

LAB7: EIGRP – IPv4

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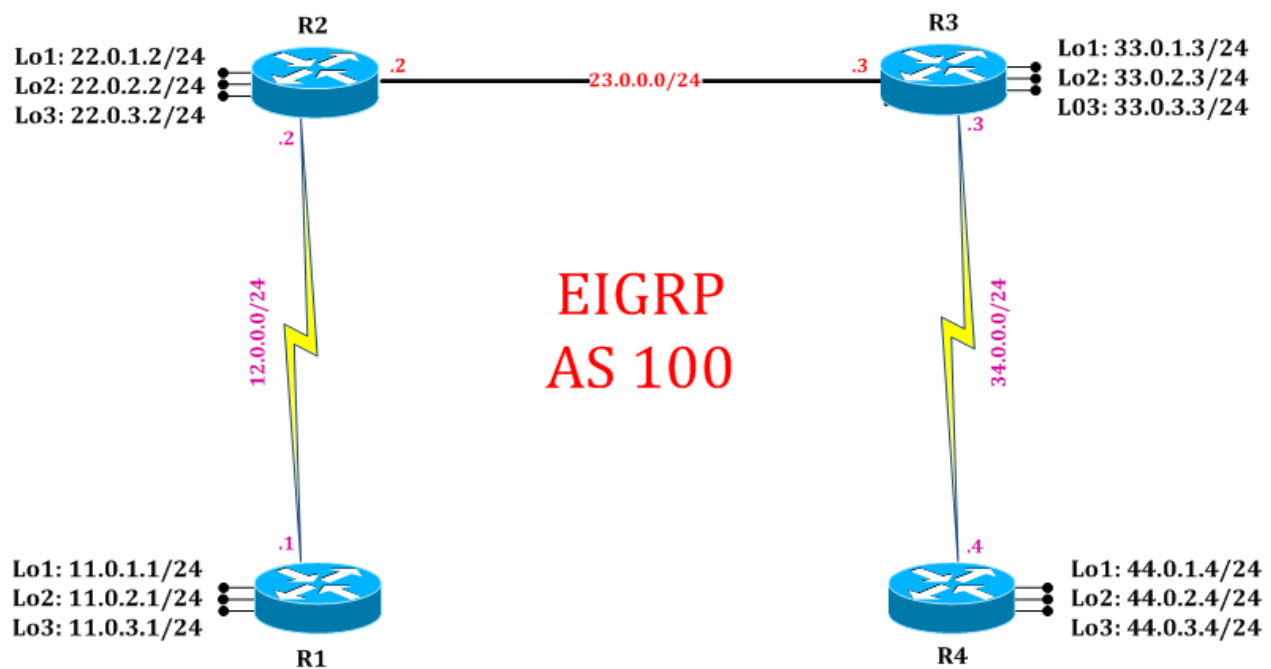
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EIGRP: Summarization

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LAB 7: Diagram

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



LAB 7: EIGRP Summarization

Task 1: Configure IPv4 EIGRP Summarization

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

```
R1:
interface loopback 1
ip address 11.0.0.1 255.255.255.0
exit
interface loopback 2
ip address 11.0.1.1 255.255.255.0
exit
interface loopback 3
ip address 11.0.2.1 255.255.255.0
exit
interface loopback 4
ip address 11.0.3.1 255.255.255.0
exit
```

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

```
R1:
router eigrp 100
no auto-summary
exit
```

```
R2#show ip route
```

! (Shows 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, *M

```
D 11.0.0.0 [90/2297856] via 12.0.0.1, 01:27:34, Serial2/0
D 11.0.1.0 [90/2297856] via 12.0.0.1, 01:27:34, Serial2/0
D 11.0.2.0 [90/2297856] via 12.0.0.1, 01:27:34, Serial2/0
D 11.0.3.0 [90/2297856] via 12.0.0.1, 01:03:44, 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
C 22.0.1.0/24 is directly connected, Loopback1
L 22.0.0.2/32 is directly connected, Loopback1
C 22.0.1.0/24 is directly connected, Loopback2
L 22.0.1.2/32 is directly connected, Loopback2
C 22.0.2.0/24 is directly connected, Loopback3
```

```

L    22.0.2.2/32 is directly connected, Loopback3
C    22.0.3.0/24 is directly connected, Loopback4
L    22.0.3.2/32 is directly connected, Loopback4
    33.0.0.0/24 is subnetted, 4 subnets
D    33.0.0.0 [90/409600] via 23.0.0.3, 01:27:32, Ethernet0/0
D    33.0.1.0 [90/409600] via 23.0.0.3, 01:27:32, Ethernet0/0
D    33.0.2.0 [90/409600] via 23.0.0.3, 01:27:32, Ethernet0/0
D    33.0.3.0 [90/409600] via 23.0.0.3, 00:41:32, Ethernet0/0
    44.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
D    44.0.0.0 [90/2323456] via 23.0.0.3, 00:33:37, Ethernet0/0
D    44.0.1.0 [90/2835456] via 23.0.0.3, 01:10:08, Ethernet0/0
D    44.0.2.0 [90/2835456] via 23.0.0.3, 01:10:08, Ethernet0/0
D    44.0.3.0 [90/2835456] via 23.0.0.3, 01:10:08, Ethernet0/0

