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APPLIED INDUSTRIAL INTERNET OF THINGS

CONFIGURATION OF ADDRESS RESOLUTION PROTOCOL (ARP)

Aim:

Construct simple LAN and understand the concept and operation of Address Resolution Protocol (ARP) using Cisco Packet Tracer. Utilize PCs, 8 port switch and LAN cable.

Problem statement:

The goal is to construct a **basic Local Area Network (LAN)** using PCs, a switch, and LAN cables in **Cisco Packet Tracer**, and then observe how **ARP** works to resolve IP addresses to MAC addresses when devices communicate within the LAN.

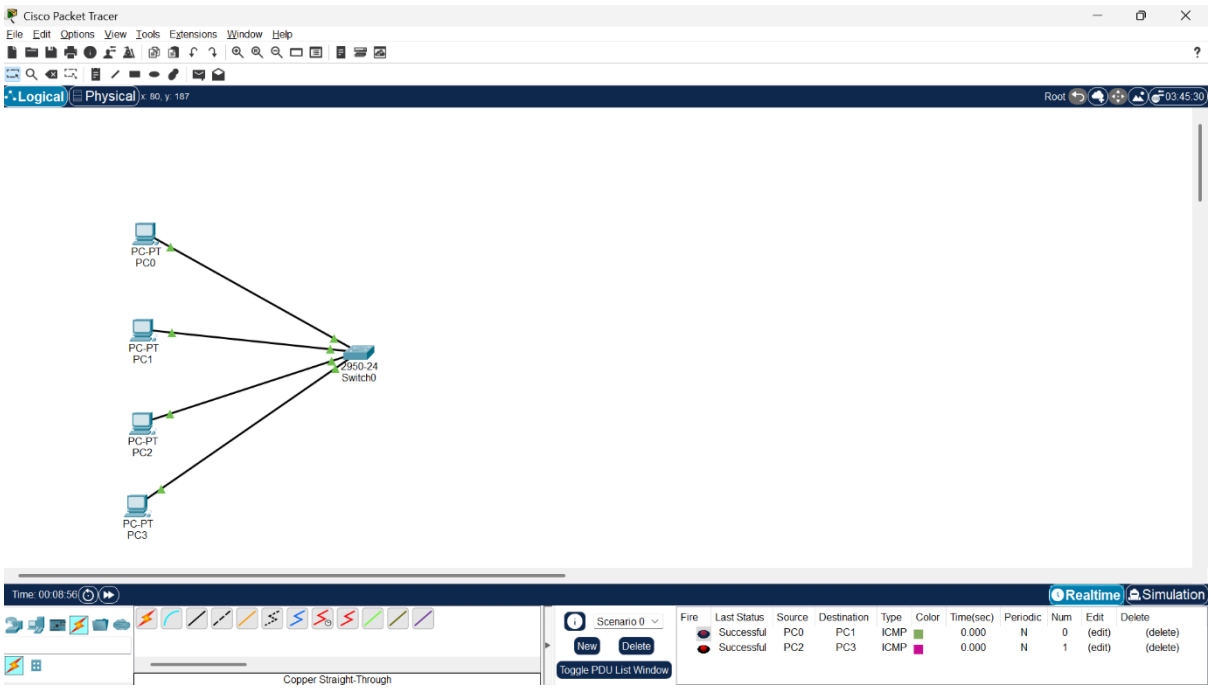
Scope of the solution:

1. **LAN Construction & Connectivity:**
    - Demonstrates how to design and implement a basic LAN using PCs, a switch, and cables in Cisco Packet Tracer.
    - Covers IP addressing and subnetting for devices within a single subnet.
    - Validates end-to-end connectivity through ping tests.
2. **Understanding ARP Operations:**
    - Shows how devices in a LAN use ARP to map IP addresses to MAC addresses.
    - Demonstrates ARP broadcast request and unicast reply.
    - Provides practical exposure to the ARP cache table (arp -a) and its role in packet forwarding.
3. **Simulation of Real-World Networking:**
    - Replicates how actual PCs communicate in a local area network.
    - Highlights the role of a switch in frame forwarding based on MAC addresses.
4. **Educational & Training Use:**

- Helps learners understand basic networking concepts (LAN setup, addressing, ARP).
- Useful for CCNA beginners and practical labs in networking courses.

