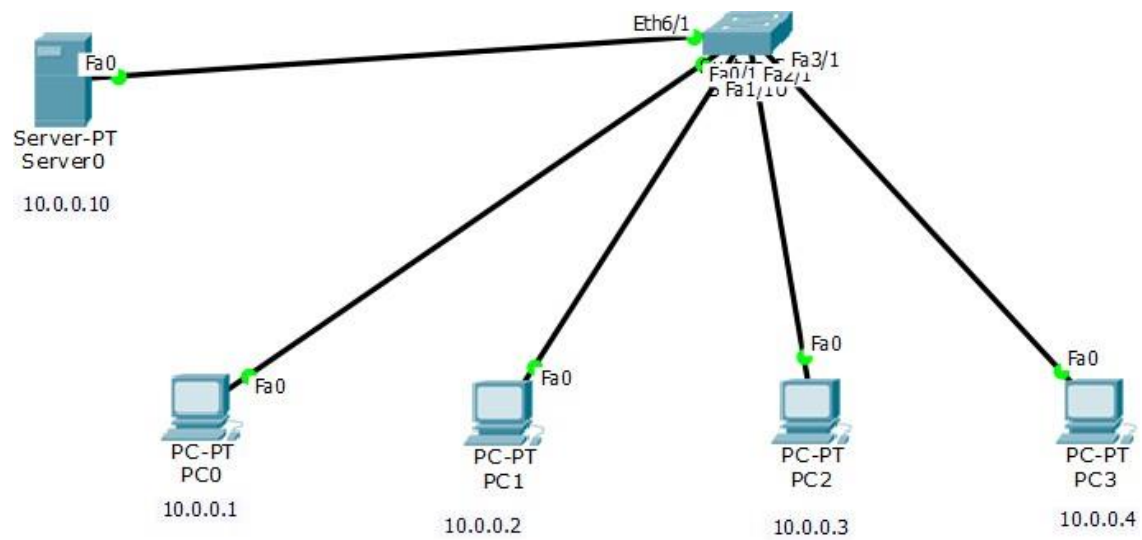


## LAB 8:

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

### Topology:



## ARP Tables while pinging:

### Ping from PC0 to Server0:

The screenshot shows the initial state of a network simulation in Cisco Packet Tracer. The network topology includes a central switch (S1) connected to four PCs (PC0-PC3) and a server (Server0). The ARP tables for the switch and the server are empty. The command prompt on PC0 shows the command 'PC>ping 10.0.0.10' being entered, but no output is visible yet.

ARP Table for Switch0:

IP Address	Hardware Address	Interface
------------	------------------	-----------

ARP Table for Server0:

IP Address	Hardware Address	Interface
------------	------------------	-----------

ARP Table for PC0:

IP Address	Hardware Address	Interface
------------	------------------	-----------

ARP Table for PC1:

IP Address	Hardware Address	Interface
------------	------------------	-----------

ARP Table for PC2:

IP Address	Hardware Address	Interface
------------	------------------	-----------

ARP Table for PC3:

IP Address	Hardware Address	Interface
------------	------------------	-----------

Command Prompt (PC0):

```
Packet Tracer PC Command Line 1.0
PC>ipconfig
No ARP Entries Found
PC>ping 10.0.0.10
Pinging 10.0.0.10 with 32 bytes of data:
```

The screenshot shows the network simulation after the ping command has been executed. The ARP tables for the switch and the server now contain entries for the destination IP address 10.0.0.10. The command prompt on PC0 shows the output of the ping command, indicating that the ping was successful.

