LAB5: OSPF – IPv4

Disclaimer

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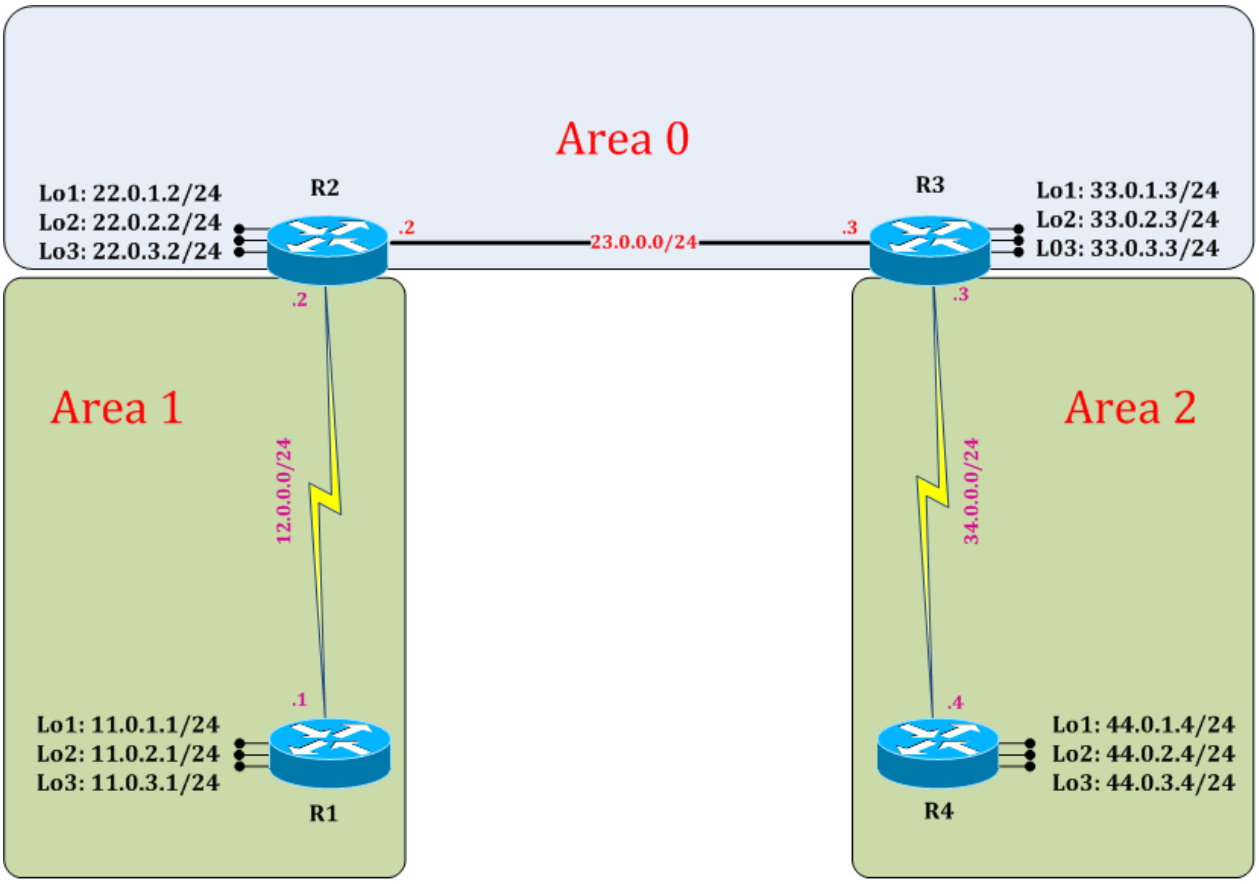
LAB 5: Diagram

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



LAB 5: OSPF Stub:

Task 1: Configure OSPF Stub

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 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, 00:56:32, Serial2/0
O       11.0.2.1 [110/65] via 12.0.0.1, 00:56:32, Serial2/0
O       11.0.3.1 [110/65] via 12.0.0.1, 00:56:32, 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, 00:55:48, Ethernet0/0
O       33.0.2.3 [110/11] via 23.0.0.3, 00:55:48, Ethernet0/0
O       33.0.3.3 [110/11] via 23.0.0.3, 00:55:48, Ethernet0/0
     34.0.0.0/24 is subnetted, 1 subnets
O IA    34.0.0.0 [110/74] via 23.0.0.3, 00:55:48, Ethernet0/0
     44.0.0.0/32 is subnetted, 3 subnets
O IA    44.0.1.4 [110/75] via 23.0.0.3, 00:55:10, Ethernet0/0
O IA    44.0.2.4 [110/75] via 23.0.0.3, 00:55:10, Ethernet0/0
O IA    44.0.3.4 [110/75] via 23.0.0.3, 00:55:10, Ethernet0/0
     100.0.0.0/24 is subnetted, 4 subnets
O E1    100.0.0.0 [110/84] via 12.0.0.1, 00:00:39, Serial2/0
O E1    100.0.1.0 [110/84] via 12.0.0.1, 00:00:39, Serial2/0
O E1    100.0.2.0 [110/84] via 12.0.0.1, 00:00:39, Serial2/0
O E1    100.0.3.0 [110/84] via 12.0.0.1, 00:00:39, Serial2/0
```

Step 2 Configure OSPF Stub

R3:

```
router ospf 1
area 2 stub
exit
```

R4:

```
router ospf 1
area 2 stub
exit
```

Task 2: Verification:

Step 1 Verify routes on neighbor router routing table

```
R4#show ip route
! (Show router's routing table and IPv4 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, 00:00:46, Serial2/0
    11.0.0.0/32 is subnetted, 3 subnets
O IA   11.0.1.1 [110/139] via 34.0.0.3, 00:00:46, Serial2/0
O IA   11.0.2.1 [110/139] via 34.0.0.3, 00:00:46, Serial2/0
O IA   11.0.3.1 [110/139] via 34.0.0.3, 00:00:46, Serial2/0
    12.0.0.0/24 is subnetted, 1 subnets
O IA   12.0.0.0 [110/138] via 34.0.0.3, 00:00:46, Serial2/0
    22.0.0.0/32 is subnetted, 3 subnets
O IA   22.0.1.2 [110/75] via 34.0.0.3, 00:00:46, Serial2/0
O IA   22.0.2.2 [110/75] via 34.0.0.3, 00:00:46, Serial2/0
O IA   22.0.3.2 [110/75] via 34.0.0.3, 00:00:46, Serial2/0
    23.0.0.0/24 is subnetted, 1 subnets
O IA   23.0.0.0 [110/74] via 34.0.0.3, 00:00:46, Serial2/0
    33.0.0.0/32 is subnetted, 3 subnets
O IA   33.0.1.3 [110/65] via 34.0.0.3, 00:00:46, Serial2/0
O IA   33.0.2.3 [110/65] via 34.0.0.3, 00:00:46, Serial2/0
O IA   33.0.3.3 [110/65] via 34.0.0.3, 00:00:46, 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

(Stub area is area in which external routes LSA 5 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