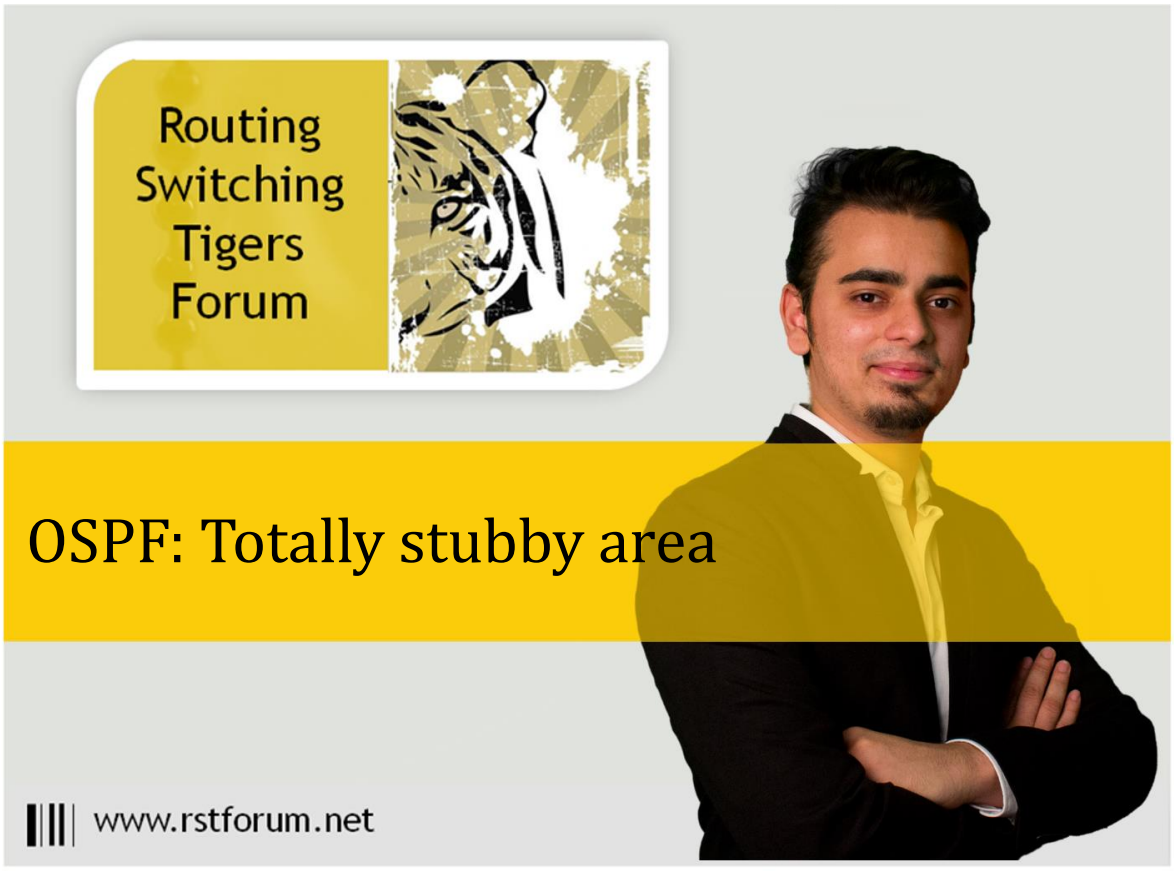
LAB6: OSPF – IPv4

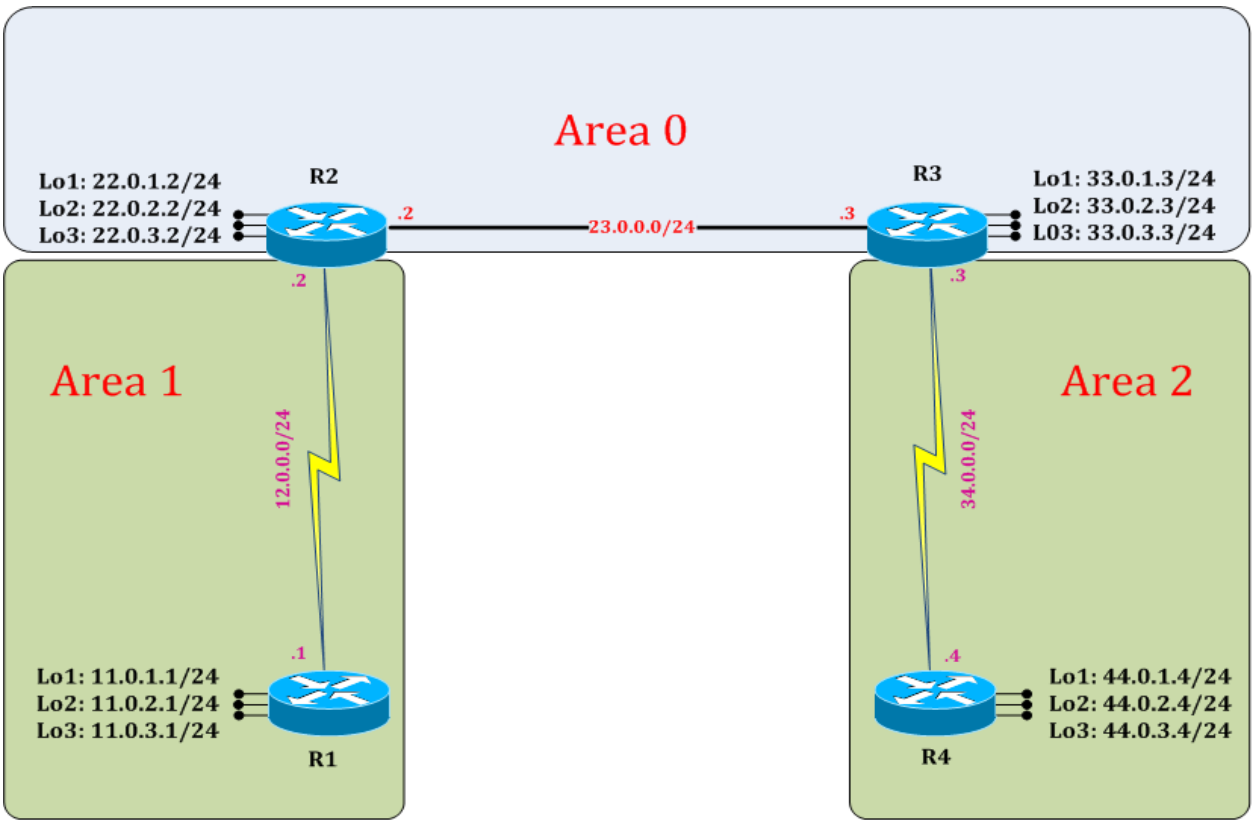
Disclaimer

This Configuration Guide is designed to assist members to enhance their skills in respective technology area. While every effort has been made to ensure that all material is as complete and accurate as possible, the enclosed material is presented on an "as is" basis. Neither the authors nor Forum assume any liability or responsibility to any person or entity with respect to loss or damages incurred from the information contained in this guide. This Lab Guide was developed by RSTForum. Any similarities between material presented in this configuration guide and any other material is completely coincidental.



LAB 6: Diagram

Note: This Lab was developed on Cisco IOS Version15.2(4) M1 ADVENTERPRISEK9-M.



LAB 6: OSPF Totally Stubby Area

Task 1: Configure OSPF Totally Stubby Area

Step 1 In the configuration mode of router configure loopbacks with network address in sequence & redistribute these connected network in OSPF process

R1:
```
interface loopback 100
ip address 100.0.0.2 255.255.255.0
interface loopback 101
ip address 100.0.1.2 255.255.255.0
interface loopback 102
ip address 100.0.2.2 255.255.255.0
interface loopback 103
ip address 100.0.3.2 255.255.255.0
exit
```

