

LAB15: OSPF – IPv6

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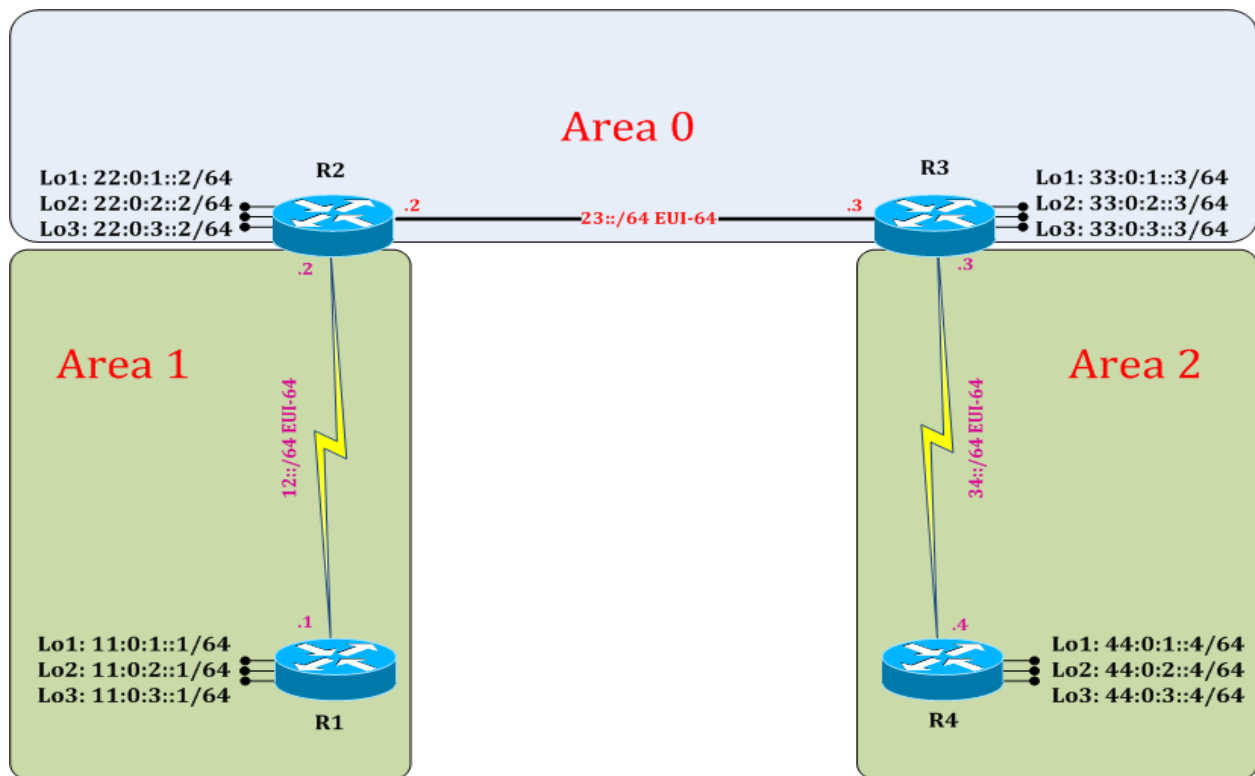
Routing
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OSPF: Not So Stubby Area

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LAB 15: Diagram

Note: This Lab was developed on Cisco IOS Version 15.2(4) M1 ADVENTERPRISEK9-M.



