

AIM :

To know the basics of Packet-Tracer functionality.

Pre-requisite :

Knowledge of network devices :

Hubs, switch, Router

How connectivity and IP configuration  
are to be set up.

Apparatus :

Cisco Packet Tracer

Objective :

Use and functioning of Hub,  
switch and Router by making a  
network using them.

Steps of Experiment :

1. Open Cisco Packet tracer.

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2. Click on hubs, select on first type generic and drag to the workspace.
3. Click on the hubs placed in the workspace, the physical view will open.
4. Click on config tab to show global setting of hub.
5. Now place 5 components around hub
6. Click on any PC, you should see something similar to CPU.  
Physical view of PC
7. On gateway / DNS select DHCP. Set up DHCP server to assign IP addresses to the PC's.
8. Click on server. Go to config tab. Configure static IP address / gateway / subnet Mask.

IP address : 192.168.0.254

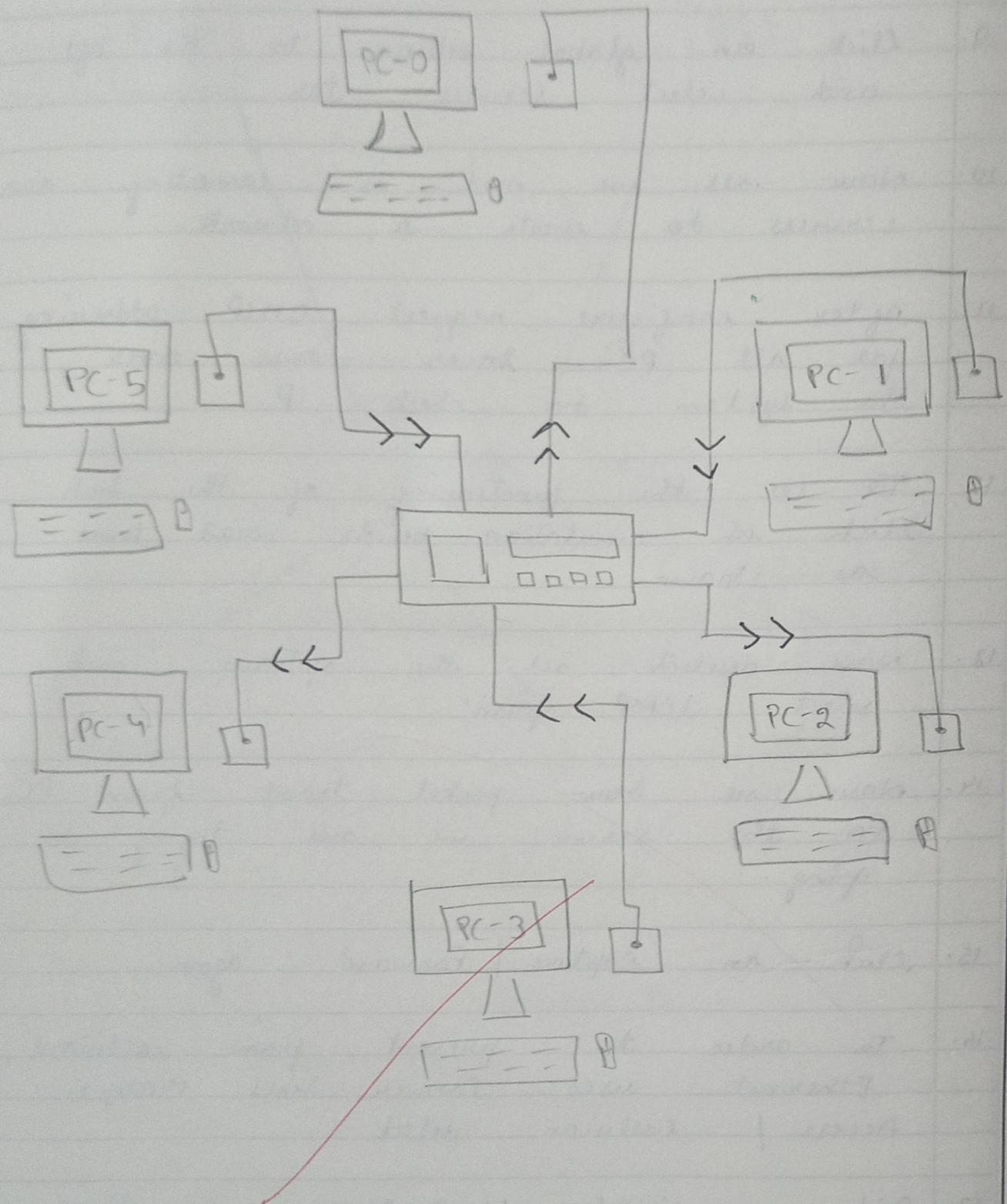
