

Weekly Assessment - 1

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Week1- Topologies

AIM:

To understand and implement different network topologies in Cisco Packet Tracer, including Bus, Star, Ring, Mesh, Tree, and Hybrid topologies.

DESCRIPTION:

Network topologies define the arrangement of devices in a network. Each topology has unique advantages and use cases. Here, we will be doing step-by-step instructions for setting up these topologies, along with required devices, connection and procedures.

1 .Bus Topology:

Use & Importance:

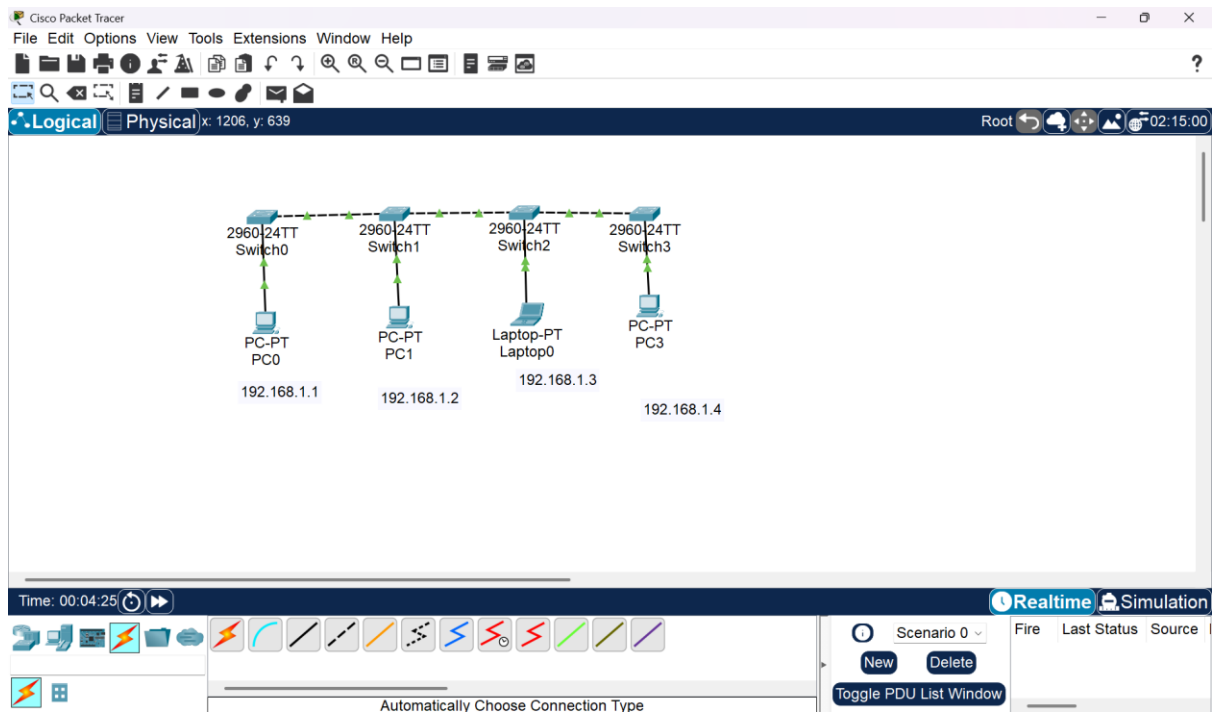
- **Use:** Suitable for small networks with minimal devices.
- **Importance:** Cost-effective and easy to set up but has a single point of failure.

Devices Needed:

- PCs - 4
- Switches - 4
- Copper straight-through cables

Steps:

1. **Place PCs** in a row.
2. **Connect them to their adjacent switches and connect all the switches**
3. Assign **IP addresses** to all PCs. 4.
4. Test connectivity using the ping command



