EXPERIMENT NO. 8

Designing a two network configuration and updating the routing table of a router for a given topology (Static Routing)

Aim

To design a two network configuration and updating the routing table of a router for a given topology (Static Routing).

Objectives

1. Studying and implementing static routing.
2. Connecting two different networks, configuring the interfaces and updating routing table of given router for the given topology.

Procedure

Design following network scenarios:

Scenario 1: Network with 1 Router

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.
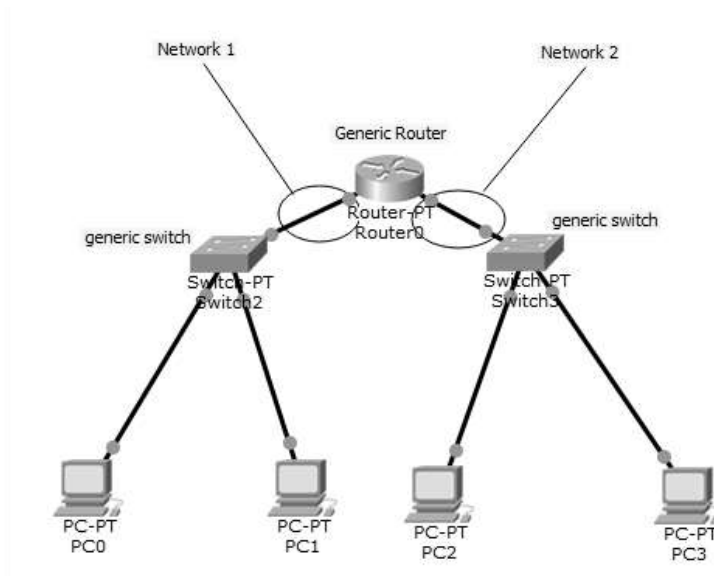3. Test the configuration either by using a ping command or by sending simple PDUs.

Figure 1

Router Configuration:

1. Reboot Router 0 by powering 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 interface 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 0' 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 0 and select the routing table from the drop down list. A routing table for Router 0 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 following entries in the routing table: Network Address, Subnet mask, Next Hop.
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 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 IP address: 192.168.1.1 Subnet address:255.255.255.0
		Interface: FastEthernet 1/0 IP address: 192.168.2.1 Subnet address: 255.255.255.0
2	PC0	IP Address: 192.168.1.2 Subnet address: 255.255.255.0 default gateway: 192.168.1.1
3	PC1	IP Address: 192.168.1.3 Subnet address: 255.255.255.0 default gateway: 192.168.1.1
4	PC2	IP Address: 192.168.2.2 Subnet address: 255.255.255.0 default gateway: 192.168.2.1

5	PC3	IP Address: 192.168.2.3
		Subnet address: 255.255.255.0
		default gateway: 192.168.2.1

Scenario 2: Network with 2 Router

1. Start packet tracer and design the network as given in Figure 2.
2. Configure the router and end devices as described.
3. Test the configuration either by using a ping command or by sending simple PDUs.
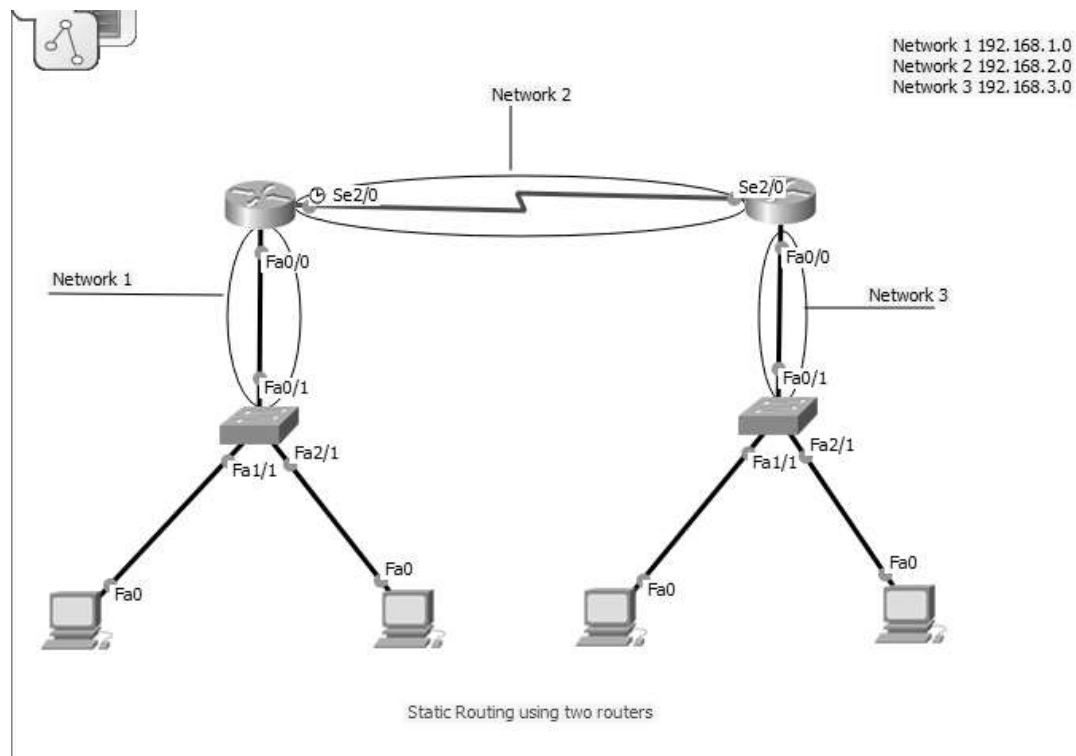