ARP Table for Switch0:

IP Address	Hardware Address	Interface
10.0.0.1	0000.5896.A5C2	FastEthernet0

ARP Table for Server0:

IP Address	Hardware Address	Interface
10.0.0.1	0000.5896.A5C2	FastEthernet0

ARP Table for PC0:

IP Address	Hardware Address	Interface
------------	------------------	-----------

ARP Table for PC1:

IP Address	Hardware Address	Interface
------------	------------------	-----------

ARP Table for PC2:

IP Address	Hardware Address	Interface
------------	------------------	-----------

ARP Table for PC3:

IP Address	Hardware Address	Interface
------------	------------------	-----------

Command Prompt (PC0):

```
Packet Tracer PC Command Line 1.0
PC>ipconfig
No ARP Entries Found
PC>ping 10.0.0.10
Pinging 10.0.0.10 with 32 bytes of data:
```

Cisco Packet Tracer Student

File Edit Options View Tools Extensions Help

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

Server-PT Server0  
10.0.0.10

PC-PT PC0  
10.0.0.1

PC-PT PC1  
10.0.0.2

PC-PT PC2  
10.0.0.3

PC-PT PC3  
10.0.0.4

ARP Table for Switch0

IP Address	Hardware Address	Interface
10.0.0.1	0000.5896.A3C2	FastEthernet0

ARP Table for Server0

IP Address	Hardware Address	Interface
10.0.0.1	0000.5896.A3C2	FastEthernet0

ARP Table for PC0

IP Address	Hardware Address	Interface
10.0.0.1	0000.5896.A3C2	FastEthernet0

ARP Table for PC1

IP Address	Hardware Address	Interface
10.0.0.1	0000.5896.A3C2	FastEthernet0

Simulation Panel

Time(sec)	Last Device	At Device	Type	Info
0.000	PC0	PC0	ICMP	
0.000	PC0	PC0	ARP	
0.001	PC0	Switch0	ARP	
0.002	Switch0	PC1	ARP	
0.002	Switch0	PC2	ARP	
0.002	Switch0	PC3	ARP	
0.002	Switch0	Server0	ARP	
0.003	Server0	Switch0	ARP	

Reset Simulation Constant Delay Captured to: 0.003 s

Play Controls Back Auto Capture / Play Capture / Forward

PC0

Physical Config Desktop Custom Interface

Command Prompt

```

Packet Tracer PC Command Line 1.0
PC>ipconfig
No ARP Entries Found
PC>ping 10.0.0.10
Pinging 10.0.0.10 with 32 bytes of data:

```

Time: 00:14:57.005 Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward

Scenario 0 Fire Last Status Source Destination Type Color

New Delete Toggle PDU List Window

24°C Partly sunny

Cisco Packet Tracer Student

File Edit Options View Tools Extensions Help

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

Server-PT Server0  
10.0.0.10

PC-PT PC0  
10.0.0.1

PC-PT PC1  
10.0.0.2

PC-PT PC2  
10.0.0.3

PC-PT PC3  
10.0.0.4

ARP Table for Switch0

IP Address	Hardware Address	Interface
10.0.0.1	0000.5896.A3C2	FastEthernet0

ARP Table for Server0

IP Address	Hardware Address	Interface
10.0.0.1	0000.5896.A3C2	FastEthernet0

ARP Table for PC0

IP Address	Hardware Address	Interface
10.0.0.1	0000.5896.A3C2	FastEthernet0

ARP Table for PC1

IP Address	Hardware Address	Interface
10.0.0.1	0000.5896.A3C2	FastEthernet0

Simulation Panel

Time(sec)	Last Device	At Device	Type	Info
0.000	PC0	PC0	ICMP	
0.001	PC0	Switch0	ARP	
0.002	Switch0	PC1	ARP	
0.002	Switch0	PC2	ARP	
0.002	Switch0	PC3	ARP	
0.002	Switch0	Server0	ARP	
0.002	Server0	Switch0	ARP	
0.003	PC0	PC0	ARP	
0.004	PC0	PC0	ICMP	

