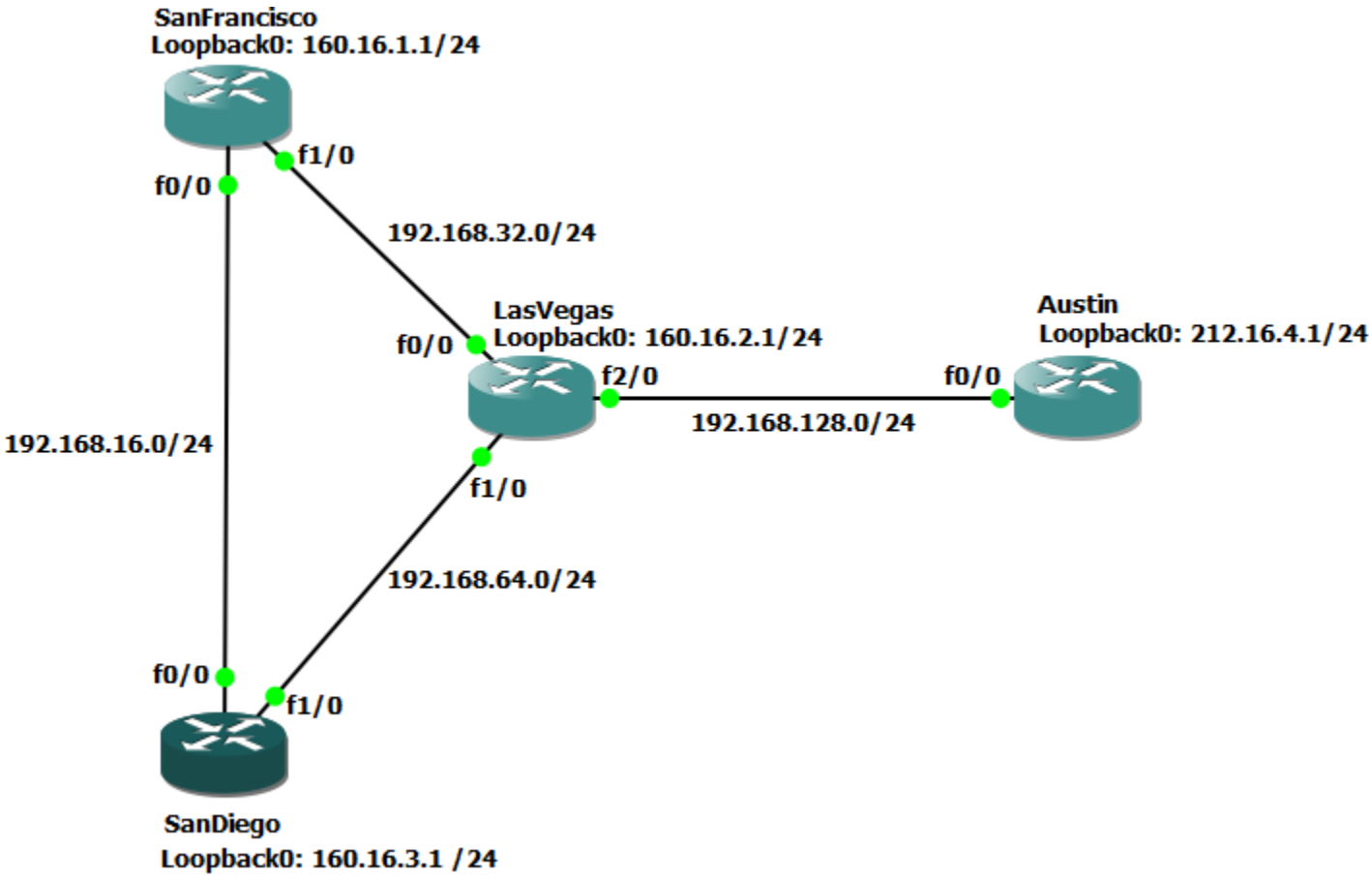
1 EIGRP – Second Part: Overview and Network Topology

To be able to do this study, you should first complete the first part of EIGRP configuration. Briefly, this lab study is written based on the assumption that

- You have configured all the interfaces on each of the four routers
- You have configured EIGRP routing protocol for all routers.



