# EXPERIMENT NO: 9

## To design a network using three routers and dynamic routing

## Aim

To design a network using three routers and configuring their routing tables for dynamic routing.

## Objectives

1. Studying and implementing dynamic routing.
2. Connecting different networks using routers, configuring the interfaces and routing tables of the routers to perform dynamic routing.

## Procedure

**Design following network scenario:**

1. Start packet tracer and design the network as given in Figure 1.
2. Configure the router and end devices as described in section below.
3. Test the configuration by sending simple PDUs.



Figure 1 Dynamic Routing
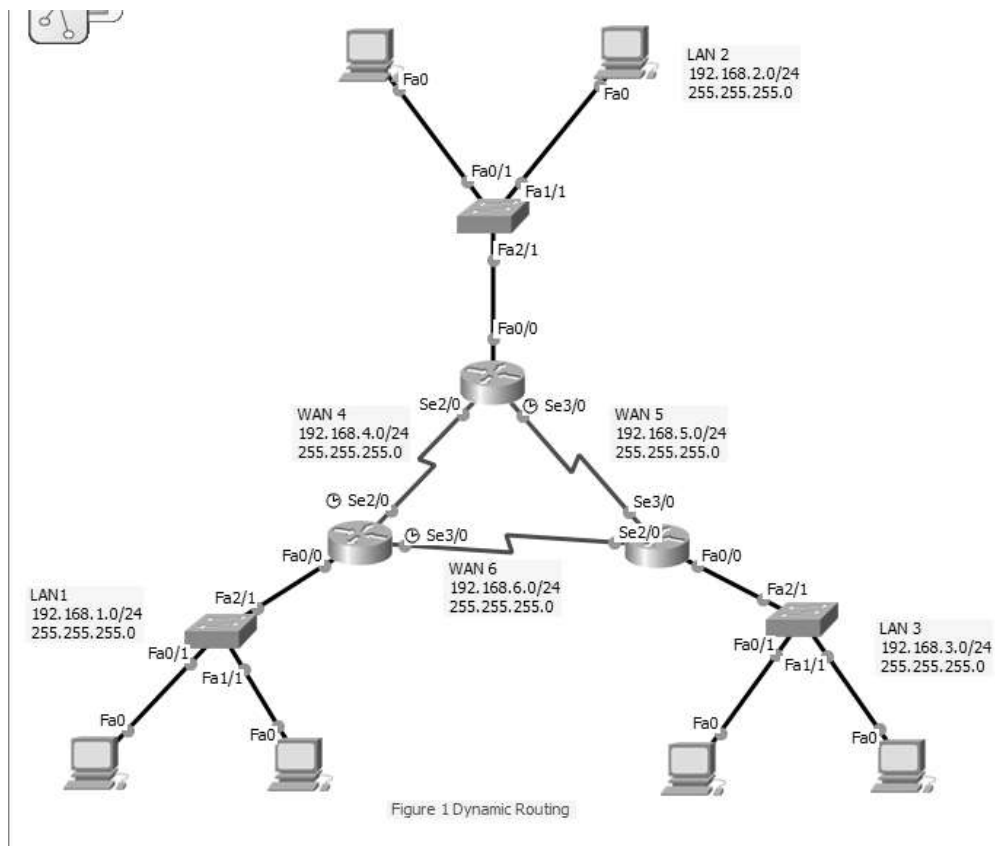
# Details of Router Configuration:

1. Reboot Router by powering it off and on under the physical tab.
2. Router performs the Power ON Self-Test (POST).
3. Click on 'Config' tab and then choose one of the interfaces for configuration. Provide appropriate IP address and subnet mask.
4. Proceed similarly for all other interfaces in use.
5. To update the routing table of Router follow these steps,
   a. Identify magnifying glass icon available at the vertical right pane of the packet tracer. Click the magnifying glass on to Router and select the routing table from the drop down list. A routing table for Router will be displayed having 2 entries typed as C (connected) with next hop field blank.
   b. The routing table is to be updated with the next hop entry, so that the Simple PDU could be send on to the other network. Provide addresses of the networks you want the router should be able to connect to. This can be done from routing 'RIP' option in 'Config' tab.
6. Configure all the end devices by providing them IP address, subnet mask and the default gateway address.
7. Test your network by sending simple PDU's or pinging the computers from one network to other network.
8. Specify your network's router configuration details in table given below.

