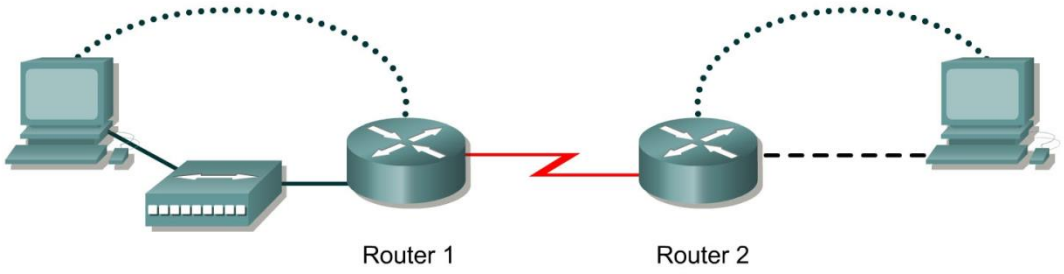
Lab – Topic 6

The **answer sheet URL** is posted on OLE. Please login to your OUHK Google Gmail account (gxxxxxxx@study.ouhk.edu.hk) and submit your answer online. **Due date**: Wed, 28 Apr 2021, 23:59

Lab 7.2.2 Configuring RIP



Router Designation	Router Name	Gigabit Ethernet 0/0 Address	Interface type	Serial 0/0/0 Address	Subnet mask for both interfaces
Router 1	GAD	172.16.0.1	DCE	172.17.0.1	255.255.0.0
Router 2	BHM	172.18.0.1	DTE	172.17.0.2	255.255.0.0

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 diagram.

For users of CISCO router:

- **Note**: Go to the "Erasing and reloading the router" instructions. Perform those steps on all routers in this lab assignment before continuing.
- Start HyperTerminal session:
  1. Download putty.
  2. Choose "Serial" as the Connection type.
  3. Click "Open" button.

For users of CISCO Packet Tracer:

- Place two 2901 routes (with one HWIC-2T module installed on each route) as Router 1 and Router 2.

Step 1 Configure the routers.

a. From the global configuration mode, configure the hostname as shown in chart. Next, configure the interfaces according to the chart.

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

     172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       172.16.0.0/16 is directly connected, GigabitEthernet0/0
L       172.16.0.1/32 is directly connected, GigabitEthernet0/0
     172.17.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       172.17.0.0/16 is directly connected, Serial0/0/0
L       172.17.0.1/32 is directly connected, Serial0/0/0
```

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

     172.17.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       172.17.0.0/16 is directly connected, Serial0/0/0
L       172.17.0.2/32 is directly connected, Serial0/0/0
     172.18.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       172.18.0.0/16 is directly connected, GigabitEthernet0/0
L       172.18.0.1/32 is directly connected, GigabitEthernet0/0
```

Step 3 Configure the routing protocol on 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 (PCs) with the proper IP address, subnet mask and default gateway

Step 8 Verify that the internetwork is functioning by pinging the GigabitEthernet0/0 interface of the other router

a. From the host attached to GAD, is it possible to ping the BHM router GigabitEthernet0/0 interface?

_____

b. From the host attached to BHM, is it possible to ping the GAD router GigabitEthernet0/0 interface?

_____

c. If the answer is no for either question, troubleshoot the router configuration 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? (routing entries for codes C or R only)

(i) _____

(ii) _____

(iii)_____

c. What are the entries in the BHM routing table? (routing entries for codes C or R only)

(i) _____

(ii) _____

(iii)_____

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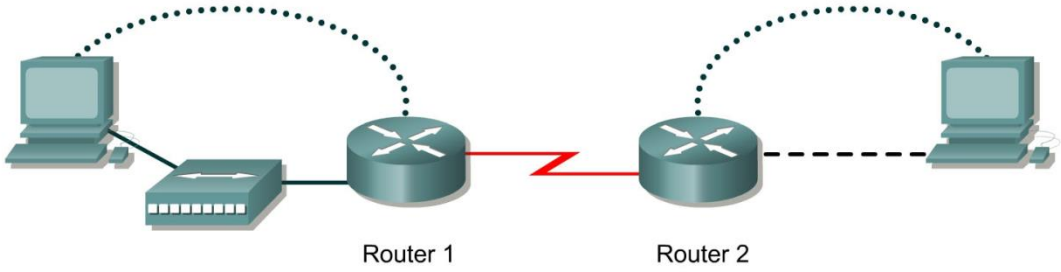
Lab 7.2.6 Troubleshooting RIP



