

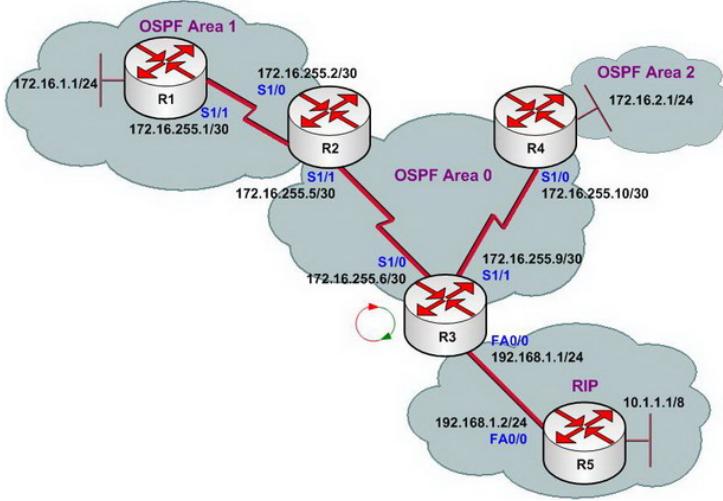
OSPF Lab5 - Configuring OSPF Totally Stub Area

?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

Network	Link	Distance	Protocol	Next-Hop	Age	Serial
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!