Institute of Computer Technology

B. Tech Computer Science and Engineering

Sub: CN

NAME: SUJAL SUTHAR

SEM: CSE 5-B (BATCH53)

ER NO. : 23162581026

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

A Hub is a very basic device. When you connect multiple computers to a hub and send data from one computer, the hub sends that data to all the other computers, even if only one computer was supposed to receive it. So, everyone gets the data whether they need it or not. This creates a lot of unwanted traffic and chances of data collision. That's why hubs are considered slow and not secure.

A Switch is smarter than a hub. It knows which device is connected to which port by checking the MAC address of each device. So when data is sent, the switch only sends it to the right device instead of everyone. This reduces network traffic, makes communication faster, and also improves security.

In simple words, using a hub is like talking loudly in a classroom where everyone hears it. Using a switch is like calling only one friend and talking privately.

Task 2:

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

ARP means Address Resolution Protocol. It is a network protocol that helps a computer find the MAC address of another device when it only knows the IP address. This is needed because data is delivered using MAC addresses, not IPs, at the local level.

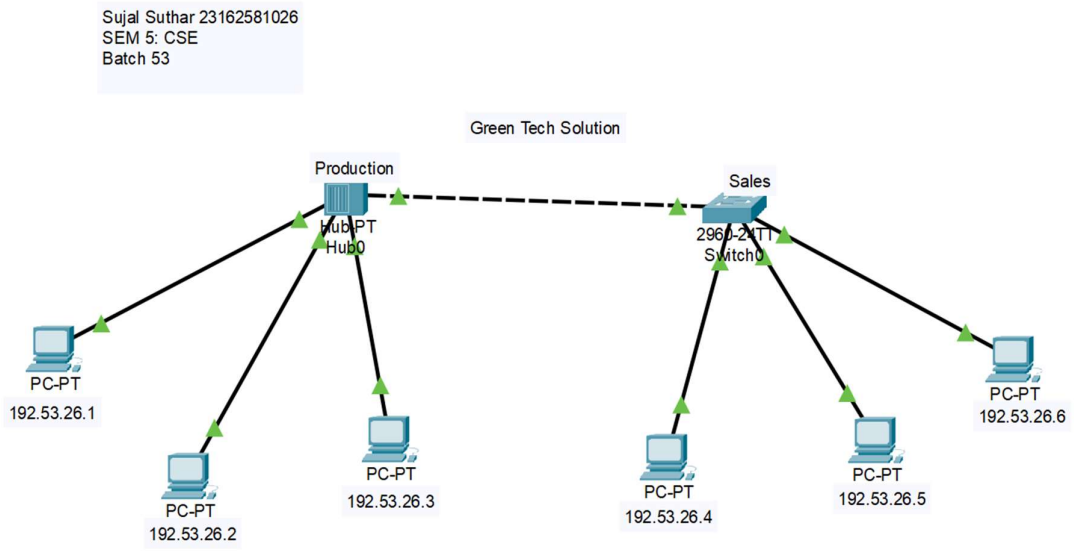
To check this practically:

1. I opened Command Prompt and typed **arp -a** this showed my ARP table (a list of known IP and MAC address pairs).
2. Then I used the ping command to ping a system in the lab (for example ping 192.53.26.4).
3. After that, I again typed **arp -a**, and I saw that the new MAC address was now listed.

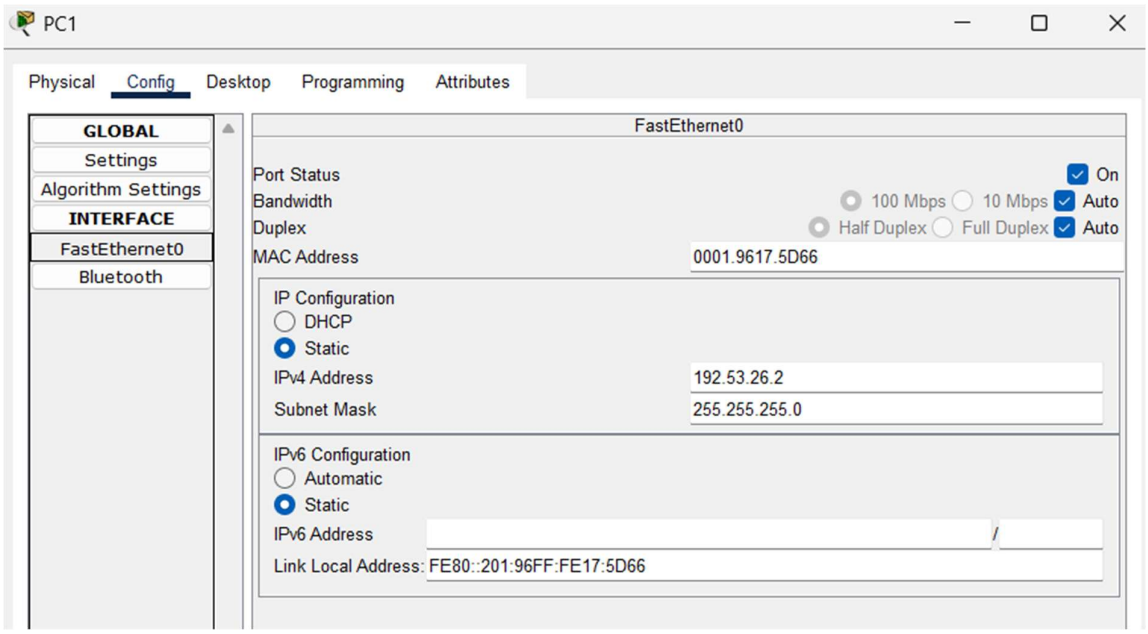
This shows how ARP works automatically behind the scenes to make communication possible in a network.

