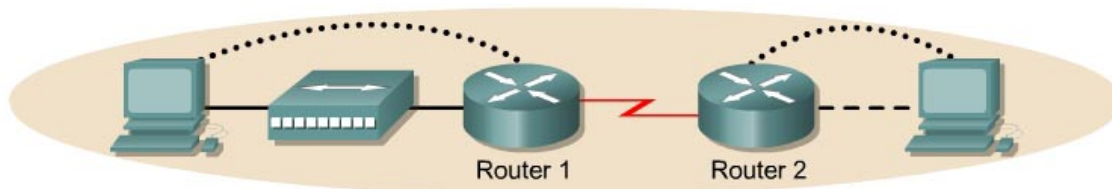


### Lab 3.2.3 Verifying Basic EIGRP Configuration – 2500 Series



Router Designation	Router Name	Enable Secret Password	Enable, VTY, and Console Passwords	Routing Protocol	Network Statements
Router 1	Paris	class	cisco	EIGRP	192.168.3.0 192.168.2.0
Router 2	Warsaw	class	cisco	EIGRP	192.168.1.0 192.168.2.0

Router Designation	IP Host Table Entry	FastEthernet 0 Address/Subnet Mask	Interface Type Serial 0	Serial 0 Address/Subnet Mask	Loopback 0 Address/Subnet Mask
Router 1	Warsaw	192.168.3.1/24	DCE	192.168.2.1/30	192.168.0.2/24
Router 2	Paris	192.168.1.1/24	DTE	192.168.2.2/30	No address

Note: The IP Host Table Entry column contents indicate the name(s) of the other router(s) in the IP host table.

Straight-through cable		Console (Rollover)	
Serial cable		Crossover cable	

**Note to instructor:** In the graphic above, 192.168.0.0 will need to be added to network statments for Router 1.

#### Objective

- Setup an IP addressing scheme for the network.
- Configure and verify Enhanced Interior Gateway Routing Protocol (EIGRP) routing.

#### Background/Preparation

Cable a network similar to the one shown in the diagram. Any router that meets the interface requirements displayed on the above diagram may be used. For example, router series 800, 1600, 1700, 2500, and 2600 or any such combination can be used. Please refer to the chart at the end of the lab to correctly identify the interface identifiers to be used based on the equipment in the lab. The configuration output used in this lab is produced from 1721 series routers. Any other router used may produce slightly different output. Perform the following steps on each router unless specifically instructed otherwise.

Start a HyperTerminal session.

**Note:** Go to the erase and reload instructions at the end of this lab. Perform those steps on all routers in this lab assignment before continuing.

## Step 1 Configure the routers

On the routers, enter the global configuration mode and configure the hostname as shown in the chart. Then configure the console, virtual terminal and enable passwords. Next configure the interfaces according to the chart. Finally, configure the IP hostnames. Do not configure the routing protocol until specifically told to. If there are any problems configuring the router basics, refer to the lab “Review of Basic Router configuration with RIP”.

### Router1

```
Router>enable
Router#configure terminal
Router(config)#hostname PARIS

PARIS(config)#enable secret class
PARIS(config)#line console 0
PARIS(config-line)#password cisco
PARIS(config-line)#login
PARIS(config-line)#line vty 0 4
PARIS(config-line)#password cisco
PARIS(config-line)#login
PARIS(config-line)#exit
PARIS(config)#interface serial 0
PARIS(config-if)#ip address 192.168.2.1 255.255.255.252
PARIS(config-if)#clock rate 64000
PARIS(config-if)#no shutdown
PARIS(config-if)#exit
PARIS(config-if)#interface loopback 0
PARIS(config-if)#ip address 192.168.0.2 255.255.255.0
PARIS(config-if)#exit
PARIS(config)#interface ethernet 0
PARIS(config-if)#ip address 192.168.3.1 255.255.255.0
PARIS(config-if)#no shutdown
PARIS(config-if)#exit
PARIS(config)#ip host WARSAW 192.168.2.2 192.168.1.1
```

### Router2

```
Router>enable
Router#configure terminal
Router(config)#hostname WARSAW

WARSAW(config)#enable secret class
WARSAW(config)#line console 0
WARSAW(config-line)#password cisco
WARSAW(config-line)#login
WARSAW(config-line)#line vty 0 4
WARSAW(config-line)#password cisco
WARSAW(config-line)#login
WARSAW(config-line)#exit
WARSAW(config)#interface serial 0
WARSAW(config-if)#ip address 192.168.2.2 255.255.255.252
WARSAW(config-if)#no shutdown
WARSAW(config-if)#exit
WARSAW(config)#interface ethernet 0
WARSAW(config-if)#ip address 192.168.1.1 255.255.255.0
WARSAW(config-if)#no shutdown
WARSAW(config-if)#exit
WARSAW(config)#ip host PARIS 192.168.2.1 192.168.3.1
```

