

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

**Part 1: 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.

1. 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**
2. 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 |
|  |  |  |  |  |

## Step 2: 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.

# Part 2: 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.

## Step 1: 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.

1. 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

What device has the destination MAC that is shown?

Answer: It’s router’s mac address.

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?

Answer: Yes, we used wireless and copper twisted pair cables to connect devices.

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

Answer: The cables didn’t change but the type of media was changed from ethernet to wirless.

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

Answer: Yes, in PDU packet we see that there is only one OSI model used it’s only physical layer.

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

Answer: It does nothing, it just repeats all the signals to the all ports except incoming port.

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

Answer: It converted from ethernet to wireless frame.

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

Answer: No

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

Answer: Physical Layer

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

Answer: No, it transmitted to the all devices that connected to them.

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

Answer: The destination MAC address.

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

Answer: Because a device firstly needs to know to which device send the packet.

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

Answer: When pinging device from different network the destination MAC address becomes router’s MAC address, and if the ping in the local network the source MAC address is the MAC address of to which device ping was sent.

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

Answer: No.

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?

Answer: At router, it replaces source MAC address with its MAC address.

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

Answer: Router’s interface that connected to 172.16.31.0 network.

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

Answer:

00D0:D311:C788 (PC 172.16.31.5)

000C:85CC:1DA7 (PC 172.16.31.2)

0060:2F84:4AB6(Router interface on 10.10.10.0 network)

00D0:588C:2401(Device 10.10.10.2)

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

Answer: No, Ip addresses remained the same.

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

Answer: Yes, the source IP becomes destination IP and vise versa.

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

Answer: 172.16.31.0 its’s local network and 10.10.10 wireless network

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

Answer: Because it has to forward packages between different networks and it will have only one IP address it won’t work.

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

Answer: Instead of Arp we would use NDP and link local addresses also would be used.