Figure 2

Sr. No.	Network Device	Configuration (IP address, subnet mask, default gateway addr)
1	Generic Router 0	Interface: FastEthernet0/0
		IP address: 192.168.1.1
		Subnet address: 255.255.255.0

		Interface: Serial2/0 IP address: 192.168.2.1 Subnet address: 255.255.255.0
		Static Routing Table 192.168.3.0/24 via 192.168.2.2
2	Generic Router 1	Interface: FastEthernet0/0 IP address: 192.168.3.1 Subnet address: 255.255.255.0
		Interface: Serial2/0 IP address:192.168.2.2 Subnet address:255.255.255.0
		Static Routing Table 192.168.1.0/24 via 192.168.2.1

Take screenshots for both the network scenarios showing successful PDU transmission from one network to other and attach as the output.

Conclusion:

In this experiment the routers interfaces and routing tables are configured statically 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 static routing.

Post Experiment Exercise:

Design a network with three routers to perform static routing. Draw the diagram (on journal sheet) and indicate all the configurations required to perform static routing.
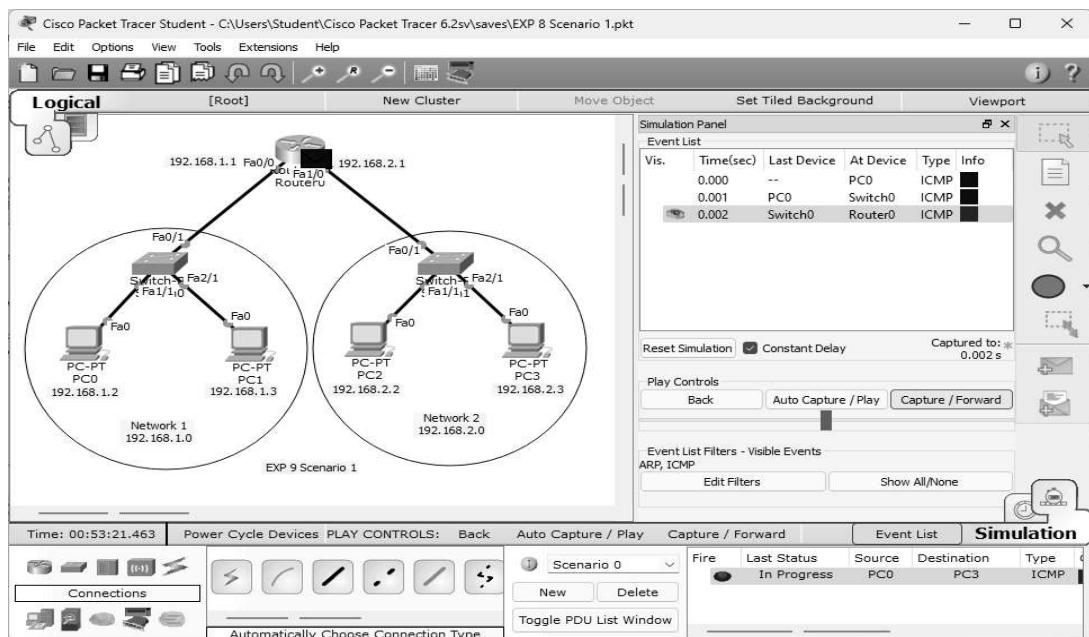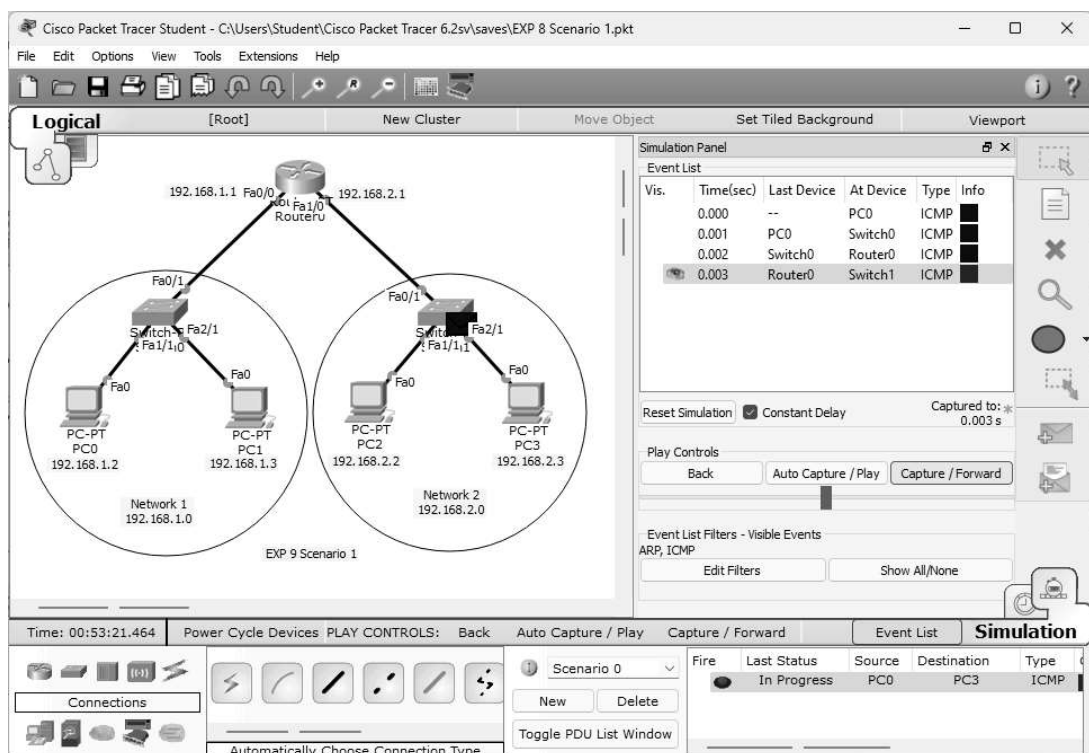
Scenario 1:
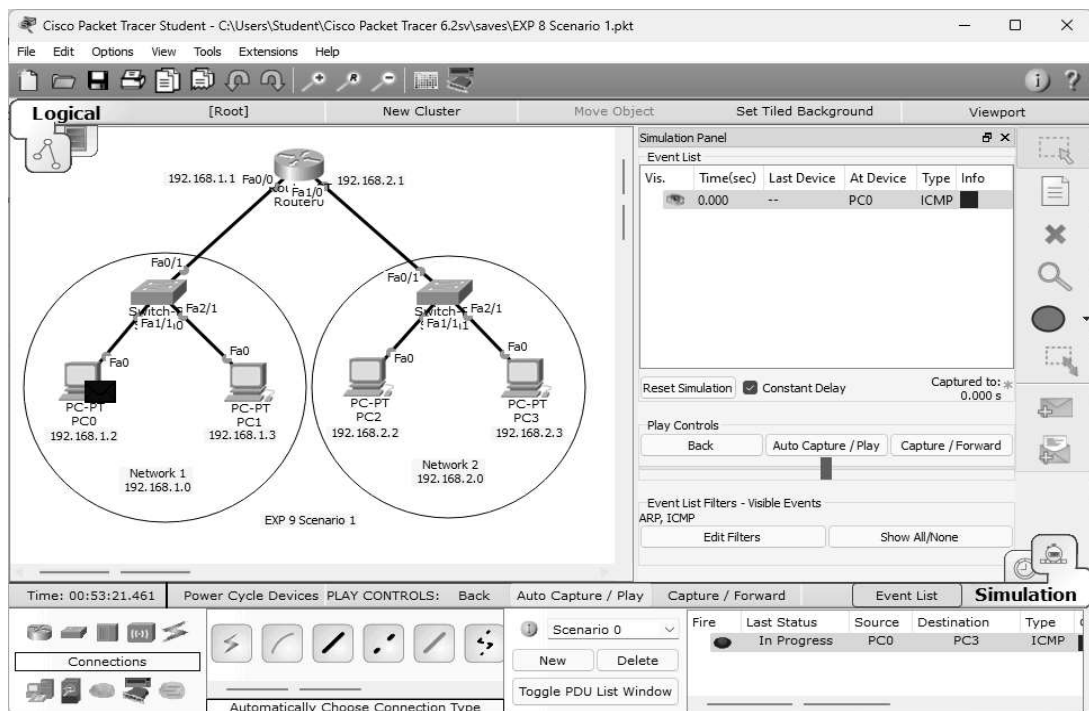
In the given scenario, a packet is set from the source PC0 (192.168.1.2) in network 1 (192.168.1.0) to PC3 (192.168.2.3).
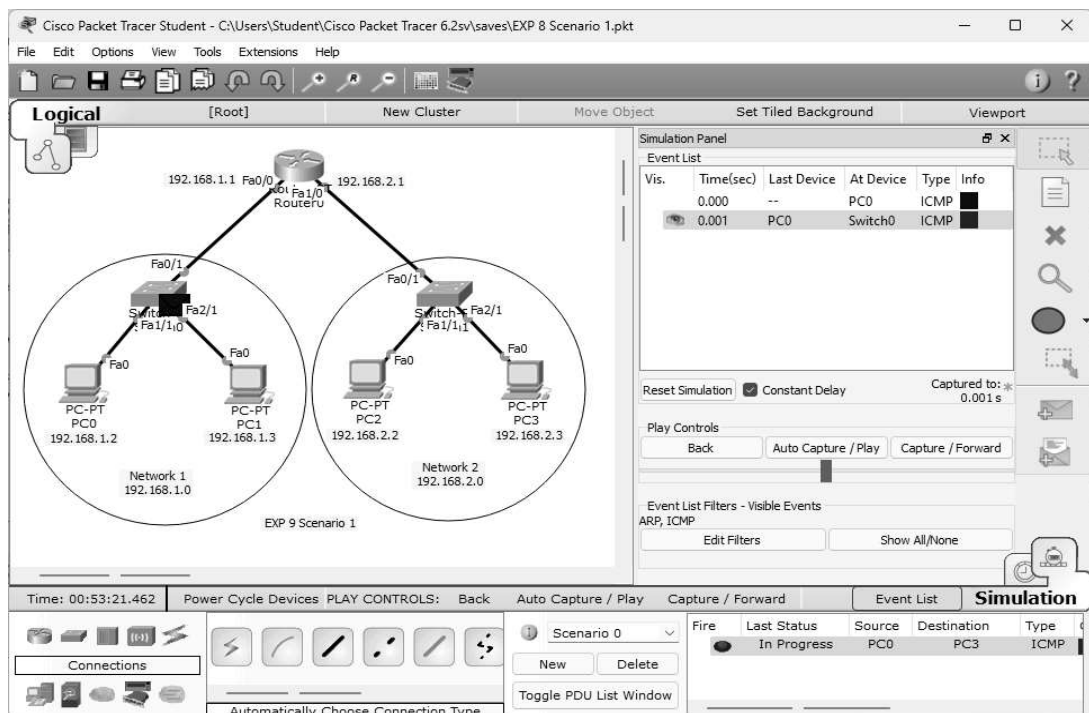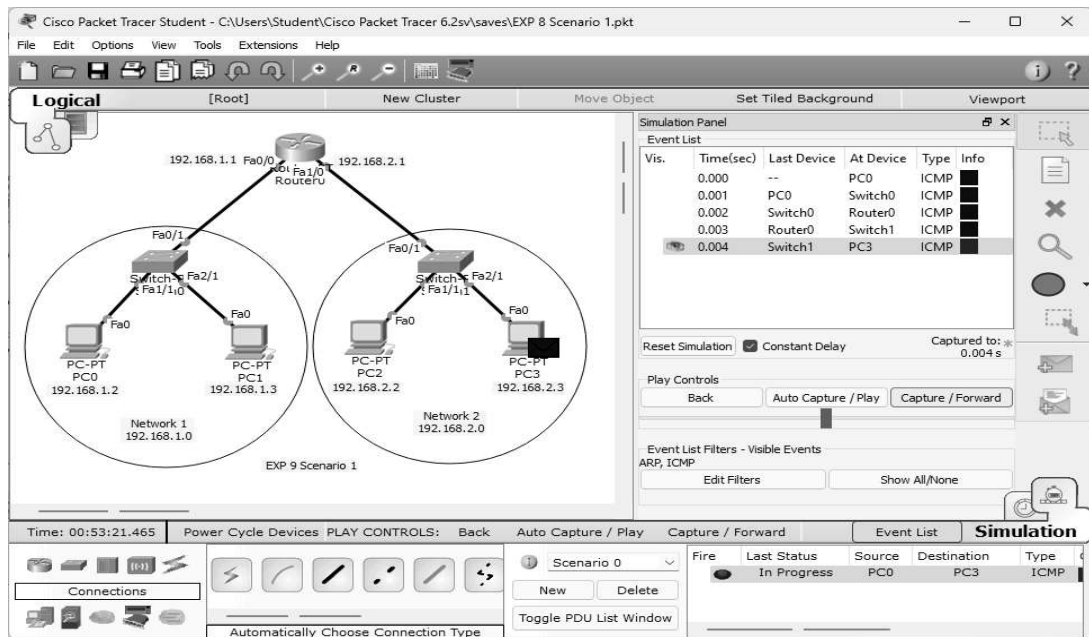