| Sr. No. | Network Device | Configuration (IP address, subnet mask, default gateway addr) |
|---------|----------------|----------------------------------------------------------------|
| 1 | Generic Router 0 | Interface: FastEthernet 0/0<br>IP address:192.168.1.1<br>Subnet address:255.255.255.0 |
| | | Interface: Serial2/0<br>IP address:192.168.4.1<br>Subnet address:255.255.255.0 |
| | | Interface: Serial3/0<br>IP address:192.168.6.1<br>Subnet address:255.255.255.0 |
| | | Dynamic Routing Table<br>Network Addresses:<br><br>192.168.1.0 |

| | | 192.168.4.0 |
|---|---|---|
| | | 192.168.6.0 |
| 2 | Generic Router 1 | Interface: FastEthernet 0/0<br>IP address:192.168.2.1<br>Subnet address:255.255.255.0 |
| | | Interface: Serial2/0<br>IP address:192.168.4.2<br>Subnet address:255.255.255.0 |
| | | Interface: Serial3/0<br>IP address:192.168.5.1<br>Subnet address:255.255.255.0 |
| | | Dynamic Routing Table<br>Network Addresses:192.168.2.0<br>192.168.4.0<br>192.168.5.0 |
| 3 | Generic Router 2 | Interface: FastEthernet 0/0<br>IP address:192.168.3.1<br>Subnet address:255.255.255.0 |
| | | Interface: Serial2/0<br>IP address:192.168.6.2<br>Subnet address:255.255.255.0 |
| | | Interface: Serial3/0<br>IP address:192.168.5.2<br>Subnet address:255.255.255.0 |
| | | Dynamic Routing Table<br>Network Addresses:192.168.3.0<br>192.168.5.0<br>192.168.6.0 |

Take screenshots for the network scenario showing successful pakcet transmission from one network to other and attach as the output. Explain the screenshots in detail.

## Conclusion:

In this experiment the routers interfaces and routing tables are configured to perform dynamic routing and checked that simple PDU's are transmitted from one network to another through routers. Thus we learned to design a simple network with routers using dynamic routing.