Reset Simulation Constant Delay Captured to: 0.004 s

Play Controls Back Auto Capture / Play Capture / Forward

PC0

Physical Config Desktop Custom Interface

Command Prompt

```

Packet Tracer PC Command Line 1.0
PC>ipconfig
No ARP Entries Found
PC>ping 10.0.0.10
Pinging 10.0.0.10 with 32 bytes of data:

```

Time: 00:14:57.006 Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward

Scenario 0 Fire Last Status Source Destination Type Color

New Delete Toggle PDU List Window

24°C Partly sunny

Cisco Packet Tracer Student

File Edit Options View Tools Extensions Help

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

Server-PT Server0  
10.0.0.10

PC-PT PC0  
10.0.0.1

PC-PT PC1  
10.0.0.2

PC-PT PC2  
10.0.0.3

PC-PT PC3  
10.0.0.4

ARP Table for Switch0

IP Address	Hardware Address	Interface

ARP Table for Server0

IP Address	Hardware Address	Interface
10.0.0.1	0000.5896.A5C2	FastEthernet0

ARP Table for PC0

IP Address	Hardware Address	Interface
10.0.0.10	0000.BAEB.7409	FastEthernet0

ARP Table for PC1

IP Address	Hardware Address	Interface

Simulation Panel

Vis.	TimeSec	Last Device	At Device	Type	Info
0.001	PC0	Switch0	ARP		
0.002	Switch0	PC1	ARP		
0.002	Switch0	PC2	ARP		
0.002	Switch0	PC3	ARP		
0.002	Switch0	Server0	ARP		
0.003	Server0	Switch0	ARP		
0.004	Switch0	PC0	ICMP		
0.004	PC0	Switch0	ICMP		
0.005	PC0	Switch0	ICMP		

Reset Simulation Constant Delay Captured to a 0.005 s

Play Controls Back Auto Capture / Play Capture / Forward

Command Prompt

```

Packet Tracer PC Command Line 1.0
PC>arp -a
No ARP Entries Found
PC>ping 10.0.0.10

Pinging 10.0.0.10 with 32 bytes of data:
  
```

Time: 00:14:37.007 Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward

Connections 4 Automatically Choose Connection Type

Scenario 0 Fire Last Status Source Destination Type Color

New Delete Toggle PDU List Window

Cisco Packet Tracer Student

File Edit Options View Tools Extensions Help

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

Server-PT Server0  
10.0.0.10

PC-PT PC0  
10.0.0.1

PC-PT PC1  
10.0.0.2

PC-PT PC2  
10.0.0.3

PC-PT PC3  
10.0.0.4

ARP Table for Switch0

IP Address	Hardware Address	Interface

ARP Table for Server0

IP Address	Hardware Address	Interface
10.0.0.1	0000.5896.A5C2	FastEthernet0

ARP Table for PC0

IP Address	Hardware Address	Interface
10.0.0.10	0000.BAEB.7409	FastEthernet0

ARP Table for PC1

IP Address	Hardware Address	Interface

Simulation Panel

Vis.	TimeSec	Last Device	At Device	Type	Info
0.002	Switch0	PC1	ARP		
0.002	Switch0	PC2	ARP		
0.002	Switch0	PC3	ARP		
0.002	Switch0	Server0	ARP		
0.003	Server0	Switch0	ARP		
0.004	Switch0	PC0	ARP		
0.004	PC0	Switch0	ICMP		
0.005	PC0	Switch0	ICMP		
0.006	Switch0	Server0	ICMP		

Reset Simulation Constant Delay Captured to a 0.006 s

Play Controls Back Auto Capture / Play Capture / Forward

Command Prompt

```

Packet Tracer PC Command Line 1.0
PC>arp -a
No ARP Entries Found
PC>ping 10.0.0.10

Pinging 10.0.0.10 with 32 bytes of data:
  
