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1. Introduction

Cisco Packet Tracer:

Cisco Packet Tracer is a network simulation tool developed by Cisco, designed for learning and practicing networking concepts. It allows users to create network topologies, simulate network devices, and visualize data flow in a virtual environment.

Packet Tracer is widely used by students and professionals to understand and practice networking protocols, configurations, and troubleshooting without the need for physical hardware.

Introduce to Hybrid Topology :

A **hybrid topology** is a network structure that combines two or more different basic topologies (e.g., star, bus, mesh) to take advantage of the strengths of each one.

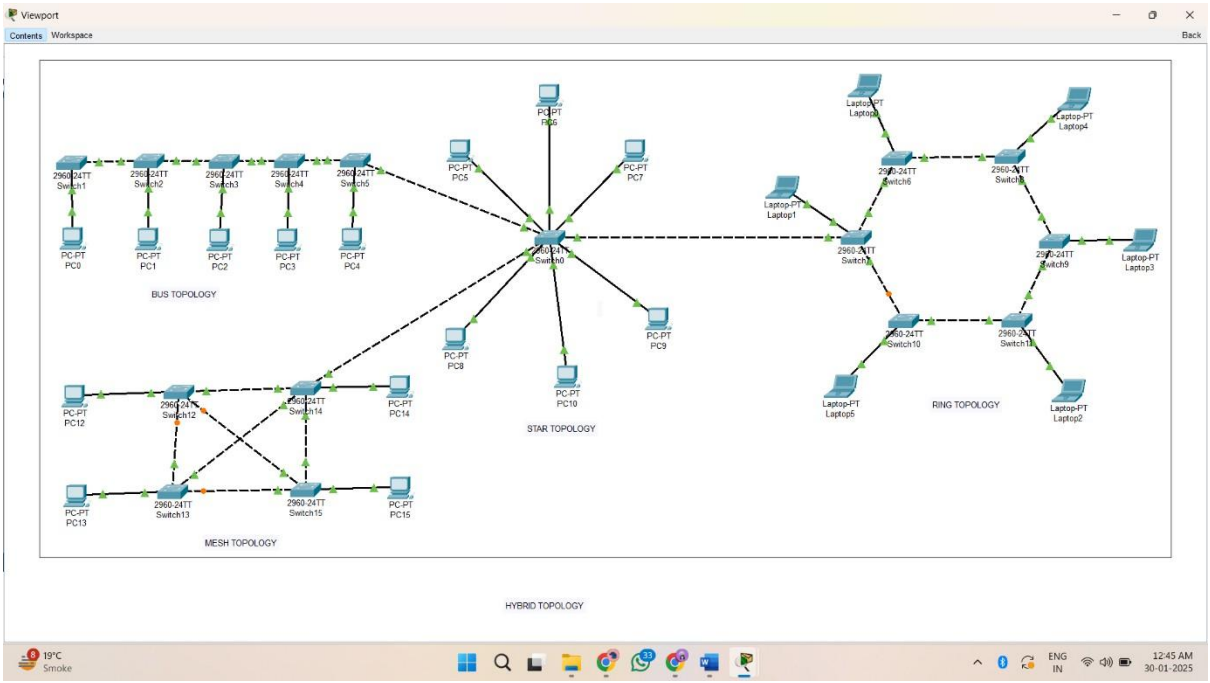
Hybrid topologies offer greater flexibility, redundancy, and scalability. They are commonly used in large-scale networks where different segments of the network might have distinct requirements.

For example, parts of the network might use a star topology for easy management, while other parts use a mesh topology for redundancy and fault tolerance.

