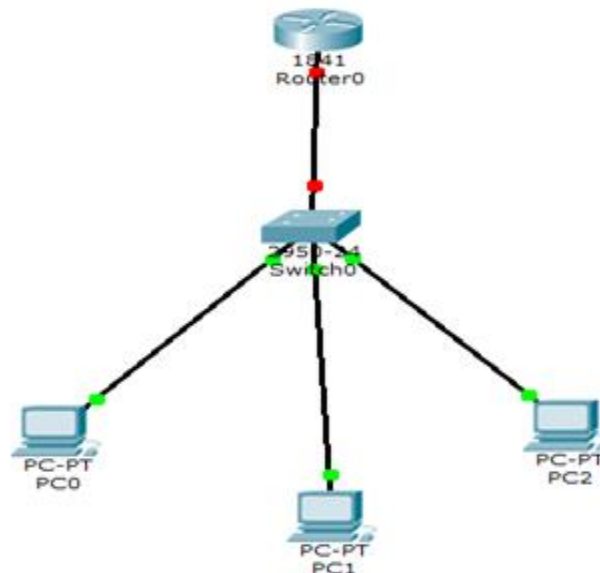


**Lab#05(a)****Router on a Stick**

Perform router on a stick.

**THEORY****ROUTER:**

This device forwards data packets along networks. It is connected to at least two networks, commonly two LANs or WANs or a LAN and its ISP.s network. Routers are located at gateways, the places where two or more networks connect. Routers use headers and forwarding tables to determine the best path for forwarding the packets.

**METHOD:**

First assign IP to all the pc using same class and their default subnet mask. Now go to router CLI tab and write down the following commands .

```
Press RETURN to get started!

Router>enable
Router#configure t
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fa 0/0
Router(config-if)#ip address 192.168.2.1 255.255.255.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
Router(config-if)#exit
```

After these commands your network are able to communicate with routers and pcs, now you can check your network by passing messages and ping command.

### Exercises:

Q1.What happens if we connect PC directly to the router without using switch in between the two devices i.e. PC's and router?

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Q2. What do you understand by the term **Default-Gateway IP?** why we need to assign this?

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Q3. Can we implement V-LAN by using router on stick?

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**Q.4.** Explain the function of this command “Router(config-if)#”

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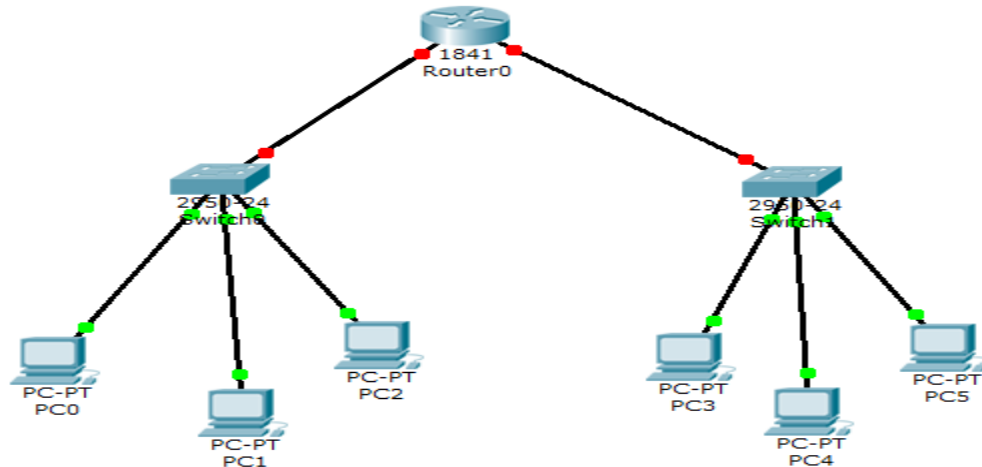
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## **Lab Session 05(b)**

### **Communication Between Networks**

To study how router will configure through different networks.

#### **THEORY**



#### **ROUTER:**

A router [a] is a networking device that forwards data packets between computer networks. Routers perform the traffic directing functions on the Internet. A data packet is typically forwarded from one router to another through the networks that constitute the internetwork until it reaches its destination node.

#### **Subnet mask:**

A subnet mask is combined with an IP address in order to identify two parts: the extended network address and the host address. Like an IP address, a subnet mask is made up of 32 bits.

A subnet mask is a screen of numbers used for routing traffic within a subnet. Once a packet has arrived at an organization's gateway or connection point with its unique network number, it can be routed to its destination within the organization's internal gateways using the subnet number.

## Default Gateway:

A default gateway serves as an access point or IP router that a networked computer uses to send information to a computer in another network or the Internet. Default simply means that this gateway is used by default, unless an application specifies another gateway.

## Steps:

Create network according to the above diagram after then follow the instructions as follow:

- Assign ip to the router and pc .
- Assign default gateway to the pc.
- Write the following commands on router CLI.

```
Router>ENABLE
Router#configure t
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fa 0/0
Router(config-if)#ip address 192.168.2.1 255.255.255.0
Router(config-if)#no shutdown
^
% Invalid input detected at '^' marker.

Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
Router(config-if)#exit
Router(config)#interface fa 0/1
Router(config-if)#ip address 10.0.0.1 255.0.0.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
Router(config-if)#exit
```

After these commands you are able to pass messages on different networks.

**EXERCISES:**

Q.1) For each of the following networks, discuss the consequences if the connection fails.

1. Five devices are arranged in mesh topology?
2. Five devices are arranged in star topology (not counting hub/switch)?
3. Five devices are arranged in bus topology?
4. Five devices are arranged in mesh topology?

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Q2.) what do you mean by tree topology?

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Q.3) Why we use router in this network?

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Q.4) PC1 is configured with default gateway address. PC2 is not configured with a default gateway. What would happen if PC1 pings PC2.

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Q.5) Define network topology?

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