## Post Experiment Exercise:

Test the network for its dynamic routing by disabling one router to router link. Take screenshots and show the path chosen by the network in case of disabled link. Explain the screenshots in detail.
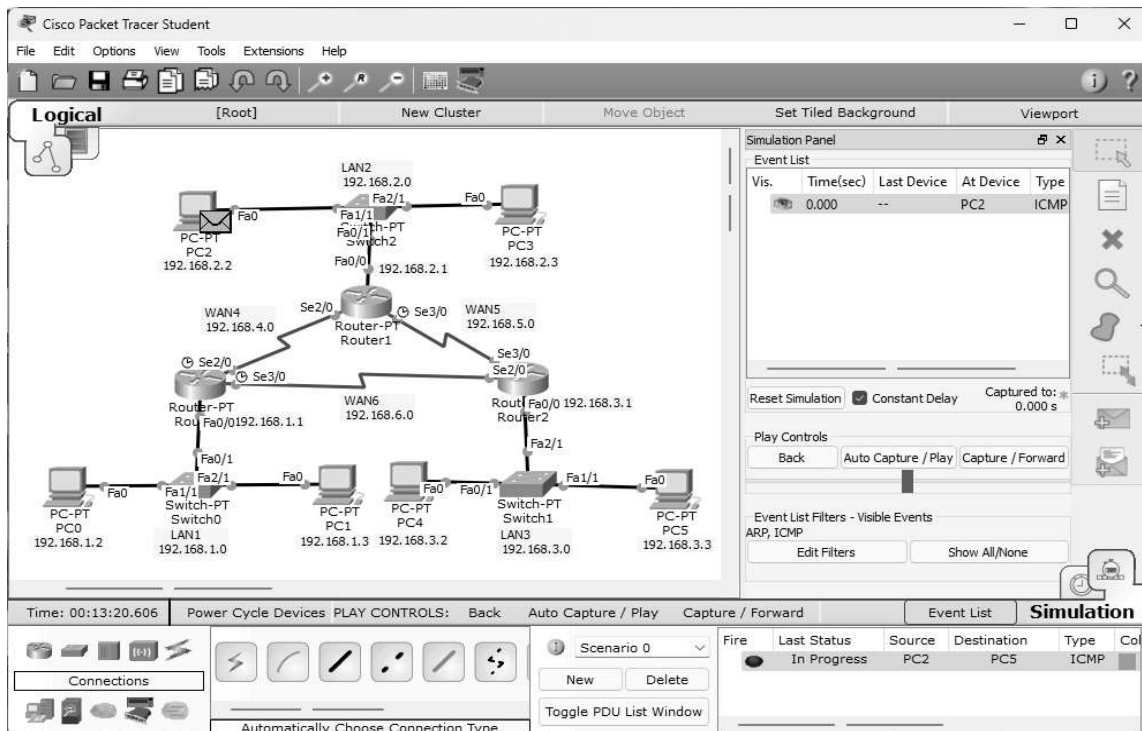
We started with creating a network as in image and then tested if all the router and their respective Network is working. We will be sending ICMP packet from network 2
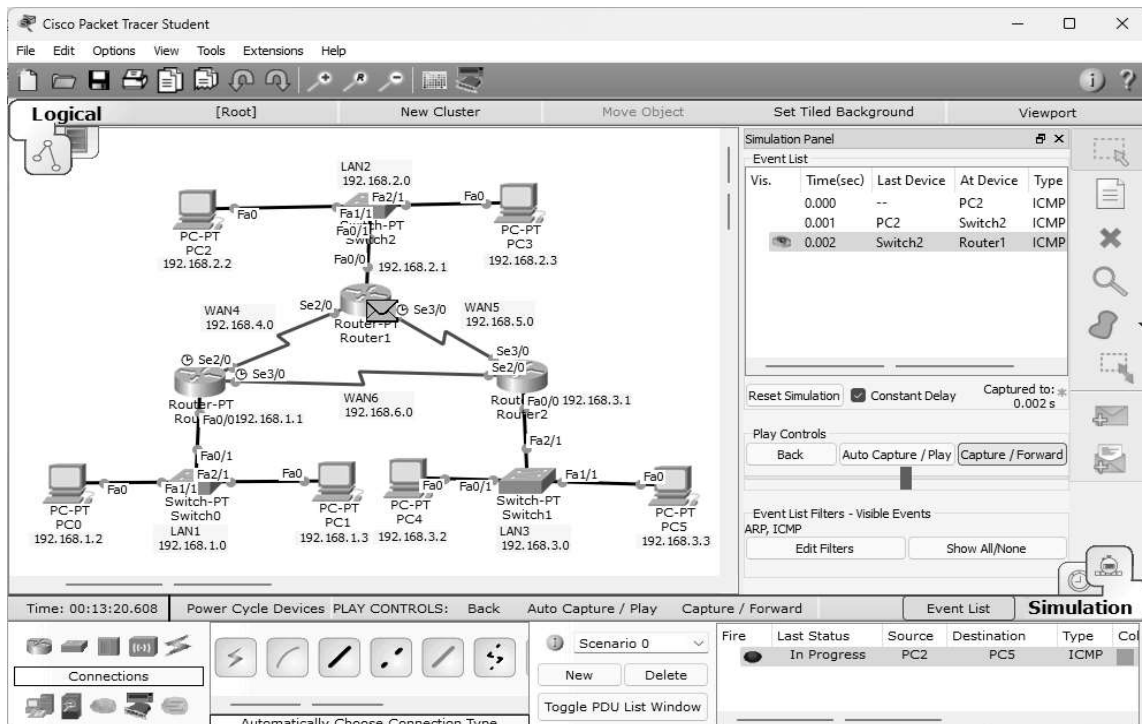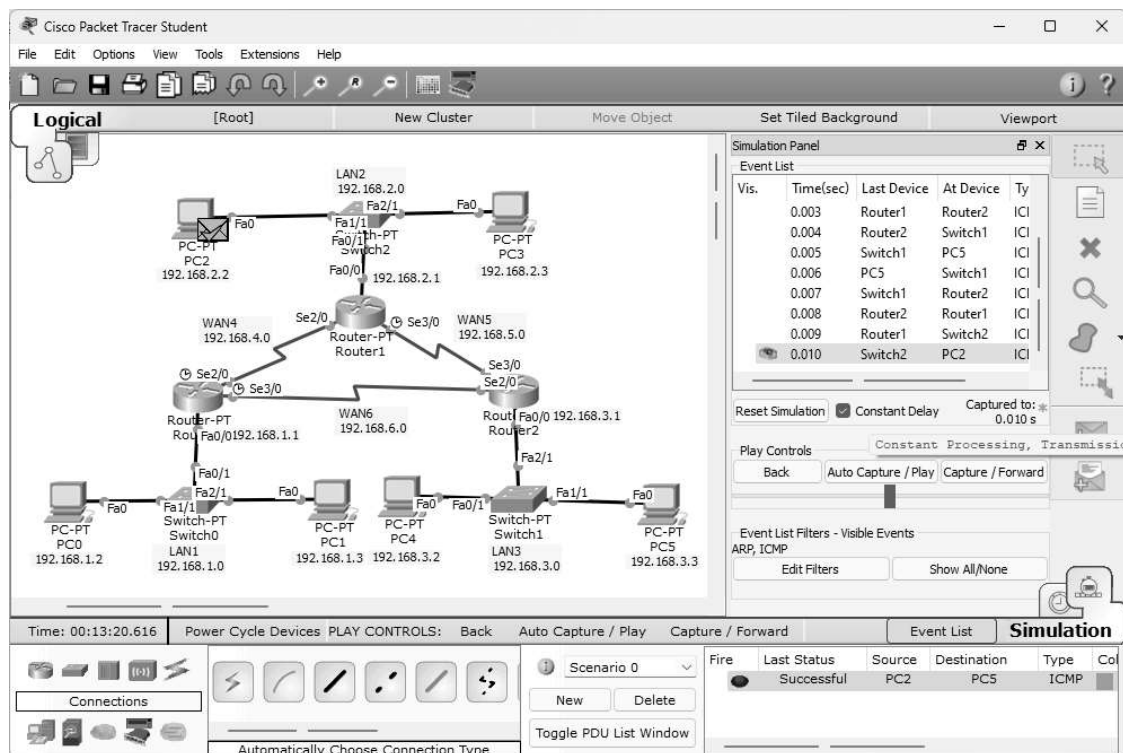


