Week#4 – Starting from Jan 25 – 2016

Learning objectives:

A. To appreciate the Dynamic routing mechanism (RIP) .
   a. In previous lab, Static network mechanism was used where every router has to be manually configured
   b. In this lab, you will see how the dynamic routing technique makes the configuration easy.

B. Illustration of DHCP
   - How to add DHCP facility in a network?
   - See the 4 steps of DHCP.
   - How DHCP can be used to restrict the users.
   - All the services provided by DHCP.

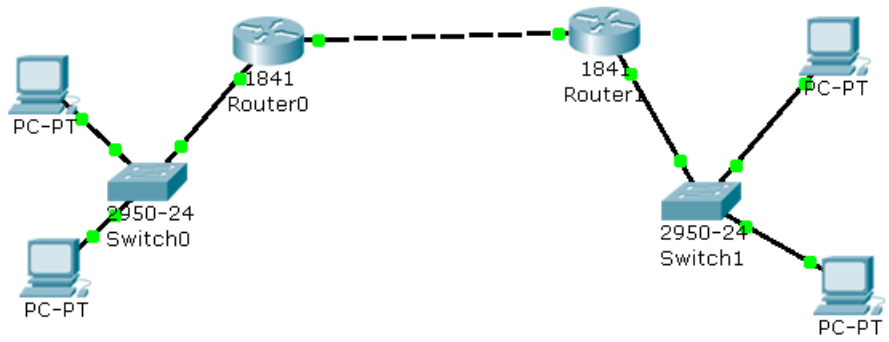
This session has 2 Parts :

Part A. Router based network

1. Network with two routers (Dynamic routing-RIP)
2. Network with 4 routers-Linier topology (Dynamic routing-RIP)
3. 4.Network with 3 routers looped- (Reliablity to be incorporated)

Part B. Understanding DHCP

A.1 - Network with two routers (Dynamic routing-RIP)



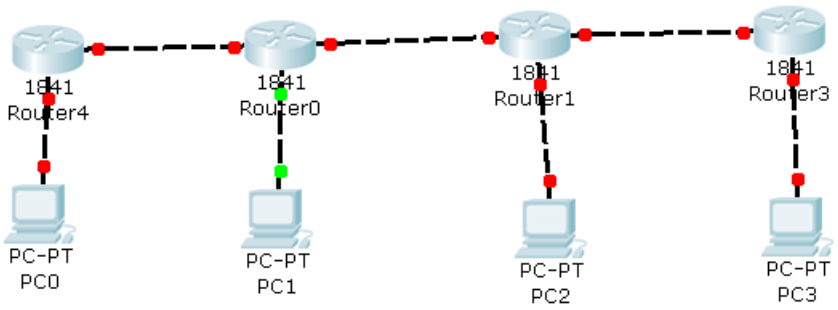
	Action	What to observe?	Comments/ Questions /Reasons
1	Create the topology as shown.		
2	Create 3 subnets .		
3	Configure the routers as follows : **Router R0:** • Select Config • Select RIP • Enter the Subnet IDs of two Subnets directly connected to this Router (Subnet 1 and Subnet 2) **Router R1 :** • Same as R0, enter Subnet IDs of Subnet2 and Subnet 3		
4	Ping from any host to host	Observe the status ; If configuration is correct, successful transmission should happen.	

		Check the Routing table of R0	Write down the table
		Check the Routing table of R0	Write down the table

Standing instruction :