## Step 2 Save the configuration information from the privileged EXEC command mode

```
Paris#copy running-config startup-config
Destination filename [startup-config]? [Enter]
```

### Step 3 Configure the hosts with the proper IP address, subnet mask and default gateway

- Each workstation should be able to ping the attached router. Troubleshoot as necessary. Remember to assign a specific IP address and default gateway to the workstation. If running Windows 98, check by using **Start > Run > winipcfg**. If running Windows 2000, check by using the **ipconfig** command in a DOS window.
- At this point the workstations will not be able to communicate with each other. The following steps will demonstrate the process required to get communication working using EIGRP as the routing protocol.

```
Host connected to router Paris
IP Address:      192.168.3.2
Subnet mask:     255.255.255.0
Default gateway: 192.168.3.1
```

```
Host connected to router Warsaw
IP Address:      192.168.1.2
Subnet mask:     255.255.255.0
Default gateway: 192.168.1.1
```

### Step 4 View the routers configuration and interface information

- At the privileged EXEC mode prompt type:  
  
Paris#**show running-config**
- Using the **show ip interface brief** command, check the status of each interface.
- What is the state of the interfaces on each router?

Paris:

Ethernet 0: Up

Serial 0: Up

Warsaw:

Ethernet 0: Up

Serial 0: Up

- Ping from one of the connected serial interfaces to the other.
- What the ping successful? Yes
- If the ping was not successful, troubleshoot the routers configuration until the ping is successful.

### Step 5 Configure EIGRP routing on router Paris

- Enable the EIGRP routing process on Paris, and configure the networks it will advertise. Use EIGRP autonomous system number 101.

```
Paris(config)#router eigrp 101
Paris(config-router)#network 192.168.3.0
Paris(config-router)#network 192.168.2.0
Paris(config-router)#network 192.168.0.0
```

```
Paris(config-router)#end
```

- b. Show the routing table for the Paris router.

```
Paris#show ip route
```

- c. Are there any EIGRP entries in the routing table? No
- d. Why? EIGRP is not configured on Warsaw

### Step 6 Configure EIGRP routing on router Warsaw

- a. Enable the EIGRP routing process on Warsaw, and configure the networks it will advertise. Use EIGRP autonomous system number 101.

```
Warsaw(config)#router eigrp 101
Warsaw(config-router)#network 192.168.2.0
Warsaw(config-router)#network 192.168.1.0
Warsaw(config-router)#end
```

- b. Show the routing table for the Warsaw router.

```
Warsaw#show ip route
```

- c. Are there any EIGRP entries in the routing table now? Yes
- d. What is the address type in the EIGRP 192.168.2.0 route? C, Directly connected
- e. What does the D mean in the first column of the routing table? The route was learned via EIGRP.

### Step 7 Show EIGRP neighbors

- a. From the Paris router show any neighbors connected using the `show ip eigrp neighbors` command at the privileged EXEC mode prompt.
- b. Are any neighbors shown? Yes

### Step 8 Test network connectivity

- a. Ping the Paris host from the Warsaw host. Was it successful? Yes
- b. If not troubleshoot as necessary.

### Step 9 View the topology table

- a. To view the topology table, issue the `show ip eigrp topology all-links` command.
- b. How many routes are in passive mode? 3
- c. To view more specific information about a topology table entry, use an IP address with this command:

```
Paris#show ip eigrp topology 192.168.1.0
```

- d. Based on the output of this command, does it tell what external protocol originated this route to 192.168.2.0? Yes
- e. Does it tell which router originated the route? Yes

- f. Finally, use `show` commands to view key EIGRP statistics. On the Paris router, issue the `show ip eigrp traffic` command.
- g. How many hello packets has the Paris router received? Answers will vary.
- h. How many has it sent? Answers will vary.

Once the previous steps are completed, log off by typing `exit`, and turn the router off. Then remove and store the cables and adapter.

## Erasing and reloading the router

Enter into the privileged EXEC mode by typing **enable**.