```

Time: 00:14:37.008 Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward

Connections 4 Automatically Choose Connection Type

Scenario 0 Fire Last Status Source Destination Type Color

New Delete Toggle PDU List Window

Cisco Packet Tracer Student

File Edit Options View Tools Extensions Help

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

Server-PT Server0 10.0.0.10

PC-PT PC0 10.0.0.1

PC-PT PC1 10.0.0.2

PC-PT PC2 10.0.0.3

PC-PT PC3 10.0.0.4

ARP Table for Switch0

IP Address	Hardware Address	Interface
------------	------------------	-----------

ARP Table for Server0

IP Address	Hardware Address	Interface
10.0.0.1	0000.5896.A3C2	FastEthernet0

ARP Table for PC3

IP Address	Hardware Address	Interface
10.0.0.10	0000.BAEB.7409	FastEthernet0

Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type	Info
0.002	0.002	Switch0	PC3	ARP	
0.002	0.002	Switch0	Server0	ARP	
0.003	0.003	Server0	Switch0	ARP	
0.004	0.004	Switch0	PC0	ARP	
0.004	0.004	PC0	PC0	ICMP	
0.005	0.005	PC0	Switch0	ICMP	
0.006	0.006	Switch0	Server0	ICMP	
0.007	0.007	Server0	Switch0	ICMP	

Reset Simulation Constant Delay Captured to 0.007 s

Play Controls Back Auto Capture / Play Capture / Forward

Command Prompt

```

Packet Tracer PC Command Line 1.0
PC>ipconfig /all
No ARP Entries Found
PC>ping 10.0.0.10

Pinging 10.0.0.10 with 32 bytes of data:

```

Time: 00:14:57.009 Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward

Connections

Automatically Choose Connection Type

Scenario 0 New Delete

Toggle PDU List Window

Cisco Packet Tracer Student

File Edit Options View Tools Extensions Help

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

Server-PT Server0 10.0.0.10

PC-PT PC0 10.0.0.1

PC-PT PC1 10.0.0.2

PC-PT PC2 10.0.0.3

PC-PT PC3 10.0.0.4

ARP Table for Switch0

IP Address	Hardware Address	Interface
------------	------------------	-----------

ARP Table for Server0

IP Address	Hardware Address	Interface
10.0.0.1	0000.5896.A3C2	FastEthernet0

ARP Table for PC3

IP Address	Hardware Address	Interface
10.0.0.10	0000.BAEB.7409	FastEthernet0

Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type	Info
0.002	0.002	Switch0	PC3	ARP	
0.002	0.002	Switch0	Server0	ARP	
0.003	0.003	Server0	Switch0	ARP	
0.004	0.004	Switch0	PC0	ARP	
0.004	0.004	PC0	PC0	ICMP	
0.005	0.005	PC0	Switch0	ICMP	
0.006	0.006	Switch0	Server0	ICMP	
0.007	0.007	Server0	Switch0	ICMP	
0.008	0.008	Switch0	PC0	ICMP	

Reset Simulation Constant Delay Captured to 0.008 s

Play Controls Back Auto Capture / Play Capture / Forward

Command Prompt

```

Packet Tracer PC Command Line 1.0
PC>ipconfig /all
No ARP Entries Found
PC>ping 10.0.0.10

Pinging 10.0.0.10 with 32 bytes of data:
Reply from 10.0.0.10: bytes=32 time=1ms TTL=128

```

Time: 00:14:57.010 Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward

Connections

Automatically Choose Connection Type

Scenario 0 New Delete

Toggle PDU List Window

Cisco Packet Tracer Student - C:\Users\Admin\Desktop\18M21CS048\CN-lab\lab 8\lab8.cnpt

File Edit Options View Tools Extensions Help

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

Simulation Panel

Event List

Time	Time(sec)	Last Device	At Device	Type	Info
2.019	PC0	Switch0	ICMP		
2.020	Switch0	Server0	ICMP		
2.021	Server0	Switch0	ICMP		
2.022	Switch0	PC0	ICMP		
3.023	PC0	Switch0	ICMP		
3.025	Switch0	Server0	ICMP		
3.027	Server0	Switch0	ICMP		
3.028	Switch0	PC0	ICMP		

