RIP

1. Introduction

1.1 Objectives

The objective of this work is learning about routing protocols.

1.2 Learning outcomes

At the end of this assignment, you should know:

- How RIP works;
- How a routing table works;

2. General Guidelines

2.1 Equipment

Lab PC, 3 (three) MikroTik RouterBoard 450 routers, 4 (four) RJ45 Ethernet cables.

2.2 Preparation

Assign the Lab PC an appropriate IP address, network mask and default gateway for its adequate connection on eth3 port of BridgeA10 of router A in the topology shown in section 3.1.

Identify the networks and corresponding network masks that are interconnected by the routers in the topology shown in section 3.1.

Read carefully this assignment and the materials about RIP.

2.3 Documentation

To know about the RIP protocol read:

- Slides about IP routing

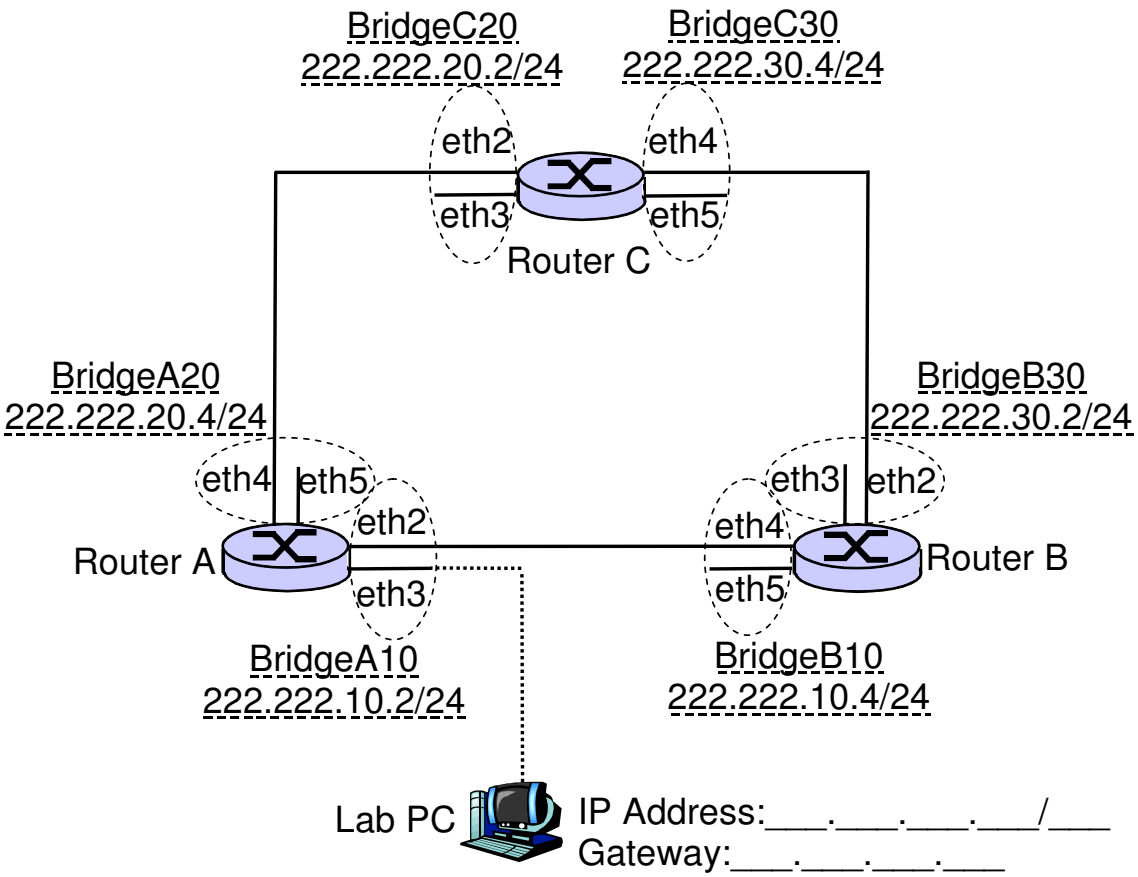
To read before and use during the lab exercises:

- MikroTik-configuration.pdf – to configure the MikroTik routers

3. Lab Activities

3.1 Lab setup

Build the network shown in the picture:



Configure each of the 3 routers separately through its eth1 interface using Winbox. This interface must be kept with the default 192.168.88.1/24 address.

It is recommended to reset each router configuration before starting working.

In each router, create two bridges: one joining interfaces eth2 and eth3; and the other joining interfaces eth4 and eth5. To create each bridge, click **Bridge** → **Bridge** → **+** (this step has to be done 2 times for each router). To associate each interface to a bridge, click **Bridge** → **Ports** → **+** (this step has to be done 4 times for each router).

Assign IP addresses to each bridge, according with the addresses shown in the picture. To assign an IP address to a bridge, click **IP** → **Addresses** → **+**.

Configure RIP by clicking **Routing** → **RIP** → **Networks** and add the addresses of the two subnets the router is directly attached to by clicking **+**. Then select **Routing** → **RIP** → **Interfaces** and add the two bridges. While doing this, change boxes **Send:** and **Receive:** to **v2**. This will configure version 2 of the RIP protocol.

Repeat these steps for the other two routers.

Finally connect the Lab PC to the eth3 interface of RouterA and configure the PC to be able to communicate with any interface of the entire network. Verify this with the ping command (sent from the PC).

3.2 Routing Tables

Access the configuration interface of each router and register the contents of their routing tables. You can visualize the routing table in **Routing** → **RIP** → **Routes**. Take a screen capture of the window to include in the report. This can be done with the take "screenshot" Linux application. Explain the meaning of the parameters **From** and **Metric**.

Note that, since you have IP connectivity to the entire network, you can access any router's configuration interface by opening Winbox and filling the "Connect to" box with an IP address of the router from the topology in the picture above. You do not need to connect the PC to the router eth1 interface nor change the PC IP address.

3.3 RIP Traffic

Using Wireshark with a **rip** filter, observe the RIP packets sent to each subnet. You can do that by connecting the PC to the eth3 interface of each router (you do not need to change the IP address of the PC when moving between routers, because the PC will only be listening passively to what is received in the Ethernet interface).

Note that this RIP implementation uses split horizon with poisonous reverse.

What is the periodicity used by each router to send **RIP Response** packets? Explain the contents of the body of these packets, namely the **IP Address** and corresponding **Metric**. Relate this information to the one observed in the routing tables.

Observe the default RIP timer values by looking into **Routing** → **RIP** → **Interfaces** → **RIP Settings**.

3.4 Link Failure

Have the PC connected to RouterA eth3 interface.

Start a ping to the IP address of RouterC eth2 interface and a Wireshark capture with a **rip or icmp** filter.

Observing router A's routing table, disable **BridgeA20** from router A. To disable the bridge, click **Interfaces** → **Interfaces**, select the line corresponding the bridge to be disabled and click the disable button **X**.

Explain what happened. How much time did the routers take to find a new route for ping to work again? What is now the route from the PC to RouterC eth2 interface? Confirm using the traceroute command.

Show to the teacher this route.

3.5 Link Recovery

Keep the ping and Wireshark capture running.

Now enable again **BridgeA20** in router A. To enable the bridge, click **Interfaces** → **Interfaces**, select the line corresponding the bridge to be enabled and click the enable button ☑.

Explain what happened.

4. REPORT

A report should be delivered through the Fenix project Delivery System in PDF format, until 48h before the next laboratory class.

The report should include:

- The information you were requested to register;
- The answers to the questions and explanations requested;