TCOM 515
IP Routing
Lab Exercise 4

EIGRP Routing

Name:
Lab Day:
Router Name:
Team Members:

Objective: The purpose of this lab is to become familiar with configuring EIGRP and observe it in the lab. You will physically set-up the equipment, configure the routers, and learn the configuration and operation of EIGRP.

In this lab, you will execute the following tasks:

1. Make physical connectivity between devices
2. Login to the terminal server via telnet
3. Configure the router and its interfaces
4. Configure EIGRP
5. Turn up one additional link

References:

How to use Cisco CLI
Cisco Command Line Overview
Configuring Interfaces
Configuring EIGRP

Equipment Used:

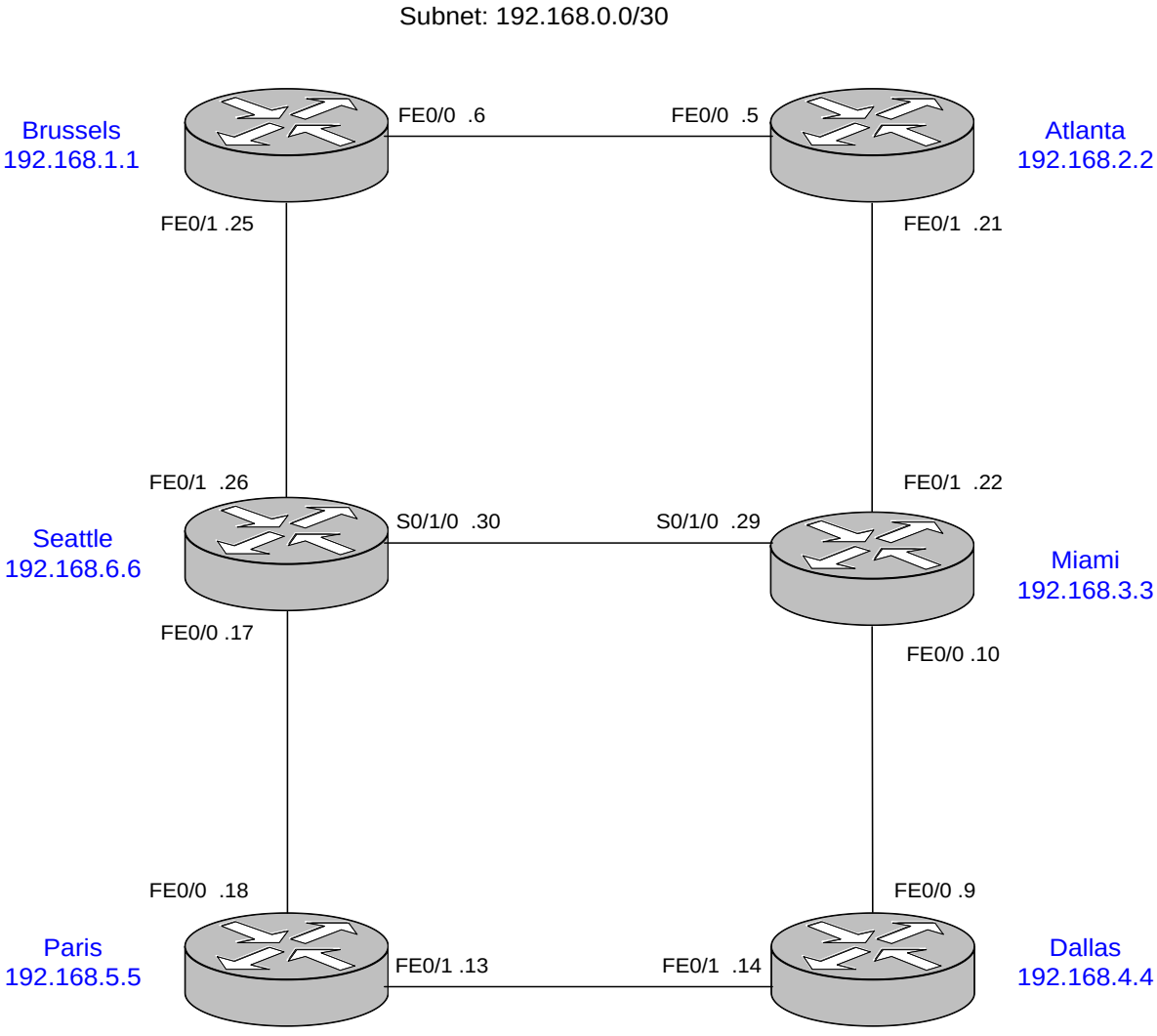
- Cisco router 2511 (terminal server)
- Six 2811 Cisco ISRs
- PC workstations for management

Detailed Lab Steps

1. Make physical connectivity between devices

The first objective of this lab is to create the physical topology required. The physical connectivity is shown below in Figure 1 – Lab 3 Physical Connectivity. Each router will have a FastEthernet connection to two other routers.

Figure 1 Lab 3 Physical Connectivity



2. Login to the router

You must connect to your assigned router through the terminal server.

Connect to the router by choosing corresponding router from the list. Login using the following info,

- User: student
- Password: nocnoc

Once you are on the appropriate router, type the following commands:

- *"enable"*
- *"nocnoc"*
- *"erase start"*
- *"reload"*

When the router reloads you will get the autoinstall menu, type "no" or "ctrl-c" to cancel the autoinstall program. Now you will see a prompt that look like this:

router>

Now enter the following commands:

- *"enable"*
- *"conf t"*
- *"hostname <your router's name>"*
- *"no ip domain lookup"*
- *"line console 0"*
- *"logging synchronous"*

3. Configure the router and its interfaces

Now that you have configured a few basic global parameters, you will configure the physical interfaces for your base topology.

