# LAB: RIP Routing Protocol (Distance Vector)

1. Configuring the Serial Interfaces



**Figure 1: Lab Topology**

**Objective**

* Configure a serial interface on each of two routers so they can communicate.

**Background/Preparation**

Any router that meets the interface requirements may be used. Possible routers include 800, 1600, 1700, 2500, 2600, 2800,2900 routers, or a combination. 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 following steps are intended to be executed on each router unless specifically instructed otherwise.

**Start a PUTTY 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 Basic Router Configuration**

1. Configure the router. Connect the routers as shown in the diagram. This lab requires a null serial cable and two rollover or console cables.

**Step 2 Configure the name and passwords for Router 1**

1. On Router 1, enter the global configuration mode and configure the hostname as shown in the chart.
2. Configure the console, virtual terminal and enable passwords. If there are any problems, refer to the previous labs concerning Configuration of Passwords.

**Step 3 Configure serial interface Serial 0/0 (or e.g. S0/0/0)**

From global configuration mode, configure serial interface Serial 0/0 on Router GAD. Refer to Interface Summary.

GAD(config)#interface serial 0/0

GAD(config-if)#ip address 172.17.0.1 255.255.0.0

GAD(config-if)#clock rate 64000

GAD(config-if)#no shutdown

GAD(config-if)#exit

GAD(config)#exit

**Note:** Once the interface configuration mode is entered, note the IP address of the interface. Enter the subnet mask. Enter the clock rate only on the DCE side of the device. The command **no shutdown** turns on the interface. Shutdown is when the interface is off.

**Step 4 Save the running configuration**

Save the running configuration to the startup configuration at the privileged EXEC mode:

GAD#copy running-config startup-config

**Note:** Save the running configuration for the next time that the router is restarted. The router can be restarted either by a software **reload** command or a power shutdown. The running configuration will be lost if the running configuration is not saved. The router uses the startup configuration when the router is started.

**Step 5 Display information about Serial interface 0/0 on GAD**

1. Enter the command show interface serial 0 on GAD. Refer to interface chart.

GAD#show interface serial 0/0

This will show the details of interface serial 0.

1. List at least three details discovered by issuing this command.
2. Serial 0 is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Line protocol is\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .
3. Internet address is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. Encapsulation \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. To what OSI layer is the “Encapsulation” referring? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. If the Serial interface was configured, why did the **show interface serial 0** say that the interface is down?

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**Step 6 Configure the name and passwords for Router 2**

1. On the Birmingham router, enter the global configuration mode. Configure hostname, console, virtual terminal and enable passwords as shown in the previous chart.

**Step 7 Configure serial interface Serial 0 /0**

From the global configuration mode, configure serial interface Serial 0 on Router BHM. Refer to interface chart.

BHM(config)#interface serial 0/0

BHM(config-if)#ip address 172.17.0.2 255.255.0.0

BHM(config-if)#no shutdown

BHM(config-if)#exit

BHM(config)#exit

**Step 8 Save the running configuration**

Save the running configuration to the startup configuration at the privileged EXEC mode:

BHM#copy running-config startup-config

**Step 9 Display information about Serial interface 0 on BHM**

1. Enter the command **show interface serial 0** on BHM. Refer to interface chart.

BHM#show interface serial 0/0

This will show the details of interface serial 0.

1. List at least three details discovered by issuing this command.
2. Serial 0 is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, line protocol is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .
3. Internet address is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .
4. Encapsulation \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. What is the difference in the Line and Protocol status recorded on GAD earlier? Why?

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**Step 10 Verify that the serial connection is functioning**

1. **ping** the serial interface of the other router.

BHM#ping 172.17.0.1

GAD#ping 172.17.0.2

1. From GAD, ping the BHM router serial interface. Does the ping work? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. From BHM, ping the GAD router serial interface. Does the ping work? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. If the answer is no for either question, troubleshoot the router configurations to find the error. Then ping the interfaces again until the answer to both questions is yes.
5. Configuring RIP Routing

**Objective**

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

**Background/Preparation**

**Step 1 Configure the routers**

1. 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.

**Be sure to configure the FastEthernet Interfaces as per the previous labs**

**Step 2 Check the routing table entries**

1. 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, FastEthernet0/0

C 172.17.0.0/16 is directly connected, Serial0/0

1. 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**

1. 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**

1. 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? \_\_\_\_\_\_\_\_\_\_\_\_\_

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 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?

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

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