INSTITUTE OF COMPUTER TECHNOLOGY

B. TECH COMPUTER SCIENCE AND ENGINEERING

Subject: *Computer Networks[CN]*

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SEM : 5

Class : A

Batch : 52 (CS)

Practical 1

Aim: To verify the role of Address Resolution Protocol (ARP) in a network of an organization.

Scenario:

An organization named Green Tech Solution contains 2 departments: Production and Sales in the same premises. Each department has 3 users. Departments are connected with each other using switches. Report the changes in ARP table when any user from production department communicates with any user of sales department.

Note:

Make sure last two digits of your enrollment numbers appears in network IP address that must be visible in snapshot of the cisco packet tracer. i.e. 192. YY . XX .1 (YY indicates batch number in two digit. XX indicates last two digits of your enrollment no.)

Task 1:

To compare working of HUB and SWITCH

| No.	Basis	Hub	Switch
1	Definition	A hub is a basic networking device that connects multiple devices and transmits data to all.	A switch connects devices and sends data only to the intended device.
2	Data Transmission	Broadcasts data to all connected devices.	Sends data only to the destination device (unicast).
3	OSI Layer	Operates at Layer 1 (Physical Layer).	Operates at Layer 2 (Data Link Layer).
4	MAC Address Handling	Does not store or use MAC addresses.	Stores MAC addresses in a MAC address table.
5	Bandwidth Sharing	Shared bandwidth, leading to more collisions.	Dedicated bandwidth per port, reducing collisions.
6	Performance	Slower, due to more traffic and collisions.	Faster and more efficient in data transfer.
7	Security	Less secure as data is visible to all devices.	More secure; data is sent only to the intended device.
8	Cost and Usage	Cheaper and outdated; rarely used now.	Costlier but widely used in modern networks.

Task 2:

To verify the role of Address Resolution Protocol (ARP) in a network of an organization.
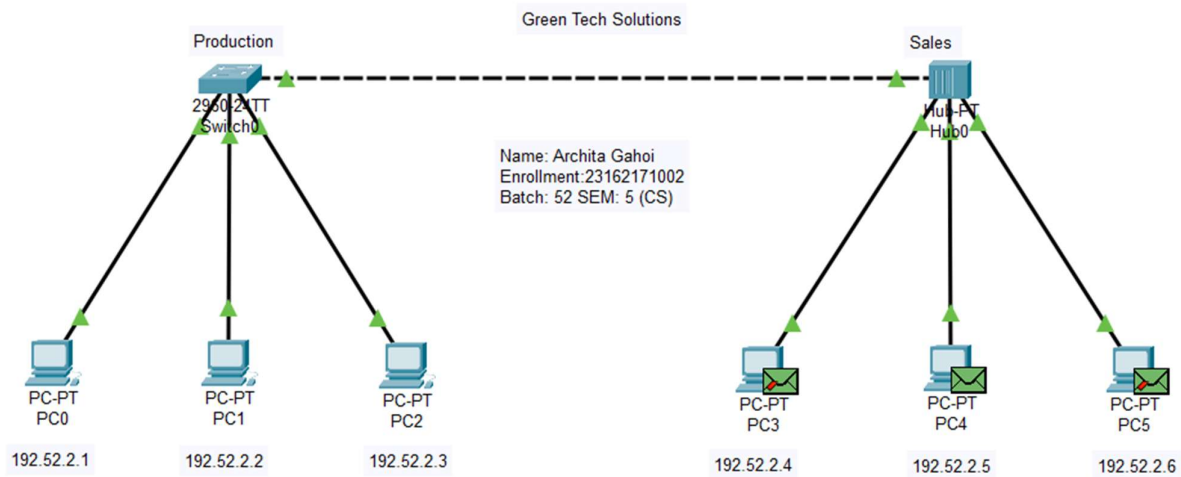