Reset Simulation Constant Delay Captured to: 3.028 s

PC0

Physical Config Desktop Custom Interface

Command Prompt

```

Packet Tracer PC Command Line 1.0
PC>ipconfig
No ARP Entries Found
PC>ping 10.0.0.10

Pinging 10.0.0.10 with 32 bytes of data:
Reply from 10.0.0.10: bytes=32 time=4ms TTL=128
Reply from 10.0.0.10: bytes=32 time=4ms TTL=128
Reply from 10.0.0.10: bytes=32 time=4ms TTL=128
Reply from 10.0.0.10: bytes=32 time=4ms TTL=128

Ping statistics for 10.0.0.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 4ms, Maximum = 4ms, Average = 4ms

PC>ipconfig
Internet Address    Physical Address    Type
10.0.0.10           0000.baa8.7409      dynamic
  
```

Time: 00:15:00.030 Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward

Connections

Automatically Choose Connection Type

Scenario 0 Fire Last Status Source Destination Type Co

New Delete Toggle PDU List Window

## Ping from PC0 to PC1:

Cisco Packet Tracer Student - C:\Users\Admin\Desktop\18M21CS048\CN-lab\lab 8\lab8.cnpt

File Edit Options View Tools Extensions Help

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

Simulation Panel

Event List

Time	Time(sec)	Last Device	At Device	Type	Info
8.701	PC0	Switch0	ARP		
8.702	Switch0	PC1	ARP		
8.702	Switch0	PC2	ARP		
8.702	Switch0	PC3	ARP		
8.702	Switch0	Server0	ARP		
8.703	PC1	Switch0	ARP		
8.704	--	Switch0	DTP		
8.704	Switch0	PC0	ARP		
8.704	--	PC0	ICMP		

Reset Simulation Constant Delay Captured to: 8.704 s

Play Controls Back Auto Capture / Play Capture / Forward

PC0

Physical Config Desktop Custom Interface

Command Prompt

```

Packet Tracer PC Command Line 1.0
PC>ipconfig
No ARP Entries Found
PC>ping 10.0.0.10

Pinging 10.0.0.10 with 32 bytes of data:
Reply from 10.0.0.10: bytes=32 time=4ms TTL=128
Reply from 10.0.0.10: bytes=32 time=4ms TTL=128
Reply from 10.0.0.10: bytes=32 time=4ms TTL=128
Reply from 10.0.0.10: bytes=32 time=4ms TTL=128

Ping statistics for 10.0.0.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 4ms, Maximum = 4ms, Average = 4ms

PC>ipconfig
Internet Address    Physical Address    Type
10.0.0.10           0000.baa8.7409      dynamic
  