Required components to develop solutions:

- **2 or more PCs** (PC0, PC1, PC2…)
- **1 Switch** (8-port switch, e.g., 2960)
- **Straight-through Ethernet cables** (Copper Straight-Through)
- **Cisco Packet Tracer**



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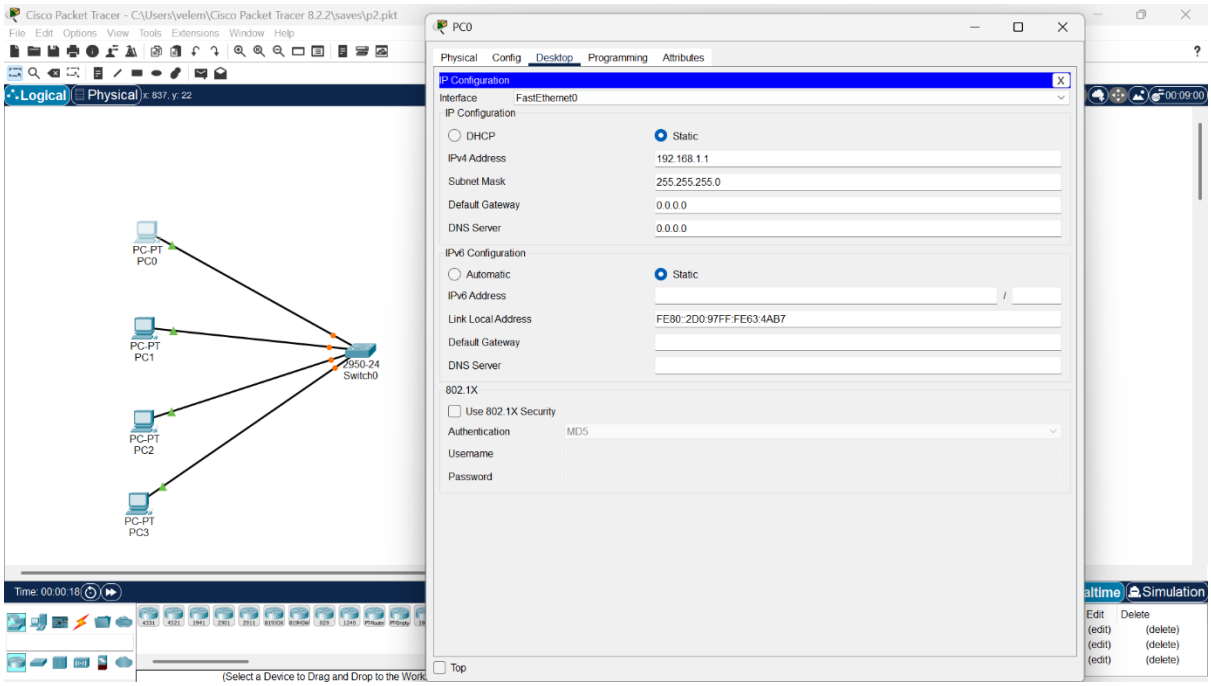

