

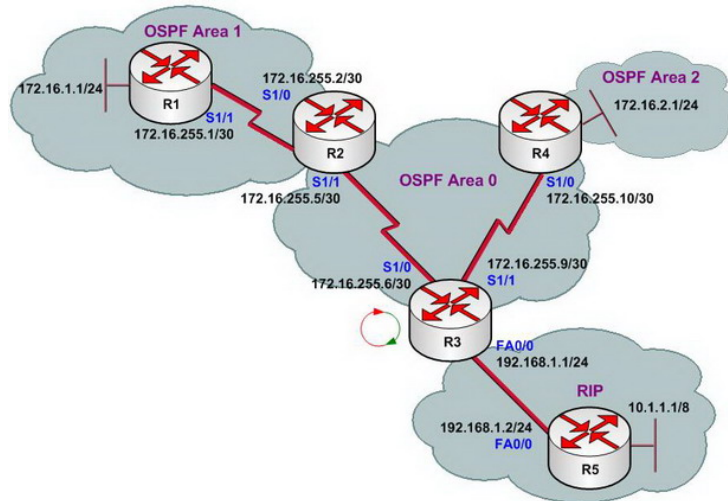
OSPF Lab5 - Configuring OSPF Totally Stub Area

?Lab Objectives?

1. Learn LSA function of type1, type2, type3, type4 and type5.
2. Learn area features of OSPF Totally Stub
3. Learn area configuration methods of OSPF Totally Stub
4. Learn area configuration requirements of OSPF Stub: Stub has at least one ABR, but not ASBR.

Note: Not-So-Stubby Area (NSSA) is CISCO private.

?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 OSPF and RIP protocol, and use ping and show ip route command to confirm that protocol can work normally
3. Configure redistribution on R3 to complete lab requirements. Configure as follows:

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

4. First configure area1 as ospf stub area
5. Check R1 routing table and data link status database

```
R1#show ip ospf database
```

```
OSPF Router with ID (172.16.1.1) (Process ID 1)
```

```
Router Link States (Area 1)
```

```
Link ID ADV Router Age Seq# Checksum Link count  
172.16.1.1 172.16.1.1 155 0x80000005 0x0055C7 3  
172.16.255.5 172.16.255.5 155 0x80000005 0x004F97 2
```

```
Summary Net Link States (Area 1)
```

```
Link ID ADV Router Age Seq# Checksum  
0.0.0.0 172.16.255.5 168 0x80000001 0x00017B  
172.16.2.0 172.16.255.5 168 0x80000002 0x0068D3  
172.16.255.4 172.16.255.5 168 0x80000002 0x00B7C6  
172.16.255.8 172.16.255.5 168 0x80000002 0x001228
```

```
R1#
```

```
R1#show ip route
```

```
Gateway of last resort is 172.16.255.2 to network 0.0.0.0
```

```
172.16.0.0/16 is variably subnetted, 5 subnets, 2 masks  
C 172.16.255.0/30 is directly connected, Serial1/1  
O IA 172.16.255.4/30 [110/128] via 172.16.255.2, 00:04:19, Serial1/1  
O IA 172.16.255.8/30 [110/192] via 172.16.255.2, 00:04:19, Serial1/1  
C 172.16.1.0/24 is directly connected, Loopback0  
O IA 172.16.2.0/24 [110/193] via 172.16.255.2, 00:04:19, Serial1/1  
O*IA 0.0.0.0/0 [110/65] via 172.16.255.2, 00:04:19, Serial1/1  
R1#
```

6. With stub area features configuration, we can effectively reduce the size of routing table. But the R1 routing table is not the simplest. We may use totally stub area feature to further reduce the size of routing table. The following shows the configuration:

```
R2(config)#router ospf 1  
R2(config-router)#area 1 stub no-summary  
R2(config-router)#exit  
R2(config)#exit
```

```
R1(config)#router ospf 1
R1(config-router)#area 1 stub
R1(config-router)#exit
R1(config)#exit
```

7. Check R1 routing table again

```
R1#show ip route
Codes: C - connected, S - static, I - IGRP, 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, E - EGP
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 172.16.255.2 to network 0.0.0.0

```
172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
C 172.16.255.0/30 is directly connected, Serial1/1
C 172.16.1.0/24 is directly connected, Loopback0
O*IA 0.0.0.0/0 [110/65] via 172.16.255.2, 00:34:32, Serial1/1
R1#
```

8. Check link status database of R1. It has only LSA of type1 and type3 (after summary). LSA of other OSPF areas is forbidden.

```
R1#show ip ospf database
```

OSPF Router with ID (172.16.1.1) (Process ID 1)

Router Link States (Area 1)

```
Link ID ADV Router Age Seq# Checksum Link count
172.16.1.1 172.16.1.1 387 0x80000006 0x0053C8 3
172.16.255.5 172.16.255.5 412 0x80000006 0x004D98 2
```

Summary Net Link States (Area 1)

Link ID ADV Router Age Seq# Checksum

0.0.0.0 172.16.255.5 295 0x80000003 0x00FC7D

R1#

9. Use ping command to confirm routes.

R1#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 80 percent (4/5), round-trip min/avg/max = 216/570/1488 ms

10. The main point of this lab is: Totally Stub Area refuses LSA of type3, type4 and type5. Default route is used in non-OSPF autonomous system network of other areas.

11. Lab finished.

Hope to helpful for you!