Devices & Components Used in Hybrid Topology :

- **Computer System**
- **Laptop System**
- **2960 – Switches**

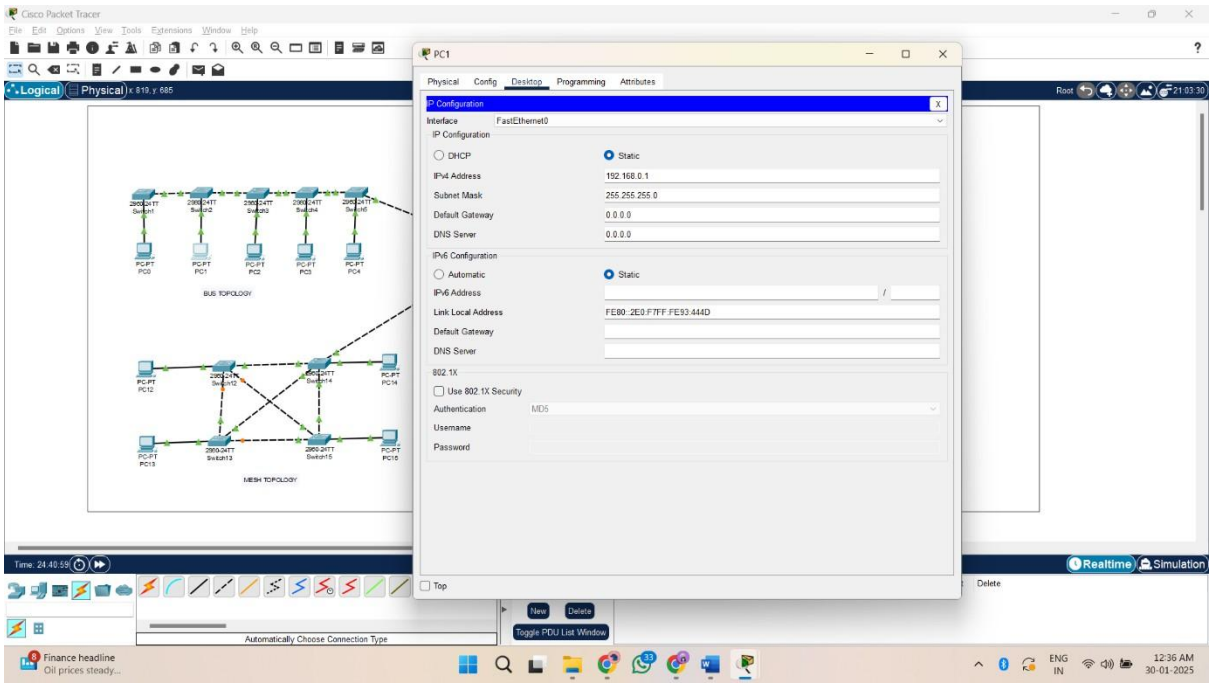
2 Workspace Screenshot



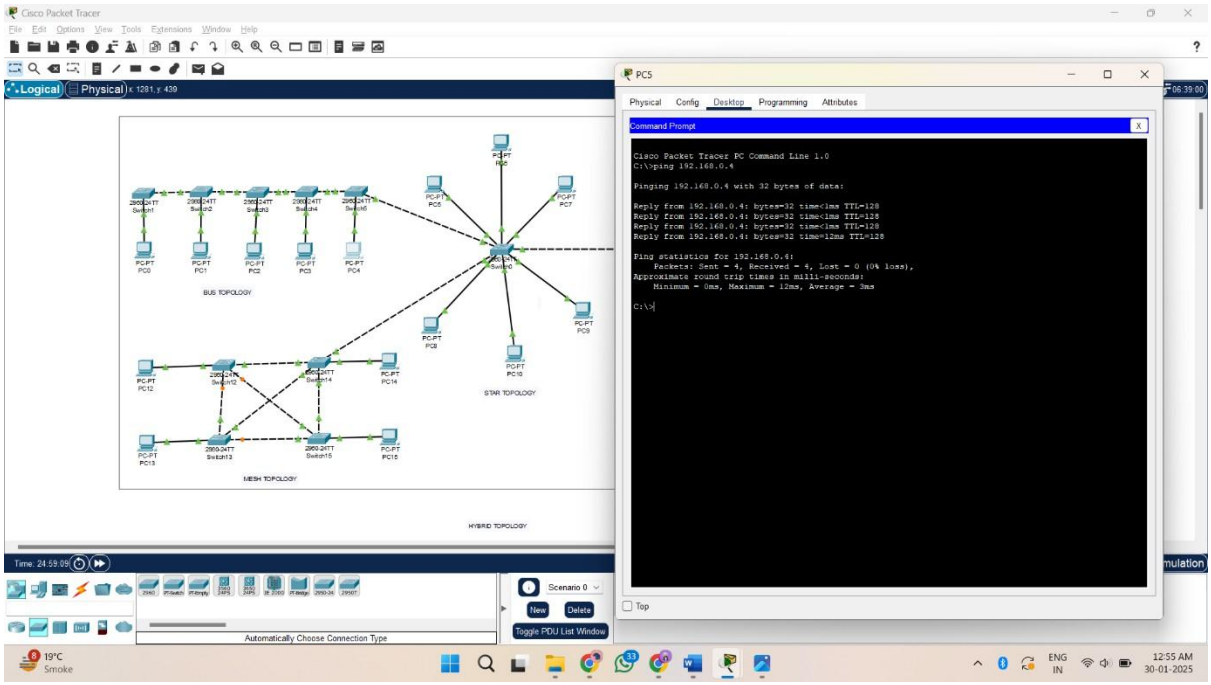
Devices & Components Used in Hybrid Topology :

