Lab Assignment – 02

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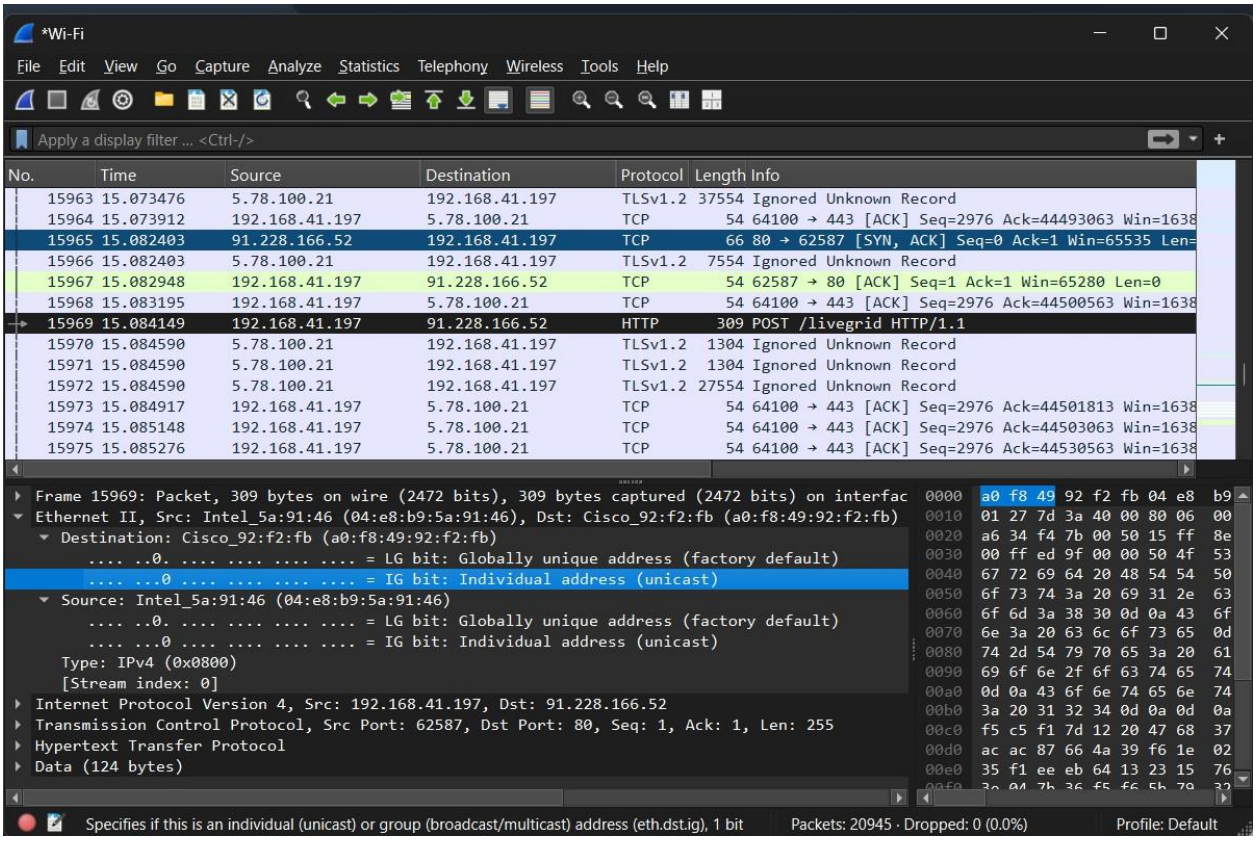
Roll No.:-2024IMG-026

