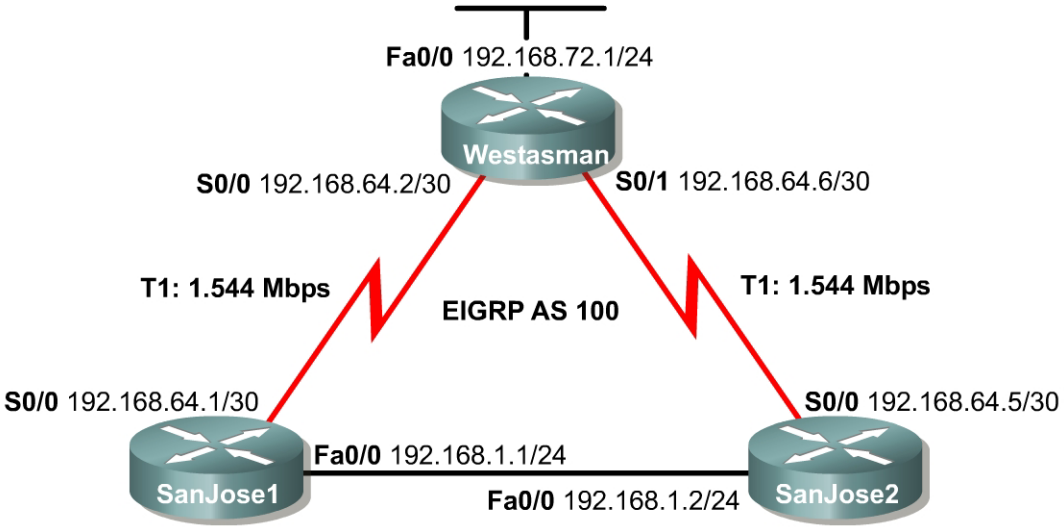
Lab 5.7.2 Configuring EIGRP Fault Tolerance



Objective

In this lab EIGRP will be configured over a full mesh topology and then tested to 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. EIGRP is to be configured and tested for 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. If using the configuration files from the previous lab, be sure to change IP addresses according to the diagram. Also, remove all loopback interfaces.

Set the bandwidth for each serial interface to reflect the diagram. Use the **`show interface`** command to verify the configuration.

Use **`ping`** and **`show ip route`** to verify the configuration 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, s - sia Status

P 192.168.72.0/24, 1 successors, FD is 1889792, serno 53
```



```
         via 192.168.64.6 (2297856/128256), Serial0/0
         via 192.168.1.1 (2300416/2297856), FastEthernet0/0
P 192.168.64.0/30, 1 successors, FD is 2273792, serno 50
         via 192.168.64.6 (2681856/2169856), Serial0/0
P 192.168.64.0/24, 1 successors, FD is 1761792, serno 52
         via Summary (2169856/0), Null0
         via 192.168.1.1 (2172416/2169856), FastEthernet0/0, serno 48
P 192.168.64.4/30, 1 successors, FD is 2169856, serno 51
         via Connected, Serial0/0
P 192.168.1.0/24, 1 successors, FD is 28160, serno 2
         via Connected, FastEthernet0/0
```

The router topology table for SanJose2 includes two paths to the 192.168.72.0 network. Use the **show ip route** to determine which path is installed in the SanJose2 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. The computed distance is listed first.

3. What is the reported distance (RD) of the route to 192.168.72.0 by way of 192.168.1.1?

_____

4. Is this RD greater than, less than, or equal to the FD of the route?

_____

Step 3

To display debugging information about EIGRP feasible successor metrics (FSM) and to observe how EIGRP deals with the loss of a successor to a route, use the **debug eigrp fsm** command.

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

Next, shut down or unplug the router serial connection to SanJose2. This will cause the SanJose2 router to lose its preferred route to 192.168.72.0 by way of 192.168.64.6.

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

```
<output omitted>
11:15:55: DUAL: Destination 192.168.72.0/24
11:15:55: DUAL: Find FS for dest 192.168.72.0/24. FD is 1889792, RD is 2297856
11:15:55: DUAL:         192.168.64.6 metric 4294967295/4294967295
11:15:55: DUAL:         192.168.1.1 metric 2300416/2297856 not found Dmin is 2300416
11:15:55: DUAL: Dest 192.168.72.0/24 entering active state.
11:15:55: DUAL: Set reply-status table. Count is 1.
<output omitted>
11:15:55: DUAL: rcvreply: 192.168.72.0/24 via 192.168.1.1 metric 2300416/2297856
11:15:55: DUAL: reply count is 1
11:15:55: DUAL: Clearing handle 1, count now 0
11:15:55: DUAL: Freeing reply status table
```



```
11:15:55: DUAL: Find FS for dest 192.168.72.0/24. FD is 4294967295, RD is 4294967295
found
11:15:55: DUAL: Removing dest 192.168.72.0/24, nexthop 192.168.64.6
11:15:55: DUAL: RT installed 192.168.72.0/24 via 192.168.1.1
11:15:55: DUAL: Send update about 192.168.72.0/24.  Reason: metric chg
11:15:55: DUAL: Send update about 192.168.72.0/24.  Reason: new if
<output omitted>
```

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 by way of 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. 192.168.64.6 will be restored as the preferred route to the 192.168.72.0 network.

Save the configuration files for the routers.

