

## LAB 8

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

### OBSERVATION:

Lab - 7 3-8-23

ARP:-

Aim:- To construct simple LAN & understand the concept & operation of Address Resolution Protocol.

Topology:-

```
graph TD
    Switch[Switch]
    Server[SERVER 10.0.0.0] --- Fa0_0[Fa0/0]
    Fa0_0 --- Switch
    PC1[PC 10.0.0.1] --- Fa0_1[Fa0/1]
    Fa0_1 --- Switch
    PC2[PC 10.0.0.2] --- Fa0_2[Fa0/2]
    Fa0_2 --- Switch
    PC3[PC 10.0.0.3] --- Fa0_3[Fa0/3]
    Fa0_3 --- Switch
    PC4[PC 10.0.0.4] --- Fa0_4[Fa0/4]
    Fa0_4 --- Switch
```

Procedure:-

Step 1:- Create a topology of 4 PCs & server.  
Give a IP address to all & connect them through a switch.

Step 2:- Use the Packet tool to click on a PC to see the ARP table.

→ To add a extra port on switch & turn off the switch & drag the port which is below to the empty slot.

→ then select the PC go to command prompt  
give arp -a.

→ initially ARP table is empty.

→ Also in CLI of switch the command  
show mac address-table can be given  
on every transaction to see how the switch  
learns from transactions & build the  
address-table

→ use the capture button in the simulation  
panel to go step by step so that the  
changes in ARP can be clearly noted.

→ observe the switch as well as the  
nodes update the ARP table as & when  
a new communication starts.

output:

PC > ping 10.0.0.4

Pinging 10.0.0.4 with 32 bytes of data

Reply from 10.0.0.4 : bytes = 32 time 0 ms TTL=64

Reply from 10.0.0.4 bytes = 32 time 0 ms TTL=64

Reply from 10.0.0.4 bytes = 32 time 0 ms TTL=64

4  
Ping statistics for 10.0.0.4:

Packets: sent = 4, Received = 4, lost = 0 (0% loss)

Approximate round trip times in milliseconds

Minimum = 0ms, Maximum = 0ms, Average = 0ms

PC > arp -a

Internet address

physical address

Type

10.0.0.4

0060.2f00.324d

dynamic.

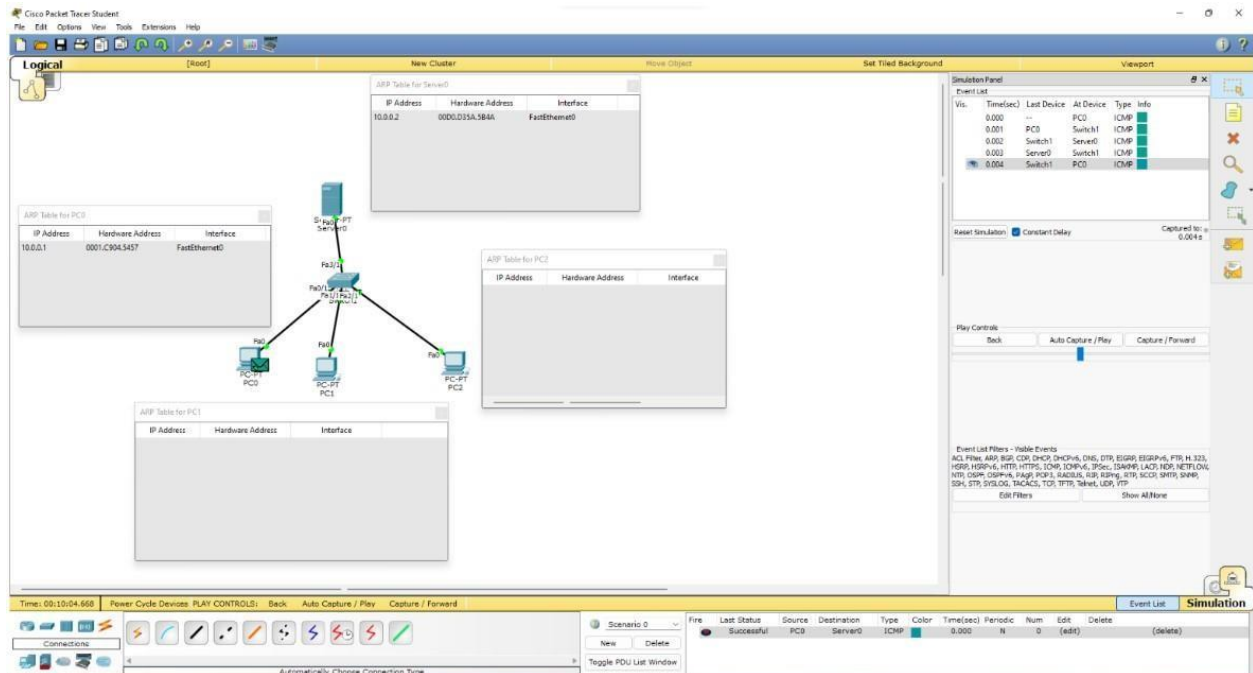
observation:

- when we ping 1 PC & server the address of server is known to PC & vice-versa.
- when we ping two other two PC's simultaneously the addresses of each other are known.
- every time a host requests a MAC address in order to send a packet to another host in the LAN, it checks its ARP cache to see if the IP to MAC address transition already exists. If the transition doesn't exist it performs ARP.

