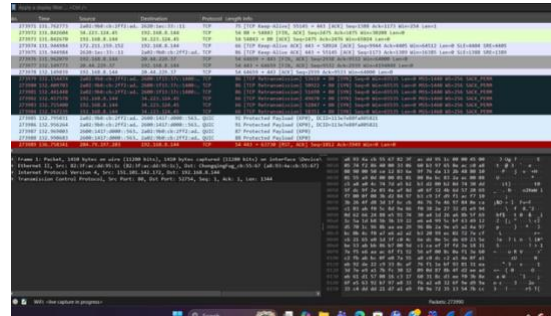


Lap 1

Part 1:

Task 1:



Task 2:

No.	Time	Source	Destination	Protocol	Length	Info
748	21.645624	192.168.8.144	34.223.124.45	HTTP	566	GET /online HTTP/1.1
750	21.973247	34.223.124.45	192.168.8.144	HTTP	591	HTTP/1.1 301 Moved Permanently
752	21.978314	192.168.8.144	34.223.124.45	HTTP	567	GET /online/ HTTP/1.1
755	22.260625	34.223.124.45	192.168.8.144	HTTP	149	HTTP/1.1 200 OK (text/html)
758	22.308653	192.168.8.144	34.223.124.45	HTTP	499	GET /favicon.ico HTTP/1.1
760	22.669663	34.223.124.45	192.168.8.144	HTTP	470	HTTP/1.1 200 OK (PNG)

Frame 748: Packet, 566 bytes on wire (4528 bits), 566 bytes captured (4528 bits) on interface NDevice\Wi-Fi	0000
Ethernet II, Src: ChongqingFug-ch:55:67 (a8:93:4a:ch:55:67), Dst: 82:3f:ac:dd:95:1c (82:3f:ac:dd:95:1c)	0010
Internet Protocol Version 4, Src: 192.168.8.144, Dst: 34.223.124.45	0020
Transmission Control Protocol, Src Port: 60492, Dst Port: 80, Seq: 1, Ack: 1, Len: 512	0030
Hypertext Transfer Protocol	0040
GET /online HTTP/1.1	0050
Request Method: GET	0060
Request URI: /online	0070
Request Version: HTTP/1.1	0080

748	21.645624	192.168.8.144	34.223.124.45	HTTP	566	GET /online HTTP/1.1
750	21.973247	34.223.124.45	192.168.8.144	HTTP	591	HTTP/1.1 301 Moved Permanently (text/html)
752	21.978314	192.168.8.144	34.223.124.45	HTTP	567	GET /online/ HTTP/1.1
755	22.260625	34.223.124.45	192.168.8.144	HTTP	149	HTTP/1.1 200 OK (text/html)
758	22.308653	192.168.8.144	34.223.124.45	HTTP	499	GET /favicon.ico HTTP/1.1
760	22.669663	34.223.124.45	192.168.8.144	HTTP	470	HTTP/1.1 200 OK (PNG)

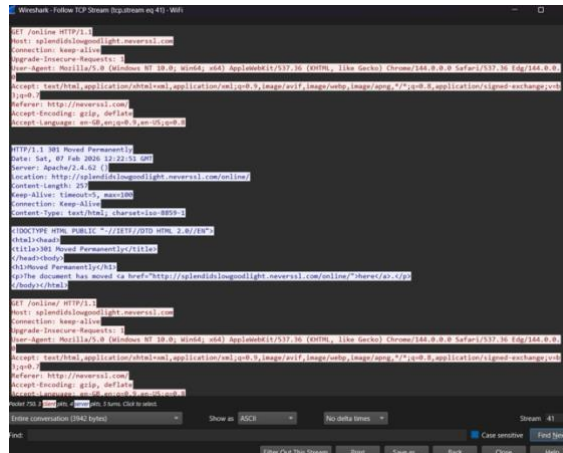
[2 Reassembled TCP Segments (1519 bytes): #754(1424), #755(95)]	0010
Hypertext Transfer Protocol	0020
HTTP/1.1 200 OK	0030
Response Version: HTTP/1.1	0040
Status Code: 200	0050
[Status Code Description: OK]	0060
Response Phrase: OK	0070
Date: Sat, 07 Feb 2026 12:22:51 GMT	0080
Server: Apache/2.4.62 (Ubuntu)	0090

When a user accesses a web page, the web browser sends an HTTP request to the web server. This request typically uses the GET method, which asks the server to retrieve a specific resource identified by a URL. The request includes important header fields such as the Host, User-Agent, and Accept, which describe the client and the type of content it can process.