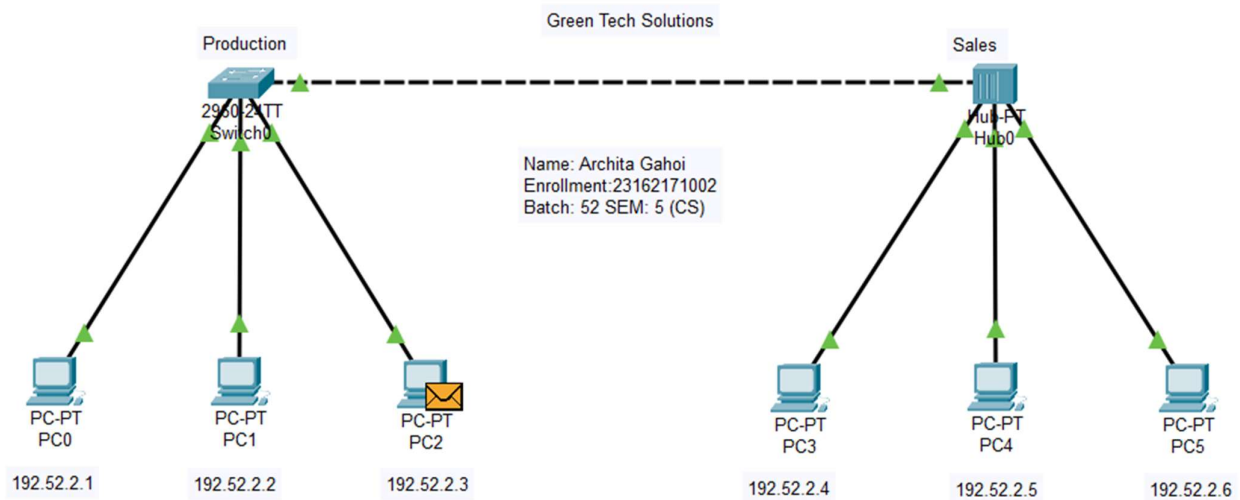
➢ Network Image
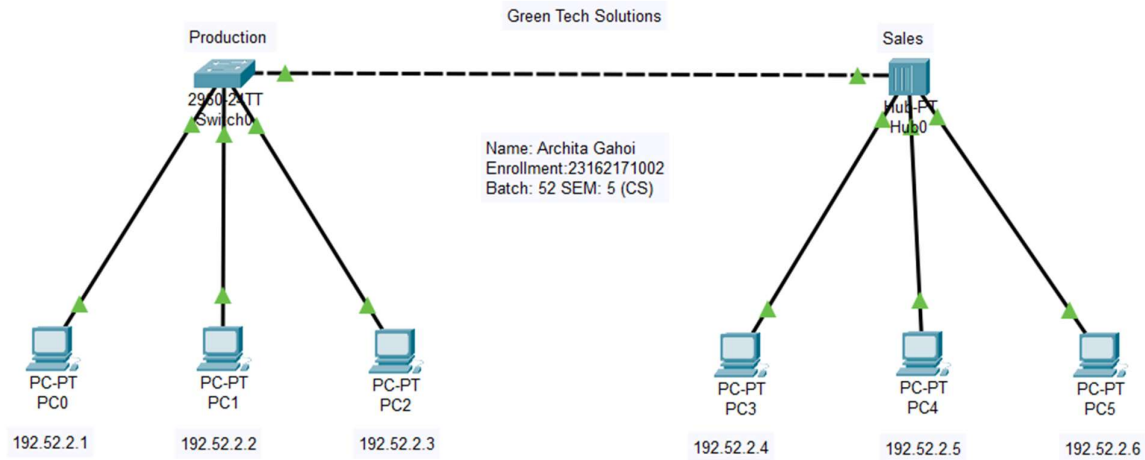
➢ IP Address
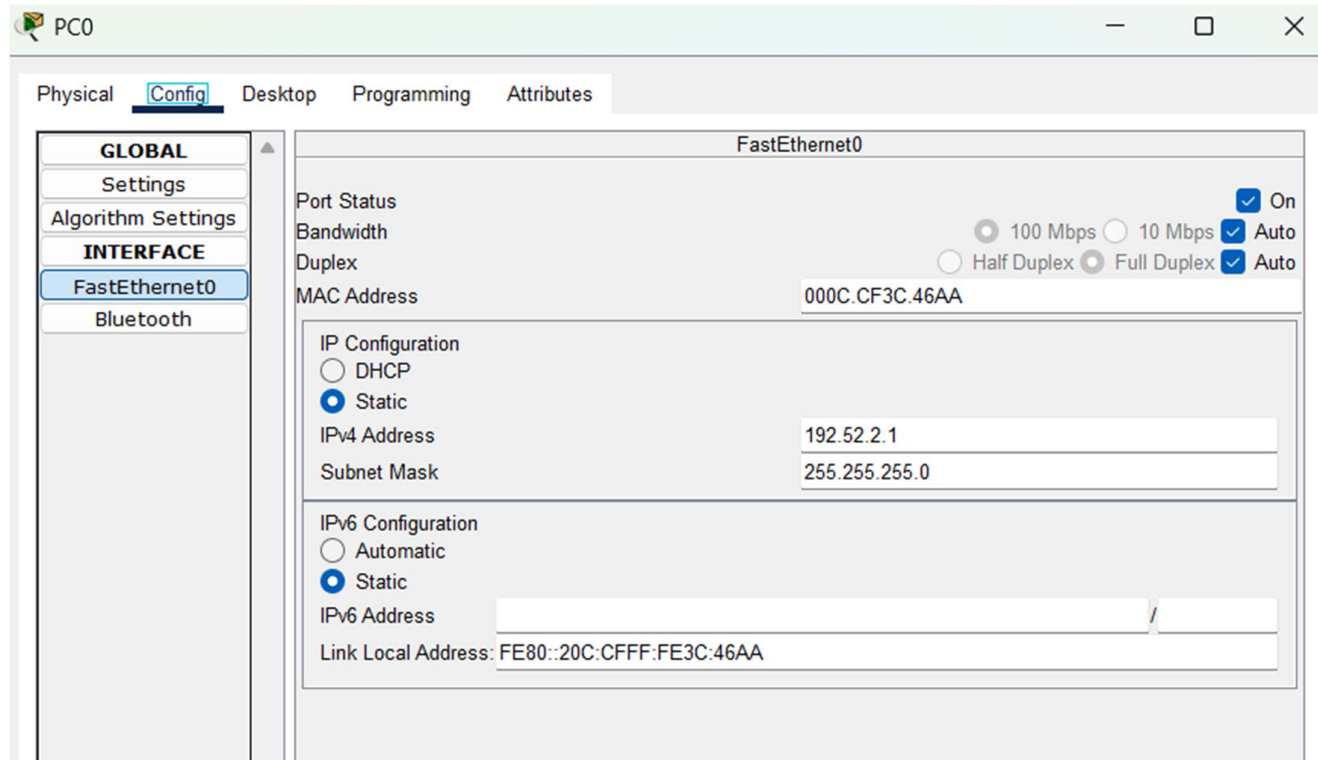
