AIM: Study of different types of Network cables and Implement the cross-wired cable and straight through cable and configure the Network Topology using Packet Tracer

Different types of Network cables:
1. Copper Straight-Through Cable

2. Copper Crossover Cable

3. Fiber-Optic Cable

4. Console Cable

5. Serial DCE/DTE Cable

6. Ethernet Cross-Over Cable (Deprecated)

7. Rolled Cable (Rollover Cable)

For this experiment only two cables are required ,they are:

Copper Straight-Through Cable

Description: A copper straight-through cable is perhaps one of the most commonly used network cables. It's characterized by the same pin configuration at both ends, meaning the wires in the cable are connected straight through from one end to the other.

Use Cases:

- Connecting a PC to a switch or hub.
- Linking a router to a switch to enable communication between different network segments.

2. Copper Crossover Cable

Description: Copper crossover cables, on the other hand, feature different pin configurations at each end. These cables are designed for connecting similar devices directly to each other, bypassing the need for intermediary networking equipment.

Use Cases:

- Connecting two PCs directly without a switch or hub.
- Creating a direct link between two switches for redundancy or high-speed interconnection.

Network Topology:
1. point-to-point topology
2. bus topology
3. ring topology

4. star topology
5. tree topology
6. mesh topology
7. hybrid topology.