The packet is sent from PC0 (192.168.1.2) to Switch0, which is connected to PC0 in network 1 (192.168.1.0).
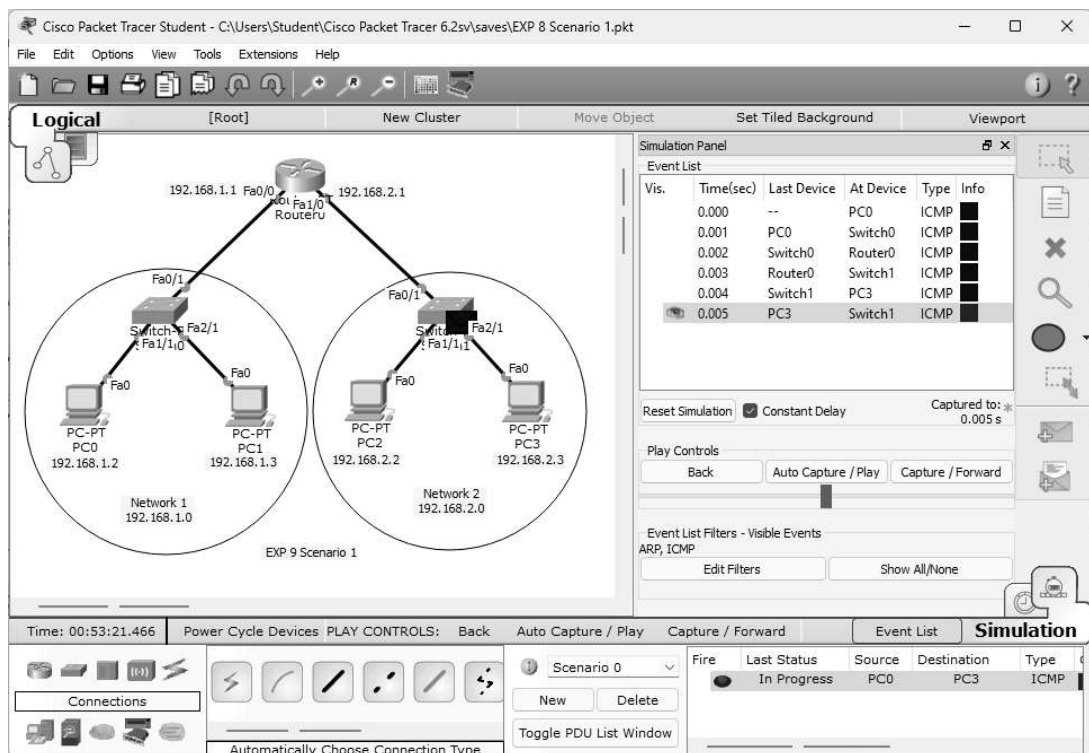
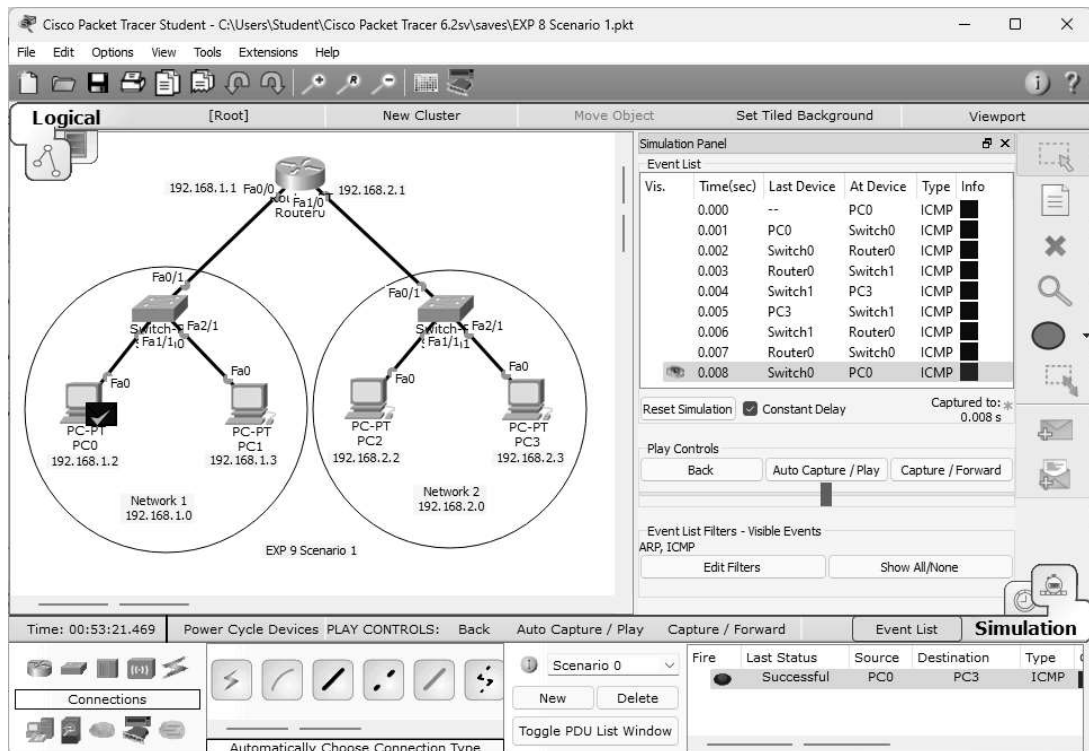Switch0 forwards the packet to the router in the network.

