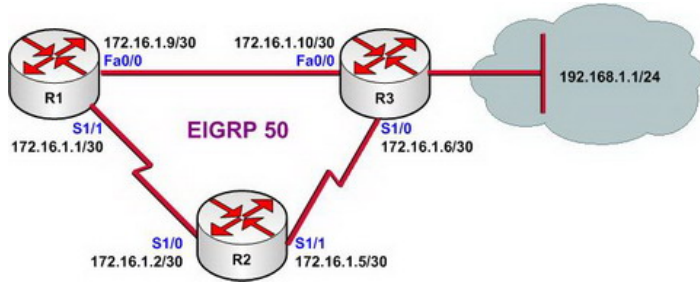# EIGRP Lab4 - Configuring EIGRP Unequal-Cost Paths

?Lab objectives?

1. Learn balance conditions of EIGRP unequal-cost
2. Learn how to change EIGRP metric value
3. Learn EIGRP AD, FD, FC, Successor, and FS

?Lab Topology?

?Lab steps?

1. Configure IP addresses of every router, and use ping command to confirm the direct interface connectivity of every router.
2. Configure on three routers EIGRP auto system number as 50
3. Observe the route for R1 to access 192.168.1.0/24 network of R3

R1#show ip route

 172.16.0.0/30 is subnetted, 3 subnets
C 172.16.1.8 is directly connected,   FastEthernet0/0
D 172.16.1.4 [90/2172416] via   172.16.1.10, 00:00:11, FastEthernet0/0
C 172.16.1.0 is directly connected,   Serial1/1
D 192.168.1.0/24 [90/156160] via 172.16.1.10, 00:00:11,   FastEthernet0/0
R1#

4. To improve network transmission, we have to use route with the next hop of 172.16.1.2, i.e. use another path with different metric value to balance load.

5. If another path is needed, we have to make sure that R1 becomes the feasible successor (FS) for R1 to access 192.168.1.0/24 network. To become FS, Feasible condition (FC) are required.

6. Check EIGRP topology on R1; R2 cannot be found in R1 topology.

R1#show ip eigrp 50   topology
???
P 192.168.1.0/24, 1 successors, FD is 156160
 via   172.16.1.10 (156160/128256), FastEthernet0/0
P 172.16.1.8/30, 1   successors, FD is 28160
 via Connected, FastEthernet0/0
???

7. Check the complete topology

R1#show ip eigrp 50   topology all-links
???
P 192.168.1.0/24, 1   successors, FD is 156160, serno 6
  via 172.16.1.10 (156160/128256),   FastEthernet0/0
 via 172.16.1.2 (2809856/2297856), Serial1/1
???

8. Confirm FC (feasible condition) formula:
AD of secondary-best route < FD of best route (Successor) = Feasible Successor
From this instance we get this conclusion:
The Distance that R2 access 192.168.1.0 network < 156160
9. Configure EIGRP metric of R2, and make sure that R2 become FS of R1

R2#configure terminal
R2(config)#interface   serial 1/1
R2(config-if)#bandwidth 10000000
R2(config-if)#delay 10
R2(config)#exit

10. Check R1 topology:

R1#show ip eigrp   topology all-links

???
P 192.168.1.0/24, 1   successors, FD is 156160, serno 6
 via 172.16.1.10 (156160/128256),   FastEthernet0/0
 via 172.16.1.2 (2300416/130816), Serial1/1
???

11. With the following formula, configure variance value of R1 EIGRP

FD of FS route < FD of best route (Successor) * Variance

With the formula we get:

2300416 < 156160 * x

x?14.73

12. First configure the variance value as 14, then test and observe the routing table.

R1(config)#router   eigrp 50
R1(config-router)#variance   14
R1(config-router)#exit
R1(config)#exit
R1#clear ip router *
R1#show ip route
???
C 172.16.1.0 is directly connected,   Serial1/1
D 192.168.1.0/24 [90/156160] via 172.16.1.10, 00:00:00, FastEthernet0/0
???
R1#

13. Change the variance value to 15 and observe the routing table.

R1(config)#router   eigrp 50
R1(config-router)#variance   15
R1(config-router)#exit
R1(config)#exit
R1#clear ip router *
R1#show ip route
???
C 172.16.1.0 is directly connected,   Serial1/1
D 192.168.1.0/24 [90/156160] via   172.16.1.10, 00:00:01, FastEthernet0/0
 [90/2300416] via 172.16.1.2,   00:00:01, Serial1/1
R1#

14. Lab finishe.

Hope to helpful for you!