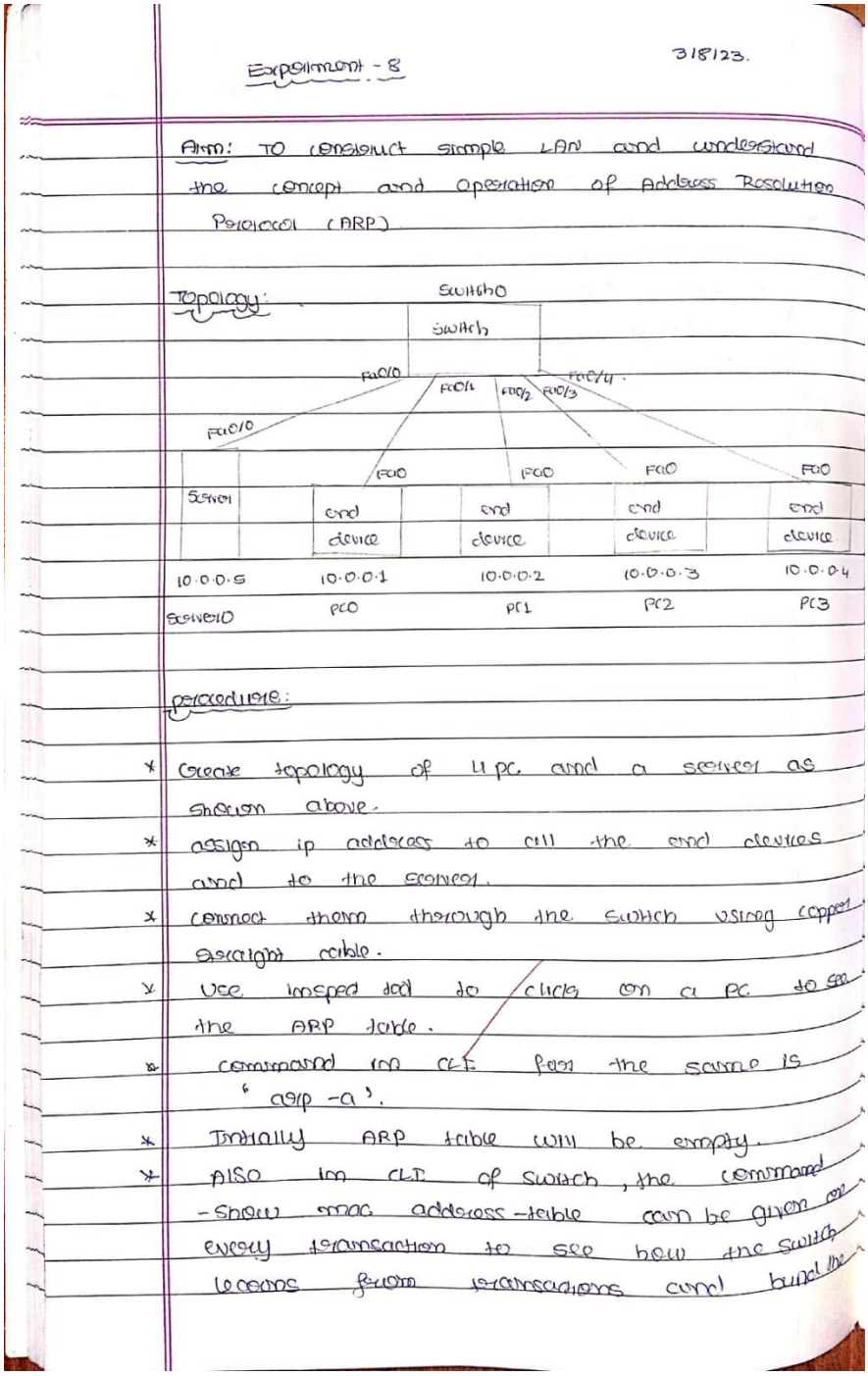
WEEK 8

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

OBSERVATION:



Experiment - 8

318123.

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

Topology:

procedure:

* Create topology of 4 pc. and a server as shown above.
* assign ip address to all the end devices and to the server.
* connect them through the switch using copper straight cable.
* Use inspect tool to click on a PC to see the ARP table.
* command in CLI for the same is 'arp -a'.
* Initially ARP table will be 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 and build the

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address table.

* Use 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 the nodes update the ARP table as and when a new communication starts.

Result:

SERVER > arp -a.