Subnet Mask : 255.255.255.0

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9. Click on global settings to the left and select services tab.
10. Now all we need is connecting our services to create a network.
11. After configure request DHCP addressing for all PC's move mouse over the system to check IP.
12. To see the functioning of the hub click on simulation beside real time as shown.
13. Now deselect all the options and select ICMP option.
14. Now see how packet travel from PC to the server we are trying to ping.
15. Click on capture / forward again.
16. In order to prevent frame collisions, Ethernet uses Carrier Sense Multiple Access / collision detect.
17. Add a simple ICMP PDU as done previously.

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## Connections :



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## Output :

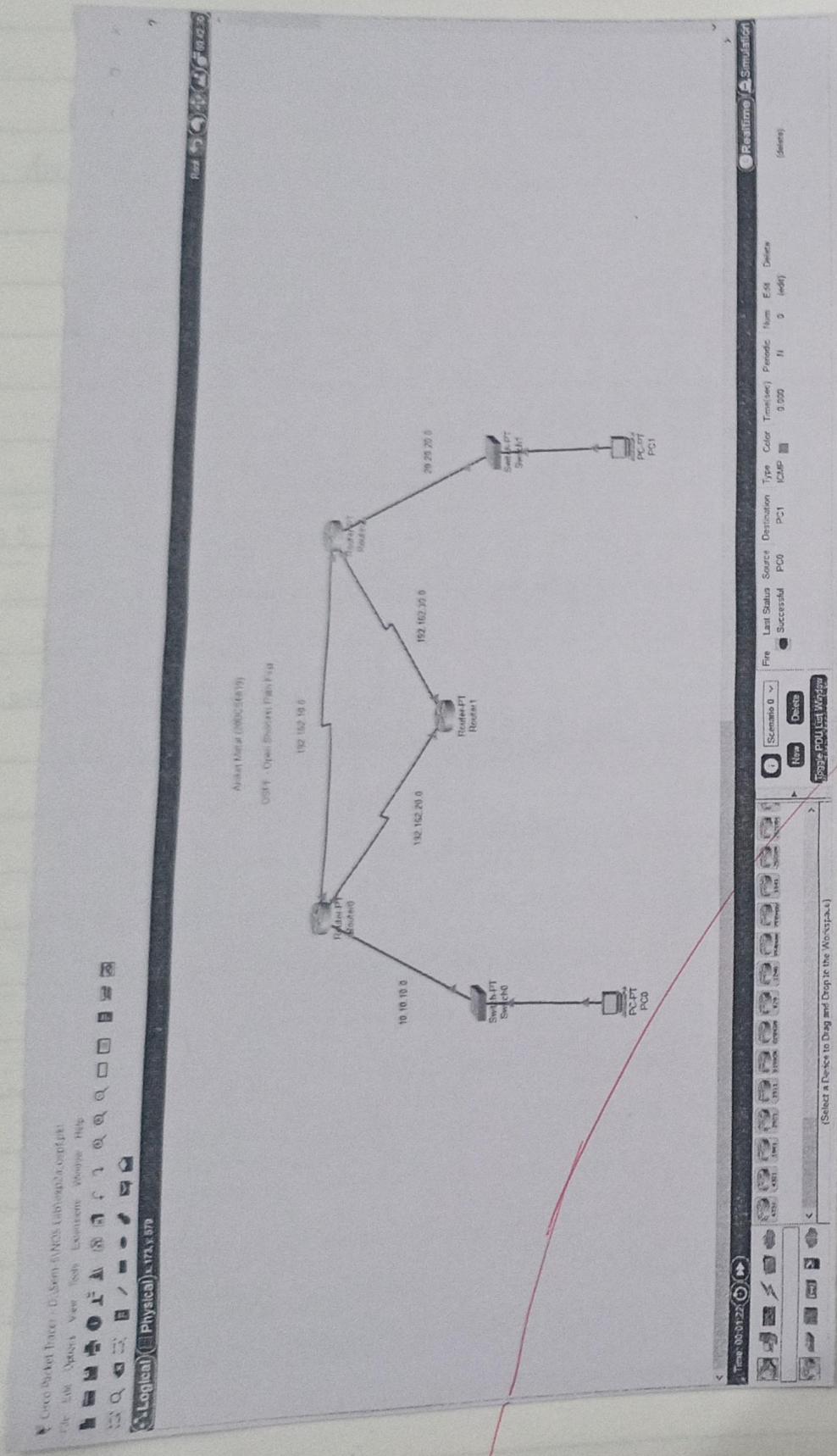
Total data has been shared between the end devices successfully.