Upon receiving the request, the server processes it and sends back an HTTP response. The response contains a status code (such as 200 OK indicating success or 301 Moved Permanently indicating redirection), response headers, and optionally the requested content (e.g., HTML). This request-response exchange forms the basis of communication between the client and the server in the HTTP protocol

Task 1:

The TCP stream contained unreadable characters because the transmitted data was not in plain text format. This indicates that TCP transfers raw binary data, while application-layer protocols such as HTTP interpret this data into meaningful information



Task 2

1: TCP Three-Way Handshake

The TCP three-way handshake consists of SYN, SYN-ACK, and ACK packets. The sequence and acknowledgment numbers are used to synchronize communication between the client and server.

```

787 21.645159      192.168.8.144      34.223.124.45      TCP      54 60492 → 80 [ACK] Seq=513 Ack=106 Win=65280 Len=0
788 21.645624      192.168.8.144      34.223.124.45      HTTP/1.1
789 21.645724      192.168.8.144      34.223.124.45      TCP      54 60492 → 80 [ACK] Seq=513 Ack=106 Win=65280 Len=0
790 21.573247      192.168.8.144      34.223.124.45      HTTP/1.1 301 Moved Permanently (text/html)
791 21.573167      24080:144:ch:2f2:ad. 34.223.124.45      TCP      78 62128 → 443 [FIN, ACK] Seq=1803 Ack=1804 Win=65280 Len=0
792 21.573254      192.168.8.144      34.223.124.45      HTTP      567 GET /onlin HTTP/1.1
793 22.054724      24080:144:ch:2f2:ad. 34.223.124.45      TCP      74 443 → 62218 [ACK] Seq=6020 Ack=1804 Win=64218 Len=0
794 22.068205      192.168.8.144      34.223.124.45      TCP      1478 80 → 60492 [ACK] Seq=138 Ack=2057 Win=27956 Len=1424 [TCP PDU reassembled]
795 22.068205      192.168.8.144      34.223.124.45      HTTP      149 HTTP/1.1 200 OK (text/html)
796 22.260744      192.168.8.144      34.223.124.45      TCP      44 60492 → 80 [ACK] Seq=1926 Ack=2057 Win=65280 Len=0
797 22.389653      192.168.8.144      34.223.124.45      HTTP      699 GET /favicon.ico HTTP/1.1

Frame 749: Packet, 54 bytes on wire (432 bits), 54 bytes captured (432 bits) on interface \Device\NPF...
Ethernet II, Src: 82:f3:ac:95:1c:62 (82:f3:ac:95:1c:62), Dst: Chongqing-ecb-55:67 (82:f3:ac:95:1c:67)
Internet Protocol Version 4, Src: 192.168.8.144, Dst: 34.223.124.45
Transmission Control Protocol, Src Port: 80, Dst Port: 60492, Seq: 1, Ack: 513, Len: 0
Source Port: 80
Destination Port: 60492
[Stream index: 41]
[Stream Packet Number: 8]
[Conversation completeness: Complete, WITH_DATA [33]]
[TCP Segment Len: 0]
Sequence Number: 1 (relative sequence number)
Sequence Number (raw): 3841264717
[Next Sequence Number: 1 (relative sequence number)]
Acknowledgment Number: 513 (relative ack number)
Acknowledgment Number (raw): 2276271580
RST: 0...= Header Length: 20 bytes (5)
Flags: 0000 (0)
Window: 219
[Captured windows: 0]