- There are Fifteen Computer System Used
- There are Six Laptop System Used
- There are Sixteen 2960 – switches

3 IP Address Assignment

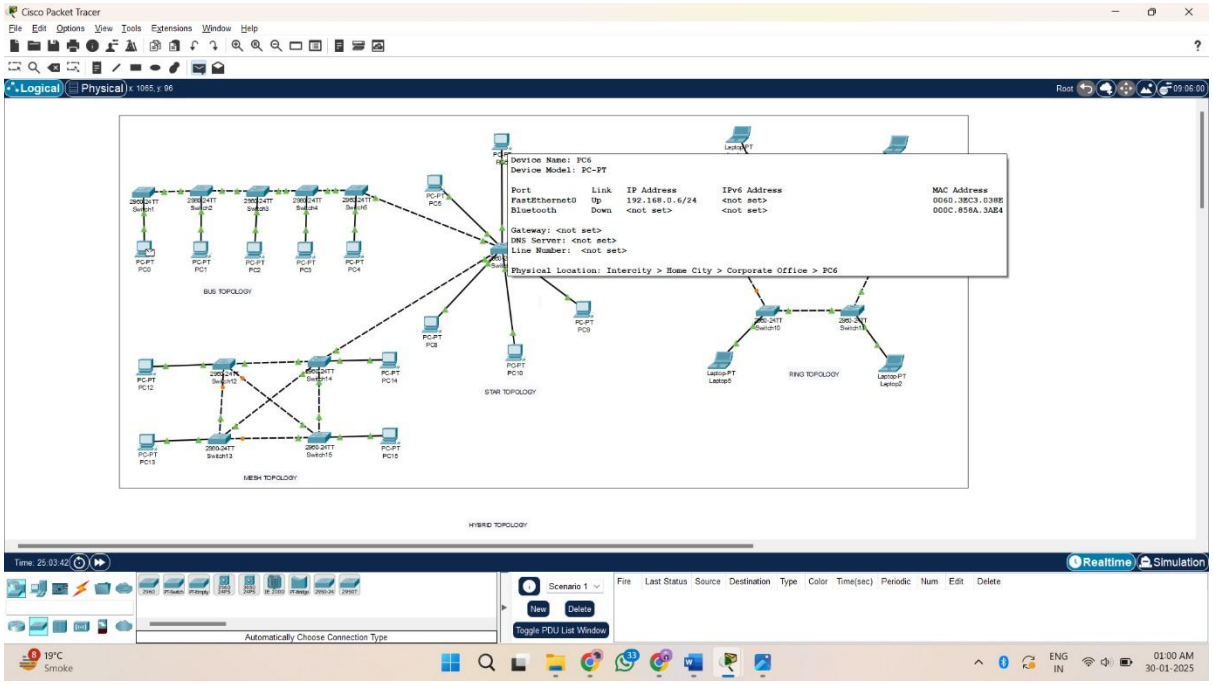


❾ **Check via Command Prompt using ping command :**

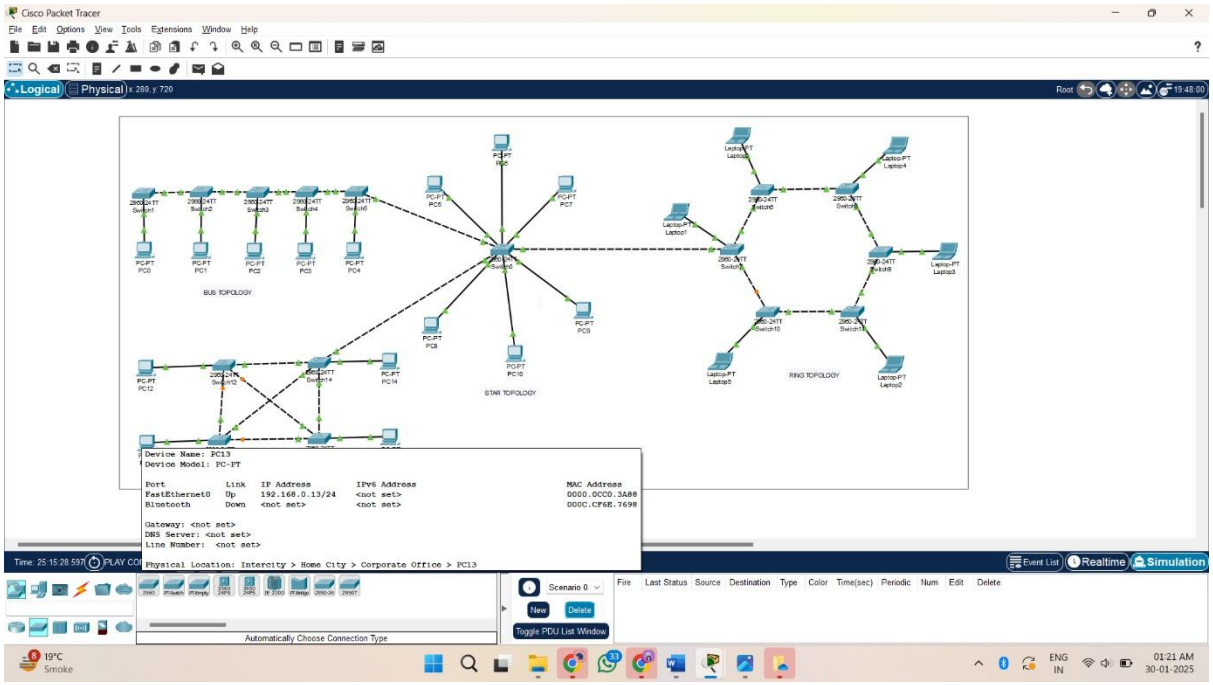