## Learning Outcomes :

- Learned about the basics of computer networks.
- Learned about Cisco Packet Tracer usage.
- Created connections with Router, switch and hub.

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## Experiment - 2 A

AIM :

To make a complete network and apply OSPF routing protocol.

Tools required : Cisco Packet Tracer.

IP Address of devices :

PC's :-

S.No	Device	IP address	Subnet Mask	Default Gateway
1.)	PC - 0	10.10.10.2	255.0.0.0	10.10.10.1
2.)	PC - 1	20.20.20.2	255.0.0.0	20.20.20.1

Router Configuration

S.NO	Device	Interface	IPv4 add.	Subnet Mask
1.)	Router - 0	Fast Ethernet 0/0	10.10.10.1	255.0.0.0
		Serial 2/0	192.168.20.1	255.255.255.0
		Serial. 3/0	192.168.10.1	255.255.255.0
2.)	Router - 1	Serial 2/0	192.162.20.2	255.255.255.0
		serial 3/0	192.162.30.2	255.255.255.0

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3.) Router-2	Fast Ethernet 0/0	20.20.20.1	255.0.0.0
	Serial 2/0	192.162.10.2	255.255.255.0
	Serial 3/0	192.162.30.1	255.255.255.0

Steps of experiment :

1. Connect all PCs and routers accordingly, routers should be connected serially.
2. Input the IP addresses and default gateways for all networks.
3. Write the CLI code for OSPF (open shortest path first) protocol.
4. Now check the ping from one PC to another, it will transfer data.

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## PC-O

A.G.O. on top

1. Click on PC-O
2. Go to Desktop
3. Select Command prompt
4. Enter following command

Cisco Packet Tracer PC Command Line 1.0

C:\> ping 20.20.20.2

Pinging 20.20.20.2 with 32 bytes of data:

Reply from 20.20.20.2 : bytes=32 time=12ms TTL=126  
Reply from 20.20.20.2 : bytes=32 time=18ms TTL=126  
Reply from 20.20.20.2 : bytes=32 time=12ms TTL=126  
Reply from 20.20.20.2 : bytes=32 time=5ms TTL=126

Ping statistics for 20.20.20.2 :

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 5ms, Maximum = 18ms, Average = 11ms

C:\> |

CLI Code :-

Router - 0

Router &gt; en

Router # config t

Enter configuration commands, one per line.