Packet via switch reaches to respective networks router
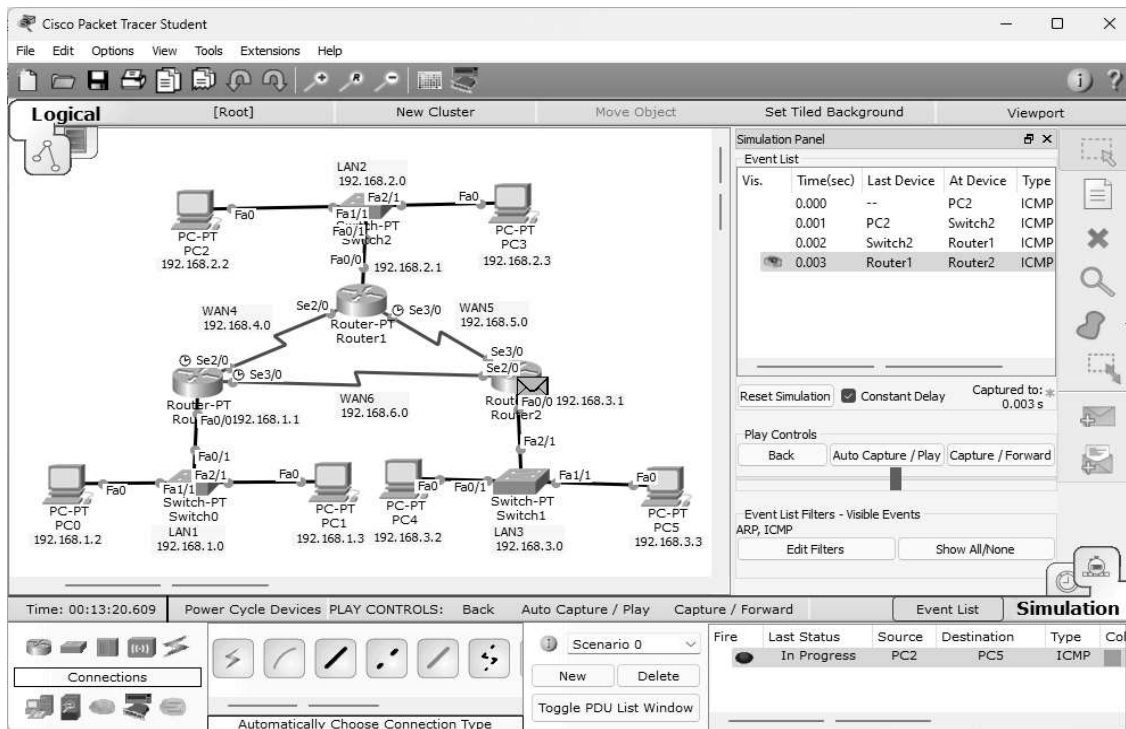
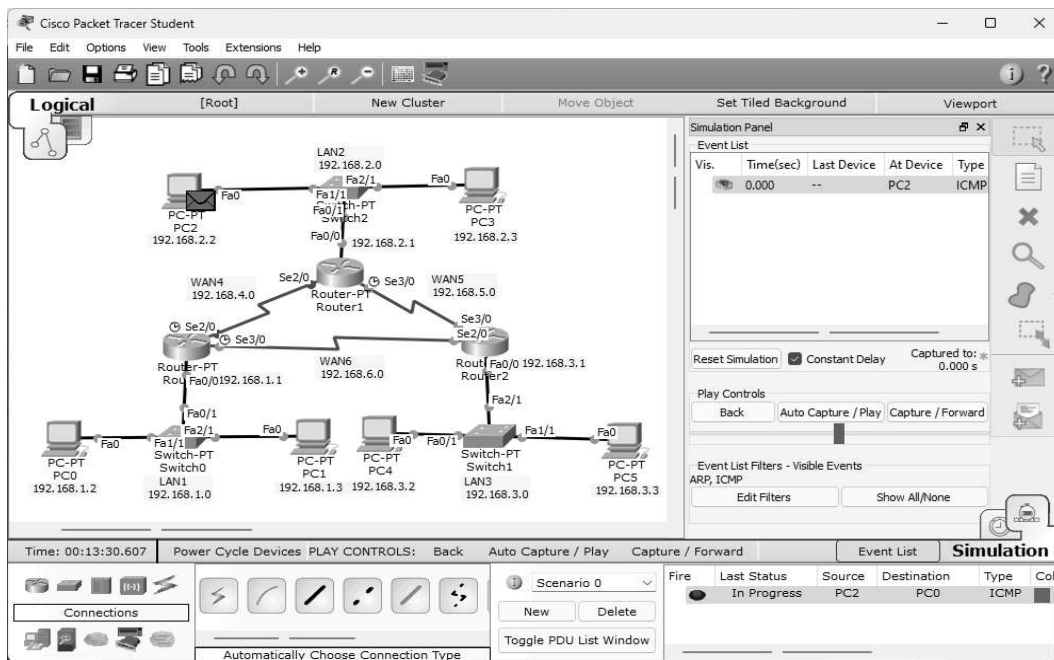Router