Cisco Packet Tracer

File Edit Options View Tools Extensions Window Help

Logical Physical x: 834, y: 299

02:00:30

2960-24TT Switch0 2960-24TT Switch1

PC-PT PC0 PC-PT PC1

192.168.1.1 192.168.1.2

Time: 00:03:57

Realtime Simulation

Scenario 0 New Delete Toggle PDU List Window

Automatically Choose Connection Type

Laptop0

Physical Config Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.1.3

Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address /

Link Local Address FE80::207:ECFF:FEAA:B8D7

Default Gateway

DNS Server

802.1X

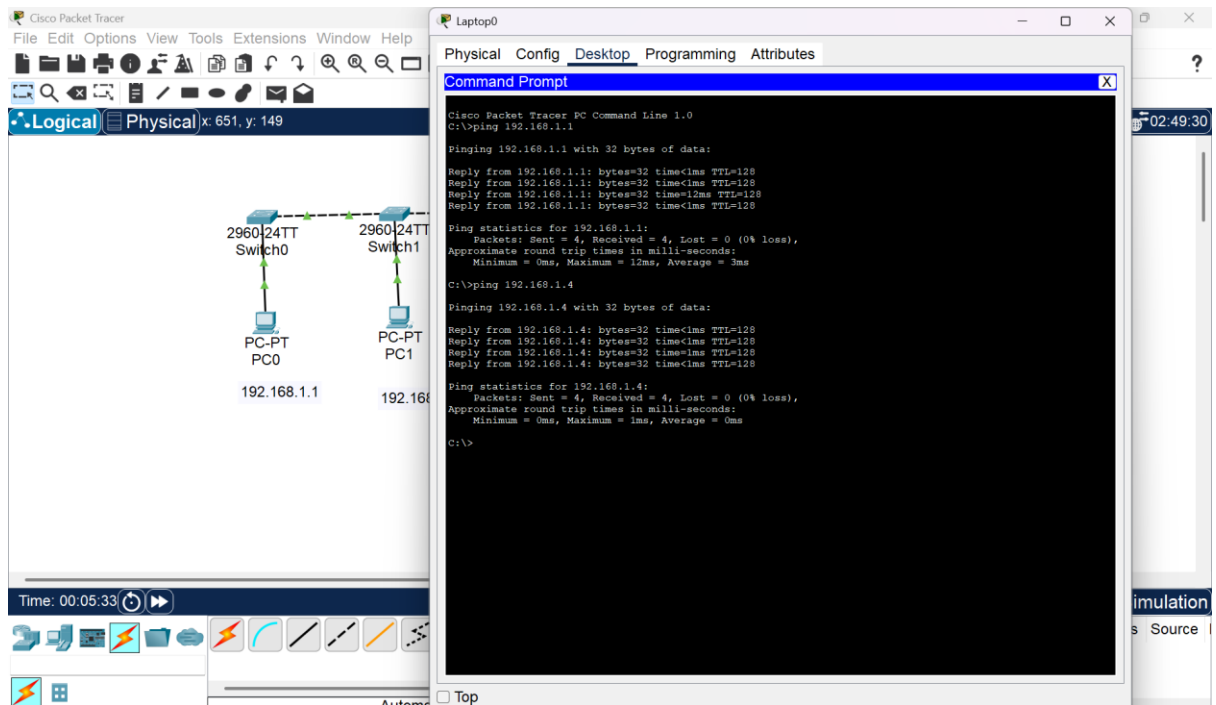
☐ Use 802.1X Security

Authentication MD5

Username

Password

Top



2. Star Topology

Use & Importance:

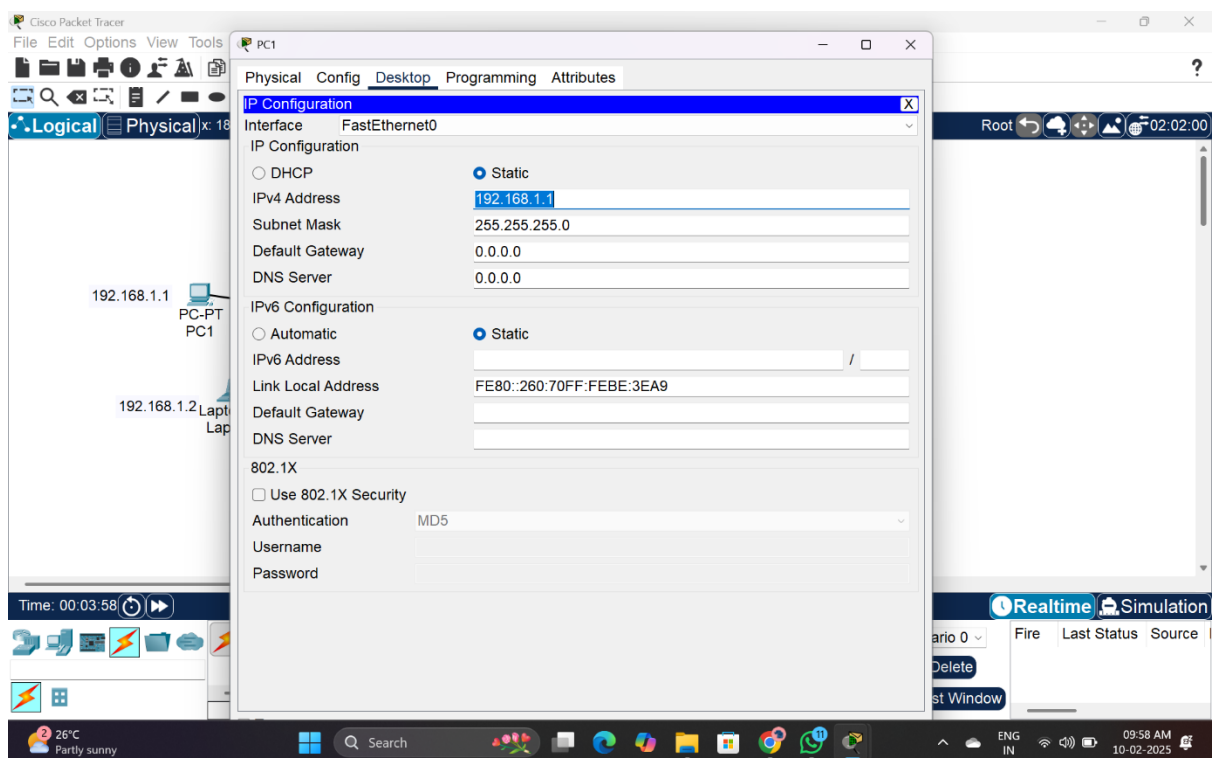
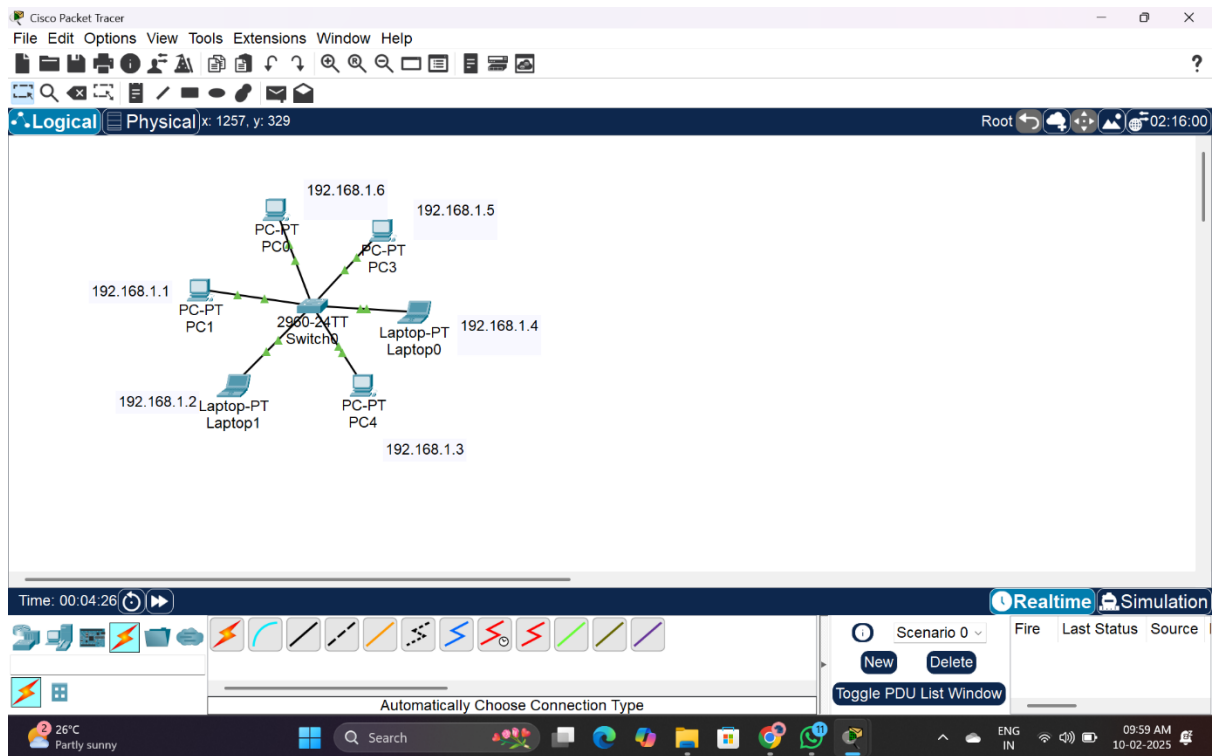
- Use: Common in home and office networks.
- Importance: Easy to manage and troubleshoot; failure of a single device does not affect the network.

