CIT 223: Data Communication and Computer Network Lab
Assignment #06
Introduction to Routers and Switch Connection

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Published Date: July 2, 2024, Deadline Date: **July 09, 2024**

1 Introduction

In Packet Tracer, you can connect routers and switches to create a network topology. Routers are used to connect different networks or subnets, while switches are used to connect devices within the same network.

1. Add a switch and a router to your project. These devices can be found in the device library or palette.
2. Connect the switch and router using an Ethernet cable. In the packet tracer software, you can drag and drop cables to create connections between devices.
3. Configure the switch and router interfaces. For example, assign IP addresses to the router's LAN interface and switch's VLAN interface.
4. Configure VLANs on the switch. Create VLANs and assign ports to respective VLANs.
5. Configure routing on the router. Set up routing protocols or static routes to enable communication between VLANs or between the LAN and external networks.
6. Connect end devices like computers or servers to the switch ports. Configure IP addresses on the end devices as per the VLAN configurations.
7. Test connectivity between devices in the LAN. Verify that the devices can communicate with each other within their respective VLANs and access external networks through the router.

2 Objectives

The objectives of the lab are:

1. to configure switch and router

3 Instructions

3.1 Configuring the Switch

Step 1

1. Enter privileged EXEC mode
2. Enter global configuration mode
3. Set a hostname for the switch
4. Configure VLANs.

Command Line

```
Configuring the VLANs
    vlan vlan_id
    name vlan_name
```

Step 2

1. Assign Ports to VLANs.

Command Line

```
interface interface_id
switchport mode access
switchport access vlan vlan_id
```

Step 3

Enable Trunking on a port:

Info: Use this command if you want to connect the switch to a router or another switch using a trunk link.

Command Line

```
interface interface_id
switchport mode trunk
```

3.2 Configuring the Router

Step 1

Configure the LAN interface

Command Line

```
interface interface_id
ip address ip_address subnet_mask
no shutdown
```

Command Line

```
Configuring the Serial Connection

interface serial <interface_number>
encapsulation hdlc
```

Replace interface_id with the LAN interface ID (e.g., FastEthernet0/0, GigabitEthernet0/0), ip_address with the IP address for the LAN interface, and subnet_mask with the appropriate subnet mask.