then send that packet to the router of the destination network
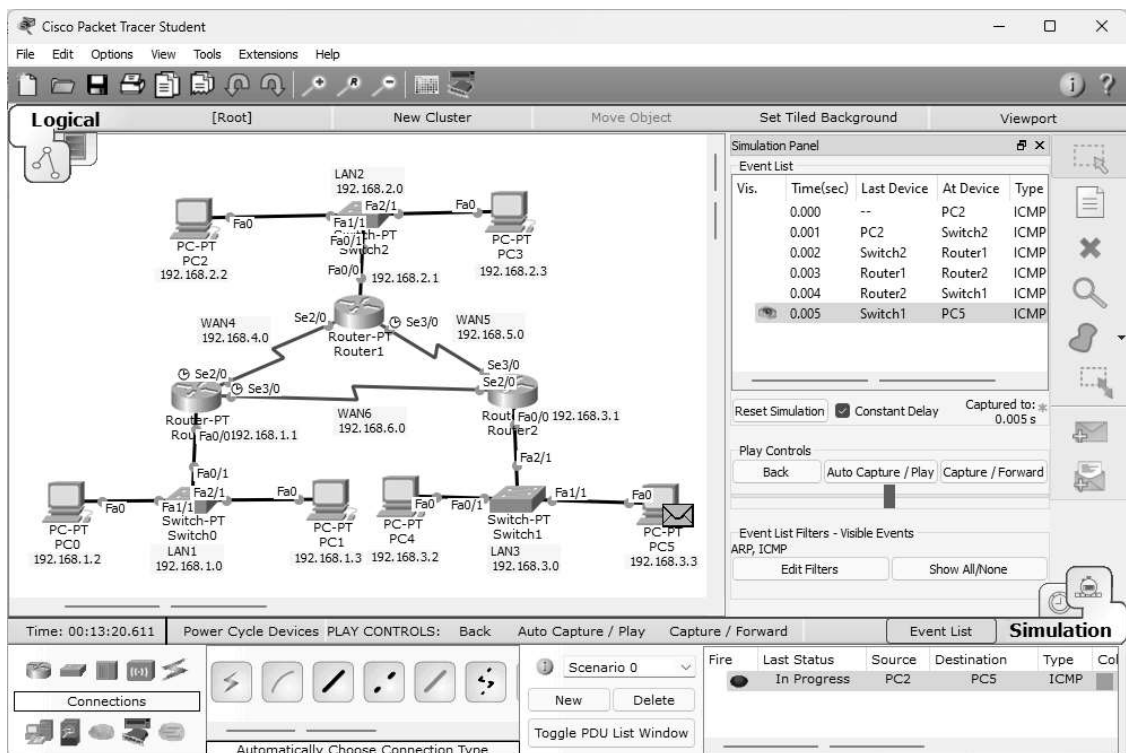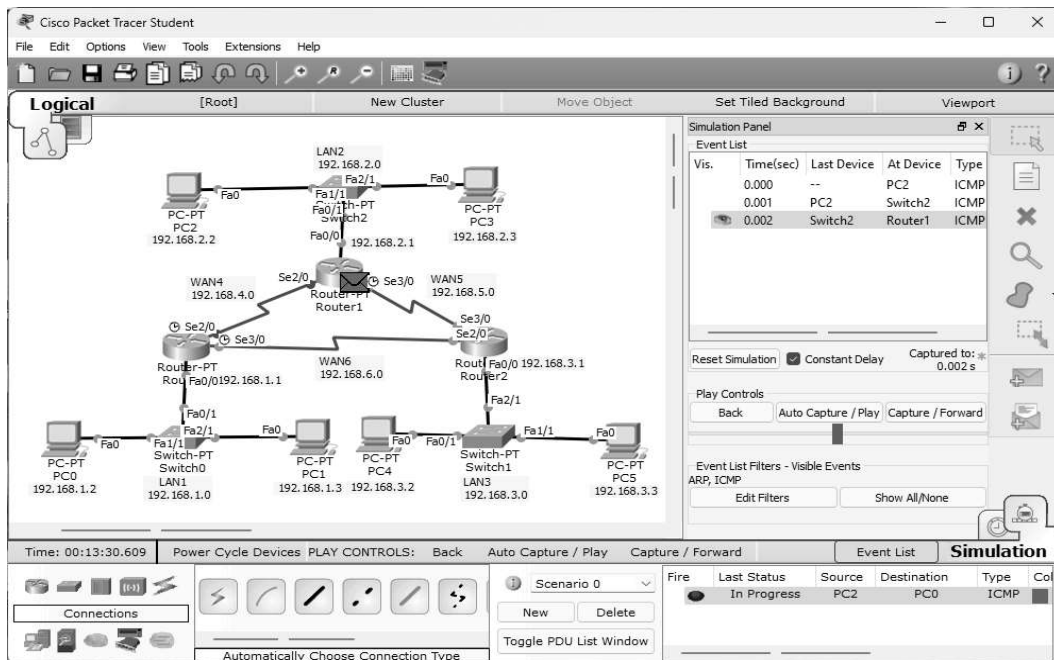