SanFrancisco

- f0/0 192.168.16.1/24
- f1/0 192.168.32.1/24

SanDiego

- f0/0 192.168.16.2/24
- f1/0 192.168.64.2/24

LasVegas

- f0/0 192.168.32.3/24
- f1/0 192.168.64.3/24
- f2/0 192.168.128.3/24

Austin

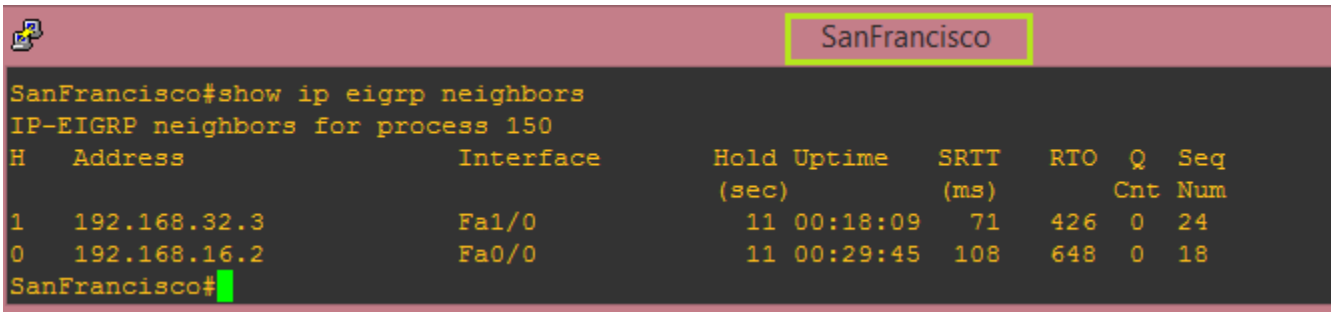
- f0/0 192.168.128.4/24

Interface IP Address List

2 Configuring Routes with EIGRP

To display the neighbors discovered by Enhanced Interior Gateway Routing Protocol (EIGRP), we use the **show ip eigrp neighbors** command in EXEC mode.

```
SanFrancisco# show ip eigrp neighbors
```



Namely, the Router SanFrancisco has 2 neighbors:

- At f1/0, 192.168.32.3 (LasVegas)
- At f0/0, 192.168.16.2 (SanDiego)

Please note that these are the neighbors we expected to see based on the given topology and Interface IP Address List above. Using this command, you can verify if you have configured the EIGRP properly at the first part. If the output of the **show ip eigrp neighbors** command for each router does not match the given Interface IP List, please repeat the steps in the previous lab study and make sure everthing is configured properly.

Please take screen shot of the ENTIRE SCREEN for the Routers SanFrancisco, SanDiego, LasVegas, and Austin; where we can see the result of the **show ip eigrp neighbors** Command. Please DO NOT MAXIMIZE the console screen and allow your background to be seen in the image. Otherwise, your grade for this image will be zero. The file name must be as follows; otherwise, your grade for this image will be zero.

EiNg.SF.FirstName.LastName.png
EiNg.SD.FirstName.LastName.png
EiNg.LV.FirstName.LastName.png
EiNg.Au.FirstName.LastName.png

3 Testing Full EIGRP Connectivity

Please test if the Router SanFrancisco is able to ping the loopbacks of all other routers. For example, this is how the Router SanFrancisco pings the loopback of the Router SanDiego.

```
SanFrancisco# ping 160.16.3.1
```

Please take screen shot of the ENTIRE SCREEN for the router SanFrancisco; where we can see the result of the 3 ping commands. Please DO NOT MAXIMIZE the console screen and allow your background to be seen in the image. Otherwise, your grade for this image will be zero. The file name must be as follows; otherwise, your grade for this image will be zero

P3LB.SF.FirstName.LastName.png

What other routers can the router SanFrancisco ping? Please describe why? You can use the **show ip route** (sh ip route) command to display the routes configured on the Router SanFrancisco.

On all the routers, please use the **no auto-summary** command as shown below. Here is the example for the Router SanFrancisco.

```
SanFrancisco#enable
SanFrancisco#configure terminal
SanFrancisco(config)#router eigrp 150
SanFrancisco(config-router)#no auto-summary
SanFrancisco(config-router)#end
```

After all the routers are configured to be no auto-summary, please test if the Router SanFrancisco is now able to ping the loopbacks of all other routers.