If prompted for a password, enter **class**. If that does not work, ask the instructor for assistance.

```
Router>enable
```

At the privileged EXEC mode, enter the command **erase startup-config**.

```
Router#erase startup-config
```

The responding line prompt will be:

```
Erasing the nvram filesystem will remove all files! Continue?  
[confirm]
```

Press **Enter** to confirm.

The response should be:

```
Erase of nvram: complete
```

Now at the privileged EXEC mode, enter the command **reload**.

```
Router#reload
```

The responding line prompt will be:

```
System configuration has been modified. Save? [yes/no]:
```

Type **n** and then press **Enter**.

The responding line prompt will be:

```
Proceed with reload? [confirm]
```

Press **Enter** to confirm.

In the first line of the response will be:

```
Reload requested by console.
```

After the router has reloaded the line prompt will be:

```
Would you like to enter the initial configuration dialog? [yes/no]:
```

Type **n** and then press **Enter**.

The responding line prompt will be:

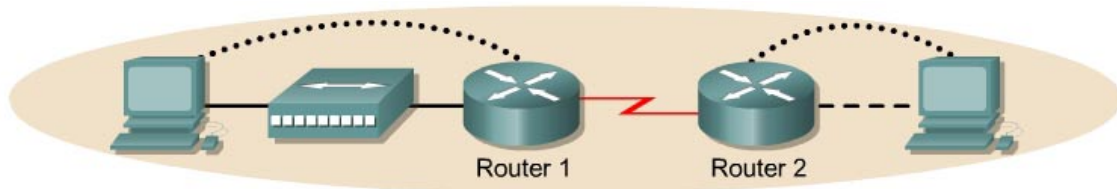
```
Press RETURN to get started!
```

Press **Enter**.

Now the router is ready for the assigned lab to be performed.

Router Interface Summary				
Router Model	Ethernet Interface #1	Ethernet Interface #2	Serial Interface #1	Serial Interface #2
800 (806)	Ethernet 0 (E0)	Ethernet 1 (E1)		
1600	Ethernet 0 (E0)	Ethernet 1 (E1)	Serial 0 (S0)	Serial 1 (S1)
1700	FastEthernet 0 (FA0)	FastEthernet 1 (FA1)	Serial 0 (S0)	Serial 1 (S1)
2500	Ethernet 0 (E0)	Ethernet 1 (E1)	Serial 0 (S0)	Serial 1 (S1)
2600	FastEthernet 0/0 (FA0/0)	FastEthernet 0/1 (FA0/1)	Serial 0/0 (S0/0)	Serial 0/1 (S0/1)
<p>In order to find out exactly how the router is configured, look at the interfaces. This will identify what type and how many interfaces the router has. There is no way to effectively list all of the combinations of configurations for each router class. What is provided are the identifiers for the possible combinations of interfaces in the device. This interface chart does not include any other type of interface even though a specific router may contain one. An example of this might be an ISDN BRI interface. The string in parenthesis is the legal abbreviation that can be used in IOS command to represent the interface.</p>				

### Lab 3.2.3 Verifying Basic EIGRP Configuration – 2600 Series



Router Designation	Router Name	Enable Secret Password	Enable, VTY, and Console Passwords	Routing Protocol	Network Statements
Router 1	Paris	class	cisco	EIGRP	192.168.3.0 192.168.2.0
Router 2	Warsaw	class	cisco	EIGRP	192.168.1.0 192.168.2.0

Router Designation	IP Host Table Entry	FastEthernet 0 Address/Subnet Mask	Interface Type Serial 0	Serial 0 Address/Subnet Mask	Loopback 0 Address/Subnet Mask
Router 1	Warsaw	192.168.3.1/24	DCE	192.168.2.1/30	192.168.0.2/24
Router 2	Paris	192.168.1.1/24	DTE	192.168.2.2/30	No address

Note: The IP Host Table Entry column contents indicate the name(s) of the other router(s) in the IP host table.

Straight-through cable	—————	Console (Rollover)	.....
Serial cable	————— ⚡	Crossover cable	-----

**Note to instructor:** In the graphic above, 192.168.0.0 will need to be added to network statments for Router 1.

#### Objective

- Setup an IP addressing scheme for the network.
- Configure and verify Enhanced Interior Gateway Routing Protocol (EIGRP) routing.

#### Background/Preparation

Cable a network similar to the one shown in the diagram. Any router that meets the interface requirements displayed on the above diagram may be used. For example, router series 800, 1600, 1700, 2500, and 2600 or any such combination can be used. Please refer to the chart at the end of the lab to correctly identify the interface identifiers to be used based on the equipment in the lab. The configuration output used in this lab is produced from 1721 series routers. Any other router used may produce slightly different output. Perform the following steps on each router unless specifically instructed otherwise.