Requirement Submission:

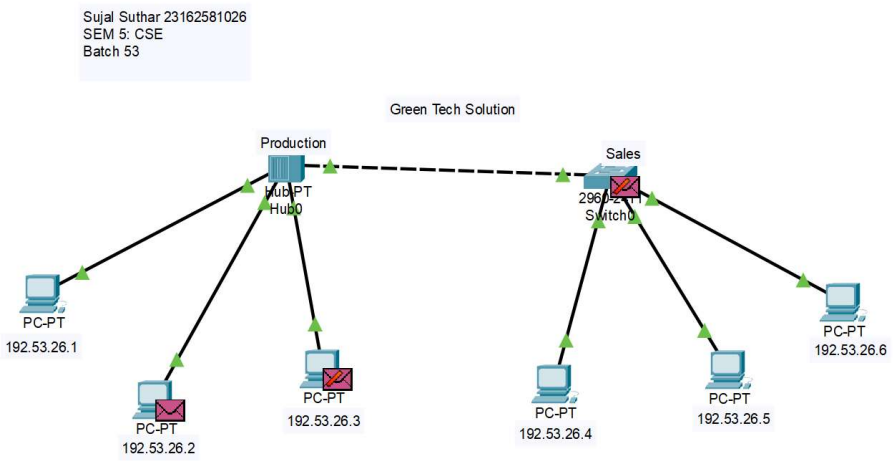
- Network image



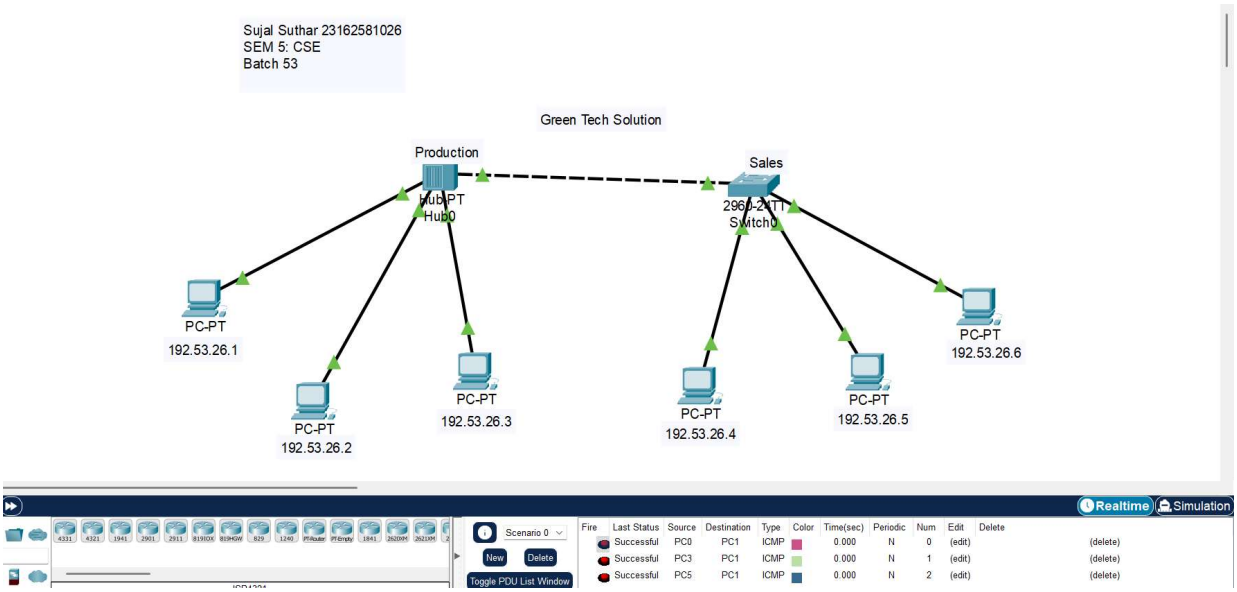
- PC IP address



- Broadcasting



- Packet status (Successful)



- ARP table in PC

```
Cisco Packet Tracer PC Command Line 1.0
C:\>arp -a
  Internet Address      Physical Address      Type
  192.53.26.1           0060.47dc.3e33        dynamic

C:\>arp -a
  Internet Address      Physical Address      Type
  192.53.26.1           0060.47dc.3e33        dynamic
  192.53.26.4           0050.0fbd.e24e        dynamic
  192.53.26.6           0002.4aa0.20c7        dynamic

C:\>
```

- MAC table in switch

```
Switch#show mac-address-table
          Mac Address Table
-------------------------------------------

Vlan    Mac Address       Type        Ports
----    -----------       --------    -----

   1    0001.9617.5d66    DYNAMIC     Fa0/4
   1    0002.4aa0.20c7    DYNAMIC     Fa0/3
   1    0050.0fbd.e24e    DYNAMIC     Fa0/1
Switch#
```

Conclusion:

After doing Practical 1 in Cisco Packet Tracer, I was able to clearly see the difference between a hub and a switch. The hub sent data to all devices, causing unnecessary traffic, while the switch sent data only to the correct device, which made the network faster and more secure. I also learned how important ARP is it helps devices find each other's MAC addresses using their IP addresses so that communication works smoothly inside a local network. Doing this practical helped me understand both concepts better by actually seeing the results in the Packet Tracer simulation.