Please take screen shot of the ENTIRE SCREEN for the router SanFrancisco; where we can see the result of the 3 ping commands. Please DO NOT MAXIMIZE the console screen and allow your background to be seen in the image. Otherwise, your grade for this image will be zero. The file name must be as follows; otherwise, your grade for this image will be zero

P3NA.SF.FirstName.LastName.png

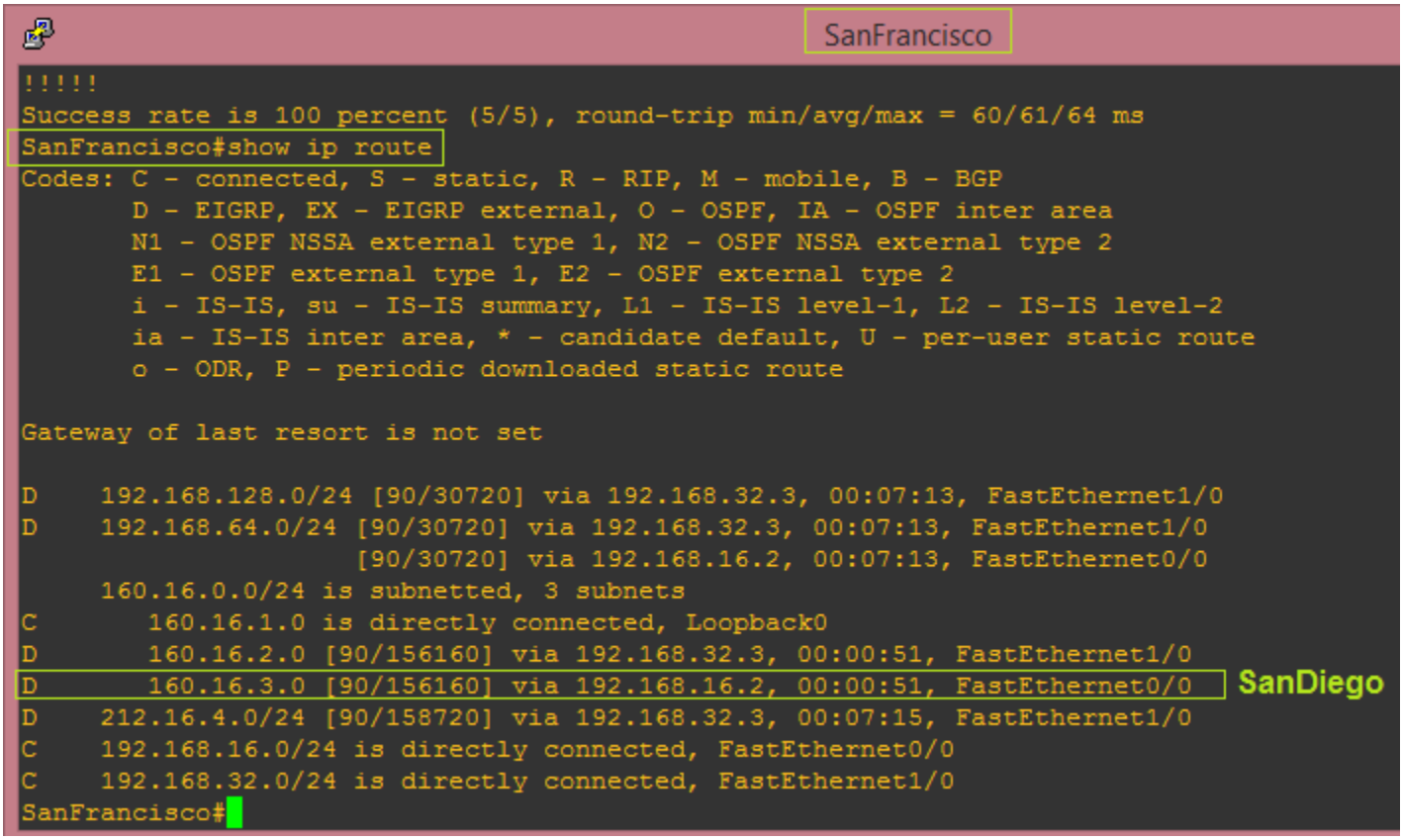
4 Enforcing a Route Change

Let us find out how the Router SanFrancisco communicates with the router SanDiego; namely, which route:

- Direct Link, or
- Via LasVegas

is used by the Router SanFrancisco.

