Department of
Computer Science and Engineering

Title: Study of network topologies using packet tracer software.

Data Communication Lab

CSE 308

Green University of Bangladesh

1 Problem Statement

Network topology refers to the manner in which the links and nodes of a network are arranged to relate to each other. Topologies are categorized as either physical network topology, which is the physical signal transmission medium, or logical network topology, which refers to the manner in which data travels through the network between devices, independent of physical connection of the devices.

2 Objective(s)

- To learn Packet Tracer software.
- To learn different network topology using packet tracer software.
- To gather practical knowledge about different network topologis.

3 Problem analysis

Basically a network topology means that, connection style of the network nodes. To build a Network, we need a network topolog. There are different LAN Network Topologies that can be used for different network scenarios. These Network Topologies can be summarized like below :

- **Bus Topology:** Also known as backbone network topology, this configuration connects all devices to a main cable via drop lines. The advantages of bus network topology lie in its simplicity, as there is less cable required than in alternative topologies, which makes for easy installation.

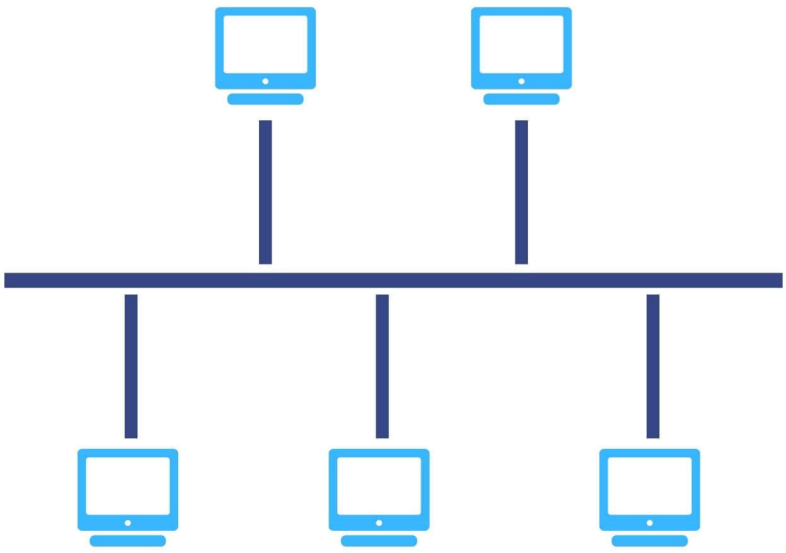

Figure 1: Bus Network Topology

- **Mesh Topology:** A mesh topology is a network setup where each computer and network device is interconnected with one another. A dedicated point-to-point link connects each device on the network to another device on the network. This topology setup allows for most transmissions to be distributed even

if one of the connections goes down. It is a topology commonly used for wireless networks. Below is a visual example of a simple computer setup on a network using a mesh topology.

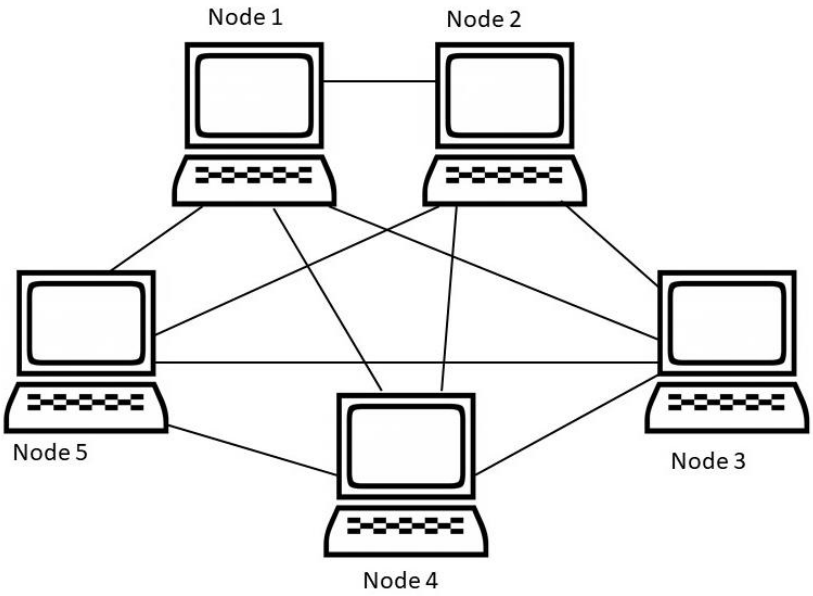

Figure 2: Mesh Network Topology

- **Ring Topology:** Two dedicated point-to-point links connect a device to the two devices located on either side of it, creating a ring of devices through which data is forwarded via repeaters until it reaches the target device.