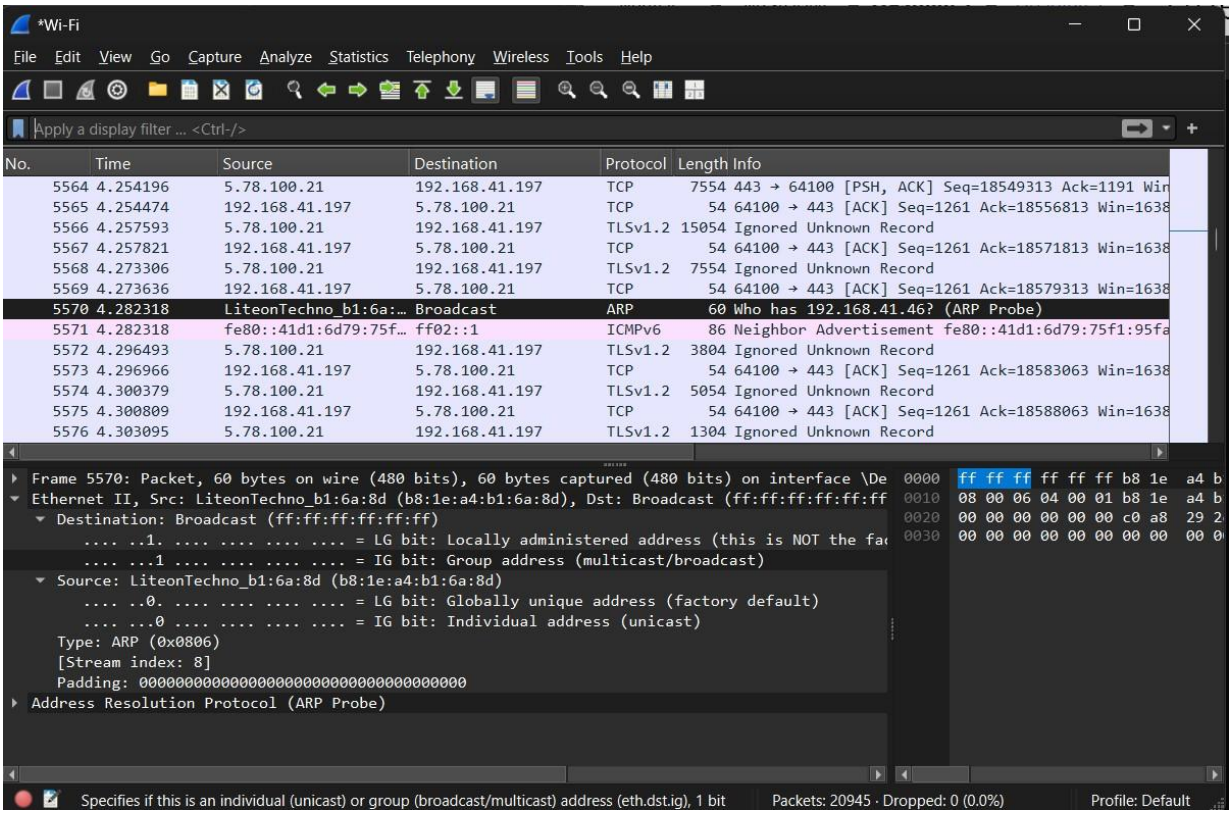
Assignment – Packet Sniffing and Packet Analysis Using Wireshark: Physical layer and DLL

