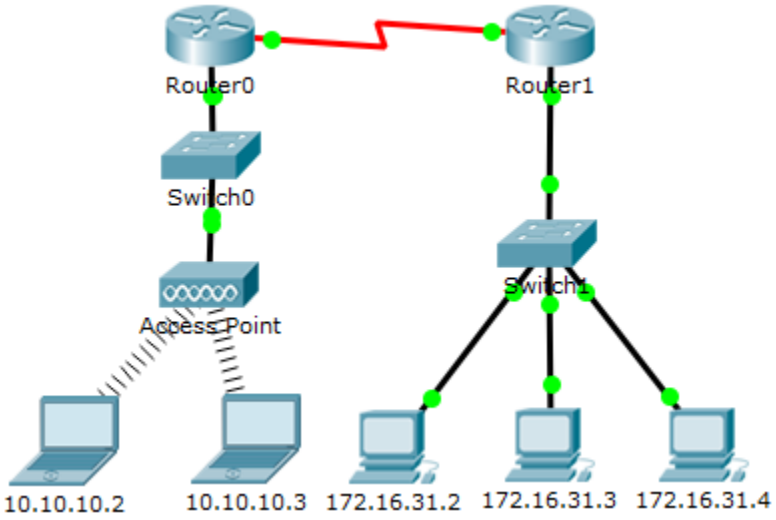
Packet Tracer - Examine the ARP Table

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.

a. Click **172.16.31.2** and open the **Command Prompt**.

b. Enter the **arp -d** command to clear the ARP table.

c. 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.

d. 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? No

e. Click **Capture/Forward** to move the PDU to the next device. How many copies of the PDU did **Switch1** make? 3

f. What is the IP address of the device that accepted the PDU? 172.16.31.3

g. Open the PDU and examine Layer 2. What happened to the source and destination MAC addresses?
The source became the destination, FFFF.FFFF.FFFF turned into MAC address of 172.16.31.3

h. 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? 1

Step 2: Examine the ARP table.

a. 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? Yes

b. Switch back to **Realtime** and the ping completes.

c. Click **172.16.31.2** and enter the **arp –a** command. To what IP address does the MAC address entry correspond? 172.16.31.3

d. In general, when does an end device issue an ARP request?
When it does not know the receiver's MAC address

Part 2: Examine a Switch MAC Address Table

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

a. From **172.16.31.2**, enter the **ping 172.16.31.4** command.

b. Click **10.10.10.2** and open the **Command Prompt**.

c. Enter the **ping 10.10.10.3** command. How many replies were sent and received? 4 sent and 4 recieved

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

a. Click **Switch1**and then the **CLI** tab. Enter the **show mac-address-table** command. Do the entries correspond to those in the table above? Yes

b. Click **Switch0**, then the **CLI** tab. Enter the **show mac-address-table** command. Do the entries correspond to those in the table above? Yes

c. Why are two MAC addresses associated with one port?
Because both devices connect to one port through the access point

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? 172.16.31.1

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? 2

f. Click **Capture/Forward**. Click the PDU that is now at **Switch1**. What is the target destination IP destination address of the ARP request? 172.16.31.1

g. The destination IP address is not 10.10.10.1. Why?
If the receiving host is not on the same network, the source uses the ARP process to determine a MAC address for the router interface serving as the gateway. The gatway address of the router interface is stored in the IPV4 configuration of the hosts.

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?
None, because this command means something differently than the switch command show mac address-table

c. Enter the **show arp** command. Is there an entry for **172.16.31.2**? Yes

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

Suggested Scoring Rubric

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