Packet reached to the destination PC

Similar path is followed by the Acknowledgment to reach the source PC thus making the scenario successful
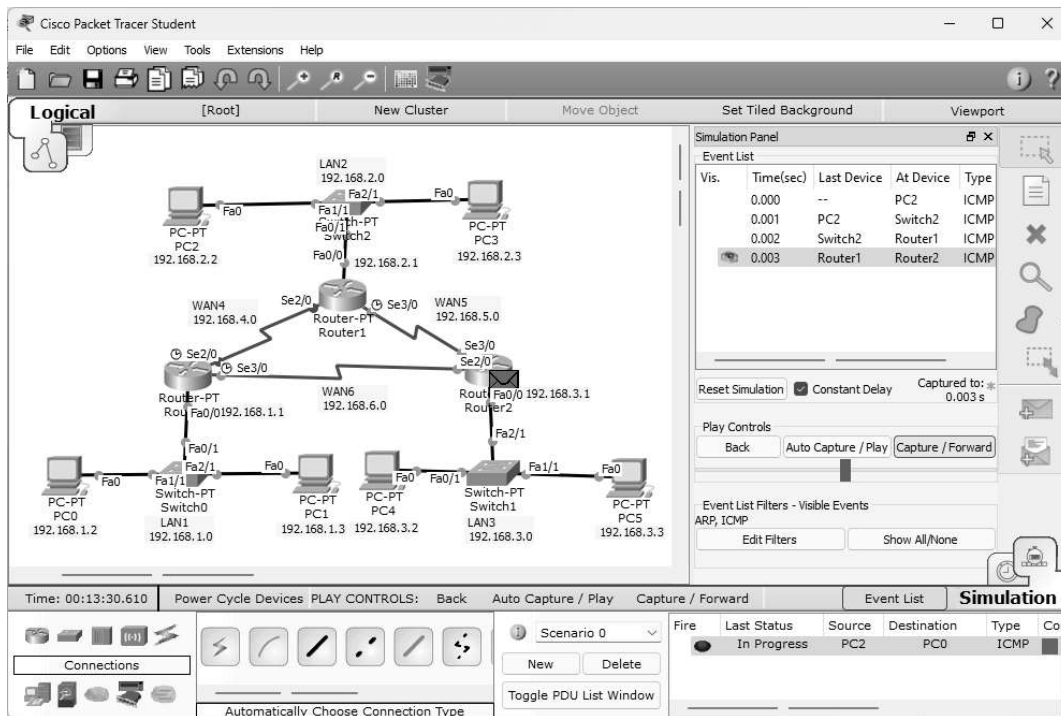
# POST EXPERIMENT



