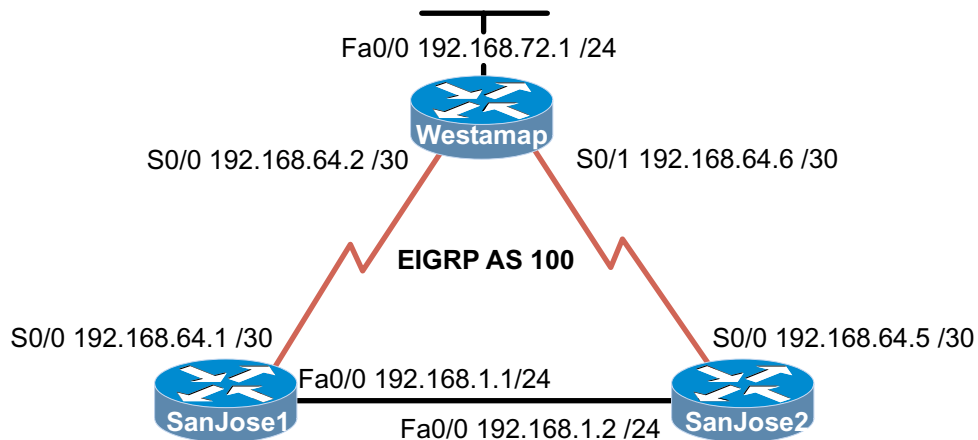


## 6.7.2 Configuring EIGRP Fault Tolerance



### Objective

In this lab, you configure EIGRP over a full-mesh topology so that you can test and observe DUAL replace a successor with a feasible successor after a link failure.

### Scenario

The International Travel Agency wants to run EIGRP on its core, branch, and regional routers. You are asked to configure EIGRP and test its ability to install alternate routes in the event of link failure.

### Step 1

Build and configure the network according to the diagram, configuring EIGRP as indicated for AS 100.

Check each serial interface's bandwidth and change to 1544 if necessary. Use the **show interface** command to verify the configuration.

Use **ping** and **show ip route** to verify your work and test connectivity between all routers.

### Step 2

Verify that EIGRP maintains all routes to destination networks in its topology table.

From the SanJose2 router, issue the **show ip eigrp topology all-links** command:

```
SanJose2#show ip eigrp topology all-links
IP-EIGRP Topology Table for AS(100)/ID(192.168.64.5)

Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - Reply status

P 192.168.72.0/24, 1 successors, FD is 20514560, serno 10
   via 192.168.64.6 (20514560/28160), Serial0/0
   via 192.168.1.1 (20517120/20514560), FastEthernet0/0
P 192.168.64.0/30, 1 successors, FD is 21024000, serno 11
   via 192.168.64.6 (21024000/2169856), Serial0/0
P 192.168.64.0/24, 1 successors, FD is 20512000, serno 4
   via Summary (20512000/0), Null0
   via 192.168.1.1 (20514560/20512000), FastEthernet0/0
P 192.168.64.4/30, 1 successors, FD is 20512000, serno 3
   via Connected, Serial0/0
P 192.168.1.0/24, 0 successors, FD is Inaccessible, serno 0
   via 192.168.64.6 (21026560/2172416), Serial0/0
```

The SanJose2 router's topology table includes two paths to the 192.168.72.0 network. Use the **show ip route** command to determine which of the two is installed in SanJose2's routing table.

1. Which route is installed?  
\_\_\_\_\_
2. According to the output of the **show ip eigrp topology all-links** command, what is the feasible distance (FD) for the route 192.168.72.0?  
\_\_\_\_\_

Both paths to 192.168.72.0 are listed in the topology table with their computed distance and reported distance in parentheses. Computed distance is listed first.

3. What is the reported distance (RD) of the route to 192.168.72.0 via 192.168.1.1?  
\_\_\_\_\_
4. Is this RD greater than, less than, or equal to the route's FD?  
\_\_\_\_\_

### Step 3

You must use the **debug eigrp fsm** command to observe how EIGRP deals with the loss of a successor to a route.

On the SanJose2 router, issue the command **debug eigrp fsm**.

Next, shut down or unplug the SanJose2 router's serial connection. This causes the SanJose2 router to lose its preferred route to 192.168.72.0 via 192.168.64.6.

Examine the **debug eigrp fsm** output for information regarding the route to 192.168.72.0, as shown in this example:

```
0:25:25: %LINK-3-UPDOWN: Interface Serial0/0, changed state to
down
00:25:25: DUAL: Find FS for dest 192.168.72.0/24. FD is 20514560,
RD is 20514560
00:25:25: DUAL:      192.168.64.6 metric 4294967295/4294967295
00:25:25: DUAL:      192.168.1.1 metric 20517120/20514560 not
found Dmin is 20517120
00:25:25: DUAL: Dest 192.168.72.0/24 entering active state.
00:25:25: DUAL: Set reply-status table. Count is 1.
00:25:25: DUAL: Not doing split horizon
00:25:25: DUAL: dual_rcvreply(): 192.168.72.0/24 via 192.168.1.1
metric 20517120/20514560
00:25:25: DUAL: Count is 1
00:25:25: DUAL: Clearing handle 0, count is now 0
00:25:25: DUAL: Freeing reply status table
00:25:25: DUAL: Find FS for dest 192.168.72.0/24. FD is
4294967295, RD is 4294967295 found
00:25:25: DUAL: Removing dest 192.168.72.0/24, nexthop
192.168.64.6
00:25:25: DUAL: RT installed 192.168.72.0/24 via 192.168.1.1
00:25:25: DUAL: Send update about 192.168.72.0/24. Reason: metric
chg
00:25:25: DUAL: Send update about 192.168.72.0/24. Reason: new if
```

The highlighted portion of the sample output shows DUAL attempting to locate a feasible successor (FS) for 192.168.72.0. In this case, DUAL failed to find a feasible successor, and the router entered the active state. After querying its EIGRP neighbors, SanJose2 locates and installs a route to 192.168.72.0/24 via 192.168.1.1.

#### Step 4

Verify that the new route has been installed by using the **show ip route** command.

Bring the SanJose2 router serial interface back up. You will see 192.168.64.6 restored as the preferred route to the 192.168.72.0 network.