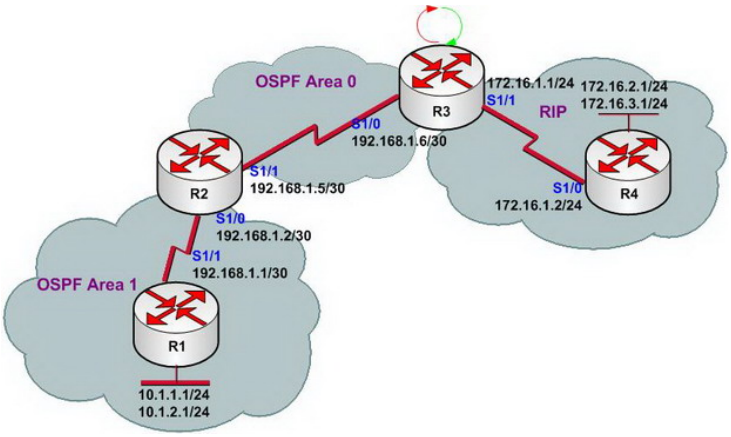
OSPF Lab3 - Configuring OSPF External Summary

?Lab Objectives?

1. Learn OSPF external route summary configuration
2. Differentiate route of external summary
3. Learn OSPF external summary route types and calculation methods.

?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. R3 (ASBR: Autonomous System Border Router)configuration

```
R3(config)#router ospf  1
R3(config-router)#network  192.168.1.4 0.0.0.3 area 0
R3(config-router)#exit
R3(config)#exit
R3#
R3(config)#router rip
R3(config-router)#network  172.16.0.0
R3(config-router)#exit
R3#
```

3. Check routing table of R1 or R2

```
R1#show ip route
```

Gateway of last resort is not set

10.0.0.0/24 is subnetted, 2 subnets
C 10.1.2.0 is directly connected, Loopback1
C 10.1.1.0 is directly connected, Loopback0
192.168.1.0/30 is subnetted, 2 subnets
C 192.168.1.0 is directly connected, Serial1/1
O IA 192.168.1.4 [110/128] via 192.168.1.2, 00:03:50, Serial1/1
R1#

4. Configure redistribution on R3 (For analysis of redistribution, please refer to the following chapters)

R3(config)#router ospf 1
R3(config-router)#redistribute rip metric 200 subnets
R3(config-router)#exit
R3(config)#router rip
R3(config-router)#redistribute ospf 1 metric 10
R3(config-router)#exit
R3(config)#

5. Check R1 routing table and use ping command to confirm routes

R1#show ip route

Gateway of last resort is not set

172.16.0.0/24 is subnetted, 3 subnets
O E1 172.16.1.0 [110/328] via 192.168.1.2, 00:04:22, Serial1/1
O E1 172.16.2.0 [110/328] via 192.168.1.2, 00:04:22, Serial1/1
O E1 172.16.3.0 [110/328] via 192.168.1.2, 00:04:22, Serial1/1
10.0.0.0/24 is subnetted, 2 subnets
C 10.1.2.0 is directly connected, Loopback1
C 10.1.1.0 is directly connected, Loopback0
192.168.1.0/30 is subnetted, 2 subnets
C 192.168.1.0 is directly connected, Serial1/1
O IA 192.168.1.4 [110/128] via 192.168.1.2, 00:16:54, Serial1/1
R1#

Form the above comparison; we will easily know the route metric calculation methods of R1 and R2.
6. Check link status database of R1.

```
R1#show ip ospf  database

 OSPF Router with ID (10.1.2.1)  (Process ID 1)

 Router Link States (Area 1)
Link ID ADV Router Age Seq# Checksum Link count
10.1.2.1 10.1.2.1 1413 0x80000009 0x0003FD 4
192.168.1.5 192.168.1.5 1413 0x80000006 0x0025B8 2

 Summary Net Link States (Area  1)
Link ID ADV Router Age Seq# Checksum
192.168.1.4 192.168.1.5 1437 0x80000001 0x00E33E

 Summary ASB Link States (Area  1)
Link ID ADV Router Age Seq# Checksum
192.168.1.6 192.168.1.5 1061 0x80000001 0x00D348

 Type-5 AS External Link  States
Link ID ADV Router Age Seq# Checksum Tag
172.16.1.0 192.168.1.6 3603 0x80000003 0x00CF35 0
172.16.2.0 192.168.1.6 3603 0x80000003 0x00C43F 0
172.16.3.0 192.168.1.6 3603 0x80000003 0x00B949 0
R1#
```

7. Three external routes are displayed in the above routing table. In order to reduce the size of routing table, we can conduct external route summary on R3. The configurations are as follows:

```
R3(config)#router ospf  1
R3(config-router)#summary-address 172.16.0.0  255.255.0.0
R3(config-router)#exit
R3(config)#exit
```

8. Check R1 routing table and make sure that summary succeed.

R1#show ip route

Gateway of last resort is not set

O E1 172.16.0.0/16 [110/328] via 192.168.1.2, 00:01:29, Serial1/1
10.0.0.0/24 is subnetted, 2 subnets
C 10.1.2.0 is directly connected, Loopback1
C 10.1.1.0 is directly connected, Loopback0
192.168.1.0/30 is subnetted, 2 subnets
C 192.168.1.0 is directly connected, Serial1/1
O IA 192.168.1.4 [110/128] via 192.168.1.2, 00:24:56, Serial1/1
R1#

9. Lab finished.
Hope to helpful for you!