Here We have Set the port off between Router of Network 2 and Network 1 and we are sending packet from PC in network 2 to PC in network 1
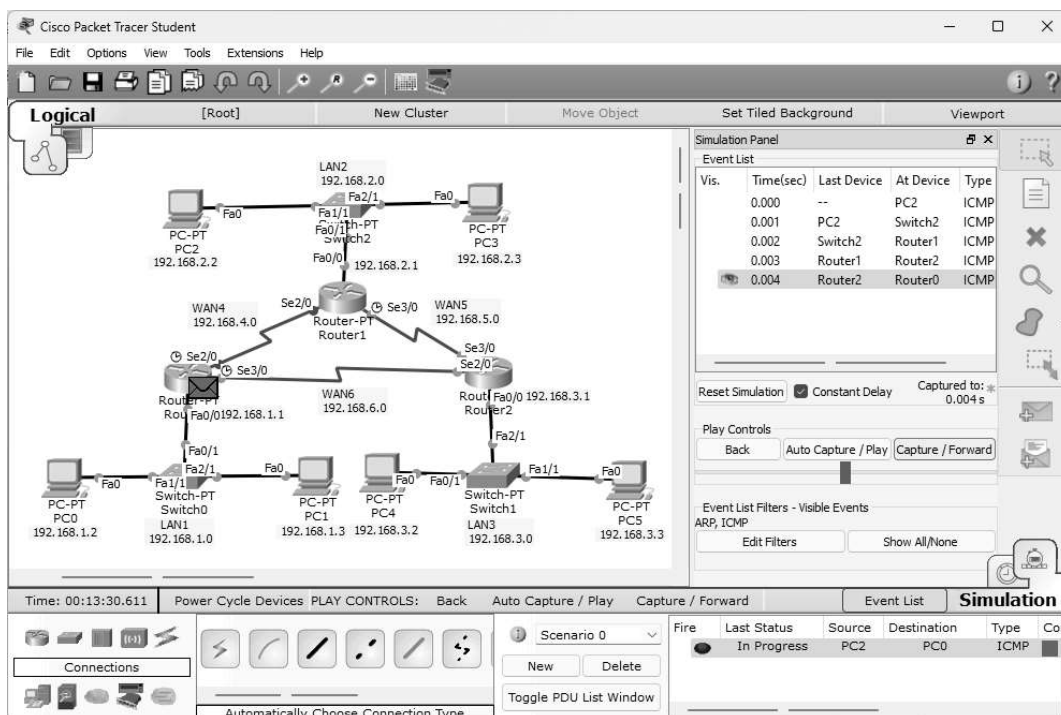