> Broadcasting
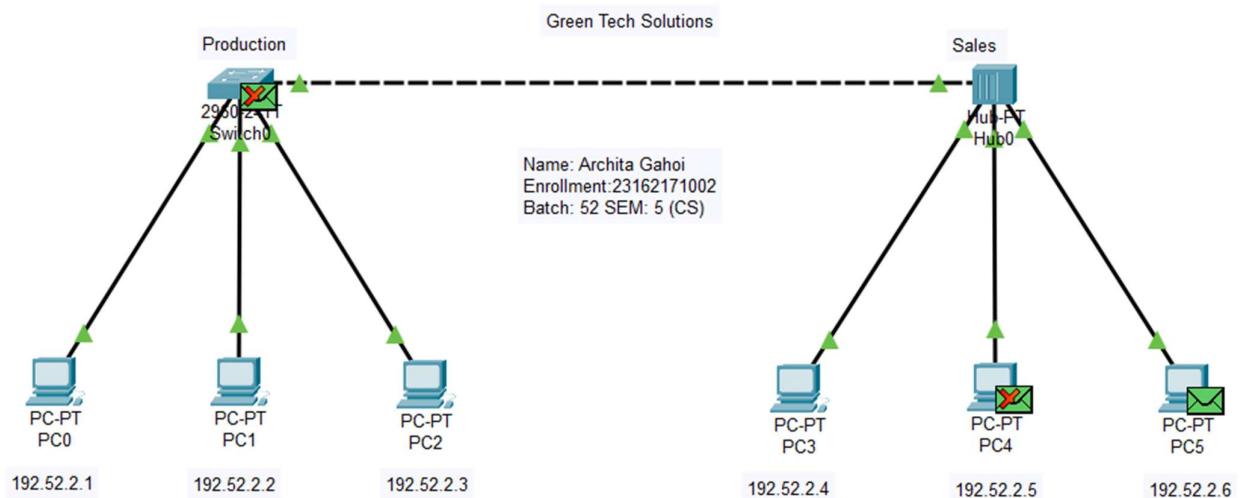 CASE 1: SWITCH TO HUB (PC1 – PC4)
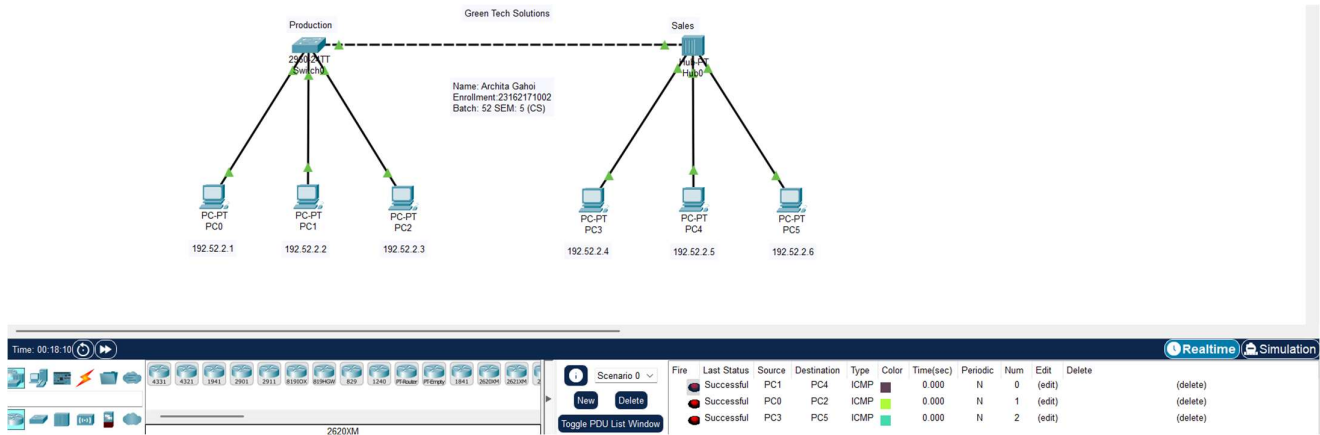