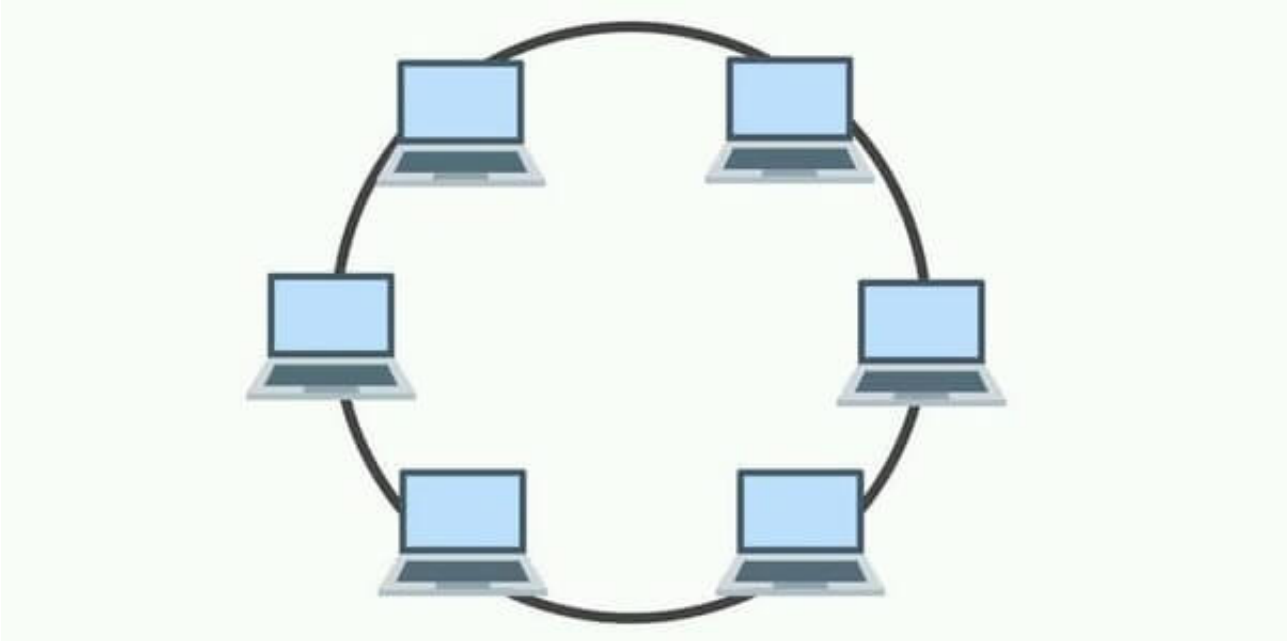

Figure 3: Ring Network Topology

- **Star Topology:** The most common network topology, star topology connects each device in the network to a central hub. Devices can only communicate with each other indirectly through the central hub.
- **Tree Topology:** This topology consists of a parent-child hierarchy in which star networks are interconnected via bus networks. Nodes branch out linearly from one root node, and two connected nodes only share one mutual connection.

