Mohawk College
Electrical and Computer Engineering Technology
CYBR10005
Communication and Network Security
Lab/Activity 1-2
PDU Simulation and Analysis

Name: ID:

Background

In networking, Protocol Data Units (PDUs) are the specific units of data that are used to transport information across networks. They are an important aspect of networking protocols, such as the OSI model, where they represent the different data layers.

In this activity, the devices in the simulated network have already been configured, allowing you to focus on gathering PDU information in simulation mode. Once you have collected this information, you will be asked to answer a series of questions about your collected data. This will help you understand how PDUs are used in a network and how they can troubleshoot issues that may arise. Through this activity, you will gain a deeper understanding of the role of PDUs in networking and how to analyze them effectively.
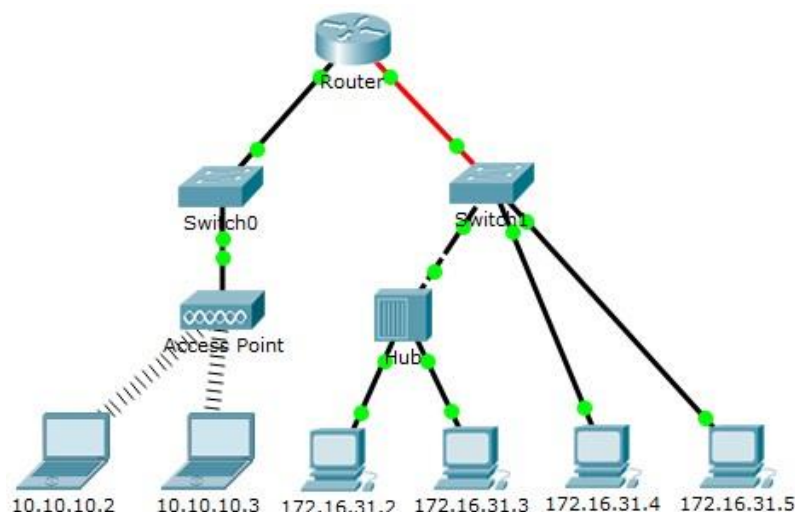
Objective

1. To understand and troubleshoot network issues using simulation-based PDU analysis activity.

Tools and Preparation

1. You will need a computer, and Cisco Packet Tracer installed on your computer.

Topology

Part 1: Gather PDU Information

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

Step 1: Gather PDU information as the 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:

Test	At Device	Destination MAC	Source MAC	Source IPv4	Destination 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.

a. 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.

Test	At Device	Destination MAC	Source MAC	Source IPv4	Destination IPv4

Test	At Device	Destination MAC	Source MAC	Source IPv4	Destination IPv4

Test	At Device	Destination MAC	Source MAC	Source IPv4	Destination IPv4

Test	At Device	Destination MAC	Source MAC	Source IPv4	Destination IPv4

Test	At Device	Destination MAC	Source MAC	Source IPv4	Destination IPv4

Part 2: Reflection Questions

Answer the following questions:

1. Were there different types of communication channels used to connect devices? If yes, then what?

2. What version of IP was mentioned in the IP header?

3. Did the **Hub** drop any of the PDU data that was provided to it?

4. When pinging from 172.16.31.2 to 10.10.10.3, what happened to the PDU at 172.16.31.3?

5. What did **Switch1** do with the PDU when pinging from 172.16.31.2 to 10.10.10.3?

6. When pinging from 172.16.31.2 to 10.10.10.3, what happened to the PDU at 172.16.31.3?

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7. What did the wireless **Access Point** do with the MAC addresses in the PDU? information given to it?

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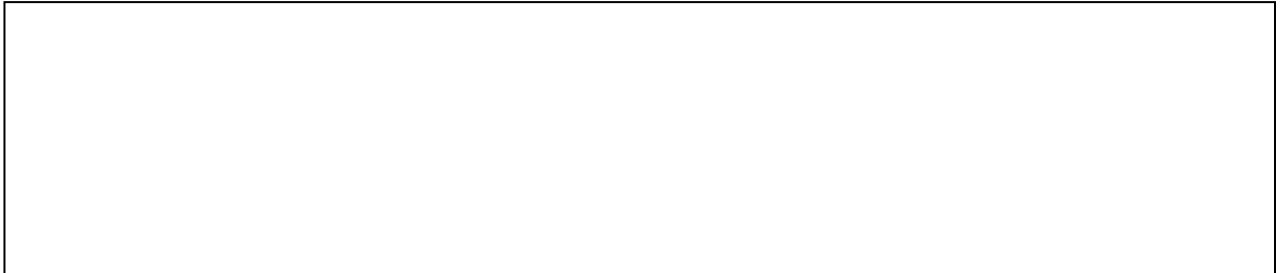
8. Is there any significant difference between Wi-Fi frames compared to Ethernet frames?

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9. Has the **Hub** or **Access Point** retransmitted a PDU marked with a red "X" indicating rejection?

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10. When examining the PDU Details, the destination MAC address appeared first. Why would the MAC addresses appear in this order?

11. Each time a PDU was sent between the 10 and 172 networks, the MAC addresses suddenly changed; where did that occur?

12. Why does the **Router** have two different IP addresses?