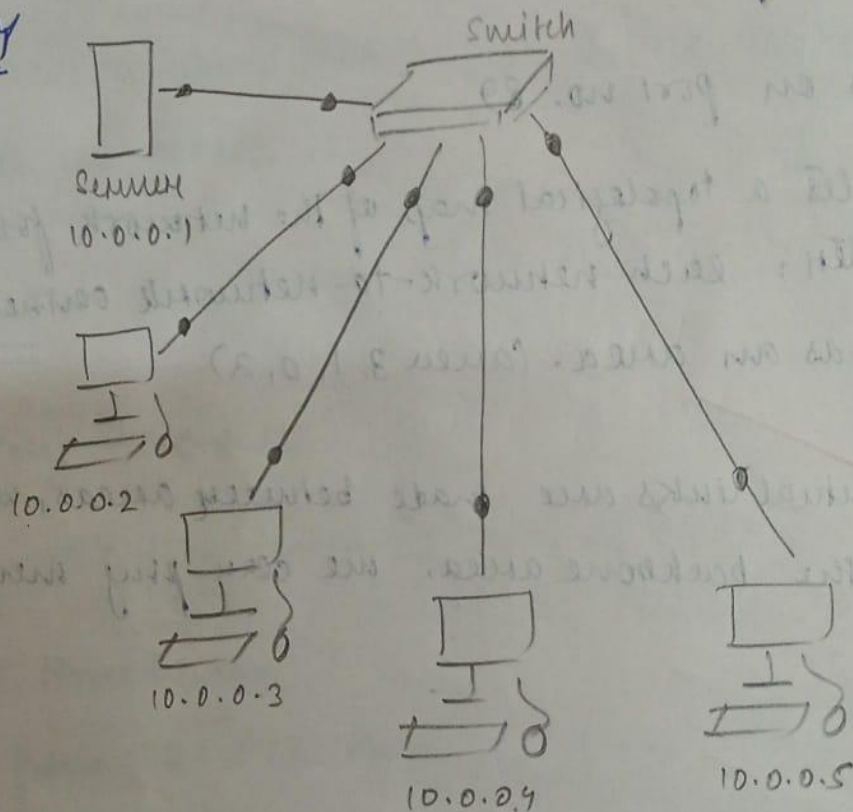


Experiment 9

AIM: To construct simple LAN and understand the concept and operation of Address Resolution Protocol (ARP)

TOPOLOGY



PROCEDURE

- Create a topology of 4 PCs and a server
- Assign IP addresses to all as shown in the fig. above
- Connect them through a switch to form a LAN
- Use the inspect tool to click on every device to check out the ARP table.
- Initially ARP table is empty.
- Then go to simulation mode and start sending packets from every device to the other. Capture it along the way & it shows up in the ARP table.

- Go to CLI of any device and give commands to check that device's ARP table

> arp -a

- Go to the switch's CLI and use the command,

> show mac address-table

to see the address table of the entire LAN network.

OUTPUT :

The screenshot displays the Packet Tracer interface. At the top, a 'Command Prompt' window is open, showing the results of a ping and an arp command on a server. Below the command prompt, the network topology is visible, featuring a central switch connected to five PCs. To the right, the 'IOS Command Line Interface' for the switch is open, showing the configuration and status of the interfaces.

Command Prompt Output:

```
Packet Tracer SERVER Command Line 1.0
SERVER>ping 10.0.0.4

Pinging 10.0.0.4 with 32 bytes of data:

Reply from 10.0.0.4: bytes=32 time=8ms TTL=128
Reply from 10.0.0.4: bytes=32 time=4ms TTL=128
Reply from 10.0.0.4: bytes=32 time=4ms TTL=128
Reply from 10.0.0.4: bytes=32 time=4ms TTL=128

Ping statistics for 10.0.0.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 4ms, Maximum = 8ms, Average = 5ms

SERVER>arp -a

Internet Address      Physical Address      Type
10.0.0.2              0001.64e0.1610       dynamic
10.0.0.3              0010.113e.54d6       dynamic
10.0.0.4              0030.f2e5.ac1e       dynamic
10.0.0.5              0060.2fd9.6c6d       dynamic

SERVER>
```

Network Diagram:

The network diagram shows a central switch connected to five PCs. The PCs are labeled as follows:

- Server-PT Server0 (10.0.0.1)
- PC-PT PC0 (10.0.0.2)
- PC-PT PC1 (10.0.0.3)
- PC-PT PC2 (10.0.0.4)
- PC-PT PC3 (10.0.0.5)

IOS Command Line Interface:

The IOS Command Line Interface for the switch shows the configuration and status of the interfaces. The output is as follows:

```
Switch1
Physical Config CLI
IOS Command Line Interface

%LINK-5-CHANGED: Interface FastEthernet3/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/1,
changed state to up
%LINK-5-CHANGED: Interface Ethernet6/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet6/1,
changed state to up

Switch>arp -a
% Invalid input detected at '' marker.

Switch>Switch>show mac address-table

Vlan    Mac Address      Type      Ports
---    -
1       0001.64e0.1610   DYNAMIC   Fa0/1
1       000c.cf3a.4e6d   DYNAMIC   Fa0/1
1       0010.113e.54d6   DYNAMIC   Fa0/1
1       0030.f2e5.ac1e   DYNAMIC   Fa0/1
1       0060.2fd9.6c6d   DYNAMIC   Eth6/1

Switch>
```

OBSERVATION:

OBSERVATION

- we observe that everytime we capture a ~~pkg~~ (data link), ~~the capture~~ the ARP table of the corresponding devices get updated.
- ARP or Address Resolution Protocol is a protocol of DLL layer
- ARP finds the hardware address, also known as MAC address of a host from its known IP address
- So after the experiment, we can see that the mac address table of switch contains all the MAC addresses of the devices in the LAN, ~~which~~ which was found out through ARP protocol & through its IP address.

By
3/3/23