```

[illegible]

```

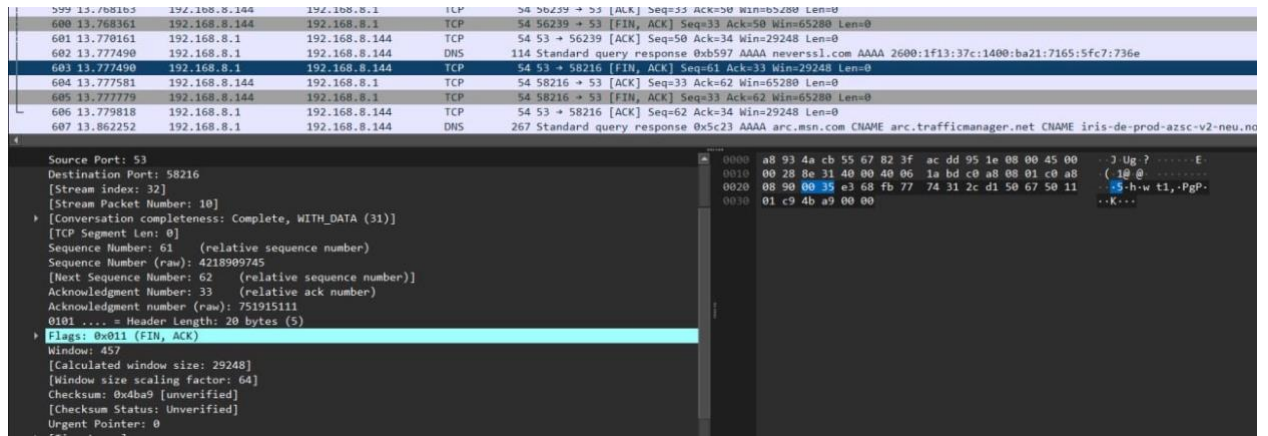
  Time    Source      Destination      Protocol Length Info
  --
  730  20.90.97057    2402:180b::ch:2ff2:ad-2600:1f13:37c:1400::c  86  [TCP:Retransmission] 56202 -> 80 [SYN] Seq=60
  741  21.01.01092    2402:180b::ch:2ff2:ad-2600:1f13:37c:1400::c  86  [TCP:Retransmission] 53522 -> 80 [SYN] Seq=60
  741  21.01.01092    192.168.8.344    34-223.124.45  TCP  66  [TCP:Retransmission] 58135 -> 80 [SYN] Seq=60
  742  21.01.01092    192.168.8.344    34-223.124.45  TCP  66  [TCP:Retransmission] 56548 -> 80 [SYN] Seq=60
  743  21.01.01092    192.168.8.344    34-223.124.45  TCP  66  [TCP:Retransmission] 56153 -> 80 [SYN] Seq=60
  743  21.01.01092    192.168.8.344    34-223.124.45  TCP  66  [TCP:Retransmission] 60862 -> 80 [SYN] Seq=60
  743  21.01.01092    192.168.8.344    34-223.124.45  TCP  66  [TCP:Retransmission] 55042 -> 80 [SYN] Seq=60
  744  21.04.05024    34-223.124.45    192.168.8.344  TCP  66 -> 60492 [SYN, ACK] Seq=60 Ack=150203
  747  21.04.05024    192.168.8.344    34-223.124.45  TCP  54 60492 -> 80 [ACK] Seq=60 Win=5208 Len=0
  747  21.04.05024    192.168.8.344    34-223.124.45  HTTP  566 GET /online/ HTTP/1.1
  749  21.97.97347    34-223.124.45    192.168.8.344  HTTP  54 8040 [ACK] Seq=60 Ack=553 Win=20832 Len=0
  750  21.97.97347    34-223.124.45    192.168.8.344  HTTP  593 HTTP/1.1 301 Moved Permanently (text/html)
  750  21.97.97347    34-223.124.45    192.168.8.344  HTTP  542 GET /online/ HTTP/1.1
  752  22.07.87324    2600:1437::8000:1563-2600:180b::ch:2ff2:ad-2  56 547 GET /geninfo/ HTTP/1.1
  752  22.07.87324    2600:1437::8000:1563-2600:180b::ch:2ff2:ad-2  56 647 GET /geninfo/ HTTP/1.1
  752  22.07.87324    2600:1437::8000:1563-2600:180b::ch:2ff2:ad-2  56 647 GET /geninfo/ HTTP/1.1
  752  22.20.60974    34-223.124.45    192.168.8.344  HTTP  143 7000 -> 60492 [ACK] Seq=60 Ack=1004 Win=20954
  752  22.20.60974    34-223.124.45    192.168.8.344  HTTP  143 HTTP/1.1 200 OK (text/html)
  752  22.20.60974    192.168.8.344    34-223.124.45  HTTP  54 60492 -> 80 [ACK] Seq=60 Ack=3051 Win=65208
  --
  # frame 793: Packet, 86 bytes on wire (608 bits), 56 bytes captured
  #   on ethern1, Src: Chongqing-ig:35:6f:4d:93:4c:55:67:6c,
  #   Internet Protocol Version 6 Src: 2402:180b::ch:2ff2:ad-2600:1f13:37c:1400::c
  #   TCP Segment Len: 86
  #   [Stream index: 36]
  #   [Stream Packet Number: 1]
  #   [Conversation completeness: Incomplete, SYN_SENT (1)]
  #   [TCP Segment Len: 86]
  #   Sequence Number: 0 (relative sequence number)
  #   Acknowledgment Number: (relative sequence number)
  #   Next Sequence Number: 1 (relative sequence number)
  #   Acknowledgment Number: 0
  #   Window Size (bytes): (relative sequence number)
  #   1000 ...= Header length: 32 bytes (8)
  #   Flags: 0x0020 (SYN)