Start a HyperTerminal session.

**Note:** Go to the erase and reload instructions at the end of this lab. Perform those steps on all routers in this lab assignment before continuing.



## Step 1 Configure the routers

On the routers, enter the global configuration mode and configure the hostname as shown in the chart. Then configure the console, virtual terminal and enable **secret** passwords. Next configure the interfaces according to the chart. Finally, configure the IP hostnames. Do not configure the routing protocol until specifically told to. If there are any problems configuring the router basics, refer to the lab “Review of Basic Router configuration with RIP”.

### Router1

```
Router>enable
Router#configure terminal
Router(config)#hostname PARIS

PARIS(config)#enable secret class
PARIS(config)#line console 0
PARIS(config-line)#password cisco
PARIS(config-line)#login
PARIS(config-line)#line vty 0 4
PARIS(config-line)#password cisco
PARIS(config-line)#login
PARIS(config-line)#exit
PARIS(config)#interface serial 0/0
PARIS(config-if)#ip address 192.168.2.1 255.255.255.252
PARIS(config-if)#clock rate 64000
PARIS(config-if)#no shutdown
PARIS(config-if)#exit
PARIS(config-if)#interface loopback 0
PARIS(config-if)#ip address 192.168.0.2 255.255.255.0
PARIS(config-if)#exit
PARIS(config)#interface fastethernet 0/0
PARIS(config-if)#ip address 192.168.3.1 255.255.255.0
PARIS(config-if)#no shutdown
PARIS(config-if)#exit
PARIS(config)#ip host WARSAW 192.168.2.2 192.168.1.1
```

### Router2

```
Router>enable
Router#configure terminal
Router(config)#hostname WARSAW

WARSAW(config)#enable secret class
WARSAW(config)#line console 0
WARSAW(config-line)#password cisco
WARSAW(config-line)#login
WARSAW(config-line)#line vty 0 4
WARSAW(config-line)#password cisco
WARSAW(config-line)#login
WARSAW(config-line)#exit
WARSAW(config)#interface serial 0/0
WARSAW(config-if)#ip address 192.168.2.2 255.255.255.252
WARSAW(config-if)#no shutdown
WARSAW(config-if)#exit
WARSAW(config)#interface fastethernet 0/0
WARSAW(config-if)#ip address 192.168.1.1 255.255.255.0
WARSAW(config-if)#no shutdown
WARSAW(config-if)#exit
WARSAW(config)#ip host PARIS 192.168.2.1 192.168.3.1
```

## Step 2 Save the configuration information from the privileged EXEC command mode

```
Paris#copy running-config startup-config
Destination filename [startup-config]? [Enter]
```

### Step 3 Configure the hosts with the proper IP address, subnet mask and default gateway

- Each workstation should be able to ping the attached router. Troubleshoot as necessary. Remember to assign a specific IP address and default gateway to the workstation. If running Windows 98, check by using **Start > Run > winipcfg**. If running Windows 2000, check by using the **ipconfig** command in a DOS window.
- At this point the workstations will not be able to communicate with each other. The following steps will demonstrate the process required to get communication working using EIGRP as the routing protocol.

```
Host connected to router Paris
IP Address:      192.168.3.2
Subnet mask:     255.255.255.0
Default gateway: 192.168.3.1
```

```
Host connected to router Warsaw
IP Address:      192.168.1.2
Subnet mask:     255.255.255.0
Default gateway: 192.168.1.1
```

### Step 4 View the routers configuration and interface information

- At the privileged EXEC mode prompt type:

```
Paris#show running-config
```

- Using the **show ip interface brief** command, check the status of each interface.
- What is the state of the interfaces on each router?

Paris:

FastEthernet 0: Up

Serial 0: Up

Warsaw:

FastEthernet 0: Up

Serial 0: Up

- Ping from one of the connected serial interfaces to the other.
- What the ping successful? Yes
- If the ping was not successful, troubleshoot the routers configuration until the ping is successful.

### Step 5 Configure EIGRP routing on router Paris

- Enable the EIGRP routing process on Paris, and configure the networks it will advertise. Use EIGRP autonomous system number 101.

```
Paris(config)#router eigrp 101
Paris(config-router)#network 192.168.3.0
Paris(config-router)#network 192.168.2.0
Paris(config-router)#network 192.168.0.0
```

```
Paris(config-router)#end
```

- b. Show the routing table for the Paris router.

```
Paris#show ip route
```

- c. Are there any EIGRP entries in the routing table? No  
d. Why? EIGRP is not configured on Warsaw.