End with CNTL/Z.

Router (config) # router ospf 1

Router (config-router) # network 10.10.10.0  
0.255.255.255 area 0Router (config-router) # network 192.162.10.0  
0.0.0.255 area 0Router (config-router) # network 192.162.20.0  
0.0.0.255 area 0

Router (config-router) # exit

Router (config) # exit

Router #

Router - 1

Router &gt; en

Router # config t

Router (config) # router ospf 1

Router (config-router) # network 192.162.20.0  
0.0.0.255 area 0Router (config-router) # network 192.162.30.0  
0.0.0.255 area 0

Router (config-router) # exit

Router (config) # exit

Router #

## Conclusion :

After applying all the routing protocols of OSPF (Open shortest Path First), we can see the router and different way of transmission of the data.

## Learning Outcomes :

1. Learned about the concept of OSPF
2. Learnt to make complex network using OSPF Protocol in Cisco software.
3. Learnt about different uses of router and switches.

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Router - 2

Router > en

Router # config t

Router (config) # router ospf 1

Router (config-router) # network 20.20.20.0  
0.255.255.255 area 0

Router (config-router) # network 192.162.10.0  
0.0.0.255 area 0

Router (config-router) # network 192.162.30.0  
0.0.0.255 area 0

Router (config-router) # exit

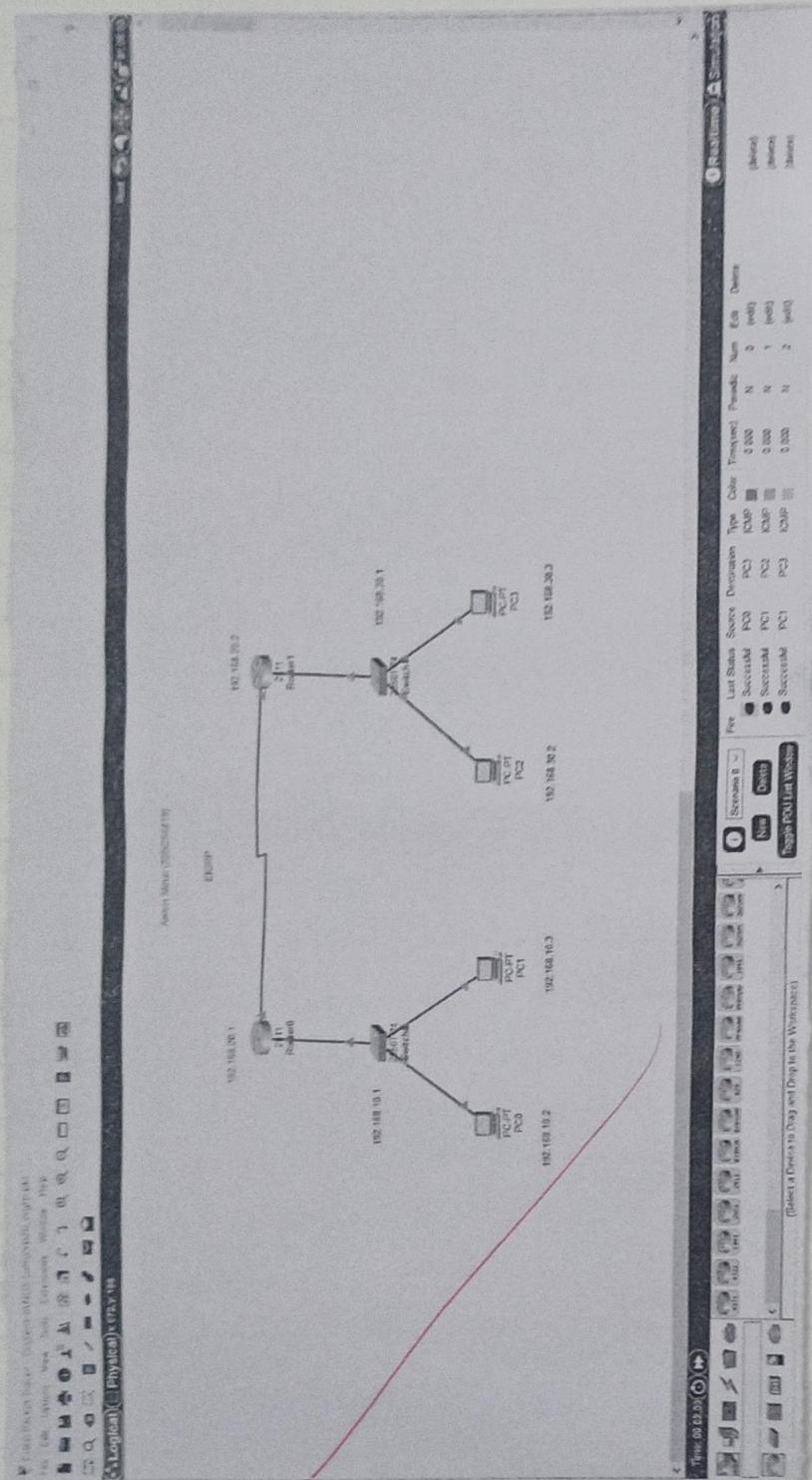
Router (config) # exit

Router #

For Switch

S.NO	Device	Interface	IP address
1.)	Switch-0	N/A	N/A
2.)	Switch -1	N/A	N/A

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## Experiment - 2B

### AIM :

To make a complete network and apply EIGRP, Enhanced Interior Gateway Routing Protocol.

Tools required : Wireshark Packet Tracer

IP Addresses of devices :