Packet Tracer

A Cisco packet tracer is a simulation tool that is used for understanding the networks. The best part of the Cisco packet tracer is its visualization, we can see the actual flow of the message and understand the workflow of the network devices.
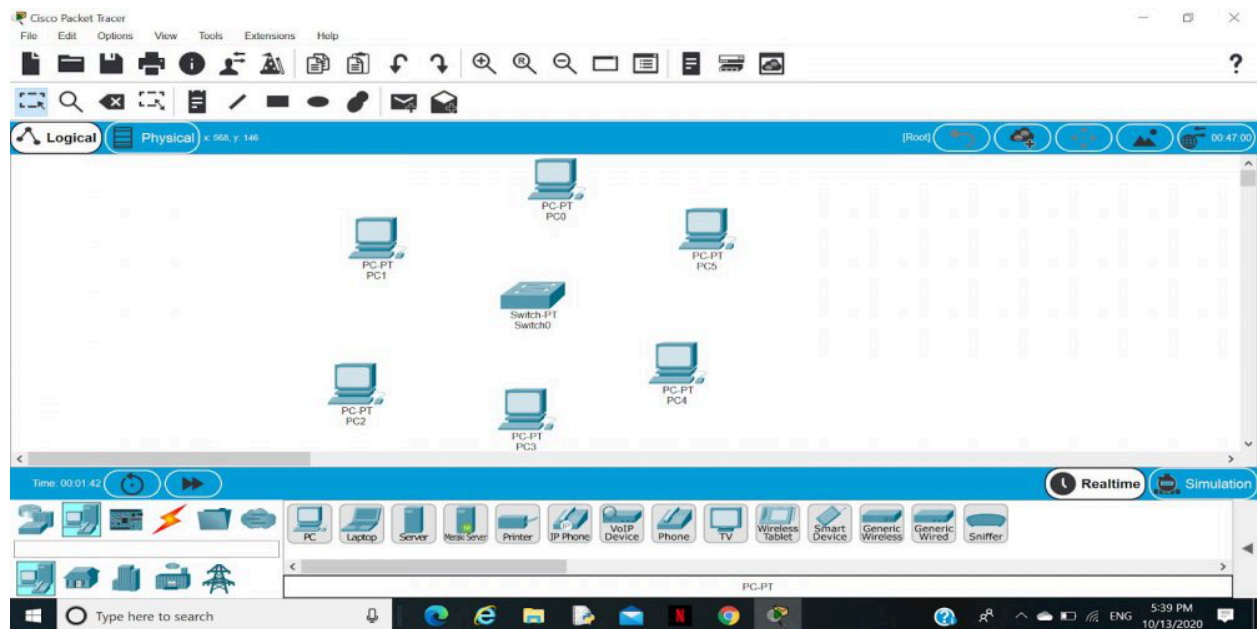
 Implementation of Topologies using Cisco Packet Tracer
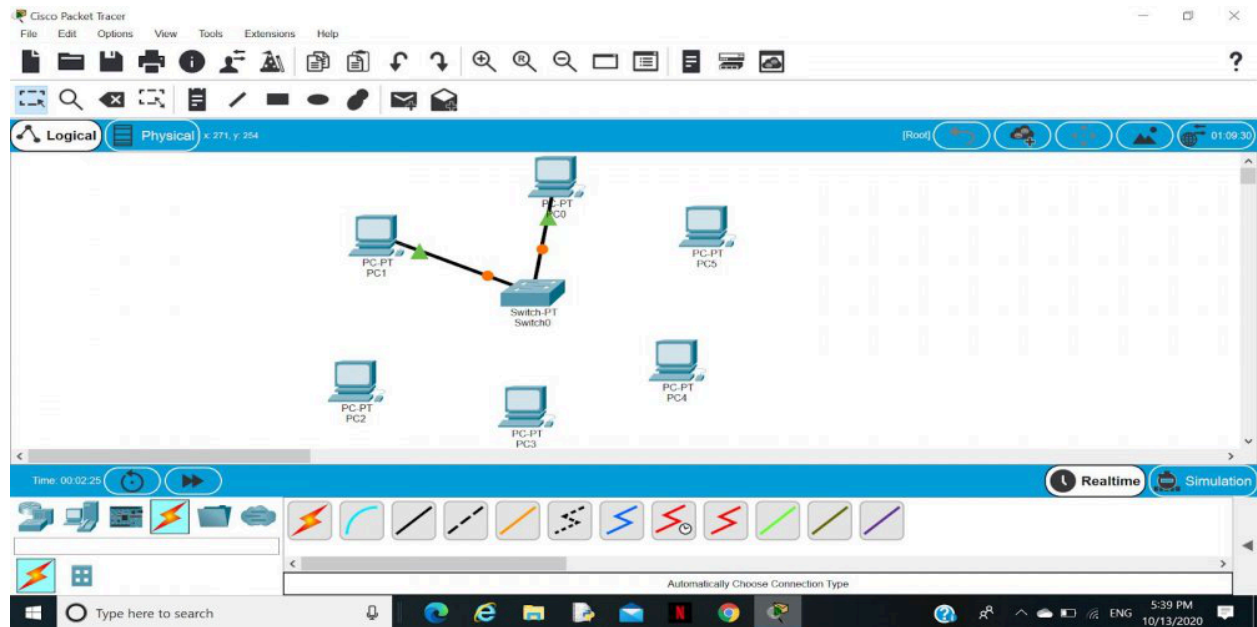
star topology:
In a star topology, all nodes are connected to a central hub using a communication link. Each node needs a separate wire to establish a point-to-point connection with the hub, which functions as a server to control and manage the entire network.

Steps Implementing Star Topology using Cisco Packet Tracer:

Step 1: We have taken a switch and linked it to six end devices.
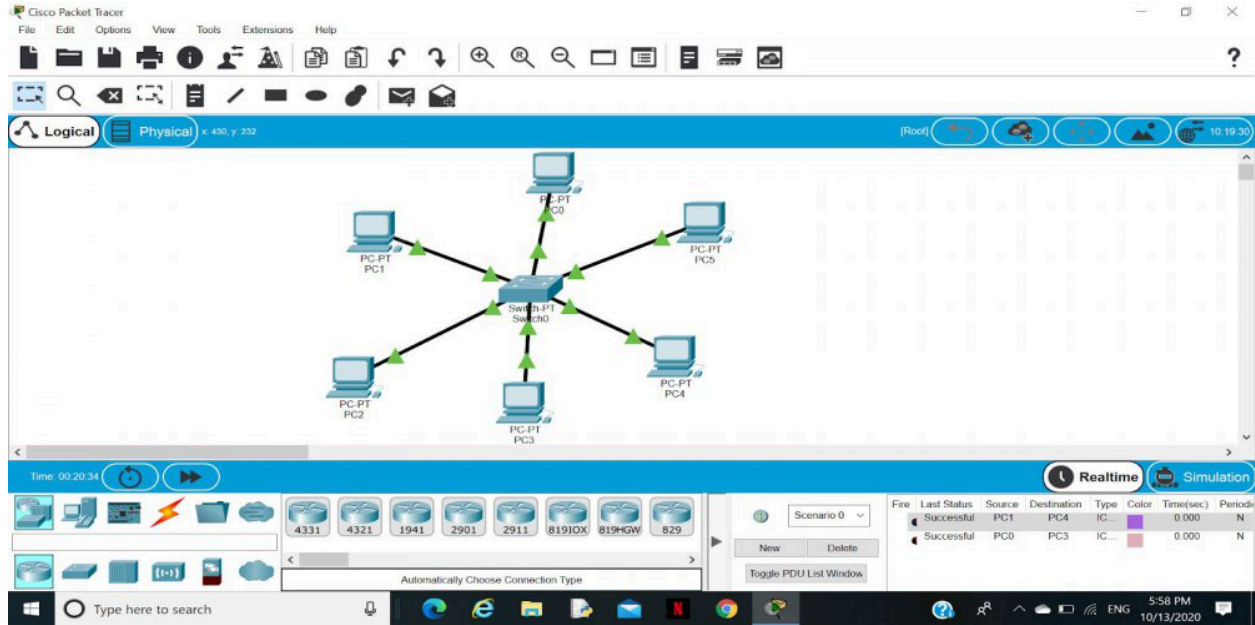

Step 2: Link every device with the switch.

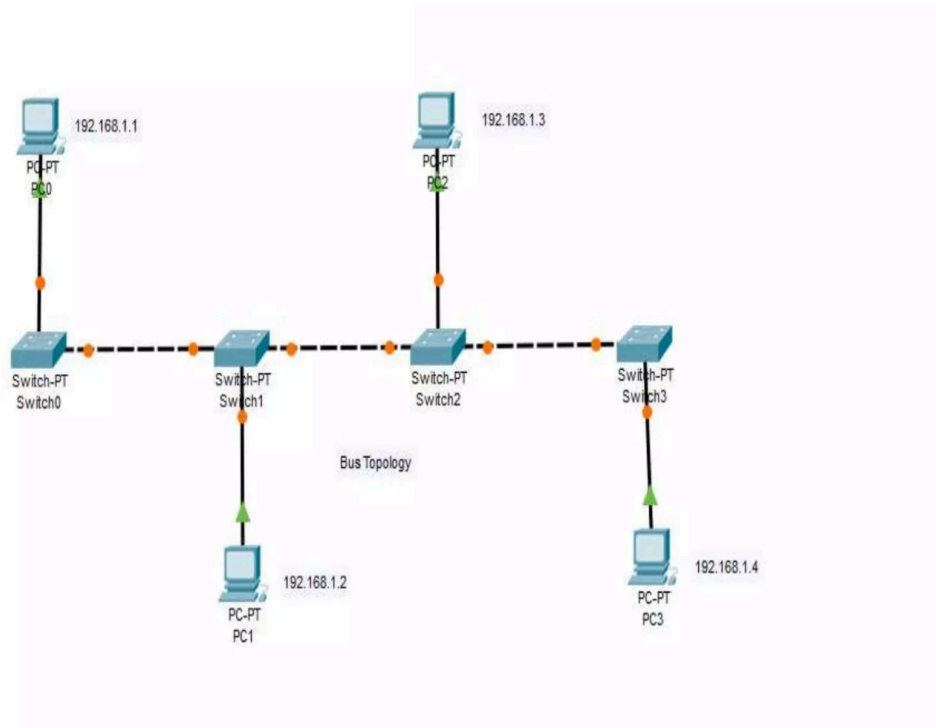**Step 3: Provide the IP address to each device.**