Router Designation	Router Name	Gigabit Ethernet 0/0 Address	Interface type	Serial 0/0/0 Address	Subnet mask for both interfaces
Router 1	GAD	172.16.0.1	DCE	172.17.0.1	255.255.0.0
Router 2	BHM	172.18.0.1	DTE	172.17.0.2	255.255.0.0

Objective

- Set up an IP addressing scheme using class B networks.
- Configure RIP on routers.
- Observe routing activity using the **`debug ip rip`** command.
- Examine routes using the **`show ip route`** command.

Background/Preparation

Cable a network similar to the one in the diagram.

Step 1 Configure the routers

a. On the routers, enter the global configuration mode and configure the hostname as shown in the chart.

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

Step 3 Make sure that routing updates are being sent

a. Type the command **`debug ip rip`** in 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 show ? _____

d. To turn off specific debug commands type the **no** option, for example **`no debug ip rip`**. To turn off all debug command, type **`undebug all`**.

Step 4 Show the RIP routing table entries for each other

a. Enter **`show ip route rip`**

b. List the routes listed in the routing table? (routing entries for codes R only)

i) GAD: _____

ii) BHM: _____

c. What is the administrative distance? _____

Step 5 Verify that the internetwork is functioning by pinging the ethernet interface of the other router

a. From the host attached to GAD, is it possible to ping the BHM router GigabitEthernet0/0 interface?

_____

b. From the host attached to BHM, is it possible to ping the GAD router GigabitEthernet0/0 interface?

_____

c. If the answer is no for either question, troubleshoot the router configuration using **`show ip route`** to find the error. Also check the workstation IP settings. Then do the pings again until the answer to both questions is yes.

Step 6 Check Point: Send your screen capture to the instructor by email.

a. Take one screen capture with the following items. (Sample capture is on next page).

I. CLI of the routers showing the prompt and the output on Step 4.
II. ~~The Computer name and Domain~~.
III. The date and time of your capture.

b. Save the screen capture to a Word file with filename “your_8_digit_student_number-topic6.docx”. (Eg. **12345678-topic6.docx**).

c. Email your saved file to thluk@ouhk.edu.hk (subject: **topic 6**).

