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 |

# 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?

NoType 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?

Two copies (three total PDUs)Type your answers here.

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

172.16.31.3Type your answers here.

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

#### Question:

What happened to the source and destination MAC addresses?

The source MAC address changed to the MAC address of the receiver of the ARP request (device 172.16.31.3). The destination MAC address changed to the MAC address of the original client that sent the ARP request (device 172.16.31.2)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?

None, there is only the one PDU.Type your answers 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?

YesType your answers here.

* + - 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?

172.16.31.3Type your answers here.

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

A device will issue an ARP request when the device does not have the MAC address of the IP address the device is trying to communicate with in its ARP cache.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?

4 and 4Type your answers here.

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?

YesType your answers here.

* + - 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?

YesType your answers here.

Why are two MAC addresses associated with one port?

The port is a wireless interface, so multiple devices can access the same port.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?

172.16.31.1Type 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?

2Type 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?

172.16.31.1Type your answers here.

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

#### Question:

Why?

***When a target IP address is not on the same network, the target IP address is set to the default gateway and the ARP process is used to find the receiver’s MAC address.***

### 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?

***None, because a router uses an ARP table for routing while a switch uses a MAC table for switching.***

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

#### Questions:

Is there an entry for **172.16.31.2**?

YesType your answers here.

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

It appears as a lost frame in the ping output, but it was really utilized to send the ARP request and is functioning normally.Type your answers here.

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