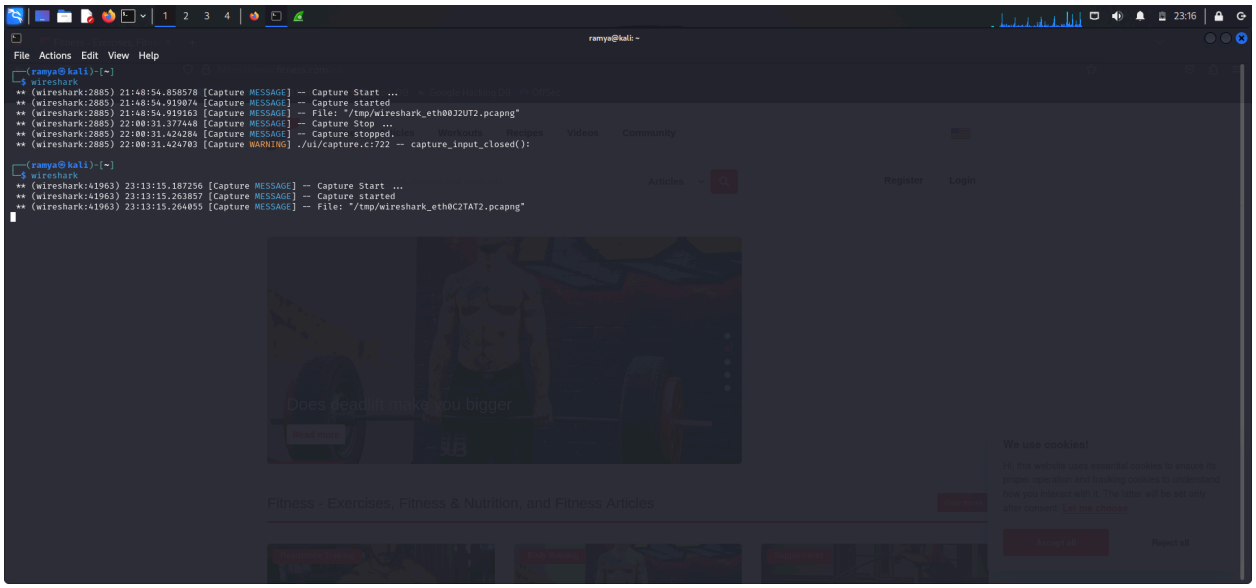
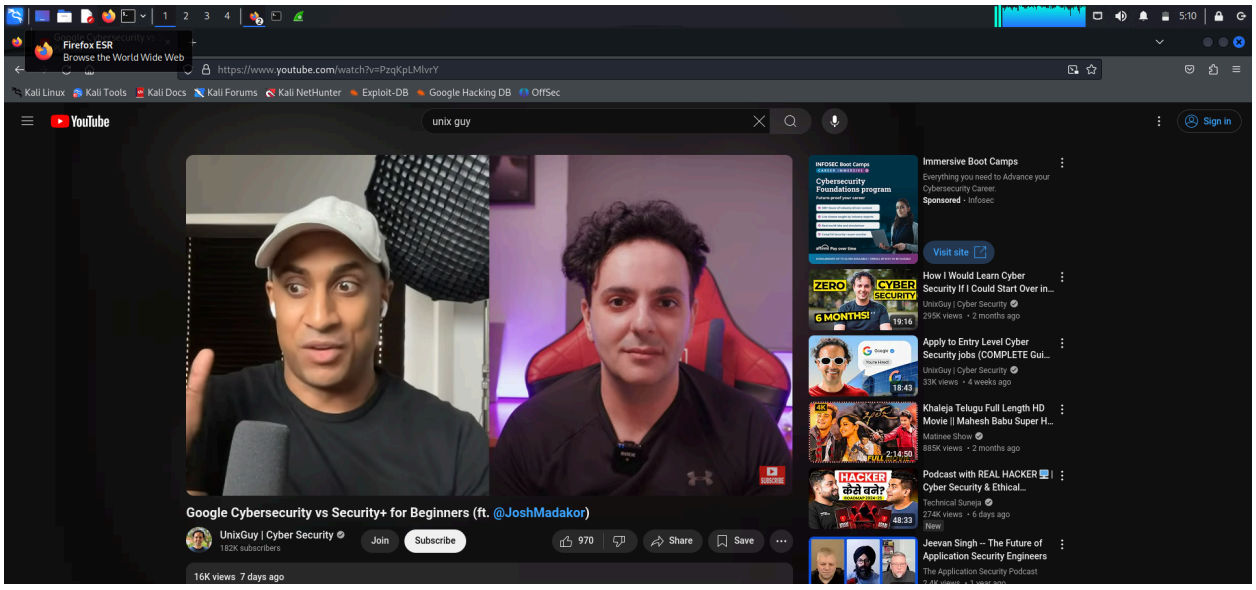
UDP Session Analysis