### Step 6 Configure EIGRP routing on router Warsaw

- a. Enable the EIGRP routing process on Warsaw, and configure the networks it will advertise. Use EIGRP autonomous system number 101.

```
Warsaw(config)#router eigrp 101  
Warsaw(config-router)#network 192.168.2.0  
Warsaw(config-router)#network 192.168.1.0  
Warsaw(config-router)#end
```

- b. Show the routing table for the Warsaw router.

```
Warsaw#show ip route
```

- c. Are there any EIGRP entries in the routing table now? Yes  
d. What is the address type in the EIGRP 192.168.2.0 route? C, Directly connected  
e.  
f. What does the D mean in the first column of the routing table? The route was learned via EIGRP

### Step 7 Show EIGRP neighbors

- a. From the Paris router show any neighbors connected using the `show ip eigrp neighbors` command at the privileged EXEC mode prompt.  
b. Are any neighbors shown? Yes

### Step 8 Test network connectivity

- a. Ping the Paris host from the Warsaw host. Was it successful? Yes  
b. If not troubleshoot as necessary.

### Step 9 View the topology table

- a. To view the topology table, issue the `show ip eigrp topology all-links` command.  
b. How many routes are in passive mode? 3  
c. To view more specific information about a topology table entry, use an IP address with this command:

```
Paris#show ip eigrp topology 192.168.1.0
```

- d. Based on the output of this command, does it tell what external protocol originated this route to 192.168.2.0? Yes  
e. Does it tell which router originated the route? Yes

- f. Finally, use `show` commands to view key EIGRP statistics. On the Paris router, issue the `show ip eigrp traffic` command.
- g. How many hello packets has the Paris router received? Answers will Vary.
- h. How many has it sent? Answers will Vary.

Once the previous steps are completed, log off by typing `exit`, and turn the router off. Then remove and store the cables and adapter.

## Erasing and reloading the router

Enter into the privileged EXEC mode by typing **enable**.

If prompted for a password, enter **class**. If that does not work, ask the instructor for assistance.

```
Router>enable
```

At the privileged EXEC mode, enter the command **erase startup-config**.

```
Router#erase startup-config
```

The responding line prompt will be:

```
Erasing the nvram filesystem will remove all files! Continue?  
[confirm]
```

Press **Enter** to confirm.

The response should be:

```
Erase of nvram: complete
```

Now at the privileged EXEC mode, enter the command **reload**.

```
Router#reload
```

The responding line prompt will be:

```
System configuration has been modified. Save? [yes/no]:
```

Type **n** and then press **Enter**.

The responding line prompt will be:

```
Proceed with reload? [confirm]
```

Press **Enter** to confirm.

In the first line of the response will be:

```
Reload requested by console.
```

After the router has reloaded the line prompt will be:

```
Would you like to enter the initial configuration dialog? [yes/no]:
```

Type **n** and then press **Enter**.

The responding line prompt will be:

```
Press RETURN to get started!
```

Press **Enter**.

Now the router is ready for the assigned lab to be performed.

Router Interface Summary				
Router Model	Ethernet Interface #1	Ethernet Interface #2	Serial Interface #1	Serial Interface #2
800 (806)	Ethernet 0 (E0)	Ethernet 1 (E1)		
1600	Ethernet 0 (E0)	Ethernet 1 (E1)	Serial 0 (S0)	Serial 1 (S1)
1700	FastEthernet 0 (FA0)	FastEthernet 1 (FA1)	Serial 0 (S0)	Serial 1 (S1)
2500	Ethernet 0 (E0)	Ethernet 1 (E1)	Serial 0 (S0)	Serial 1 (S1)
2600	FastEthernet 0/0 (FA0/0)	FastEthernet 0/1 (FA0/1)	Serial 0/0 (S0/0)	Serial 0/1 (S0/1)
<p>In order to find out exactly how the router is configured, look at the interfaces. This will identify what type and how many interfaces the router has. There is no way to effectively list all of the combinations of configurations for each router class. What is provided are the identifiers for the possible combinations of interfaces in the device. This interface chart does not include any other type of interface even though a specific router may contain one. An example of this might be an ISDN BRI interface. The string in parenthesis is the legal abbreviation that can be used in IOS command to represent the interface.</p>				