East West University

CSE350

Data Communications

Project Report

Data Communication in a Network

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Problem Statement

The purpose of this project is to design and implement a network infrastructure consisting of three routers three switches and five PCs. We have chosen OSPF routing protocol for this system as a routing protocol. Here class C IP addresses will be assigned for both network and host addresses. The primary object is to establish a seamless communication between PC1 and PC5, connected to Router1 and PC5, Connected to Router 3.

Objective

The main objective is to show that PC1, which is in the subnet of Router 1, and PC5, which is in the subnet of Router 3, can successfully communicate with one another. This calls for setting up EIGRP routing, subnetting, and IP addressing correctly to guarantee effective packet forwarding between the routers.

Design

In Cisco Packet Tracer, the network design was put into practice. Enhanced Interior Gateway Routing Protocol (EIGRP) is implemented as the dynamic routing protocol to ensure efficient routing within the university's network. OSPF enables routers to discover the network topology and calculate the best paths.

The Network elements used in the project were:

1. PCs
2. Routers
3. Switches
4. Straight Through Cable and Serial DCE

Design Steps

Router Configuration:

- Assign appropriate IP addresses to router interfaces.
- Implement EIGRP on all routers for dynamic routing.

Switch Configuration:

- Create VLANs on switches corresponding to router-subnet associations.

- Assign IP addresses to switch VLANs.

PC Configuration:

- Configure PCs with IP addresses in accordance with their respective subnets.

Testing:

- Conduct PING operations to validate connectivity between PC1 and PC5.
- Ensure EIGRP routing tables are updated correctly.

Router Configuration Code :

###########Router Configurations###########

Router1 :

interface FastEthernet0/0

ip address 192.168.1.1 255.255.255.0

no shutdown

exit

interface Serial0/0/0

ip address 198.168.1.1 255.255.255.0

clock rate 64000

no shutdown

exit

interface Serial0/0/1

ip address 198.168.3.2 255.255.255.0

no shutdown

exit

Router2 :

interface FastEthernet0/0

ip address 193.168.1.1 255.255.255.0

no shutdown

exit

interface Serial0/0/0

ip address 198.168.2.2 255.255.255.0

no shutdown

exit

interface Serial0/0/1

ip address 198.168.1.2 255.255.255.0

no shutdown

exit

Router3 :

interface FastEthernet0/0

ip address 194.168.1.1 255.255.255.0

no shutdown

exit

interface Serial0/0/0

ip address 198.168.2.1 255.255.255.0

clock rate 64000

no shutdown

exit

interface Serial0/0/1

ip address 198.168.3.1 255.255.255.0

clock rate 64000

no shutdown

exit

#########EIGRP Protocol##########

Router-3 :

router eigrp 1

network 194.168.1.0 0.0.0.255

network 198.168.2.0

network 198.168.3.0

exit

Router-2 :

router eigrp 1

network 193.168.1.0 0.0.0.255

network 198.168.2.0 0.0.0.255

network 198.168.1.0

exit

Router-1 :

