

Ex. No: 6 Identifying MAC and IP Addresses Using Packet Tracer

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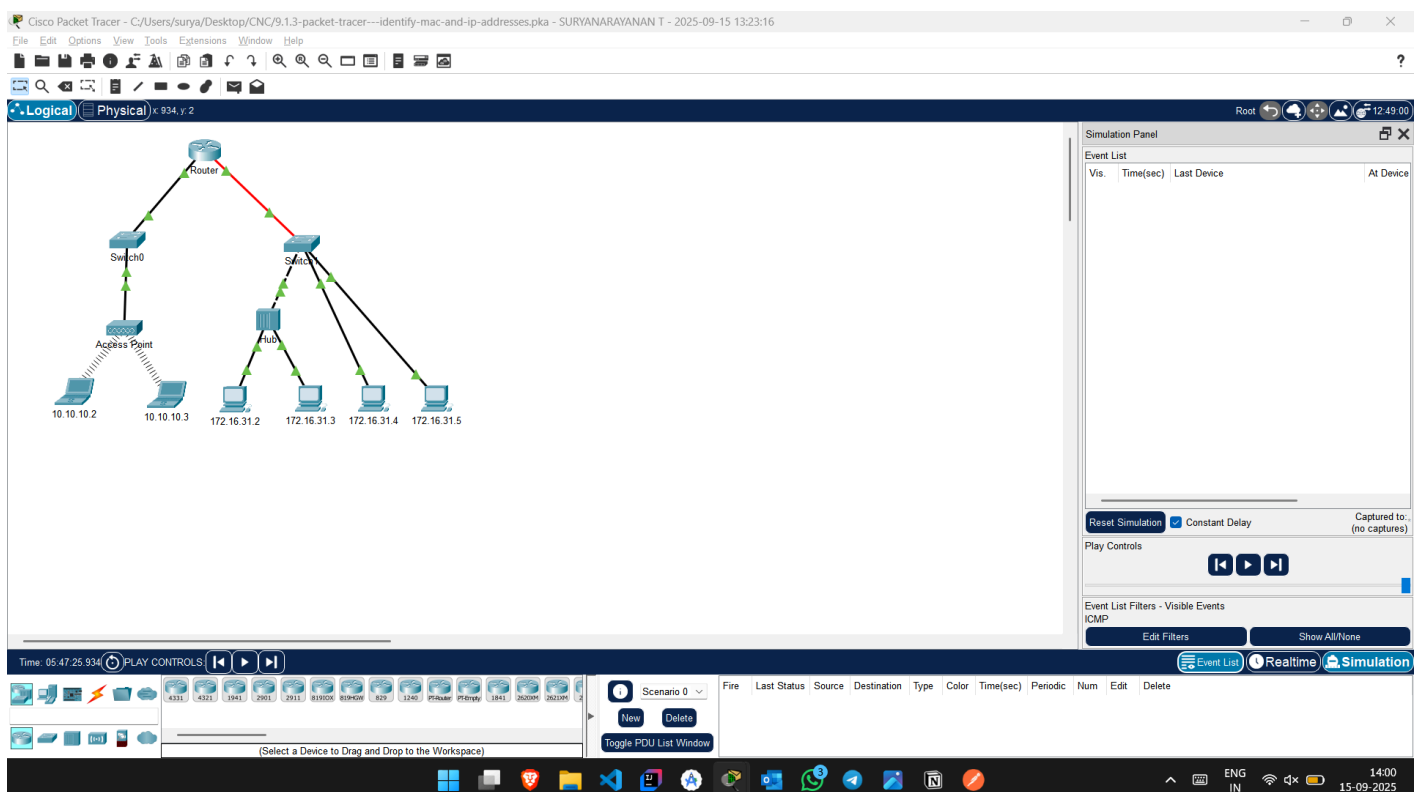
Objective

To use Cisco Packet Tracer simulation mode to capture and analyze MAC and IP address information for both local and remote network communication.

