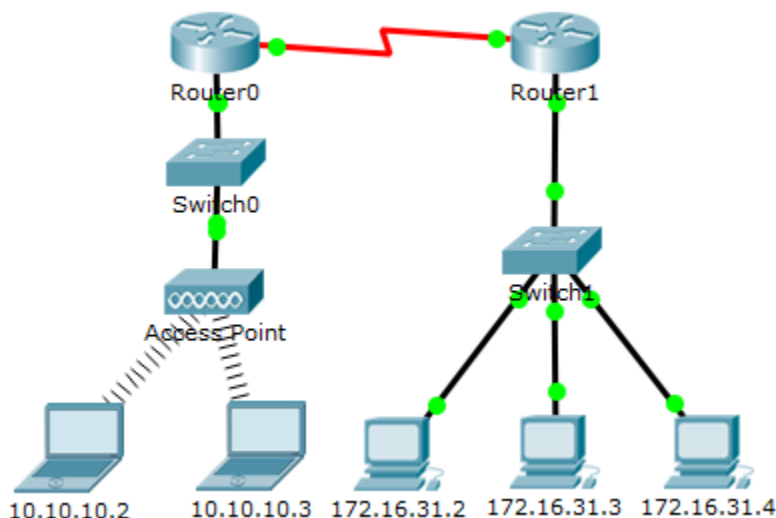


# Packet Tracer - Examine the ARP Table

## Topology



## Addressing Table

Device	Interface	MAC Address	Switch Interface
Router0	Gg0/0	0001.6458.2501	G0/1
	S0/0/0	N/A	N/A
Router1	G0/0	00E0.F7B1.8901	G0/1
	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.

## Part 1: Examine an ARP Request

### Step 1: Generate ARP requests by pinging 172.16.31.3 from 172.16.31.2.

- Click **172.16.31.2** and open the **Command Prompt**.
- Enter the **arp -d** command to clear the ARP table.
- 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.
- 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. Is this address listed in the table above?
- Click **Capture/Forward** to move the PDU to the next device. How many copies of the PDU did **Switch1** make?
- What is the IP address of the device that accepted the PDU?
- Open the PDU and examine Layer 2. What happened to the source and destination MAC addresses?
- Click **Capture/Forward** until the PDU returns to **172.16.31.2**. How many copies of the PDU did the switch make during the ARP reply?

### Step 2: Examine the ARP table.

- Note that the ICMP packet reappears. Open the PDU and examine the MAC addresses. Do the MAC addresses of the source and destination align with their IP addresses?
- Switch back to **Realtime** and the ping completes.
- Click **172.16.31.2** and enter the **arp -a** command. To what IP address does the MAC address entry correspond?
- In general, when does an end device issue an ARP request?

## Part 2: Examine a Switch MAC Address Table

### Step 1: Generate additional traffic to populate the switch MAC address table.

- From **172.16.31.2**, enter the **ping 172.16.31.4** command.
- Click **10.10.10.2** and open the **Command Prompt**.
- Enter the **ping 10.10.10.3** command. How many replies were sent and received?

### Step 2: Examine the MAC address table on the switches.

- Click **Switch1** and then the **CLI** tab. Enter the **show mac-address-table** command. Do the entries correspond to those in the table above?
- Click **Switch0**, then the **CLI** tab. Enter the **show mac-address-table** command. Do the entries correspond to those in the table above?
- Why are two MAC addresses associated with one port?

## Part 3: Examine the ARP Process in Remote Communications

### Step 1: Generate traffic to produce ARP traffic.

- a. Click **172.16.31.2** and open the **Command Prompt**.
- b. Enter the **ping 10.10.10.1** command.
- c. Type **arp -a**. What is the IP address of the new ARP table entry?
- d. Enter **arp -d** to clear the ARP table and switch to **Simulation** mode.
- e. Repeat the ping to 10.10.10.1. How many PDUs appear?
- f. Click **Capture/Forward**. Click the PDU that is now at **Switch1**. What is the target destination IP destination address of the ARP request?
- g. The destination IP address is not 10.10.10.1. Why?

### Step 2: Examine the ARP table on Router1.

- a. Switch to **Realtime** mode. Click **Router1** and then the **CLI** tab.
- b. Enter privileged EXEC mode and then the **show mac-address-table** command. How many MAC addresses are in the table? Why?
- c. Enter the **show arp** command. Is there an entry for **172.16.31.2**?  
What happens to the first ping in a situation where the router responds to the ARP request?

## Suggested Scoring Rubric

Activity Section	Question Location	Possible Points	Earned Points
Part 1: Examine an ARP Request	Step 1	10	
	Step 2	15	
<b>Part 1 Total</b>		<b>25</b>	
Part 2: Examine a Switch MAC Address Table	Step 1	5	
	Step 2	20	
<b>Part 2 Total</b>		<b>25</b>	
Part 3: Examine the ARP Process in Remote Communications	Step 1	25	
	Step 2	25	
<b>Part 3 Total</b>		<b>50</b>	
<b>Total Score</b>		<b>100</b>	