

LAB12: OSPF – IPv6

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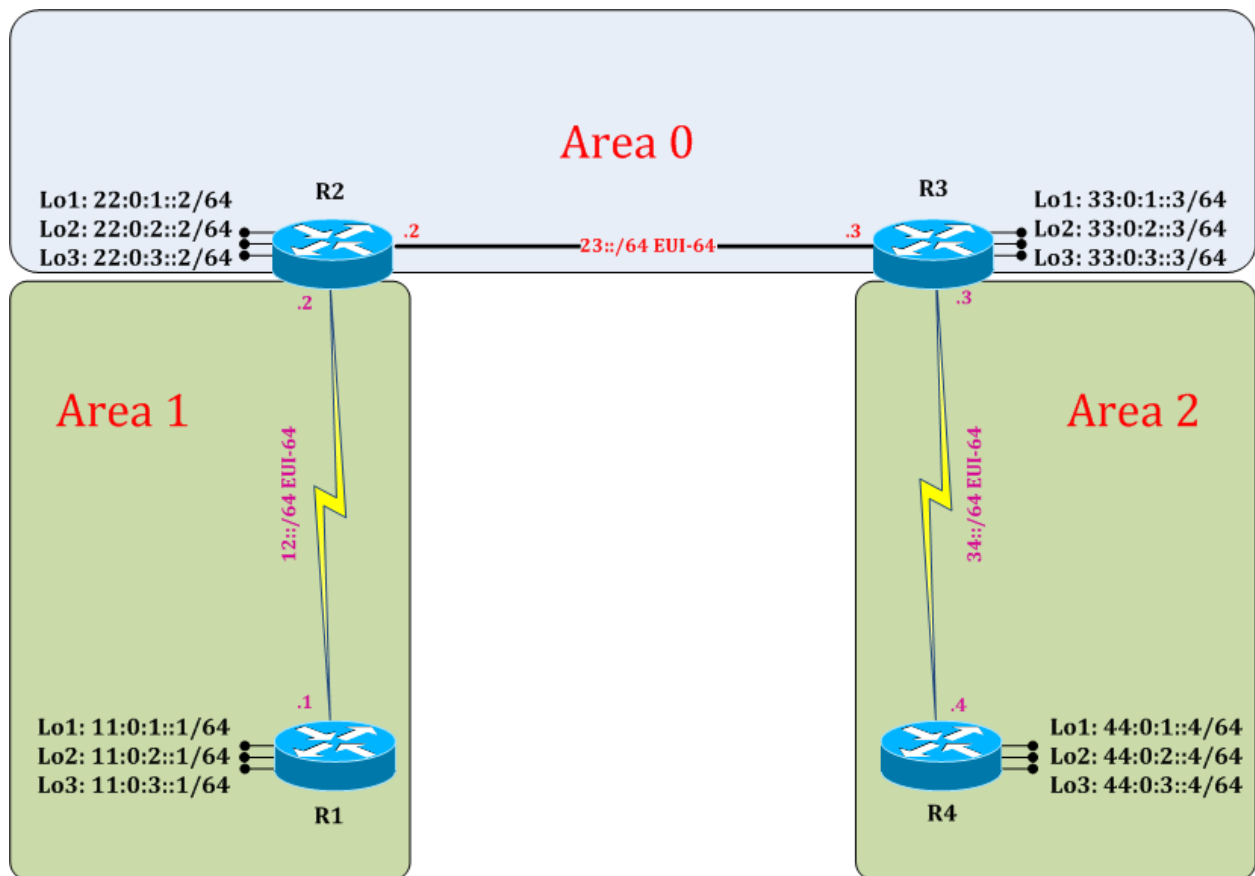
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OSPF: Redistribution

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LAB 12: Diagram

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



LAB 12: IPv6 OSPF Redistribution:

Task 1: Configure IPv6 OSPF Redistribution

Step 1 In the configuration mode of router configure 4 loopbacks with network address in sequence

```
R1:
interface loopback 101
ipv6 address 100:0:1::2/64
interface loopback 102
ipv6 address 100:0:2::2/64
interface loopback 103
ipv6 address 100:0:3::2/64
exit
```

