

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.

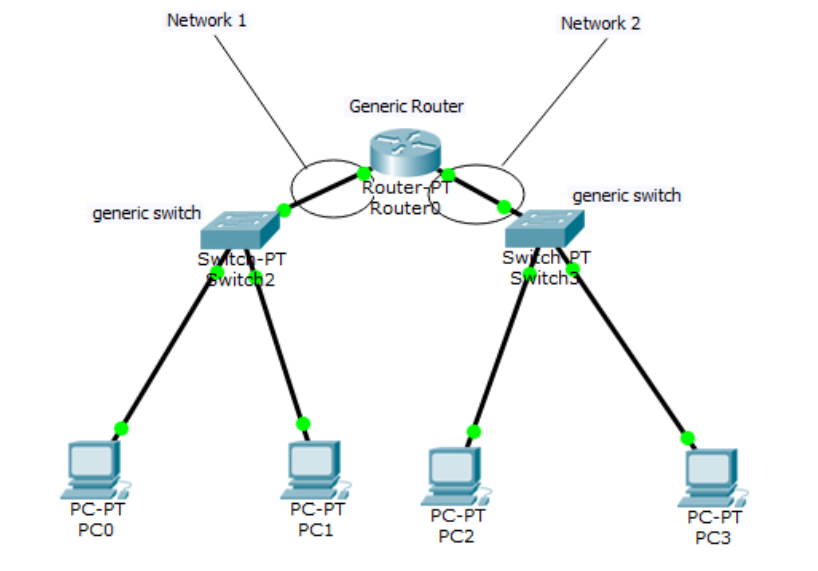


Figure 1

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.

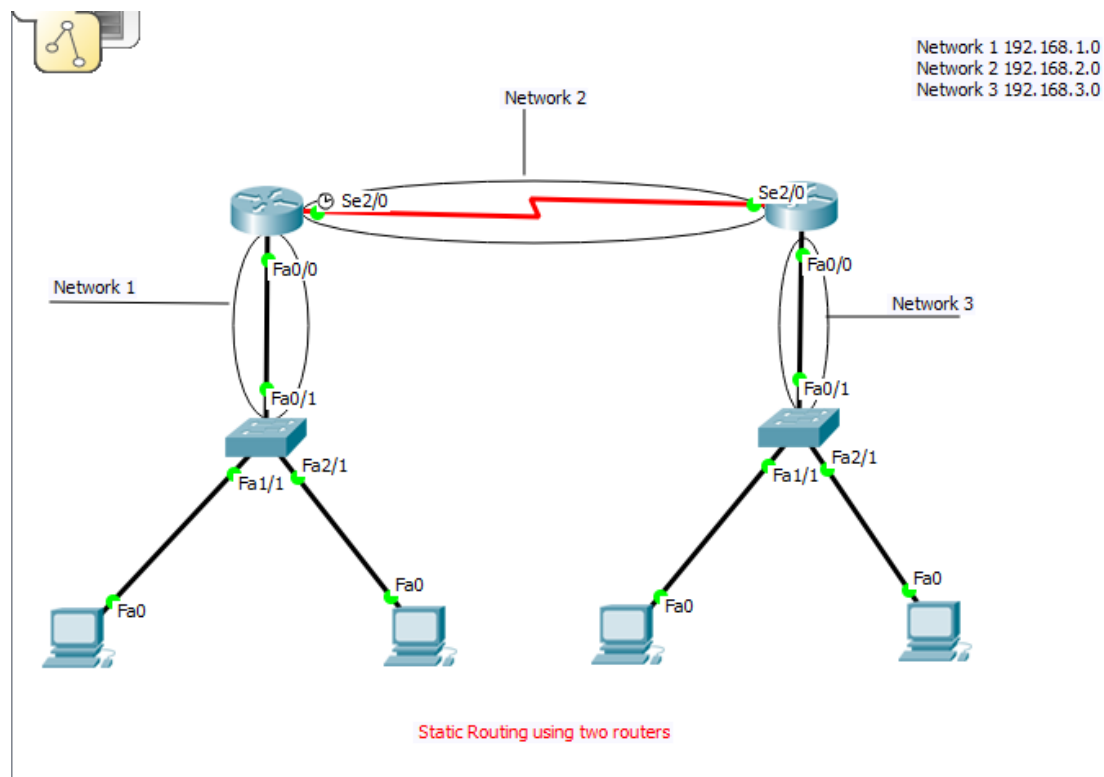


Figure 2

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

| | | |
|---|------------------|---|
| | | Interface: Serial 2/0 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: FastEthernet 0/0 IP address:192.168.3.1 Subnet address:255.255.255.0 |
| | | Interface: Serial 2/0 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:

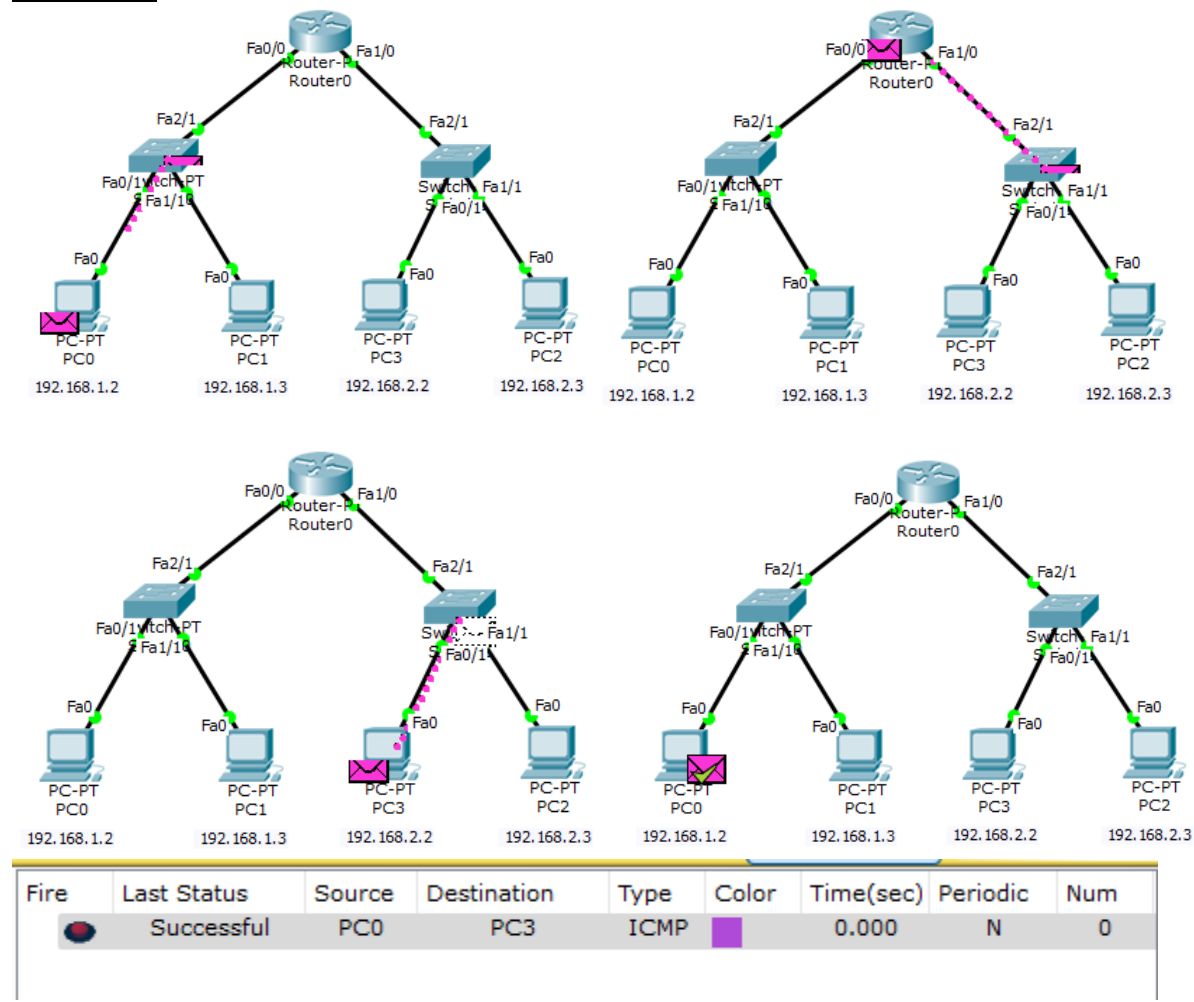
In this experiment the routers interfaces and routing tables are configured statically and checked that simple PDU's are transmitted from one network to another through routers. Thus we learned to design a simple network with routers using static routing.

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.