PC's :-

S.No	Device	IP address	Subnet Mask	Default Gateway
1)	PC-0	192.168.10.2	255.255.255.0	192.168.10.1
2)	PC-1	192.168.10.3	255.255.255.0	192.168.10.1
3)	PC-2	192.168.30.2	255.255.255.0	192.168.30.1
4)	PC-3	192.168.30.3	255.255.255.0	192.168.30.1

### Router Configuration

S.No	Device	Interface	IPv4 add.	Subnet Mask
1)	Router-0	FastEthernet 0/0	192.168.10.1	255.255.255.0
		Serial 0/0/0	192.168.20.1	255.255.255.0

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2.) Router - 1	Fast Ethernet 0/0	192.168.30.1 255.255.255.0
	Serial 0/0/0	192.168.20.2 255.255.255.0

Steps of Experiment :

1. Open Cisco Packet Tracer.
2. Navigate to bottom left corner.
3. Then select 2 Routers (2811), 2 switches (2950T-24) and 4 PC-PT ;  
Drag them to the work space.
4. Now make connections between devices, use Straight-through cable for connecting PC's to Switches and switches to Routers.  
use Serial DCE cable to make connections between routers.
5. Now for every PC we need to provide IP addresses :  
select one PC at a time, then select 'IP configuration' then enter the values of IP address, Subnet Mask and Default gateway.

## PC - 0

1. Click on PC - 0
2. Click on Desktop
3. Now select the command prompt
4. Enter the following command

Cisco Packet Tracer PC Command Line 1.0

C:\> ping 192.168.30.3

Pinging 192.168.30.3 with 32 bytes of data:

Reply from 192.168.30.3 : bytes=32, time=10 ms TTL=126

Reply from 192.168.30.3 : bytes=32, time=1 ms TTL=126

Reply from 192.168.30.3 : bytes=32, time=2 ms TTL=126

Reply from 192.168.30.3 : bytes=32, time=1 ms TTL=126

Ping statistics for 192.168.30.3

Bytes: Sent=4, Received=4, Lost=0 (0% loss),  
Approximate round trip time in milli-seconds:

Minimum = 1ms, Maximum = 10ms, Average = 3ms

C:\>1

Now, we need to do configuration on CLI (Command Line Interface) in routers and write following commands :

CLI Code :

Router 0 :

Router > en

Router # config t

Router (config) # interface fastethernet 0/0

Router (config-if) # ip address 192.168.10.1 255.255.255.0

Router (config-if) # no shutdown

Router (config-if) # exit

Router (config) # interface serial 0/0/0

Router (config-if) # ip address 192.168.20.1 255.255.255.0

Router (config-if) # clock rate 128000

Router (config-if) # no shutdown

Router (config-if) # exit

Router (config) # exit

Router # copy running-config startup-config

Router #

Teacher's Signature : \_\_\_\_\_

## Conclusion :

After applying all the routing protocols of EIGRP, we saw the router and different way of transmission of the data.

## Learning Outcomes :

1. Learned about the concept of EIGRP protocol.
2. Learnt to make complex network using EIGRP in Cisco Router.
3. Learnt about different uses of router and switches.

Router - 1

```

Router > en
Router # config t
Router (config) # interface fastEthernet 0/0
Router (config-if) # ip address 192.168.30.1 255.255.255.0
Router (config-if) # no shutdown
Router (config-if) # exit
Router (config) # interface serial 0/0/0
Router (config-if) # ip address 192.168.20.2 255.255.255.0
Router (config-if) # no shutdown
Router (config-if) # exit
Router (config) # exit
Router # copy running-config startup-config
Router #

```

7. Now, we need to do  
eigrp configuration in both routers,  
as shown below :

Router - 0

```

> en
# config t
# router eigrp 10
# network 199.168.10.0 255.255.255.0
# network 192.168.20.0 255.255.255.0
# exit
# copy running-config startup-config

```

Teacher's Signature : \_\_\_\_\_

Router - 1

```

> en
# config t
# router e1g4p 10
# network 192.168.20.0 255.255.255.0
# network 192.168.30.0 255.255.255.0
# exit
# copy running-config startup-config

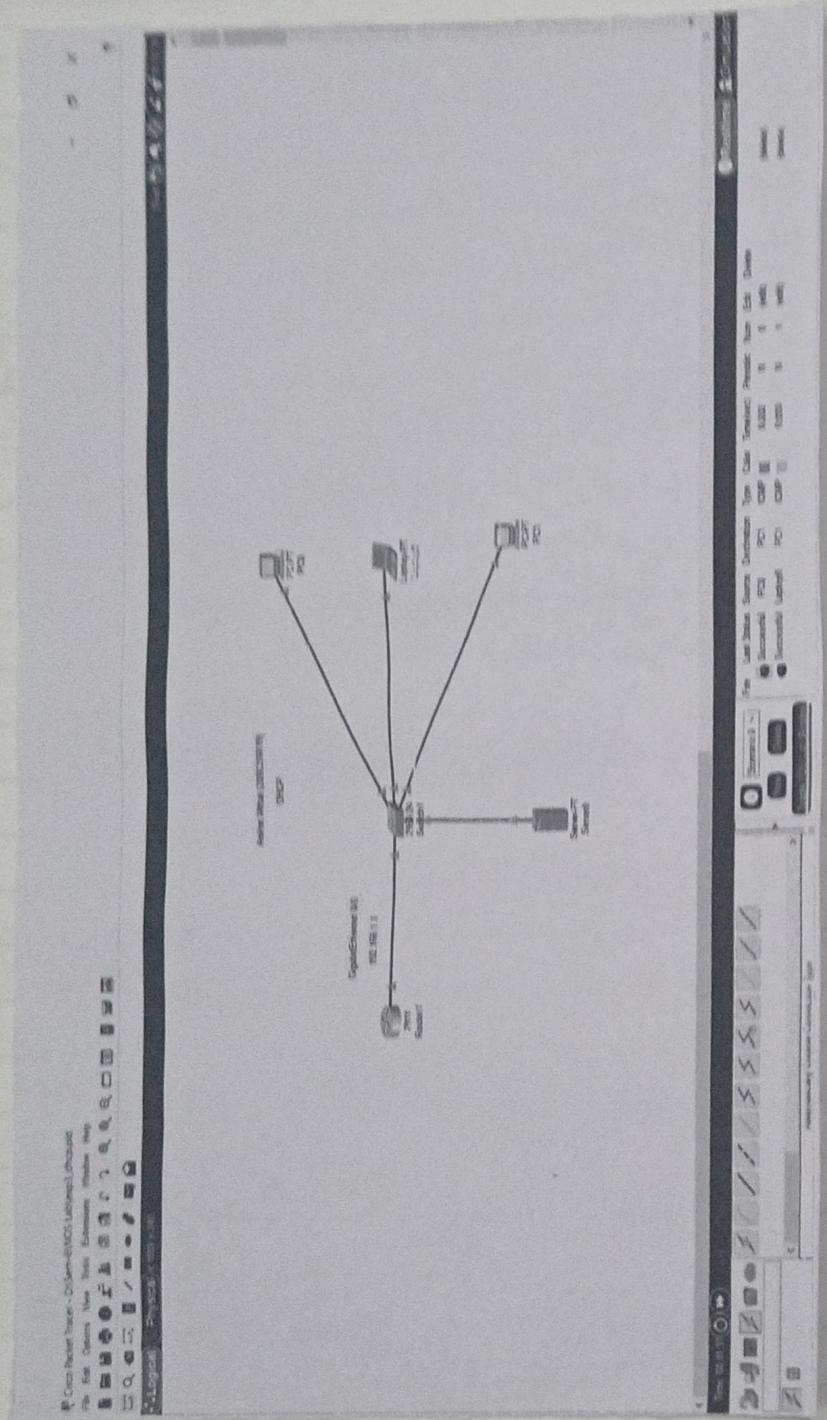
```

