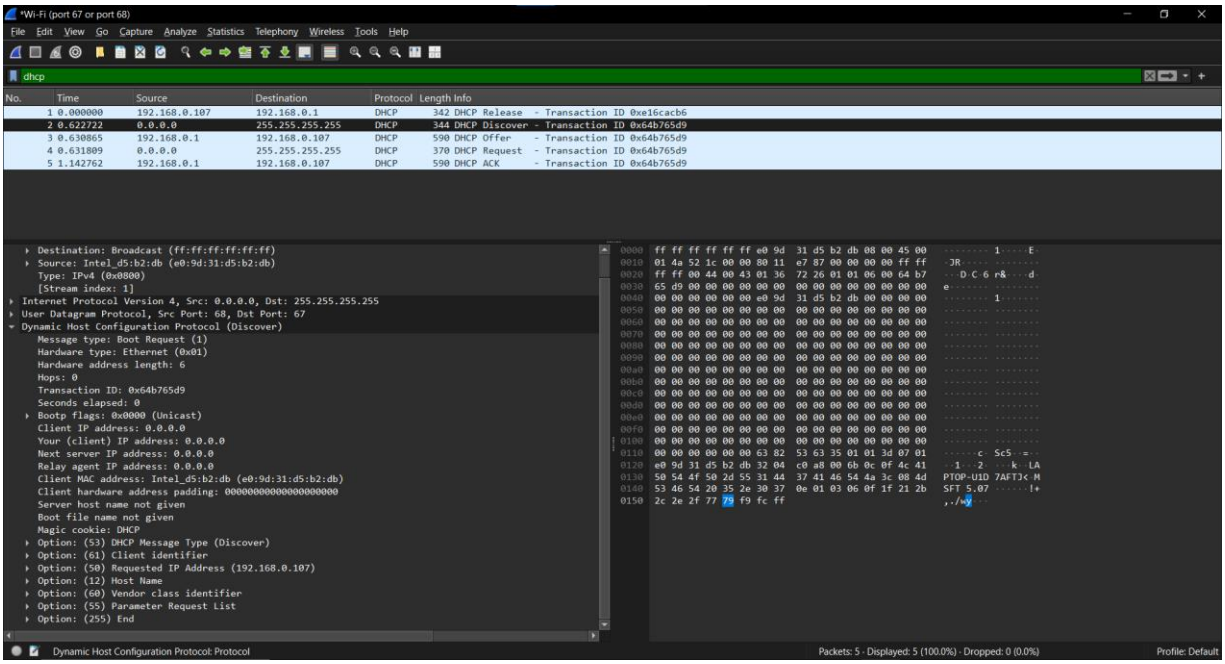
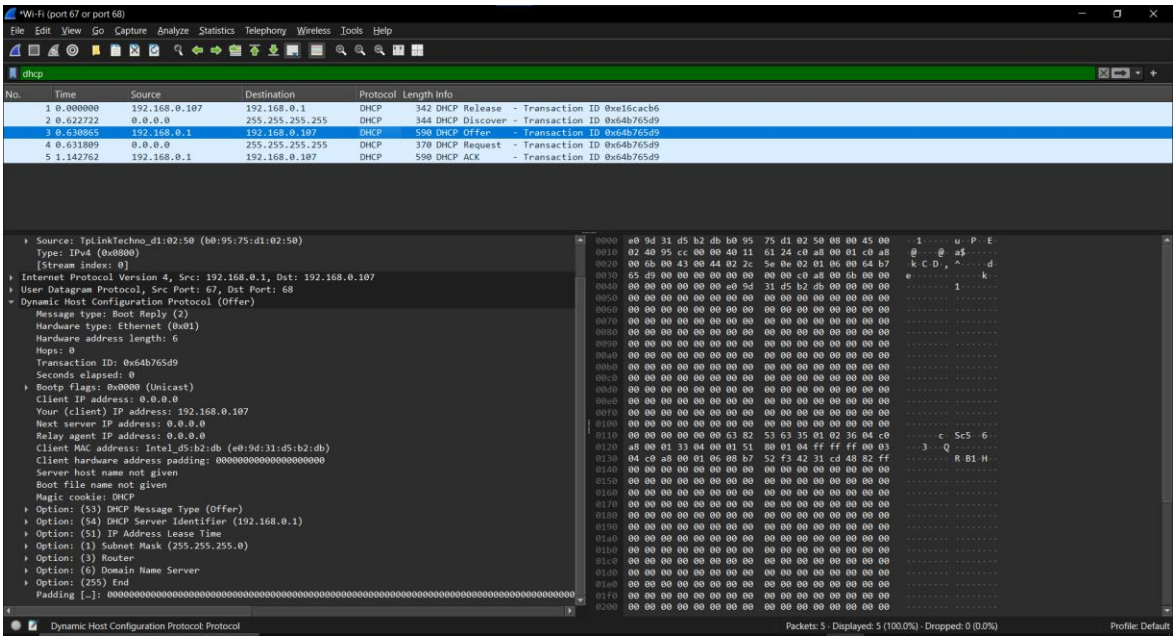
4. Use Wireshark to capture DHCP Discover, Offer, Request, and Acknowledge messages and explain the process.