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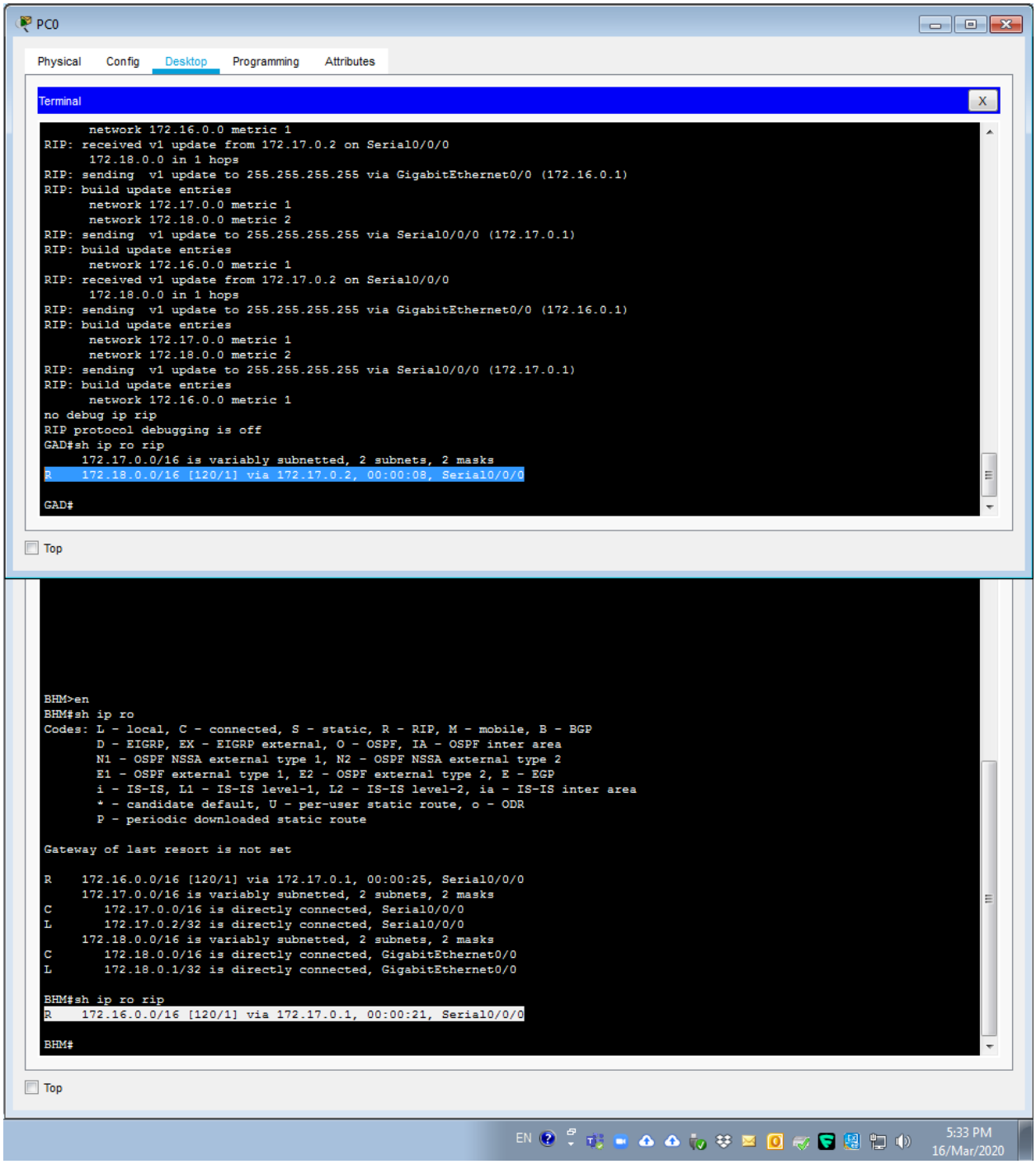
PC0
Physical
Config
Desktop
Programming
Attributes
Terminal
network 172.16.0.0 metric 1
RIP: received v1 update from 172.17.0.2 on Serial0/0/0
172.18.0.0 in 1 hops
RIP: sending v1 update to 255.255.255.255 via GigabitEthernet0/0 (172.16.0.1)
RIP: build update entries
network 172.17.0.0 metric 1
network 172.18.0.0 metric 2
RIP: sending v1 update to 255.255.255.255 via Serial0/0/0 (172.17.0.1)
RIP: build update entries
network 172.16.0.0 metric 1
RIP: received v1 update from 172.17.0.2 on Serial0/0/0
172.18.0.0 in 1 hops
RIP: sending v1 update to 255.255.255.255 via GigabitEthernet0/0 (172.16.0.1)
RIP: build update entries
network 172.17.0.0 metric 1
network 172.18.0.0 metric 2
RIP: sending v1 update to 255.255.255.255 via Serial0/0/0 (172.17.0.1)
RIP: build update entries
network 172.16.0.0 metric 1
no debug ip rip
RIP protocol debugging is off
GAD#sh ip ro rip
172.17.0.0/16 is variably subnetted, 2 subnets, 2 masks
R 172.18.0.0/16 [120/1] via 172.17.0.2, 00:00:08, Serial0/0/0
GAD#
Top
BHM>en
BHM#sh ip ro
Codes: L - local, C - connected, S - static, 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
R 172.16.0.0/16 [120/1] via 172.17.0.1, 00:00:25, Serial0/0/0
172.17.0.0/16 is variably subnetted, 2 subnets, 2 masks
C 172.17.0.0/16 is directly connected, Serial0/0/0
L 172.17.0.2/32 is directly connected, Serial0/0/0
172.18.0.0/16 is variably subnetted, 2 subnets, 2 masks
C 172.18.0.0/16 is directly connected, GigabitEthernet0/0
L 172.18.0.1/32 is directly connected, GigabitEthernet0/0
BHM#sh ip ro rip
R 172.16.0.0/16 [120/1] via 172.17.0.1, 00:00:21, Serial0/0/0
BHM#
Top
EN
5:33 PM
16/Mar/2020