Bakka Ramyasree

1. **Set Up the Environment:**
    - Use a UDP-based application (e.g., a simple DNS query or streaming service).
    - Start capturing traffic in Wireshark.

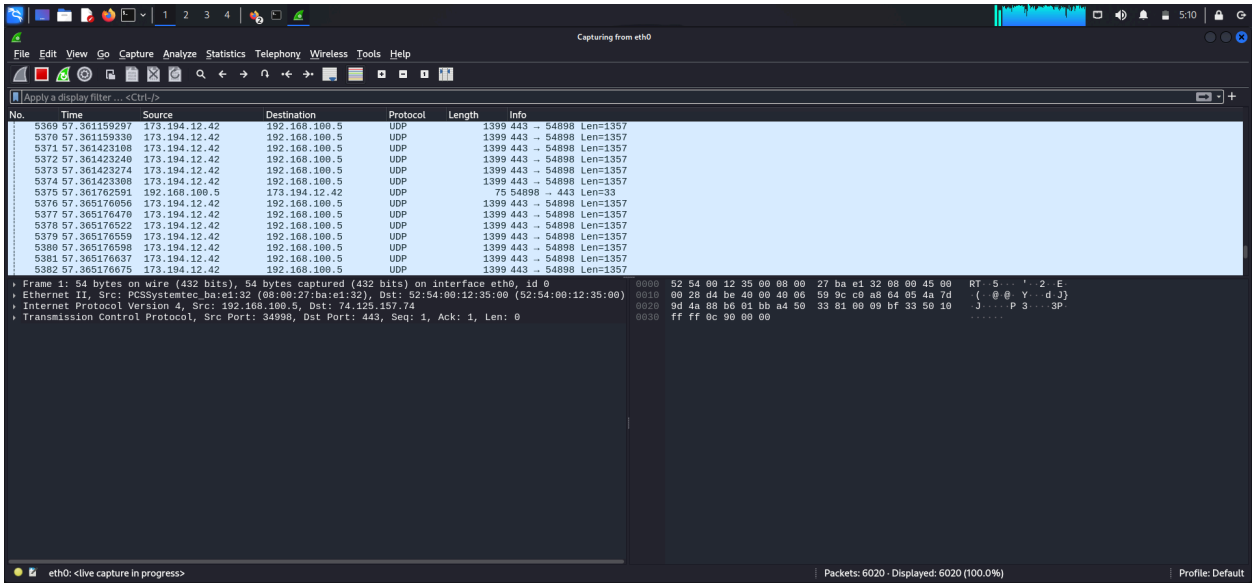


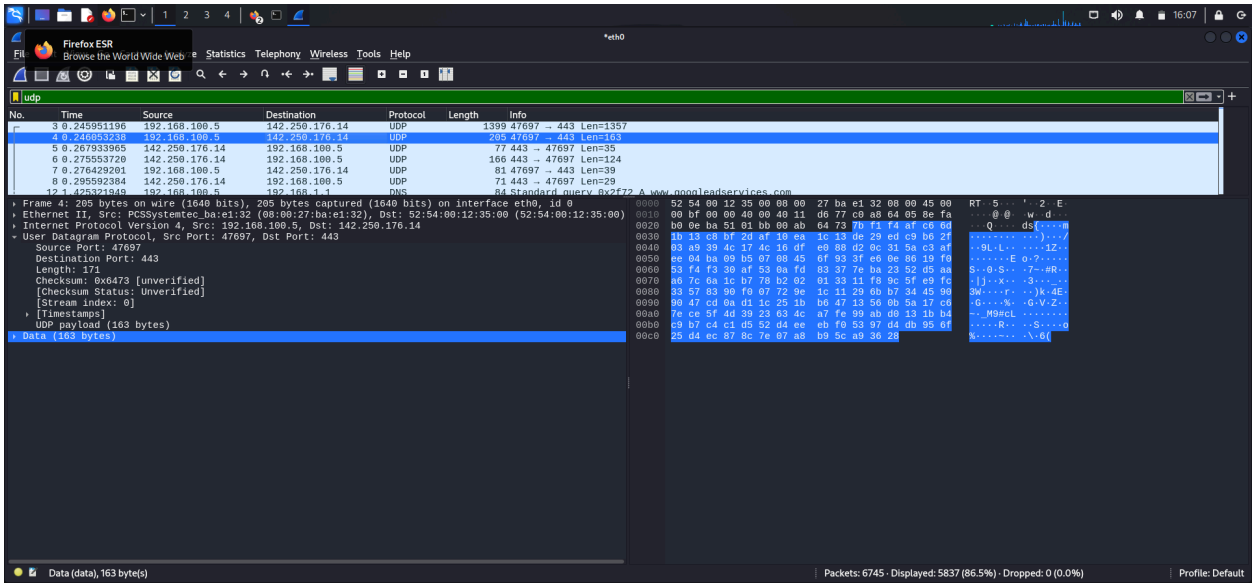


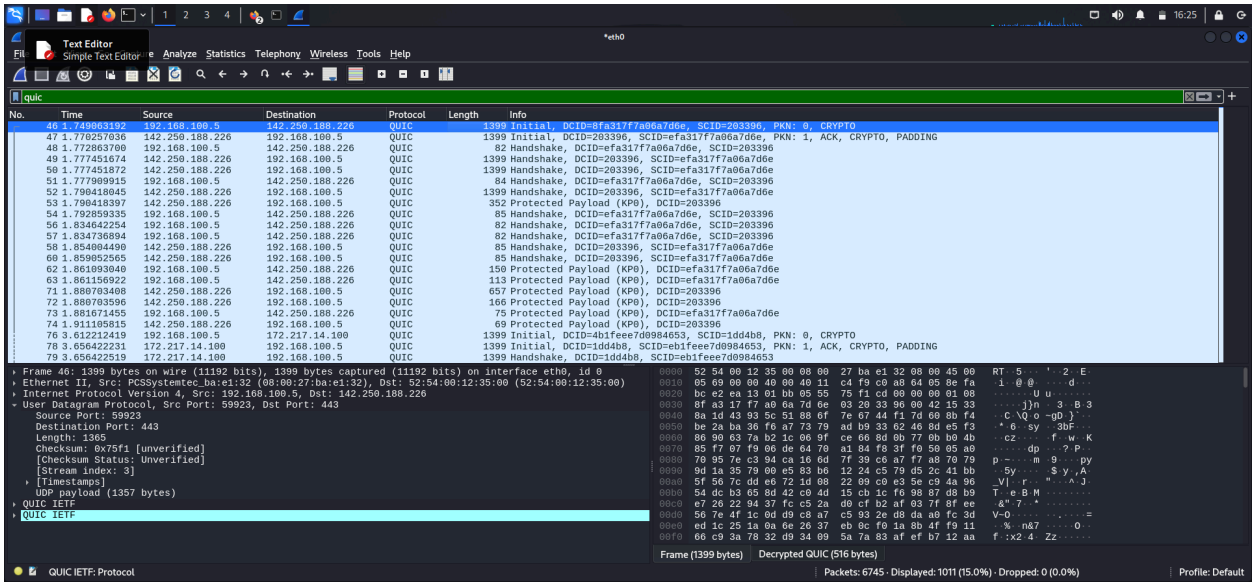
Perform a UDP-Based Task:

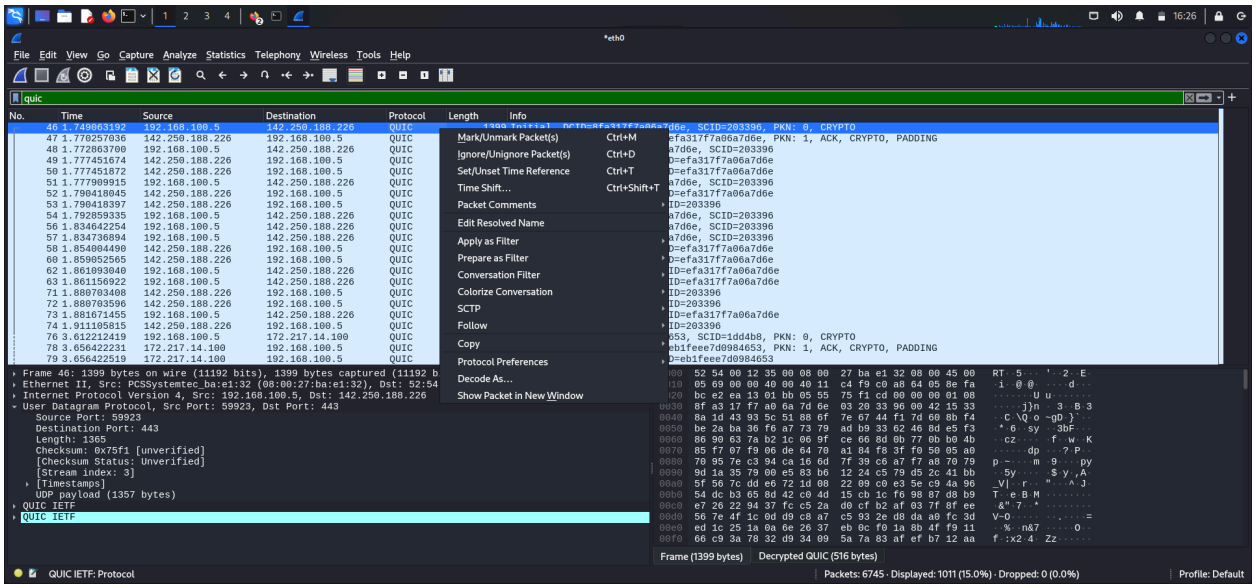
- For streaming, play a short video clip. I used firefox to play video on you tube

2. **Identify UDP Packets:**
   - Filter Wireshark traffic using `udp`.
   - Locate the packets corresponding to your activity.