Step 4: Transfer message from one device to another and check the Table for Validation.
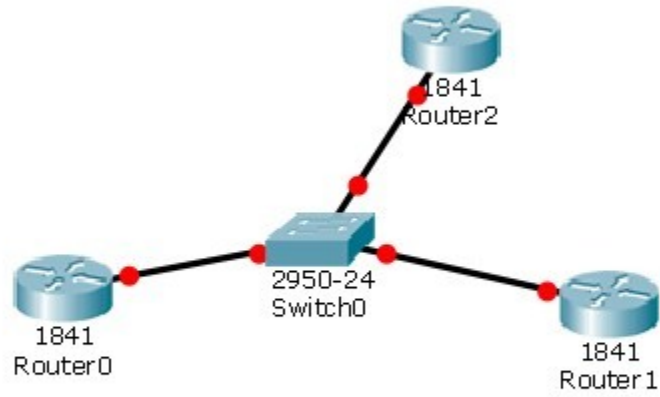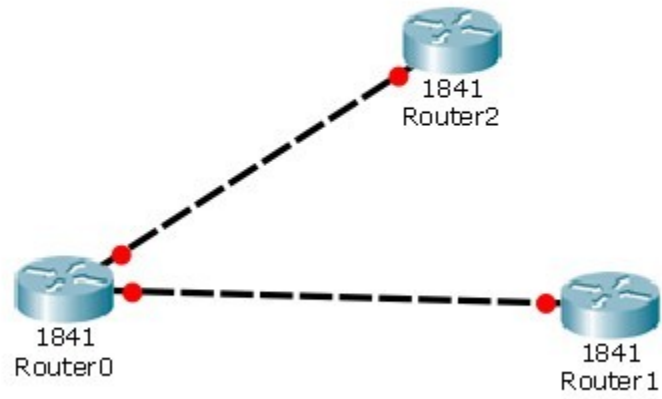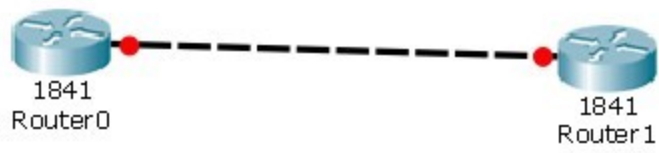
Bus Topology:

In a bus topology, all the nodes are linked using a single cable with a terminator on both ends. This configuration sees one main cable acting as the backbone for the whole network.
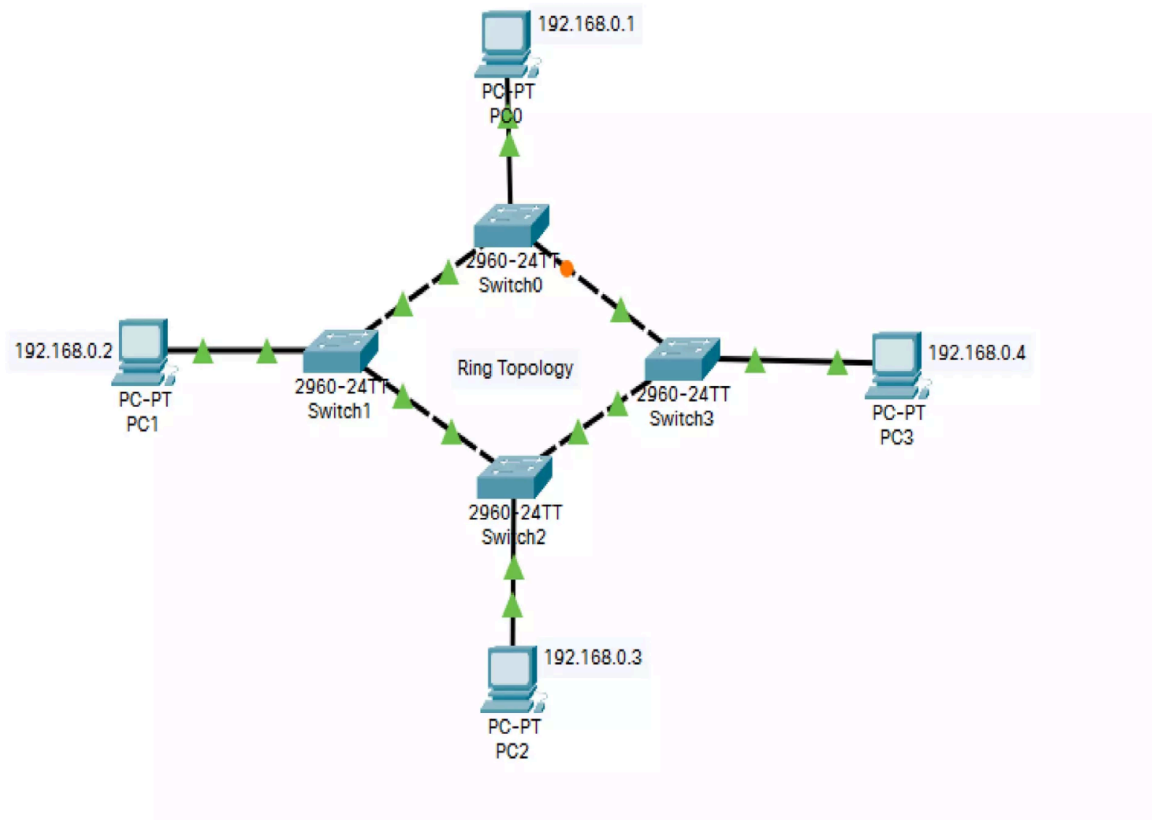

Bus Topology

point-to-point and multipoint topologies:

Point to point is a simple topology that directly links two nodes and reserves the entire bandwidth of the connection for them to communicate with one another. Physically, point-to-point connections rely on a cable or wire that connects the two endpoints.
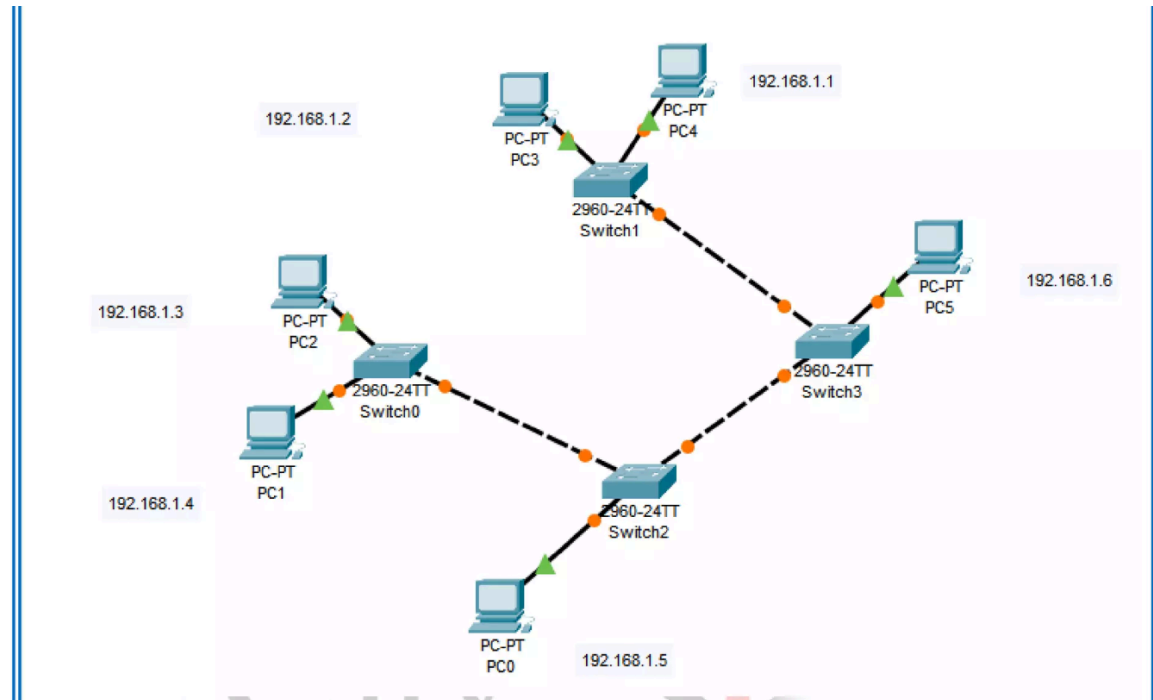
1841
Router0