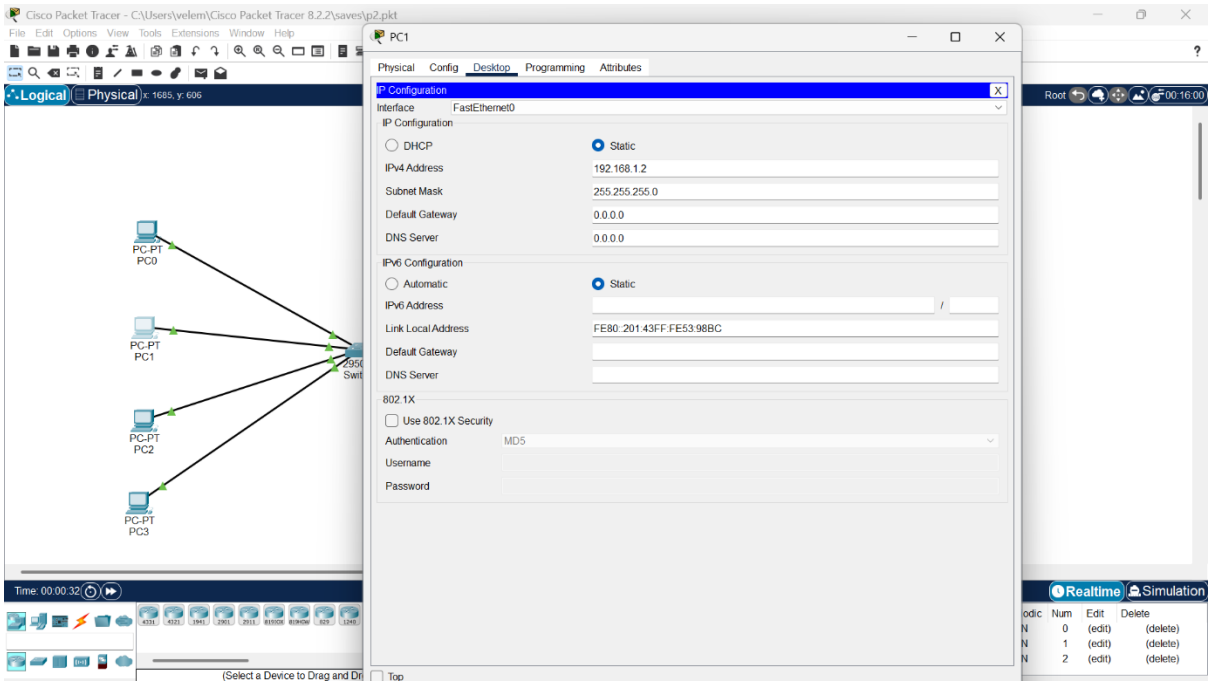