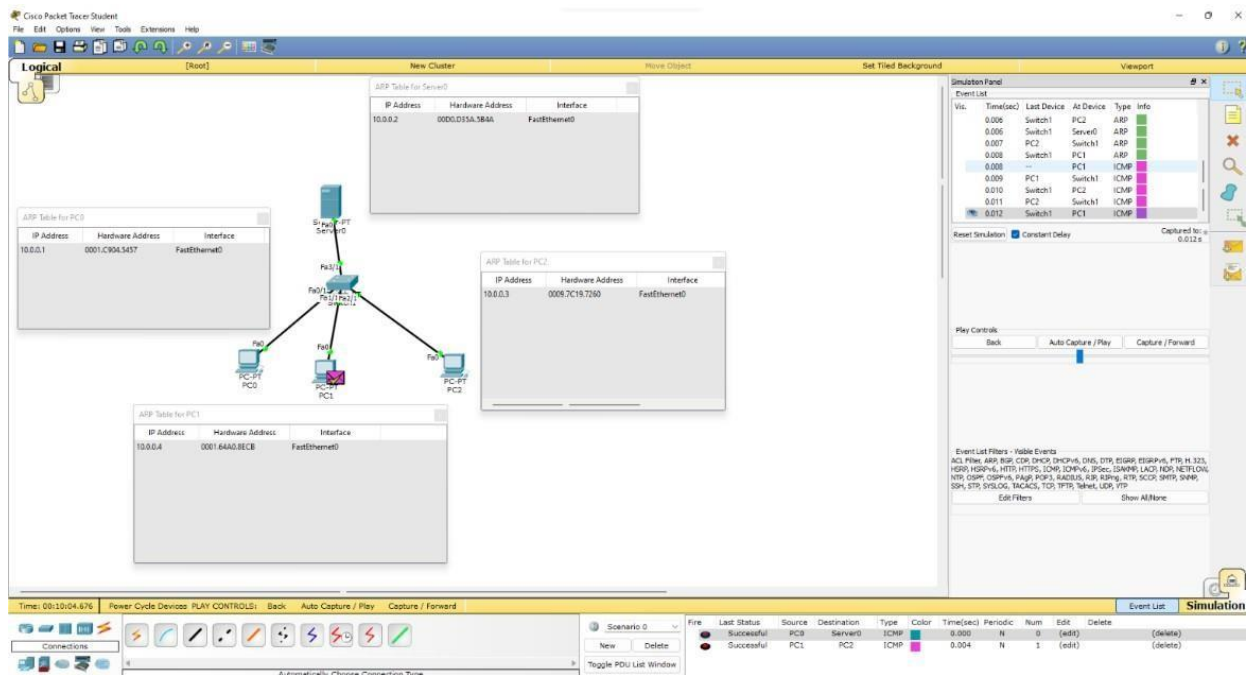
1.1.231. line



# TOPOLOGY:



# OUTPUT:



Cisco Packet Tracer

File Edit Options View Tools Extensions Help

Logical [Root] New Cluster Move Object Set Tiled Background Viewport

ARP Table for Server0

IP Address	Hardware Address	Interface
10.0.0.2	0000.035A.3B44	FastEthernet0/24

ARP Table for PC0

IP Address	Hardware Address	Interface
10.0.0.1	0001.C95A.5457	FastEthernet0/24

ARP Table for PC1

IP Address	Hardware Address	Interface
10.0.0.4	0001.6A40.8ECB	FastEthernet0/24

ARP Table for PC2

IP Address	Hardware Address	Interface
10.0.0.3	0000.7C19.7260	FastEthernet0/24

Switch1

Physical Config CLI

IOS Command Line Interface

```
Switch0>no shutdown: Line protocol on Interface FastEthernet0/24, changed state to up
Switch0>show ip interface: Interface FastEthernet0/24, changed state to up
Switch0>show ip interface: Line protocol on Interface FastEthernet0/24, changed state to up
Switch0>show ip interface: Line protocol on Interface FastEthernet0/24, changed state to up
Switch0>show ip interface: Line protocol on Interface FastEthernet0/24, changed state to up
Switch>arp-a
Translating 'arp-a'..domain server (255.255.255.255)
* Unknown command or computer name, or unable to find computer address
Switch>show mac address-table
Mac Address Table
-----
VLAN    Mac Address      Type      Ports
----    -
1       0001.6A40.8ECB   DYNAMIC   Fa0/1
1       0001.C95A.5457   DYNAMIC   Fa0/1
1       0000.7C19.7260   DYNAMIC   Fa0/1
1       0000.035A.3B44   DYNAMIC   Fa0/1
Switch>
```

Time: 00:12:08.033 Power Cycle Devices: PLAY CONTROLS: Back Auto Capture / Play Capture / Forward

Connections

Scenario 0

New Delete

Toggle PDU List Window

Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete

In Progress	PC0	Server0	ICMP		0.000	N	0	(edit)	(delete)
Successful	PC1	PC2	ICMP		0.004	N	1	(edit)	(delete)

Simulation