```

Time: 00:15:05.706 Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward

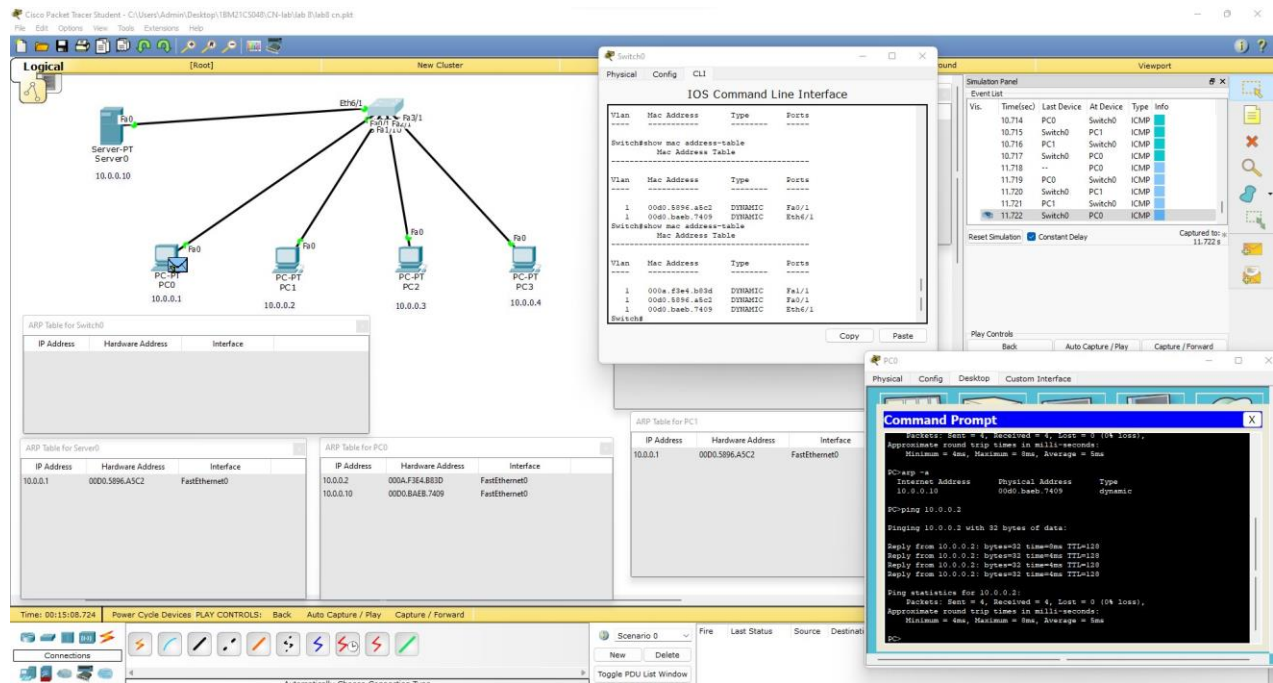
Connections

Automatically Choose Connection Type

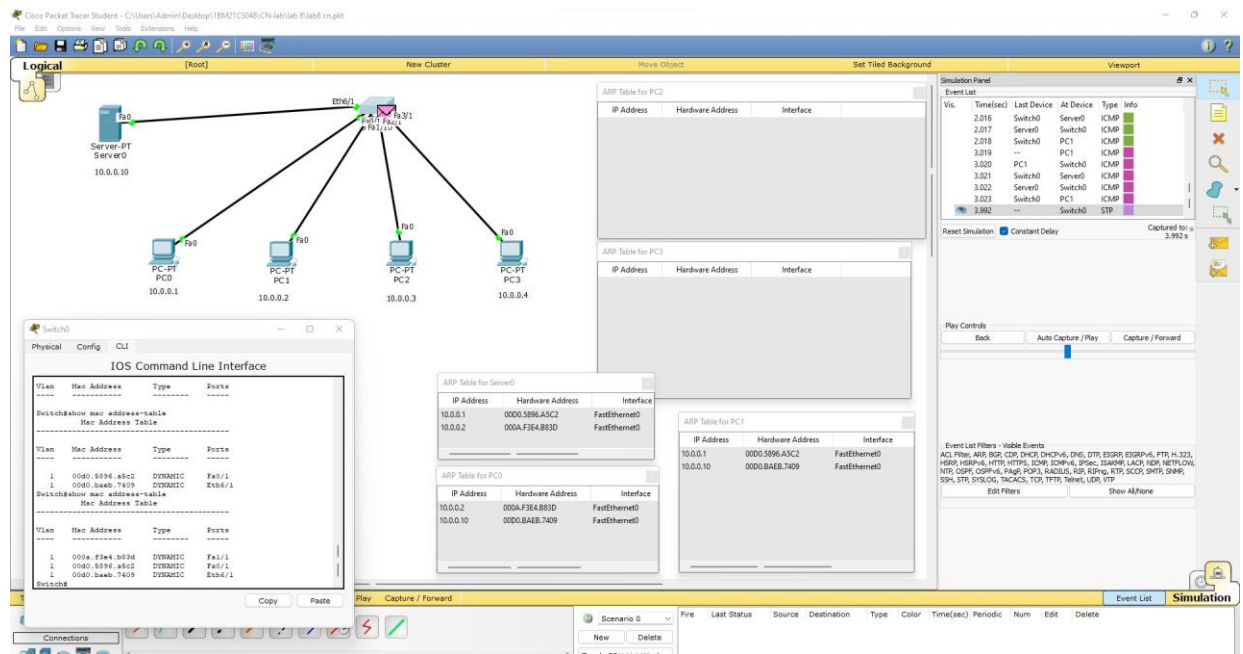
Scenario 0 Fire Last Status Source Destination Type Co

