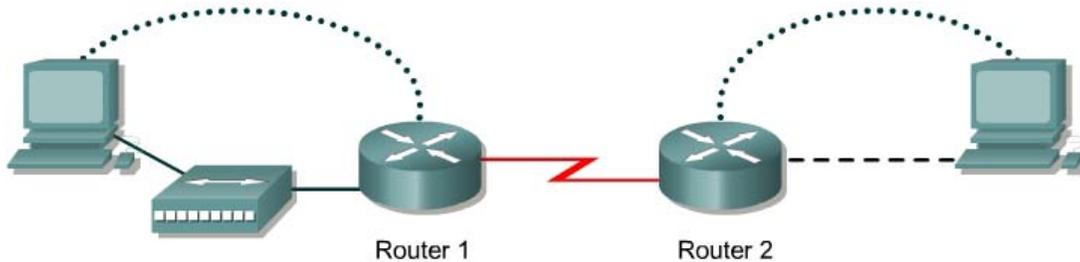
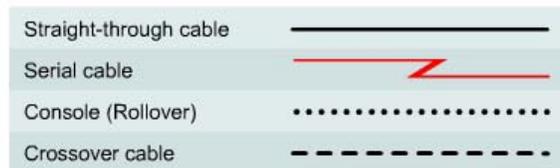


### Lab 9.1.1 Using `show ip route` to Examine Routing Tables



Router Designation	Router Name	Fast Ethernet 0 Address	Interface type	Serial 0 Address	Subnet mask for both interfaces	Enable secret password	Enable, VTY and console password
Router 1	GAD	172.16.0.1	DCE	172.17.0.1	255.255.0.0	class	cisco
Router 2	BHM	172.18.0.1	DTE	172.17.0.2	255.255.0.0	class	cisco



### Objective

- Setup IP an addressing scheme using class B networks.
- Configure RIP and IGRP on routers.
- Examine the impact on the routing table using multiple routing protocols using the `show ip route` command.

### Background/Preparation

In this lab, a default route will be configured and RIP used to propagate this default information to other routers. When this configuration is working properly, the network will migrate from RIP to IGRP, and default routing will be configured to work with that protocol as well.

Cable a network similar to the one in the diagram. Any router that meets the interface requirements displayed on the above diagram, such as 800, 1600, 1700, 2500, 2600 routers, or a combination may 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 a slightly different output. The following steps are intended to be executed on each router unless specifically instructed otherwise.

Start a HyperTerminal session as performed in the Establishing a HyperTerminal session lab.

**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

- a. 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. If there is a problem doing this, refer to the Configuring Router Passwords lab. Next configure the interfaces according to the chart. If there is a problem doing this, refer to the Configuring Host Tables lab. Finally, configure RIP routing. This is covered in the Configuring RIP lab if help is needed. Do not forget to save the configurations to the startup configuration file.

### Step 2 Configure the hosts with the proper IP address, subnet mask and default gateway

### Step 3 Verify that the internetwork is functioning by pinging the FastEthernet interface of the other router

- a. From the host attached to GAD, is it possible to ping the BHM router FastEthernet interface?  
\_\_\_\_\_
- b. From the host attached to BHM, is it possible to ping the GAD router FastEthernet interface?  
\_\_\_\_\_
- c. If the answer is no for either question, troubleshoot the router configurations to find the error. Then do the pings again until the answer to both questions is yes.

### Step 4 Make sure that routing updates are being sent

- a. Type the command `debug ip rip` at the privileged EXEC mode prompt. Wait for at least 45 seconds.
- b. Was there any output from the debug command? \_\_\_\_\_
- c. What did the output display? \_\_\_\_\_
- d. Stop the debug with `no debug ip rip`.

### Step 5 Show the routing tables for each router

- a. Examine the routing table entries, using command `show ip route` command on each router.
- b. What are the entries in the GAD routing table?  
\_\_\_\_\_
- c. What are the entries in the BHM routing table?  
\_\_\_\_\_

### Step 6 Enable IGRP routing on both routers

- a. Leave RIP enabled but enter router `igrp 25` on both routers at the configuration prompt. Enter the appropriate network statements for each router.

```
GAD(config-router)#network 172.16.0.0
GAD(config-router)#network 172.17.0.0
BHM(config-router)#network 172.18.0.0
BHM(config-router)#network 172.17.0.0
```

- b. On the router where `debug ip rip` was entered, now enter `debug ip igrp events`. Then wait at least two minutes.
- c. What type of routing updates are being sent? \_\_\_\_\_
- d. Why are both protocols sending updates? \_\_\_\_\_

### Step 7 Show the routing tables for each router again

- Examine the routing table entries, using command `show ip route` command on each router.
- What are the entries in the GAD routing table?  
\_\_\_\_\_
- What are the entries in the BHM routing table?  
\_\_\_\_\_
- Why are the RIP routes not in the tables?  
\_\_\_\_\_
- What should be done in order for this network to be more efficient?  
\_\_\_\_\_

### Step 8 Add a second serial cable between routers

- Add a second serial cable between interface S1 on GAD to serial S1 on BHM. GAD is the DCE.
- Configure the GAD router with the additional statements.

```
GAD(config)#interface Serial1
GAD(config-if)#ip address 172.22.0.1 255.255.0.0
GAD(config-if)#clockrate 56000
GAD(config-if)#no shutdown
```

- Configure the BHM router with the additional statements.

```
BHM(config)#interface Serial1
BHM(config-if)#ip address 172.22.0.2 255.255.0.0
BHM(config-if)#no shutdown
```

- On the BHM router remove the IGRP network statement `network 172.18.0.0` so the `router IGRP 25` should only contain the `network 172.17.0.0` statement.

### Step 9 Clear the routing tables on both routers

- Type the command `clear ip route *` at the privileged EXEC prompt on both routers. Wait at least 90 seconds. Then type the command `show ip route` on both routers.
- What types of routes are shown on GAD? \_\_\_\_\_
- What types of routes are shown on BHM? \_\_\_\_\_
- Why is this? \_\_\_\_\_

### Step 10 Use show ip route to see different routes by type

- Enter `show ip route` while connected to the GAD router.
- What networks are displayed?  
\_\_\_\_\_
- What interface is directly connected? \_\_\_\_\_
- Enter `show ip route rip`.
- List the routes listed in the routing table: \_\_\_\_\_

- f. What is the administrative distance? \_\_\_\_\_
- g. Enter **show ip route** while connected to the BHM router.
- h. What networks are displayed? \_\_\_\_\_
- i. What interface is directly connected? \_\_\_\_\_
- j. Enter **show ip route rip**.
- k. List the routes listed in the routing table: \_\_\_\_\_
- l. If you saw none then that is correct, why? \_\_\_\_\_
- m. Enter **show ip route igrp**
- n. List the routes listed in the routing table: \_\_\_\_\_
- o. What is the administrative distance? \_\_\_\_\_

Upon completion of the previous steps, log off by typing **exit** and turn the router off.

## Erasing and reloading the router

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

If prompted for a password, enter **class**. If “class” 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(config)#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**.

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

<b>Router Interface Summary</b>					
Router Model	Ethernet Interface #1	Ethernet Interface #2	Serial Interface #1	Serial Interface #2	Interface #5
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 the type of router as well as 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>					