

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

Observation:

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Lab - 8.

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

Topology:

```

graph TD
    Switch[Switch] --- Server[Server - PT Server 0]
    Switch --- PC0[PC - PT PC 0]
    Switch --- PC1[PC - PT PC 1]
    Switch --- PC2[PC - PT PC 2]
  
```

Procedure:

1. Create a topology of 3 PC's and server.
2. Assign IP address to all devices.
3. connect them through a switch.
4. Using 'inspect' tool to click on PC & server to see ARP table.
5. In command prompt of PC type arp -a.
6. In CLI of switch type `show mac address-table`.
can be given on transaction, you can see a address-table.

Ping Output.

pc> arp -a

Internet Address	Physical Address	Type
10.0.0.1	0001.0904.5457	dynamic.

Switch> show mac address-table.

MAC Address Table.

Vlan	Mac Address	Type	Ports
1	0001.0904.5457	Dynamic	Fa 2/1
1	0001.0904.5457	DYNAMIC	Fa 3/1
1	0009.7c19.7260	DYNAMIC	Fa 1/1
1	00d0.d35a.5b4a	DYNAMIC	Fa 0/1.

Observation:

When we ping one PC and server the address of server is known to PC and vice versa. When we ping between other two PC's similarly the addresses of each other are known. by ARP protocol.

As switch is the common between all, so when you see the mac address table you can see all the PC and server mac addresses.

NP
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Topology:

Cisco Packet Tracer Student

File Edit Options View Tools Extensions Help

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

Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type	Info
0.000	--	PC0	Switch1	ICMP	
0.001	PC0	Switch1	ICMP		
0.002	Switch1	Server0	ICMP		
0.003	Server0	Switch1	ICMP		
0.004	Switch1	PC0	ICMP		

Reset Simulation Constant Delay Captured to: 0.004 s

Play Controls

Back Auto Capture / Play Capture / Forward

Event List Filters - Visible Events

ACL, File, ARP, RST, CDP, DHCP, DHCPv6, DNS, DTP, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPsec, ISAKMP, LACP, NTP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, RADIUS, RDP, RDPv6, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TFTP, Telnet, UDP, VTP

Edit Filters Show All/None

Time: 00:10:04.668 Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward

Connections

Scenario 0

New Delete

Toggle PDU List Window

Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC0	Server0	ICMP		0.000	N	0	(edit)	(delete)

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File Edit Options View Tools Extensions Help

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

Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type	Info
0.006	Switch1	PC2	ARP		
0.006	Switch1	Server0	ARP		
0.007	PC2	Switch1	ARP		
0.008	Switch1	PC1	ARP		
0.008	--	PC1	ICMP		
0.009	PC1	Switch1	ICMP		
0.010	Switch1	PC2	ICMP		
0.011	PC2	Switch1	ICMP		
0.012	Switch1	PC1	ICMP		

Reset Simulation Constant Delay Captured to: 0.012 s

Play Controls

Back Auto Capture / Play Capture / Forward

Event List Filters - Visible Events

ACL, File, ARP, RST, CDP, DHCP, DHCPv6, DNS, DTP, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPsec, ISAKMP, LACP, NTP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, RADIUS, RDP, RDPv6, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TFTP, Telnet, UDP, VTP

Edit Filters Show All/None

Time: 00:10:04.676 Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward

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Scenario 0

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Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC0	Server0	ICMP		0.000	N	0	(edit)	(delete)
	Successful	PC1	PC2	ICMP		0.004	N	1	(edit)	(delete)

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Output:

The image shows a Cisco Packet Tracer simulation of a network. The network topology consists of a central switch (Switch1) connected to a server (Server0) and three PCs (PC1, PC2, PC3). The switch is configured with VLANs and interfaces. The ARP tables for each device are as follows:

ARP Table for Server0

IP Address	Hardware Address	Interface
10.0.0.2	00D0.D35A.3B4A	FastEthernet0

ARP Table for PC1

IP Address	Hardware Address	Interface
10.0.0.1	0001.C90A.5457	FastEthernet0

ARP Table for PC2

IP Address	Hardware Address	Interface
10.0.0.3	0009.7C19.7260	FastEthernet0

ARP Table for PC3

IP Address	Hardware Address	Interface
10.0.0.4	0001.6AA0.9ECB	FastEthernet0

The IOS Command Line Interface window shows the following commands and output:

```
Switch1>enable
Switch1#configure terminal
Switch1(config)#vlan 1
Switch1(config-vlan)#name VLAN1
Switch1(config-vlan)#exit
Switch1(config)#interface FastEthernet0/1
Switch1(config-if)#no shutdown
Switch1(config-if)#exit
Switch1(config)#interface FastEthernet0/2
Switch1(config-if)#no shutdown
Switch1(config-if)#exit
Switch1(config)#interface FastEthernet0/3
Switch1(config-if)#no shutdown
Switch1(config-if)#exit
Switch1(config)#interface FastEthernet0/4
Switch1(config-if)#no shutdown
Switch1(config-if)#exit
Switch1(config)#exit
Switch1#show ip arp
Switch1#show mac address-table
```

The output of the `show ip arp` command is:

Vlan	Mac Address	Type	Port
1	0001.6AA0.9ECB	DYNAMIC	FastEthernet0/1
1	0001.C90A.5457	DYNAMIC	FastEthernet0/2
1	0009.7C19.7260	DYNAMIC	FastEthernet0/3
1	00D0.D35A.3B4A	DYNAMIC	FastEthernet0/4

The output of the `show mac address-table` command is:

Vlan	Mac Address	Type	Port
1	0001.6AA0.9ECB	DYNAMIC	FastEthernet0/1
1	0001.C90A.5457	DYNAMIC	FastEthernet0/2
1	0009.7C19.7260	DYNAMIC	FastEthernet0/3
1	00D0.D35A.3B4A	DYNAMIC	FastEthernet0/4