LAB-8: Basic router configuration and static routing in Packet Tracer

Theory

a. Router

A router is a networking device that forwards data packets between computer networks. Routers direct traffic, ensuring that data packets reach their intended destination across different networks. The basic function of a router is to determine the best path for sending the data and forward it to its next destination.

b. Components used:

- **Switch (2960):** Connects multiple devices within the LAN.

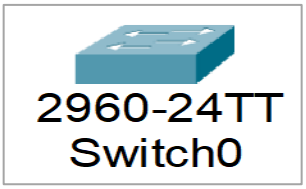

Fig: switch 2960

- **Router (ISR4331):** Directs data packets between different networks, ensuring they reach the correct destination.

Fig: Router ISR4331

- **End Devices (PC):** Computers or servers that interact over the network.

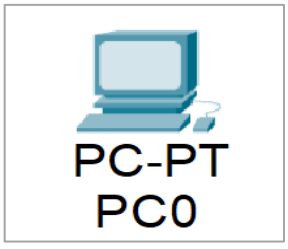

Fig: PC-PT

- **Ethernet Cables:** Used to connect devices to the switch and routers.

Fig: Straight through cable

c. Network Diagram

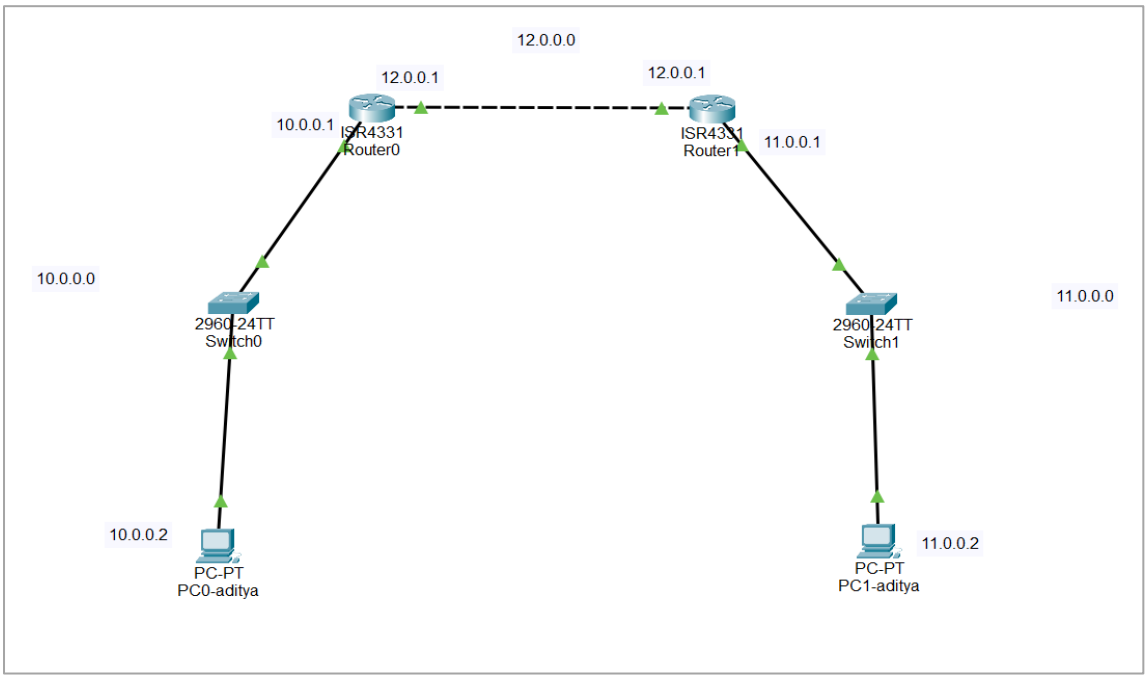

Fig: Connection of different networks using router

Implementation sequence:

To configure the global parameters, gigabit ethernet and network follow the given steps:

1. **Select necessary nodes and network device from selection panel**

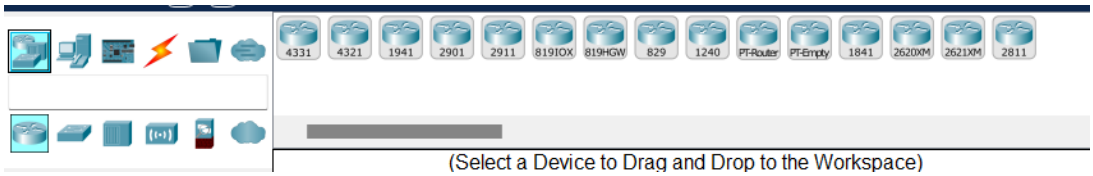

Fig: Device selection

2. Select devices and drag them on workspace

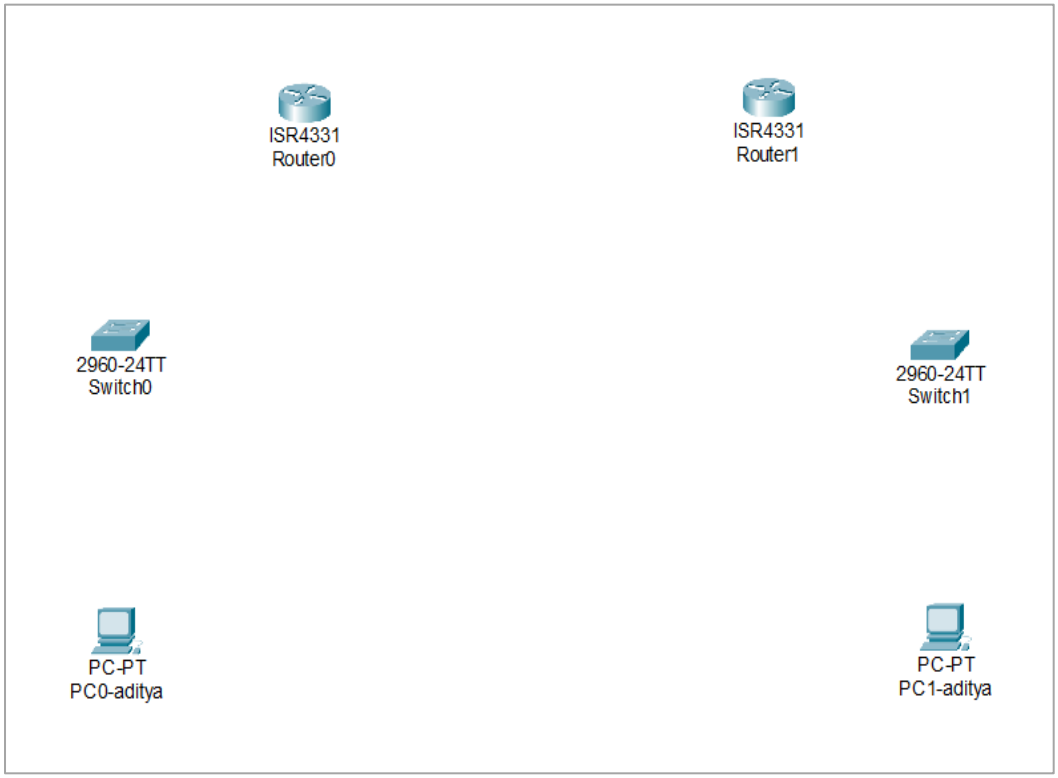

Fig: Adding devices in the workspace

3. Now connecting the added devices.

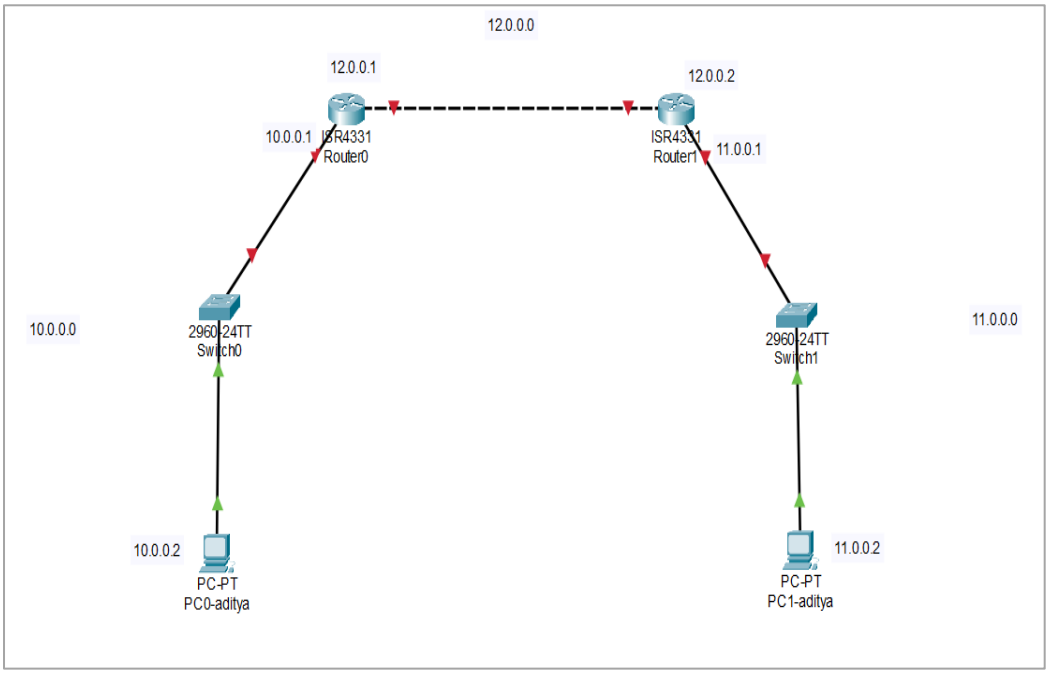

Fig: Connecting the devices

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4. **Configuring global parameters of router**

