LAB17: EIGRP – IPv6

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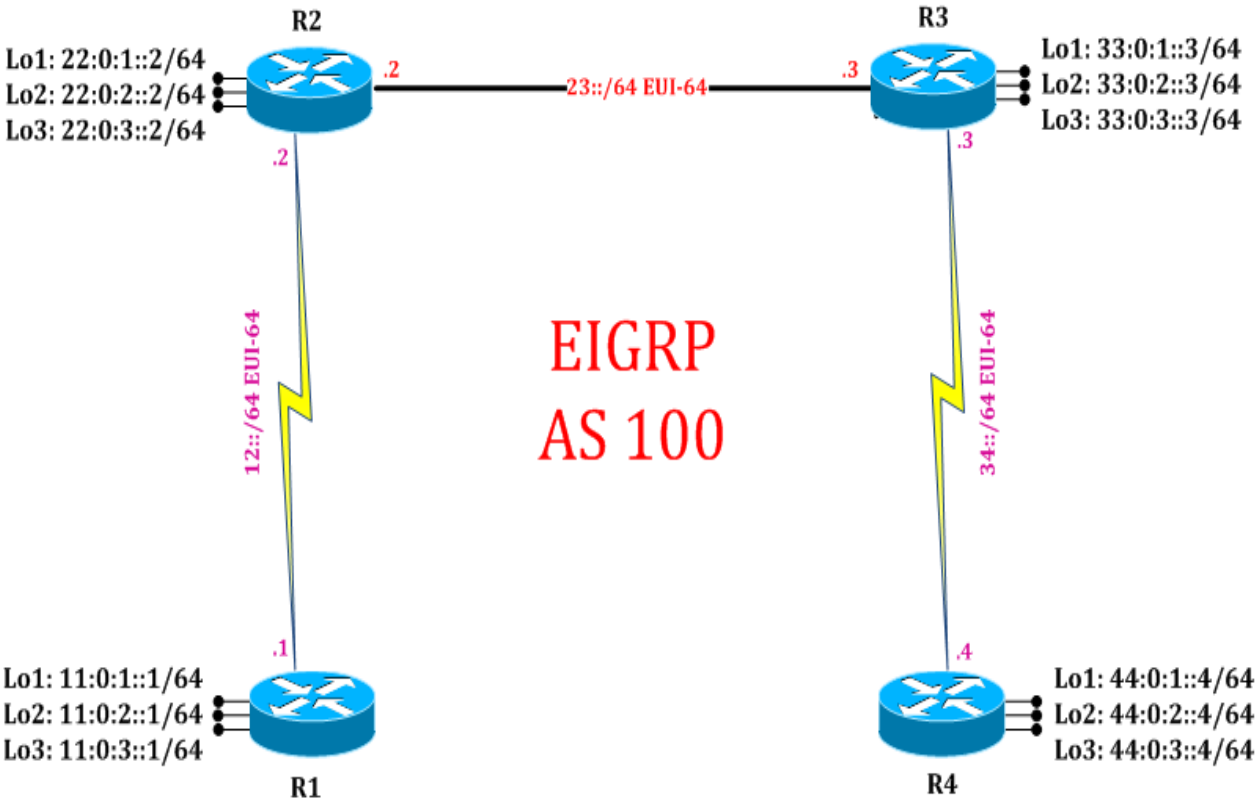
LAB 17: Diagram

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



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LAB 17: Configuring EIGRP for IPv6

Task 1: Configure IPv6 EIGRP process for Autonomous

Step 1 In the configuration mode of router configure IPv6 EIGRP Process and enables EIGRP for IPv6 on a specified interfaces by following command:

R1:

```
ipv6 unicast-routing              ! (To enable IPv6 routing)
ipv6 router eigrp 100             ! (Initiate IPv6 EIGRP process for AS 100)
interface serial 2/0              ! (Send updates on interface)
ipv6 eigrp 100
exit
interface loopback 1
ipv6 eigrp 100
exit
interface loopback 2
ipv6 eigrp 100
exit
interface loopback 3
ipv6 eigrp 100
exit
```

R2:

```
ipv6 unicast-routing
ipv6 router eigrp 100
interface serial 2/0
ipv6 eigrp 100
exit
interface ethernet 0/0
ipv6 eigrp 100
exit
interface loopback 1
ipv6 eigrp 100
exit
interface loopback 2
ipv6 eigrp 100
exit
interface loopback 3
ipv6 eigrp 100
exit
```


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R3:
```
ipv6 unicast-routing
ipv6 router eigrp 100
interface serial 2/0
ipv6 eigrp 100
exit
interface ethernet 0/0
ipv6 eigrp 100
exit
interface loopback 1
ipv6 eigrp 100
exit
interface loopback 2
ipv6 eigrp 100
exit
interface loopback 3
ipv6 eigrp 100
exit
```

R4:
```
ipv6 unicast-routing
ipv6 router eigrp 100
interface serial 2/0
ipv6 eigrp 100
exit
interface loopback 1
ipv6 eigrp 100
exit
interface loopback 2
ipv6 eigrp 100
exit
interface loopback 3
ipv6 eigrp 100
exit
```

Task 2: Verification:

Step 1 Verify IPv6 protocols and its details by following command:

```
R2# show ipv6 protocols
! (Gives details of IPv6 protocols running on router)

IPv6 Routing Protocol is "connected"
IPv6 Routing Protocol is "ND"
IPv6 Routing Protocol is "eigrp 100"
EIGRP-IPv6 Protocol for AS(100)
  Metric weight K1=1, K2=0, K3=1, K4=0, K5=0
  NSF-aware route hold timer is 240
  Router-ID: 22.0.3.2
```


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```
 Topology : 0 (base)
   Active Timer: 3 min
   Distance: internal 90 external 170
   Maximum path: 16
   Maximum hopcount 100
   Maximum metric variance 1
 Interfaces:
   Serial2/0
   Ethernet0/0
   Loopback1
   Loopback2
   Loopback3
 Redistribution:
   None
```

Step 2 Verify IPv6 EIGRP updates are sent on relevant interface

```
R2#show ipv6 eigrp interfaces
! (Gives detailed list of interfaces on which IPv6 EIGRP is sending updates)

EIGRP-IPv6 Interfaces for AS(100)
                        Xmit Queue      PeerQ        Mean   Pacing Time   Multicast    Pending
Interface    Peers      Un/Reliable     Un/Reliable  SRTT   Un/Reliable   Flow Timer   Routes
Se2/0          1            0/0             0/0        12          0/16          68           0
Et0/0          1            0/0             0/0         5           0/2          50           0
Lo1            0            0/0             0/0         0           0/0           0           0
Lo2            0            0/0             0/0         0           0/0           0           0
Lo3            0            0/0             0/0         0           0/0           0           0
```

Step 3 Verify IPv6 EIGRP neighborship:

```
R2#show ipv6 eigrp neighbors
! (Gives details and list of IPv6 EIGRP neighbors)

EIGRP-IPv6 Neighbors for AS(100)
H   Address                 Interface       Hold  Uptime   SRTT   RTO  Q   Seq
                                            (sec)         (ms)       Cnt Num
1   Link-local address:     Et0/0            14   00:20:29  5      100  0   6
    FE80::A8BB:CCFF:FE00:300
0   Link-local address:     Se2/0            11   00:21:31  12     100  0   10
    FE80::A8BB:CCFF:FE00:100
```


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Step 4 Verify IPv6 EIGRP Topology table:

```
R1#show ipv6 eigrp topology
! (Displays the IPv6 EIGRP topology table)

EIGRP-IPv6 Topology Table for AS(100)/ID(22.0.3.2)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status

P 11:0:1::/64, 1 successors, FD is 2297856
        via FE80::A8BB:CCFF:FE00:100 (2297856/128256), Serial2/0
P 11:0:2::/64, 1 successors, FD is 2297856
        via FE80::A8BB:CCFF:FE00:100 (2297856/128256), Serial2/0
P 11:0:3::/64, 1 successors, FD is 2297856
        via FE80::A8BB:CCFF:FE00:100 (2297856/128256), Serial2/0
P 12::/64, 1 successors, FD is 2169856
        via Connected, Serial2/0
P 22:0:1::/64, 1 successors, FD is 128256
        via Connected, Loopback1
P 22:0:2::/64, 1 successors, FD is 128256
        via Connected, Loopback2
P 22:0:3::/64, 1 successors, FD is 128256
        via Connected, Loopback3
P 23::/64, 1 successors, FD is 281600
        via Connected, Ethernet0/0
P 33:0:1::/64, 1 successors, FD is 409600
        via FE80::A8BB:CCFF:FE00:300 (409600/128256), Ethernet0/0
P 33:0:2::/64, 1 successors, FD is 409600
        via FE80::A8BB:CCFF:FE00:300 (409600/128256), Ethernet0/0
P 33:0:3::/64, 1 successors, FD is 409600
        via FE80::A8BB:CCFF:FE00:300 (409600/128256), Ethernet0/0
P 34::/64, 1 successors, FD is 2195456
        via FE80::A8BB:CCFF:FE00:300 (2195456/2169856), Ethernet0/0
P 44:0:1::/64, 1 successors, FD is 2323456
        via FE80::A8BB:CCFF:FE00:300 (2323456/2297856), Ethernet0/0
P 44:0:2::/64, 1 successors, FD is 2323456
        via FE80::A8BB:CCFF:FE00:300 (2323456/2297856), Ethernet0/0
P 44:0:3::/64, 1 successors, FD is 2323456
        via FE80::A8BB:CCFF:FE00:300 (2323456/2297856), Ethernet0/0
```

Step 5 Verify routing table and EIGRP route entries

```
R1#show ipv6 route
! (Shows router's routing table and IPv6 entries)

IPv6 Routing Table - default - 21 entries
Codes: C - Connected, L - Local, S - Static, U - Per-user Static route
       B - BGP, HA - Home Agent, MR - Mobile Router, R - RIP
       ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2, l - LISP
```


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```
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   22:0:1::/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   33:0:1::/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   44:0:1::/64 [90/2323456]
     via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
D   44:0:2::/64 [90/2323456]
     via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
D   44:0:3::/64 [90/2323456]
     via FE80::A8BB:CCFF:FE00:300, Ethernet0/0
L   FF00::/8 [0/0]
     via Null0, receive
```


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