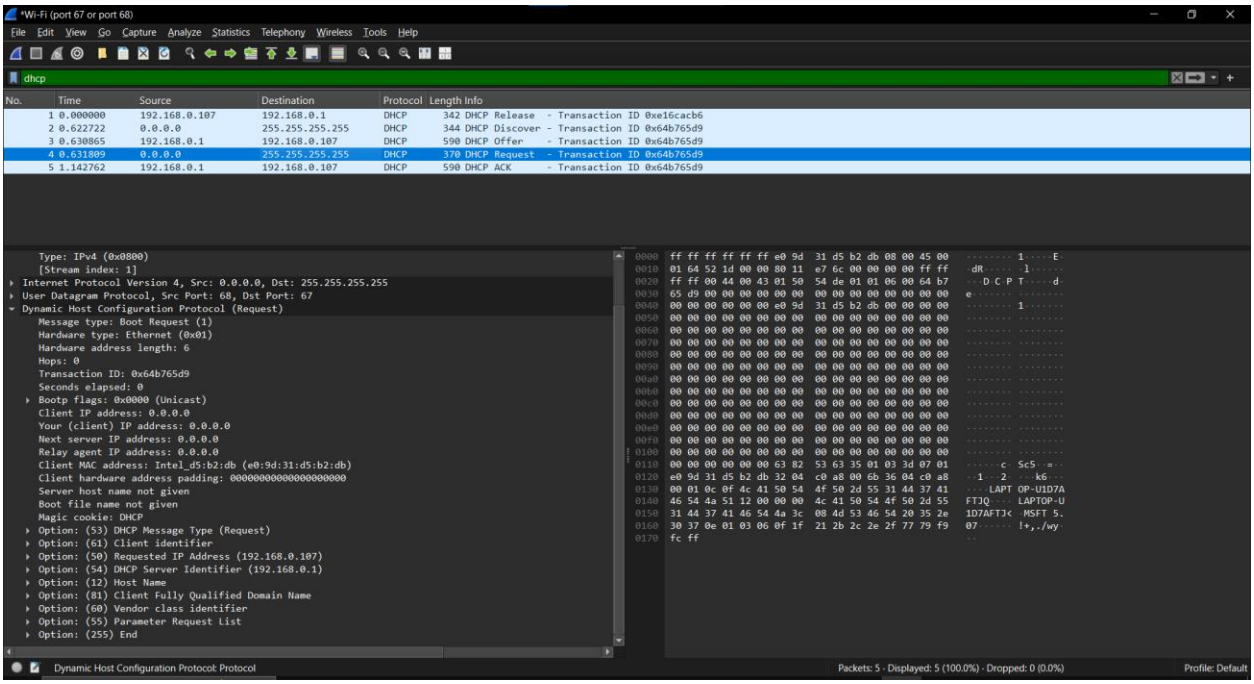
DHCP Discover



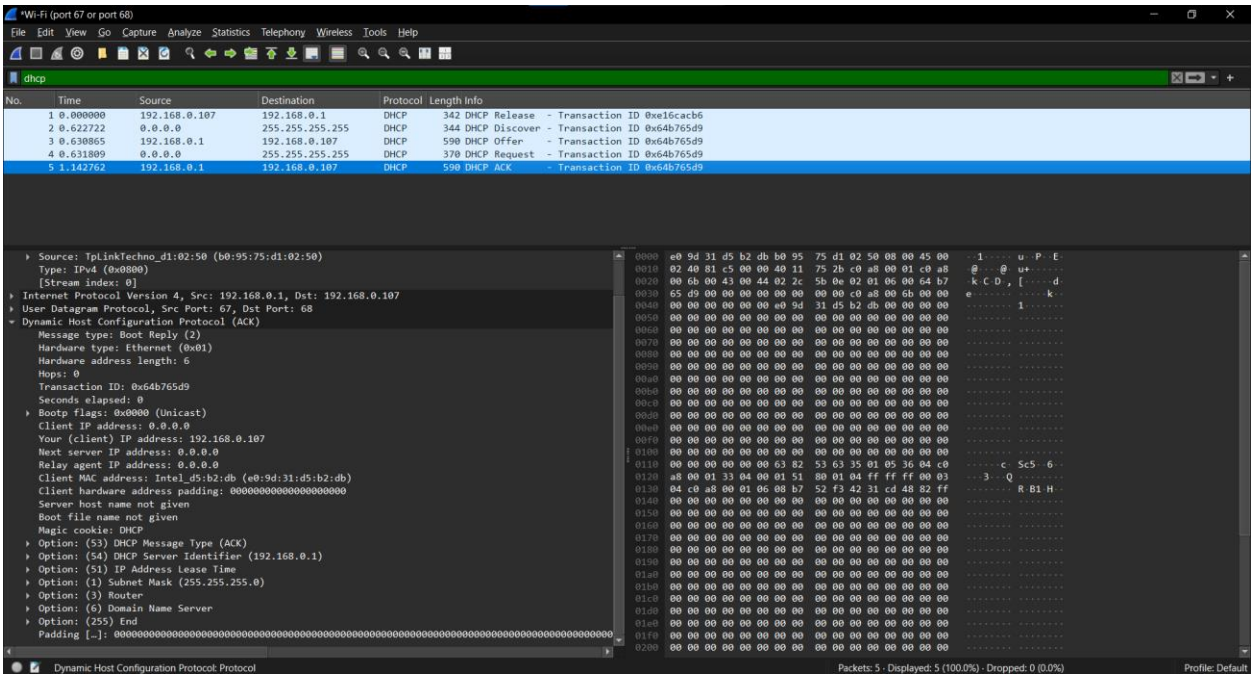
DHCP Offer



DHCP Request

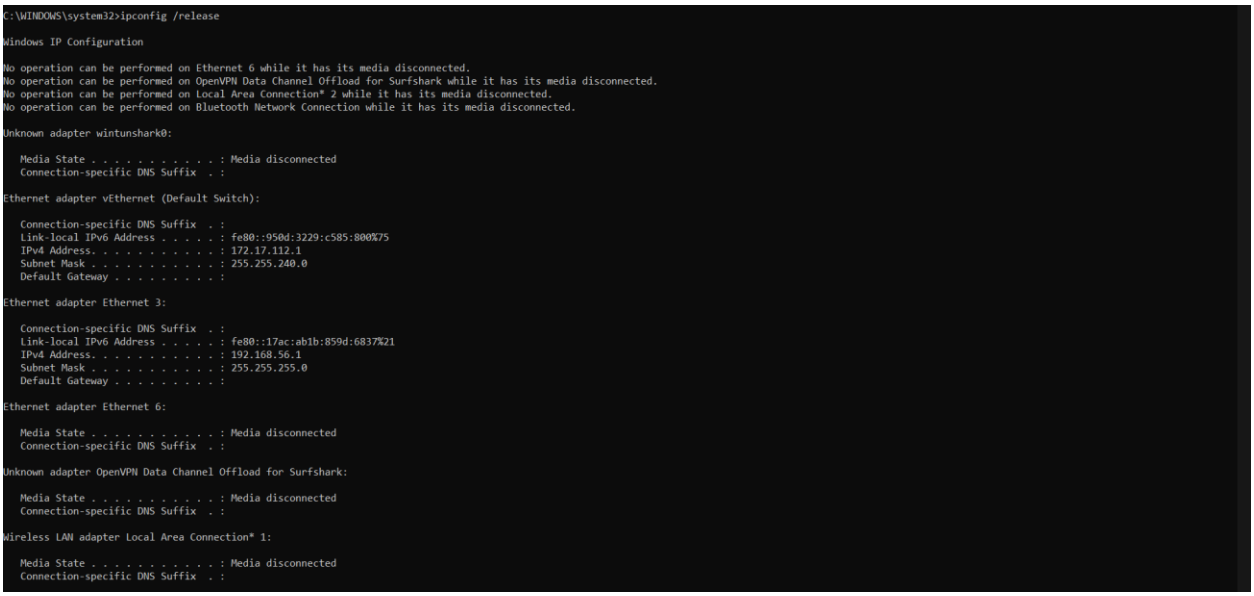


DHCP Acknowledge



To capture DHCP packets, you need to **force a device to request a new IP**.

We can do it by using ipconfig /release



The Dynamic Host Configuration Protocol (DHCP) is used to assign IP addresses to devices automatically. The process follows four steps known as DORA:

1) DHCP Discover (Client → Broadcast)
When a device (PC, phone, etc.) connects to a network, it doesn't have an IP address.
It sends a DHCP Discover message to find available DHCP servers.
This message is broadcasted (sent to all devices in the network) since the client doesn't know the DHCP server's IP.

2) DHCP Offer (Server → Broadcast)
A DHCP server receives the Discover request and offers an IP address to the client.
The server sends a DHCP Offer message with an available IP address and other network details like subnet mask, gateway, and DNS.

3) DHCP Request (Client → Broadcast)
The client accepts the offered IP by sending a DHCP Request message.
This message is also broadcasted because there may be multiple DHCP servers, and the client wants to inform everyone which server's offer it is accepting.

4) DHCP Acknowledge (Server → Unicast)
The DHCP server confirms the assignment by sending a DHCP Acknowledge (ACK) message.
The client can now use the assigned IP address to communicate in the network.