

## Group A – Assignment 2

### Problem Statement:

Demonstrate the different types of topologies and types of transmission media using a packet tracer tool.

### Objectives:

1. To understand the working of different types of topologies.
2. To understand the transmission media.
3. To understand the working of Cisco packet tracer tool.

### Outcomes:

Demonstrate types of technologies and types of transmission media using Cisco Packet tracer tool.

### Tools Required:

Software: Cisco Packet Tracer

### Procedure:

- Open the CISCO Packet tracer software
- Drag and drop 4 pcs using End Device Icons on the left corner
- Select 8 port switch from switch icon list in the left bottom corner
- Make the connections using Straight through Ethernet cables
- Give IP address of the PCs as per table, ping between PCs and observe the transfer of data packets in real and simulation mode.

### Theory:

#### Cisco Packet Tracer:

Cisco Packet Tracer (CPT) is multi-tasking network simulation software to perform and analyze various network activities such as implementation of different topologies, select optimum path based on various routing algorithms, create DNS and DHCP server, sub netting, analyze various network configuration and troubleshooting commands. In order to start communication between end user devices and to design a network, we need to select appropriate networking devices like routers, switches, hubs and make physical Connection by connection cables to serial and fast Ethernet ports from the component list of packet tracer. Networking devices are costly so it is better to perform first on packet tracer to understand the concept and behavior of networking.

### Types of Topologies:

#### Bus Topology

In local area network, it is a single network cable runs in the building or campus and all nodes are connected along with this communication line with two endpoints called the bus or backbone. In other words, it is a multipoint data communication circuit that is easily control data flow between the computers because this configuration allows all stations to receive every transmission over the network. For bus topology we build network using three generic pc which are serially connected with three switches using copper straight through cable and switches are interconnected using copper cross over cable.

