

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:

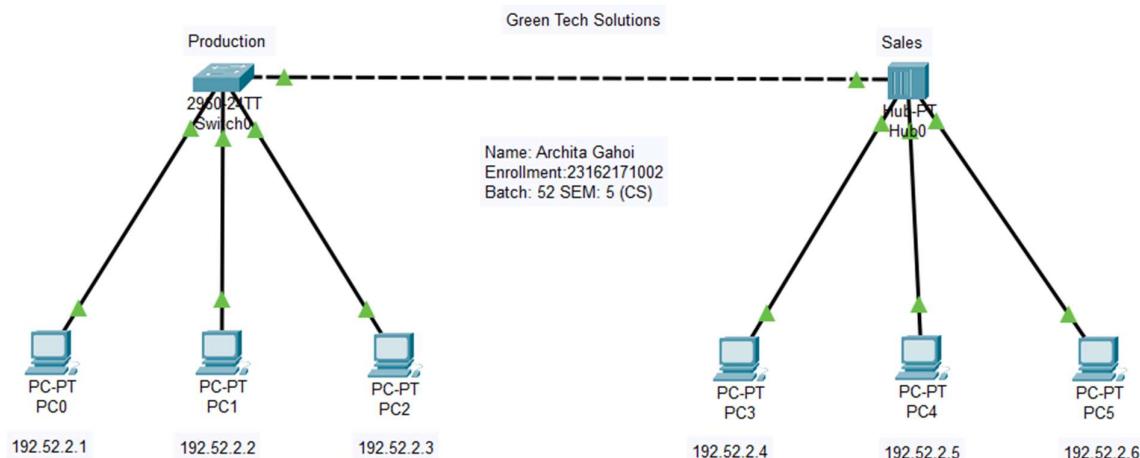
To compare working of HUB and SWITCH

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8	Cost and Usage	Cheaper and outdated; rarely used now.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.

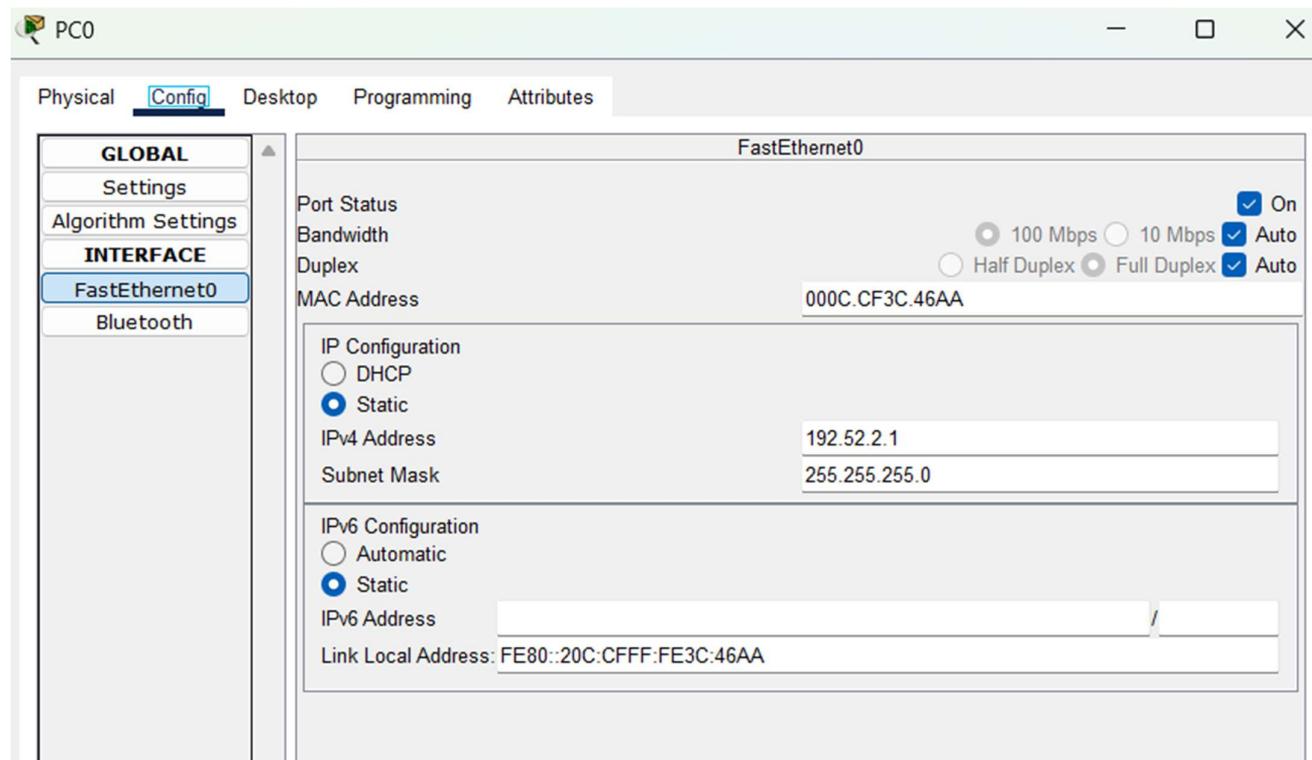
## Task 2:

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

### ➤ Network Image

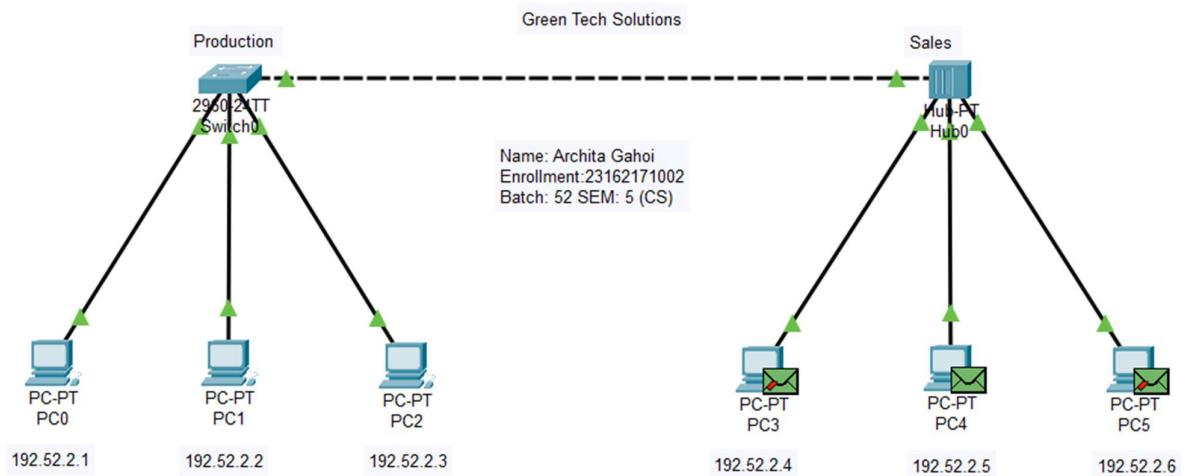


### ➤ IP Address

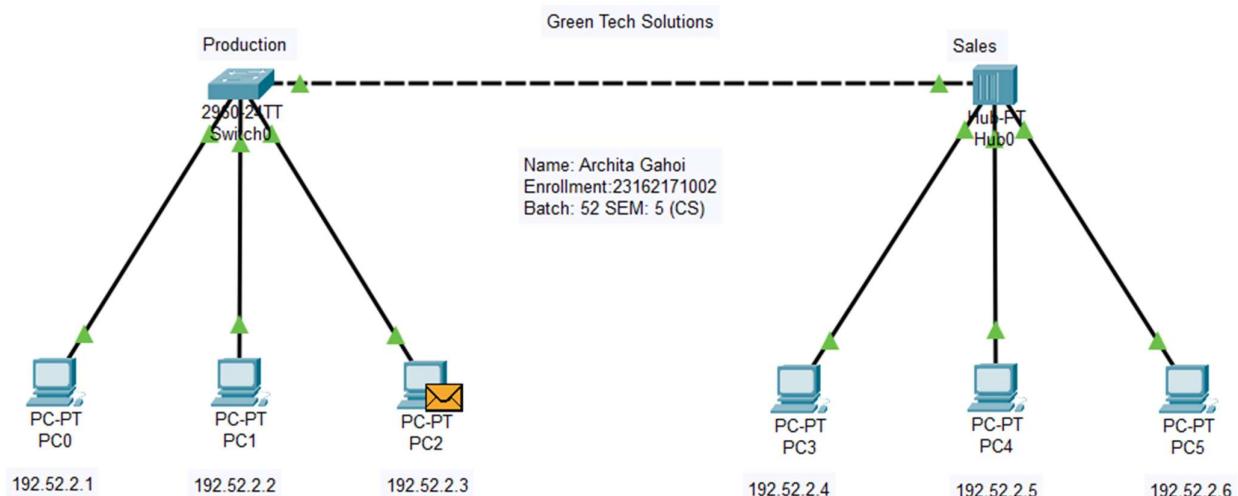


## ➤ Broadcasting

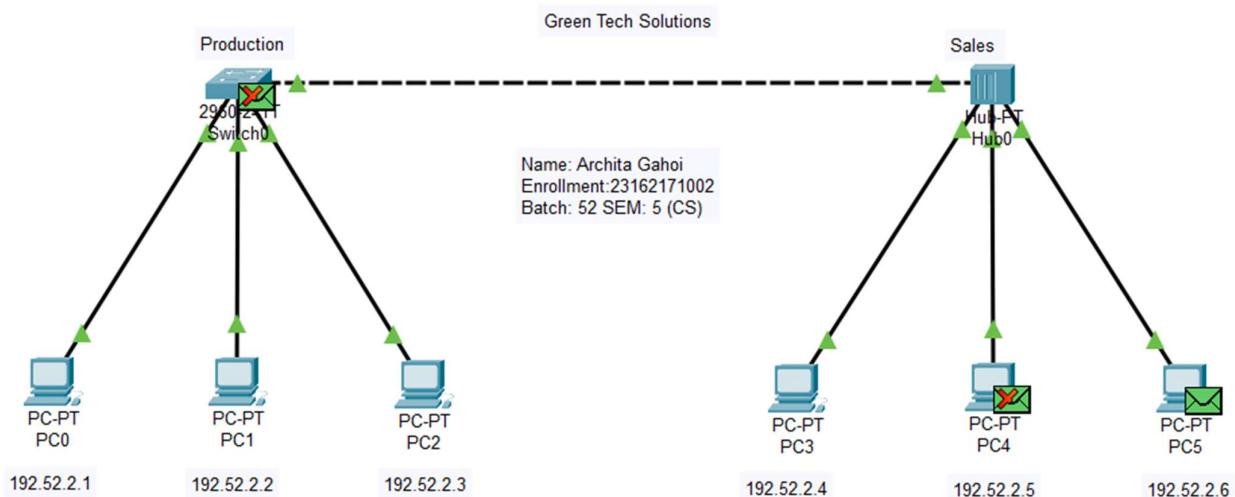
### CASE 1: SWITCH TO HUB (PC1 – PC4)