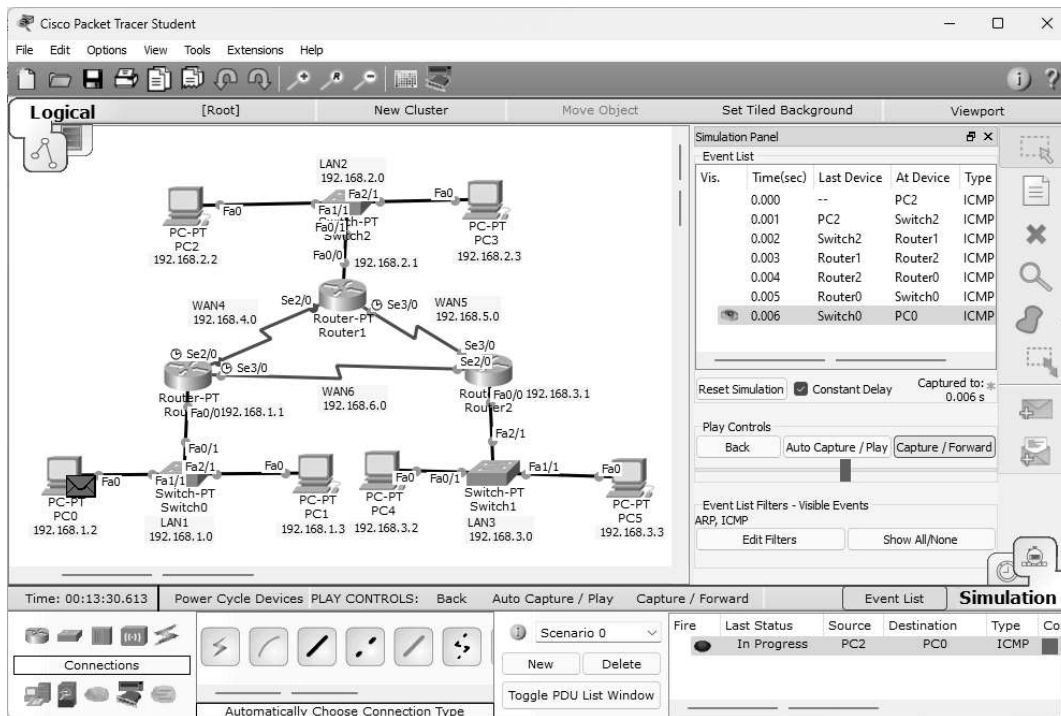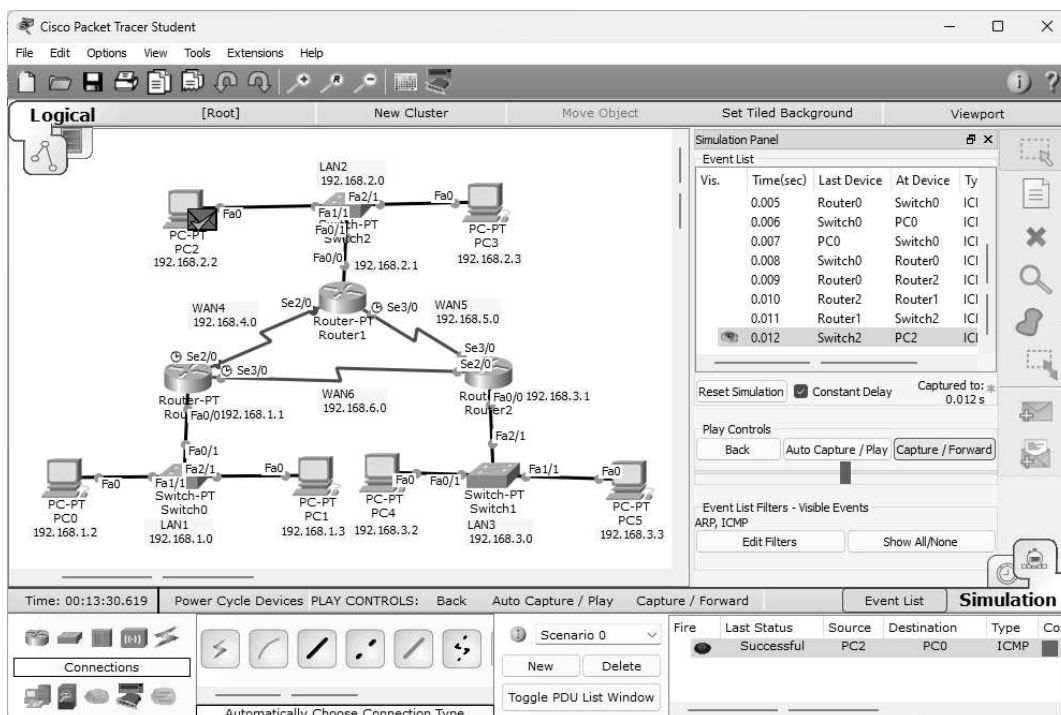Packet via switch reaches to respective networks router

As the Port is disabled between 2-1, packets will go via a 2-3-1 path. so it reaches the router of network 3



That network 3 router forward it to network 1 router

And through network 1 router it reaches the destination PC in network 1



Similar path is followed by the Acknowledgment to reach the source PC thus making the scenario successful