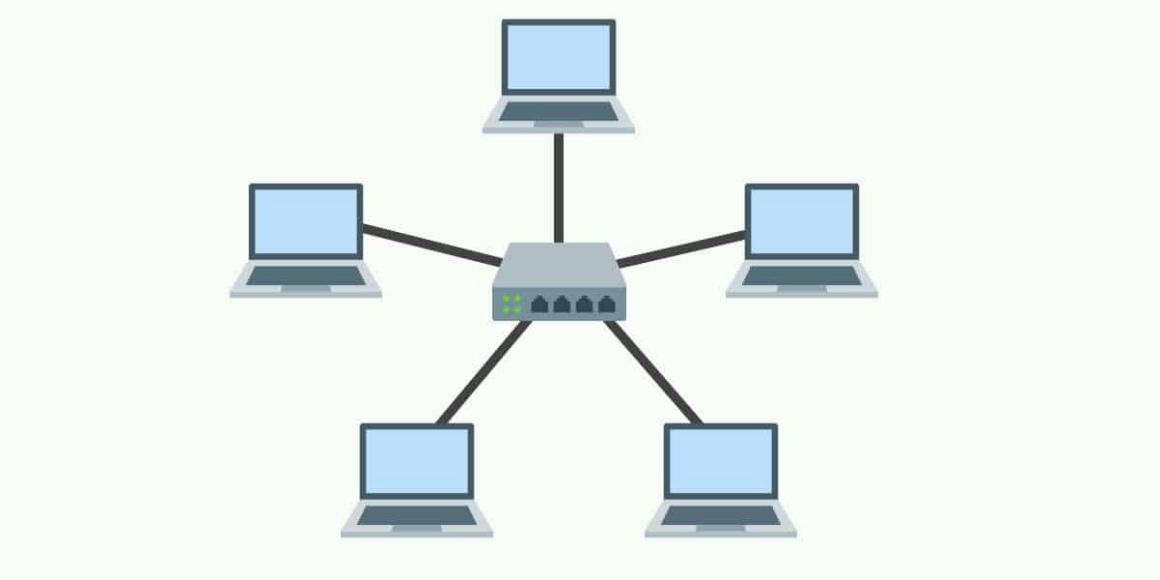

Figure 4: Star Network Topology

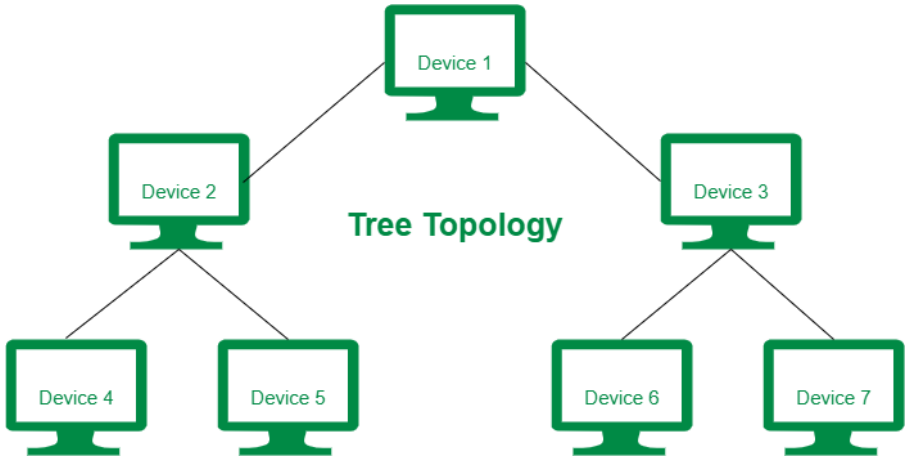

Figure 5: Tree Network Topology

4 Procedure

To implement this practical following network topology is required to be configured using the commands. After configuring the given network a packet should be ping from any one machine to another.