```

2: Data Transfer: After the TCP connection is established, data transfer begins between the client and the server. The data is transmitted in segments that are acknowledged to ensure reliable delivery. TCP uses sequence and acknowledgment numbers to maintain correct data ordering and detect any lost packets, guaranteeing accurate and complete transmission.

3: TCP Termination

Once data transfer is completed, the TCP connection is terminated in an orderly manner. This process uses FIN and ACK packets exchanged between the client and the server to confirm that both sides have finished sending data, ensuring a graceful and reliable connection closure.



Part 3:

Task 1:

No.	Time	Source	Destination	Protocol	Length	Info
751	21.978107	2a02:9b0:cb:2ff2:ad...	2600:1417:d000::563...	TCP	74	62210 → 443 [FIN, ACK] Seq=1803 Ack=6020 Win=65280 Len=0
752	21.978314	192.168.8.144	34.223.124.45	HTTP	567	GET /online/ HTTP/1.1
753	22.054724	2600:1417:d000::563...	2a02:9b0:cb:2ff2:ad...	TCP	74	443 → 62210 [ACK] Seq=6020 Ack=1804 Win=64128 Len=0
754	22.260625	34.223.124.45	192.168.8.144	TCP	1478	80 → 60492 [ACK] Seq=538 Ack=1026 Win=29056 Len=1424
755	22.260625	34.223.124.45	192.168.8.144	HTTP	149	HTTP/1.1 200 OK (text/html)
756	22.260744	192.168.8.144	34.223.124.45	TCP	54	60492 → 80 [ACK] Seq=1026 Ack=2057 Win=65280 Len=0
757	22.288785	2a02:9b0:cb:2ff2:ad...	2600:1417:d000::563...	QUIC	91	Protected Payload (KP0), DCID=294a5257fa805821
758	22.308653	192.168.8.144	34.223.124.45	HTTP	499	GET /favicon.ico HTTP/1.1
759	22.464320	2600:1417:d000::563...	2a02:9b0:cb:2ff2:ad...	QUIC	86	Protected Payload (KP0)
760	22.669663	34.223.124.45	192.168.8.144	HTTP	470	HTTP/1.1 200 OK (PNG)
761	22.716554	192.168.8.144	34.223.124.45	TCP	54	60492 → 80 [ACK] Seq=1471 Ack=2473 Win=65024 Len=0
762	26.223989	192.168.8.144	20.54.232.160	TCP	54	52903 → 443 [FIN, ACK] Seq=1 Ack=1 Win=254 Len=0
763	26.224518	192.168.8.144	20.54.232.160	TCP	54	52902 → 443 [FIN, ACK] Seq=1 Ack=1 Win=254 Len=0
764	26.460659	20.54.232.160	192.168.8.144	TCP	54	443 → 52902 [FIN, ACK] Seq=1 Ack=2 Win=16387 Len=0
765	26.460659	20.54.232.160	192.168.8.144	TCP	54	443 → 52903 [FIN, ACK] Seq=1 Ack=2 Win=16387 Len=0
766	26.460808	192.168.8.144	20.54.232.160	TCP	54	52902 → 443 [ACK] Seq=2 Ack=2 Win=254 Len=0
767	26.460933	192.168.8.144	20.54.232.160	TCP	54	52903 → 443 [ACK] Seq=2 Ack=2 Win=254 Len=0
768	27.726593	34.223.124.45	192.168.8.144	TCP	54	80 → 60492 [FIN, ACK] Seq=2473 Ack=1471 Win=30208 Len=0
769	27.726713	192.168.8.144	34.223.124.45	TCP	54	60492 → 80 [ACK] Seq=1471 Ack=2474 Win=65024 Len=0

Frame 1: Packet, 54 bytes on wire (432 bits), 54 bytes captured (432 bits) on interface \Device\NPF_{493...}

Ethernet II, Src: ChongqingFug_cb:55:67 (a8:93:4a:cb:55:67), Dst: 82:3f:ac:dd:95:1c (82:3f:ac:dd:95:1c)

Internet Protocol Version 4, Src: 192.168.8.144, Dst: 37.252.172.124

Transmission Control Protocol, Src Port: 50378, Dst Port: 443, Seq: 1, Ack: 1, Len: 0

Task 2: UDP is a simple transport-layer protocol that provides minimal communication services. It has a small header and does not include mechanisms for reliability, ordering, or error recovery. This simplicity reduces overhead and allows faster data transmission compared to more complex protocols such as TCP.