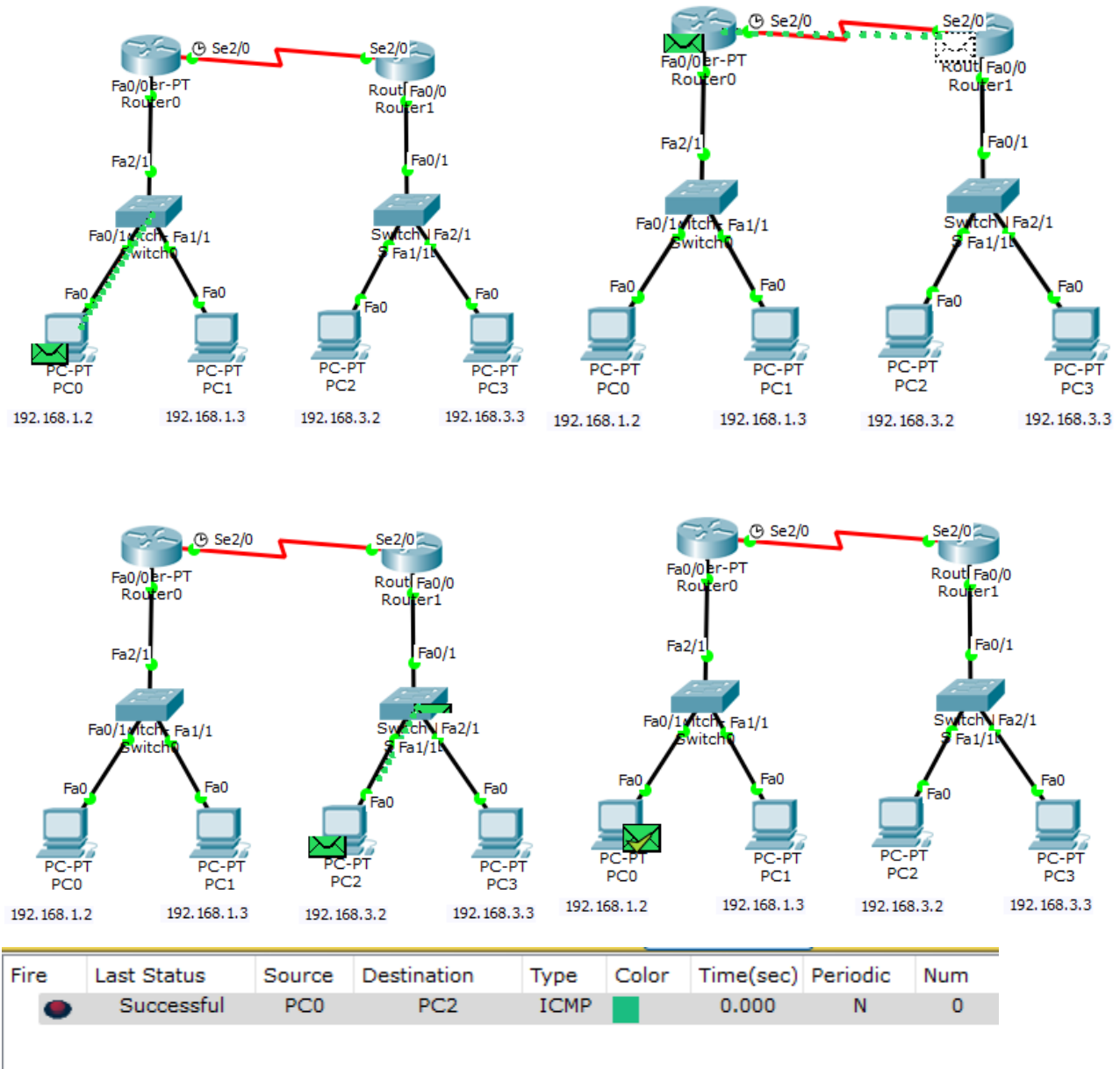
Screenshots:

Scenario 1:



Observations: The simulation involved sending an ICMP packet (ping) from PC0 (192.168.1.2) to PC3 (192.168.2.3) to test network connectivity. The packet successfully traveled through the network, passing through the router and reaching the destination without errors. This confirms that the static routing configuration is correctly implemented, allowing seamless communication between different subnets. The recorded transmission time of 0.000 seconds indicates efficient packet forwarding with no noticeable delay. Additionally, no packet loss or failures were observed, demonstrating that the routing table and network settings are properly configured.

Scenario 2:



Observations: The simulation demonstrates successful communication between different subnets using two routers. An ICMP packet was sent from PC0 (192.168.1.2) to PC2 (192.168.3.2), and the transmission was completed successfully without any errors or packet loss. The routers effectively forwarded the packet through the static routes, ensuring seamless connectivity between the networks. The recorded transmission time of 0.000 seconds indicates efficient routing with no delays. This confirms that the static routing table is correctly configured, allowing proper communication between devices across multiple networks.