Packet Tracer - Examine the ARP Table

# Addressing Table

| Device | Interface | MAC Address | Switch Interface |
| --- | --- | --- | --- |
| Router0 | Gg0/0 | 0001.6458.2501 | G0/1 |
| Router0 | S0/0/0 | N/A | N/A |
| Router1 | G0/0 | 00E0.F7B1.8901 | G0/1 |
| Router1 | S0/0/0 | N/A | N/A |
| 10.10.10.2 | Wireless | 0060.2F84.4AB6 | F0/2 |
| 10.10.10.3 | Wireless | 0060.4706.572B | F0/2 |
| 172.16.31.2 | F0 | 000C.85CC.1DA7 | F0/1 |
| 172.16.31.3 | F0 | 0060.7036.2849 | F0/2 |
| 172.16.31.4 | G0 | 0002.1640.8D75 | F0/3 |

1. Blank Line, No additional information

# Objectives

Part 1: Examine an ARP Request

Part 2: Examine a Switch MAC Address Table

Part 3: Examine the ARP Process in Remote Communications

# Background

This activity is optimized for viewing PDUs. The devices are already configured. You will gather PDU information in simulation mode and answer a series of questions about the data you collect.

# Instructions

## Examine an ARP Request

### Generate ARP requests by pinging 172.16.31.3 from 172.16.31.2.

Open a command prompt

* + - 1. Click **172.16.31.2** and open the **Command Prompt**.
      2. Enter the **arp -d** command to clear the ARP table.

Close a command prompt

* + - 1. Enter **Simulation** mode and enter the command **ping 172.16.31.3**. Two PDUs will be generated. The **ping** command cannot complete the ICMP packet without knowing the MAC address of the destination. So the computer sends an ARP broadcast frame to find the MAC address of the destination.
      2. Click **Capture/Forward** once. The ARP PDU moves **Switch1** while the ICMP PDU disappears, waiting for the ARP reply. Open the PDU and record the destination MAC address.

#### Question:

Is this address listed in the table above?

Yes.

DEST ADDR:0060.7036.2849

Type your answers here.

* + - 1. Click **Capture/Forward** to move the PDU to the next device.

#### Question:

How many copies of the PDU did **Switch1** make?

1

Type your answers here.

What is the IP address of the device that accepted the PDU?

172.16.31.3

Type your answers here.

* + - 1. Open the PDU and examine Layer 2.

#### Question:

What happened to the source and destination MAC addresses?

They switched. Source became destination and destination became source.

DEST ADDR:000C.85CC.1DA7-> 172.16.31.2

SRC ADDR:0060.7036.2849 - > 172.16.31.3

Type your answers here.

* + - 1. Click **Capture/Forward** until the PDU returns to **172.16.31.2**.

#### Question:

How many copies of the PDU did the switch make during the ARP reply?

1

here.

### Examine the ARP table.

* + - 1. Note that the ICMP packet reappears. Open the PDU and examine the MAC addresses.

#### Question:

Do the MAC addresses of the source and destination align with their IP addresses?

Yes

* + - 1. Switch back to **Realtime** and the ping completes.
      2. Click **172.16.31.2** and enter the **arp –a** command.

#### Question:

To what IP address does the MAC address entry correspond?

Internet Address Physical Address Type

172.16.31.3 0060.7036.2849 dynamic

Type your answers here.

In general, when does an end device issue an ARP request?

If it needs to know the MAC Adress for a specific IP.

Type your answers here.

## Examine a Switch MAC Address Table

### Generate additional traffic to populate the switch MAC address table.

Open a command prompt

* + - 1. From **172.16.31.2**, enter the ping **172.16.31.4** command.
      2. Click **10.10.10.**2 and open the **Command Prompt**.
      3. Enter the **ping 10.10.10.3** command.

#### Question:

How many replies were sent and received?Type your answers here.

All pings were successful – 4 pings.

Close a command prompt

### Examine the MAC address table on the switches.

* + - 1. Click **Switch1**and then the **CLI** tab. Enter the **show mac-address-table** command.

#### Question:

Do the entries correspond to those in the table above?

Yes.

Vlan Mac Address Type Ports

---- ----------- -------- -----

1 0002.1640.8d75 DYNAMIC Fa0/3

1 000c.85cc.1da7 DYNAMIC Fa0/1

1 0060.7036.2849 DYNAMIC Fa0/2

1 00e0.f7b1.8901 DYNAMIC Gig0/1

* + - 1. Click **Switch0**, then the **CLI** tab. Enter the **show mac-address-table** command.

#### Questions:

Do the entries correspond to those in the table above?

Yes

Vlan Mac Address Type Ports

---- ----------- -------- -----

1 0001.6458.2501 DYNAMIC Gig0/1

1 0060.2f84.4ab6 DYNAMIC Fa0/2

1 0060.4706.572b DYNAMIC Fa0/2

Type your answers here.

Why are two MAC addresses associated with one port?

Because both laptops are using access point (Wireless Interface) that is connected to F0/2 on Switch0

Type your answers here.

## Examine the ARP Process in Remote Communications

### Generate traffic to produce ARP traffic.

Open a command prompt

* + - 1. Click **172.16.31.2** and open the **Command Prompt**.
      2. Enter the **ping 10.10.10.1** command.
      3. Type **arp –a**.

#### Question:

What is the IP address of the new ARP table entry?

Internet Address Physical Address Type

172.16.31.1 00e0.f7b1.8901 dynamic

172.16.31.3 0060.7036.2849 dynamic

172.16.31.4 0002.1640.8d75 dynamic

Type your answers here.

* + - 1. Enter **arp -d** to clear the ARP table and switch to **Simulation** mode.
      2. Repeat the ping to 10.10.10.1.

#### Question:

How many PDUs appear?

2 PDU: ARP and ICMP

Type your answers here.

Close a command prompt

* + - 1. Click **Capture/Forward**. Click the PDU that is now at **Switch1**.

#### Question:

What is the target destination IP destination address of the ARP request?

TARGET IP:172.16.31.1

Type your answers here.

* + - 1. The destination IP address is not 10.10.10.1.

#### Question:

Why?

Because since it is a remote host the PDU will sent to Default gateway (Router1) IP instead.

Type your answers here.

### Examine the ARP table on Router1.

* + - 1. Switch to **Realtime** mode. Click **Router1** and then the **CLI** tab.
      2. Enter privileged EXEC mode and then the **show mac-address-table** command.

#### Question:

How many MAC addresses are in the table? Why?

There is no MAC Address

Type your answers here.

* + - 1. Enter the **show arp** command.

#### Questions:

Is there an entry for **172.16.31.2**?

Yes.

Protocol Address Age (min) Hardware Addr Type Interface

Internet 172.16.31.1 - 00E0.F7B1.8901 ARPA GigabitEthernet0/0

Internet 172.16.31.2 11 000C.85CC.1DA7 ARPA GigabitEthernet0/0

Type your answers here.

What happens to the first ping in a situation where the router responds to the ARP request?

If the ARP cache has the information already the first ping will be successful.

In case the ARP table has no information the first ping is discarded because there is no MAC address associated with the IP. So first they need the arp request answered so the ping can be successful.Type your answers here.

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