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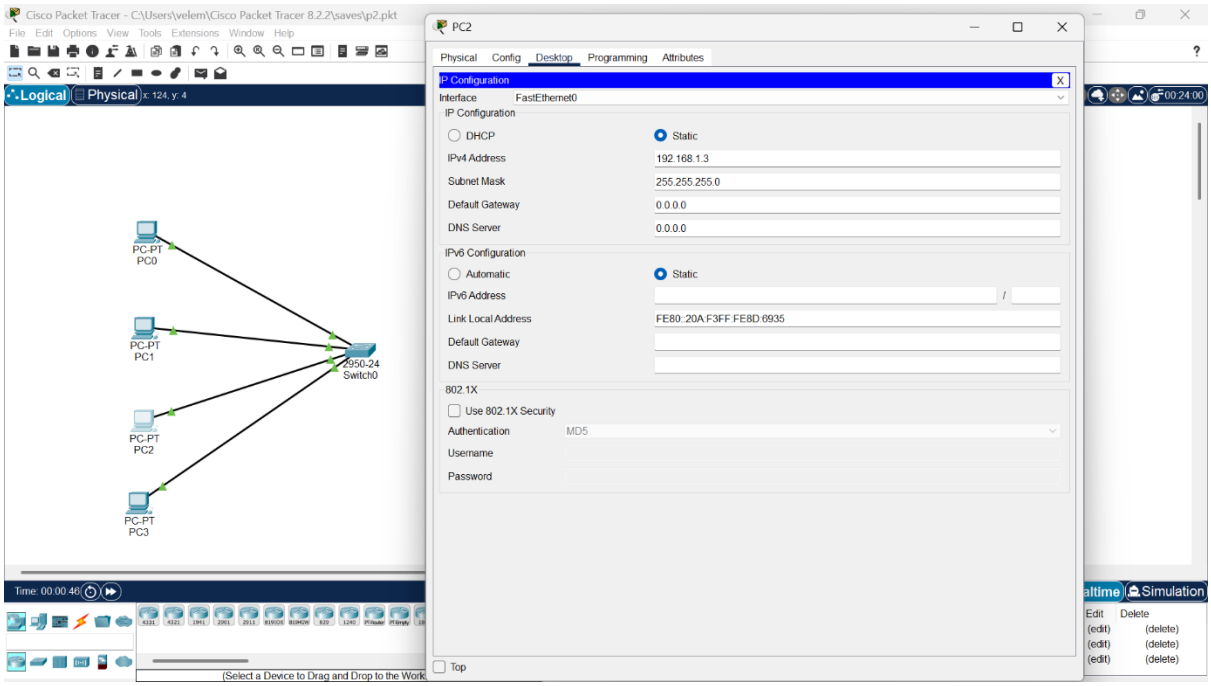