R1:
```
router ospf 1
redistribute connected subnet metric-type 1
exit
```

R2#show ip route
! (Show router's routing table and IPv4 routes entries)

```
Codes: L - local, C - connected, S - static, 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
       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, H - NHRP, l - LISP
       + - replicated route, % - next hop override

Gateway of last resort is not set

     11.0.0.0/32 is subnetted, 3 subnets
O       11.0.1.1 [110/65] via 12.0.0.1, 01:07:41, Serial2/0
O       11.0.2.1 [110/65] via 12.0.0.1, 01:07:41, Serial2/0
O       11.0.3.1 [110/65] via 12.0.0.1, 01:07:41, Serial2/0
     12.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       12.0.0.0/24 is directly connected, Serial2/0
L       12.0.0.2/32 is directly connected, Serial2/0
     22.0.0.0/8 is variably subnetted, 6 subnets, 2 masks
C       22.0.1.0/24 is directly connected, Loopback1
L       22.0.1.2/32 is directly connected, Loopback1
C       22.0.2.0/24 is directly connected, Loopback2
```

```
L       22.0.2.2/32 is directly connected, Loopback2
C       22.0.3.0/24 is directly connected, Loopback3
L       22.0.3.2/32 is directly connected, Loopback3
     23.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       23.0.0.0/24 is directly connected, Ethernet0/0
L       23.0.0.2/32 is directly connected, Ethernet0/0
     33.0.0.0/32 is subnetted, 3 subnets
O       33.0.1.3 [110/11] via 23.0.0.3, 01:06:57, Ethernet0/0
O       33.0.2.3 [110/11] via 23.0.0.3, 01:06:57, Ethernet0/0
O       33.0.3.3 [110/11] via 23.0.0.3, 01:06:57, Ethernet0/0
     34.0.0.0/24 is subnetted, 1 subnets
O IA    34.0.0.0 [110/74] via 23.0.0.3, 01:06:57, Ethernet0/0
     44.0.0.0/32 is subnetted, 3 subnets
O IA    44.0.1.4 [110/75] via 23.0.0.3, 00:01:45, Ethernet0/0
O IA    44.0.2.4 [110/75] via 23.0.0.3, 00:01:45, Ethernet0/0
O IA    44.0.3.4 [110/75] via 23.0.0.3, 00:01:45, Ethernet0/0
     100.0.0.0/24 is subnetted, 4 subnets
O E1    100.0.0.0 [110/84] via 12.0.0.1, 00:11:48, Serial2/0
O E1    100.0.1.0 [110/84] via 12.0.0.1, 00:11:48, Serial2/0
O E1    100.0.2.0 [110/84] via 12.0.0.1, 00:11:48, Serial2/0
O E1    100.0.3.0 [110/84] via 12.0.0.1, 00:11:48, Serial2/0
```

Step 2 Configure OSPF Stub

R3:

```
router ospf  1
area 2 stub no-summary
exit
```

R4:

```
router ospf 1
area 2 stub no-summary
exit
```

Task 2: Verification:

Step 1 Verify routes on neighbor router routing table

```
R4#show ip route
! (Show router's routing table and IPv4 routes entries)

Codes: L - local, C - connected, S - static, 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
       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, H - NHRP, l - LISP
```

+ - replicated route, % - next hop override

Gateway of last resort is 34.0.0.3 to network 0.0.0.0

O*IA 0.0.0.0/0 [110/65] via 34.0.0.3, 00:00:05, Serial2/0
    34.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C   34.0.0.0/24 is directly connected, Serial2/0
L   34.0.0.4/32 is directly connected, Serial2/0
    44.0.0.0/8 is variably subnetted, 6 subnets, 2 masks
C   44.0.1.0/24 is directly connected, Loopback1
L   44.0.1.4/32 is directly connected, Loopback1
C   44.0.2.0/24 is directly connected, Loopback2
L   44.0.2.4/32 is directly connected, Loopback2
C   44.0.3.0/24 is directly connected, Loopback3
L   44.0.3.4/32 is directly connected, Loopback3

(Total Stubby area is area in which external routes LSA 5 and Inter-area routes LSA3/4 does not propagate, instead it automatically creates default route 0.0.0.0 towards ABR.)

R4#ping 100.0.1.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 100.0.1.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 8/8/9 ms

R4#ping 22.0.1.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 22.0.1.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 8/8/9 ms