

## Laboratory 2: Routing Information Protocol (RIP) -I

### Objective:

- To assign IP addresses to network interfaces automatically
- To configure and analyze the performance of RIP
- To understand the routing table of each router created by RIP
- To determine the path from one router to another router

### Introduction

RIP is one of the Intra-domain distance vector based routing protocol. Each router builds a vector which consists of other router name and cost. The router distributes the routing table to its neighbors only. The router advertise the routing table every 30sec. A router sends also trigger update whenever a router entry is changed.

In this Lab you have to create a project-using RIP with three scenarios. In first scenario (**startrip**), you will configure the router and RIP parameter and analyze the performance of startrip. In second scenario, you will observe the routing table and calculate the convergence time when one of the links is broken. Finally, in third scenario you determine the path when the broken link is recovered.

### Create a project

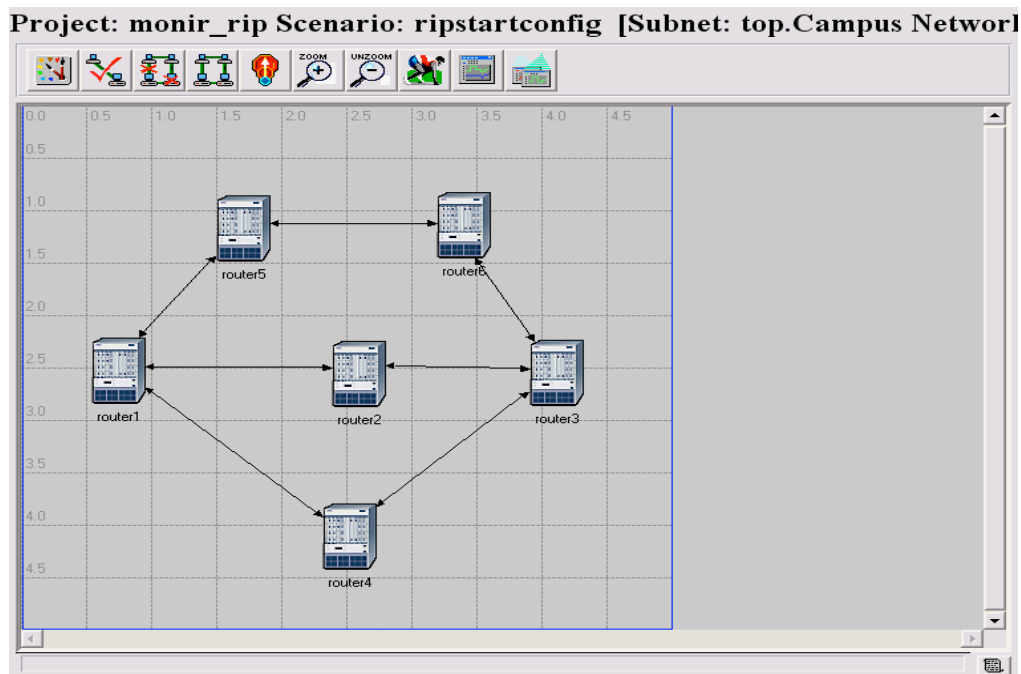
#### First Scenario:

1. Create a project (**yourid\_rip**) and first scenario (**start**).
2. Select **create empty scenario** and click next
3. Select **Network Scale: Campus**

**Network Size: 4 mi x 4 mi**  
**Model family: internet\_toolbox and routers**

Now you will see an empty workspace.

4. Click the object Palette and bring ethernet2\_slip8\_gtwy (one of the routers) object to workspace and change the name router1. Now make 5 copies of router1 and give router name router2.....router6. Connect the router using PPP-DS1 link in the following way



***Configure Router parameter:***

5. Now click one of the routers (say router1) and right click and **select similar nodes** from pull-down menu. Now right click one of the routers again and choose **Edit Attributes**. Click the box **Apply changes to selected objects**. Select and expand the **Report/ RIP Routing Table**.