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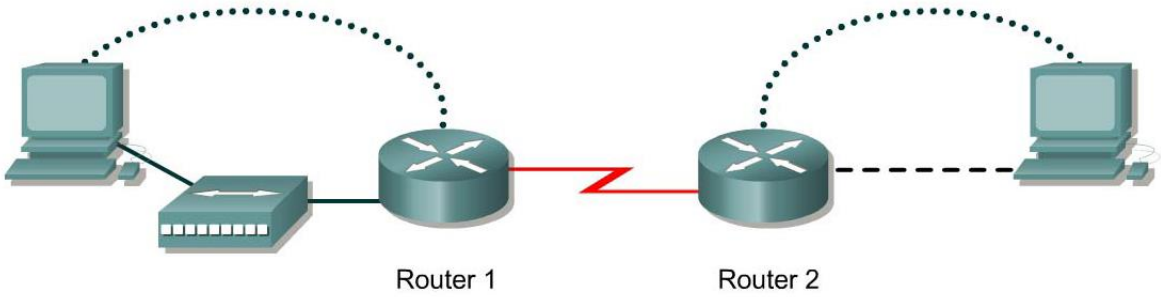
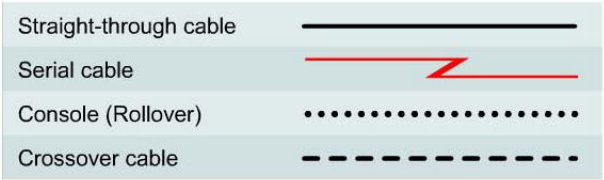
Lab 7.3.5 Configuring EIGRP



Router Designation	Router Name	Gigabit Ethernet 0/0 Address	Interface type	Serial 0/0/0 Address	Subnet mask for both interfaces
Router 1	GAD	192.168.20.1	DCE	192.168.22.1	255.255.255.0
Router 2	BHM	192.168.25.1	DTE	192.168.22.2	255.255.255.0



Objective

- Setup IP and addressing scheme using class C networks.
- Configure EIGRP on routers.

Background/Preparation

Cable a network similar to the one in the diagram.

Step 1 Configure the routers

a. On the routers, enter the global configuration mode and configure the hostname as shown in the chart. Next, configure the interfaces according to the chart. If there is a problem doing this, refer to the Configuring Host Tables lab.

Step 2 Configure the routing protocol on the GAD router

a. Configure EIGRP using AS 101 on GAD. Go to the proper command mode and enter the following:

```
GAD(config)#router eigrp 101
GAD(config-router)#network 192.168.22.0
GAD(config-router)#network 192.168.20.0
```

Step 3 Save the GAD router configuration

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

Step 4 Configure the routing protocol on the BHM router

a. Configure EIGRP using AS 101 on BHM. Go to the proper command mode and enter the following:

```
BHM(config)#router eigrp 101
BHM(config-router)#network 192.168.25.0
BHM(config-router)#network 192.168.22.0
```

Step 5 Configure the hosts with the proper IP address, subnet mask and default gateway

Step 6 Verify that the internetwork is functioning by pinging the host of the other router

a. From the host attached to GAD, is it possible to ping the BHM host?_____

b. From the host attached to BHM, is it possible to ping the GAD host?_____

c. If the answer is no to either question, troubleshoot the router configurations to find the error. Then do the pings again until the answer to both questions is yes.

Step 7 Show the routing tables for each router

a. From the enable or privileged EXEC mode do the following:

b. Examine the routing table entries by using the **`show ip route`** command on each router.

c. What are the entries in the GAD routing table? (routing entries for codes C or D only)

(i) _____

(ii) _____

(iii)_____

d. What are the entries in the BHM routing table? (routing entries for codes C or D only)

(i) _____

(ii) _____

(iii)_____

Step 8 Verity the routing protocol

a. Type **`show ip protocol`** on both routers to verify EIGRP is running and that it is the only protocol running.

b. Is EIGRP the only protocol running on GAD? _____

c. Is EIGRP the only protocol running on BHM? _____

Step 9 Verify EIGRP statements in the running configuration of both routers

a. Use the **`show run`** command on both routers.

b. Can you see the EIGRP part of the configurations? _____

Step 10 Analyze specific routes

a. Type **`show ip route 192.168.25.0`** on the GAD router at the privileged exec mode

b. What is the total delay for this route?_____

c. What is the minimum bandwidth? _____

d. What is the Reliability of this route?_____

e. What is the minimum MTU size for this route? _____

f. Type **`show ip route 192.168.20.1`** on the BHM router at the privileged EXEC mode.

g. What is the total delay for this route?_____

h. What is the minimum bandwidth? _____

i. What is the Reliability of this route?_____

j. What is the minimum MTU size for this route? _____

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