Internet address	Physical Address	Type
10.0.0.1	0040.0b3a.7d29	dynamic
10.0.0.2	000b.be3e.708c	dynamic
10.0.0.3	0002.16d6.2205	dynamic
10.0.0.4	00e0.8f57.838a	dynamic

Switch> show mac address-table

Mac address table

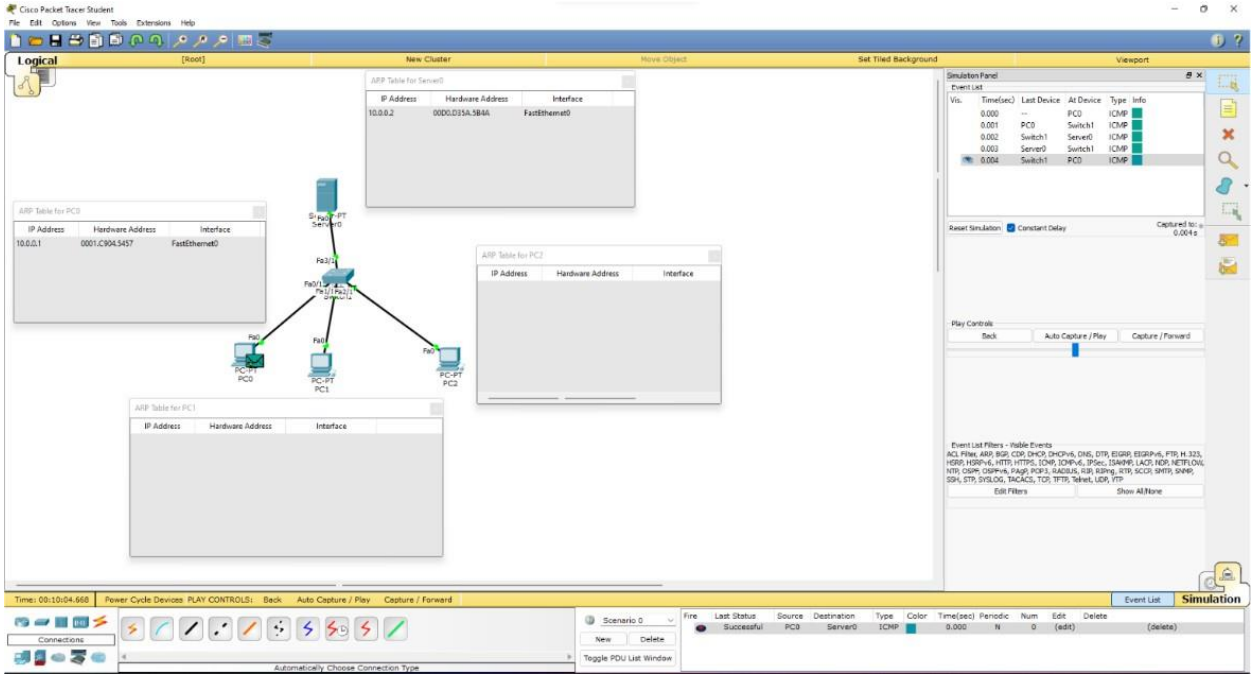
Vlan	Mac Address	Type	Ports
1	0002.16d6.2205	DYNAMIC	Fa2/1
1	0004.9a36.38e0	DYNAMIC	Eth 6/1
1	000b.be3e.708c	DYNAMIC	Fa1/1
1	0040.0b3a.7d29	DYNAMIC	Fa0/1
1	00e0.8f57.838a	DYNAMIC	Fa3/1

Observation:

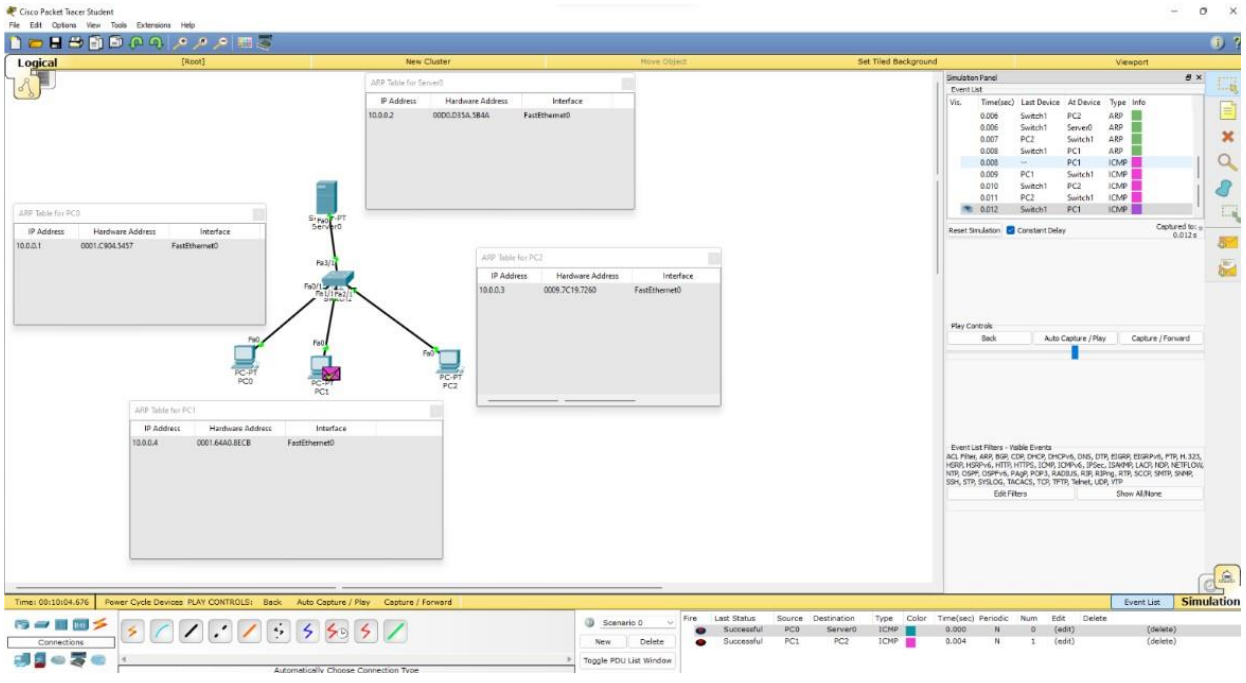
* We have observed that the switch as well as the nodes has updated the ARP table as and when a new communication starts.

