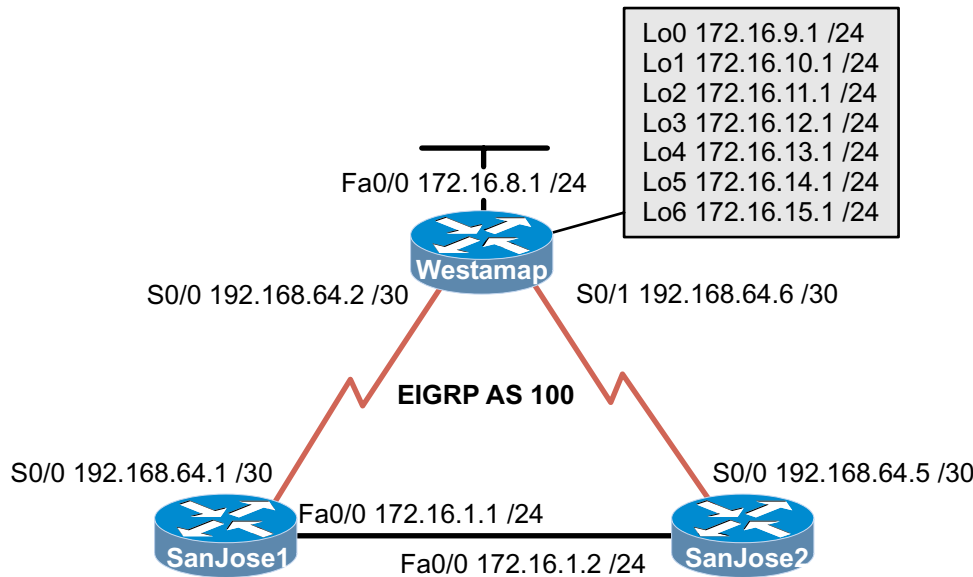


6.7.3 Configuring EIGRP Summarization



Objective

In this lab, you configure EIGRP to test its operation over discontinuous subnets by disabling automatic route summarization. Then you manually configure EIGRP to use specific summary routes.

Scenario

The International Travel Agency uses VLSM to conserve IP addresses. All LANs are addressed using contiguous subnets, but the company would like to examine the effects of discontinuous subnets using EIGRP for future reference. The existence of multiple networks is simulated by loopback interfaces on the Westasman router. The WAN links are addressed using 192.168.64.0 with a 30-bit mask.

Because this scheme creates discontinuous subnets, the default summarization behavior of EIGRP should result in incomplete routing tables. The problem should be resolved by disabling EIGRP's default summarization while maintaining a route summary at the Westasman router with manual route summarization.

Step 1

Build and configure the network according to the diagram. This configuration requires the use of subnet 0, so you might need to enter the `ip subnet- zero` command, depending on which IOS version you use. Configure the Westasman router with seven loopback interfaces using the IP addresses from the diagram. These interfaces simulate the existence of multiple networks behind the Westasman router. Configure EIGRP as indicated for AS 100.

Use `ping` to verify that all serial interfaces can ping each other. *Note:* Until you perform additional configurations, not all networks will appear in each router's routing table.

Step 2

Use `show ip route` to check SanJose1's routing table.

1. Which routes are missing?
-

The SanJose 1 router has installed a "summary route" to network 172.16.0.0 /16 via Null0. EIGRP routers create these summary routes automatically. Because the local router, in this case, the SanJose1 router, has generated the summary, there is no next hop for the route. Thus, the SanJose1 router maps this summary route to its null interface.

2. Look again at SanJose1's routing table. What is the subnet mask for the route to 192.168.64.0?
-

Check Westasman's routing table.

3. Which route is missing?
-

Examine SanJose2's routing table.

4. Which routes are missing?
-

In order to make these routing tables complete, EIGRP cannot automatically summarize routes based on classful boundaries.

Step 3

In this step, you disable EIGRP's automatic summarization feature.

On each router, issue these commands:

```
Westasman(config)#router eigrp 100
Westasman(config-router)#no auto-summary
```

After you issue these commands on all three routers, return to the SanJose1 router and type the `show ip route` command.

1. What has changed in SanJose1's routing table?
-

All three routers should now have complete routing tables.

Step 4

Now that autosummarization is disabled, the International Travel Agency's routers should build complete routing tables. Unfortunately, this would mean that the Westasman router would be advertising eight routes that should be summarized for efficiency. Use EIGRP's manual summarization feature to summarize these addresses.

The Westasman router should be advertising the existence of eight subnets:

```
172.16.8.0
172.16.9.0
172.16.10.0
172.16.11.0
172.16.12.0
172.16.13.0
172.16.14.0
172.16.15.0
```

The first 21 bits of these addresses are the same, so a summary route for all subnets can be created using a /21 prefix (255.255.248.0 in dotted-decimal notation).

Because the Westasman router must advertise the summary route to the SanJose1 and SanJose2 routers, enter the following commands on the Westasman router:

```
Westasman(config)#interface s0/0
Westasman(config-if)#ip summary-address eigrp 100 172.16.8.0
255.255.248.0
Westasman(config-if)#interface s0/1
Westasman(config-if)#ip summary-address eigrp 100 172.16.8.0
255.255.248.0
```

These commands configure EIGRP to advertise summary routes for AS 100 via the serial 0 and 1 interfaces. Verify this configuration by issuing the **show ip protocols** command.

1. Which metric is the Westasman router using for its address summarization?

After you verify manual address summarization on the Westasman router, check the routing tables on the SanJose1 and SanJose2 routers.

2. What has happened in RTA's table since you looked at it in Step 3?

From the SanJose1 or SanJose2 router, verify that you can ping 172.16.8.1.

You should be able to ping 172.16.15.1 from the SanJose1 router.

3. Is there a route to 172.16.15.0 in the SanJose1 router's routing table? Explain.