The router forwards the packet to Switch1 in network 2 after examining the destination IP address.

The switch in network 2 forwards the packet to PC3, the destination PC, as indicated by the packet's destination IP address.
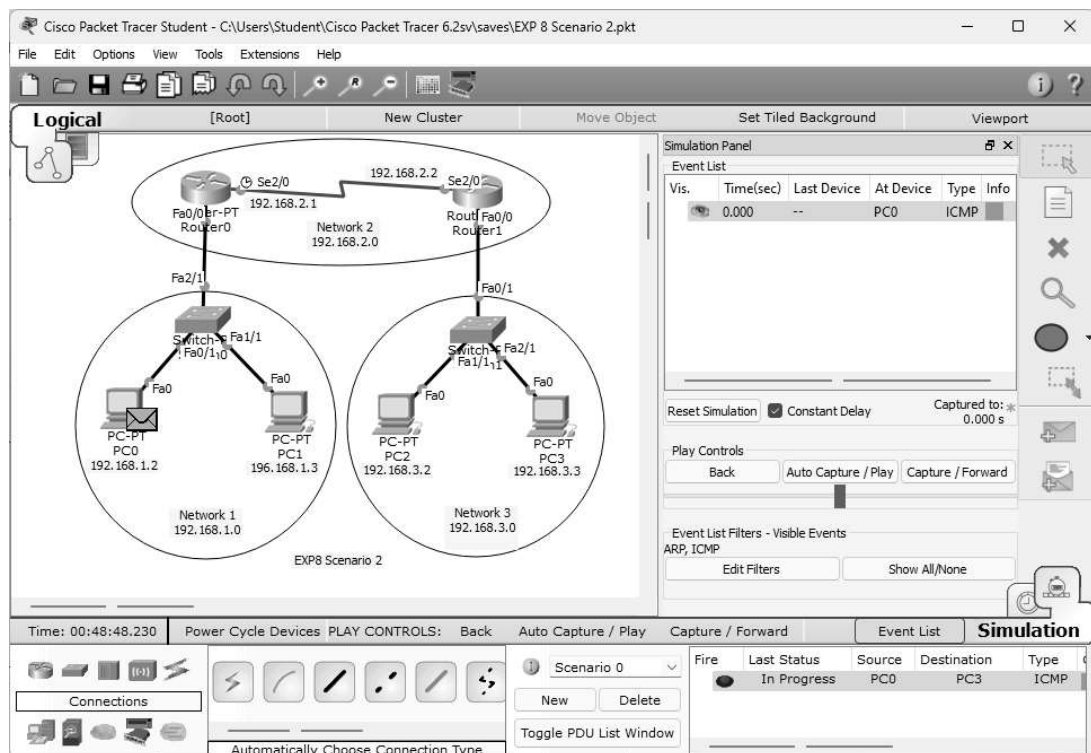

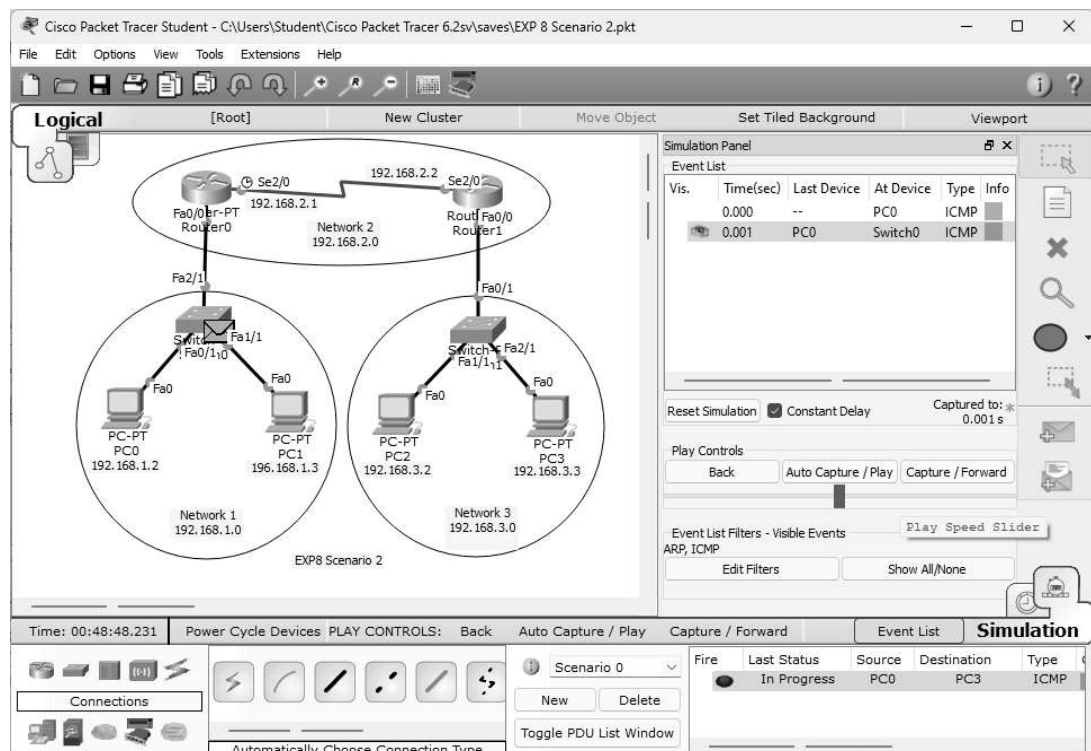An acknowledgment is generated by PC3 and sent to the switch in network 2.