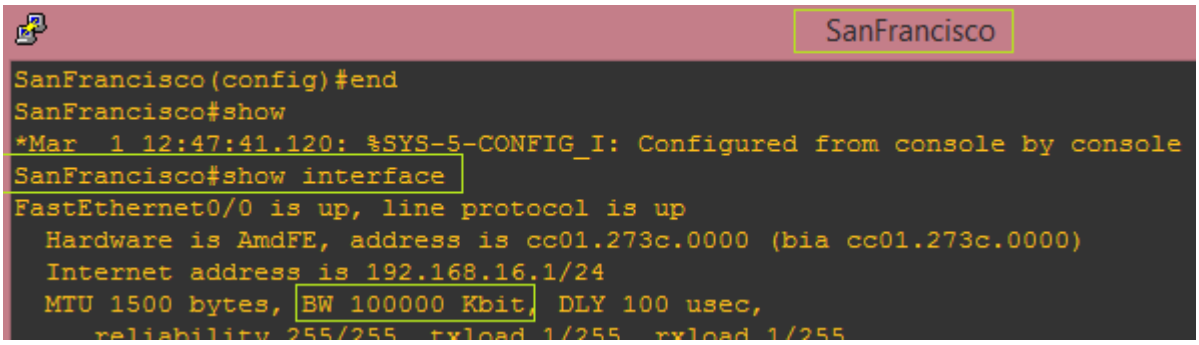
Use the command **show ip route** on the Router SanFrancisco



As we expected, the Router SanFrancisco communicates with the router SanDiego (160.16.3.0 the loopback) through the direct link (FastEtherner0/0), which is the shortest link.

Can we enforce the Router SanFrancisco to use the other route, via the Router LasVegas? If the route via the Router LasVegas becomes faster than the direct link, the Router SanFrancisco will start using it. Let's check the current bandwidth of the direct link as shown below:

```
SanFrancisco#show interface
```



The bandwidth is 100,000 Kbit. You can actually change the bandwidth value. So, if you make the bandwidth of the interface 0/0 low enough, the Router SanFrancisco will start using the Router LasVegas in order to

communicate with SanDiego. To set the inherited and received bandwidth values for an interface, you can use the **bandwidth** command. Informational bandwidth in kilobits per second. Valid values are from 1 to 10,000,000.

```
SanFrancisco#enable
SanFrancisco#configure terminal
SanFrancisco(config)#interface fastethernet 0/0
SanFrancisco(config-if)#bandwidth 50000
```

where 50000 is the new bandwidth. Please change the bandwidth of interface fastethernet 0/0 of the Router SanFrancisco using the commands given above. Then, use the command **show ip route** to see how the Router SanFrancisco now communicates with SanDiego. Please remember that you can use the command **show interface** to make sure that you could properly update the bandwidth. Please note that when the direct path becomes slower, the router may use a longer but faster path.

Please take screen shot of the ENTIRE SCREEN for the router SanFrancisco; where we can see the result of the command **show ip route** after the bandwidth update. Please DO NOT MAXIMIZE the console screen and allow your background to be seen in the image. Otherwise, your grade for this image will be zero. The file name must be as follows; otherwise, your grade for this image will be zero

ShIR.SF.FirstName.LastName.png

5 Grading

Please make the console screen large but DO NOT MAXIMIZE it and allow your background to be seen in the screenshot. Otherwise, your grade for the image will be zero.

The file name must be as follows; otherwise, your grade for the image will be zero.

EiNg.SF.FirstName.LastName.png	5 points
EiNg.SD.FirstName.LastName.png	5 points
EiNg.LV.FirstName.LastName.png	5 points
EiNg.Au.FirstName.LastName.png	5 points
P3LB.SF.FirstName.LastName.png	20 points
What other routers can the router SanFrancisco ping? Please describe why?	20 points
P3NA.SF.FirstName.LastName.png	20 points
ShIR.SF.FirstName.LastName.png	20 points

6 References

[1] A Practical Guide to Advanced Networking, 3rd Edition, Jeffrey S. Beasley and Piyasat Nilkaew, Pearson, 2012, CourseSmart
[2] http://www.cisco.com/c/en/us/support/docs/ip/enhanced-interior-gateway-routing-protocol-eigrp/16406-eigrp-toc.html
[3] http://www.cisco.com/c/en/us/td/docs/security/asa/asa82/configuration/guide/config/route_eigrp.html
[4] http://www.cisco.com/c/en/us/td/docs/ios/12_2/iproute/command/reference/fiprrp_r/1rfeigrp.html
[5] http://www.cisco.com/web/techdoc/dc/reference/cli/nxos/commands/l2/bandwidth__interface.html