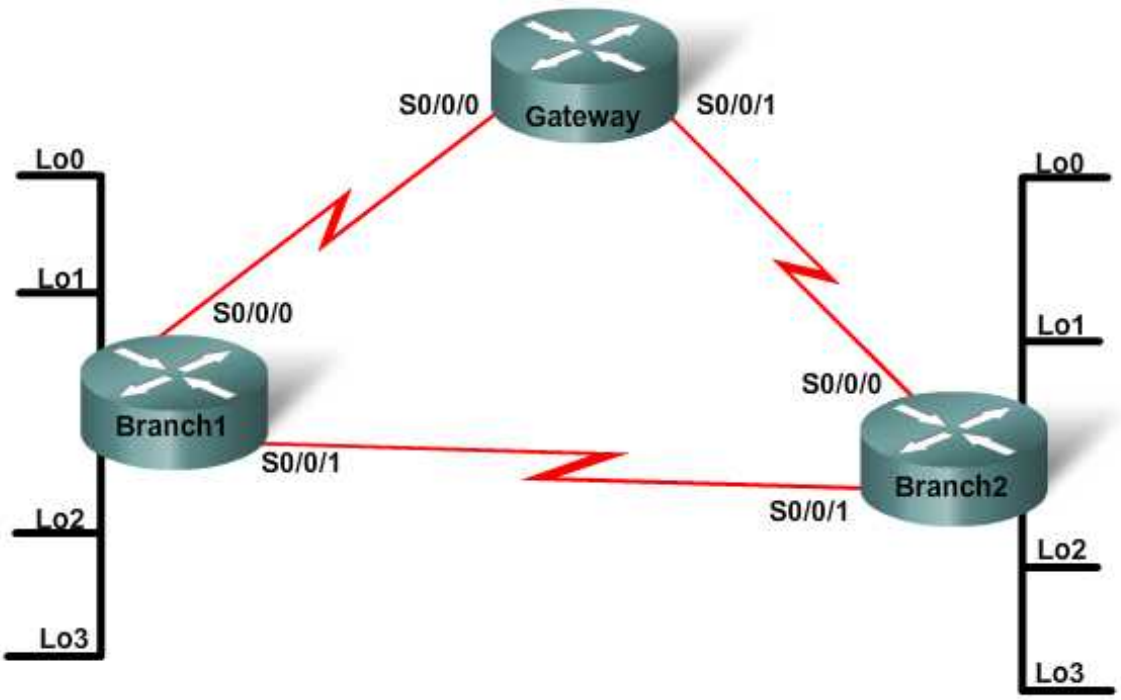
# Lab 5.4.1 Implementing EIGRP




| Device | Host Name | Loopback Interfaces / Subnet Masks | Interface S0/0/0 / Subnet Mask | Serial Interface Type | Interface S0/0/1 / Subnet Mask | Serial Interface Type | Enable Secret Password | vty, Console Password |
|---|---|---|---|---|---|---|---|---|
| Router1 | Gateway | N/A | 10.0.0.1/30 | DCE | 10.0.0.5/30 | DCE | class | cisco |
| Router2 | Branch1 | Lo0<br>172.16.0.1/24<br>Lo1<br>172.16.1.1/24<br>Lo2<br>172.16.2.1/24<br>Lo3<br>172.16.3.1/24 | 10.0.0.2/30 | DTE | 10.0.0.9/30 | DCE | class | cisco |
| Router3 | Branch2 | Lo0<br>172.17.0.1/24<br>Lo1<br>172.17.1.1/24<br>Lo2<br>172.17.2.1/24<br>Lo3<br>172.17.3.1/24 | 10.0.0.6/30 | DTE | 10.0.0.10/30 | DTE | class | cisco |

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## Objectives

- Configure a three-router topology with EIGRP and MD5 authentication.
- Verify EIGRP configuration and route table population.