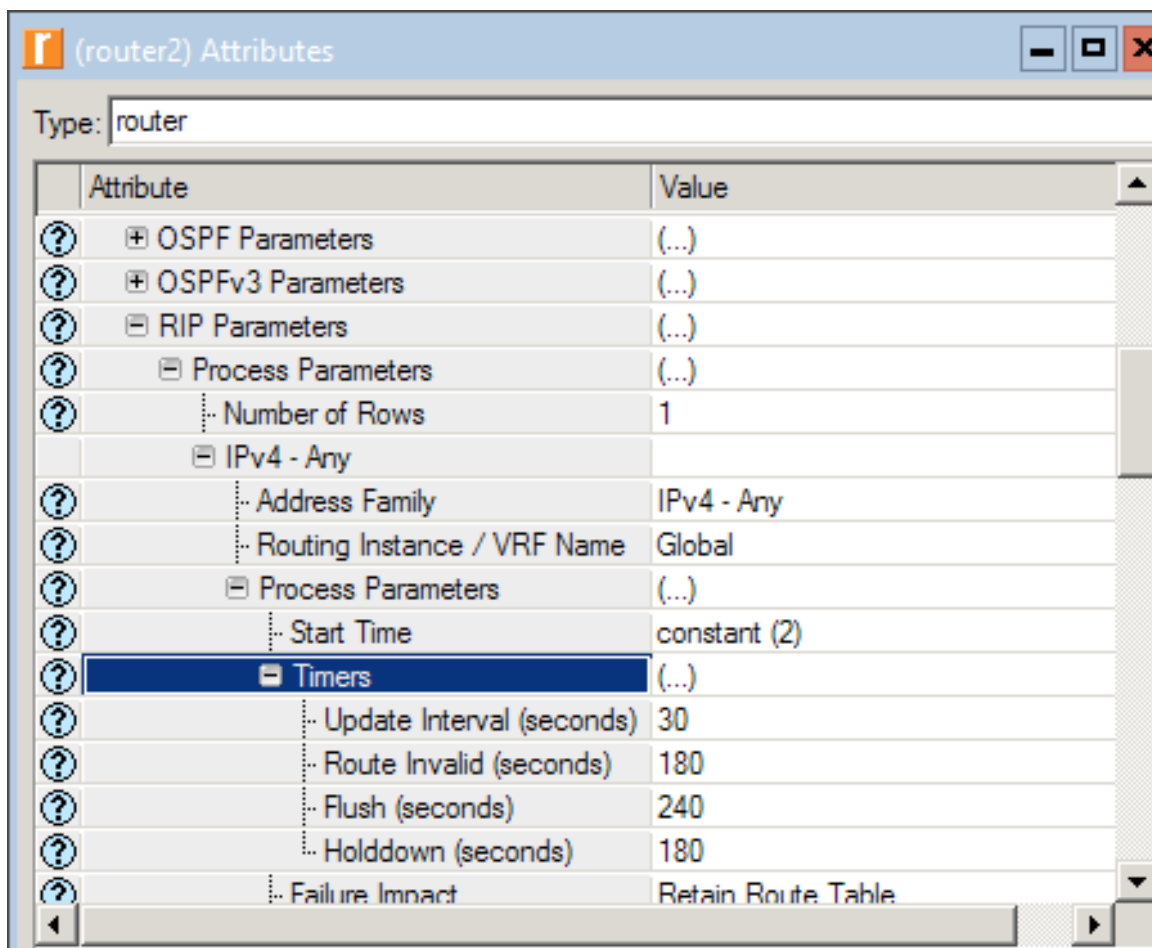
Now set **Status** as enabled and select **Export time : Once at End of Simulation**.

## ***Configure RIP parameter:***

**6. Click IP Routing Protocols\RIP Parameters\Process Parameters\IPv4\Process Parameters** to expand the parameter list.

Select start time, set as constant and 2 sec.

Now click on the **Timers** to expand it and you will see the following default parameter setting:



The screenshot shows the '(router2) Attributes' window. The 'Type' is set to 'router'. The 'Attribute' list is expanded to show 'Timers'. The 'Value' column shows the default settings for each timer.

Attribute	Value
⊕ OSPF Parameters	(...)
⊕ OSPFv3 Parameters	(...)
⊖ RIP Parameters	(...)
⊖ Process Parameters	(...)
Number of Rows	1
⊖ IPv4 - Any	
Address Family	IPv4 - Any
Routing Instance / VRF Name	Global
⊖ Process Parameters	(...)
Start Time	constant (2)
⊖ Timers	(...)
Update Interval (seconds)	30
Route Invalid (seconds)	180
Flush (seconds)	240
Holddown (seconds)	180
Failure Impact	Retain Route Table

You can click on the question mark on the left side to read information about each setting.

**6. Save** your project.

### ***Configure Simulation statistics:***

7. Right-click in any place of your workspace and select **Choose Individual Statistics** from the pup-up menu. Select the **Node** to expand the parameter. Then select **Route Table** to expand the parameter. Now click **Total number of updates**.