Text Editor
Simple Text Editor
*eth0
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
quic
No. Time Source Destination Protocol Length Info
46 1.749063192 192.168.100.5 142.250.188.226 QUIC 1399 Initial, DCID=8fa317f7a06a7d6e, SCID=203396, PKN: 0, CRYPTO
47 1.770257036 142.250.188.226 192.168.100.5 QUIC 1399 Initial, DCID=203396, SCID=efa317f7a06a7d6e, PKN: 1, ACK, CRYPTO, PADDING
48 1.772863700 192.168.100.5 142.250.188.226 QUIC 82 Handshake, DCID=efa317f7a06a7d6e, SCID=203396
49 1.777451674 142.250.188.226 192.168.100.5 QUIC 1399 Handshake, DCID=203396, SCID=efa317f7a06a7d6e
50 1.777451872 142.250.188.226 192.168.100.5 QUIC 1399 Handshake, DCID=203396, SCID=efa317f7a06a7d6e
51 1.777909915 192.168.100.5 142.250.188.226 QUIC 84 Handshake, DCID=efa317f7a06a7d6e, SCID=203396
52 1.790418045 142.250.188.226 192.168.100.5 QUIC 1399 Handshake, DCID=203396, SCID=efa317f7a06a7d6e
53 1.790418397 142.250.188.226 192.168.100.5 QUIC 352 Protected Payload (KP0), DCID=203396
54 1.792859335 192.168.100.5 142.250.188.226 QUIC 85 Handshake, DCID=efa317f7a06a7d6e, SCID=203396
56 1.834642254 192.168.100.5 142.250.188.226 QUIC 82 Handshake, DCID=efa317f7a06a7d6e, SCID=203396
57 1.834736894 192.168.100.5 142.250.188.226 QUIC 82 Handshake, DCID=efa317f7a06a7d6e, SCID=203396
58 1.854004490 142.250.188.226 192.168.100.5 QUIC 85 Handshake, DCID=203396, SCID=efa317f7a06a7d6e
60 1.859052565 142.250.188.226 192.168.100.5 QUIC 85 Handshake, DCID=203396, SCID=efa317f7a06a7d6e
62 1.861093040 192.168.100.5 142.250.188.226 QUIC 150 Protected Payload (KP0), DCID=efa317f7a06a7d6e
63 1.861156922 192.168.100.5 142.250.188.226 QUIC 113 Protected Payload (KP0), DCID=efa317f7a06a7d6e
71 1.880703408 142.250.188.226 192.168.100.5 QUIC 657 Protected Payload (KP0), DCID=203396
72 1.880703596 142.250.188.226 192.168.100.5 QUIC 166 Protected Payload (KP0), DCID=203396
73 1.881671455 192.168.100.5 142.250.188.226 QUIC 75 Protected Payload (KP0), DCID=efa317f7a06a7d6e
74 1.911105815 142.250.188.226 192.168.100.5 QUIC 69 Protected Payload (KP0), DCID=203396
76 3.612212419 192.168.100.5 172.217.14.100 QUIC 1399 Initial, DCID=4b1feee7d0984653, SCID=1dd4b8, PKN: 0, CRYPTO
78 3.656422231 172.217.14.100 192.168.100.5 QUIC 1399 Initial, DCID=1dd4b8, SCID=eb1feee7d0984653, PKN: 1, ACK, CRYPTO, PADDING
79 3.656422519 172.217.14.100 192.168.100.5 QUIC 1399 Handshake, DCID=1dd4b8, SCID=eb1feee7d0984653
Frame 46: 1399 bytes on wire (11192 bits), 1399 bytes captured (11192 bits) on interface eth0, id 0
Ethernet II, Src: PCSSystemtec_ba:e1:32 (08:00:27:ba:e1:32), Dst: 52:54:00:12:35:00 (52:54:00:12:35:00)
Internet Protocol Version 4, Src: 192.168.100.5, Dst: 142.250.188.226
User Datagram Protocol, Src Port: 59923, Dst Port: 443
Source Port: 59923
Destination Port: 443
Length: 1365
Checksum: 0x75f1 [unverified]
[Checksum Status: Unverified]
[Stream index: 3]
[Timestamps]
UDP payload (1357 bytes)
QUIC IETF
QUIC IETF
Frame (1399 bytes)
Decrypted QUIC (516 bytes)
QUIC IETF: Protocol
Packets: 6745 · Displayed: 1011 (15.0%) · Dropped: 0 (0.0%)
Profile: Default