Task A: Packet Sniffing at Data Link Layer & Physical Layer

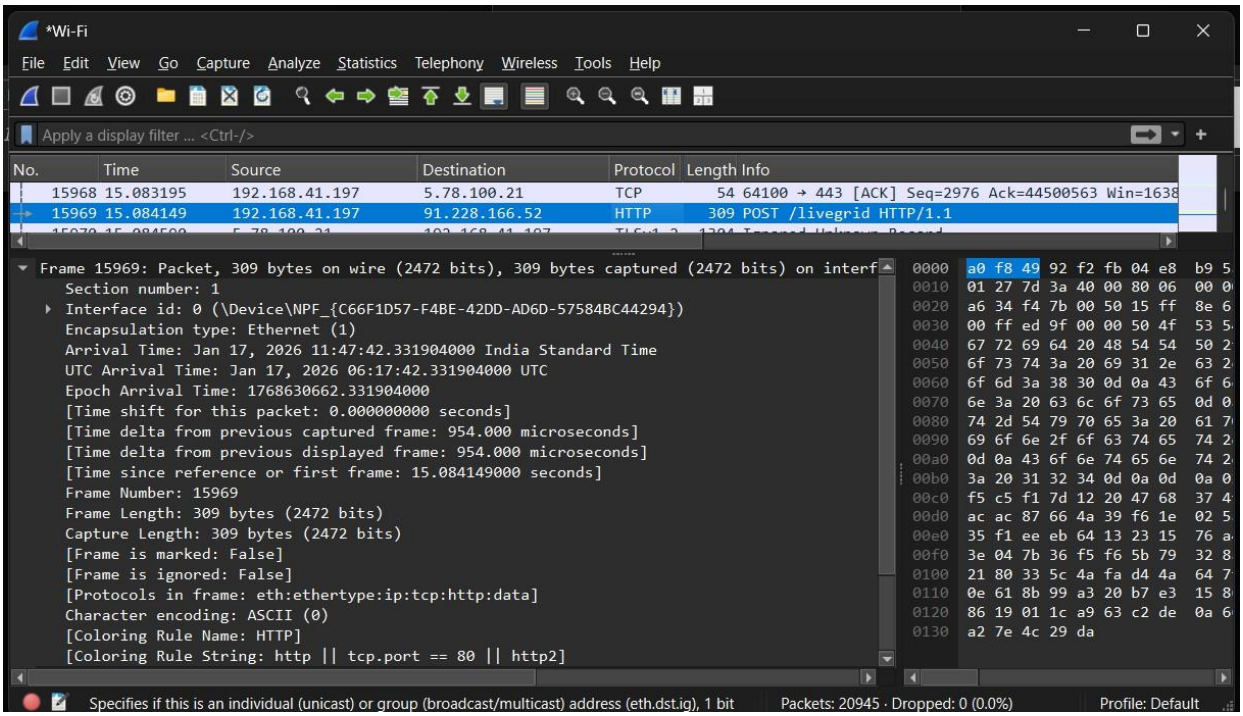


Source MAC address : 04:e8:b9:5a:91:46
Destination MAC address : a0:f8:49:92:f2:fb
Ether Type field : 0x0800
Frame Length: 309 bytes

Task B: Observe ARP packets



Task C: Physical Layer Analysis



Observe **Frame Length** (in bytes) : 309 bytes

Analyze:

- Bit rate (from interface statistics) : 23Mbps
- Transmission medium (Ethernet/Wi-Fi) : The physical medium is Wi-Fi, but the logical frame format is Ethernet II.
- Frame arrival time and inter-frame delay:
  Arrival Time : Jan 17, 2026 11:47:42.33190400
  Inter-frame Delay: 954.000 microseconds

Question:

You are provided with a system connected to a LAN/Wi-Fi network. Using **Wireshark**, capture live network traffic and analyse packets at the **Data Link Layer** and **Physical Layer**.

Activity 1: (A) Ethernet Frame Analysis Data Link Layer Capture packets on the active network interface.

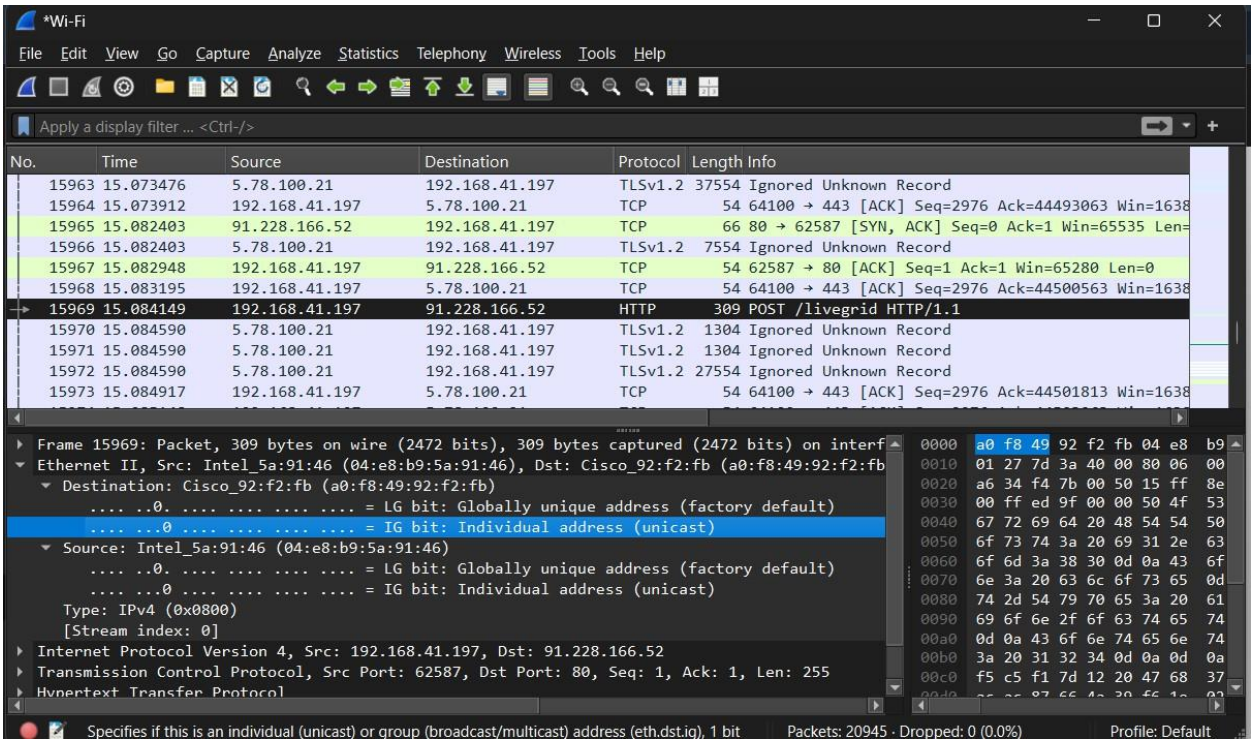
- Select any one **Ethernet frame** and record the following details:
- Source MAC Address : 04:e8:b9:5a:91:46
- Destination MAC Address : a0:f8:49:92:f2:fb
- Ether Type Field : 0x0800
- Frame Length (in bytes) : 309 bytes

a) Identify whether the destination MAC address is **unicast or broadcast**.