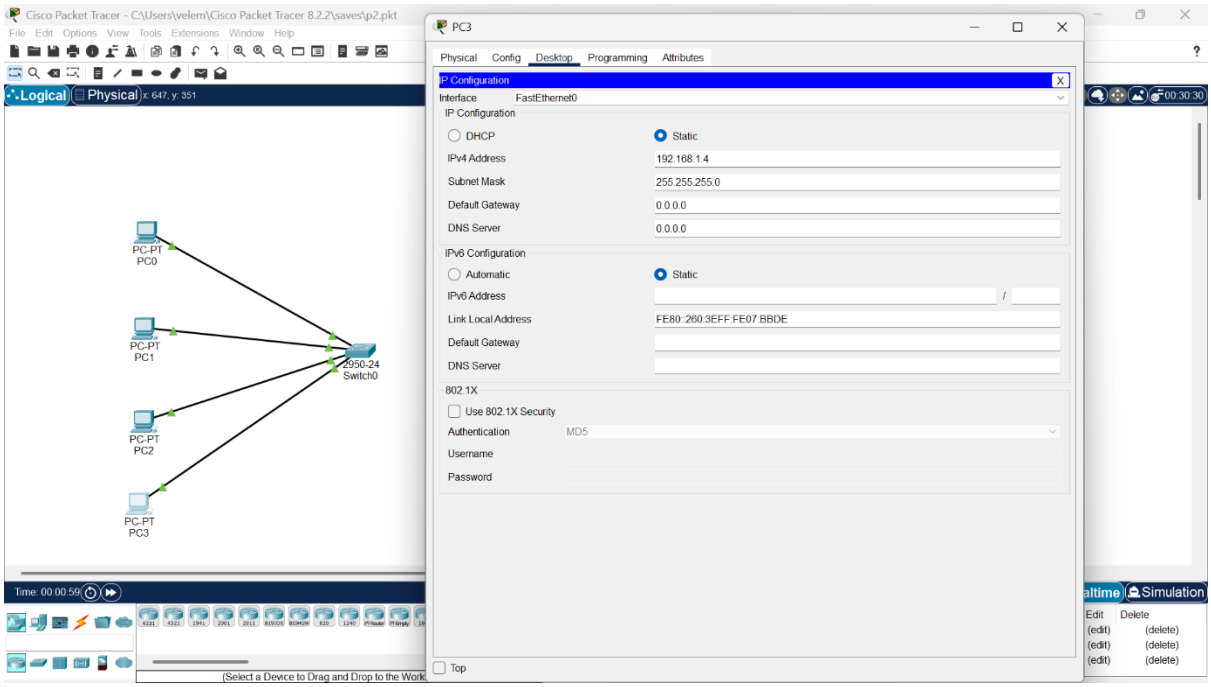

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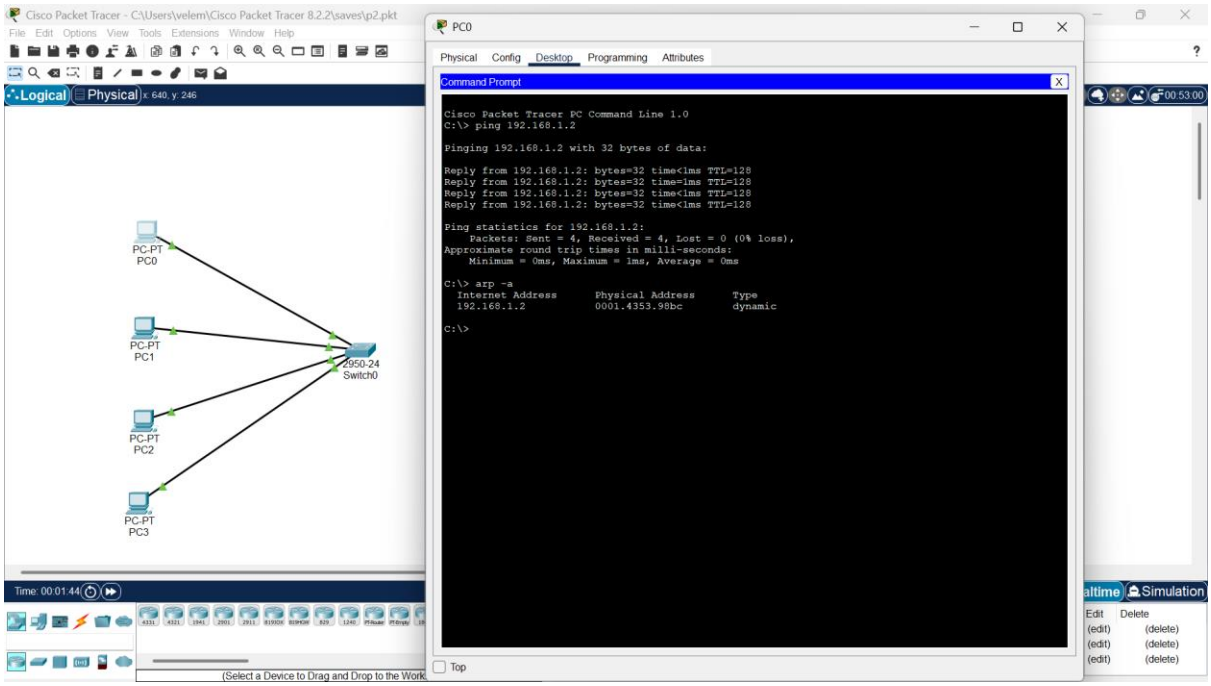