1841
Router1

1841
Router2

1841
Router0

1841
Router1

1841
Router2

2950-24
Switch0

1841
Router0

1841
Router1

Ring Topology:

In a ring topology, each node is linked with its neighbor to form a closed network. This configuration sees the data move from one node to another, either unidirectionally or bidirectionally.
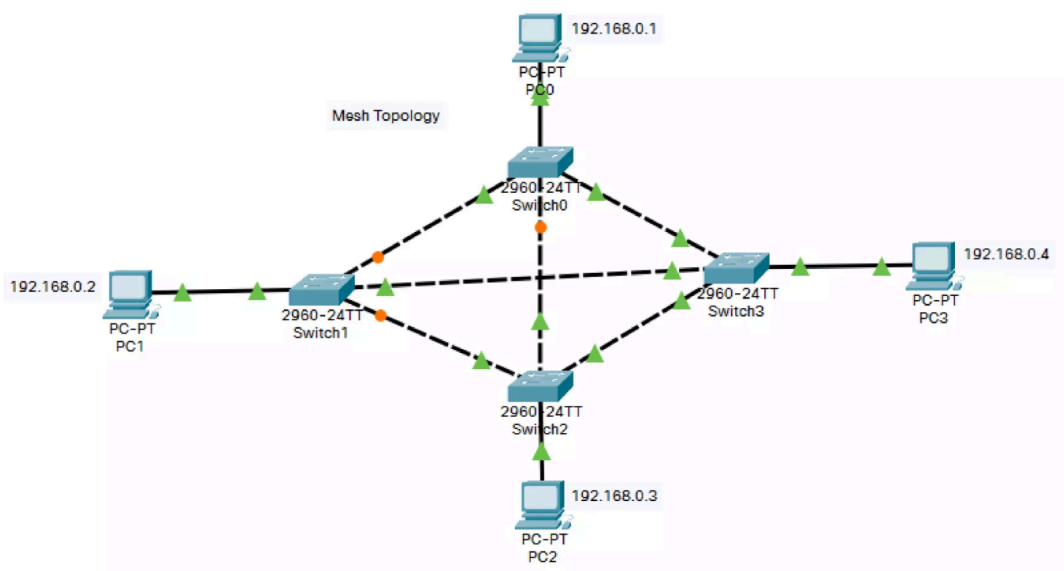

Tree Topology:
In a tree topology, nodes are arranged in a configuration that resembles a tree's leaves, branches, and trunk. Endpoints, or 'leaves,' are connected to mid-level nodes or 'branches' linked to the tree's 'trunk.' The trunk is the backbone connection that links multiple mid-level nodes.

Mesh Topology:

In a mesh topology, all the nodes are interconnected and can send and receive their data and relay data from other nodes. Full mesh networks, wherein each node is connected to every other node, are usually reserved for critical networks as they are extremely costly to implement and challenging to maintain.

Hybrid Topology:

A hybrid network topology, as the name suggests, features characteristics of multiple other topologies. The creation of such a configuration depends on the requirement of the network.Two most commonly used hybrid topologies are star-ring and star-bus. In the former, the central hubs of multiple star topologies are linked using a ring topology. In the latter, the hubs of numerous star topologies are connected using a bus topology.