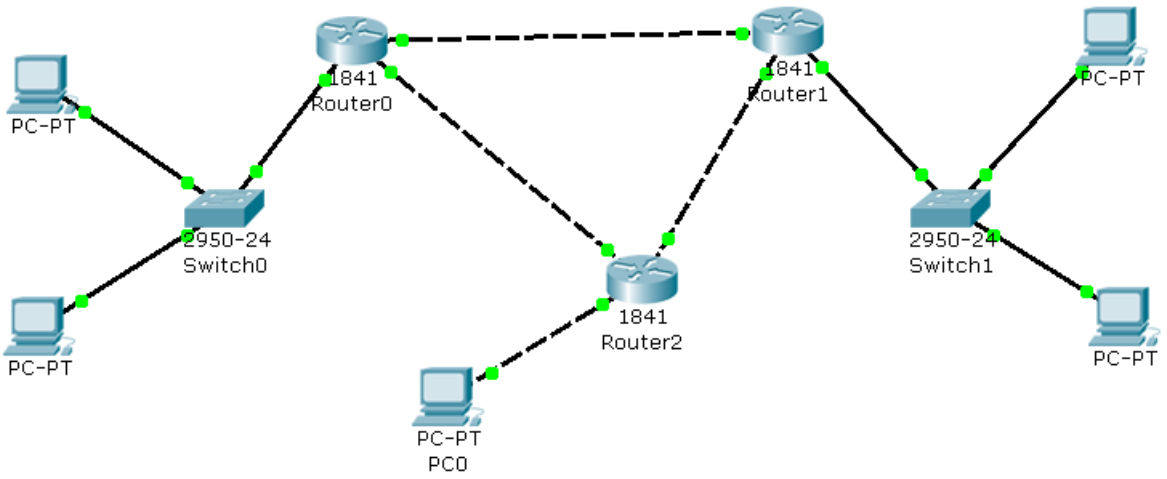
1. **Whenever Router is configured, don't forget to save.When POWER CYCLE DEVICES is clicked, configuration will be lost, if you have not saved.**
2. **In order to know the port labels, select OPTIONS , and select 'preferences' and then 'show always port labels.**

A.2.Network with 4 routers-Linier topology (Dynamic routing-RIP)



1	Create the topology as shown.		
2	Configure all the subnets .		
3	Configure Routers as done in the previous experiment		
4	Ping from any host to any host	Check the success of the transmission	Write down at least one key observation.

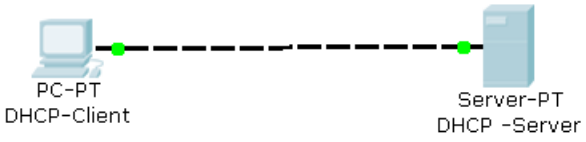
A.3-.Network with 3 routers looped- (Reliablity to be incorporated)



	Action	What to observe?	Comments/ Questions /Reasons
1	Create the topology as shown.		
2	Create 6 subnets .		
3	Configure Routers as done in the previous experiment		
4	Ping from any host to any host	Check the success of the transmission	
5	Cut one of the links		
	Ping from any host to any host	Check the success of the transmission	

Part B : Understanding DHCP

B.1. Illustration- how a client gets automatically IP address?



B.1. 1 DHCP in Real Time Mode

	Action	What to observe?	Comments/ Questions /Reasons
1	Create the simple topology as shown		
2	**Configure PC0 as DHCP Client** • Select Config • Select Fast Ethernet0 • Select IP Configuration as **DHCP not Static**	Note : There may be some default IP address like 169.x.x.x/16. **IGNORE**	
3	**Configure Server as DHCP Server** • Select Config • Select Services • Select DHCP • Tick Service ON • Enter Start IP address as 1.1.1.0 • Retain all other default parameters • **Click Save**		
4	**Configure IP Address of DHCP server** • Configure the Fast Ethernet Interface of DHCP Server as 1.0.0.1/8		
5	**Run DHCP** • **Select PC0** • **Select Config** • **Click Fast Ethernet**	Observe the IP address obtained from the Server	Write down the IP address
Note : Whenever you want to repeat the configuration, please click Power Cycle Devices and configure			

B.1.2. Understand the 4 Steps of DHCP in SIMULATION Mode

	Action	What to observe?	Comments/ Questions /Reasons
1	Use the same topology and configuration as in the previous experiment.		
2	Select SIMULATION MODE		
3	Select Event List		
4	Filter out all other protocols and retain only DHCP; Keep the event list panel visible		
5	Click Power Cycle Devices (To start the simulation from the beginning)		
6	Run DHCP • Select PC0 • Select Config • Click Fast Ethernet	**Observe in the Event list Panel, DHCP protocol initiation is shown**	
4	Run Simulation • Clicking Auto Capture & Play	**Observe DHCP Packets (Envelops) moving back and forth between Client and Server**	
5	Wait until the protocol ic completed (4 Interactions has to be completed)		
6	Stop simulation • Clicking Auto Capture & Play		

ANALYSE DHCP

Check and write down, the values of the following fields of DHCP PDU, at different stages.

Step	When	Operation Field OP :	Source IP Address	Destination IP Address	'YOUR CLIENT ADDRESS'
Step1	**DHCP PDU originated from Client**				
Step2	**Server receives and replies**				
Step3	**Client receives and replies**				
Step4	**Server receives and replies**				

Home Assignment :

Have you observed that there is a field called 'Relay Agent Address' in the DHCP PDU ?

Find out what is it