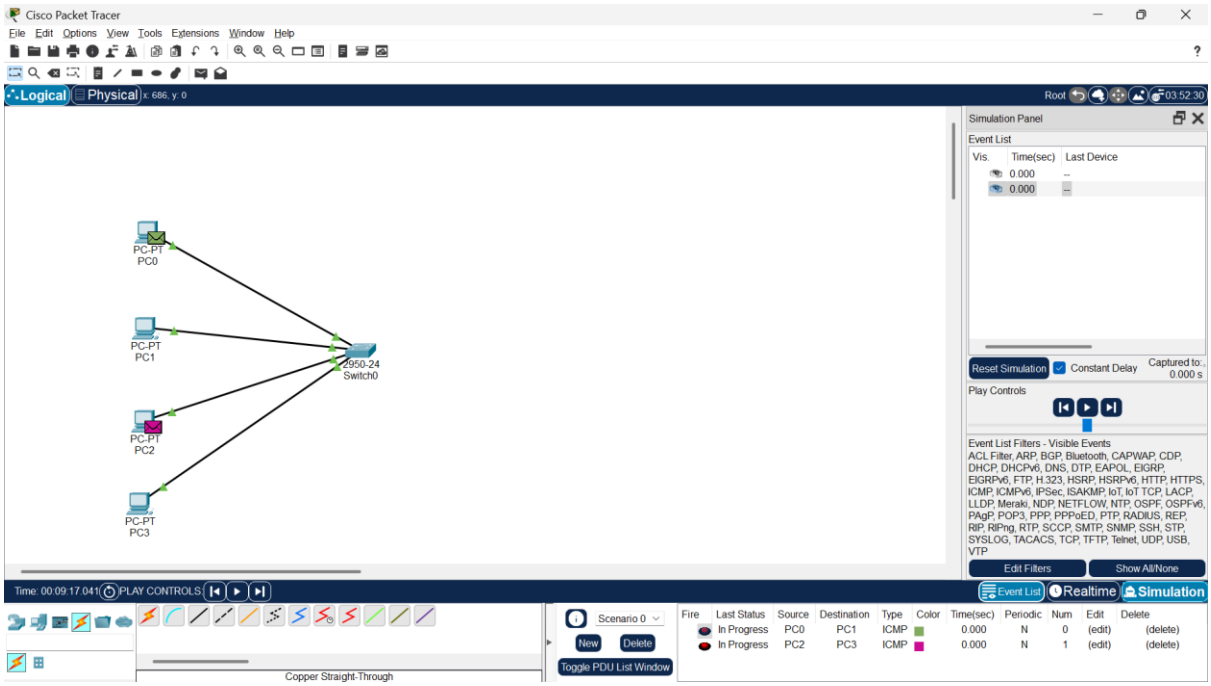

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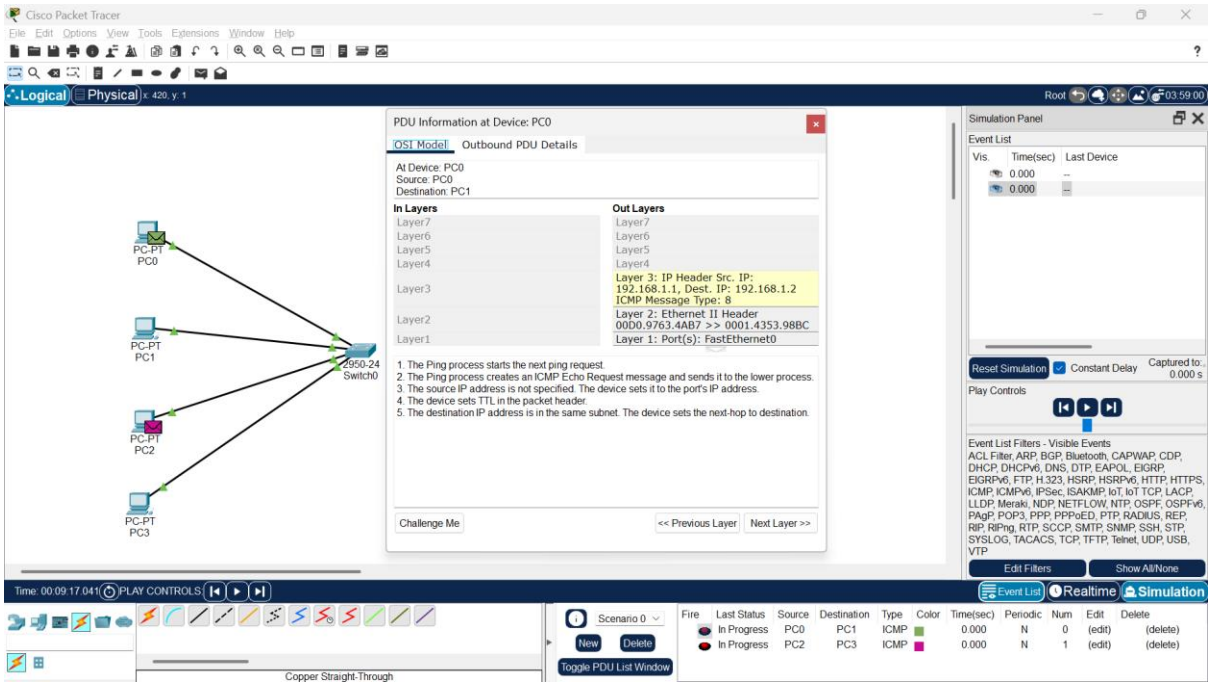

