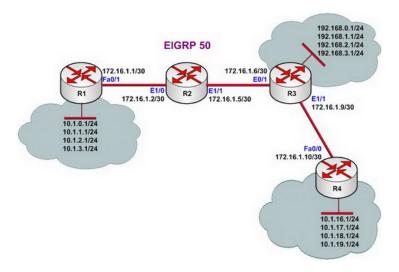
EIGRP Lab3 - Manually Summarizing EIGRP Routes

?Lab Objectives?

- 1. To master the shortcomings of automatic summary of EIGRP.
- 2. To master the configuration methods of manual auto-summary regarding EIGRP.

?Lab Topology?



?Lab Process?

- 1. Configure the router's IP address, and use the Ping command to confirm the connect's interoperability of each router.
- 2. To configure the BGP protocols for each router and not to close the auto-summary.
- 3. When you use ping to test the network route on R2, you will find that router R2 is not able to ping the subnet 10.1.X.0/24 which linked to router R4. And shown as below:

R2#ping 10.1.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.1.1, timeout is 2 seconds:

!!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/46/92 ms

R2#

R2#ping 10.1.16.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.16.1, timeout is 2 seconds:

U.U.U

Success rate is 0 percent (0/5)

R2#

R2#ping 10.1.17.1

R2#show ip route

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.17.1, timeout is 2 seconds:

ппп

Success rate is 0 percent (0/5)

R2#

4. Check the routing table of R2:

Gateway of last resort is not set
172.16.0.0/30 is subnetted, 3 subnets
D 172.16.1.8 [90/307200] via 172.16.1.6, 00:06:25, Ethernet1/1
C 172.16.1.4 is directly connected, Ethernet1/1
C 172.16.1.0 is directly connected, Ethernet1/0
D 10.0.0.0/8 [90/409600] via 172.16.1.1, 00:06:09, Ethernet1/0
D 192.168.0.0/24 [90/409600] via 172.16.1.6, 00:06:25, Ethernet1/1
D 192.168.1.0/24 [90/409600] via 172.16.1.6, 00:06:25, Ethernet1/1

D 192.168.2.0/24 [90/409600] via 172.16.1.6, 00:06:25, Ethernet1/1 D 192.168.3.0/24 [90/409600] via 172.16.1.6, 00:06:25, Ethernet1/1

5. Check topology database of router R2:

R2#show ip eigrp topology all-links
IP-EIGRP Topology Table for AS(50)/ID(172.16.1.5)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply, r - Reply status
P 10.0.0.0/8, 1 successors, FD is 409600, serno 3
via 172.16.1.1 (409600/128256), Ethernet1/0
via 172.16.1.6 (435200/409600), Ethernet1/1
P 192.168.0.0/24, 1 successors, FD is 409600, serno 4
via 172.16.1.6 (409600/128256), Ethernet1/1
P 192.168.1.0/24, 1 successors, FD is 409600, serno 5
via 172.16.1.6 (409600/128256), Ethernet1/1
P 192.168.2.0/24, 1 successors, FD is 409600, serno 6
via 172.16.1.6 (409600/128256), Ethernet1/1

P 192.168.3.0/24, 1 successors, FD is 409600, serno 7 via 172.16.1.6 (409600/128256), Ethernet1/1
P 172.16.1.8/30, 1 successors, FD is 307200, serno 8 via 172.16.1.6 (307200/281600), Ethernet1/1
P 172.16.1.4/30, 1 successors, FD is 281600, serno 2 via Connected, Ethernet1/1
P 172.16.1.0/30, 1 successors, FD is 281600, serno 1 via Connected, Ethernet1/0

- 6. The main reason that makes R2 is not able to ping the network 10.1.X.0/24 linked by R4 is: R1 belongs to the border of the main category, it will automatically summarize the subnet of the local routing table to main-category network, while as well as R4 will perform the same action. So R2 will receive the same summary route from different interfaces, that is, network route of 10.0.0.0/8. Because R2 chooses the route with lower FD value after compared the possible distance of the two routes that is the summary route of 10.0.0.0/8 which is notified by R1. In fact, the real reason is not the error from the route choice but the auto-summary can not perform the precise control.
- 7. In order to solve the problem of summary, it needs to close auto-summary on R1 and R4, while use manual summary. The configuration is shown as below:

R1(config)#router eigrp 50 R1(config-router)#no auto-summary R1(config-router)#exit

R1(config)#interface fastEthernet 0/1
R1(config-if)#ip summary-address eigrp 50 10.1.0.0 255.255.252.0
R1(config-if)#exit
R1(config)#exit

R4(config)#router eigrp 50 R4(config-router)#no auto-summary R4(config-router)#exit

R4(config)#interface fastEthernet 0/0
R4(config-if)#ip summary-address eigrp 50 10.1.16.0 255.255.252.0
R4(config-if)#exit