Step 2 Redistribute these connected network in IPv6 OSPF process (External Type 2)

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

! (Redistributed connected will redistribute its connected network. Subnet will allow classless IPv6 routes in OSPF process.)

```
R2#show ipv6 route
```

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

IPv6 Routing Table - default - 25 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

```
OE2 11::/64 [110/20]
  via FE80::A8BB:CCFF:FE00:100, Serial2/0
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 100:0:1::/64 [110/20]
  via FE80::A8BB:CCFF:FE00:100, Serial2/0
OE2 100:0:2::/64 [110/20]
  via FE80::A8BB:CCFF:FE00:100, Serial2/0
OE2 100:0:3::/64 [110/20]
  via FE80::A8BB:CCFF:FE00:100, Serial2/0
L FF00::/8 [0/0]
  via Null0, receive

```

(E2 means External type 2, in which will not change cost after every hop throughout the OSPF.)

Step 3 Redistribute these connected network in OSPF process (External Type 1)

R1:

```
ipv6 router ospf 1
redistribute connected metric-type 1
```

(Redistributed connected will redistribute its connected network. Subnet will allow classless IPv6 routes in OSPF process. Metric type 1 means will redistribute in the form of E1, in which will change cost after every hop.)

R2#show ipv6 route

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

IPv6 Routing Table - default - 25 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

```
OE1 11::/64 [110/84]
  via FE80::A8BB:CCFF:FE00:100, Serial2/0
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
OE1 100:0:1::/64 [110/84]
  via FE80::A8BB:CCFF:FE00:100, Serial2/0
OE1 100:0:2::/64 [110/84]
  via FE80::A8BB:CCFF:FE00:100, Serial2/0
OE1 100:0:3::/64 [110/84]
  via FE80::A8BB:CCFF:FE00:100, Serial2/0
L FF00::/8 [0/0]
  via Null0, receive

```

(E1 means External type 1, in which will change cost after every hop throughout the OSPF.)

Task 2: Verification:

Step 1 Analyze network type as E1 or E2 and its cost of redistribution route in neighbor router

External Type 2:

```
R2#show ipv6 route
```

```

OE2 100:0:1::/64 [110/20]
  via FE80::A8BB:CCFF:FE00:200, Serial2/0
OE2 100:0:2::/64 [110/20]
  via FE80::A8BB:CCFF:FE00:200, Serial2/0
OE2 100:0:3::/64 [110/20]
  via FE80::A8BB:CCFF:FE00:200, Serial2/0

```

```
R3#show ipv6 route
OE2 100:0:1::/64 [110/20]
    via FE80::A8BB:CCFF:FE00:200, Serial2/0
OE2 100:0:2::/64 [110/20]
    via FE80::A8BB:CCFF:FE00:200, Serial2/0
OE2 100:0:3::/64 [110/20]
    via FE80::A8BB:CCFF:FE00:200, Serial2/0
```

(R2 router receives redistributed 100 network with metric (cost) 20 and R3 router also receives redistributed 100 network with metric (cost) 20. Hence External type 2 (E2) cost remains constant after every hop.)

Step 2 Analyze network type as E1 or E2 and its cost of redistribution route in neighbor router

External Type 1:

```
R2#show ipv6 route

OE1 100:0:1::/64 [110/84]
    via FE80::A8BB:CCFF:FE00:200, Serial2/0
OE1 100:0:2::/64 [110/84]
    via FE80::A8BB:CCFF:FE00:200, Serial2/0
OE1 100:0:3::/64 [110/84]
    via FE80::A8BB:CCFF:FE00:200, Serial2/0
```

```
R3#show ipv6 route

OE1 100:0:1::/64 [110/94]
    via FE80::A8BB:CCFF:FE00:200, Ethernet0/0
OE1 100:0:2::/64 [110/94]
    via FE80::A8BB:CCFF:FE00:200, Ethernet0/0
OE1 100:0:3::/64 [110/94]
    via FE80::A8BB:CCFF:FE00:200, Ethernet0/0
```

(R1 router receives redistributed 100 network with metric (cost) 84 and R3 router receives redistributed 100 network with metric (cost) 94. Hence External type 1 (E1) allows to change cost after every hop.)