*eth0
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
quic
No. Time Source Destination Protocol Length Info
Mark/Unmark Packet(s) Ctrl+M
Ignore/Unignore Packet(s) Ctrl+D
Set/Unset Time Reference Ctrl+T
Time Shift... Ctrl+Shift+T
Packet Comments
Edit Resolved Name
Apply as Filter
Prepare as Filter
Conversation Filter
Colorize Conversation
SCTP
Follow
Copy
Protocol Preferences
Decode As...
Show Packet in New Window
Frame (1399 bytes)
Decrypted QUIC (516 bytes)
QUIC IETF: Protocol
Packets: 6745 · Displayed: 1011 (15.0%) · Dropped: 0 (0.0%)
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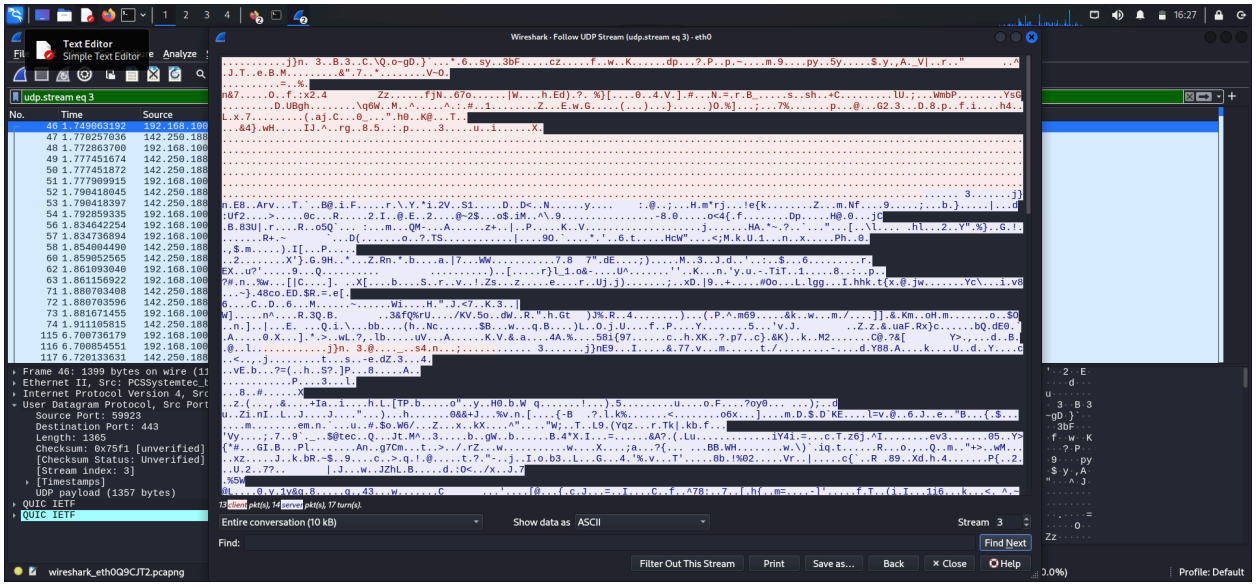