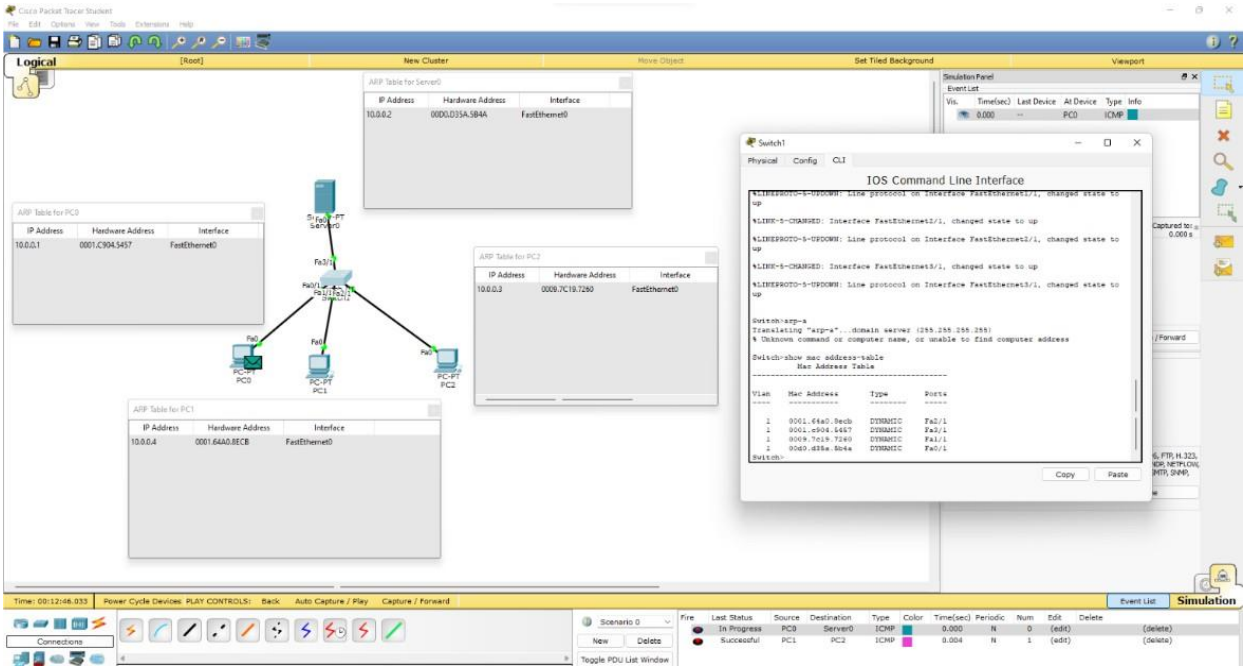
* ARP stands for Address Resolution Protocol.
* ARP broadcast a packet to all the devices of the source network. The devices of the network peel the header of the data link layer from the protocol data unit (PDU) called frame and transfer the packet to network layer, where network ID of packet is validated with destination IP's network ID.
* If it's equal then it responds to source with MAC of destination else packet reaches to gateway and broadcasts packet to devices it is connected.
* This process continues till second last network device in the path reaches destination.

TOPOLOGY:



OUTPUT:




Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
ARP Table for Server0
IP Address Hardware Address Interface
10.0.0.2 00D0.D35A.5B4A FastEthernet0
ARP Table for PC0
IP Address Hardware Address Interface
10.0.0.1 0001.C904.5457 FastEthernet0
ARP Table for PC2
IP Address Hardware Address Interface
10.0.0.3 0009.7C19.7260 FastEthernet0
ARP Table for PC1
IP Address Hardware Address Interface
10.0.0.4 0001.64A0.8ECB FastEthernet0
Switch1
Physical Config CLI
IOS Command Line Interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/1, changed state to up
%LINK-5-CHANGED: Interface FastEthernet2/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet2/1, changed state to up
%LINK-5-CHANGED: Interface FastEthernet3/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/1, 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 0001.64a0.8ecb DYNAMIC Fa2/1
1 0001.c904.5457 DYNAMIC Fa3/1
1 0009.7c19.7260 DYNAMIC Fa1/1
1 00d0.d35a.5b4a DYNAMIC Fa0/1
Switch>
Copy
Paste
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type Info
0.000 -- PC0 ICMP
Time: 00:12:46.033
Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward
Event List
Simulation
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)