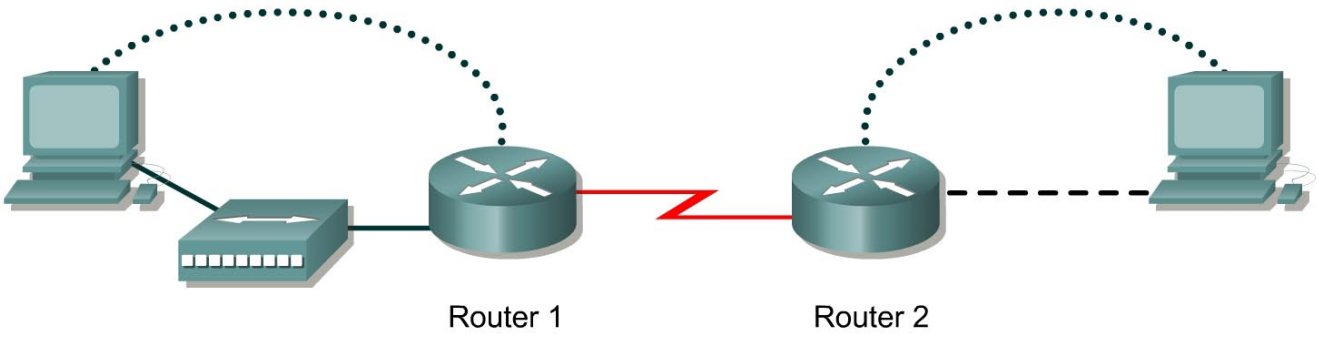
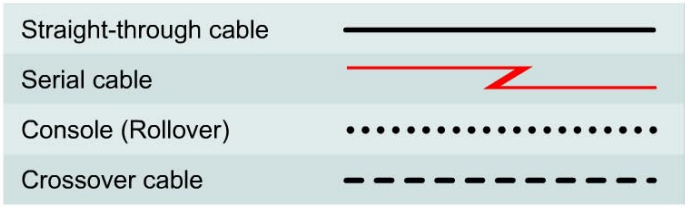
Lab 7.2.2 Configuring RIP – Instructor Version 2500



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 an IP addressing scheme using class B networks.
- Configure the RIP dynamic routing protocol on routers.

Background/Preparation

Setup a network similar to the one in the diagram. Any router that meets the interface requirements displayed in 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. From the global configuration mode, 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. Refer to the Configuring Host Tables lab for assistance.

Step 2 Check the routing table entries

a. Using the command **show ip route**, view the IP routing table for GAD.

```
GAD>show ip route

output eliminated


Gateway of last resort is not set

C    172.16.0.0/16 is directly connected, FastEthernet0
C    172.17.0.0/16 is directly connected, Serial0
```

b. Using the command **show ip route**, view the IP routing table for BHM.

```
BHM>show ip route

output eliminated

Gateway of last resort is not set

C    172.17.0.0/24 is directly connected, Serial0
C    172.18.0.0/24 is directly connected, FastEthernet0
```

Step 3 Configure the routing protocol on the GAD router

a. From the global configuration mode, enter the following:

```
GAD(config)#router rip
GAD(config-router)#network 172.16.0.0
GAD(config-router)#network 172.17.0.0
GAD(config-router)#exit
GAD(config)#exit
```

Step 4 Save the GAD router configuration

```
GAD#copy running-config startup-config
```

Step 5 Configure the routing protocol on the BHM router

a. From the global configuration mode, enter the following:

```
BHM(config)#router rip
BHM(config-router)#network 172.17.0.0
BHM(config-router)#network 172.18.0.0
BHM(config-router)#exit
BHM(config)#exit
```


Step 6 Save the BHM router configuration

```
BHM#copy running-config startup-config
```

Step 7 Configure the hosts with the proper IP address, subnet mask and default gateway

Step 8 Verify that the internetwork is functioning by pinging the ~~Fast~~Ethernet interface of the other router

a. From the host attached to GAD, is it possible to ping the BHM router ~~Fast~~Ethernet interface?
Yes

b. From the host attached to BHM, is it possible to ping the GAD router ~~Fast~~Ethernet interface?
Yes

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 9 Show the routing tables for each router

a. From the enable or privileged EXEC mode, examine the routing table entries using the **show ip route** command on each router.

b. What are the entries in the GAD routing table?

```
C    172.16.0.0/16 is directly connected, Ethernet0
C    172.17.0.0/16 is directly connected, Serial0
R    172.18.0.0/16 [120/1] via 172.17.0.2, 00:00:25, Serial0
```

c. What are the entries in the BHM routing table?

```
R    172.16.0.0/16 [120/1] via 172.17.0.1, 00:00:04, Serial0
C    172.17.0.0/16 is directly connected, Serial0
C    172.18.0.0/16 is directly connected, Ethernet0
```

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)#reloadRouter#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.