To configure global parameters on the router, click on the router on your workspace go on the CLI and use following commands.

Router>en

Router #conf t

Router(config) #hostname [name]

Router(config) #enable secret [password]

Router(config) #no Ip domain-lookup

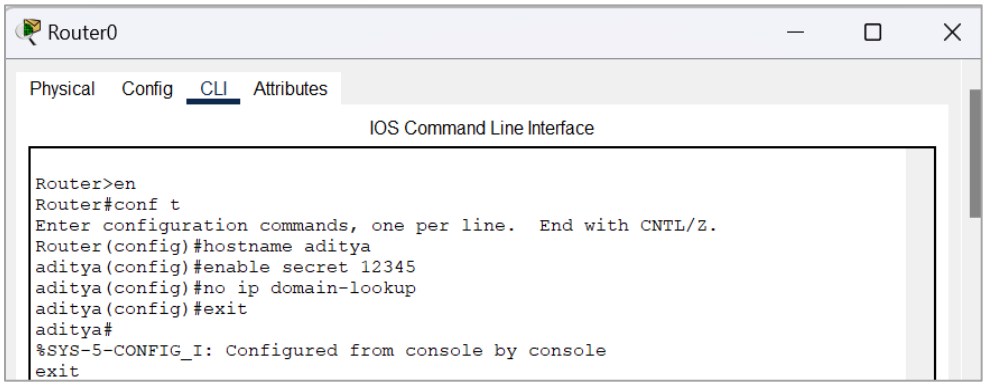

Fig: Configuring global variables of a router

5. **Now configuring the gigabit ethernet connections.**

To configure the gigabit ethernet connection enter the given command on the routers CLI.

