected, FastEthernet0/1
B       8.1.7.0/30 [200/0] via 8.8.8.2, 00:09:21
C       8.1.6.0/30 is directly connected, FastEthernet2/0
ISP3#
```

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ROUTE-REFLECTOR ISP3:

```
router bgp 65001
 no synchronization
 bgp log-neighbor-changes
 redistribute connected
 neighbor 8.8.8.1 remote-as 65001
 neighbor 8.8.8.1 update-source Loopback0
 neighbor 8.8.8.1 route-reflector-client
 neighbor 8.8.8.2 remote-as 65001
 neighbor 8.8.8.2 update-source Loopback0
 neighbor 8.8.8.2 route-reflector-client
 neighbor 8.8.8.4 remote-as 65001
 neighbor 8.8.8.4 update-source Loopback0
 neighbor 8.8.8.4 route-reflector-client
 neighbor 8.8.8.5 remote-as 65001
 neighbor 8.8.8.5 update-source Loopback0
 neighbor 8.8.8.5 route-reflector-client
 no auto-summary
```

ISP4 routing table:

```
ISP4#show ip route
Codes: C - connected, S - static, 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
       i - IS-IS, su - IS-IS summary, 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

     17.0.0.0/30 is subnetted, 2 subnets
B       17.1.1.0 [20/0] via 8.1.2.1, 00:09:42
B       17.1.2.0 [200/0] via 8.1.7.2, 00:09:37
     8.0.0.0/8 is variably subnetted, 13 subnets, 2 masks
B       8.1.8.0/30 [200/0] via 8.8.8.5, 00:09:42
B       8.1.1.0/30 [200/0] via 8.8.8.1, 00:09:42
O       8.8.8.1/32 [110/21] via 8.1.4.2, 00:10:23, FastEthernet0/1
O       8.8.8.2/32 [110/12] via 8.1.4.2, 00:10:23, FastEthernet0/1
O       8.1.3.0/30 [110/20] via 8.1.4.2, 00:10:23, FastEthernet0/1
O       8.8.8.3/32 [110/11] via 8.1.4.2, 00:10:25, FastEthernet0/1
C       8.1.2.0/30 is directly connected, FastEthernet0/0
C       8.8.8.4/32 is directly connected, Loopback0
O       8.1.5.0/30 [110/11] via 8.1.4.2, 00:10:25, FastEthernet0/1
O       8.8.8.5/32 [110/12] via 8.1.4.2, 00:10:27, FastEthernet0/1
C       8.1.4.0/30 is directly connected, FastEthernet0/1
B       8.1.7.0/30 [200/0] via 8.8.8.2, 00:09:46
O       8.1.6.0/30 [110/11] via 8.1.4.2, 00:10:27, FastEthernet0/1
ISP4#
```

ISP5 routing table:

```
ISP5#show ip route
Codes: C - connected, S - static, 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
       i - IS-IS, su - IS-IS summary, 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

     17.0.0.0/30 is subnetted, 2 subnets
B       17.1.1.0 [200/0] via 8.1.1.1, 00:09:55
B       17.1.2.0 [20/0] via 8.1.8.2, 00:10:00
     8.0.0.0/8 is variably subnetted, 13 subnets, 2 masks
C       8.1.8.0/30 is directly connected, FastEthernet0/0
B       8.1.1.0/30 [200/0] via 8.8.8.1, 00:10:00
O       8.8.8.1/32 [110/21] via 8.1.6.1, 00:10:31, FastEthernet0/1
O       8.8.8.2/32 [110/12] via 8.1.6.1, 00:10:31, FastEthernet0/1
O       8.1.3.0/30 [110/20] via 8.1.6.1, 00:10:31, FastEthernet0/1
O       8.8.8.3/32 [110/11] via 8.1.6.1, 00:10:33, FastEthernet0/1
B       8.1.2.0/30 [200/0] via 8.8.8.4, 00:10:02
O       8.8.8.4/32 [110/21] via 8.1.6.1, 00:10:33, FastEthernet0/1
O       8.1.5.0/30 [110/11] via 8.1.6.1, 00:10:33, FastEthernet0/1
C       8.8.8.5/32 is directly connected, Loopback0
O       8.1.4.0/30 [110/20] via 8.1.6.1, 00:10:34, FastEthernet0/1
B       8.1.7.0/30 [200/0] via 8.8.8.2, 00:10:03
C       8.1.6.0/30 is directly connected, FastEthernet0/1
ISP5#
```

Conclusions

Luis Carlos:

Throughout this practice, I have gained a deeper understanding of BGP (Border Gateway Protocol) and how the internet actually works on a global level. It was only when configuring it that I realized why BGP is suitable for managing routing between external networks. Although the protocol may seem slow compared to other methods we are used to, this slowness is precisely what makes it ideal for maintaining internet stability. BGP performs updates gradually, which helps prevent immediate network disruptions and ensures that the internet functions in a stable and reliable manner without sudden outages.

Additionally, during the configuration process, I also learned about the importance of *route reflectors*, which simplify the topology of a BGP network. Instead of requiring a full mesh of connections between all routers, *route reflectors* reduce complexity by reflecting routes between clients, decreasing the number of necessary connections. This mechanism not only optimizes network performance but also makes route management more efficient in large networks.

Another aspect is that BGP is essential in networks with multi-homing, where multiple connections to different internet providers ensure redundancy and resilience in the face of failures. This not only improves service availability but also allows for the implementation of more detailed routing policies, which is key to managing traffic based on priorities or peering agreements between networks.

Diego Gutiérrez:

We are integrating more and more topics as part of the same practice, in this case we integrate the routing protocols (EIGRP and OSPF) without using the "redistribution" of protocols as we did in the past practice, but this time we use an edge protocol (BGP).

I understand that BGP is functional in very large network architectures and the communication of networks and neighbors is relevant to the exits or edges of a company/client to the internet. But as mentioned in class, and we were able to corroborate it in practice, updates are slow, so it is not advisable to use it internally in a company, since if you need speed in redundancy you will have problems due to this slowness in updates.

Another important issue that we used in BGP in the ISP3 configuration was the reflector router. It is an efficient tool that avoids having routers connected directly creating mayas and obviously spending on infrastructure so that everyone is connected by cable. I think that reflection helps with the physical infrastructure part, and even with the configurations in the routers, since it allows the sharing of information between the routers connected to those that are reflector routers.

Sources

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