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Computer Networks

Lab No.: 9

Hardware Router Configurations

Objectives:

- To be familiar with Hardware Router Connections and Configurations

Requirements:

- Hardware routers and PCs
- Connecting cables: straight-through cable / crossover cable and console cable

Configuring an Interface

Steps to configure an Ethernet/Serial interface:

- Enter into interface configuration mode as:
  User EXEC mode ⇒ Privileged EXEC ⇒ Global configuration mode ⇒ Interface configuration mode
- Enter IP address and subnet mask
- Set clock rate if interface is **serial** and is connected as **DCE**, else skip this step
- Turn on the interface

Configuring Serial interface as DTE

```
Router> enable
Router# configure terminal
Router(config)# interface serial 1
Router(config-if)# ip address 201.100.11.2  255.255.255.0
Router(config-if)# no shutdown
```

Note: Configuration of Ethernet or FastEthernet or GigabitEthernet interface is also similar, except the name of interface.

Configuring Serial interface as DCE

```
Router> enable
Router# configure terminal
Router(config)# interface serial 0
Router(config-if)# ip address 201.100.11.1  255.255.255.0
Router(config-if)# clock rate 56000
Router(config-if)# no shutdown
```

Note: Clock rate is necessary when it is connected as DCE

Activities

Perform the **following activities sequentially** and note down the result by observing it.

A. Create the physical network like following:

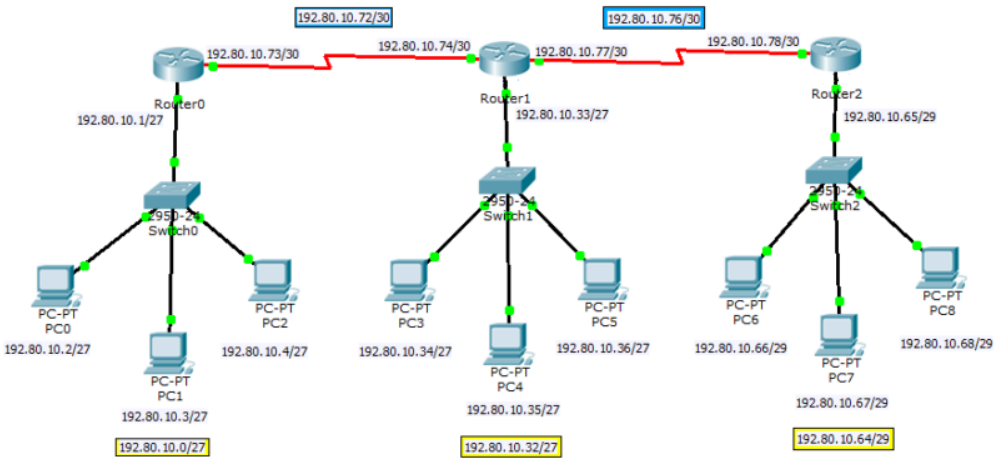

Figure 1: Network Topology

Note: Each LAN interface of the router should contain at least one PC connected directly using a crossover cable.

1. Configure the different interfaces of all routers with given IP addresses and subnet masks. Use **no shutdown** command to activate the corresponding interface.
2. Configure the static routes in each router to route the data packet from one network to each of the destination networks.
3. Test the connectivity from one PC to other PCs and IP addresses of routers.
4. Use traceroute from one PC to other PCs.
5. Observe the routing table of each router.
6. Add one more router (Router3) with Router2 using serial interface. Choose a suitable **/30** network for interconnection between routers and a **/24** network in its Ethernet interface.
7. Add additional static routing to make connectivity between each network.

B. For the topology at the end of activity A, perform the followings:
   1. Remove all the static routes and Configure RIP routing. (choose appropriate version of RIP)
   2. Observe the routing table and test the connectivity using ping and traceroute.

C. **Optional Activity**: For the topology used in activity B, perform the followings:
   1. Remove the RIP configuration and configure OSPF routing considering only area 0.
   2. Observe the routing table and test the connectivity using ping and traceroute.

<u>Exercises</u>:

1. What kind of differences have you experienced during this hardware based lab as compared with simulation based lab? Discuss briefly.
2. Note down the observations of each step with necessary commands used in above activities mentioned above and comment on it.

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