Router>en

Router #conf t

Router(config)#interface gig0/0/1

Router(config-if) #ip address 10.0.0.1 255.0.0.0

Router(config-if) #no shutdown

Router(config-if) #interface gig0/0/0

Router(config-if) #ip address 12.0.0.1 255.0.0.0

Router(config-if) #no shutdown

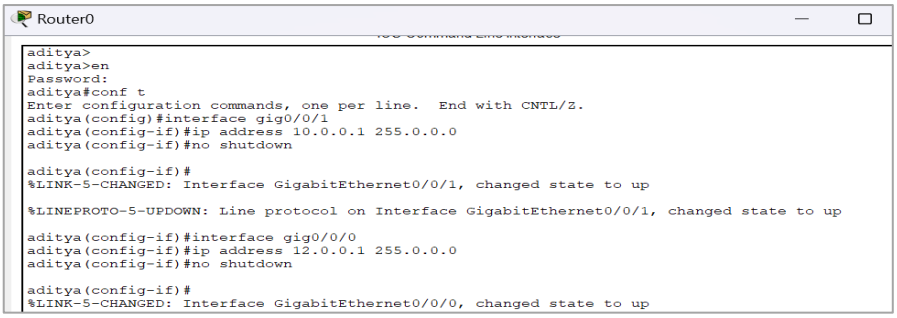

Fig: Configuring gigabit Ethernet

6. **Now configuring Ip addresses on the pc.**

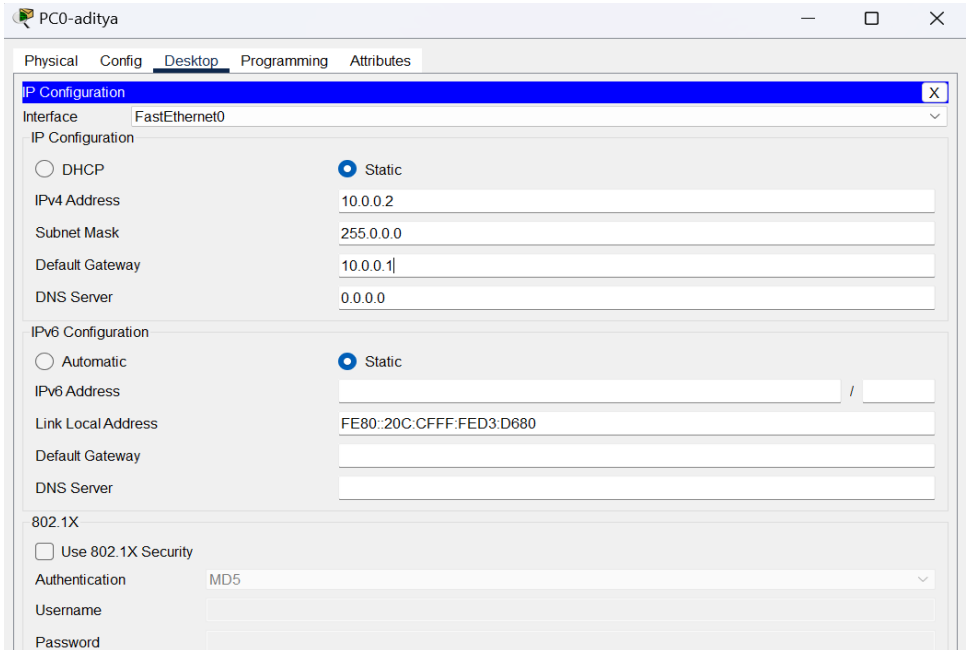

Fig: Setting up Ip and default gateway on pcs

7. **Pinging node on another network before static configuration.**

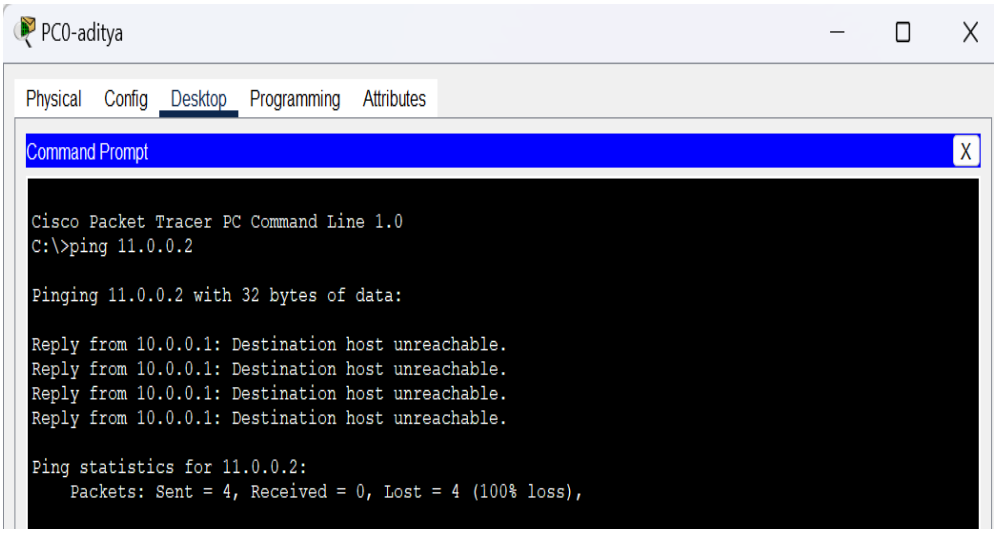

Fig: Pinging before static routing

As we can see before setting up a static Ip path the destination host is shown unreachable when pinging the Ip.