The table below lists the IP addresses for the various router interfaces as they were identified in Figure 1. Identify your interface from the table below:

Router Name	Loopback0	FastEthernet Interface 0/0 and mask	FastEthernet Interface 0/1 and mask
Brussels	192.168.1.1/32	192.168.0.6/30	192.168.0.25/30
Atlanta	192.168.2.2/32	192.168.0.5/30	192.168.0.21/30
Miami	192.168.3.3/32	192.168.0.10/30	192.168.0.22/30
Dallas	192.168.4.4/32	192.168.0.9/30	192.168.0.14/30
Paris	192.168.5.5/32	192.168.0.18/30	192.168.0.13/30
Seattle	192.168.6.6/32	192.168.0.17/30	192.168.0.26/30

To enter configuration mode again,

- Type "*config terminal* "

To enter the interface configuration mode from the global configuration mode,

- Type *"interface <your FastEthernet interface> "*

Now type your FastEthernet description.

- Type *"description Link to <Other Router Name> <Network Address> "*

Now you will assign the IP addresses to your interfaces.

- Type *"ip address <address number from chart> 255.255.255.252 "*

Note that the 255.255.255.252 is the dotted decimal equivalent of the network mask listed a /30 in the chart.

To bring the interface up,

- Type *"no shut "*

Repeat the last 4 commands for your other FastEthernet interface.

Now you will configure your loopback interface, which is logical rather than physical like the FastEthernet interfaces above.

- Type *"interface loop 0 "*

Now you will assign the IP addresses to your loopback0 interface.

- Type *"ip address <address number from chart> 255.255.255.255 "*

To bring the interface up,

Type *"no shut "*

Exit the interface configuration mode and the global configuration mode by typing either "ctrl-z" or "end".

The groups on Seattle and Miami have one last interface to configure but not turn up.

Seattle S0/1/0	Miami S0/1/0
192.168.0.30/30	192.168.0.29/30

Type “show ip interface brief”

3.1 Are each the interfaces you configured up that should be? Which ones?

- Now type “show ip route”

3.2 What does your route table look like, how many entries, what kind of entries?

4. Configure EIGRP

Now you will turn EIGRP on your router. In global configuration mode:

- *"router eigrp1"*
- *"network <ethernet1 network address> 255.255.255.252"*
- *"network <ethernet2 network address> 255.255.255.252"*
- *"network <loopback network address> 255.255.255.255"*
- *"no auto-summary"*

Note: Older routers do not need the subnet mask

Do not turn up EIGRP on the link between Seattle and Miami (S0/1/0)!

Here is an example configuration from Atlanta router,
router eigrp 1
network 192.168.0.4 255.255.255.252
network 192.168.0.20 255.255.255.252
network 192.168.2.2 255.255.255.255
no auto-summary

Look at these show commands on your router and use the output to answer the questions.

- *"show IP route"*
- *"show IP route <network address>"*
- *"show IP protocol"*
- *"show IP EIGRP neighbors"*
- *"show IP EIGRP topology"*
- *"show IP EIGRP topology <network address> <subnet mask>"*

Make sure all groups have EIGRP configured and all IP subnets are reachable before answering the questions.

4.1 How many entries are now visible in the IP route table? How has the table changed from section 3?
4.2 Who are your EIGRP neighbors?
4.3 Take an entry from the topology table and decipher each part of it.
4.4 Take one EIGRP route entry from the IP route table and decipher each part of it.
4.5 What are the two types of EIGRP routes and their administrative distances?

Now if you are on Paris, Seattle or Brussels, traceroute to Miami's loopback. If you are on Dallas, Miami or Atlanta, traceroute to Seattle's loopback.

- Type "traceroute X.X.X.X"

4.7 What is the feasible distance to your destination? How is the feasible distance usually calculated?
4.8 What is/are your path(s)?

Stop here and wait for all the groups to complete section 4.

5. Turn up one additional link

Seattle and Miami should now turn up their third link on interface S0/1/0.

Make sure all IP subnets are reachable before using the show commands and outputs to answer the questions.

- *"show IP route"*
- *"show IP route <network address>"*
- *"show IP protocols"*
- *"show IP EIGRP neighbors"*
- *"show IP EIGRP topology*
- *"show IP EIGRP topology <network address> <subnet mask>"*

5.1 How has the IP routing table changed from section 4? Any new network entries?
5.2 What command(s) was used to turn up EIGRP on the additional link?

Now if you are on Paris, Seattle or Brussels, traceroute to Miami's loopback. If you are on Dallas, Miami or Atlanta, traceroute to Seattle's loopback. Save the output.

5.3 Has the feasible distance and path to your destination changed? If so, how?
5.4 *What is/are your path(s)? Has this changed?*

Stop here and wait for all the groups to complete section 5.

6. Power down the router and undo all cabling.

Lab Questions: Answer these questions in addition to all questions contained within the lab itself. **2-3 sentence answers** should suffice.

1. *What was the most important piece of knowledge you took away from this lab?*
2. *What new command did you find most useful and why?*
3. *Identify at least one problem you experienced in this lab. How did you figure out the problem? How did you resolve it?*

We used "no auto-summary" to configure EIGRP in this lab. What is the purpose of this command? Any potential issues on the network if this command was not used?