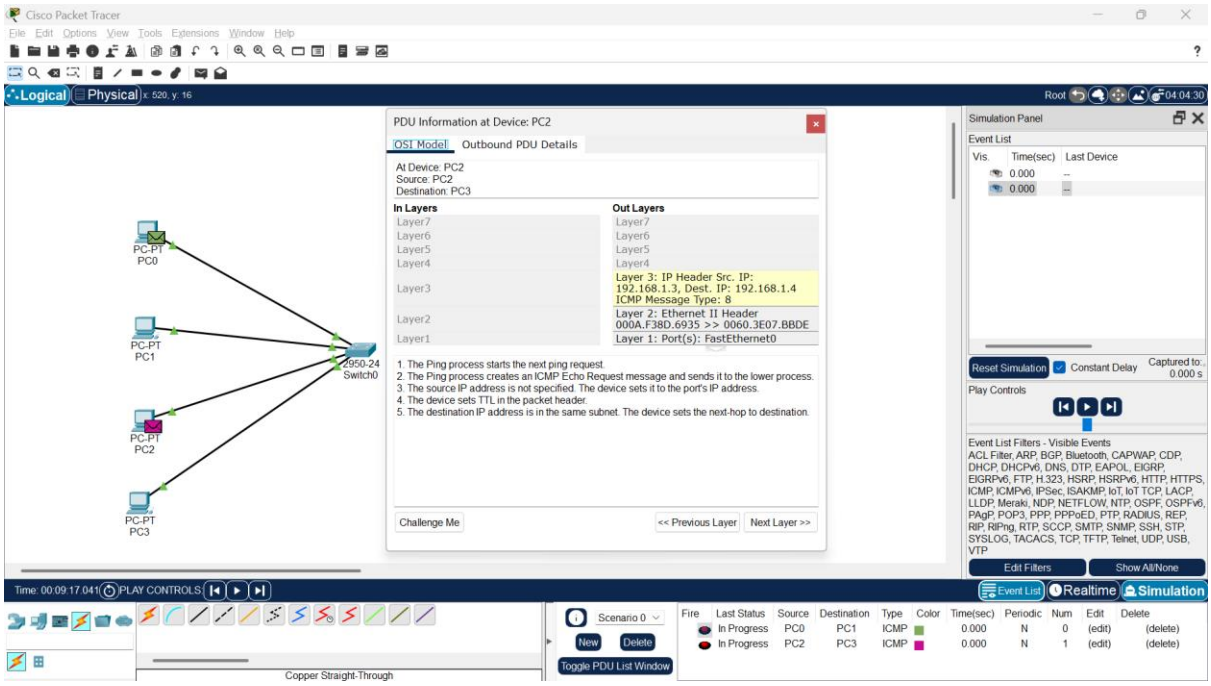
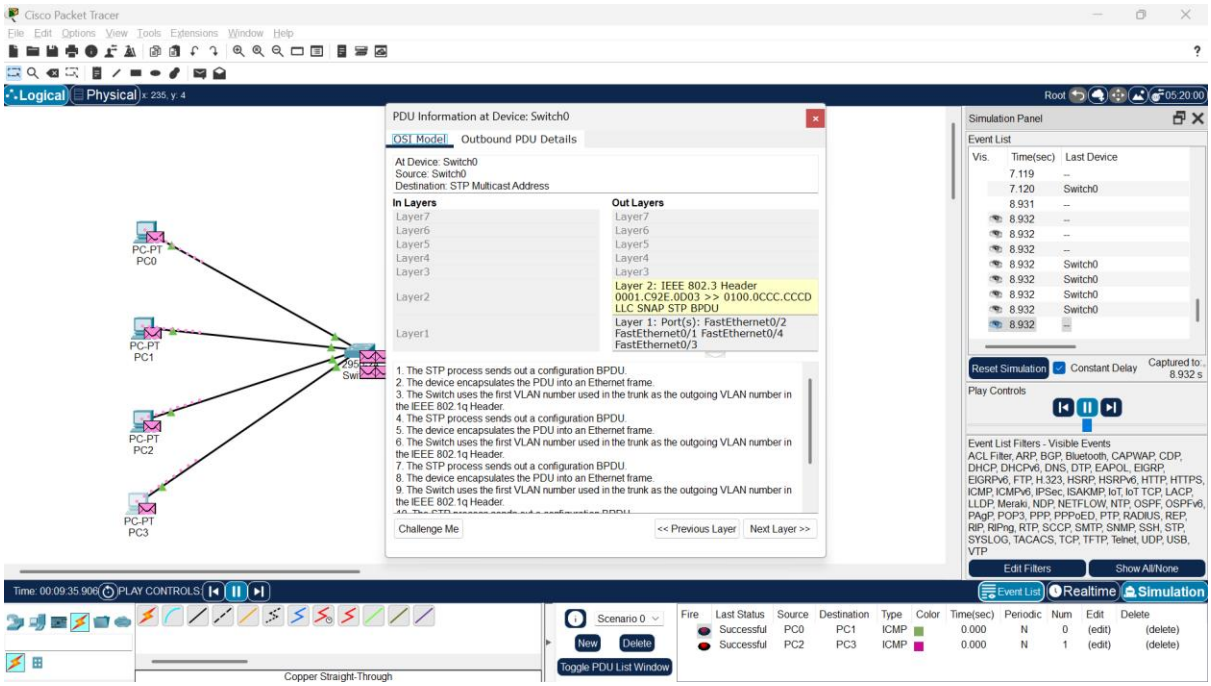
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