

Aim-8

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

Topology:

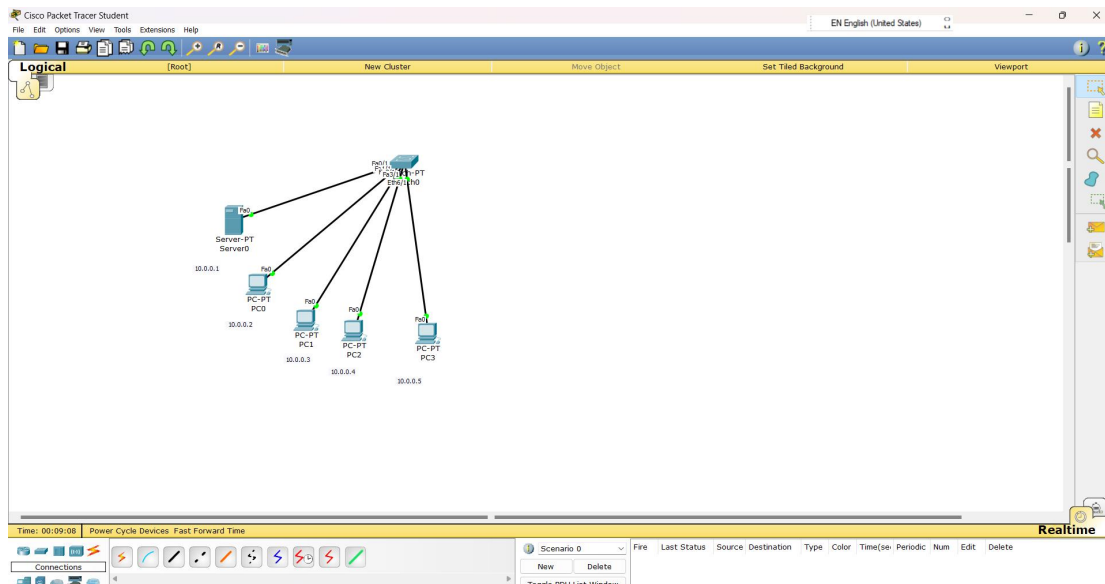


Fig 1: Topology

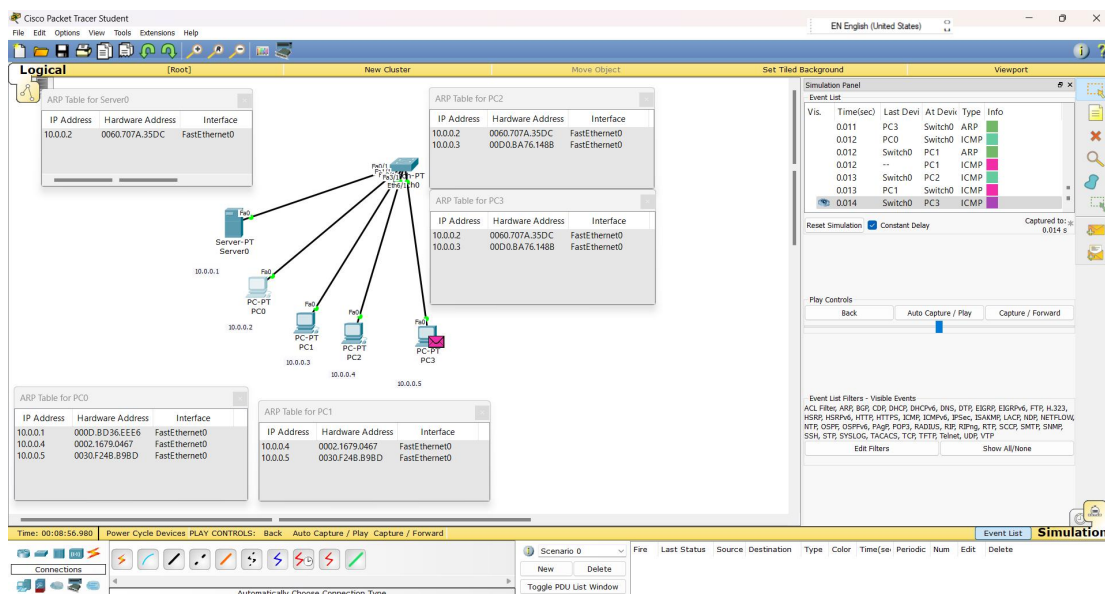


Fig 2: ARP tables of the devices connected in the topology

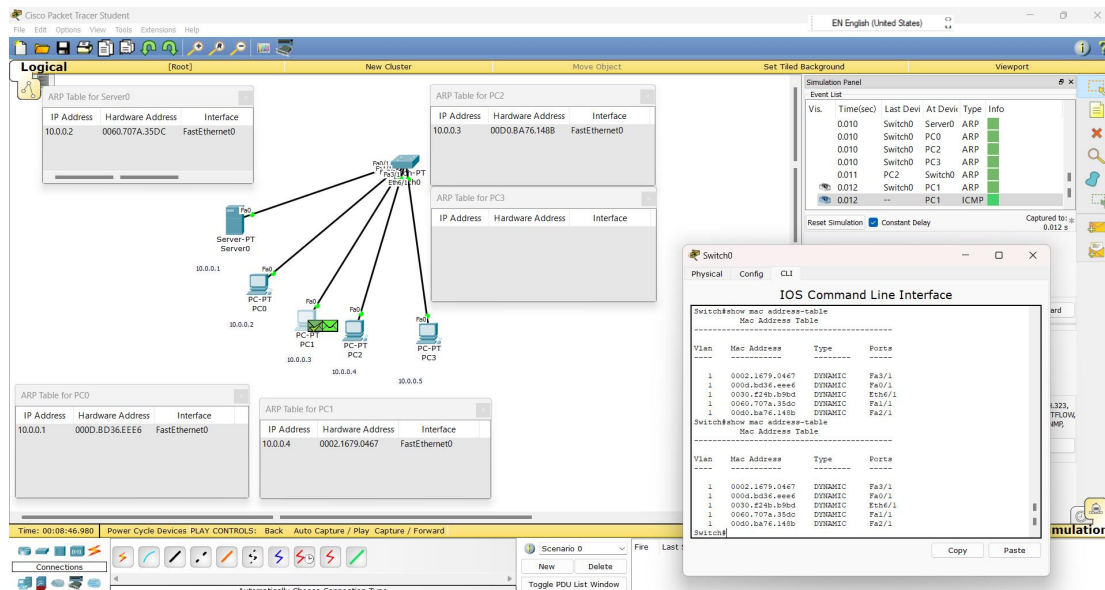


Fig 3: PDU packets are being sent/received with acknowledgement

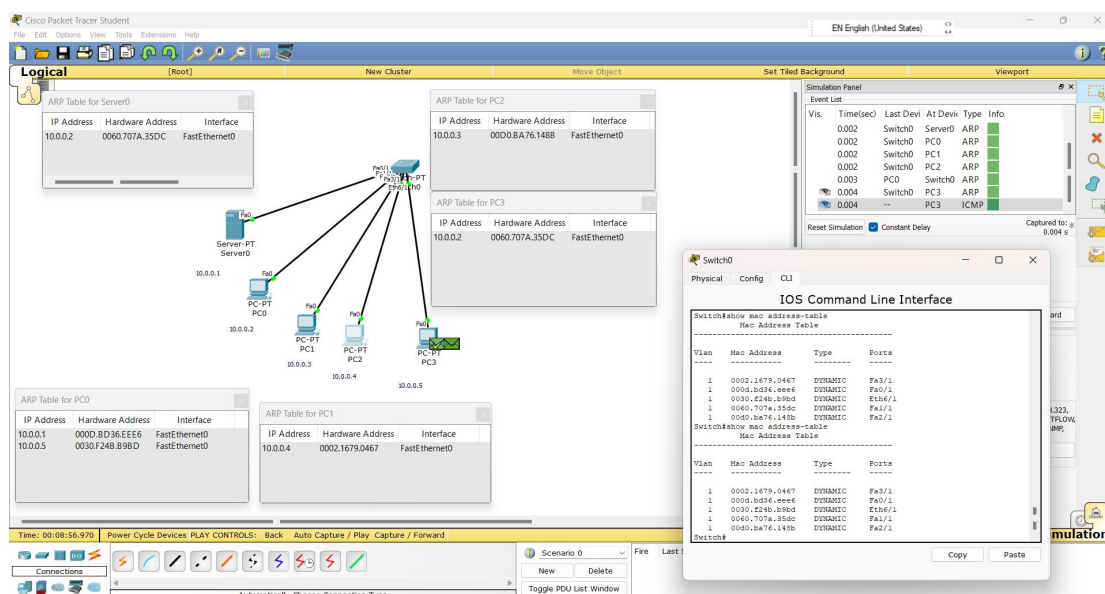


Fig 4: PDU packets are being sent/received with acknowledgement

Procedure and Observation:

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8. To Construct Simple LAN and understand the Concept and Operation of Address Resolution Protocol (ARP).

Topology

The diagram illustrates a star network topology. At the top center is a switch labeled 'Switch0'. Five lines radiate from the switch to five different devices below it. On the left is a server icon labeled 'Server0' with IP address '10.0.0.1'. Below the server is a PC icon labeled 'pc0' with