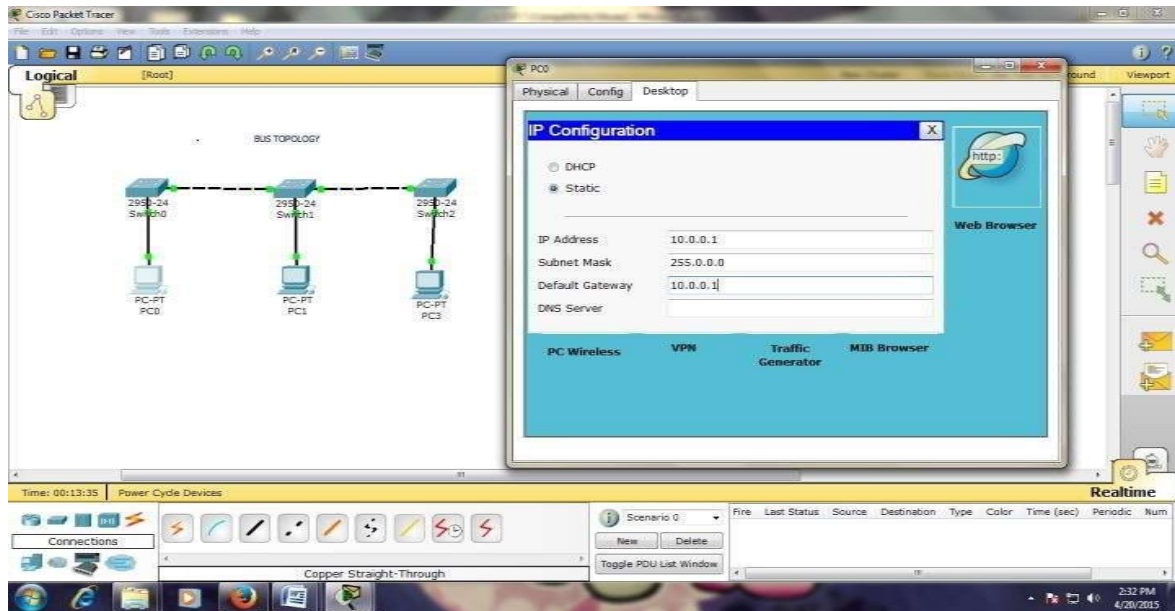


Fig -1: Design of bus topology

#### Star Topology:

In star topology, all the cables run from the computers to a central location where they are all connected by a device called a hub. It is a concentrated network, where the end points are directly reachable from a central location when network is expanded. Ethernet 10 base T is a popular network based on the star topology. For star topology we build network using five generic pc which are centrally connected to single switch 2950 -24 using copper straight through cable.

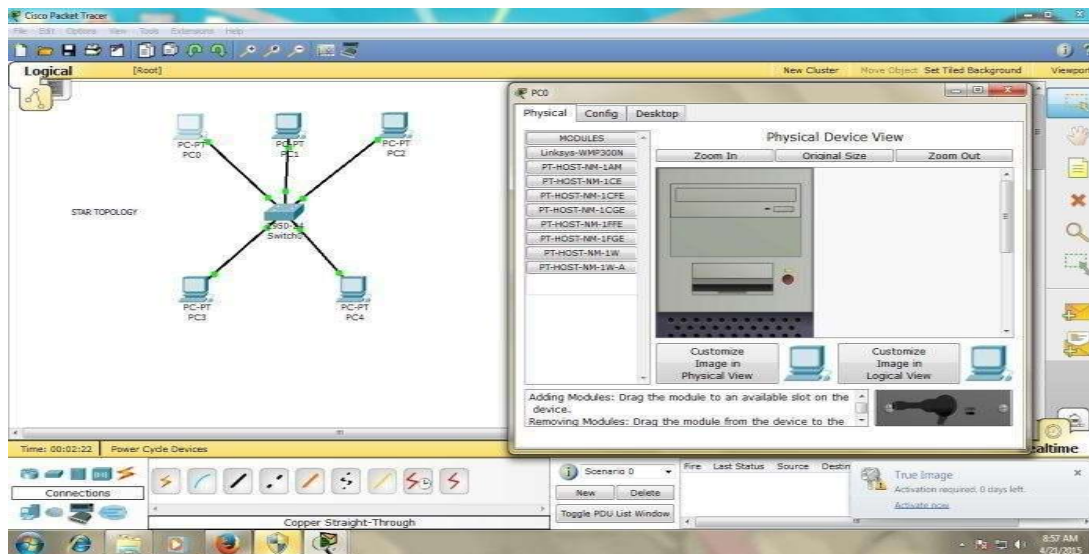


Fig -2: Design of star topology

#### Mesh Topology:

In mesh topology every device has a dedicated point to point link to every other device. The term dedicated stand for link carries traffic only between two devices it connects. It is a well- connected topology; in this every node has a connection to every other node in the network. The cable requirements

are high and it can include multiple topologies. Failure in one of the computers does not cause the network to break down, as they have alternative paths to other computers star topology, all the cables run from the computers to a central location For mesh topology we build network using five 1841 router. To design four serial port router, click on router ->turn off->drag the WIC2T module two t times.

>power on to establish connection between router to router using DCE cables.