8. Click **OK** and save your project

### ***Configure Simulation Parameters:***

9. Click on the **Configure and Run** button from the menu. Now select the **IP** and change the following:

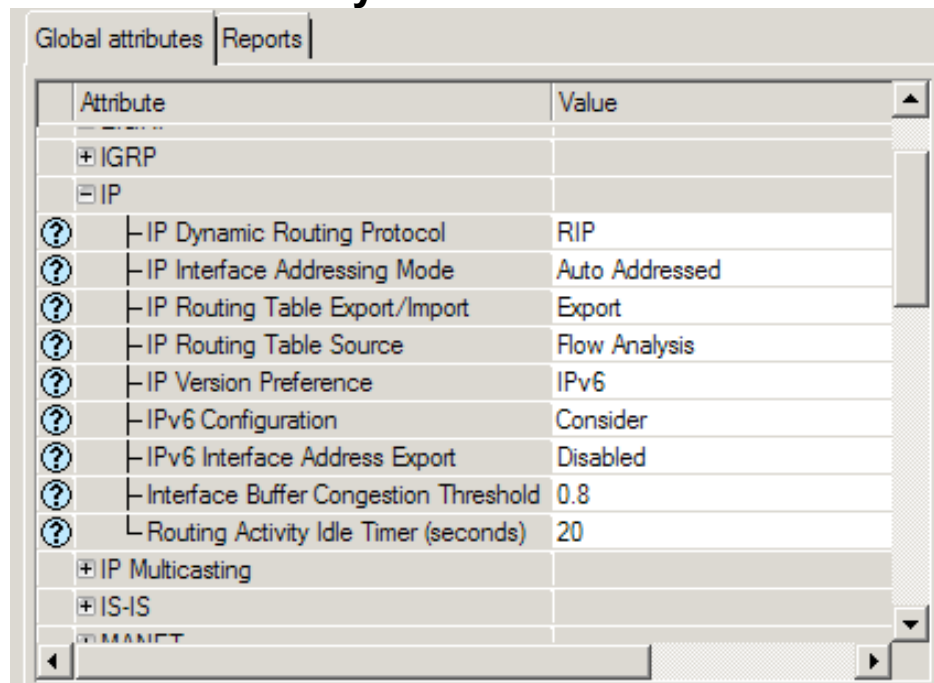
- \* **IP Dynamic Routing Protocol: RIP**

- \* **IP Interface Addressing Mode: Auto Addressed/Export**

- \* **IP Routing Table Export/Import: Export**

and select the **Simulation Efficiency** and set:

- \* **RIP Sim Efficiency: Disabled**



Global attributes		Reports
Attribute	Value	
Simulation Efficiency		
ARP Sim Efficiency	Enabled	
BGP Sim Efficiency Mode	Enabled	
EIGRP Sim Efficiency	Enabled	
EIGRP Stop Time (seconds)	365	
IGMP Sim Efficiency	Enabled	
IGRP Sim Efficiency	Enabled	
IGRP Stop Time (seconds)	365	
IPv6 ND Simulation Efficiency	Disabled	
ISIS Sim Efficiency	Enabled	
ISIS Stop Time (seconds)	260	
LACP Simulation Efficiency	Enabled	
OSPF Sim Efficiency	Enabled	
OSPF Stop Time (seconds)	260	
PIM-SM Sim Efficiency	Enabled	
RIP Sim Efficiency	Disabled	
RIP Stop Time (seconds)	65	
RIPng Sim Efficiency	Enabled	
RIPng Stop Time (seconds)	65	

### ***Run the Simulation:***

10. Click the **RUN** button to run the simulation for **200 sec** and collect statistics. Save the project

### ***Collect the results:***

Now we want to collect the router interface address, which is allocated automatically.

11. Select **DES/Results/View Results**.

12. Click on the **DES Run Table** tab, you can see the forwarding table of routers as following:

DES Graphs   DES Parametric Studies   DES Run (1) Tables   Flow Analysis Graphs					
<b>Object Tables</b> Campus Network router1 Performance IP Forwarding Table at End of Simulation router2 router3 router4 router5					
Preview					
	Destination	Source Protocol	Route Preference	Metric	Next Hop
1	192.0.0.0/24	Direct	0	0	192.0.0.1
2	192.0.1.0/24	Direct	0	0	192.0.1.1
3	192.0.2.0/24	RIP	120	1	192.0.2.1
4	192.0.3.0/24	RIP	120	1	192.0.3.1
5	192.0.4.0/24	RIP	120	2	192.0.4.1
6	192.0.5.0/24	RIP	120	1	192.0.5.1
7					
8	Gateway of last resort is not set				
9					
<input type="checkbox"/> Ignore views					
Results Generated: 02:08:58 Mar 14 2016					
<a href="#">Generate Web Report...</a> <a href="#">Add to Report Showcase</a> <a href="#">Show</a>					

## **Task1:**

13. Write down all the router interface address.

14. Observe all routers routing table and try to understand all information. (You need the IP addresses of the interfaces to help you understand the routing table).

**\*\* Save the project in your folder because you will use the same model in order the complete Lab3 tasks on RIP.**