

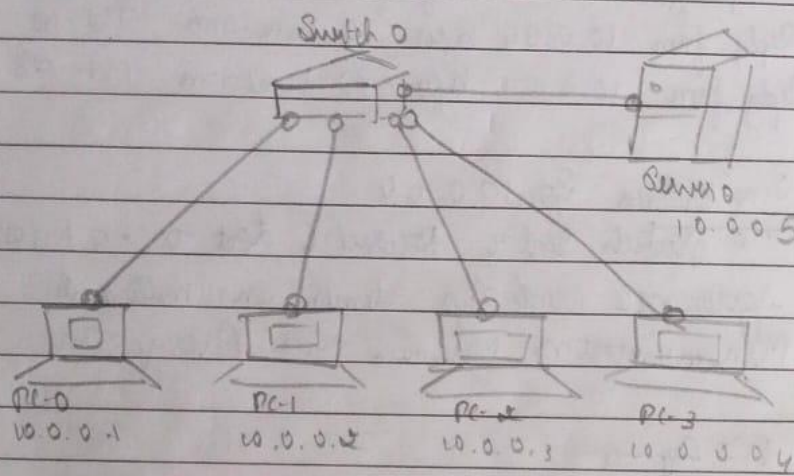
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Construct simple LAN and understand the concept and operation of Address Resolution Protocol

Topology:



Procedure:

- 1) Create a topology of 4 PCs and a server
- 2) IP addresses assigned to all
- 3) Connect them through a switch
- 4) Use the inspect tool to click on a PC to see the ARP table
- 5) Command the CLI for the same asp-a
- 6) Initially ARP table is empty
- 7) Also in CLI of switch, the command - show mac address-table can be given on every transaction to see how the switch learns from connections and build the address-table

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=0ms TTL=128
Reply from 10.0.0.4: bytes=32 time=0ms TTL=128
Reply from 10.0.0.4: bytes=32 time=0ms TTL=128
Reply from 10.0.0.4: bytes=32 time=0ms TTL=128
```

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

| Inland address | Physical address | Type |
|----------------|------------------|---------|
| 10.0.0.4 | 0060.2f00.3e1d | Dynamic |

Observation

- When we ping PC and server the address of server is known as to PC & vice versa.
- When we ping between other 2 PCs simultaneously the address of each other is known.
- Every time a host request a MAC address in order to send a packet to another host as the LAN it checks its ARP cache list if the IP to MAC address has already exist. If the destination doesn't exist perform ARP.

TOPOLOGY & OUTPUT

File Edit Options View Tools Extensions Help

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

ARP Table for PC0

| IP Address | Hardware Address | Interface |
|------------|------------------|---------------|
| 10.0.0.2 | 000C.8566.E0... | FastEthernet0 |
| 10.0.0.3 | 0090.218C.4006 | FastEthernet0 |
| 10.0.0.4 | 00E0.B048.BCC3 | FastEthernet0 |

ARP Table for PC3

| IP Address | Hardware Address | Interface |
|------------|------------------|---------------|
| 10.0.0.1 | 0090.21CE.43D7 | FastEthernet0 |

ARP Table for Server0

| IP Address | Hardware Address | Interface |
|------------|------------------|---------------|
| 10.0.0.1 | 0090.21CE.43D7 | FastEthernet0 |

ARP Table for PC2

| IP Address | Hardware Address | Interface |
|------------|------------------|---------------|
| 10.0.0.1 | 0090.21CE.43D7 | FastEthernet0 |

ARP Table for PC1

| IP Address | Hardware Address | Interface |
|------------|------------------|---------------|
| 10.0.0.1 | 0090.21CE.43D7 | FastEthernet0 |

Simulation Panel

| Vis. | Time(sec) | Last De | At Dev | Type | Info |
|------|-----------|---------|-----------|------|------|
| | 0.016 | Switch0 | Server... | ARP | |
| | 0.016 | Switch0 | PC1 | ARP | |
| | 0.016 | Switch0 | PC2 | ARP | |
| | 0.016 | Switch0 | PC3 | ARP | |
| | 0.017 | Server0 | Switch... | ARP | |

Reset Simulation ☒ Constant Delay Captured to: 0.017 s

Switch0 Physical Config CLI

IOS Command Line Interface

```
$LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet6/1, changed state to up

Switch>show mac address-table
Mac Address Table
-----
Vlan    Mac Address      Type      Ports
----    -
1       000c.8566.e0dc   DYNAMIC   Fa2/1
1       0090.21bc.4006   DYNAMIC   Fa3/1
1       0090.21ce.43d7   DYNAMIC   Fa1/1
1       00e0.b048.bcc3   DYNAMIC   Eth6/1
1       00e0.f78b.ac89   DYNAMIC   Fa0/1

Switch>
```

Time: 00:05:08.650 Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward

Connections

Automatically Choose Connection Type

Scenario 0 New Delete

Toggle PDU List Window

| Fire | Last Sta | PC0 | PC3 | IC... | 0.000 | N | 0 | (ed... | (delete) |
|------------|----------|-----|-----|-------|-------|---|---|--------|----------|
| Successful | | PC0 | PC1 | IC... | 0.007 | N | 1 | (ed... | (delete) |
| Successful | | PC0 | PC2 | IC... | 0.007 | N | 2 | (ed... | (delete) |