UDP is a connectionless protocol, meaning it does not establish a connection or perform a handshake before sending data. Packets are transmitted independently without confirming delivery or readiness of the receiver, which makes UDP suitable for time-sensitive applications where speed is more important than reliability.

2	0.030748	2600:1417:d000::563...	2a02:9b0:cb:2ff2:ad...	UDP	88	443 → 53189	Len=26
7	0.236678	2a02:9b0:cb:2ff2:ad...	2600:1417:d000::563...	UDP	91	53189 → 443	Len=29
8	0.310229	2a02:9b0:cb:2ff2:ad...	2600:1417:d000::563...	UDP	91	53189 → 443	Len=29
9	0.325450	2600:1417:d000::563...	2a02:9b0:cb:2ff2:ad...	UDP	88	443 → 53189	Len=26
10	0.338506	2600:1417:d000::563...	2a02:9b0:cb:2ff2:ad...	UDP	90	443 → 53189	Len=28
11	0.538582	2a02:9b0:cb:2ff2:ad...	2a00:1450:4019:5::a	UDP	1290	61917 → 443	Len=1228
12	0.538759	2a02:9b0:cb:2ff2:ad...	2a00:1450:4019:5::a	UDP	96	61917 → 443	Len=34
13	0.538899	2a02:9b0:cb:2ff2:ad...	2600:1417:d000::563...	UDP	91	53189 → 443	Len=29
14	0.571025	2600:1417:d000::563...	2a02:9b0:cb:2ff2:ad...	UDP	90	443 → 53189	Len=28
15	0.583530	2a00:1450:4019:5::a	2a02:9b0:cb:2ff2:ad...	UDP	188	443 → 61917	Len=126
16	0.583530	2a00:1450:4019:5::a	2a02:9b0:cb:2ff2:ad...	UDP	1287	443 → 61917	Len=1225
17	0.583530	2a00:1450:4019:5::a	2a02:9b0:cb:2ff2:ad...	UDP	1292	443 → 61917	Len=1230
18	0.583530	2a00:1450:4019:5::a	2a02:9b0:cb:2ff2:ad...	UDP	1292	443 → 61917	Len=1230
19	0.583530	2a00:1450:4019:5::a	2a02:9b0:cb:2ff2:ad...	UDP	1292	443 → 61917	Len=1230
20	0.583530	2a00:1450:4019:5::a	2a02:9b0:cb:2ff2:ad...	UDP	1292	443 → 61917	Len=1230
21	0.588203	2a00:1450:4019:5::a	2a02:9b0:cb:2ff2:ad...	UDP	1292	443 → 61917	Len=1230
22	0.588203	2a00:1450:4019:5::a	2a02:9b0:cb:2ff2:ad...	UDP	1292	443 → 61917	Len=1230
23	0.588203	2a00:1450:4019:5::a	2a02:9b0:cb:2ff2:ad...	UDP	1292	443 → 61917	Len=1230
24	0.594552	2a00:1450:4019:5::a	2a02:9b0:cb:2ff2:ad...	UDP	1292	443 → 61917	Len=1230

Frame 7: Packet, 91 bytes on wire (728 bits), 91 bytes captured (728 bits) on interface \Device\NPF_{45...}

Ethernet II, Src: Chongqingfug_cb:55:67 (a8:93:4a:cb:55:67), Dst: 82:3f:ac:dd:95:1c (82:3f:ac:dd:95:1c)

Internet Protocol Version 6, Src: 2a02:9b0:cb:2ff2:ad95:a62c:5426:5e5e, Dst: 2600:1417:d000::5633:5eea

User Datagram Protocol, Src Port: 53189, Dst Port: 443

Source Port: 53189

Destination Port: 443

Length: 37

Checksum: 0xd724 [unverified]

[Checksum Status: Unverified]

[Stream index: 0]

[Stream Packet Number: 2]

[Timestamps]

UDP payload (29 bytes)

Data (29 bytes)

Data: 5e1c326c0df98058219c26678e6db7eed1fa810da95184896ea58d5003

[Length: 29]