Packet Tracer - Identify MAC and IP Addresses

# Objectives

Part 1: Gather PDU Information for Local Network Communication

Part 2: Gather PDU Information for Remote Network Communication

# 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

## Gather PDU Information for Local Network Communication

**Note**: Review the Reflection Questions in Part 3 before proceeding with Part 1. It will give you an idea of the type of information you will need to gather PDU information as a packet travels from 172.16.31.5 to 172.16.31.2.

* + - 1. Click **172.16.31.5** and open the **Command Prompt**.
      2. Enter the **ping 172.16.31.2** command.
      3. Switch to simulation mode and repeat the **ping 172.16.31.2** command. A PDU appears next to **172.16.31.5**.
      4. Click the PDU and note the following information from the **OSI Model** and **Outbound PDU Layer** tabs:
* Destination MAC Address: **000C:85CC:1DA7**
* Source MAC Address: **00D0:D311:C788**
* Source IP Address: **172.16.31.5**
* Destination IP Address: **172.16.31.2**
* At Device: **172.16.31.5**
  + - 1. Click **Capture / Forward (the right arrow followed by a vertical bar)** 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

| At Device | Dest. MAC | Src MAC | Src IPv4 | Dest IPv4 |
| --- | --- | --- | --- | --- |
| 172.16.31.5 | 000C:85CC:1DA7 | 00D0:D311:C788 | 172.16.31.5 | 172.16.31.2 |
| Switch1 | 000C:85CC:1DA7 | 00D0:D311:C788 | N/A | N/A |
| Hub | N/A | N/A | N/A | N/A |
| 172.16.31.2 | 00D0:D311:C788 | 000C:85CC:1DA7 | 172.16.31.2 | 172.16.31.5 |

### Gather additional PDU information from other pings.

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

* Ping 172.16.31.2 from 172.16.31.3.
* Ping 172.16.31.4 from 172.16.31.5.

Return to Realtime mode.

## Gather PDU Information for Remote Network Communication

In order to communicate with remote networks, a gateway device is necessary. Study the process that takes place to communicate with devices on the remote network. Pay close attention to the MAC addresses used.

### Gather PDU information as a packet travels from 172.16.31.5 to 10.10.10.2.

* + - 1. Click **172.16.31.5** and open the **Command Prompt**.
      2. Enter the **ping 10.10.10.2** command.
      3. Switch to simulation mode and repeat the **ping 10.10.10.2** command. A PDU appears next to **172.16.31.5**.
      4. Click the PDU and note the following information from the **Outbound PDU Layer** tab:
* Destination MAC Address: 00D0:BA8E:741A
* Source MAC Address: 00D0:D311:C788
* Source IP Address: 172.16.31.5
* Destination IP Address: 10.10.10.2
* At Device: 172.16.31.5

#### Question:

What device has the destination MAC that is shown?

Routeryour answers here.

* + - 1. Click **Capture / Forward (the right arrow followed by a vertical bar)** 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 from pinging 172.16.31.5 to 10.10.10.2 into a spreadsheet using a format like the sample table shown below:

| At Device | Dest. MAC | Src MAC | Src IPv4 | Dest IPv4 |
| --- | --- | --- | --- | --- |
| 172.16.31.5 | 00D0:BA8E:741A | 00D0:D311:C788 | 172.16.31.5 | 10.10.10.2 |
| Switch1 | 00D0:BA8E:741A | 00D0:D311:C788 | N/A | N/A |
| Router | 0060:2F84:4AB6 | 00D0:588C:2401 | 172.16.31.5 | 10.10.10.2 |
| Switch0 | 0060:2F84:4AB6 | 00D0:588C:2401 | N/A | N/A |
| Access Point | N/A | N/A | N/A | N/A |
| 10.10.10.2 | 00D0:588C:2401 | 0060:2F84:4AB6 | 10.10.10.2 | 172.16.31.5 |

## Reflection Questions

Answer the following questions regarding the captured data:

* 1. Were there different types of cables/media used to connect devices?

Yes, copper and fiber answers here.

* 1. Did the cables change the handling of the PDU in any way?

Yes, there is a different Data Link layer PDU for ethernet and WiFi. Type your answers here.

* 1. Did the **Hub** lose any of the information that it received?

*No*

* 1. What does the **Hub** do with MAC addresses and IP addresses?

Ignores them and forwards the PDU out all portsType your answers here.

* 1. Did the wireless **Access Point** do anything with the information given to it?

Yes, it re-encapsulated the packet as 802.11 instead of Ethernet Type your answers here.

* 1. Was any MAC or IP address lost during the wireless transfer?

NoType your answers here.

* 1. What was the highest OSI layer that the **Hub** and **Access Point** used?

Layer 1, however I am surprised the access point isn’t considered to use Layer 2 in order to repackage it. I suppose it just strips the Layer 2 frame and reframes it without actually using the data in the Layer 2 frame, hence the access point only using Layer 1?

* 1. Did the **Hub** or **Access Point** ever replicate a PDU that was rejected with a red “X”?

YesType your answers here.

* 1. When examining the **PDU Details** tab, which MAC address appeared first, the source or the destination?

DestinationType your answers here.

* 1. Why would the MAC addresses appear in this order?

*The device processing the packet won’t have to look as far (process as much of the packet) in order to forward the packet onto the next MAC destination. It is quicker this way.*

* 1. Was there a pattern to the MAC addressing in the simulation?

NoType your answers here.

* 1. Did the switches ever replicate a PDU that was rejected with a red “X”?

NoType your answers here.

* 1. 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 routerType your answers here.

* 1. Which device uses MAC addresses that start with 00D0:BA?

RouterType your answers here.

* 1. What devices did the other MAC addresses belong to?

***The devices sending and receiving the ping***

* 1. Did the sending and receiving IPv4 addresses change fields in any of the PDUs?

NoType your answers here.

* 1. When you follow the reply to a ping, sometimes called a *pong*, do you see the sending and receiving IPv4 addresses switch?

YesType your answers here.

* 1. What is the pattern to the IPv4 addressing used in this simulation?

Every router port needs a unique set of IP addresses.e your answers here.

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

So that the router knows which port(s) to forward the packets to in order to send the packet to the correct network.your answers here.

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

***The source and destination IPs would be IPv6 addresses instead of IPv4 addresses.***