IP address '10.0.0.2'. To the right of pc0 are three more PC icons labeled 'pc1' (IP '10.0.0.3'), 'pc2' (IP '10.0.0.4'), and 'pc3' (IP '10.0.0.5'). Each of the five devices (server and four PCs) has a label 'Falo' next to its connection line to the switch, indicating Fast Ethernet ports.

⇒ Create a topology of 4 PCs and a Server to a switch.

⇒ Assign IP addresses according to the topology drawn above.

⇒ Use the inspect tool to click on a PC to see the ARP table.

⇒ Command in PPT CLI for the same is
arp -a (this command is to be used
in pc's command prompt which is situated
in desktop tab.

⇒ when the "arp -a" command is used
initially you will get a reply
saying 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~~/forward button in
the simulation panel to go step by
step so that the changes in ARP can be
clearly noted.

Outcome

output observation

⇒ when ping message is passed from pc0 to Server0 in simulation mode.

Commands

* (pc0 - Server0)

⇒ arp -a

No ARP Entries Found.

⇒ Ping 10.0.0.1

⇒ then click on capture/forward

→ After the message / ARP packets / packets are passed there's an entry made in

Server0's ARP table

" ⇒ 10.0.0.2 0060.207A.35DC FastEthernet0

⇒ then there's an entry made in PC0's ARP table.

" ⇒ 10.0.0.1 000D.BD36.EEE6 FastEthernet0

⇒ Like wise the packets / messages have been passed from PC1-PC2, PC3 to PC0, PC2-PC0 & PC1-PC3.

⇒ the entries in respective PC's ARP table will be made as switch learns their ^{MAC} addresses.

Output

⇒ stop check the MAC / address table in switch

⇒ check the MAC address table in switch ^{after} each transaction is ~~be~~ being made.

Switchy enable

Switch # show mac address-table

Mac Address Table

Vlan	Mac Address	Type	Port
1	0002.1b78.0467	DYNAMIC	Fa3/1
1	000d.bd36.eceb	DYNAMIC	Fa0/1
1	0030.824b.69bd	DYNAMIC	Eth6/1
1	0060.707a.35dc	DYNAMIC	Fa2/1
1	00d0.ba76.148b	DYNAMIC	Fa2/1

Output:

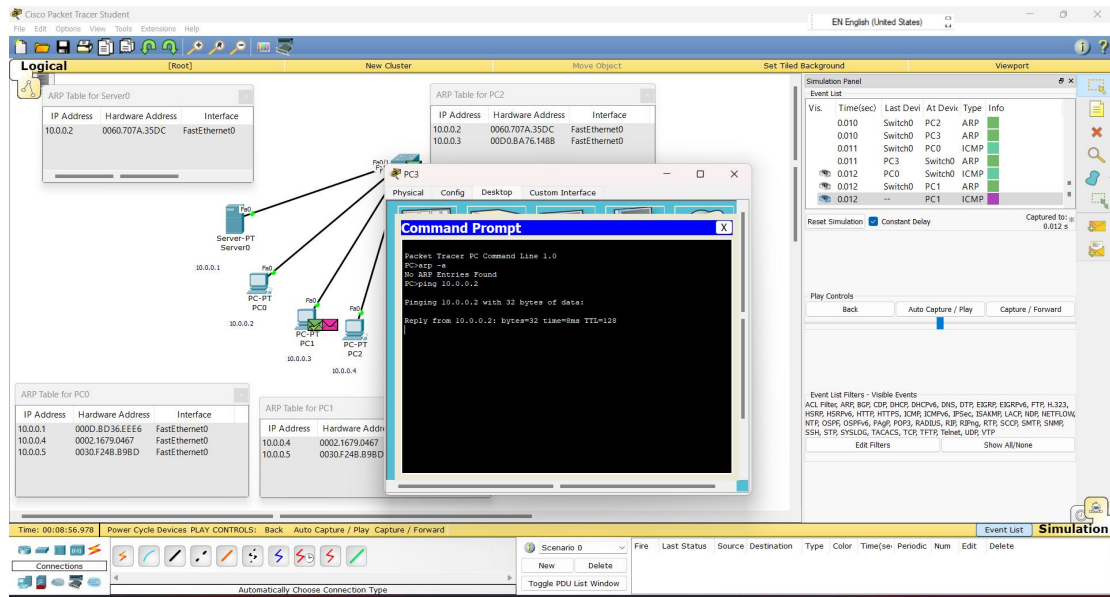


Fig 5: Initially you will not find any entries in ARP table

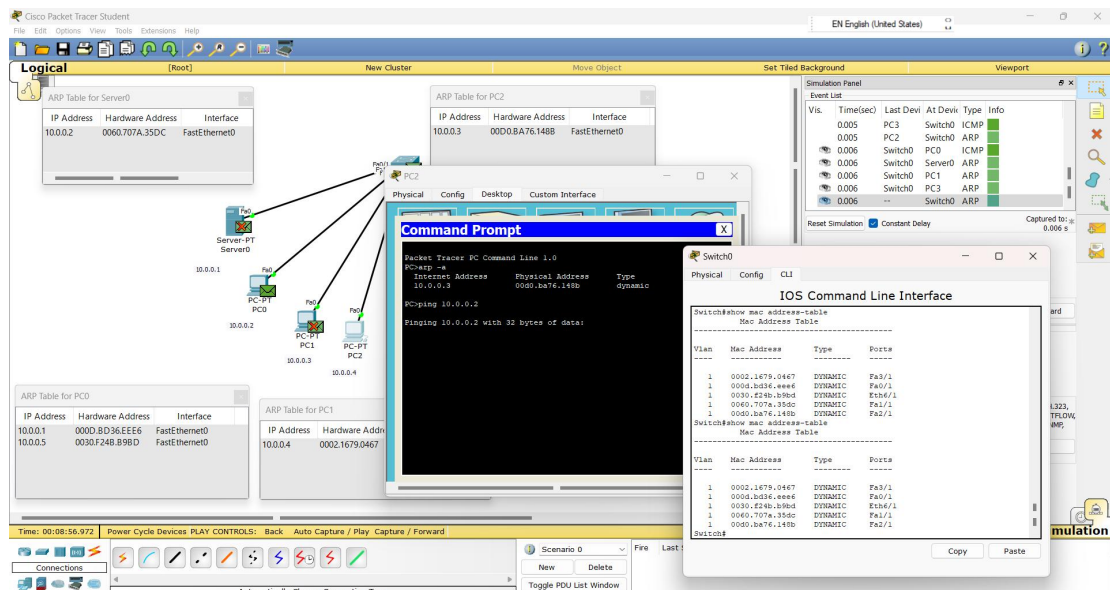


Fig 6: showing the contents of the ARP table