Step 2

Configure the Static Routing

Command Line

```
ip route network_address subnet_mask next_hop_ip_address
```

4 Lab Tasks

Question 1

Create a network topology as shown in the Figure 1

Question 2

Create a network topology as shown in the Figure 2

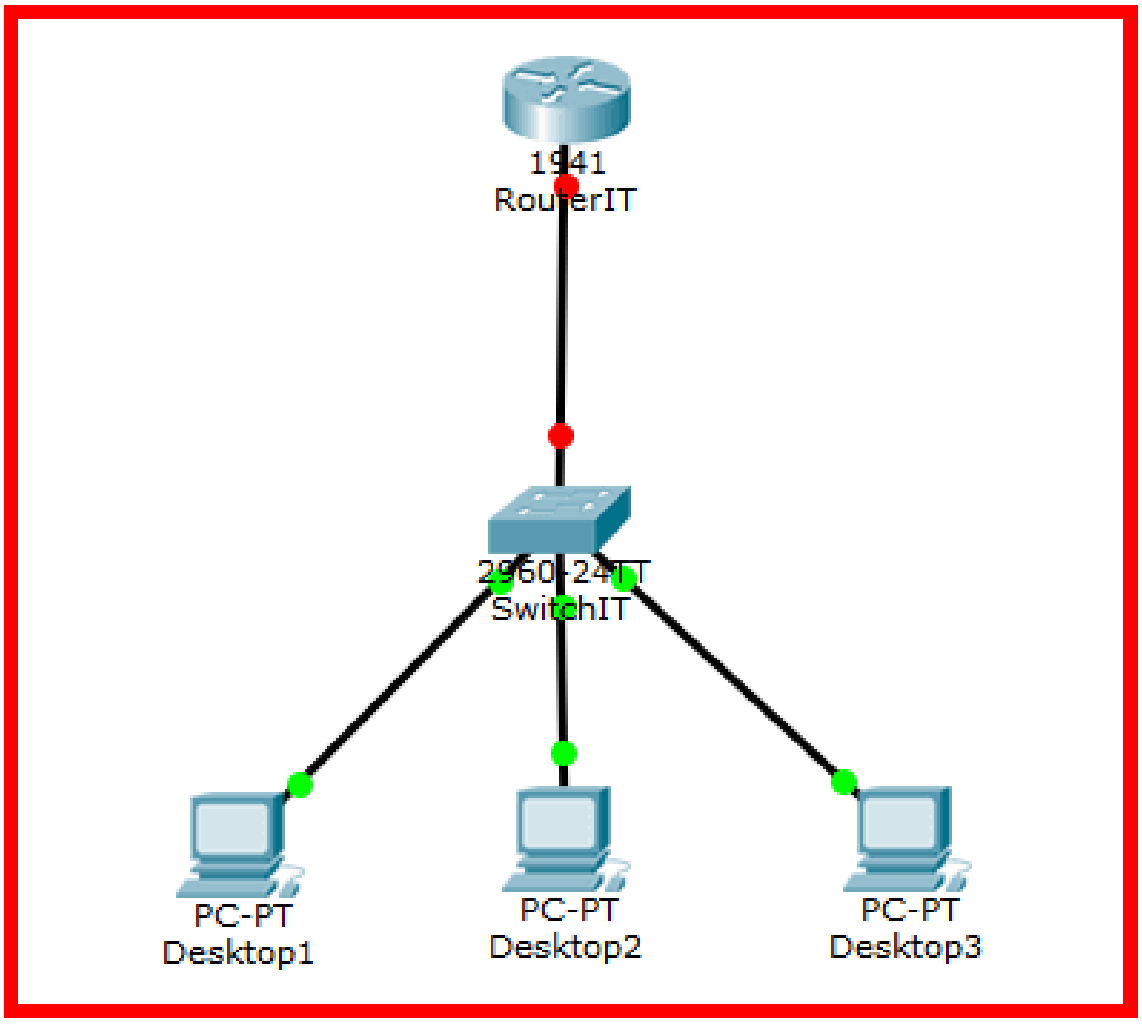