4 Pre-Simulation Setup

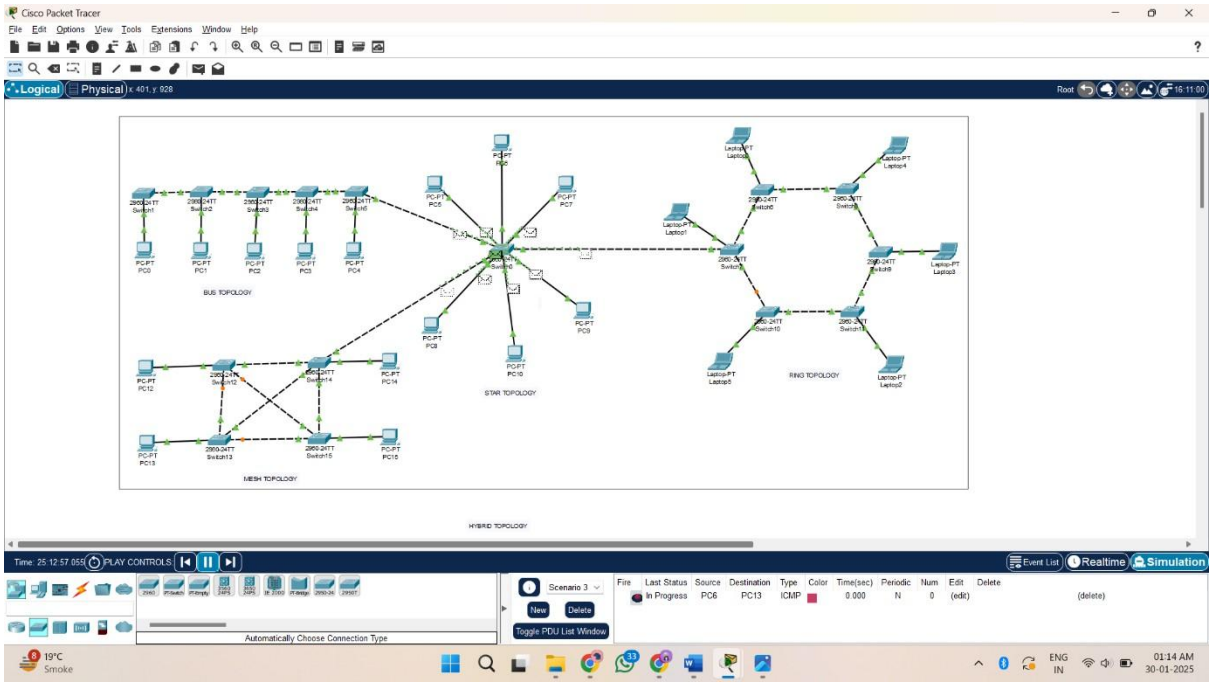
- **From pc – 6**

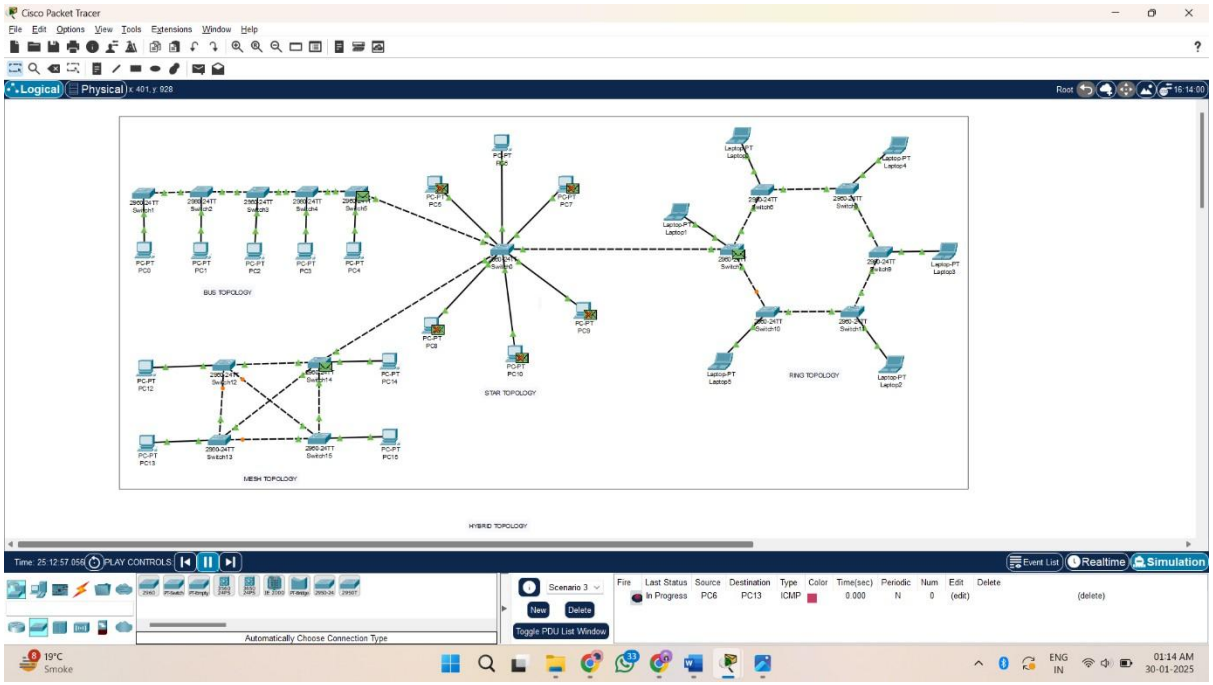

Cisco Packet Tracer
Device Name: PC6
Device Model: PC-PT
Port Link IP Address IPv6 Address MAC Address
FastEthernet0 Up 192.168.0.6/24 <not set> 0060.3EC3.038E
Bluetooth Down <not set> <not set> 000C.858A.3AE4
Gateway: <not set>
DNS Server: <not set>
Line Number: <not set>
Physical Location: Intercity > Home City > Corporate Office > PC6
BUS TOPOLOGY
STAR TOPOLOGY
RING TOPOLOGY
MESH TOPOLOGY
HYBRID TOPOLOGY