```

Step 3 Summarize EIGRP routes outgoing interfaces

```

R1:
interface serial 2/0
ip summary-address eigrp 100 11.0.0.0 255.255.252.0
exit

```

(Summarization is configurable on a per-interface basis in any router within network. Router R1 sends summary of 11.0.0.0 network on interface s2/0)

Task 2: Verification:

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

```

R2#show ip route
! (Shows 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

```

```

lGateway of last resort is not set

```

```

    11.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
D    11.0.0.0/22 [90/2297856] via 12.0.0.1, 00:21:50, 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, 8 subnets, 2 masks

C 22.0.0.0/24 is directly connected, Loopback1

L 22.0.0.2/32 is directly connected, Loopback1

C 22.0.1.0/24 is directly connected, Loopback2

L 22.0.1.2/32 is directly connected, Loopback2

C 22.0.2.0/24 is directly connected, Loopback3

L 22.0.2.2/32 is directly connected, Loopback3

C 22.0.3.0/24 is directly connected, Loopback4

L 22.0.3.2/32 is directly connected, Loopback4

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

33.0.0.0/24 is subnetted, 4 subnets

D 33.0.0.0 [90/409600] via 23.0.0.3, 01:06:04, Ethernet0/0

D 33.0.1.0 [90/409600] via 23.0.0.3, 01:51:52, Ethernet0/0

D 33.0.2.0 [90/409600] via 23.0.0.3, 01:51:52, Ethernet0/0

D 33.0.3.0 [90/409600] via 23.0.0.3, 01:51:52, Ethernet0/0

34.0.0.0/24 is subnetted, 1 subnets

D 34.0.0.0 [90/2195456] via 23.0.0.3, 01:51:52, Ethernet0/0

44.0.0.0/8 is variably subnetted, 2 subnets, 2 masks

D 44.0.0.0 [90/2323456] via 23.0.0.3, 00:33:37, Ethernet0/0

D 44.0.1.0 [90/2835456] via 23.0.0.3, 01:10:08, Ethernet0/0

D 44.0.2.0 [90/2835456] via 23.0.0.3, 01:10:08, Ethernet0/0

D 44.0.3.0 [90/2835456] via 23.0.0.3, 01:10:08, Ethernet0/0

(Summarized routes are received from neighbor router.)

Step 2 Verify creation of null interface in routing table:

R1#show ip route

! (Shows 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

11.0.0.0/8 is variably subnetted, 9 subnets, 3 masks

D 11.0.0.0/22 is a summary, 00:23:54, Null0

C 11.0.0.0/24 is directly connected, Loopback1

L 11.0.0.1/32 is directly connected, Loopback1

```

C    11.0.1.0/24 is directly connected, Loopback2
L    11.0.1.1/32 is directly connected, Loopback2
C    11.0.2.0/24 is directly connected, Loopback3
L    11.0.2.1/32 is directly connected, Loopback3
C    11.0.3.0/24 is directly connected, Loopback4
L    11.0.3.1/32 is directly connected, Loopback4
    12.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C    12.0.0.0/24 is directly connected, Serial2/0
L    12.0.0.1/32 is directly connected, Serial2/0
    22.0.0.0/24 is subnetted, 4 subnets
D    22.0.0.0 [90/2297856] via 12.0.0.2, 01:53:58, Serial2/0
D    22.0.1.0 [90/2297856] via 12.0.0.2, 01:53:58, Serial2/0
D    22.0.2.0 [90/2297856] via 12.0.0.2, 01:53:58, Serial2/0
D    22.0.3.0 [90/2297856] via 12.0.0.2, 01:20:30, Serial2/0
    23.0.0.0/24 is subnetted, 1 subnets
D    23.0.0.0 [90/2195456] via 12.0.0.2, 01:53:58, Serial2/0
    33.0.0.0/24 is subnetted, 4 subnets
D    33.0.0.0 [90/2323456] via 12.0.0.2, 01:53:56, Serial2/0
D    33.0.1.0 [90/2323456] via 12.0.0.2, 01:53:56, Serial2/0
D    33.0.2.0 [90/2323456] via 12.0.0.2, 01:53:56, Serial2/0
D    33.0.3.0 [90/2323456] via 12.0.0.2, 01:08:08, Serial2/0
    34.0.0.0/24 is subnetted, 1 subnets
D    34.0.0.0 [90/2707456] via 12.0.0.2, 01:53:56, Serial2/0
    44.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
D    44.0.0.0 [90/2323456] via 12.0.0.2, 00:33:37, Serial2/0
D    44.0.1.0 [90/2835456] via 12.0.0.2, 01:10:08, Serial2/0
D    44.0.2.0 [90/2835456] via 12.0.0.2, 01:10:08, Serial2/0
D    44.0.3.0 [90/2835456] via 12.0.0.2, 01:10:08, Serial2/0

```

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