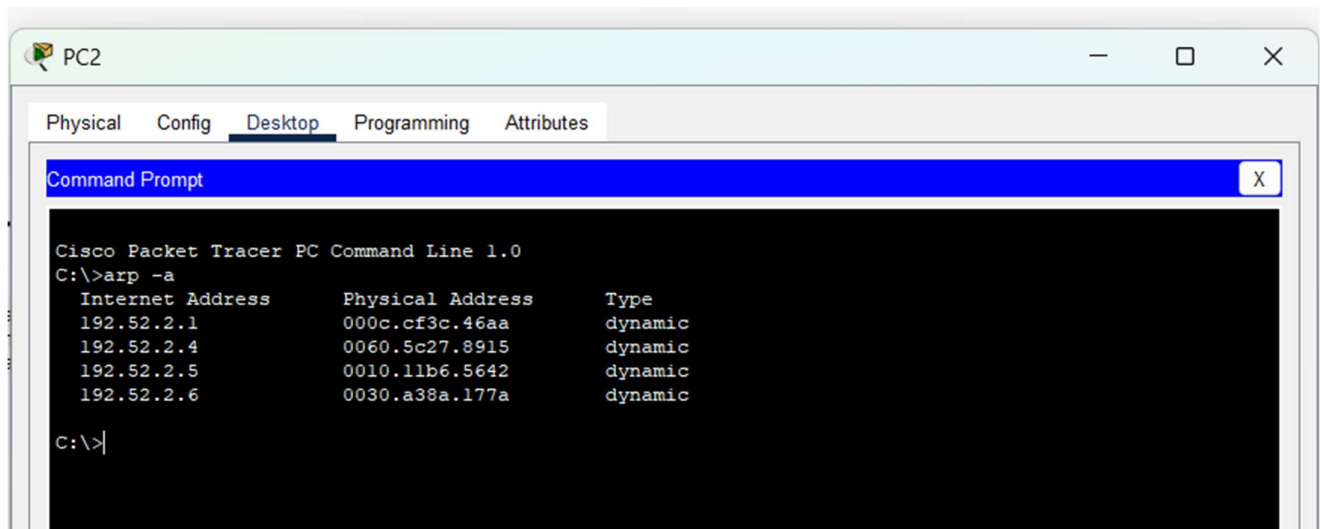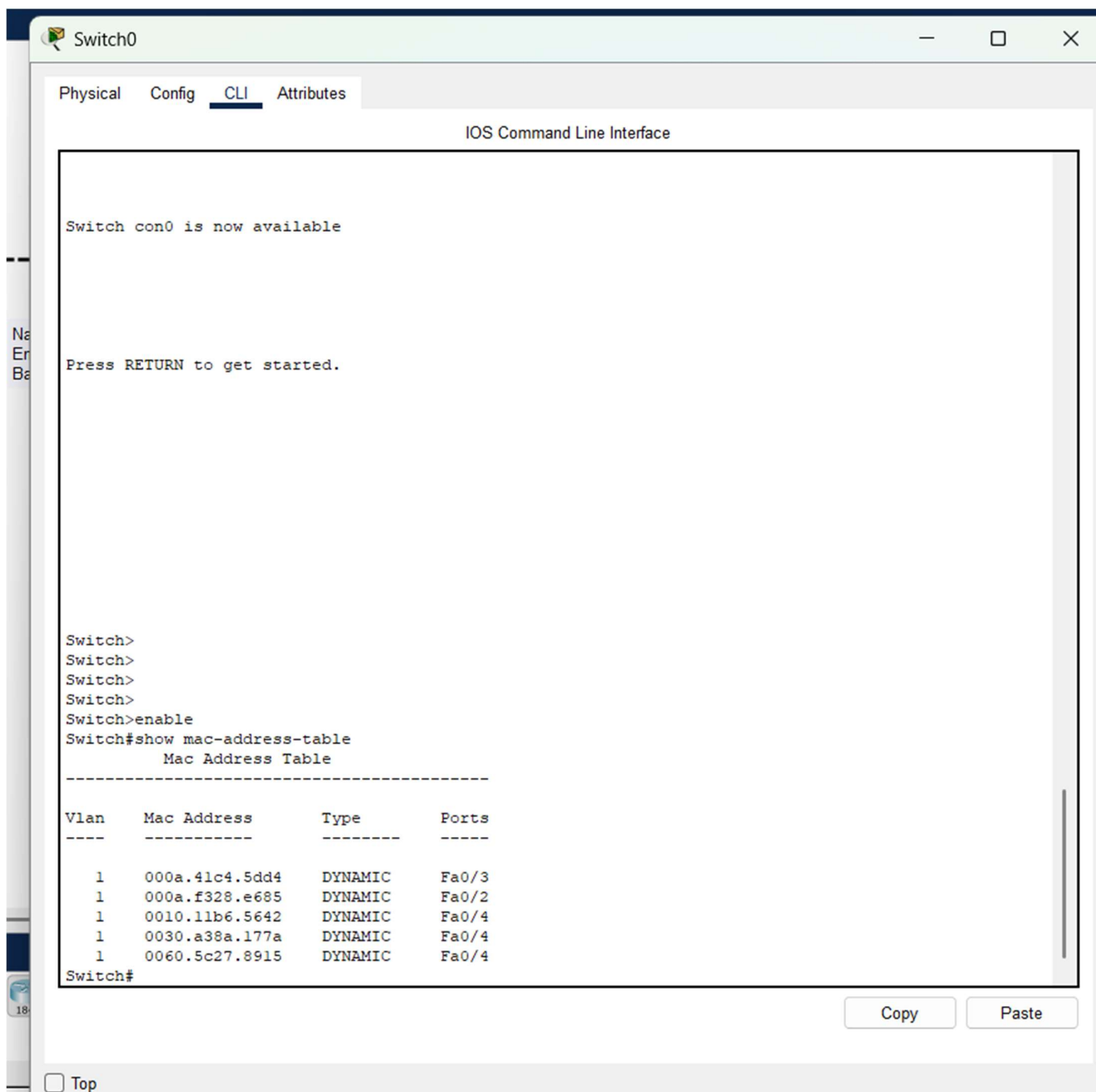CASE 2: SWITCH TO SWITCH (PC0 – PC2)

CASE 2: HUB TO HUB (PC3 – PC5)

➢ Packet status (Successful)

➢ ARP table in PC

➤ MAC table in switch

Conclusion:

The experiment successfully demonstrated the role of Address Resolution Protocol (ARP) in a network. ARP is essential for mapping IP addresses to MAC addresses, enabling communication between devices within a local network. It ensures that data packets reach the correct destination by resolving hardware addresses dynamically, thus playing a critical role in smooth and efficient network operations.