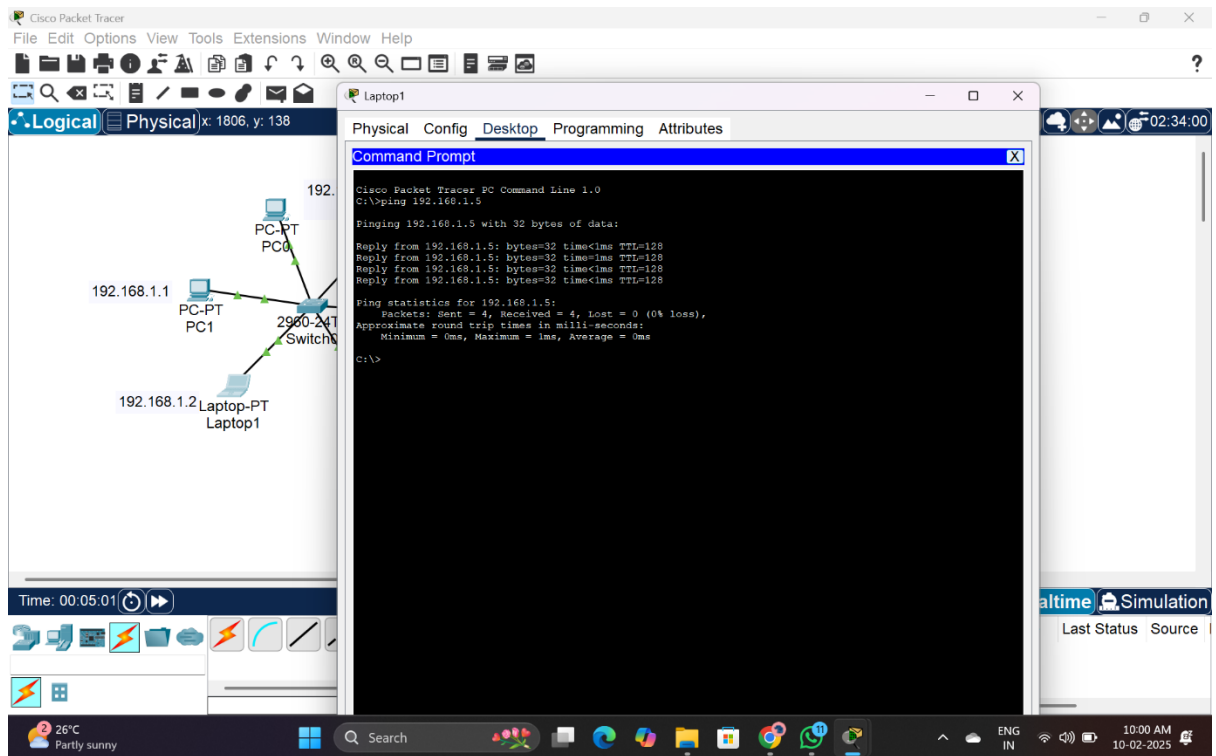
Devices Needed:

- 1 Switch
- 4-6 PCs
- Copper straight-through cables

Steps:

1. Place a switch in the center.
2. Connect all PCs to the switch using copper straight-through cables.
3. Assign IP addresses to all PCs.
4. Test connectivity using the ping command.





3. Ring Topology

Use & Importance:

Use: Suitable for high-speed LANs and token-based networks.

Importance: Efficient for data transfer, but failure of one device can disrupt the network.

Devices Needed:

- **4 PCs**
- **4 Switches (to simulate a logical ring)**
- **Copper straight-through cables**

Steps:

1. Arrange **PCs in a circular layout**.
2. **Connect each PC to two neighboring switches, forming a ring.**
3. Assign **IP addresses** to all PCs.
4. Test connectivity using ping.

