LAB20: EIGRP – IPv6

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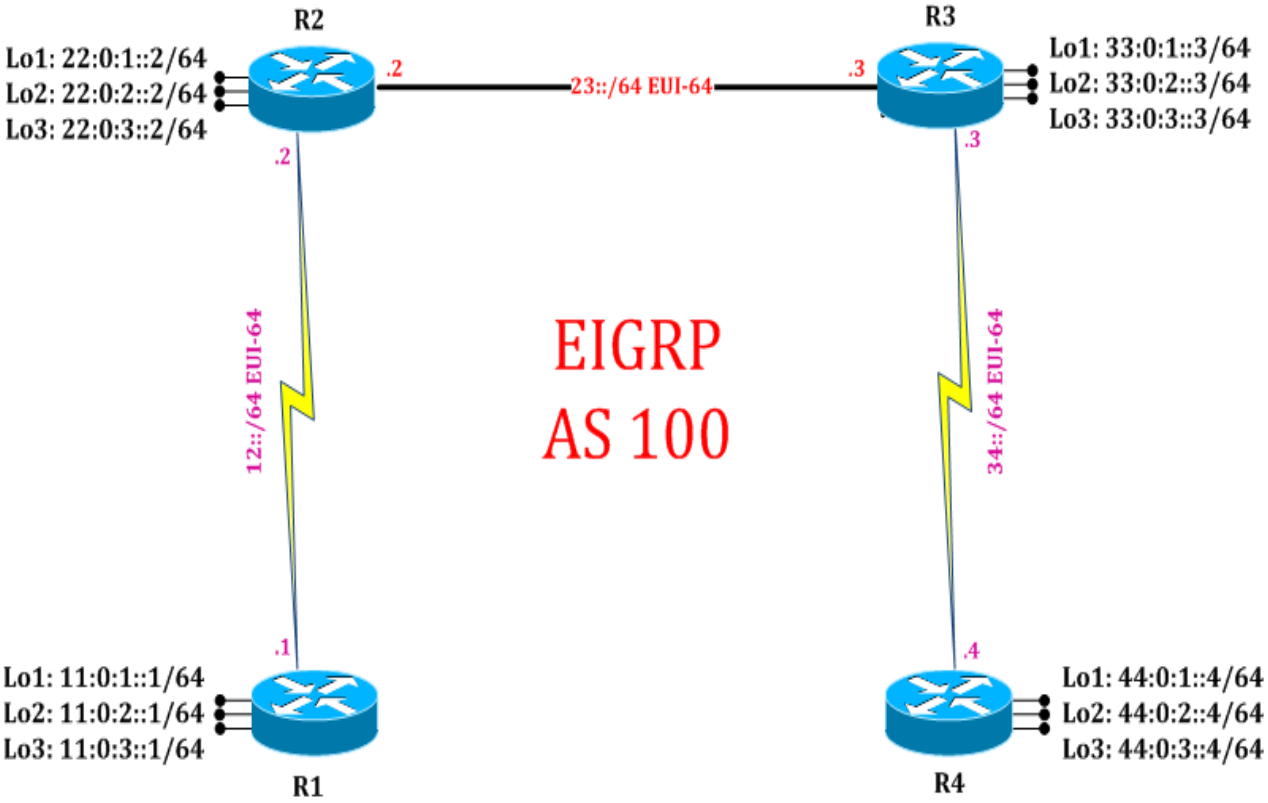
LAB 20: Diagram

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



LAB 20: IPv6 EIGRP Summarization

Task 1: Configure IPv6 EIGRP Summarization

Step 1 In the configuration mode of router configure 4 loopbacks with IPv6 network address in sequence

R1:

```
interface loopback 1
ipv6 address 11:0:0::1/64
exit
interface loopback 2
ipv6 address 11:0:1::1/64
exit
interface loopback 3
ipv6 address 11:0:2::1/64
exit
interface loopback 4
ipv6 address 11:0:3::1/64
exit
```

Step 2 Disable auto-summarization in IPv6 EIGRP Process & verify IPv6 routes on neighbor routing table