8. Now we need to add a packet from PC0 to PC3 and then click on simulation and then click on Play.

The simulation is successfully played.

(b) 23/03/23

# Connections



## Experiment - 3

## AIM :

To implement DHCP in network.

## Objective :

Functioning of the routing protocol with DHCP (Dynamic Host Configuration Protocol).

## Tools required :

Cisco Packet Tracer.

## Steps to Configure DHCP :

1. Open Cisco Packet Tracer.
2. Navigate to bottom left corner.
3. Then select 1 router, 1 switch, 1 server, 2 PC's, 1 Laptop, Drag them to the workspace.

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4. Now make connections between all devices using various cables.

5. Now, we need to do configuration on CLI (Command Line Interface) in router.

6. After giving the CLI commands, go to each PC one at a time, then select 'IP configuration' and then click on DHCP.

7. Now select a data packet and send it between PC's and laptop, the data will transfer successfully.

### CLI Commands :

```
Router > en
Router # config t
```

```

Router (config) # interface gigabitethernet 0/0
Router (config-if) # ip address 192.166.1.1
                  255.255.255.0
Router (config-if) # no shutdown
Router (config-if) # exit
Router (config) # exit
Router #

```

```

Router (config) # ip dhcp pool arkit-pool
Router (dhcp-config) # network 192.166.1.0
                      255.255.255.0
Router (dhcp-config) # default-router
                      192.166.1.1

```

```

Router (dhcp-config) # dns-server
                      192.166.1.254

```

```

Router (dhcp-config) # exit

```

for memory

```

Router # en

```

```

Router # write memory
Building configuration ...
[OK]

```

```

Router # DHCP address conflict :
server pinged 192.166.1.1

```

Conclusion :

After applying all the routing protocols, we saw the different way of transmission of data.

Learning Outcomes :

1. Learned about the concept of DHCP protocol.
2. Learned to make complex network using DHCP in Cisco packet Tracer.
3. Learned about Routing protocols.