Apparatus/Tools Required

- Cisco Packet Tracer
- Pre-configured network topology (as provided in the activity file)
- PCs, switches, router, hub, and wireless access point (as per given setup)

Network Topology Diagram



Description:

- The topology contains a local network (172.16.31.0/24) connected to a remote network (10.10.10.0/24) via a router.
 - Devices include PCs, switches, hub, and wireless AP.
- (Insert screenshot of your Packet Tracer setup here)

IP Addressing Table

(Example – actual values from simulation)

Device	IPv4 Address	Subnet Mask	MAC Address
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PC-A	172.16.31.5	255.255.255.0	00D0:D311:C788
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PC-B	172.16.31.2	255.255.255.0	000C:85CC:1DA7
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Router (G0/0)	172.16.31.1	255.255.255.0	00D0:BA8E:741A
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PC-Remote	10.10.10.2	255.255.255.0	00D0:588C:2401
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Procedure

Part 1: Local Network Communication

1. Click PC-A (172.16.31.5) and open the Command Prompt.
2. Enter ping 172.16.31.2.
3. Switch to Simulation Mode and repeat the ping.
4. When the PDU appears, click it and record: Destination MAC, Source MAC, Source IP, Destination IP, and the device name.
5. Use Capture/Forward to follow the PDU through the network until it reaches PC-B.
6. Record the information in a table.
7. Repeat the above process for:
 - o Ping from 172.16.31.3 to 172.16.31.2
 - o Ping from 172.16.31.5 to 172.16.31.4
- Part 2: Remote Network Communication
8. From PC-A (172.16.31.5), enter ping 10.10.10.2.
9. Switch to Simulation Mode and repeat the ping.
10. When the PDU appears, note the Destination MAC, Source MAC, Source IP, and Destination IP.
11. Follow the PDU step-by-step until it reaches the remote PC.
12. Observe how MAC addresses change at the router while IP addresses remain constant end-to-end.

Example Data Recording Table

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
172.16.31.2	00D0:D311:C788	000C:85CC:1DA7	172.16.31.2	172.16.31.5

Output (Screenshots)

• PDU details for local communication

At 172.16.31.2

The screenshot shows a network topology in Cisco Packet Tracer. A Router is connected to Switch0 and Switch1. Switch0 is connected to an Access Point, which is connected to two PCs (10.10.10.2 and 10.10.10.3). Switch1 is connected to a Hub, which is connected to three PCs (172.16.31.2, 172.16.31.3, and 172.16.31.4). The PDU Information window is open for device 172.16.31.5, showing the following details:

PDU Information at Device: 172.16.31.5

OSI Model Inbound PDU Details

At Device: 172.16.31.5
Source: 172.16.31.5
Destination: 172.16.31.2

In Layers

- Layer7
- Layer6
- Layer5
- Layer4
- Layer3: IP Header Src. IP: 172.16.31.2, Dest. IP: 172.16.31.5 ICMP Message Type: 0
- Layer2: Ethernet II Header 000C.85CC.IDA7 >> 00D0.D311.C788
- Layer1: Port GigabitEthernet0**

Out Layers

- Layer7
- Layer6
- Layer5
- Layer4
- Layer3
- Layer2
- Layer1

1. GigabitEthernet0 receives the frame.

The Event List on the right shows the following events:

Vis.	Time(sec)	Last Device
	1652.476	172.16.31.5
	1652.477	Switch1
	1652.478	Hub
	1652.478	Hub
	1652.479	172.16.31.2
	1652.480	Hub
	1652.480	Hub
	1652.481	Switch1
	1653.482	--
	1653.483	172.16.31.5
	1653.484	Switch1
	1653.485	Hub
	1653.485	Hub
	1653.486	172.16.31.2
	1653.487	Hub
	1653.487	Hub
	1653.488	Switch1

At 172.16.31.3

The screenshot shows the same network topology as above. The PDU Information window is open for device 172.16.31.3, showing the following details:

PDU Information at Device: 172.16.31.3

OSI Model Inbound PDU Details

At Device: 172.16.31.3
Source: 172.16.31.3
Destination: 172.16.31.2

In Layers

- Layer7
- Layer6
- Layer5
- Layer4
- Layer3: IP Header Src. IP: 172.16.31.2, Dest. IP: 172.16.31.3 ICMP Message Type: 0
- Layer2: Ethernet II Header 000C.85CC.IDA7 >> 0060.7036.2849
- Layer1: Port FastEthernet0**