➔ The Destination MAC address for broadcast must be **ff:ff:ff:ff:ff:ff** but the Destination MAC address is not **ff:ff:ff:ff:ff:ff**; it specifies a particular device here hence Destination MAC address is a **unicast**.

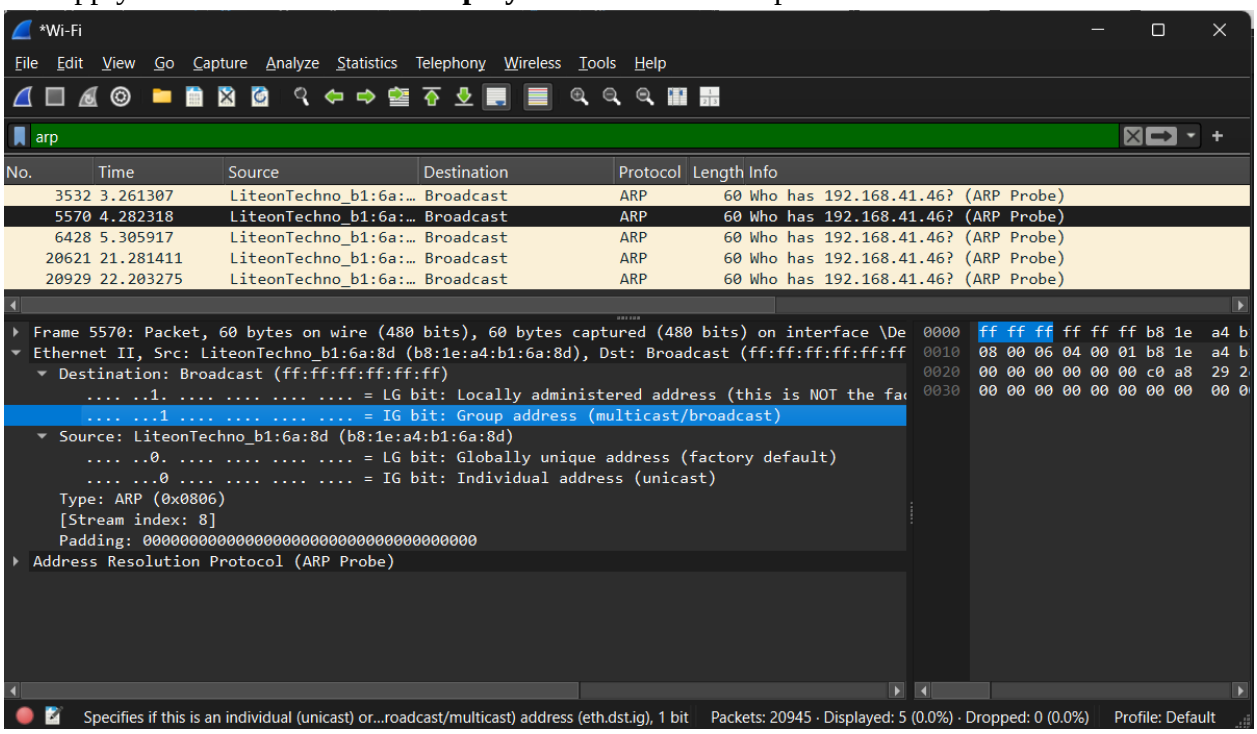
b) State the protocol indicated by the Ether Type field.

➔ **IPv4**



Activity 2: (B) ARP Packet Observation

1. Apply a suitable **Wireshark display filter** to view ARP packets.



2. Select one **ARP Request** and one **ARP Reply** packet and record:

   - Sender IP and MAC address: b8:1e:a4:b1:6a:8d
   - Target IP and MAC address: ff:ff:ff:ff:ff:ff

3. Explain the role of **ARP** in local area network communication.

   ➔ ARP's role is to map devices logical IP addresses to its physical MAC addresses; allowing devices to find each other and send data frames directly on the same local network by broadcasting a request for the IP's MAC and receiving a direct reply to update its internal cache, ensuring efficient, targeted communication.