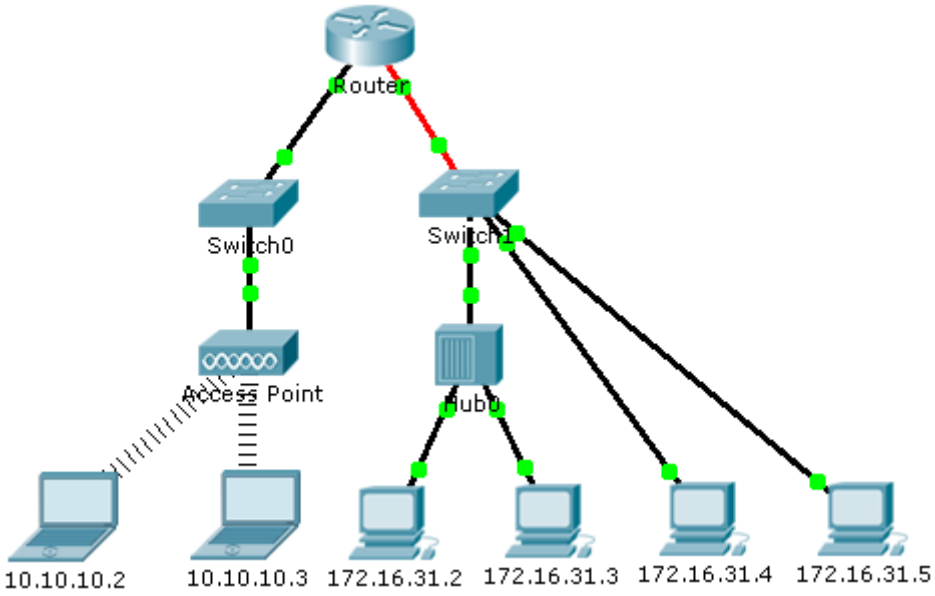
Packet Tracer - Identify MAC and IP Addresses

Topology



Objectives

Part 1: Gather PDU Information

Part 2: Reflection Questions

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: Gather PDU Information

Note: Review the Reflection Questions in Part 2 before proceeding with Part 1. It will give you an idea of the types of information you will need to gather.

Step 1: Gather PDU information as a packet travels from 172.16.31.2 to 10.10.10.3.

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

b. Enter the **ping 10.10.10.3** command.

c. Switch to simulation mode and repeat the **ping 10.10.10.3** command. A PDU appears next to **172.16.31.2**.

d. Click the PDU and note the following information from the **Outbound PDU Layer** tab:

- Destination MAC Address: 00D0:BA8E:741A
- Source MAC Address: 000C:85CC:1DA7
- Source IP Address: 172.16.31.2
- Destination IP Address: 10.10.10.3

- At Device: Computer

e. Click **Capture / Forward** to move the PDU to the next device. Gather the same information from Step 1d. Repeat this process until the PDU reaches its destination. Record the PDU information you gathered into a spreadsheet using a format like the table shown below:

Example Spreadsheet Format

Test	At Device	Dest. MAC	Src MAC	Src IPv4	Dest IPv4
Ping from 172.16.31.2 to 10.10.10.3	172.16.31.2	00D0:BA8E:741A	000C:85CC:1DA7	172.16.31.2	10.10.10.3
	Hub	--	--	--	--
	Switch1	00D0:BA8E:741A	000C:85CC:1DA7	--	--
	Router	0060:4706:572B	00D0:588C:2401	172.16.31.2	10.10.10.3
	Switch0	0060:4706:572B	00D0:588C:2401	--	--
	Access Point	--	--	--	--
	10.10.10.3	0060:4706:572B	00D0:588C:2401	172.16.31.2	10.10.10.3

Step 2: Gather additional PDU information from other pings.

Repeat the process in Step 1 and gather the information for the following tests:

- Ping 10.10.10.2 from 10.10.10.3.
- Ping 172.16.31.2 from 172.16.31.3.
- Ping 172.16.31.4 from 172.16.31.5.
- Ping 172.16.31.4 from 10.10.10.2.
- Ping 172.16.31.3 from 10.10.10.2.

Why does the Access Point send a second packet back to 10.10.10.2 and 10.10.10.3?

Part 2: Reflection Questions

Answer the following questions regarding the captured data:

1. Were there different types of wires used to connect devices? Yes. Copper and Serial
2. Did the wires change the handling of the PDU in any way? No. (Should they?)
3. Did the **Hub** lose any of the information given to it? I don't think so. How do you know?
4. What does the **Hub** do with MAC addresses and IP addresses? No. used for connecting multiple Ethernet devices to act as a single network segment
5. Did the wireless **Access Point** do anything with the information given to it?
   It sent it back to the connected PCs. (Why?) It repackaged it as wireless 802.11 / wireless data transfer
6. Was any MAC or IP address lost during the wireless transfer? No. Addresses shouldn't be. Why ask? Is this possible?
7. What was the highest OSI layer that the **Hub** and **Access Point** used? Layer 1
8. Did the **Hub** or **Access Point** ever replicate a PDU that was rejected with a red “X”? Yes
9. When examining the **PDU Details** tab, which MAC address appeared first, the source or the destination?
   Destination

10. Why would the MAC addresses appear in this order?

    A switch sends to MAC address quicker if the destination is listed first

11. Was there a pattern to the MAC addressing in the simulation? No. Should there be?

12. Did the switches ever replicate a PDU that was rejected with a red "X"? No. Would this happen?

13. Every time that the PDU was sent between the 10 network and the 172 network, there was a point where the MAC addresses suddenly changed. Where did that occur?

    At the router.

14. Which device uses MAC addresses starting with 00D0? The router

15. To what devices did the other MAC addresses belong?

    PCs - sending and receiving

16. Did the sending and receiving IPv4 addresses switch in any of the PDUs? No

17. If you follow the reply to a ping, sometimes called a *pong*, do the sending and receiving IPv4 addresses switch? Yes, they swap around when the destination replies: Destination becomes source for reply and vice-versa.

18. What is the pattern to the IPv4 addressing in this simulation?

    Each port of a router requires unique IP addresses

19. Why do different IP networks need to be assigned to different ports of a router?

    To ensure that data is routed to the correct device within the network according to the router's address table.

20. If this simulation was configured with IPv6 instead of IPv4, what would be different?

Suggested Scoring Rubric

There are 20 questions worth 5 points each for a possible score of 100.