Cisco Packet Tracer

File Edit Options View Tools Extensions Window Help

Logical Physical x: 1860, y: 56

Time: 00:07:00

PC3

Physical Config Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.1.4

Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address /

Link Local Address FE80::201:42FF:FE30:B86D

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

Username

Password

Simulation

Source

Cisco Packet Tracer

File Edit Options View Tools Extensions Window Help

Logical Physical x: 1052, y: 153

Time: 00:05:28

Root

01:30:00

PC-PT PC0 192.168.1.1

PC-PT PC1 192.168.1.2

PC-PT PC2 192.168.1.3

PC-PT PC3 192.168.1.4

2960-24TT Switch0

2960-24TT Switch1

2960-24TT Switch2

2960-24TT Switch3

Time: 00:05:28

Realtime Simulation

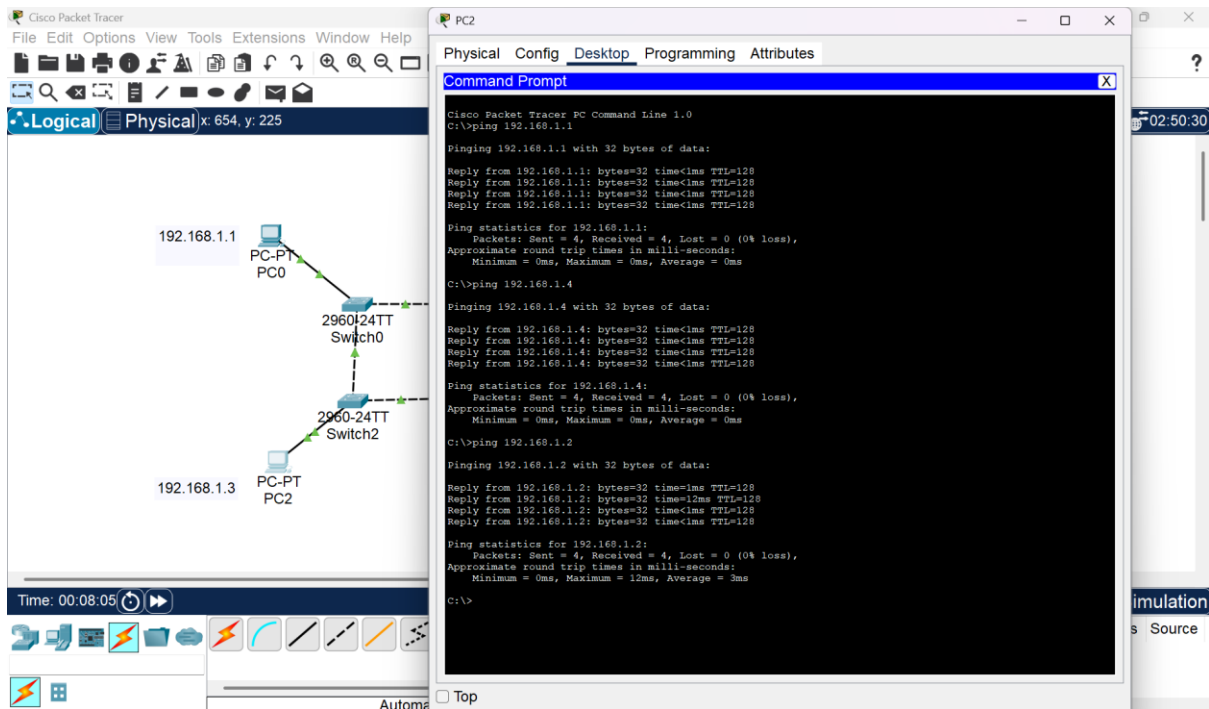
Scenario 0

New Delete

Toggle PDU List Window

Fire Last Status Source

Automatically Choose Connection Type



Mesh Topology

Use & Importance:

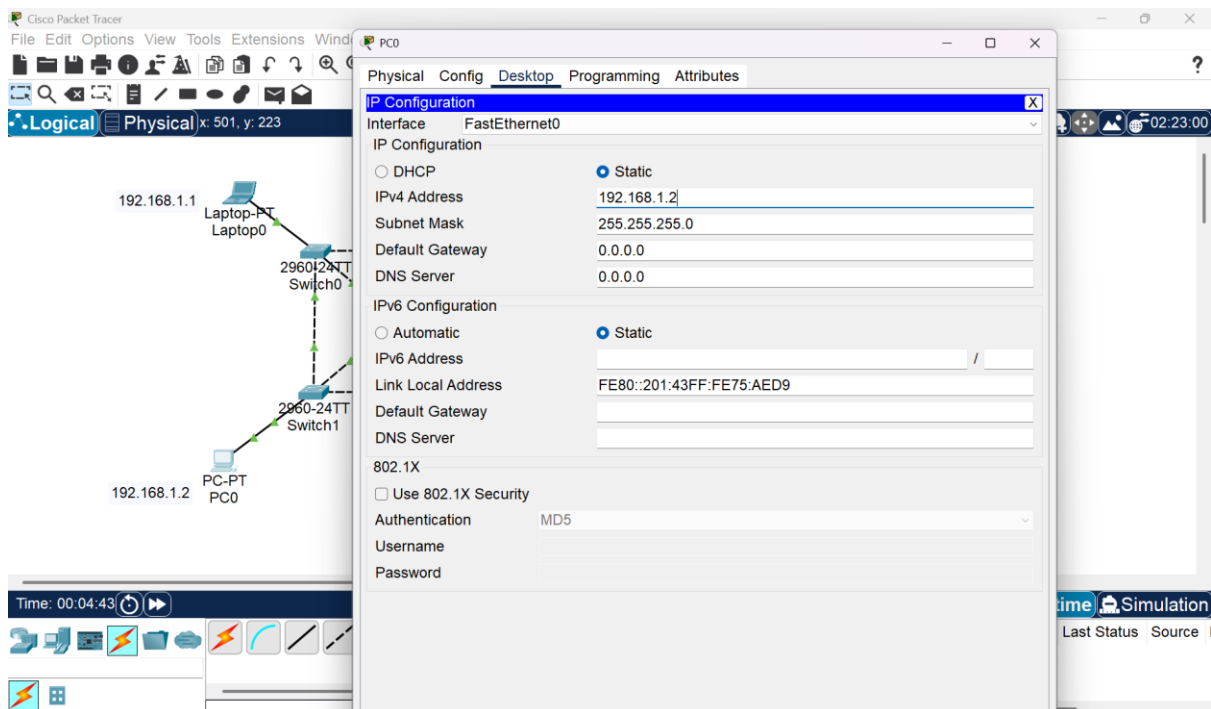
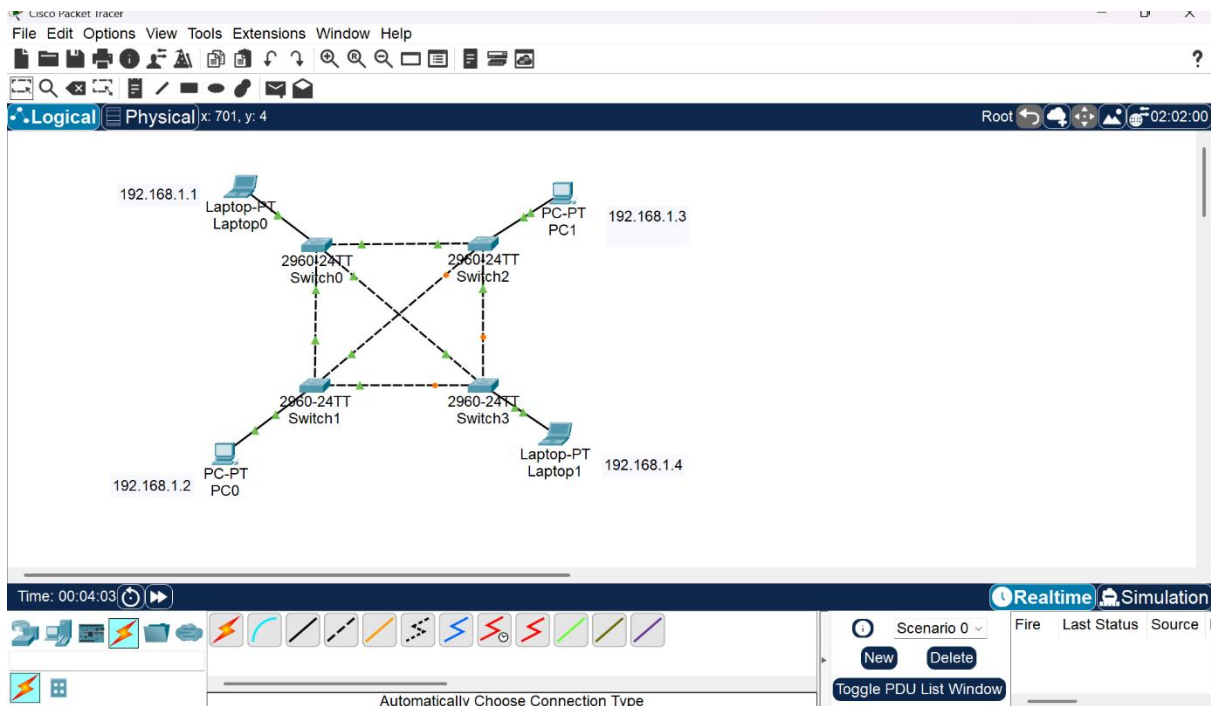
- **Use:** Used in large and critical networks where reliability is key.
- **Importance:** Provides redundancy and fault tolerance, but is expensive and complex to implement.