Router Interface Summary					
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)	
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.					


```
GAD#show running-config
Current configuration:
version 11.1
service slave-log
service udp-small-servers
service tcp-small-servers
hostname GAD
enable secret 5 $1$3ZJ0$SeuRkqa27ldTtumHwCpz60
ip subnet-zero
interface Ethernet0
 ip address 172.16.0.1 255.255.0.0
interface Serial0
 ip address 172.17.0.1 255.255.0.0
 no fair-queue
 clockrate 56000
interface Serial1
 no ip address
 shutdown
router rip
 network 172.16.0.0
 network 172.17.0.0
no ip classless
ip http server
line con 0
 exec-timeout 0 0
 password cisco
 login
 transport input none
line aux 0
 password cisco
 login
line vty 0 4
 password cisco
 login
end
GAD#
```

```
BHM#show running-config
Current configuration:
version 11.1
service slave-log
service udp-small-servers
service tcp-small-servers
hostname BHM
enable secret 5 $1$K/IA$ey9mZOdozKrYEtzaeOF0e/
interface Ethernet0
 ip address 172.18.0.1 255.255.0.0
interface Serial0
 ip address 172.17.0.2 255.255.0.0
 no fair-queue
interface Serial1
 no ip address
 shutdown
router rip
 network 172.18.0.0
 network 172.17.0.0
no ip classless
line con 0
```

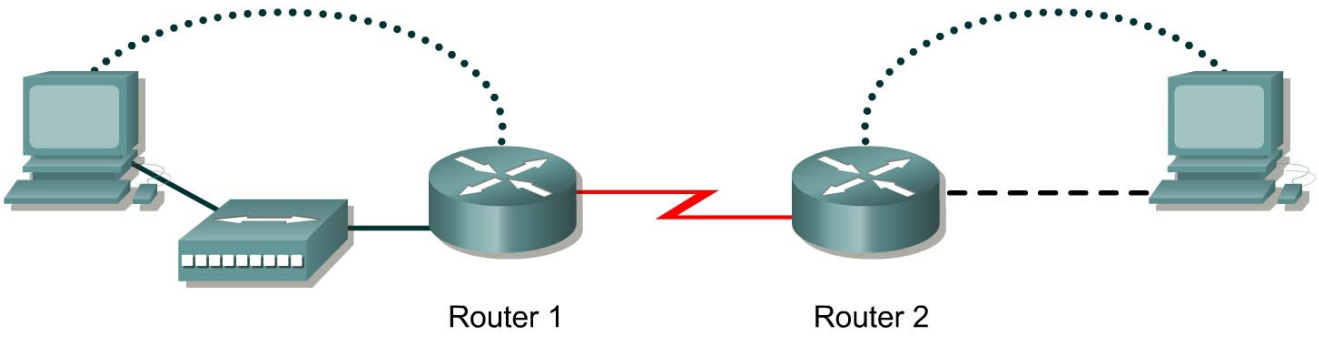


```
 password cisco
 login
line aux 0
line vty 0 4
 password cisco
 login
end
BHM#
```

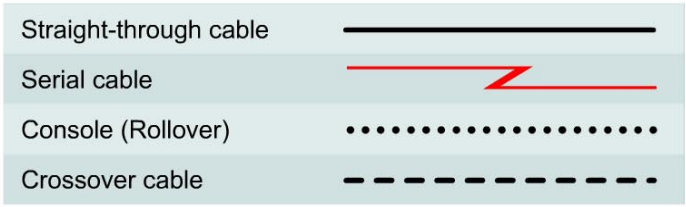
```
BHM>show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C    172.17.0.0/16 is directly connected, Serial0
R    172.16.0.0/16 [120/1] via 172.17.0.1, 00:00:19, Serial0
C    172.18.0.0/16 is directly connected, Ethernet0
```

```
GAD>show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C    172.17.0.0/16 is directly connected, Serial0
C    172.16.0.0/16 is directly connected, Ethernet0
R    172.18.0.0/16 [120/1] via 172
```


Lab 7.2.2 Configuring RIP – Instructor Version 2600



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 an IP addressing scheme using class B networks.
- Configure the RIP dynamic routing protocol on routers.