Figure 1: Connecting router and the switch

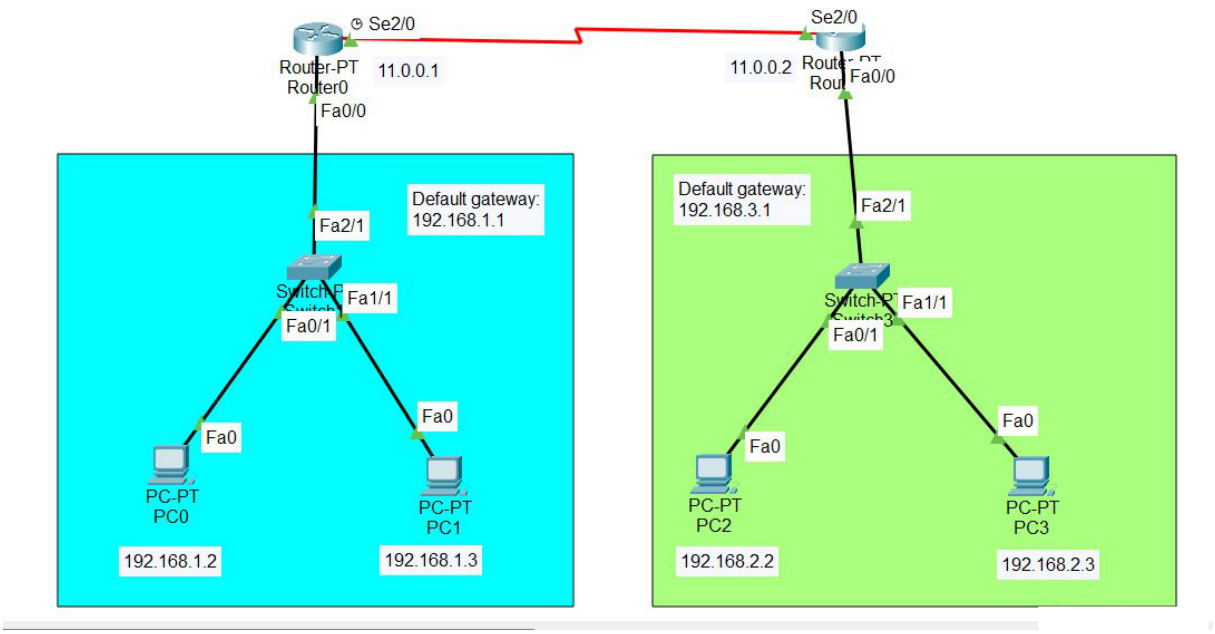

Figure 2: Connecting routers and the switch

Question 3

Create a network topology as shown in the Figure 3

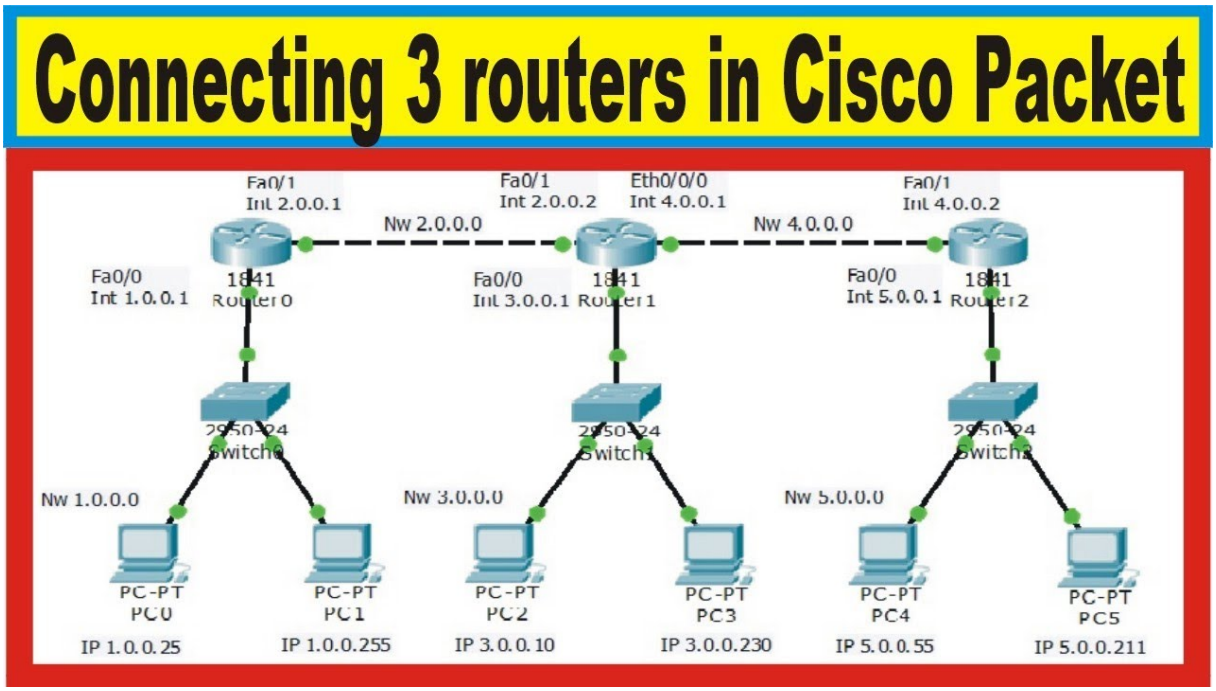

Figure 3: Connecting 3 routers