



East West University

Course title: Data Communications

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Section: 3

Mini Project Topic:
" Data Communication in a network"

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Topic: Data Communication in a network

1. Problem Statement

Three routers and three switches are available. I will design a network using these networking devices, proper wires and 6 PCs. PCs are indexed from 1 to 6. Adapt EIGRP as networking protocol in this case. Here, class C IP address will be used to assign all host address and network address. After completing the network, I will PING between 1no. PC from first router and 5no. PC from third router.

2. Design

In this network, the initial router connects to the second router, and the second router links to the third router via copper crossover cables. Each of these routers has a connected switch, and two PCs are connected to each switch using copper straight-through cables. All devices in this setup, including both host and network addresses, is assigned Class C IP addresses. In total, this design has five distinct networks.

2.2. Implementation

In this project, I have used Cisco Packet Tracer (version 8.2.1.0118) to implement the design. The components or devices are used in this project is listed below.

Components:

- Three PT routers
- Copper cross over cables
- Three 2950-24 Switches
- Straight Through Cables
- Six PCs

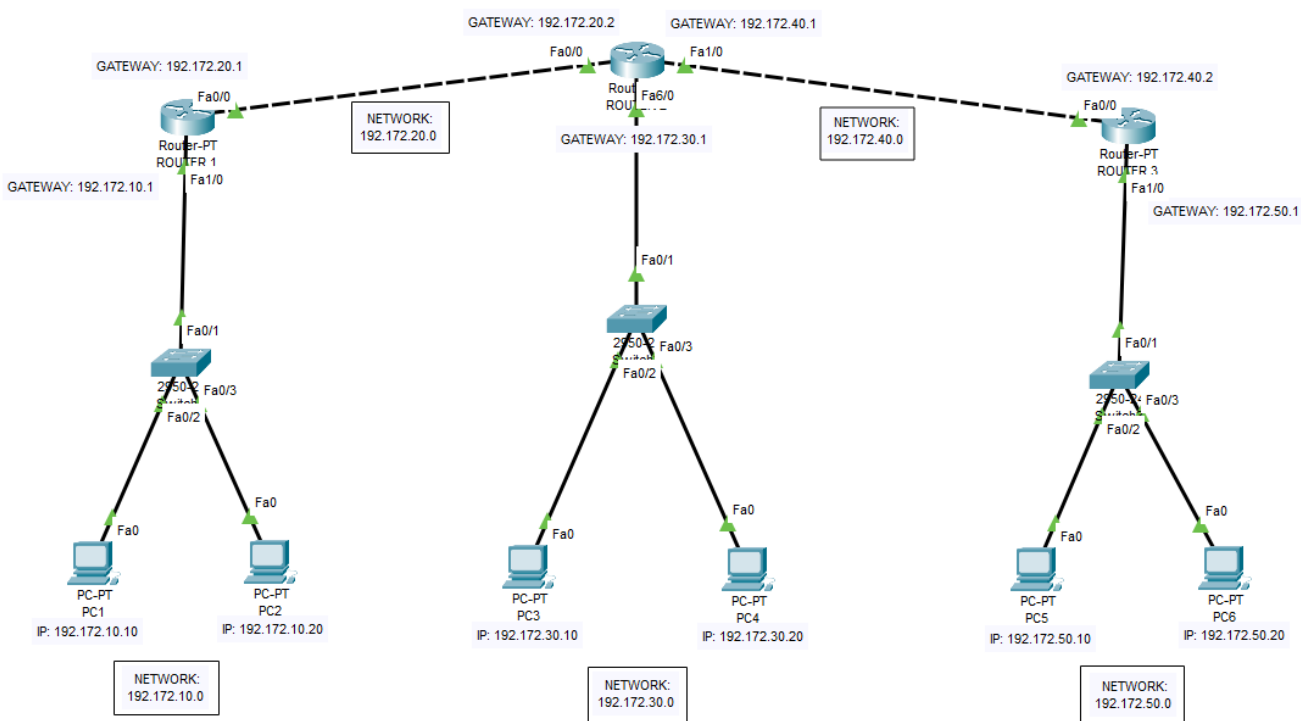


Fig 1: Network Design

2.3. IP addresses

The design has total 5 networks. There are: 192.172.10.0; 192.172.20.0; 192.172.30.0; 192.172.40.0; and 192.172.50.0. The table in the below showing IPs of the different interface in each router.