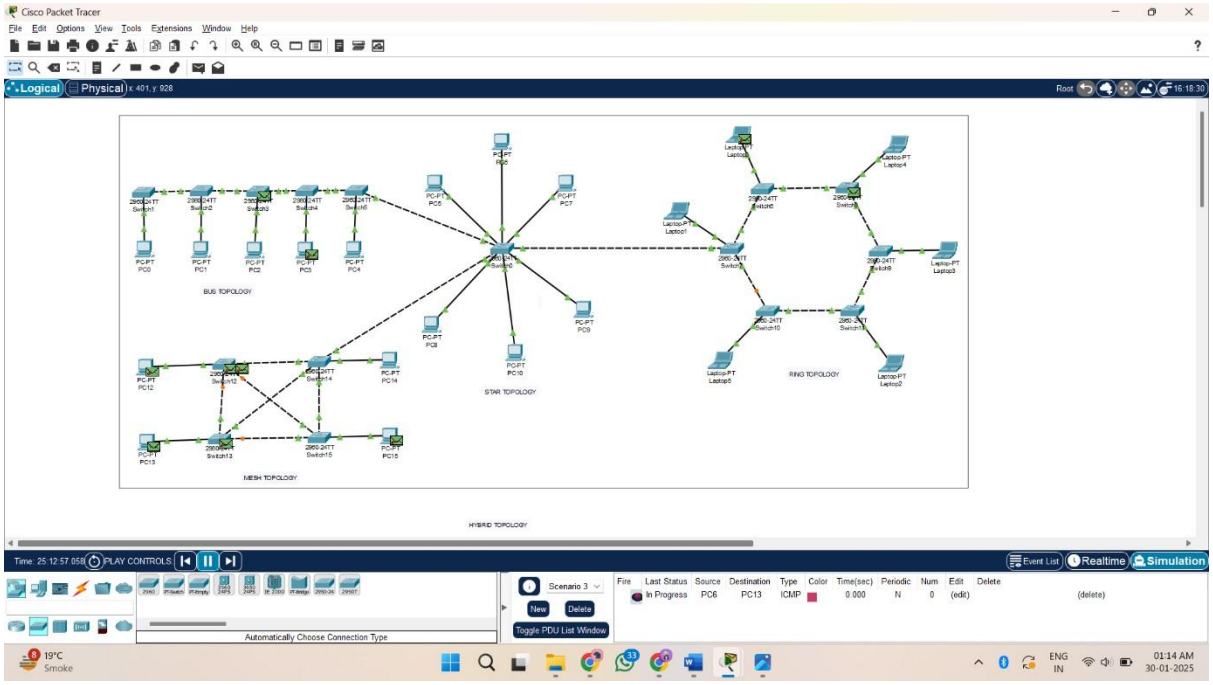
- **To Pc - 13**


Cisco Packet Tracer
Device Name: PC13
Device Model: PC-PT
Port Link IP Address IPv6 Address MAC Address
FastEthernet0 Up 192.168.0.13/24 <not set> 0000.0CC0.3A88
Bluetooth Down <not set> <not set> 000C.CF6E.7698
Gateway: <not set>
DNS Server: <not set>
Line Number: <not set>
Physical Location: Intercity > Home City > Corporate Office > PC13
BUS TOPOLOGY
STAR TOPOLOGY
RING TOPOLOGY