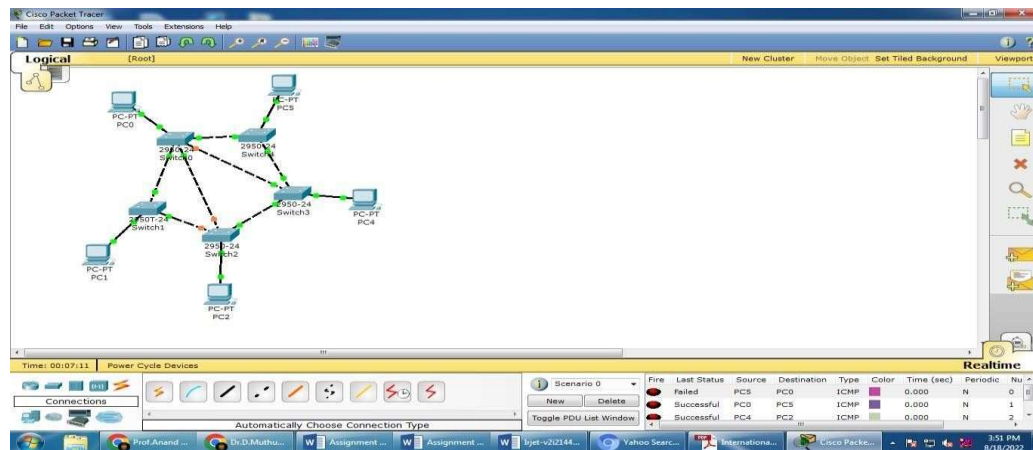


Fig -3: Design of mesh topology

Configuration of component:

Bus topology: To configure the IP address of an interface, we configure all PC one by one click on pc, open DESKTOP window, fill IP Address, Fill subnet mask and default gateway. After that, simulate the network using simulation

Star topology: To configure the IP address of an interface, we configure all PC one by one click on pc, open DESKTOP window, fill IP Address, Fill subnet mask and default gateway. After that, simulate the network using simulation.

Mesh topology: To configure the IP address of an interface, we configure all routers one by one. Click on router, open config window, and fill IP Address of serial port which are connected to router. Fill subnet mask, set clock rate and port status is ON. After that, simulate the network using simulation mode.

Simulation of network topology:

#### 1. Simulation of bus topology:

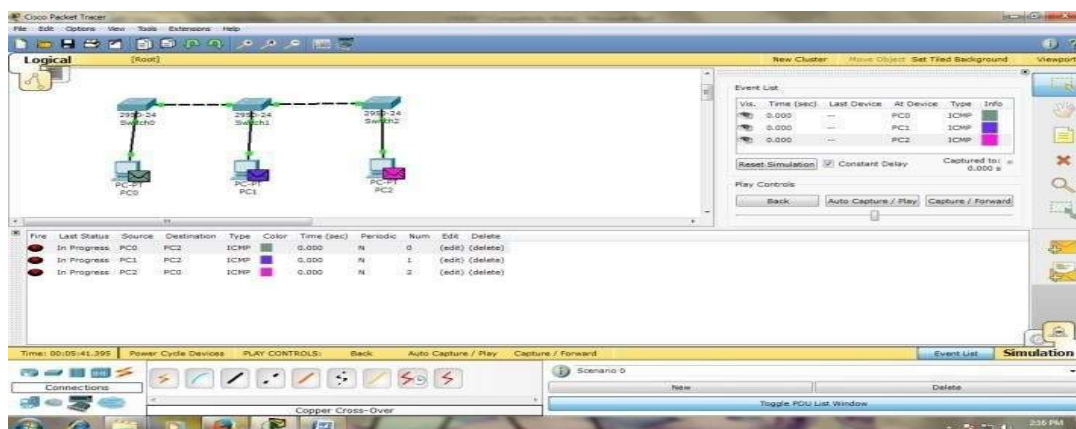


Fig.4 Simulation of Bus Topolo

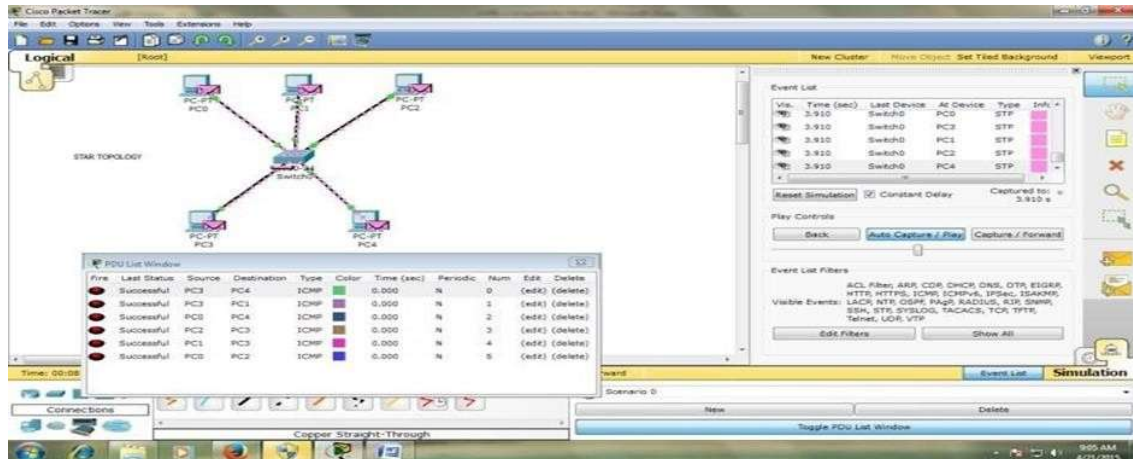


Fig.5 Simulation of Star Topology

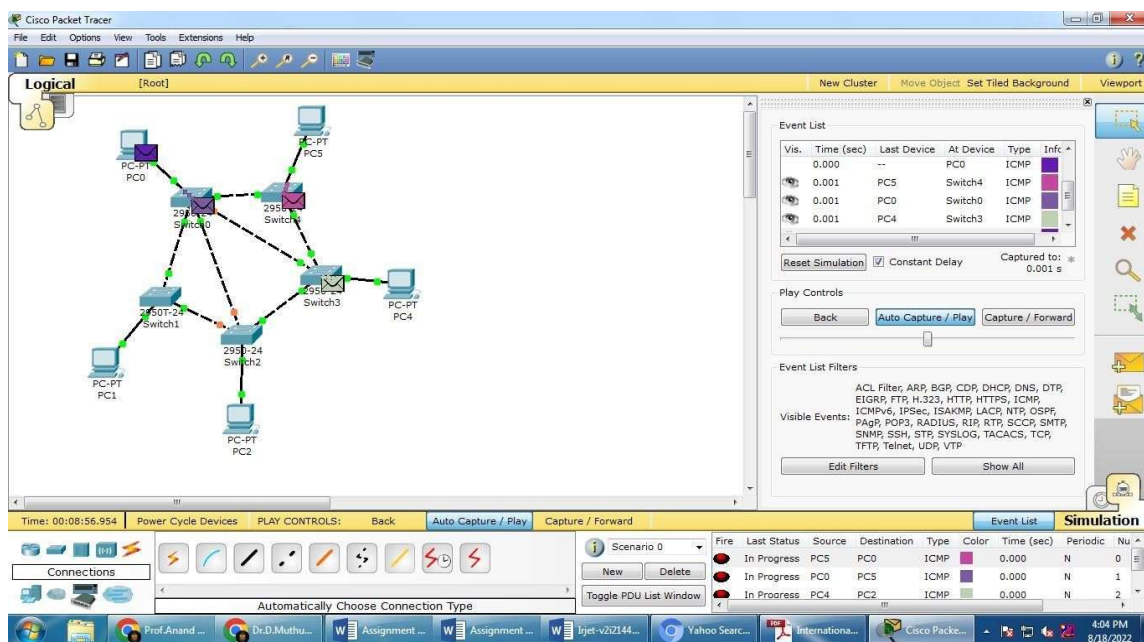


Fig.6 Simulation of Mesh Topology

**Conclusion:** Thus, we have implemented various topologies in a single network using Cisco Packet Tracer. We have used switch configuration and send packet data from one device to another.

## Frequently Asked Question

1. Differentiate between ring and star topology
2. Explain the data transmission in bus topology
3. Define the topology in your own words in your institute
4. What in ping command
5. What is the need of packet tracer analyzer