8. **Now setting up a static routing path on the routers.**
   To set up the static routing path go to the routers CLI and use the following commands.
   Router>en
   Router #conf t
   Router(config) #ip route 12.0.0.0 255.0.0.0 12.0.0.1
   Router(config) #ip route 10.0.0.0 255.0.0.0 12.0.0.1

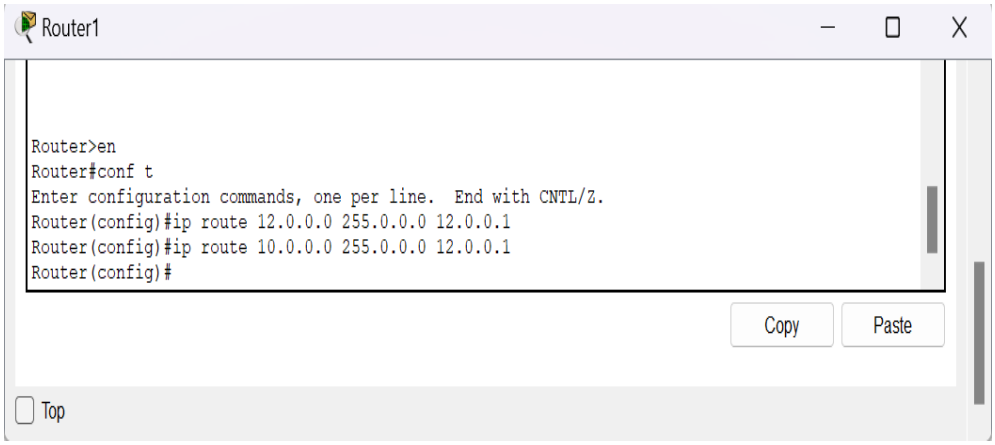

Fig: Configuring static routing path

9. **Testing and validation**

   For testing we use the ping commands on the PC to ping Ip of the PC on different network and check if we receive any reply.

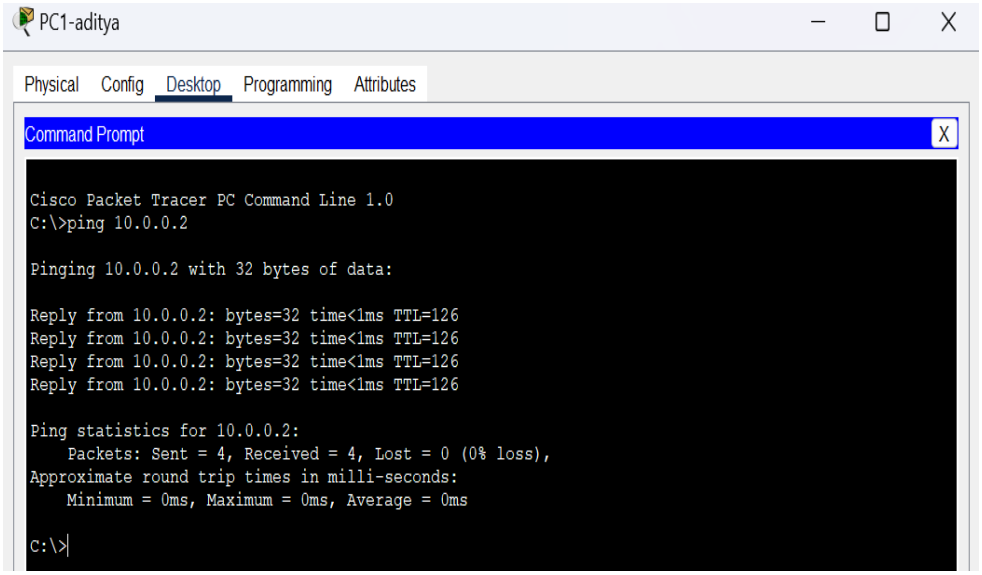

Fig: Pinging after setting up a static path

After setting up static Ip path we can successfully ping the Ip address on a different network.

Conclusion

In this lab we successfully demonstrated how to configure a basic router and set up static routing. By following the steps for configuring global parameters, Gigabit Ethernet interfaces, and adding static routes, we were able to create a functional network topology. Testing confirmed that routing between subnets was correctly established and operational.

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