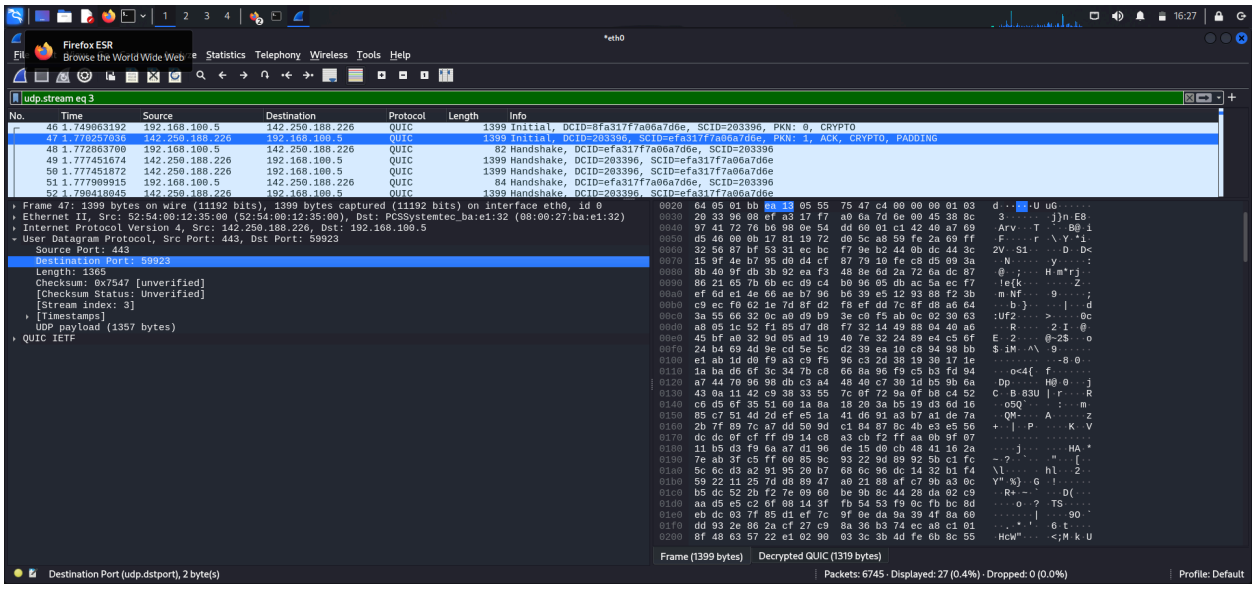

Analyze UDP Communication:

Document the source and destination IP addresses, ports, and payload sizes.

ANS: source ip addr is my kali linux :192.168.100.5

And the destination addr is youtube server :142.250.188.256

With source port :59923

Destination port:443 For QUIC, port **443** is common.

Discuss how UDP handles data transmission without establishing a session.

- Data can be sent using UDP (User Datagram Protocol) without establishing a connection between the sender and the recipient.
- No Session Setup: UDP transmits data without first establishing a connection, as opposed to TCP.
- Datagrams are the discrete packets of data that are transmitted. Every packet is transmitted independently and separately.
- Also called as fire and forget protocol it doesnt care about the data receiving or acknowledgement that is why it is faster.

Compare this with TCP session creation.

TCP	**UDP**
Connection oriented protocol	**Connectionless** protocol
Guarantee the data delivery	No Guarantee
Sets a connection by 3 way handshake	No Handshakes
Reliable	Faster but less reliable

Document Findings:

Write a report discussing the nature of UDP communication.

In order to better understand UDP (User Datagram Protocol) communication, this paper analyzes packets from a YouTube video transmitted in real life. Because of its reputation for being connectionless, UDP is frequently utilized for applications needing quick transmission.

- The nature of the connectionless protocol used by UDP communication is that data is sent without first establishing a link. Every datagram, or packet, is sent separately.
- No Handshake: There isn't a handshake procedure, in contrast to TCP. There will be no phases for connection setup or breakdown.
- No Acknowledgments: Error recovery and acknowledgments are not offered by UDP. No assurances are made on the arrival or precise arrangement of packets.

- Efficiency: UDP is speedier and better suited for real-time applications like video streaming because it does not have connection management or error checking.

Observed packets of UDP

- Firstly, packet capture

1. Overview of Packet Capture

- Wireshark was used to record the traffic during a YouTube video broadcast. The following findings were noted:
- Type of Packet: UDP packets
- Procedures QUIC, a system designed to provide faster and more secure data transmission over UDP, is observed.

2. Analysis of Key Packets

- Screenshot 1: QUIC Protocol in a UDP Packet
- 59923 is the source port.
- Port of destination: 443
- Payload 1357 bytes in size
- Details: The packet has a destination port of 443 that is used by QUIC for encrypted communication, and a source port that is characteristic of high-numbered ephemeral ports used by clients.
- Figure 2: An Additional UDP Packet
- 59924 is the source port.
- Port of destination: 443
- Size of Payload: 1357 bytes
- Details: The source port differs somewhat from the first transmission, showing that different ports are used for each packet.