Router name	Interface	IP	Gateway Information
Router 1	Fa0/0	192.172.20.1	----
	Fa1/0	192.172.10.1	Gateway IP of PC1 and PC2
Router 2	Fa0/0	192.172.20.2	----
	Fa1/0	192.172.40.1	----
	Fa6/0	192.172.30.1	Gateway IP of PC3 and PC4
Router 3	Fa0/0	192.172.40.2	----
	Fa1/0	192.172.50.1	Gateway IP of PC5 and PC6

The table in the below showing device names that are connected in each network.

Network IP	Connected Devices
192.172.10.0	Router 1, Switch 1, PC1 and PC2
192.172.20.0	Router 1 and Router 2
192.172.30.0	Router 2, Switch 2, PC3 and PC4
192.172.40.0	Router 2 and Router 3
192.172.50.0	Router 3, Switch 3, PC5 and PC6

3. Experimental Results

After doing the ping operation between PC1(192.172.10.10) from first router and PC5 (192.172.50.10) from third router, we can see that the ping is successful and there is 0% loss.

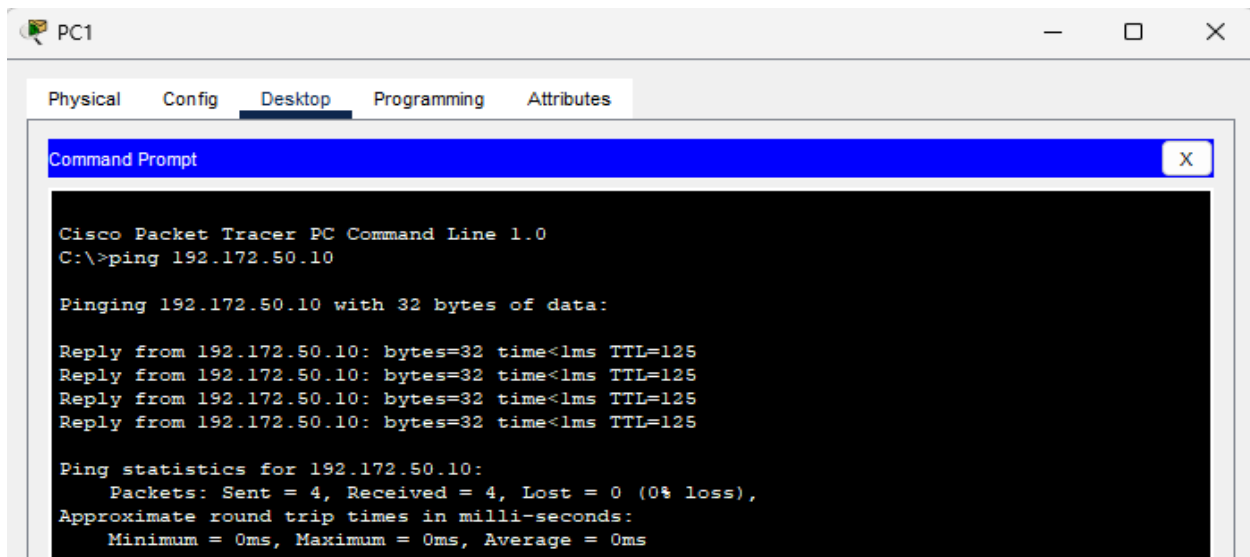


Fig 2: Ping operation from PC1 to PC5

4. Conclusion

The network setup is fully configured, with all end devices, routers, and switches interconnected. Effective communication has been established among all devices throughout the network. As a successful test, we can confirm that PC1 can be pinged from the first router to the third router, including PC5.

Codes

Router Configuration

```
ROUTER 1:
enable
config t
interface fa1/0
ip address 192.172.10.1 255.255.255.0
no shut
exit

interface fa0/0
ip address 192.172.20.1 255.255.255.0
no shut
exit

ROUTER 2:
enable
config t
interface fa0/0
ip address 192.172.20.2 255.255.255.0
no shut
exit

interface fa1/0
ip address 192.172.40.1 255.255.255.0
no shut
exit

interface fa6/0
ip address 192.172.30.1 255.255.255.0
no shut
exit

ROUTER 3:
enable
config t
interface fa1/0
ip address 192.172.50.1 255.255.255.0
no shut
exit

interface fa0/0
ip address 192.172.40.2 255.255.255.0
no shut
exit
```

Protocol EIGRP

```
ROUTER 1:
router eigrp 100
network 192.172.10.0 0.0.0.255
network 192.172.20.0 0.0.0.255
exit

ROUTER 2:
router eigrp 100
network 192.172.20.0 0.0.0.255
network 192.172.30.0 0.0.0.255
network 192.172.40.0 0.0.0.255
exit

ROUTER 3:
router eigrp 100
network 192.172.40.0 0.0.0.255
network 192.172.50.0 0.0.0.255
exit
```