New Delete Toggle PDU List Window





## Final ARP Tables after pinging:

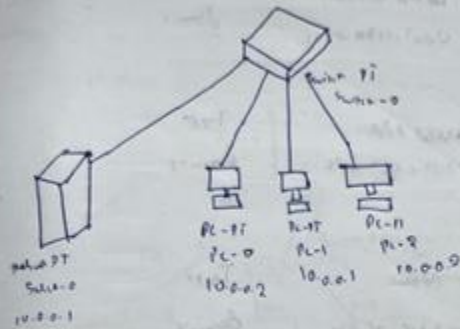




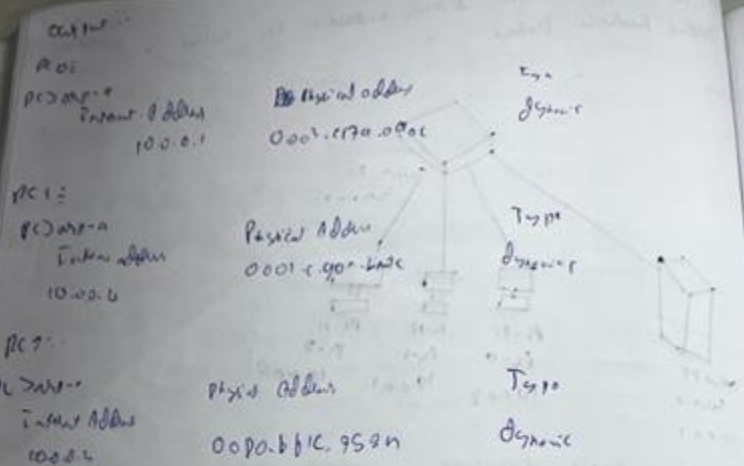




2nd-9  
 Aim: To create a simple LAN network to carry 4 options  
 of Address Resolution Protocol  
 Topology



- Procedure
- Setup topology as shown above
  - Select the interface client option & click on each switch & assign it
  - Select ARP table option & assign IP address for each client
  - Select PC-0 in the desktop CLI mode, `PC>ping 10.0.0.1 (SW-1)`
  - In the simulator on mode 1 you can see the packet request acknowledge from PC to Switch & stop by clicking on the buffer running time.
  - Similarly click PC-1-PC-3 in desktop and `PC>ping 10.0.0.4 (PC-3)`
  - So click the any address for each client click on `capture`
  - `PC>show`



Observation:

IP configuration of router interface ARP address table		
Serial	Hardware Address	Interface
100.0.0.1	00E0.0057.1B.0F	Fast Ethernet 0/24
PC-1		
IP Address	Hardware Address	Interface
10.0.0.1	0003.0070.0001	Fast Ethernet 0/24
PC-2		
IP Address	Hardware Address	Interface
10.0.0.2	0001.0000.0000	Fast Ethernet 0/24
PC-3		
IP Address	Hardware Address	Interface
10.0.0.3	0000.0000.0000	Fast Ethernet 0/24