

Internetworking using Routers (Dynamic Routing – RIP)

1. Objectives

- Using a **dynamic routing protocol (RIP)**
- To build and configure an **internetwork** using **Packet Tracer**

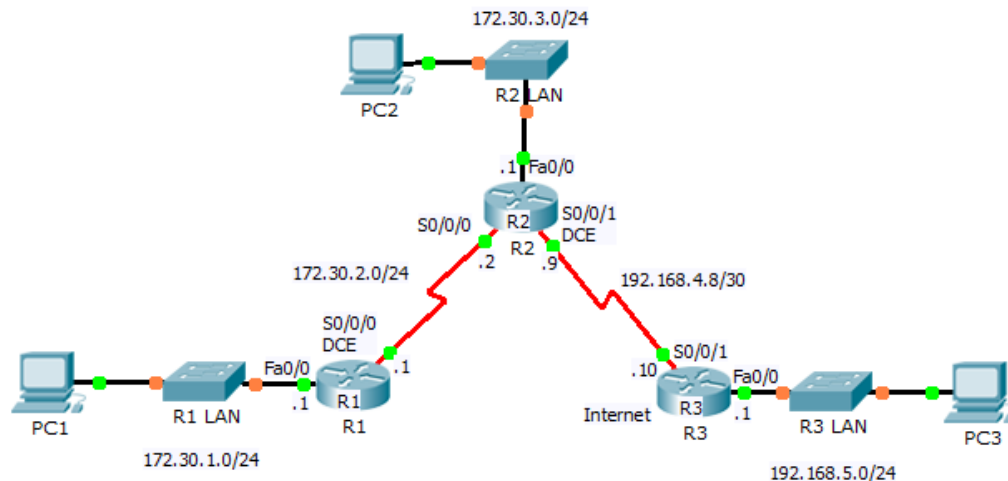
2. Background: RIP → A Dynamic Routing Protocol

In this activity, you will configure a simple dynamic routing protocol named **Routing Information Protocol (RIP)**. RIP is a relatively old but still commonly used **interior gateway protocol** created for use in small, homogeneous networks. It is a classical **distance-vector routing protocol**.

3b. Instructions: Configuring Routing Information Protocol (RIP)

Step 1: Physical Connections

Create a topology as shown in the following figure:



Step 2: IP Addressing Table

Configure IP addresses according to the following table:

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	Fa0/0	172.30.1.1	255.255.255.0	N/A
	S0/0/0	172.30.2.1	255.255.255.0	N/A
R2	Fa0/0	172.30.3.1	255.255.255.0	N/A
	S0/0/0	172.30.2.2	255.255.255.0	N/A
	S0/0/1	192.168.4.9	255.255.255.252	N/A
R3	Fa0/0	192.168.5.1	255.255.255.0	N/A
	S0/0/1	192.168.4.10	255.255.255.252	N/A
PC1	NIC	172.30.1.10	255.255.255.0	172.30.1.1
PC2	NIC	172.30.3.10	255.255.255.0	172.30.3.1
PC3	NIC	192.168.5.10	255.255.255.0	192.168.5.1

Step 3: Adding IP Addresses

Add IP addresses to both an Ethernet (i.e., Fa0/0) and serial interface (i.e., S0/0/1). For serial interface with the **DCE cable** you will need to also add the clocking with the **clock rate** command. **Get the IP addresses from the Addressing Table.**

Step 4: Adding Dynamic Routing: RIP

For this router to participate in a dynamic routing using a **dynamic routing protocol** like **RIP**, you'll need to enable a routing protocol and advertise the **directly connected networks** that want advertised. To enable a dynamic routing protocol, enter **global configuration mode** and use the **router** command. Enter **router ?** at the global configuration prompt to see a list of available routing protocols on your router.

To enable RIP, enter the command **router rip** in global configuration mode.

```
R1 (config) #router rip
R1 (config-router) #
```

Once you are in routing configuration mode, enter the network address for each **directly connected network**, using the **network** command.

```
R1 (config-router) #network 192.168.1.0
R1 (config-router) #network 192.168.2.0
R1 (config-router) #
```

The **network** command:

- Enables RIP on all interfaces that belong to this network. These interfaces will now both send and receive RIP updates.
- Advertises this network in RIP routing updates sent to other routers every 30 seconds.

When you are finished with the RIP configuration, return to **privileged EXEC mode** and save the current configuration to NVRAM.

```
R1 (config-router) #end
%SYS-5-CONFIG_I: Configured from console by
console
R1#copy run start
```

Step 4: Verify RIP

Use the **show ip route** command to verify that each router has all of the networks in the topology entered in the routing table.

FYI: We need to **advertise the network, not any particular host**. An example of that would be **enabling RIP on ISP**. We want the other router (UIU) to know that any packet destined for the network 192.168.20.0 can be sent to **ISP** which has a directly connected entry in it's routing table showing what interface to send the packet to; in this case its **fa0/0**. Check your routing table for entries that are preceded by a capital letter "R" to ensure that you are receiving routing updates using RIP. Use **show ip route** to see the routing table. Ensure that both routers configured so that you can receive his updates. **No updates, no ping.**

Exercise

Complete following topology with required routing protocols (use **static**, **default** and **rip routing**) where appropriate.

Test the connectivity and show to the instructor.