LAB 15: IPv6 OSPF Not So Stubby Area (NSSA)

Task 1: Configure IPv6 OSPF Not So Stubby Area (NSSA)

Step 1 In the configuration mode of router configure loopbacks & redistribute these connected network in IPv6 OSPF process:

```
R1:
interface loopback 50
ipv6 address 50::1/64
exit
```

```
R1:
ipv6 router ospf 1
redistribute connected
exit
```

```
R2#show ipv6 route
```

! (Shows router's routing table and IPv6 routes entries)

IPv6 Routing Table - default - 22 entries

Codes: C - Connected, L - Local, S - Static, U - Per-user Static route

B - BGP, HA - Home Agent, MR - Mobile Router, R - RIP

H - NHRP, I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea

IS - ISIS summary, D - EIGRP, EX - EIGRP external, NM - NEMO

ND - ND Default, NDp - ND Prefix, DCE - Destination, NDr - Redirect

O - OSPF Intra, OI - OSPF Inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2

ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2, I - LISP

```
O 11:0:1::1/128 [110/64]
  via FE80::A8BB:CCFF:FE00:100, Serial2/0
O 11:0:2::1/128 [110/64]
  via FE80::A8BB:CCFF:FE00:100, Serial2/0
O 11:0:3::1/128 [110/64]
  via FE80::A8BB:CCFF:FE00:100, Serial2/0
C 12::/64 [0/0]
  via Serial2/0, directly connected
L 12::A8BB:CCFF:FE00:200/128 [0/0]
  via Serial2/0, receive
C 22:0:1::/64 [0/0]
  via Loopback1, directly connected
L 22:0:1::2/128 [0/0]
  via Loopback1, receive
C 22:0:2::/64 [0/0]
  via Loopback2, directly connected
L 22:0:2::2/128 [0/0]
  via Loopback2, receive
C 22:0:3::/64 [0/0]
  via Loopback3, directly connected
```

```

L 22:0:3::2/128 [0/0]
  via Loopback3, receive
C 23::/64 [0/0]
  via Ethernet0/0, directly connected
L 23::A8BB:CCFF:FE00:200/128 [0/0]
  via Ethernet0/0, receive
O 33:0:1::3/128 [110/10]
  via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
O 33:0:2::3/128 [110/10]
  via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
O 33:0:3::3/128 [110/10]
  via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
OI 34::/64 [110/74]
  via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
OI 44:0:1::4/128 [110/74]
  via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
OI 44:0:2::4/128 [110/74]
  via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
OI 44:0:3::4/128 [110/74]
  via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
OE2 50::/64 [110/20]
  via FE80::A8BB:CCFF:FE00:100, Serial2/0
L FF00::/8 [0/0]
  via Null0, receive

```

Step 2 Configure IPv6 OSPF Not So Stubby Area

! (When loop50 is redistributed in stub area, external routes LSA 5 will no propagate in stub area and hence cannot be seen in any other router's routing table. To make seen this redistributed route to all other routers, replace stub area to Not So Stubby Area.)

```

R1:
ipv6 router ospf 1
area 1 nssa
exit

```

```

R2:
ipv6 router ospf 1
area 1 nssa
exit

```

Task 2: Verification:

Step 1 Verify routes on neighbor router routing table

```

R2#show ipv6 route
! (Shows router's routing table and IPv6 routes entries)

```

IPv6 Routing Table - default - 22 entries

Codes: C - Connected, L - Local, S - Static, U - Per-user Static route

B - BGP, HA - Home Agent, MR - Mobile Router, R - RIP

H - NHRP, I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea

IS - ISIS summary, D - EIGRP, EX - EIGRP external, NM - NEMO

ND - ND Default, NDp - ND Prefix, DCE - Destination, NDr - Redirect

O - OSPF Intra, OI - OSPF Inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2

ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2, I - LISP

```
O 11:0:1::1/128 [110/64]
  via FE80::A8BB:CCFF:FE00:100, Serial2/0
O 11:0:2::1/128 [110/64]
  via FE80::A8BB:CCFF:FE00:100, Serial2/0
O 11:0:3::1/128 [110/64]
  via FE80::A8BB:CCFF:FE00:100, Serial2/0
C 12::/64 [0/0]
  via Serial2/0, directly connected
L 12::A8BB:CCFF:FE00:200/128 [0/0]
  via Serial2/0, receive
C 22:0:1::/64 [0/0]
  via Loopback1, directly connected
L 22:0:1::2/128 [0/0]
  via Loopback1, receive
C 22:0:2::/64 [0/0]
  via Loopback2, directly connected
L 22:0:2::2/128 [0/0]
  via Loopback2, receive
C 22:0:3::/64 [0/0]
  via Loopback3, directly connected
L 22:0:3::2/128 [0/0]
  via Loopback3, receive
C 23::/64 [0/0]
  via Ethernet0/0, directly connected
L 23::A8BB:CCFF:FE00:200/128 [0/0]
  via Ethernet0/0, receive
O 33:0:1::3/128 [110/10]
  via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
O 33:0:2::3/128 [110/10]
  via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
O 33:0:3::3/128 [110/10]
  via FE80::A8BB:CCFF:FE00:300, Ethernet0/0

OI 34::/64 [110/74]
  via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
OI 44:0:1::4/128 [110/74]
  via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
OI 44:0:2::4/128 [110/74]
  via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
OI 44:0:3::4/128 [110/74]
  via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
ON2 50::/64 [110/20]
```



via FE80::A8BB:CCFF:FE00:100, Serial2/0

L FF00::/8 [0/0]
via Null0, receive

(R2 receives external routes E2 through Not so Stubby Area (NSSA) and marked as N2.)

R3#show ipv6 route

! (Shows router's routing table and IPv6 routes entries)

IPv6 Routing Table - default - 22 entries

Codes: C - Connected, L - Local, S - Static, U - Per-user Static route

B - BGP, HA - Home Agent, MR - Mobile Router, R - RIP

H - NHRP, I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea

IS - ISIS summary, D - EIGRP, EX - EIGRP external, NM - NEMO

ND - ND Default, NDp - ND Prefix, DCE - Destination, NDr - Redirect

O - OSPF Intra, OI - OSPF Inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2

ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2, l - LISP

OI 11:0:1::1/128 [110/74]
via FE80::A8BB:CCFF:FE00:200, Ethernet0/0

OI 11:0:2::1/128 [110/74]
via FE80::A8BB:CCFF:FE00:200, Ethernet0/0

OI 11:0:3::1/128 [110/74]
via FE80::A8BB:CCFF:FE00:200, Ethernet0/0

OI 12::/64 [110/74]
via FE80::A8BB:CCFF:FE00:200, Ethernet0/0

O 22:0:1::2/128 [110/10]
via FE80::A8BB:CCFF:FE00:200, Ethernet0/0

O 22:0:2::2/128 [110/10]
via FE80::A8BB:CCFF:FE00:200, Ethernet0/0

O 22:0:3::2/128 [110/10]
via FE80::A8BB:CCFF:FE00:200, Ethernet0/0

C 23::/64 [0/0]
via Ethernet0/0, directly connected

L 23::A8BB:CCFF:FE00:300/128 [0/0]
via Ethernet0/0, receive

C 33:0:1::/64 [0/0]
via Loopback1, directly connected

L 33:0:1::3/128 [0/0]
via Loopback1, receive

C 33:0:2::/64 [0/0]
via Loopback2, directly connected

L 33:0:2::3/128 [0/0]
via Loopback2, receive

C 33:0:3::/64 [0/0]
via Loopback3, directly connected

L 33:0:3::3/128 [0/0]
via Loopback3, receive

```
C 34::/64 [0/0]
  via Serial2/0, directly connected
L 34::A8BB:CCFF:FE00:300/128 [0/0]
  via Serial2/0, receive
O 44:0:1::4/128 [110/64]
  via FE80::A8BB:CCFF:FE00:400, Serial2/0
O 44:0:2::4/128 [110/64]
  via FE80::A8BB:CCFF:FE00:400, Serial2/0
O 44:0:3::4/128 [110/64]
  via FE80::A8BB:CCFF:FE00:400, Serial2/0
OE2 50::/64 [110/20]
  via FE80::A8BB:CCFF:FE00:200, Ethernet0/0
L FF00::/8 [0/0]
  via Null0, receive
```

(R3 receives external routes E2 through Not so Stubby Area (NSSA) forwarded by ABR R2 and marked as E2.)