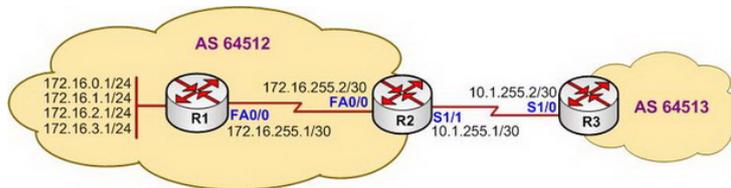# BGP Lab3 - Configuring BGP Summarization

?Lab Objectives?

1. To master the summary configuration methods which points to the static routing of interface NULL0.

2. To master the summary configuration methods by using aggregation-property route.

?Lab Topology?

?Lab Steps?

1. Configure the router's IP address, and use the command Ping to confirm the connect's interoperability of each router.

2. To configure the BGP protocol of each router and correctly declare the corresponding network:

3. Check the routing table of router R3:

R3#show ip route

Gateway of last resort   is not set

 172.16.0.0/16 is variably subnetted, 5   subnets, 2 masks
B 172.16.255.0/30 [20/0] via 10.1.255.1, 00:03:15
B 172.16.0.0/24 [20/0] via 10.1.255.1, 00:02:45
B 172.16.1.0/24 [20/0] via 10.1.255.1, 00:02:45
B 172.16.2.0/24 [20/0] via 10.1.255.1, 00:02:45
B 172.16.3.0/24 [20/0] via 10.1.255.1, 00:02:45
 10.0.0.0/30 is subnetted, 1 subnets
C 10.1.255.0 is directly connected,   Serial1/0

4. By route summary configuration, to reduce effectively the size of the routing table, and improve the efficiency of the route, so to configure the router R1 as the below:

R1(config)#ip route 172.16.0.0 255.255.252.0 null 0
R1(config)#
R1(config)#**router bgp 64512**
R1(config-router)#network 172.16.0.0 mask 255.255.252.0
R1(config-router)#**exit**

5. Check the routing table of R3:

R3#**show ip route**

Gateway of last resort   is not set

 172.16.0.0/16 is variably subnetted, 6   subnets, 3 masks
B 172.16.255.0/30 [20/0] via 10.1.255.1,   00:07:18
B 172.16.0.0/24 [20/0] via 10.1.255.1,   00:06:48
B 172.16.0.0/22 [20/0] via 10.1.255.1,   00:00:01
B 172.16.1.0/24 [20/0] via 10.1.255.1,   00:06:48
B 172.16.2.0/24 [20/0] via 10.1.255.1,   00:06:48
B 172.16.3.0/24 [20/0] via 10.1.255.1,   00:06:48
 10.0.0.0/30 is subnetted, 1 subnets
C 10.1.255.0 is directly connected,   Serial1/0

6. Network command of BGP is different from OSPF or other IGP in: when BGP detected there is a local command network, it will first check the local routing table to make sure if this route exists, if exists, then notified this route to the peer, otherwise to ignore this network command.
7. In addition, it needs to note that while R3 learned the summary route of /22 subnet, but the other / 24 specific network route is also shown the routing table at the same time, so need to make the following configuration on R1:

R1(config)#**router bgp 64512**
R1(config-router)#no network 172.16.0.0 mask   255.255.255.0
R1(config-router)#**no network 172.16.1.0 mask 255.255.255.0**
R1(config-router)#**no network 172.16.2.0 mask 255.255.255.0**
R1(config-router)#**no network 172.16.3.0 mask 255.255.255.0**
R1(config-router)#exit
R1(config)#

8. Check the routing table of R3:

R3#**show ip route**
Gateway of last resort   is not set
 172.16.0.0/16 is variably subnetted, 2   subnets, 2 masks
B 172.16.255.0/30 [20/0] via 10.1.255.1,   00:23:36
B   172.16.0.0/22 [20/0] via   10.1.255.1, 00:16:20
 10.0.0.0/30 is subnetted, 1 subnets
C 10.1.255.0 is directly connected,   Serial1/0

9. To test the validity of summary route:

R3#**ping 172.16.1.1**
Type escape sequence   to abort.
Sending 5, 100-byte   ICMP Echos to 172.16.1.1, timeout is 2 seconds:
!!!!!
Success rate is 100   percent (5/5), round-trip min/avg/max = 144/184/216 ms

10. Although it is very easy that to configure BGP's summary by the router pointing to interface NULL 0, and is easy to understand, but it is not conducive to clear the troubleshooting, because the other BGP's routers can not be informed where to carry out the summary, so suggest to configure summary by using aggregation of BGP.
11. To clear out the declaration of the static route pointed to interface NULL 0 on both R1 and BGP. At the same time, to make network re-declaration of the four loopbacks' subnets on R1.
12. To carry out the aggregation configuration on router R1:

R1(config)#**router bgp 64512**
R1(config-router)#aggregate-address 172.16.0.0 255.255.252.0 summary-only
R1(config-router)#

13. Check the routing table of R3:

R3#**show ip route**
Gateway of last resort   is not set

```
 172.16.0.0/16 is variably subnetted, 2   subnets, 2 masks
B 172.16.255.0/30 [20/0] via 10.1.255.1,   00:18:08
B 172.16.0.0/22 [20/0] via 10.1.255.1,   00:02:00
 10.0.0.0/30 is subnetted, 1 subnets
C 10.1.255.0 is directly connected,   Serial1/0
```

14. Check the attributes of the summary route:

R3#**show ip bgp 172.16.0.0**
BGP routing table   entry for 172.16.0.0/22, version 32
Paths: (1 available,   best #1, table Default-IP-Routing-Table)
 Not advertised to any peer
 64512, (aggregated by 64512   172.16.0.1)
 10.1.255.1 from 10.1.255.1 (172.16.255.1)
 Origin IGP, localpref 100, valid,   external, atomic-aggregate, best

15. To test the effectiveness of the summary route:

R3#**ping 172.16.0.1**
Type escape sequence   to abort.
Sending 5, 100-byte   ICMP Echos to 172.16.0.1, timeout is 2 seconds:
!!!!!
Success rate is 100   percent (5/5), round-trip min/avg/max = 68/128/168 ms

16. Lab completed.
Hope to helpful for you!