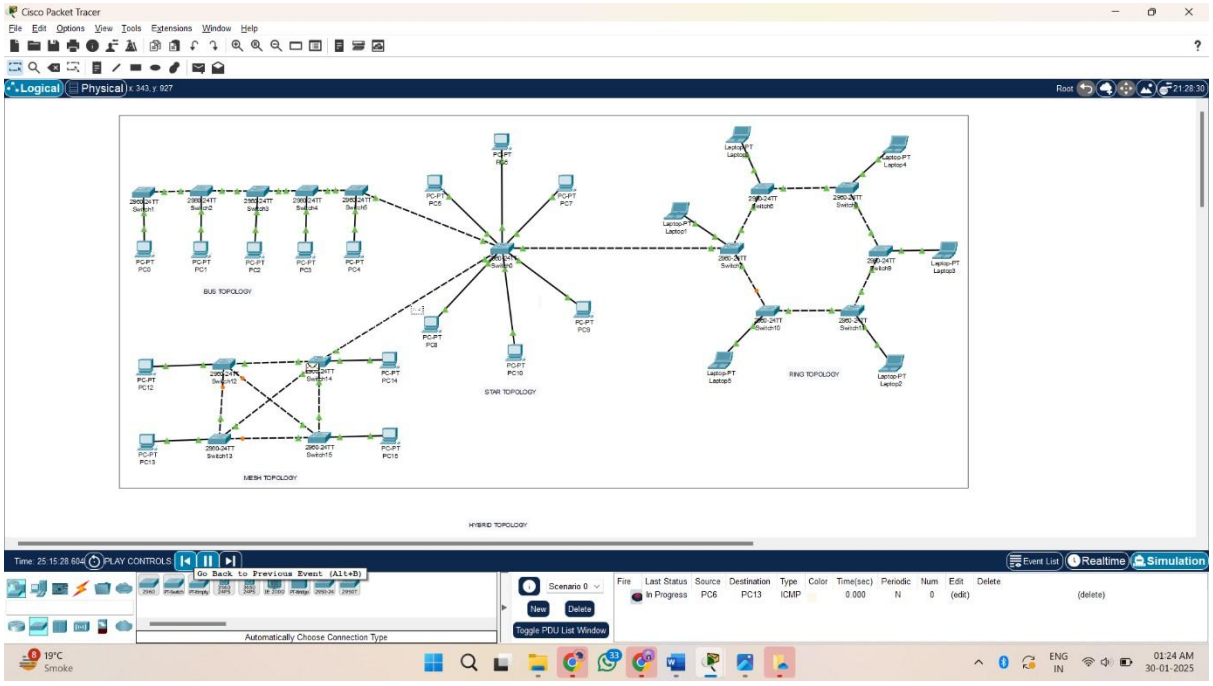
5 Mid-Simulation Progress



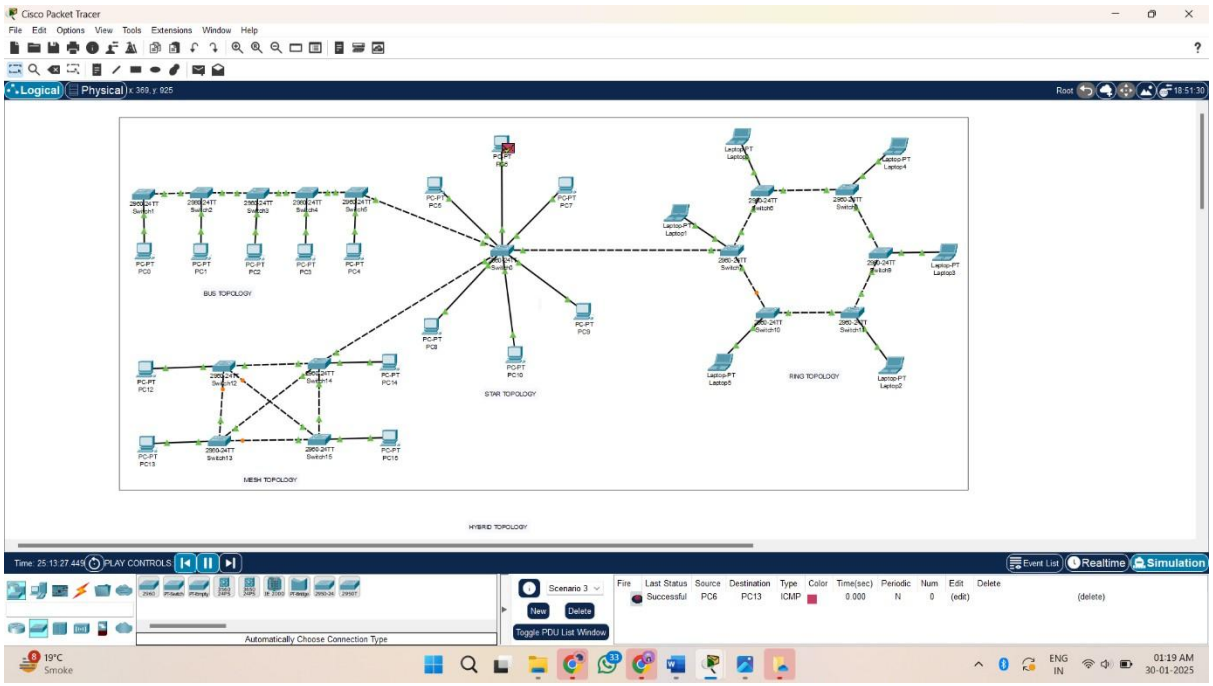




○ Returning Packet



6 Successful Simulation



❾ How Hybrid Topology works :

- **Broadcast**: When a packet is broadcast, it means that the packet is sent to all devices in the network.
- **Matching IP Address**: Each device checks if the packet's destination IP address matches its own IP address.
- **Accessing Data**: If a device finds that the packet's destination IP address matches its own, it will process and access the data.
- **Not Matching**: If the IP address does not match, the other devices will discard the packet and will not access its data.

7 Conclusion

A hybrid topology is a combination of two or more different network topologies like star, bus, ring, or mesh. This combination allows the network to leverage the strengths and mitigate the weaknesses of each individual topology. For instance, a hybrid network can offer increased flexibility, scalability, and efficiency by integrating different structures. This type of topology is highly adaptable and can be tailored to suit specific organizational needs. This adaptability makes hybrid topologies an excellent choice for diverse and complex networking environments.

- **Combination of Topologies**: Hybrid topology merges various network topologies like star, bus, ring, and mesh, creating a versatile and efficient network structure.

- **Adaptability**: The hybrid structure is highly adaptable, tailored to fit the specific needs of different organizations, making it flexible for various applications.

- **Strengths and Weaknesses**: By combining multiple topologies, hybrid topology leverages the strengths and mitigates the weaknesses of the individual topologies.

- **Redundancy and Reliability**: Hybrid topology often includes redundancy, meaning even if one part of the network fails, the rest can continue functioning, ensuring reliable operations.

- **Scalability**: It is scalable, meaning it can grow with the organization, handling increased load and complexity efficiently.