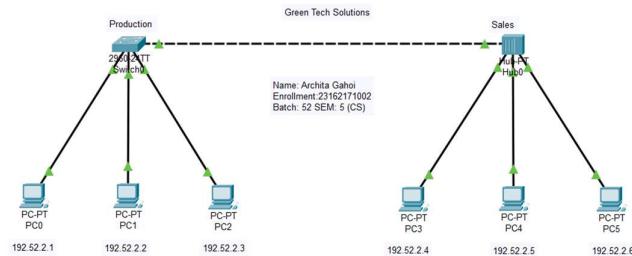
### CASE 2: SWITCH TO SWITCH (PC0 – PC2)



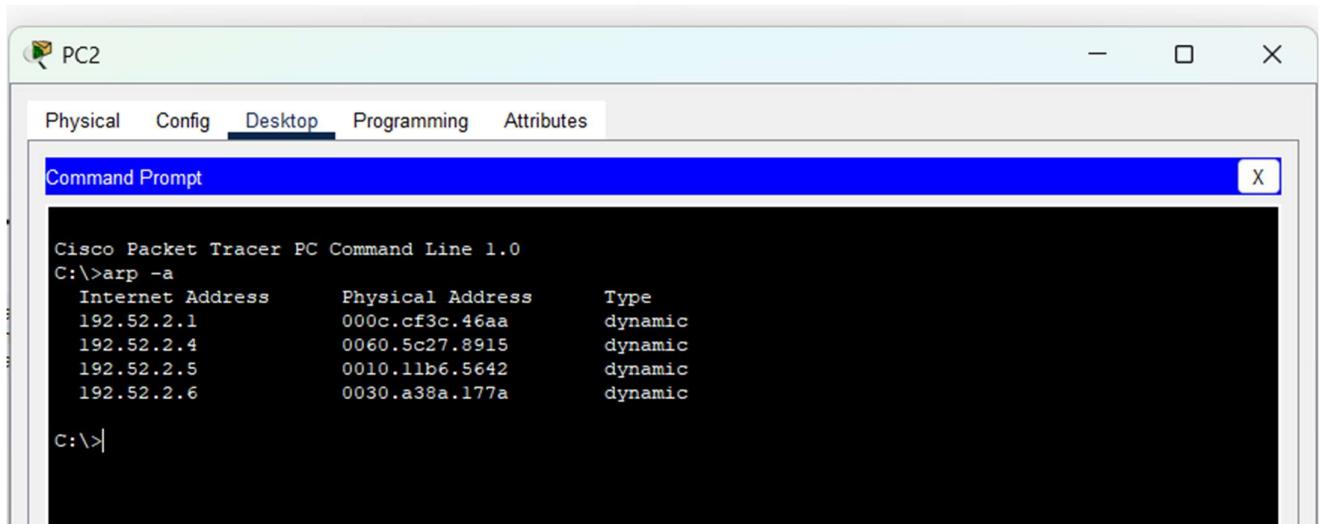
### CASE 2: HUB TO HUB (PC3 – PC5)



## ➤ Packet status (Successful)



## ➤ ARP table in PC



## ➤ MAC table in switch

The screenshot shows a terminal window titled "Switch0". The tab bar at the top includes "Physical", "Config", "CLI" (which is selected), and "Attributes". Below the tabs is a header "IOS Command Line Interface". The main area of the window displays the following text:

```
Switch con0 is now available

Press RETURN to get started.

Switch>
Switch>
Switch>
Switch>
Switch>enable
Switch#show mac-address-table
      Mac Address Table
-----
Vlan      Mac Address          Type      Ports
----      -----
  1    000a.41c4.5dd4  DYNAMIC   Fa0/3
  1    000a.f328.e685  DYNAMIC   Fa0/2
  1    0010.11b6.5642  DYNAMIC   Fa0/4
  1    0030.a38a.177a  DYNAMIC   Fa0/4
  1    0060.5c27.8915  DYNAMIC   Fa0/4
```

At the bottom right of the terminal window are two buttons: "Copy" and "Paste". At the bottom left is a checkbox labeled "Top".

## 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.