The acknowledgment follows the same path as the packet, reaching PC0 through the network.
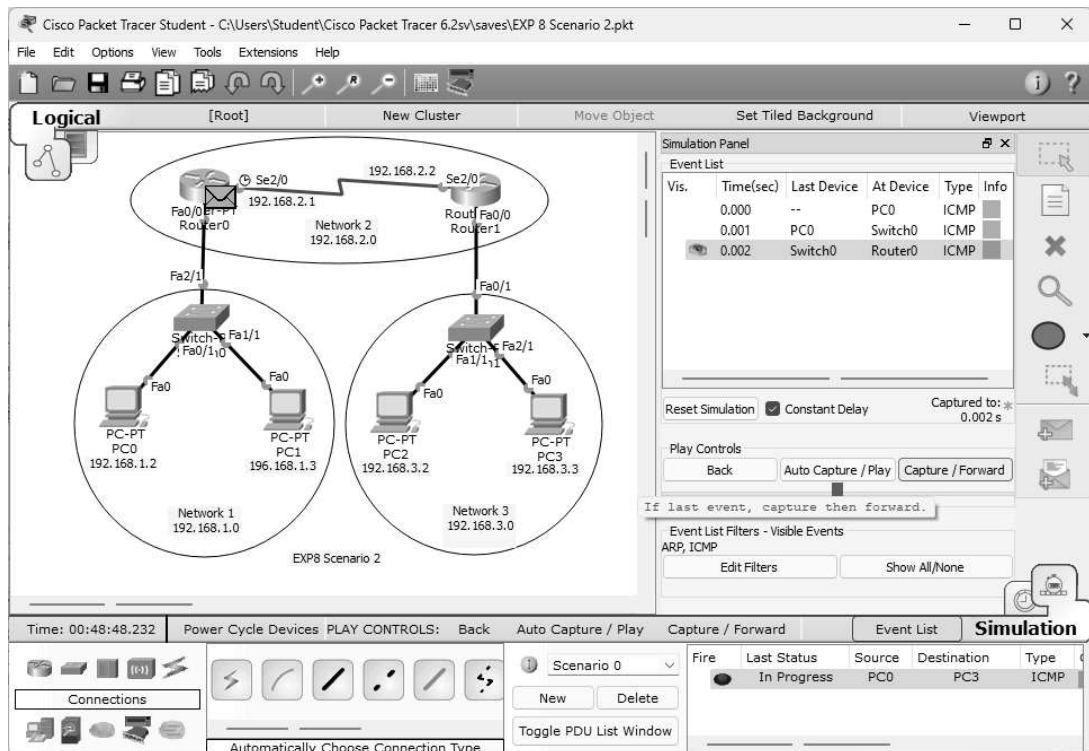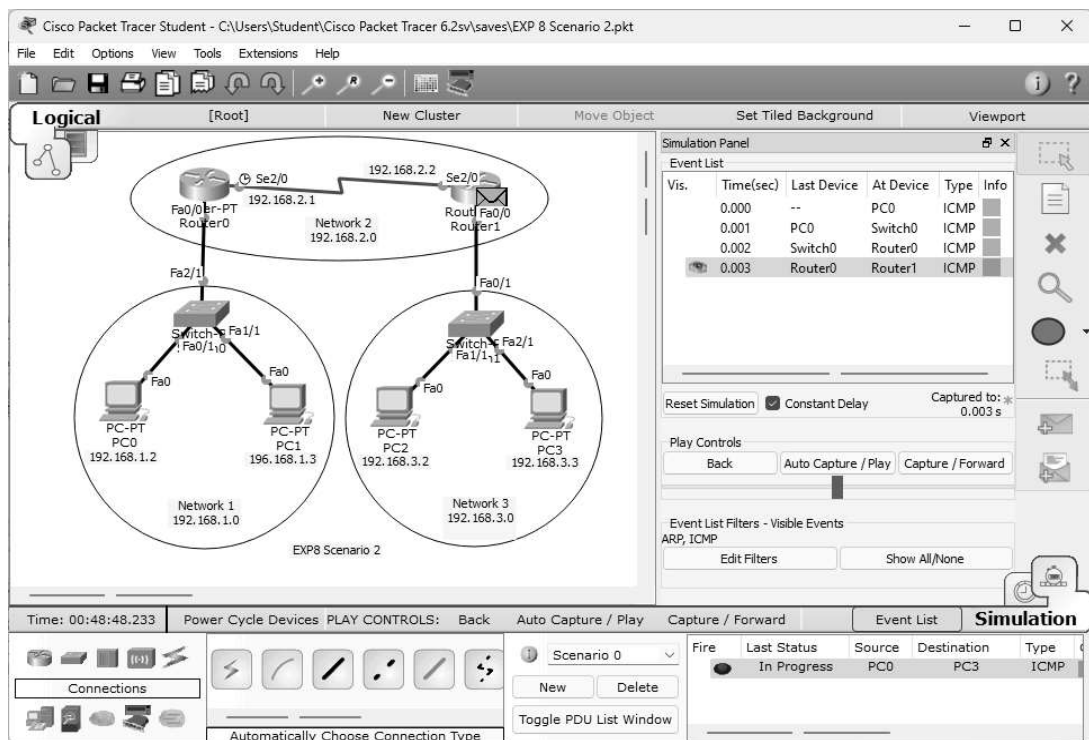
Scenario 2:

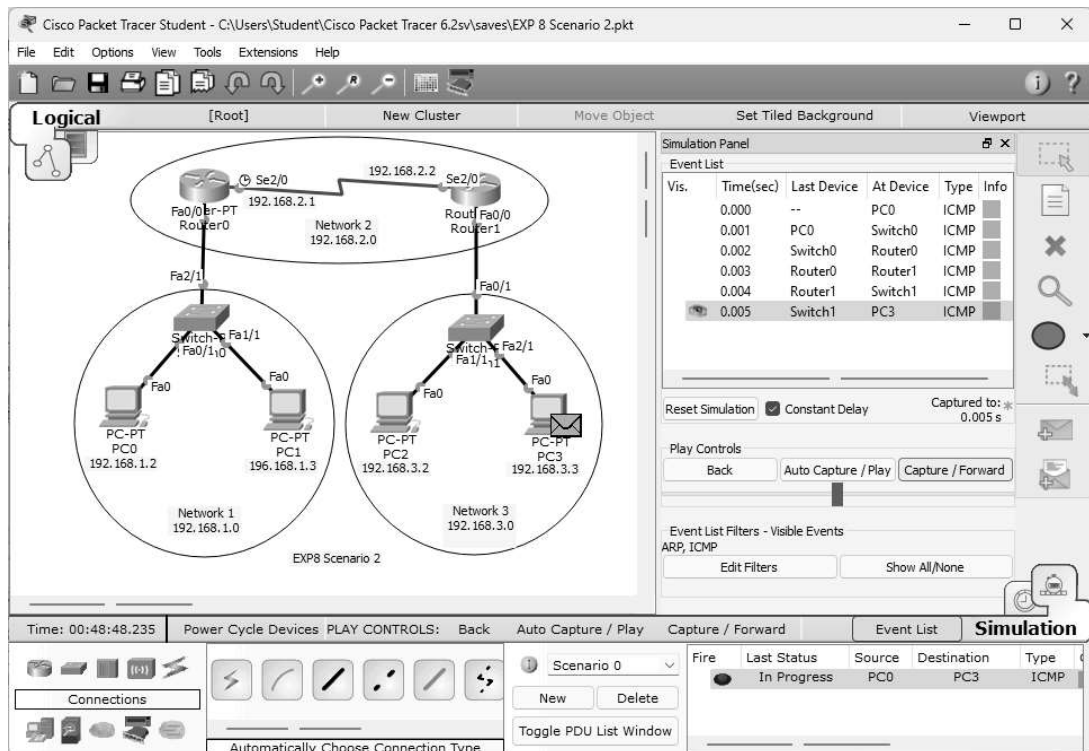In the image, a packet is set with the source at PC0 and the destination at PC3.

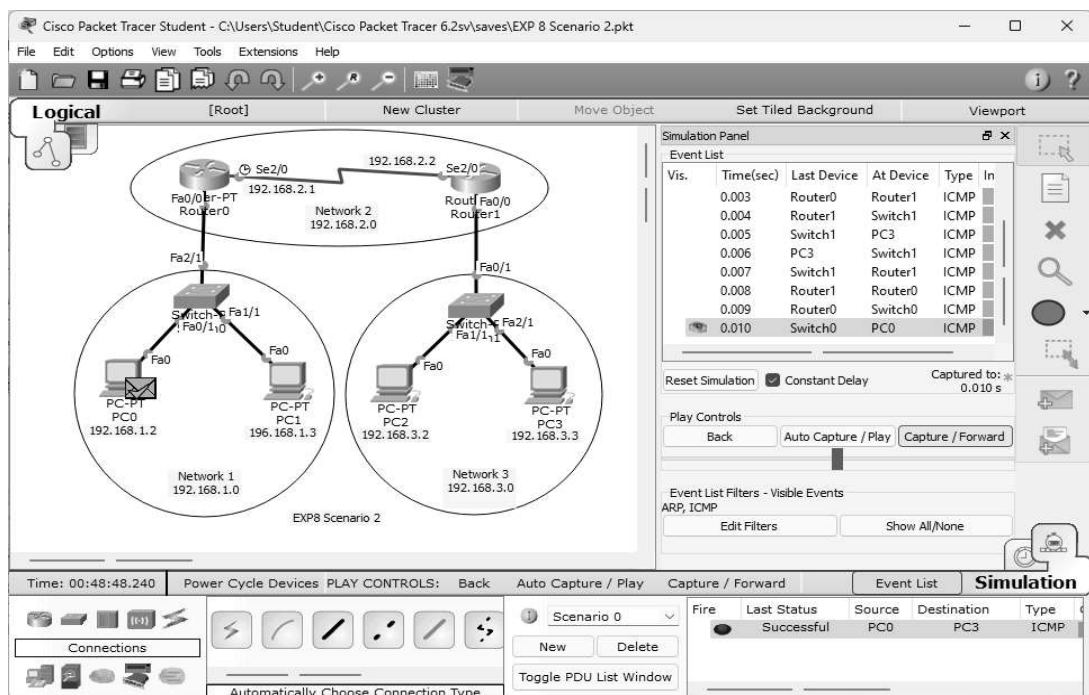The packet is sent from PC0 to Switch0.

Switch0 forwards the packet to the router0.

Router0 determines the next router in the path towards the network where PC3 is connected.

The packet is sent from Router0 to Router1, then to Switch1 in network 2, and finally to PC3, its intended destination.

Similarly, the acknowledgment traces back the path from PC3 to Switch1, then to Router1, and finally to Router0. It then travels from Router0 to Switch0 and finally to PC0, completing the scenario successfully