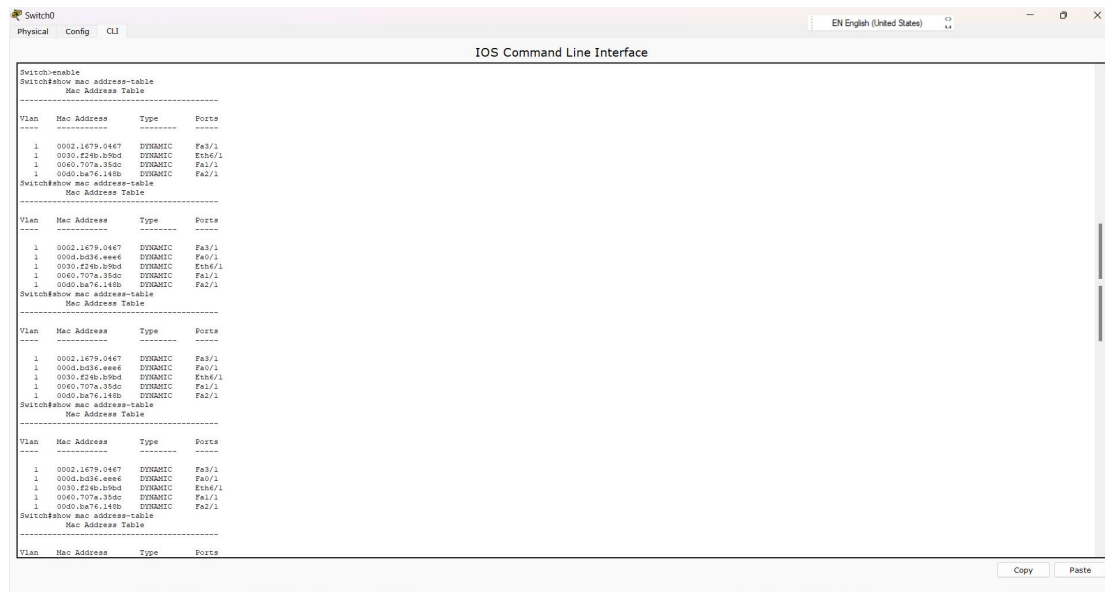


Fig 7: Showing mac address-table for every transaction

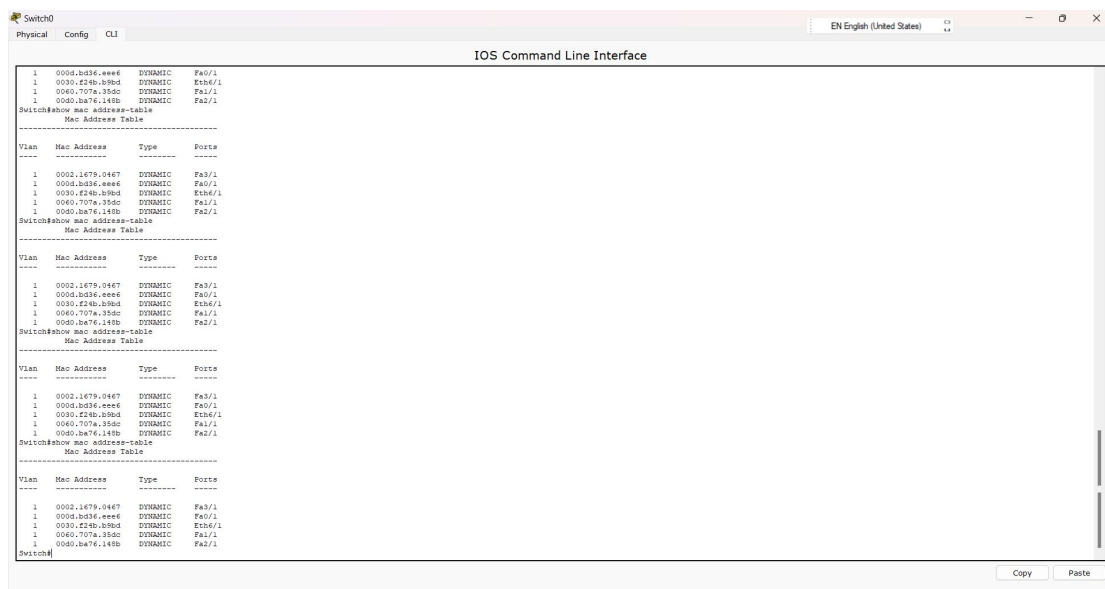


Fig 8: Showing mac address-table for every transaction

