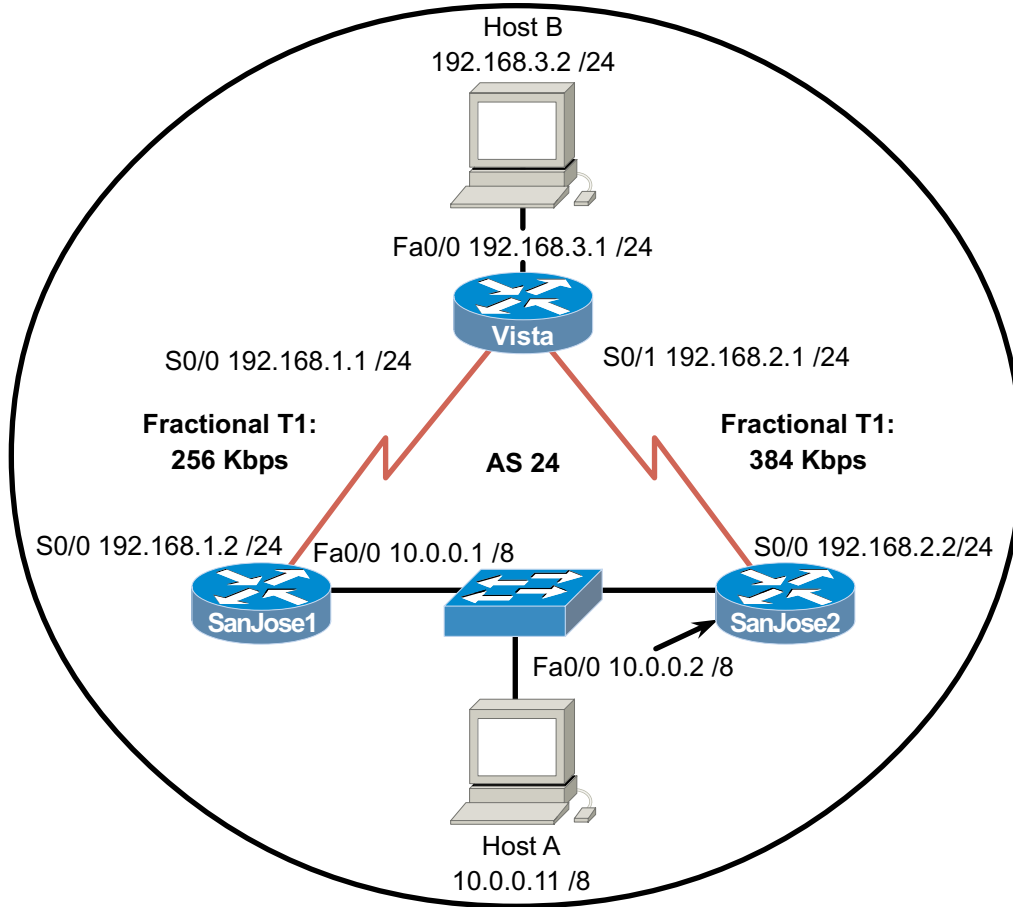


3.6.2: Configuring IGRP



Objective

In this lab, you configure IGRP for unequal-cost load balancing and tune IGRP's timers to improve performance.

Scenario

International Travel Agency (ITA) asked you to implement IGRP in its WAN.

Step 1

Build and configure the network according to the diagram. **Note:** Host A and Host B are not required to complete this lab, but they might be used in testing or as Telnet clients. If used, Host A's gateway may be either SanJose1 router or the SanJose2 router.

On all three routers, configure IGRP for Autonomous System 24, and enable updates on all active interfaces with the **network** command. Configure unequal-cost load balancing using the **variance 5** command (a default value of 1 is used for equal-cost load balancing). Here are some sample commands for SanJose1:

```
SanJose1(config)#router igrp 24
SanJose1(config-router)#network 192.168.1.0
SanJose1(config-router)#network 10.0.0.0
SanJose1(config-router)#variance 5
```

Use **ping** and **show ip route** to verify full connectivity within the network.

Step 2

Because IGRP's metric includes bandwidth in its calculation, you must manually configure the bandwidth of serial interfaces in order for metrics to be accurate. Use the following commands to configure the correct bandwidth settings for each serial interface:

```
SanJose1(config)#interface serial 0/0
SanJose1(config-if)#bandwidth 256

Vista(config)#interface serial 0/0
Vista(config-if)#bandwidth 256
Vista(config-if)#interface serial 0/1
Vista(config-if)#bandwidth 384

SanJose2(config-if)#interface serial 0/0
SanJose2(config-if)#bandwidth 384
```

Use the output from the **show interface** command to verify the correct bandwidth settings. Use the **show ip route** command to verify that the routers are installing two unequal-cost routes to the same destination:

```
Vista#show ip route
<output omitted>

I    10.0.0.0/8 [100/41072] via 192.168.1.2, 00:00:01, Serial0/0
      [100/28051] via 192.168.2.2, 00:00:00, Serial0/1
C    192.168.1.0/24 is directly connected, Serial0/0
C    192.168.2.0/24 is directly connected, Serial0/1
C    192.168.3.0/24 is directly connected, FastEthernet0/0
```

Step 3

On any router, issue the **show ip protocols** command and check IGRP's invalid, holddown, and flush timers.

Note: A route does not become invalid until after 270 seconds and is not flushed from the table until after more than 10 minutes (630 seconds). Also, the maximum hop count is set at 100 by default.

In small networks, it is advised that you adjust IGRP's timers to speed up the convergence process.

Fast IGRP is a specific set of timer settings that result in improved convergence. To configure Fast IGRP, you need to change the IGRP timers as follows: 15 seconds between updates, 45 seconds for route expiration, 0 seconds for holddown, and 60 seconds for flushing the route from the table. As part of this configuration you must disable holddowns completely. This is done so that after the route, for a given network has been removed, a new route for that destination network will be accepted immediately. Finally, you will reduce IGRP's maximum hop count to a number appropriate to ITA's network.

Configure Fast IGRP by issuing the following commands on all three routers:

```
SanJose1(config-router)#timers basic 15 45 0 60
SanJose1(config-router)#no metric holddown
SanJose1(config-router)#metric maximum-hops 10
```

Verify your settings with the **show ip protocols** command.

Step 4

In this step, you test your IGRP timer settings by simulating a link failure.

On SanJose1, enable debug so that any changes to the routing table will be reported to the console:

```
SanJose1#debug ip routing
```

If you are connected via Telnet, you must also enter the **terminal monitor** command so that you can see the logging output.

With your connection to SanJose1 open, log into Vista (on a separate workstation if necessary). On Vista, shut down the FastEthernet interface. This will cause the removal of 192.168.3.0 /24 from Vista's routing table.

```
Vista(config)#interface fastethernet 0/0  
Vista(config-if)#shutdown
```

Use the **show ip route** command to verify that Vista no longer possesses a route to 192.168.3.0 /24.

Return to SanJose1 and issue the **show ip route** command.

Note: The route to 192.168.3.0 is still in SanJose1's table, but it is flagged as possibly down.

1. How long will you have to wait before this route is removed?

To check your answer, wait for the debug output on SanJose1 to report that the route to 192.168.3.0 has been flushed.

2. If SanJose1 had been configured with default timers, how long would it have taken for the route to be flushed?