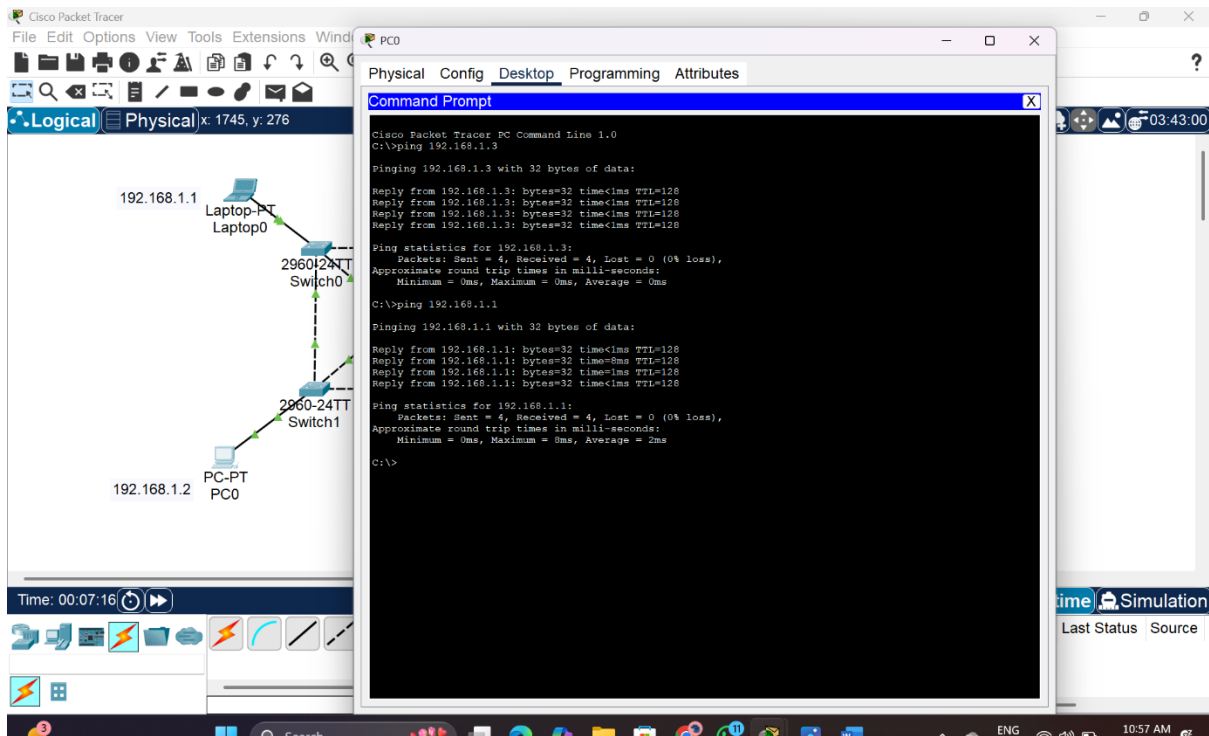
Devices Needed:

- 4 PCs
- 4 Switches
- Copper straight-through cables

Steps:

1. **Connect every device to multiple others .**
2. Assign **IP addresses** to all PCs.
3. Test connectivity using ping.





Tree Topology:

Use & Importance:

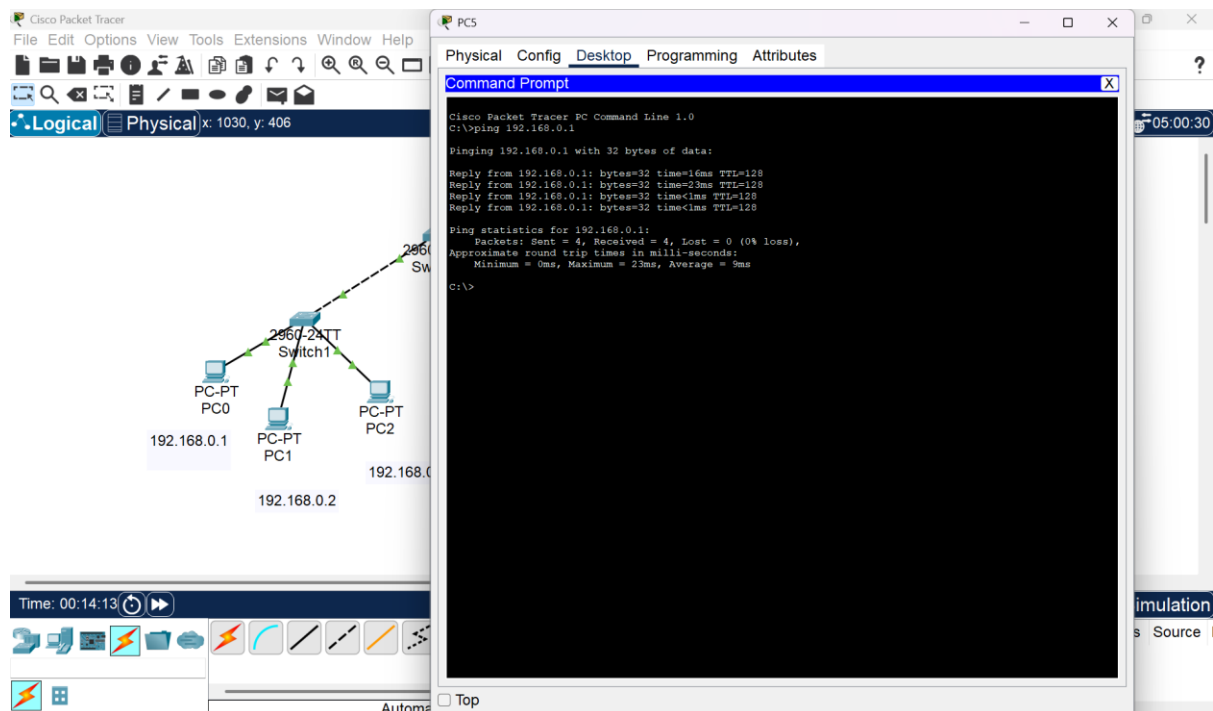
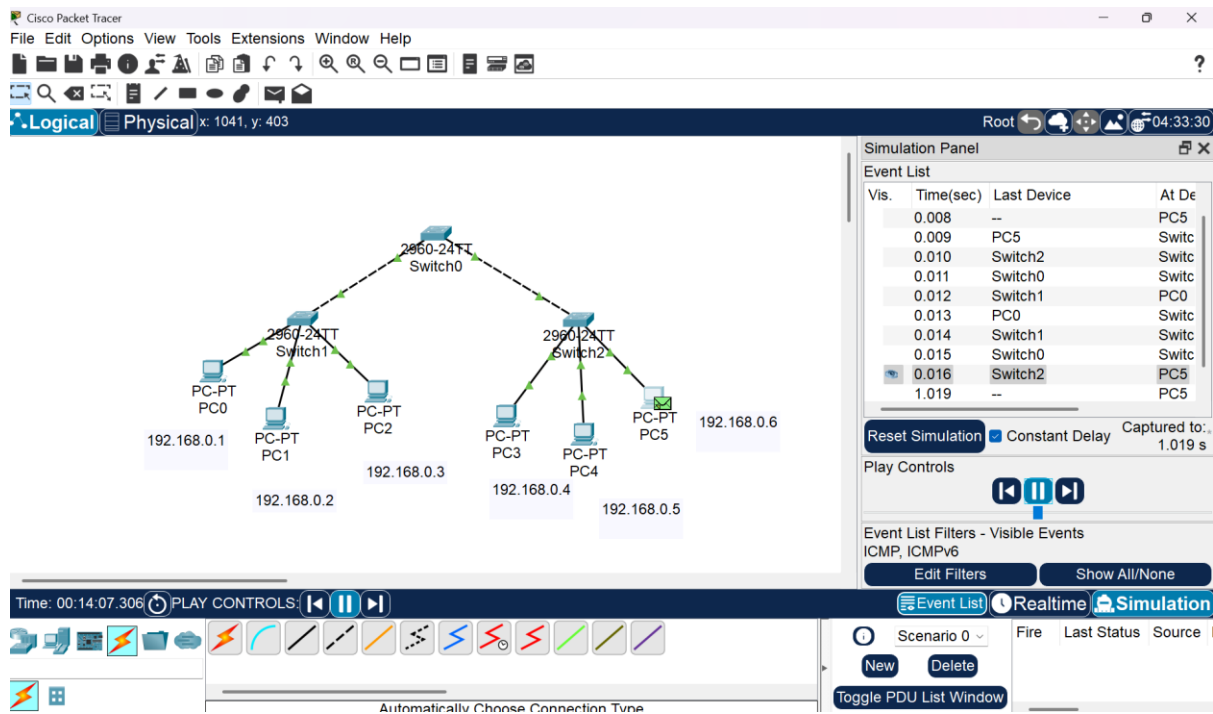
- **Use:** Commonly used in large organizations and data centers.
- **Importance:** Scalable and allows for easy network expansion but can be complex to manage.

Devices Needed:

- Root Switch
- Two intermediate switches
- 4-6 PCs
- Copper straight-through cables

Steps:

1. Place the root switch at the top.
2. Connect two intermediate switches below it.
3. Connect PCs to intermediate switches.
4. Assign IP addresses to PCs.
5. Test connectivity using ping.



6. Hybrid Topology

Use & Importance:

- **Use:** Used in enterprise networks and service provider environments.

Importance: Flexible and scalable but requires careful planning and higher costs

Devices Needed:

- Combination of switches, routers, and PCs
- Copper straight-through cables & serial connections

Steps:

1. Combine **two or more** topologies (e.g., ring + bus).
2. Assign **IP addresses** and configure **routing protocols** (if needed).
3. Test connectivity using ping.

