

Program 10

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

Topology , Procedure and Observation:

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LAB-10

Aim: To construct simple LAN & understand the concept and operation of ARP.

TOPOLOGY:

The diagram illustrates a star network topology. A central switch is connected to four devices: a server and three PCs. The server is labeled 'Server 10.0.0.4'. The three PCs are labeled 'PC 10.0.0.1', 'PC 10.0.0.2', and 'PC 10.0.0.3'. All devices are connected to the same central switch.

PROCEDURE:

- 1) Create the topology as shown above.
- 2) Configure the PCs and the server.
- 3) Click on Inspect mode, then click on the end devices and open ARP tables.
- 4) Send a data packet from any end device say server to say 10.0.0.3 PC.
- 5) Open Sniffer mode to capture each step of data transfer.

OBSERVATIONS:

- 1) The ARP tables of all end devices are initially empty.

2) When new data packet from source arrives at the switch, since the source MAC address is unknown, it sends a broadcast message to all devices.

3) The device with IP address present in the destination address of the data packet responds to message.

4) The server and PC update their ARP table matching IP addresses to MAC address.

5) Over time the ARP table grows as data packets are sent.

6) The MAC table of switch which was initially empty updates its MAC table gradually too.

7) Similarly other ARP tables are updated.

Screen Shots:

The screenshot displays a network topology with a central switch (Switch0) connected to three PCs (PC0, PC1, PC2) and a Server (Server0). The IP addresses for the PCs are 10.0.0.1, 10.0.0.2, and 10.0.0.3, respectively. The Server IP is 10.0.0.4. The switch interface is Fa0/24.

On the left, four ARP tables are shown:

- ARP Table for PC0:**

IP Address	Hardware Address	Interface
10.0.0.2	0003.E490.6097	FastEthernet0
- ARP Table for PC1:**

IP Address	Hardware Address	Interface
10.0.0.1	0004.9A10.2391	FastEthernet0
- ARP Table for PC2:**

IP Address	Hardware Address	Interface
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- ARP Table for Server0:**

IP Address	Hardware Address	Interface
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On the right, the **ARP Table for Switch0** is shown:

IP Address	Hardware Address	Interface
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The **IOS Command Line Interface** window shows the output of the command `Switch0#show mac address-table`:

```

Switch0#show mac address-table
Mac Address Table
-----
Vlan    Mac Address      Type        Ports
-----
1       0003.e490.6097    DYNAMIC     Fa1/1
1       0004.9a10.2391    DYNAMIC     Fa0/1
1       000a.41b0.b710    DYNAMIC     Fa3/1
Switch0#
  
```

The **Event List** on the far right shows the following events:

Vis.	Time(sec)	Last Device	At Device
	0.003	PC1	Switch0
	0.004	PC0	PC0
	0.004	--	PC0
	0.005	PC0	Switch0
	0.006	Switch0	PC1
	0.007	PC1	Switch0
	0.008	Switch0	PC0
	0.172	--	Switch0