router eigrp 1

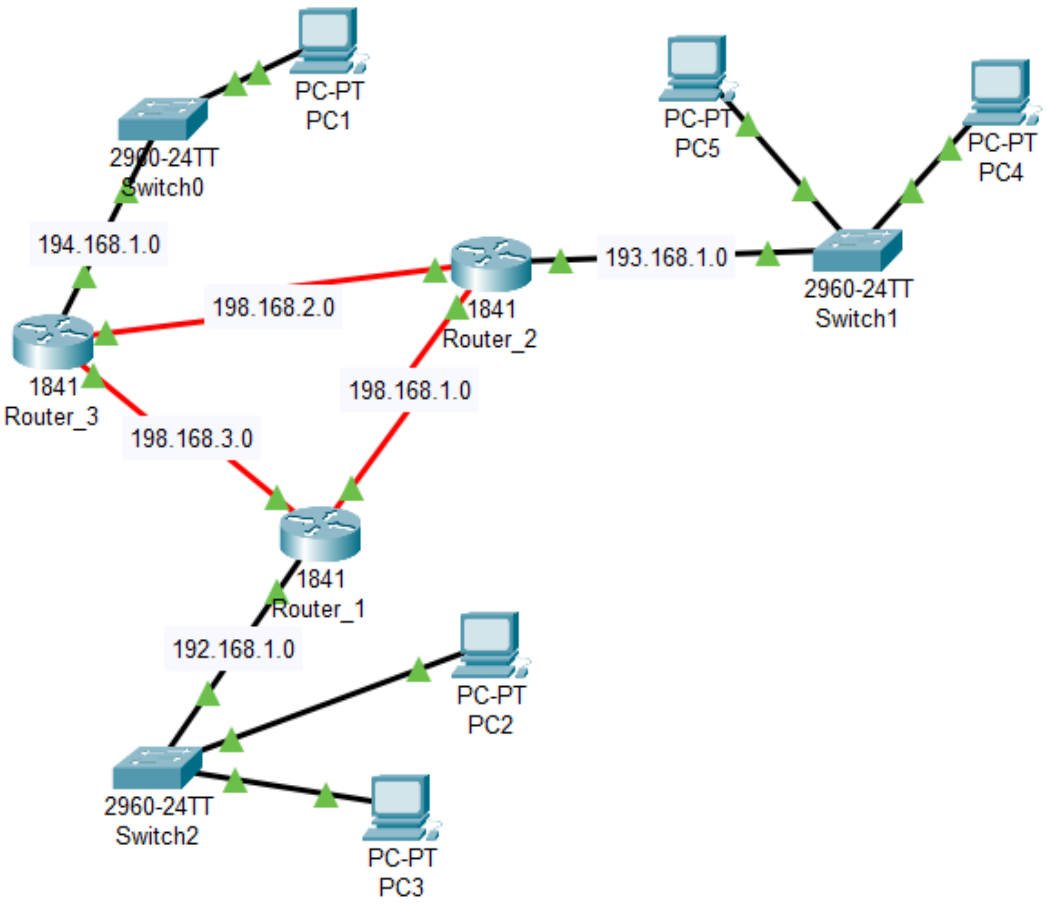
network 192.168.1.0 0.0.0.255

network 198.168.1.0 0.0.0.255

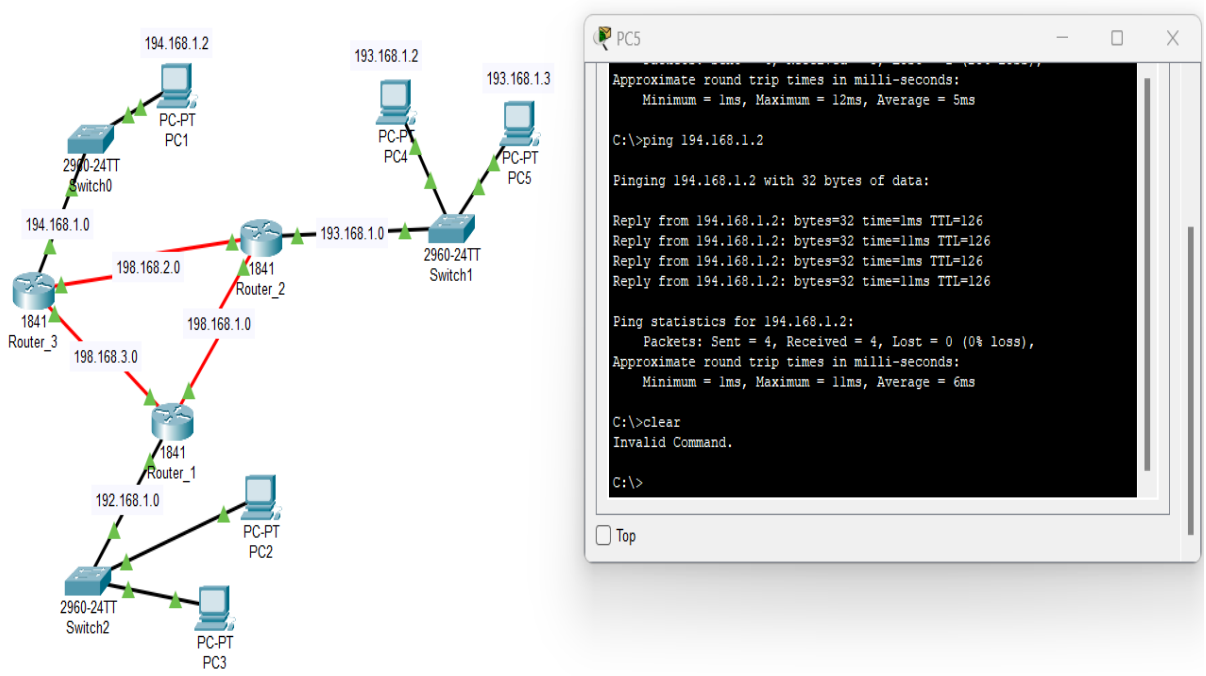
network 198.168.3.0 0.0.0.255

exit

Design Diagram :



Experimental Result



Conclusion

The objective of this project is to use EIGRP as the routing protocol to build a working network architecture. A successful solution will demonstrate how devices in various subnets may communicate with one another. The resulting documentation will prove to be an invaluable tool for network administrators in their future maintenance assignments.