Background/Preparation

Setup a network similar to the one in the diagram. Any router that meets the interface requirements displayed in 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. From the global configuration mode, 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. Refer to the Configuring Host Tables lab for assistance.

Step 2 Check the routing table entries

a. Using the command **show ip route**, view the IP routing table for GAD.

```
GAD>show ip route

output eliminated


Gateway of last resort is not set

C    172.16.0.0/16 is directly connected, FastEthernet0
C    172.17.0.0/16 is directly connected, Serial0
```

b. Using the command **show ip route**, view the IP routing table for BHM.

```
BHM>show ip route

output eliminated

Gateway of last resort is not set

C    172.17.0.0/24 is directly connected, Serial0
C    172.18.0.0/24 is directly connected, FastEthernet0
```

Step 3 Configure the routing protocol on the GAD router

a. From the global configuration mode, enter the following:

```
GAD(config)#router rip
GAD(config-router)#network 172.16.0.0
GAD(config-router)#network 172.17.0.0
GAD(config-router)#exit
GAD(config)#exit
```

Step 4 Save the GAD router configuration

```
GAD#copy running-config startup-config
```

Step 5 Configure the routing protocol on the BHM router

a. From the global configuration mode, enter the following:

```
BHM(config)#router rip
BHM(config-router)#network 172.17.0.0
BHM(config-router)#network 172.18.0.0
BHM(config-router)#exit
BHM(config)#exit
```


Step 6 Save the BHM router configuration

```
BHM#copy running-config startup-config
```

Step 7 Configure the hosts with the proper IP address, subnet mask and default gateway

Step 8 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?
Yes

b. From the host attached to BHM, is it possible to ping the GAD router FastEthernet interface?
Yes

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 9 Show the routing tables for each router

a. From the enable or privileged EXEC mode, examine the routing table entries using the **show ip route** command on each router.

b. What are the entries in the GAD routing table?

```
C    172.17.0.0/16 is directly connected, Serial0/0
C    172.16.0.0/16 is directly connected, FastEthernet0/0
R    172.18.0.0/16 [120/1] via 172.17.0.2, 00:00:03, Serial0/0
```

c. What are the entries in the BHM routing table?

```
C    172.17.0.0/16 is directly connected, Serial0/0
R    172.16.0.0/16 [120/1] via 172.17.0.1, 00:00:19, Serial0/0
C    172.18.0.0/16 is directly connected, FastEthernet0/0
```

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)#reloadRouter#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.

Router Interface Summary					
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)	
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.					


```
GAD#show running-config
Current configuration:
version 12.1
service slave-log
service udp-small-servers
service tcp-small-servers
hostname GAD
enable secret 5 $1$3ZJ0$SeuRkqa27ldTtumHwCpz60
ip subnet-zero
interface FastEthernet0/0
 ip address 172.16.0.1 255.255.0.0
interface Serial0/0
 ip address 172.17.0.1 255.255.0.0
 no fair-queue
 clockrate 56000
interface Serial0/1
 no ip address
 shutdown
router rip
 network 172.16.0.0
 network 172.17.0.0
no ip classless
ip http server
line con 0
 exec-timeout 0 0
 password cisco
 login
 transport input none
line aux 0
 password cisco
 login
line vty 0 4
 password cisco
 login
end

BHM#show running-config
Current configuration:
version 12.1
service slave-log
service udp-small-servers
service tcp-small-servers
hostname BHM
enable secret 5 $1$K/IA$ey9mZOdozKrYEtzaeOF0e/
interface FastEthernet0/0
 ip address 172.18.0.1 255.255.0.0
interface Serial0/0
 ip address 172.17.0.2 255.255.0.0
 no fair-queue
interface Serial0/1
 no ip address
 shutdown
router rip
 network 172.18.0.0
 network 172.17.0.0
no ip classless
line con 0
 password cisco
 login
line aux 0
```



```
line vty 0 4
 password cisco
 login
end
BHM#


BHM>show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C    172.17.0.0/16 is directly connected, Serial0/0
R    172.16.0.0/16 [120/1] via 172.17.0.1, 00:00:19, Serial0/0
C    172.18.0.0/16 is directly connected, FastEthernet0/0


GAD>show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C    172.17.0.0/16 is directly connected, Serial0/0
C    172.16.0.0/16 is directly connected, FastEthernet0/0
R    172.18.0.0/16 [120/1] via 172.17.0.2, 00:00:03, Serial0/0
```