Out Layers

- Layer7
- Layer6
- Layer5
- Layer4
- Layer3
- Layer2
- Layer1

1. FastEthernet0 receives the frame.

The Event List on the right shows the following events:

Vis.	Time(sec)	Last Device
	1.011	172.16.31.2
	1.012	Hub
	1.012	Hub
	2.016	--
	2.017	172.16.31.3
	2.018	Hub
	2.018	Hub
	2.019	172.16.31.2
	2.020	Hub
	2.020	Hub
	3.021	--
	3.022	172.16.31.3
	3.023	Hub
	3.023	Hub
	3.024	172.16.31.2
	3.025	Hub
	3.025	Hub

AT 172.16.31.4

The screenshot shows a Cisco Packet Tracer workspace with a network topology. A Router is connected to two Switches (Switch0 and Switch1). Switch0 is connected to an Access Point, which is connected to a laptop with IP 10.10.10.2. Switch1 is connected to a Hub, which is connected to three laptops with IP addresses 172.16.31.2, 172.16.31.3, and 172.16.31.4. A PDU Information window is open, showing details for a packet at device 172.16.31.5. The packet is an ICMP Echo Request (ping) from source IP 172.16.31.5 to destination IP 172.16.31.4. The PDU details window shows the following layers:

- Layer 3: IP Header Src. IP: 172.16.31.4, Dest. IP: 172.16.31.5 ICMP Message Type: 0
- Layer 2: Ethernet II Header 000C.CF08.BC80 >> 000D.D311.C788
- Layer 1: Port GigabitEthernet0

The Simulation Panel on the right shows an Event List with the following entries:

Vis.	Time(sec)	Last Device
	0.007	172.16.31.4
	0.008	Switch1
	1.010	--
	1.011	172.16.31.5
	1.012	Switch1
	1.013	172.16.31.4
	1.014	Switch1
	2.014	--
	2.015	172.16.31.5
	2.016	Switch1
	2.017	172.16.31.4
	2.018	Switch1
	3.018	--
	3.019	172.16.31.5
	3.020	Switch1
	3.021	172.16.31.4
	3.022	Switch1

• PDU details for remote communication

At 10.10.10.2

The screenshot shows the same network topology as the previous image. A PDU Information window is open, showing details for a packet at device 172.16.31.5. The packet is an ICMP Echo Request (ping) from source IP 172.16.31.5 to destination IP 10.10.10.2. The PDU details window shows the following layers:

- Layer 3: IP Header Src. IP: 10.10.10.2, Dest. IP: 172.16.31.5 ICMP Message Type: 0
- Layer 2: Ethernet II Header 000D.BA8E.741A >> 000D.D311.C788
- Layer 1: Port GigabitEthernet0

The Simulation Panel on the right shows an Event List with the following entries:

Vis.	Time(sec)	Last Device
	7.028	Switch0
	7.029	Router
	7.030	Switch1
	8.033	--
	8.034	172.16.31.5
	8.035	Switch1
	8.036	Router
	8.037	Switch0
	8.038	Access Point
	8.038	Access Point
	8.040	--
	8.041	10.10.10.2
	8.042	Access Point
	8.043	Switch0
	8.044	Router
	8.045	Switch1
	8.045	--

- Tables showing MAC/IP changes through each device

For Local Network Communication

PT Activity: 00:32:13

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

Time Elapsed: 00:32:13

☐ Top ☐ Dock 1/1

For Remote Network Communication

PT Activity: 00:32:36

At Device	Dest. MAC	Src MAC	Src IPv4	Dest IPv4
172.16.31.5	00D0:BABE:741A	00D0:D311:C788	172.16.31.5	10.10.10.2
Switch1	00D0:BABE: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

Time Elapsed: 00:32:36

☐ Top ☐ Dock 1/1

Result

Successfully captured and analyzed MAC and IP addresses for both local and remote communications. Verified that MAC addresses change at each hop while IP addresses remain constant from source to destination.