R1:

```
ipv6 router eigrp 100
no auto-summary
exit
```

R2#show ipv6 route

```
IPv6 Routing Table - default - 23 entries
Codes: C - Connected, L - Local, S - Static, U - Per-user Static route
       B - BGP, HA - Home Agent, MR - Mobile Router, R - RIP
       IS - ISIS summary, D - EIGRP, EX - EIGRP external, NM - NEMO
       ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2, l - LISP
D   11:0:0::/64 [90/2297856]
     via FE80::A8BB:CCFF:FE00:100, Serial2/0
D   11:0:1::/64 [90/2297856]
     via FE80::A8BB:CCFF:FE00:100, Serial2/0
D   11:0:2::/64 [90/2297856]
     via FE80::A8BB:CCFF:FE00:100, Serial2/0
D   11:0:3::/64 [90/2297856]
     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   22:0:0::/64 [0/0]
     via Loopback1, directly connected
L   22:0:0::2/128 [0/0]
     via Loopback1, 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
D   33:0:0::/64 [90/409600]
     via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
D   33:0:1::/64 [90/409600]
     via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
D   33:0:2::/64 [90/409600]
     via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
D   33:0:3::/64 [90/409600]
     via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
D   34::/64 [90/2195456]
     via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
D   44:0:0::/64 [90/2835456]
     via FE80::A8BB:CCFF:FE00:200, Serial2/0
D   44:0:1::/64 [90/2835456]
     via FE80::A8BB:CCFF:FE00:200, Serial2/0
D   44:0:2::/64 [90/2835456]
     via FE80::A8BB:CCFF:FE00:200, Serial2/0
D   44:0:3::/64 [90/2835456]
     via FE80::A8BB:CCFF:FE00:200, Serial2/0
L   FF00::/8 [0/0]
     via Null0, receive
```

Step 3 Summarize IPv6 EIGRP routes on outgoing interface

R1:
interface serial 2/0
ipv6 summary-address 11::/16
exit

(Summarization is configurable on a per-interface basis in any router within network. Router R1 sends summary of 11 network on interface s2/0.)

Task 2: Verification:

Step 1 Verify receipt of summary route in neighbors IPv6 routing table by following command:

R2#show ipv6 route

IPv6 Routing Table - default - 20 entries
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
D 11::/16 [90/2297856]
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]
L 22:0:3::2/128 [0/0]
via Loopback3, receive
C 22:0:4::/64 [0/0]
via Loopback4, directly connected
L 22:0:4::2/128 [0/0]
via Loopback4, receive
C 23::/64 [0/0]
via Ethernet0/0, directly connected
L 23::A8BB:CCFF:FE00:200/128 [0/0]
via Ethernet0/0, receive
D 33:0:1::/64 [90/409600]
via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
D 33:0:2::/64 [90/409600]

```
    via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
D   33:0:3::/64 [90/409600]
    via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
D   33:0:4::/64 [90/409600]
    via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
D   34::/64 [90/2195456]
    via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
D   44::/16 [90/2323456]
    via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
L   FF00::/8 [0/0]
    via Null0, receive
```

(An IPv6 Summarized route is received from neighbor router.)

Step 2 Verify creation of null interface in IPv6 routing table

```
R1#show ipv6 route

IPv6 Routing Table - default - 23 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

D   11::/16 [5/128256]
    via Null0, directly connected
C   11:0:1::/64 [0/0]
    via Loopback1, directly connected
L   11:0:1::1/128 [0/0]
    via Loopback1, receive
C   11:0:2::/64 [0/0]
    via Loopback2, directly connected
L   11:0:2::1/128 [0/0]
    via Loopback2, receive
C   11:0:3::/64 [0/0]
    via Loopback3, directly connected
L   11:0:3::1/128 [0/0]
    via Loopback3, receive
C   11:0:4::/64 [0/0]
    via Loopback4, directly connected
L   11:0:4::1/128 [0/0]
    via Loopback4, receive
C   12::/64 [0/0]
    via Serial2/0, directly connected
```

```
L   12::A8BB:CCFF:FE00:100/128 [0/0]
     via Serial2/0, receive
D   22:0:1::/64 [90/2297856]
     via FE80::A8BB:CCFF:FE00:200, Serial2/0
D   22:0:2::/64 [90/2297856]
     via FE80::A8BB:CCFF:FE00:200, Serial2/0
D   22:0:3::/64 [90/2297856]
     via FE80::A8BB:CCFF:FE00:200, Serial2/0
D   22:0:4::/64 [90/2297856]
     via FE80::A8BB:CCFF:FE00:200, Serial2/0
D   23::/64 [90/2195456]
     via FE80::A8BB:CCFF:FE00:200, Serial2/0
D   33:0:1::/64 [90/2323456]
     via FE80::A8BB:CCFF:FE00:200, Serial2/0
D   33:0:2::/64 [90/2323456]
     via FE80::A8BB:CCFF:FE00:200, Serial2/0
D   33:0:3::/64 [90/2323456]
     via FE80::A8BB:CCFF:FE00:200, Serial2/0
D   33:0:4::/64 [90/2323456]
     via FE80::A8BB:CCFF:FE00:200, Serial2/0
D   34::/64 [90/2707456]
     via FE80::A8BB:CCFF:FE00:200, Serial2/0
D   44::/16 [90/2835456]
     via FE80::A8BB:CCFF:FE00:200, Serial2/0
L   FF00::/8 [0/0]
     via Null0, receive
```

(When summarization is configured on a router, same router immediately created a routing point to Null 0 for loop prevention.)