5 Implementation in Packet Tracer

- **Bus Topology:**
- **Star Topology:**
- **Ring Topology:**

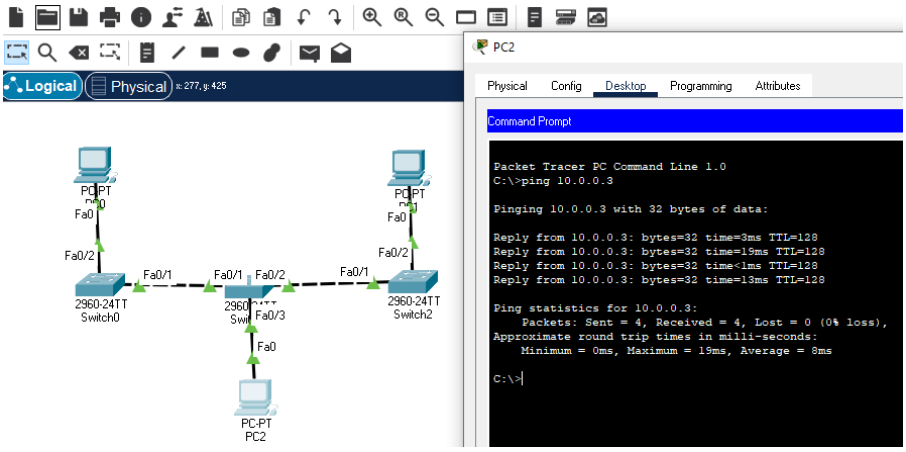

Figure 6: Bus Topology

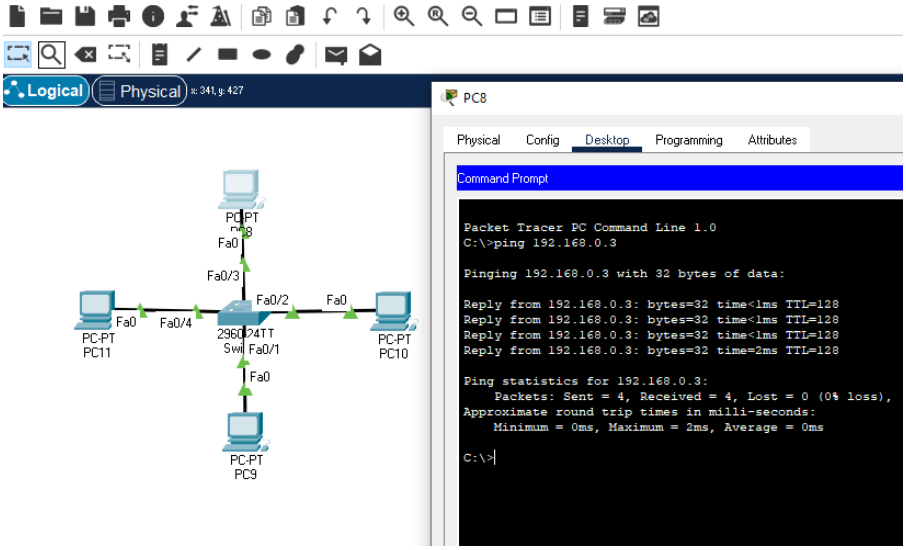

Figure 7: Start Topology

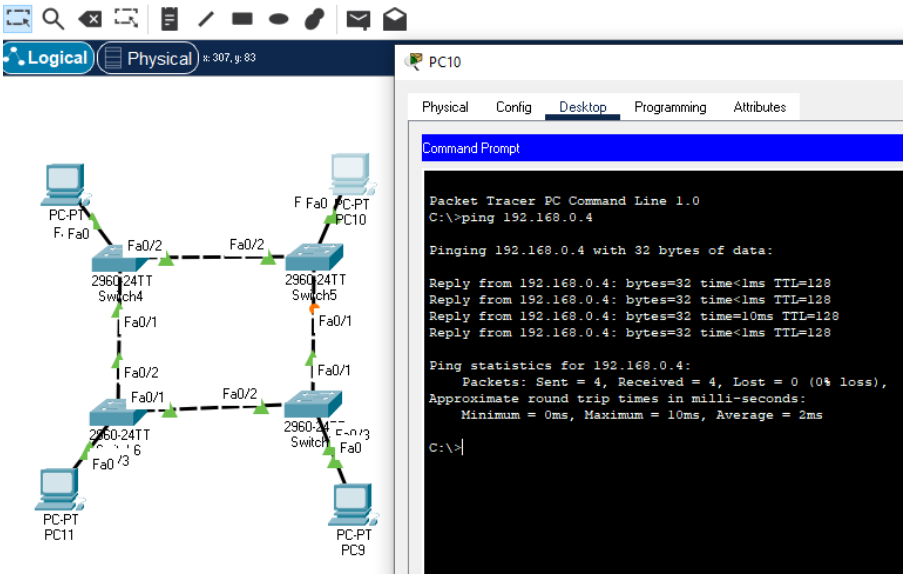

Figure 8: Ring Topology

6 Discussion & Conclusion

Based on the focused objective(s) to understand about different types of network topology and their implementation, the additional lab exercise made me more confident towards the fulfilment of the objectives(s).

7 Lab Task (Please implement yourself and show the output to the instructor)

1. Implement mesh topology in packet tracer.
2. Implement hybrid network topology.

8 Lab Exercise (Submit as a report)

- Design an office network that runs based on Tree Network Topology.
- Design and implement different types of network topology in CISCO Packet Tracer Software.

9 Policy

Copying from internet, classmate, seniors, or from any other source is strongly prohibited. 100% marks will be *deducted* if any such copying is detected.

10 Resources

- https://www.tutorialspoint.com/data_communication_computer_network/computer_network_topologies.htm
- https://www.netacad.com/courses/packet-tracer
- https://www.youtube.com/watch?v=j9V6Sb91pW4