## Background / Preparation

This lab presents a three router corporate network using variably subnetted private IP addressing. On Branch1and Branch2, loopback interfaces simulate LANs attached to those routers. The design creates discontiguous subnets on the routers which will be "hidden" when EIGRP is configured with automatic summarization as the default. You will enable EIGRP MD5 authentication to protect your routing updates.

The following resources are required:

• Three Cisco 1841 routers or comparable routers

• At least one PC with a terminal emulation program

• At least one RJ-45-to-DB-9 connector console cable

• Three serial cables to connect R1 to both R2 and R3, and to connect R2 to R3

**NOTE:** Make sure that the routers and the switches have been erased and have no startup configurations. Instructions for erasing both switch and router are provided in the Lab Manual, located on Academy Connection in the Tools section.

**NOTE: SDM Enabled Routers** – If the startup-config is erased in an SDM enabled router, SDM will no longer come up by default when the router is restarted. It will be necessary to build a basic router configuration using IOS commands. The steps provided in this lab use IOS commands and do not require the use of SDM. If you wish to use SDM, refer to the instructions in the Lab Manual, located on the Academy Connection in the Tools section or contact your instructor if necessary.

### Step 1: Connect the equipment

a. Connect Router1 to Router2 and Router3 using serial cables.

b. Connect Router2 to Router3 using serial cables.

c. Connect a PC with a console cable to perform configurations on the routers.

### Step 2: Perform basic configurations on the routers

a. Establish a console session with Router1 and configure hostname, passwords, and interfaces as described in the table. Save the configuration.

b. Establish a console session with Router2 and perform a similar configuration, using the addresses and other information from the table. Save the configuration.

c. Establish a console session with Router3. Configure hostname, passwords, and interfaces according to the table. Save the configuration.

### Step 3: Configure EIGRP routing with default commands

a. On Gateway, configure EIGRP as the routing protocol with an autonomous system number of 100, and advertise the appropriate networks.

```
Gateway(config)#router eigrp 100
Gateway(config-router)#network 10.0.0.0
Gateway(config-router)#network 10.0.0.4
```

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Predict: How will EIGRP report these subnets in the routing table?

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b. On Branch1, configure EIGRP as the routing protocol with an autonomous system number of 100, and advertise the appropriate networks:

```
Branch1(config)#router eigrp 100
Branch1(config-router)#network 10.0.0.0
Branch1(config-router)#network 10.0.0.8
Branch1(config-router)#network 172.16.0.0
Branch1(config-router)#network 172.16.1.0
Branch1(config-router)#network 172.16.2.0
Branch1(config-router)#network 172.16.3.0
```

c. Perform a similar configuration on Branch2, using EIGRP 100 and advertising the appropriate networks.

### Step 4: Configure MD5 Authentication

a. Create a keychain named **discchain.**

b. Configure a key 1 that has a key string of **san-fran**.

c. Enable the Branch1 router to utilize EIGRP MD5 authentication with each of the EIGRP neighbors and to use the keychain **discchain**.

```
Branch1(config)#key chain discchain
Branch1(config-keychain)#key 1
Branch1(config-keychain-key)#key-string san-fran
Branch1(config-keychain-key)#end
Branch1#configure terminal
Branch1(config)#interface serial 0/0/0
Branch1(config-if)#ip authentication mode eigrp 100 md5
Branch1(config-if)#ip authentication key-chain eigrp 100 discchain
Branch1(config-if)#exit
Branch1(config)#interface serial 0/0/1
Branch1(config-if)#ip authentication mode eigrp 100 md5
Branch1(config-if)#ip authentication key-chain eigrp 100 discchain
```

d. Repeat the MD5 authentication configuration for the Branch2 and Gateway routers.

e. View the contents of the Gateway, Branch1, and Branch2 routing tables to ensure all routing updates are still being accepted.

```
Gateway#show ip route
```

List the routes that are shown:

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## Step 5: Reflection

a. What is the importance of enabling authentication on the routing updates?

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