8. Check the routing table of R2 once again:

R2#show ip route

Gateway of last resort is not set

172.16.0.0/30 is subnetted, 3 subnets

D 172.16.1.8 [90/307200] via 172.16.1.6, 00:21:08, Ethernet1/1

C 172.16.1.4 is directly connected, Ethernet1/1

C 172.16.1.0 is directly connected, Ethernet1/0

10.0.0.0/22 is subnetted, 2 subnets

D 10.1.0.0 [90/409600] via 172.16.1.1, 00:03:13, Ethernet1/0

D 10.1.16.0 [90/435200] via 172.16.1.6, 00:01:02, Ethernet1/1

D 192.168.0.0/24 [90/409600] via 172.16.1.6, 00:21:08, Ethernet1/1

D 192.168.1.0/24 [90/409600] via 172.16.1.6, 00:21:08, Ethernet1/1

D 192.168.2.0/24 [90/409600] via 172.16.1.6, 00:21:08, Ethernet1/1

D 192.168.3.0/24 [90/409600] via 172.16.1.6, 00:21:08, Ethernet1/1

9. To confirm the network accessibility once again by using ping command:

R2#ping 10.1.0.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.0.1, timeout is 2 seconds:

11111

Success rate is 100 percent (5/5), round-trip min/avg/max = 16/69/145 ms

R2#ping 10.1.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.1.1, timeout is 2 seconds:

!!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 16/44/64 ms

R2#ping 10.1.16.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.16.1, timeout is 2 seconds:

11111

Success rate is 100 percent (5/5), round-trip min/avg/max = 60/97/140 ms

R2#ping 10.1.17.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.17.1, timeout is 2 seconds:

!!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 48/93/149 ms

10. Check the routing table of R2 once again:

R2#show ip route
Gateway of last resort is not set
172.16.0.0/30 is subnetted, 3 subnets
D 172.16.1.8 [90/307200] via 172.16.1.6, 00:23:45, Ethernet1/1
C 172.16.1.4 is directly connected, Ethernet1/1
C 172.16.1.0 is directly connected, Ethernet1/0
10.0.0.0/22 is subnetted, 2 subnets
D 10.1.0.0 [90/409600] via 172.16.1.1, 00:05:49, Ethernet1/0
D 10.1.16.0 [90/435200] via 172.16.1.6, 00:03:38, Ethernet1/1
D 192.168.0.0/24 [90/409600] via 172.16.1.6, 00:23:45, Ethernet1/1
D 192.168.2.0/24 [90/409600] via 172.16.1.6, 00:23:45, Ethernet1/1

D 192.168.3.0/24 [90/409600] via 172.16.1.6, 00:23:45, Ethernet1/1

11. In order to effectively reduce the size of the routing table, you can also to perform route summary manually on the C-type network route of 192.168.X.0/24 through EIGRP.

R3(config)#router eigrp 50
R3(config-router)#no auto-summary
R3(config-router)#exit
R3(config)#
R3(config)#interface ethernet 1/1
R3(config-if)#ip summary-address eigrp 50 192.168.0.0 255.255.252.0
R3(config-if)#exit

R3(config)#inter ethernet 1/0
R3(config-if)#ip summary-address eigrp 50 192.168.0.0 255.255.252.0
R3(config-if)#exit

12. Check the routing table on R4 and R2:

R4#show ip route

Gateway of last resort is not set

172.16.0.0/30 is subnetted, 3 subnets

C 172.16.1.8 is directly connected, FastEthernet0/0

D 172.16.1.4 [90/284160] via 172.16.1.9, 00:02:41, FastEthernet0/0

D 172.16.1.0 [90/309760] via 172.16.1.9, 00:02:23, FastEthernet0/0

10.0.0.0/8 is variably subnetted, 6 subnets, 2 masks

D 10.1.0.0/22 [90/437760] via 172.16.1.9, 00:02:23, FastEthernet0/0

C 10.1.19.0/24 is directly connected, Loopback0

C 10.1.18.0/24 is directly connected, Loopback0

C 10.1.17.0/24 is directly connected, Loopback0

D 10.1.16.0/22 is a summary, 00:03:33, Null0

C 10.1.16.0/24 is directly connected, Loopback0

D 192.168.0.0/22 [90/156160] via 172.16.1.9, 00:02:41, FastEthernet0/0

R2#show ip route

Gateway of last resort is not set

172.16.0.0/30 is subnetted, 3 subnets

D 172.16.1.8 [90/307200] via 172.16.1.6, 00:02:54, Ethernet1/1

C 172.16.1.4 is directly connected, Ethernet1/1

C 172.16.1.0 is directly connected, Ethernet 1/0

10.0.0.0/22 is subnetted, 2 subnets

D 10.1.0.0 [90/409600] via 172.16.1.1, 00:16:13, Ethernet1/0

D 10.1.16.0 [90/435200] via 172.16.1.6, 00:02:54, Ethernet1/1

D 192.168.0.0/22 [90/409600] via 172.16.1.6, 00:02:54, Ethernet1/1

13. Use ping command to confirm the validity of the routing:

R2#ping 192.168.0.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.0.1, timeout is 2 seconds:

