Qassim University جامعة القصيم

College of Computer | كلية الحاسب

CS471 – Web Technologies (Laboratory)

Lab-1: The Internet Protocols

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Part 1: Capturing HTTP Traffic.

Task 1: Start Wireshark and capture packets.

Step 1: Open Wireshark.

Step 2: Select the network interface connected to the internet (e.g., Ethernet or Wi-Fi).

Step 3: Click the "Start Capturing Packets" button (the shark fin icon).

Step 4: Open your favorite web browser and navigate to [(https://qu.edu.sa)](https://qu.edu.sa) website.

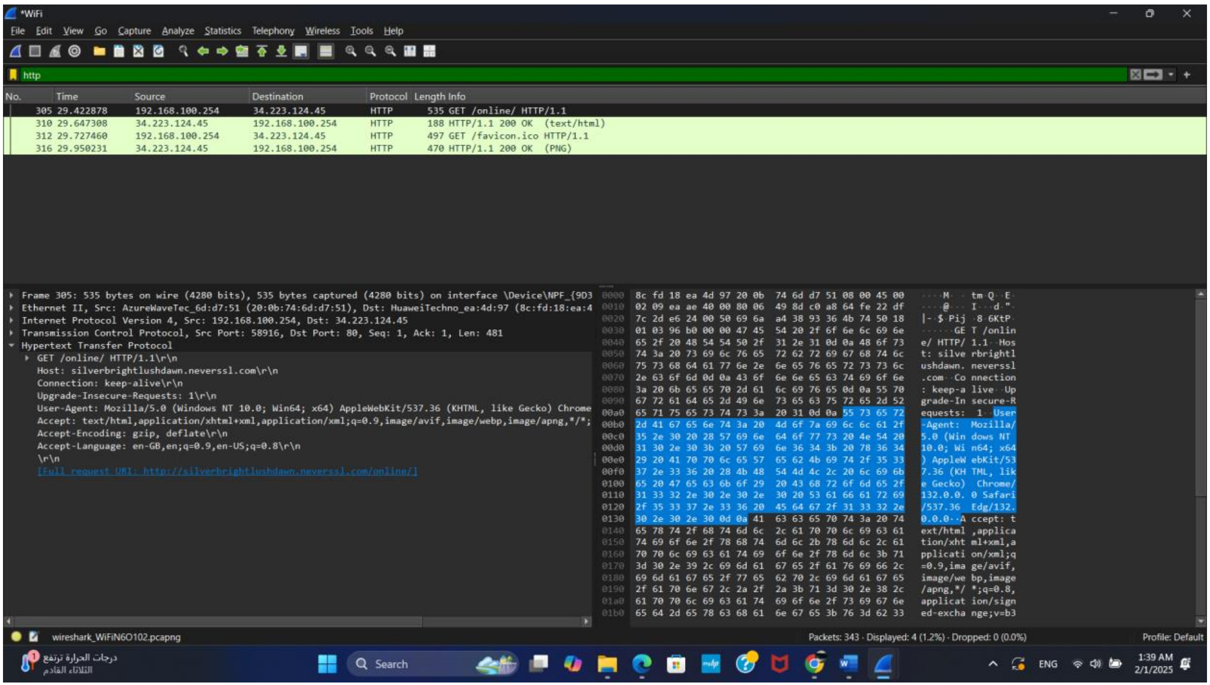
Step 5: After the website has fully loaded, stop capturing packets by clicking the red stop button in Wireshark.

Task 2: Filter HTTP packets and analyze them.

Step 1: In the filter bar, type http and press Enter. This filters out only the HTTP packets from the capture.

Step 2: Select any HTTP packet to view its details.

Step 3: Observe the HTTP request and response messages. Note the method (GET, POST), URL, response codes (200 OK, 404 Not Found), etc.


*WiFi
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
http

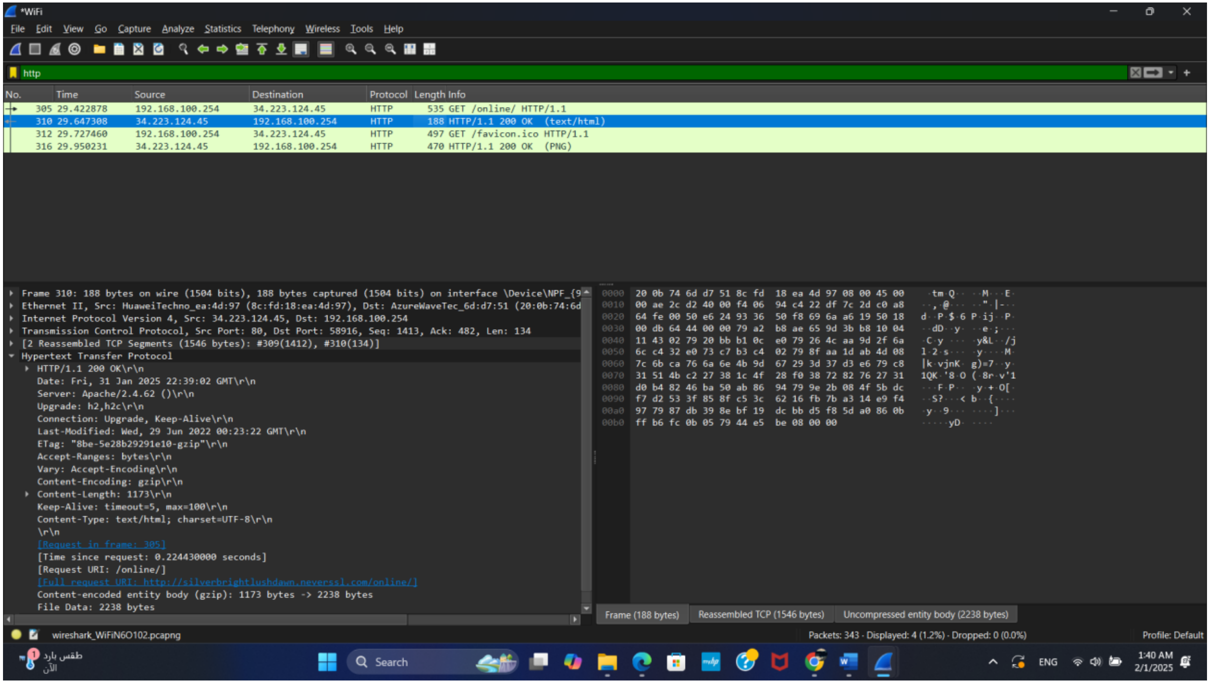
```
No.   Time        Source            Destination       Protocol Length Info
  305 29.422878   192.168.100.254   34.223.124.45     HTTP      535 GET /online/ HTTP/1.1
  310 29.647308   34.223.124.45     192.168.100.254   HTTP      188 HTTP/1.1 200 OK  (text/html)
  312 29.727460   192.168.100.254   34.223.124.45     HTTP      497 GET /favicon.ico HTTP/1.1
  316 29.950231   34.223.124.45     192.168.100.254   HTTP      470 HTTP/1.1 200 OK  (PNG)
```

```
› Frame 305: 535 bytes on wire (4280 bits), 535 bytes captured (4280 bits) on interface \Device\NPF_{9D3
› Ethernet II, Src: AzureWaveTec_6d:d7:51 (20:0b:74:6d:d7:51), Dst: HuaweiTechno_ea:4d:97 (8c:fd:18:ea:4
› Internet Protocol Version 4, Src: 192.168.100.254, Dst: 34.223.124.45
› Transmission Control Protocol, Src Port: 58916, Dst Port: 80, Seq: 1, Ack: 1, Len: 481
˅ Hypertext Transfer Protocol
  › GET /online/ HTTP/1.1\r\n
    Host: silverbrightlushdawn.neverssl.com\r\n
    Connection: keep-alive\r\n
    Upgrade-Insecure-Requests: 1\r\n
    User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome
    Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/apng,*/*;
    Accept-Encoding: gzip, deflate\r\n
    Accept-Language: en-GB,en;q=0.9,en-US;q=0.8\r\n
    \r\n
    [Full request URI: http://silverbrightlushdawn.neverssl.com/online/]
```

```
0000  8c fd 18 ea 4d 97 20 0b  74 6d d7 51 08 00 45 00   ····M·· tm·Q··E·
0010  02 09 ea ae 40 00 80 06  49 8d c0 a8 64 fe 22 df   ····@··· I···d·"·
0020  7c 2d e6 24 00 50 69 6a  a4 38 93 36 4b 74 50 18   |-·$·Pij ·8·6KtP·
0030  01 03 96 b0 00 00 47 45  54 20 2f 6f 6e 6c 69 6e   ······GE T /onlin
0040  65 2f 20 48 54 54 50 2f  31 2e 31 0d 0a 48 6f 73   e/ HTTP/ 1.1··Hos
0050  74 3a 20 73 69 6c 76 65  72 62 72 69 67 68 74 6c   t: silve rbrightl
0060  75 73 68 64 61 77 6e 2e  6e 65 76 65 72 73 73 6c   ushdawn. neverssl
0070  2e 63 6f 6d 0d 0a 43 6f  6e 6e 65 63 74 69 6f 6e   .com··Co nnection
0080  3a 20 6b 65 65 70 2d 61  6c 69 76 65 0d 0a 55 70   : keep-a live··Up
0090  67 72 61 64 65 2d 49 6e  73 65 63 75 72 65 2d 52   grade-In secure-R
00a0  65 71 75 65 73 74 73 3a  20 31 0d 0a 55 73 65 72   equests:  1··User
00b0  2d 41 67 65 6e 74 3a 20  4d 6f 7a 69 6c 6c 61 2f   -Agent:  Mozilla/
00c0  35 2e 30 20 28 57 69 6e  64 6f 77 73 20 4e 54 20   5.0 (Win dows NT 
00d0  31 30 2e 30 3b 20 57 69  6e 36 34 3b 20 78 36 34   10.0; Wi n64; x64
00e0  29 20 41 70 70 6c 65 57  65 62 4b 69 74 2f 35 33   ) AppleW ebKit/53
00f0  37 2e 33 36 20 28 4b 48  54 4d 4c 2c 20 6c 69 6b   7.36 (KH TML, lik
0100  65 20 47 65 63 6b 6f 29  20 43 68 72 6f 6d 65 2f   e Gecko)  Chrome/
0110  31 33 32 2e 30 2e 30 2e  30 20 53 61 66 61 72 69   132.0.0. 0 Safari
0120  2f 35 33 37 2e 33 36 20  45 64 67 2f 31 33 32 2e   /537.36  Edg/132.
0130  30 2e 30 2e 30 0d 0a 41  63 63 65 70 74 3a 20 74   0.0.0··A ccept: t
0140  65 78 74 2f 68 74 6d 6c  2c 61 70 70 6c 69 63 61   ext/html ,applica
0150  74 69 6f 6e 2f 78 68 74  6d 6c 2b 78 6d 6c 2c 61   tion/xht ml+xml,a
0160  70 70 6c 69 63 61 74 69  6f 6e 2f 78 6d 6c 3b 71   pplicati on/xml;q
0170  3d 30 2e 39 2c 69 6d 61  67 65 2f 61 76 69 66 2c   =0.9,ima ge/avif,
0180  69 6d 61 67 65 2f 77 65  62 70 2c 69 6d 61 67 65   image/we bp,image
0190  2f 61 70 6e 67 2c 2a 2f  2a 3b 71 3d 30 2e 38 2c   /apng,*/ *;q=0.8,
01a0  61 70 70 6c 69 63 61 74  69 6f 6e 2f 73 69 67 6e   applicat ion/sign
01b0  65 64 2d 65 78 63 68 61  6e 67 65 3b 76 3d 62 33   ed-excha nge;v=b3
```

wireshark_WiFiN6O102.pcapng   Packets: 343 · Displayed: 4 (1.2%) · Dropped: 0 (0.0%)   Profile: Default

درجات الحرارة ترتفع
الثلاثاء القادم
Search
ENG
1:39 AM
2/1/2025


*WiFi
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
http

```
No.   Time        Source            Destination       Protocol Length Info
  305 29.422878   192.168.100.254   34.223.124.45     HTTP      535 GET /online/ HTTP/1.1
  310 29.647308   34.223.124.45     192.168.100.254   HTTP      188 HTTP/1.1 200 OK  (text/html)
  312 29.727460   192.168.100.254   34.223.124.45     HTTP      497 GET /favicon.ico HTTP/1.1
  316 29.950231   34.223.124.45     192.168.100.254   HTTP      470 HTTP/1.1 200 OK  (PNG)
```

```
› Frame 310: 188 bytes on wire (1504 bits), 188 bytes captured (1504 bits) on interface \Device\NPF_{9
› Ethernet II, Src: HuaweiTechno_ea:4d:97 (8c:fd:18:ea:4d:97), Dst: AzureWaveTec_6d:d7:51 (20:0b:74:6d
› Internet Protocol Version 4, Src: 34.223.124.45, Dst: 192.168.100.254
› Transmission Control Protocol, Src Port: 80, Dst Port: 58916, Seq: 1413, Ack: 482, Len: 134
› [2 Reassembled TCP Segments (1546 bytes): #309(1412), #310(134)]
˅ Hypertext Transfer Protocol
  › HTTP/1.1 200 OK\r\n
    Date: Fri, 31 Jan 2025 22:39:02 GMT\r\n
    Server: Apache/2.4.62 ()\r\n
    Upgrade: h2,h2c\r\n
    Connection: Upgrade, Keep-Alive\r\n
    Last-Modified: Wed, 29 Jun 2022 00:23:22 GMT\r\n
    ETag: "8be-5e28b29291e10-gzip"\r\n
    Accept-Ranges: bytes\r\n
    Vary: Accept-Encoding\r\n
    Content-Encoding: gzip\r\n
  › Content-Length: 1173\r\n
    Keep-Alive: timeout=5, max=100\r\n
    Content-Type: text/html; charset=UTF-8\r\n
    \r\n
    [Request in frame: 305]
    [Time since request: 0.224430000 seconds]
    [Request URI: /online/]
    [Full request URI: http://silverbrightlushdawn.neverssl.com/online/]
    Content-encoded entity body (gzip): 1173 bytes -> 2238 bytes
    File Data: 2238 bytes
```

```
0000  20 0b 74 6d d7 51 8c fd  18 ea 4d 97 08 00 45 00    ·tm·Q·· ··M···E·
0010  00 ae 2c d2 40 00 f4 06  94 c4 22 df 7c 2d c0 a8   ··,·@··· ··"·|-··
0020  64 fe 00 50 e6 24 93 36  50 f8 69 6a a6 19 50 18   d··P·$·6 P·ij··P·
0030  00 db 64 44 00 00 79 a2  b8 ae 65 9d 3b b8 10 04   ··dD··y· ··e·;···
0040  11 43 02 79 20 bb b1 0c  e0 79 26 4c aa 9d 2f 6a   ·C·y ··· ·y&L··/j
0050  6c c4 32 e0 73 c7 b3 c4  02 79 8f aa 1d ab 4d 08   l·2·s··· ·y····M·
0060  7c 6b ca 76 6a 6e 4b 9d  67 29 3d 37 d3 e6 79 c8   |k·vjnK· g)=7··y·
0070  31 51 4b c2 27 38 1c 4f  28 f0 38 72 82 76 27 31   1QK·'8·O (·8r·v'1
0080  d0 b4 82 46 ba 50 ab 86  94 79 9e 2b 08 4f 5b dc   ···F·P·· ·y·+·O[·
0090  f7 d2 53 3f 85 8f c5 3c  62 16 fb 7b a3 14 e9 f4   ··S?···< b··{····
00a0  97 79 87 db 39 8e bf 19  dc bb d5 f8 5d a0 86 0b   ·y··9··· ····]···
00b0  ff b6 fc 0b 05 79 44 e5  be 08 00 00               ·····yD· ····
```

Frame (188 bytes)   Reassembled TCP (1546 bytes)   Uncompressed entity body (2238 bytes)

wireshark_WiFiN6O102.pcapng   Packets: 343 · Displayed: 4 (1.2%) · Dropped: 0 (0.0%)   Profile: Default

Part 2: Analyzing TCP/IP Traffic.

Task 1: Filter TCP packets

Step 1: Clear the previous filter and type TCP to focus on TCP packets.

Step 2: Select a TCP packet related to your HTTP request/response.

Step 3: Right-click on the packet and select "Follow" -> "TCP Stream".

Step 4: This shows the entire conversation between the client and server.

Task 2: Analyze TCP handshake and investigate Data Transfer and Termination Step 1:

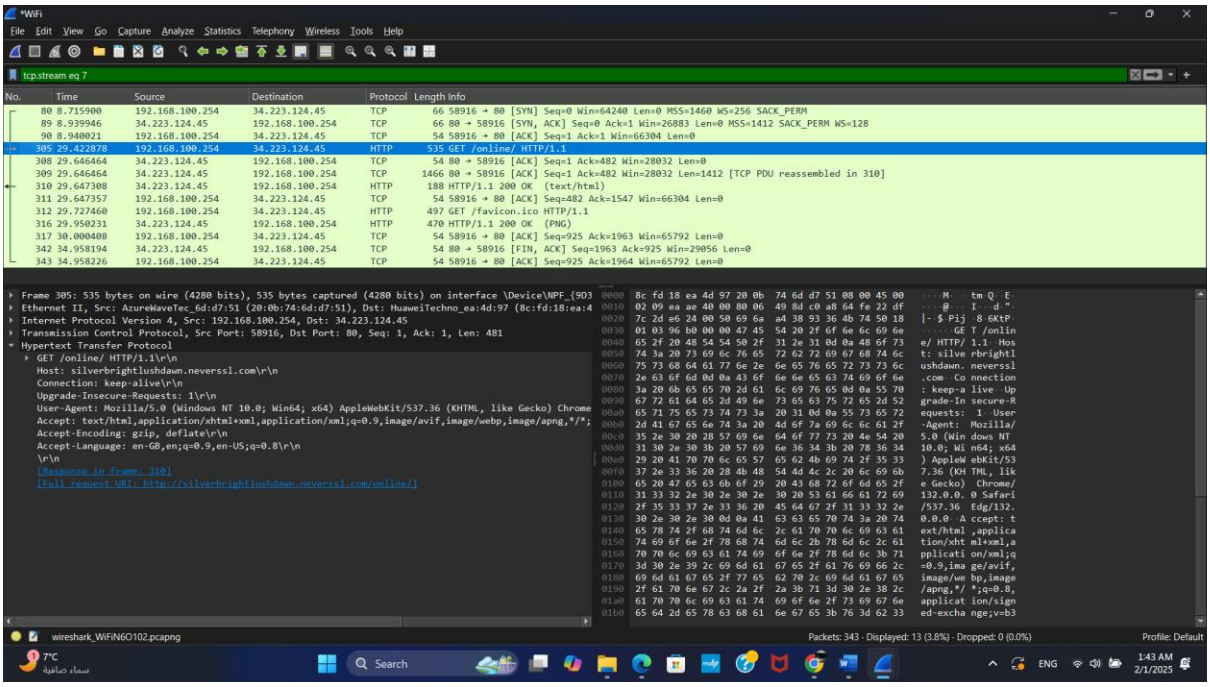
- Find and select packets related to the TCP three-way handshake:
- SYN: Initiates a connection.
- SYN-ACK: Acknowledges and responds to the SYN.

ACK: Acknowledges the SYN-ACK and establishes the connection.

Step 2: Note the sequence and acknowledgment numbers. Screenshot and upload your image to your online git repository.

Step 3: Observe the data packets exchanged between the client and server. Take a screenshot and upload it to your online git repo.

Step 4: Look at the TCP termination process (FIN, ACK packets).


*WiFi
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
wireshark_WiFiN6O102.pcapng
Profile: Default
7°C
سماء صافية
Search
ENG
1:43 AM
2/1/2025

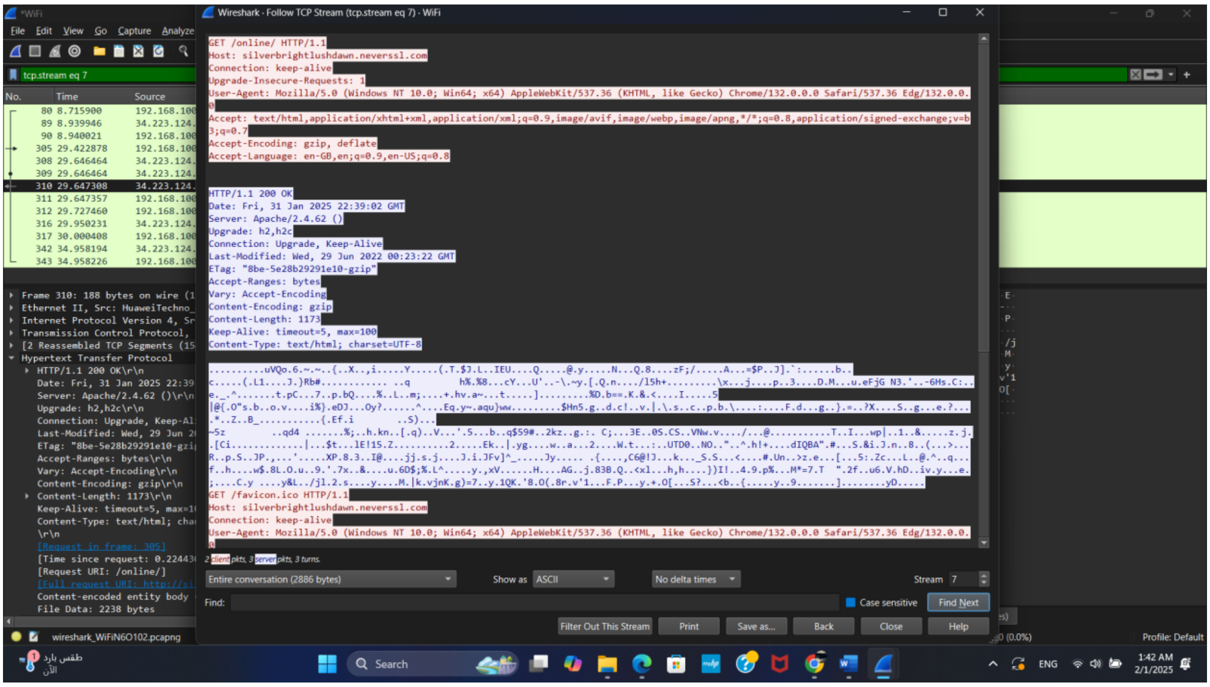
Filter: tcp.stream eq 7

```
No.  Time       Source           Destination      Protocol Length Info
 80 8.715900   192.168.100.254  34.223.124.45    TCP        66 58916 → 80 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM
 89 8.939946   34.223.124.45    192.168.100.254  TCP        66 80 → 58916 [SYN, ACK] Seq=0 Ack=1 Win=26883 Len=0 MSS=1412 SACK_PERM WS=128
 90 8.940021   192.168.100.254  34.223.124.45    TCP        54 58916 → 80 [ACK] Seq=1 Ack=1 Win=66304 Len=0
305 29.422878  192.168.100.254  34.223.124.45    HTTP      535 GET /online/ HTTP/1.1
308 29.646464  34.223.124.45    192.168.100.254  TCP        54 80 → 58916 [ACK] Seq=1 Ack=482 Win=28032 Len=0
309 29.646464  34.223.124.45    192.168.100.254  TCP      1466 80 → 58916 [ACK] Seq=1 Ack=482 Win=28032 Len=1412 [TCP PDU reassembled in 310]
310 29.647308  34.223.124.45    192.168.100.254  HTTP      188 HTTP/1.1 200 OK  (text/html)
311 29.647357  192.168.100.254  34.223.124.45    TCP        54 58916 → 80 [ACK] Seq=482 Ack=1547 Win=66304 Len=0
312 29.727460  192.168.100.254  34.223.124.45    HTTP      497 GET /favicon.ico HTTP/1.1
316 29.950231  34.223.124.45    192.168.100.254  HTTP      470 HTTP/1.1 200 OK  (PNG)
317 30.000408  192.168.100.254  34.223.124.45    TCP        54 58916 → 80 [ACK] Seq=925 Ack=1963 Win=65792 Len=0
342 34.958194  34.223.124.45    192.168.100.254  TCP        54 80 → 58916 [FIN, ACK] Seq=1963 Ack=925 Win=29056 Len=0
343 34.958226  192.168.100.254  34.223.124.45    TCP        54 58916 → 80 [ACK] Seq=925 Ack=1964 Win=65792 Len=0
```

```
▸ Frame 305: 535 bytes on wire (4280 bits), 535 bytes captured (4280 bits) on interface \Device\NPF_{9D3
▸ Ethernet II, Src: AzureWaveTec_6d:d7:51 (20:0b:74:6d:d7:51), Dst: HuaweiTechno_ea:4d:97 (8c:fd:18:ea:4
▸ Internet Protocol Version 4, Src: 192.168.100.254, Dst: 34.223.124.45
▸ Transmission Control Protocol, Src Port: 58916, Dst Port: 80, Seq: 1, Ack: 1, Len: 481
▾ Hypertext Transfer Protocol
  ▸ GET /online/ HTTP/1.1\r\n
    Host: silverbrightlushdawn.neverssl.com\r\n
    Connection: keep-alive\r\n
    Upgrade-Insecure-Requests: 1\r\n
    User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome
    Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/apng,*/*;
    Accept-Encoding: gzip, deflate\r\n
    Accept-Language: en-GB,en;q=0.9,en-US;q=0.8\r\n
    \r\n
    [Response in frame: 310]
    [Full request URI: http://silverbrightlushdawn.neverssl.com/online/]
```

```
0000  8c fd 18 ea 4d 97 20 0b  74 6d d7 51 08 00 45 00   ····M· · tm·Q··E·
0010  02 09 ea ae 40 00 80 06  49 8d c0 a8 64 fe 22 df   ····@···  I···d·"·
0020  7c 2d e6 24 00 50 69 6a  a4 38 93 36 4b 74 50 18   |-·$·Pij ·8·6KtP·
0030  01 03 96 b0 00 00 47 45  54 20 2f 6f 6e 6c 69 6e   ······GE T /onlin
0040  65 2f 20 48 54 54 50 2f  31 2e 31 0d 0a 48 6f 73   e/ HTTP/ 1.1··Hos
0050  74 3a 20 73 69 6c 76 65  72 62 72 69 67 68 74 6c   t: silve rbrightl
0060  75 73 68 64 61 77 6e 2e  6e 65 76 65 72 73 73 6c   ushdawn. neverssl
0070  2e 63 6f 6d 0d 0a 43 6f  6e 6e 65 63 74 69 6f 6e   .com··Co nnection
0080  3a 20 6b 65 65 70 2d 61  6c 69 76 65 0d 0a 55 70   : keep-a live··Up
0090  67 72 61 64 65 2d 49 6e  73 65 63 75 72 65 2d 52   grade-In secure-R
00a0  65 71 75 65 73 74 73 3a  20 31 0d 0a 55 73 65 72   equests:  1··User
00b0  2d 41 67 65 6e 74 3a 20  4d 6f 7a 69 6c 6c 61 2f   -Agent:  Mozilla/
00c0  35 2e 30 20 28 57 69 6e  64 6f 77 73 20 4e 54 20   5.0 (Win dows NT 
00d0  31 30 2e 30 3b 20 57 69  6e 36 34 3b 20 78 36 34   10.0; Wi n64; x64
00e0  29 20 41 70 70 6c 65 57  65 62 4b 69 74 2f 35 33   ) AppleW ebKit/53
00f0  37 2e 33 36 20 28 4b 48  54 4d 4c 2c 20 6c 69 6b   7.36 (KH TML, lik
0100  65 20 47 65 63 6b 6f 29  20 43 68 72 6f 6d 65 2f   e Gecko)  Chrome/
0110  31 33 32 2e 30 2e 30 2e  30 20 53 61 66 61 72 69   132.0.0. 0 Safari
0120  2f 35 33 37 2e 33 36 20  45 64 67 2f 31 33 32 2e   /537.36  Edg/132.
0130  30 2e 30 2e 30 0d 0a 41  63 63 65 70 74 3a 20 74   0.0.0··A ccept: t
0140  65 78 74 2f 68 74 6d 6c  2c 61 70 70 6c 69 63 61   ext/html ,applica
0150  74 69 6f 6e 2f 78 68 74  6d 6c 2b 78 6d 6c 2c 61   tion/xht ml+xml,a
0160  70 70 6c 69 63 61 74 69  6f 6e 2f 78 6d 6c 3b 71   pplicati on/xml;q
0170  3d 30 2e 39 2c 69 6d 61  67 65 2f 61 76 69 66 2c   =0.9,ima ge/avif,
0180  69 6d 61 67 65 2f 77 65  62 70 2c 69 6d 61 67 65   image/we bp,image
0190  2f 61 70 6e 67 2c 2a 2f  2a 3b 71 3d 30 2e 38 2c   /apng,*/ *;q=0.8,
01a0  61 70 70 6c 69 63 61 74  69 6f 6e 2f 73 69 67 6e   applicat ion/sign
01b0  65 64 2d 65 78 63 68 61  6e 67 65 3b 76 3d 62 33   ed-excha nge;v=b3
```

Packets: 343 · Displayed: 13 (3.8%) · Dropped: 0 (0.0%)



```
▸ Frame 310: 188 bytes on wire (1
▸ Ethernet II, Src: HuaweiTechno_
▸ Internet Protocol Version 4, Sr
▸ Transmission Control Protocol,
▸ [2 Reassembled TCP Segments (15
▾ Hypertext Transfer Protocol
  ▸ HTTP/1.1 200 OK\r\n
    Date: Fri, 31 Jan 2025 22:39
    Server: Apache/2.4.62 ()\r\n
    Upgrade: h2,h2c\r\n
    Connection: Upgrade, Keep-Al
    Last-Modified: Wed, 29 Jun 2
    ETag: "8be-5e28b29291e10-gzi
    Accept-Ranges: bytes\r\n
    Vary: Accept-Encoding\r\n
    Content-Encoding: gzip\r\n
  ▸ Content-Length: 1173\r\n
    Keep-Alive: timeout=5, max=1
    Content-Type: text/html; cha
    \r\n
    [Request in frame: 305]
    [Time since request: 0.22443
    [Request URI: /online/]
    [Full request URI: http://si
    Content-encoded entity body
    File Data: 2238 bytes
```

```
GET /online/ HTTP/1.1
Host: silverbrightlushdawn.neverssl.com
Connection: keep-alive
Upgrade-Insecure-Requests: 1
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/132.0.0.0 Safari/537.36 Edg/132.0.0.
0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/apng,*/*;q=0.8,application/signed-exchange;v=b
3;q=0.7
Accept-Encoding: gzip, deflate
Accept-Language: en-GB,en;q=0.9,en-US;q=0.8


HTTP/1.1 200 OK
Date: Fri, 31 Jan 2025 22:39:02 GMT
Server: Apache/2.4.62 ()
Upgrade: h2,h2c
Connection: Upgrade, Keep-Alive
Last-Modified: Wed, 29 Jun 2022 00:23:22 GMT
ETag: "8be-5e28b29291e10-gzip"
Accept-Ranges: bytes
Vary: Accept-Encoding
Content-Encoding: gzip
Content-Length: 1173
Keep-Alive: timeout=5, max=100
Content-Type: text/html; charset=UTF-8

..........uVQo.6.~.~..{..X..,i.....Y.....(.T.$J.L..IEU....Q.....@.y.....N...Q.8....zF;/.....A...=$P..J].`:......b..
c.....(.L1....J.}Rb#............ ..q         h%.%8...cY...U'..-\.~y.[.Q.n..../l5h+.........\x...j....p..3....D.M...u.eFjG N3.'..-6Hs.C:..
e._.^.......t.pC...7..p.bQ....%..L..m;....+.hv.a~...t.....]..........%D.b==.K.&.<....I.....5
|@{.O"s.b..o.v....i%}.eDJ...Oy?......^....Eq.y~.aqu}ww.........$Hn5.g..d.c!..v.|.\.s..c..p.b.\....:....F.d...g..}.=..?X....S..g...e.?...
.*..Z..B_...........{.Ef.i        ..S)...
~5z        ..qd4 .......%;..h.kn..[.q)..V...'.5...b..q$59#..2kz..g.:. C;...3E..0S.CS..VNw.v..../...@...........T..I...wp|..1..&.....z.j.
.[Ci.............|...$t...lE!15.Z..........2.....Ek..|.yg....w..a...2....W.t...:..UTD0..NO.."..^.h!+....dIQBA".#...S.&i.J.n..8..(...>...
R..p.S..JP.,...'.....XP.8.3..I@....jj.s.j....J.i.JFv]^_.....Jy.....  .{....,C6@!J...k..._S.S...<....#.Un..>z.e...[...5:.Zc...L..@.^..q...
f..h....w$.8L.O.u..9.'.7x..&....u.6D$;%.L^.....y.,xV......H....AG..j.83B.Q..<xl...h,h....})I!..4.9.p%...M*=7.T  ".2f..u6.V.hD..iv.y...e.
;....C.y ....y&L../jl.2.s....y....M.|k.vjnK.g)=7..y.1QK.'8.O(.8r.v'1...F.P...y.+.O[...S?...<b..{.....y..9.......]........yD.....
GET /favicon.ico HTTP/1.1
Host: silverbrightlushdawn.neverssl.com
Connection: keep-alive
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/132.0.0.0 Safari/537.36 Edg/132.0.0.
0
```

2 client pkts, 3 server pkts, 3 turns.

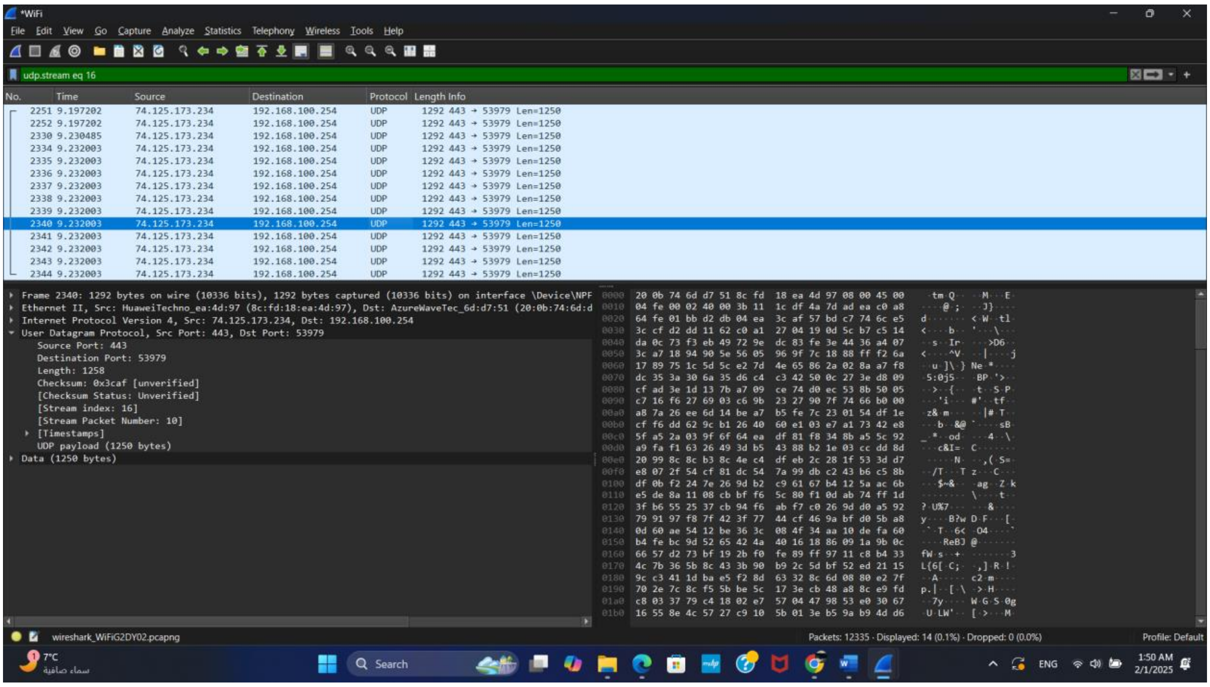
Entire conversation (2886 bytes) | Show as ASCII | No delta times | Stream 7

Find: | □ Case sensitive

Part 3: Capturing and Analyzing UDP Traffic

Task 1: Generate UDP traffic and capture packets
Step 1: Open a network application that uses UDP (e.g., streaming video, VoIP software, or custom script).
Step 2: Start the application to generate UDP traffic.
Step 3: Start capturing packets in Wireshark while the UDP application is running.
Step 4: After sufficient traffic is generated, stop capturing packets.

Task 2: Filter and analysis UDP Packets
Step 1: In the filter bar, type UDP and press Enter.
Step 2: This filters out only the UDP packets from the capture.
Step 3: Select any UDP packet to view its details.
Step 4: Observe the source and destination ports, length, and data.
Step 5: Compare the simplicity of UDP headers with TCP headers.


*WiFi
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

udp.stream eq 16

```
No.   Time      Source          Destination      Protocol Length Info
 2251 9.197202  74.125.173.234  192.168.100.254  UDP      1292 443 → 53979 Len=1250
 2252 9.197202  74.125.173.234  192.168.100.254  UDP      1292 443 → 53979 Len=1250
 2330 9.230485  74.125.173.234  192.168.100.254  UDP      1292 443 → 53979 Len=1250
 2334 9.232003  74.125.173.234  192.168.100.254  UDP      1292 443 → 53979 Len=1250
 2335 9.232003  74.125.173.234  192.168.100.254  UDP      1292 443 → 53979 Len=1250
 2336 9.232003  74.125.173.234  192.168.100.254  UDP      1292 443 → 53979 Len=1250
 2337 9.232003  74.125.173.234  192.168.100.254  UDP      1292 443 → 53979 Len=1250
 2338 9.232003  74.125.173.234  192.168.100.254  UDP      1292 443 → 53979 Len=1250
 2339 9.232003  74.125.173.234  192.168.100.254  UDP      1292 443 → 53979 Len=1250
 2340 9.232003  74.125.173.234  192.168.100.254  UDP      1292 443 → 53979 Len=1250
 2341 9.232003  74.125.173.234  192.168.100.254  UDP      1292 443 → 53979 Len=1250
 2342 9.232003  74.125.173.234  192.168.100.254  UDP      1292 443 → 53979 Len=1250
 2343 9.232003  74.125.173.234  192.168.100.254  UDP      1292 443 → 53979 Len=1250
 2344 9.232003  74.125.173.234  192.168.100.254  UDP      1292 443 → 53979 Len=1250
```

```
▸ Frame 2340: 1292 bytes on wire (10336 bits), 1292 bytes captured (10336 bits) on interface \Device\NPF
▸ Ethernet II, Src: HuaweiTechno_ea:4d:97 (8c:fd:18:ea:4d:97), Dst: AzureWaveTec_6d:d7:51 (20:0b:74:6d:d
▸ Internet Protocol Version 4, Src: 74.125.173.234, Dst: 192.168.100.254
▾ User Datagram Protocol, Src Port: 443, Dst Port: 53979
    Source Port: 443
    Destination Port: 53979
    Length: 1258
    Checksum: 0x3caf [unverified]
    [Checksum Status: Unverified]
    [Stream index: 16]
    [Stream Packet Number: 10]
  ▸ [Timestamps]
    UDP payload (1250 bytes)
▸ Data (1250 bytes)
```

```
0000  20 0b 74 6d d7 51 8c fd  18 ea 4d 97 08 00 45 00
0010  04 fe 00 02 40 00 3b 11  1c df 4a 7d ad ea c0 a8
0020  64 fe 01 bb d2 db 04 ea  3c af 57 bd c7 74 6c e5
0030  3c cf d2 dd 11 62 c0 a1  27 04 19 0d 5c b7 c5 14
0040  da 0c 73 f3 eb 49 72 9e  dc 83 fe 3e 44 36 a4 07
0050  3c a7 18 94 90 5e 56 05  96 9f 7c 18 88 ff f2 6a
0060  17 89 75 1c 5d 5c e2 7d  4e 65 86 2a 02 8a a7 f8
0070  dc 35 3a 30 6a 35 d6 c4  c3 42 50 0c 27 3e d8 09
0080  cf ad 3e 1d 13 7b a7 09  ce 74 d0 ec 53 8b 50 05
0090  c7 16 f6 27 69 03 c6 9b  23 27 90 7f 74 66 b0 00
00a0  a8 7a 26 ee 6d 14 be a7  b5 fe 7c 23 01 54 df 1e
00b0  cf f6 dd 62 9c b1 26 40  60 e1 03 e7 a1 73 42 e8
00c0  5f a5 2a 03 9f 6f 64 ea  df 81 f8 34 8b a5 5c 92
00d0  a9 fa f1 63 26 49 3d b5  43 88 b2 1e 03 cc dd 8d
00e0  20 99 8c 8c b3 8c 4e c4  df eb 2c 28 1f 53 3d d7
00f0  e8 07 2f 54 cf 81 dc 54  7a 99 db c2 43 b6 c5 8b
0100  df 0b f2 24 7e 26 9d b2  c9 61 67 b4 12 5a ac 6b
0110  e5 de 8a 11 08 cb bf f6  5c 80 f1 0d ab 74 ff 1d
0120  3f b6 55 25 37 cb 94 f6  ab f7 c0 26 9d d0 a5 92
0130  79 91 97 f8 7f 42 3f 77  44 cf 46 9a bf d0 5b a8
0140  0d 60 ae 54 12 be 36 3c  08 4f 34 aa 10 de fa 60
0150  b4 fe bc 9d 52 65 42 4a  40 16 18 86 09 1a 9b 0c
0160  66 57 d2 73 bf 19 2b f0  fe 89 ff 97 11 c8 b4 33
0170  4c 7b 36 5b 8c 43 3b 90  b9 2c 5d bf 52 ed 21 15
0180  9c c3 41 1d ba e5 f2 8d  63 32 8c 6d 08 80 e2 7f
0190  70 2e 7c 8c f5 5b be 5c  17 3e cb 48 a8 8c e9 fd
01a0  c8 03 37 79 c4 18 02 e7  57 04 47 98 53 e0 30 67
01b0  16 55 8e 4c 57 27 c9 10  5b 01 3e b5 9a b9 4d d6
```

wireshark_WiFiG2DY02.pcapng | Packets: 12335 · Displayed: 14 (0.1%) · Dropped: 0 (0.0%) | Profile: Default

Part 4: Comparing TCP and UDP by filling in the following tables. Save your work (e.g., in an MS Word document), and upload it to your online git repo.

Task 1: Fill in the following table and provide reasons.

	TCP or UDP	Reasons
Reliability and Connection Establishment	TCP	Reliable, connection-oriented (3-way handshake). ensures ordered, error-free delivery (good for web, emails).
Data Integrity and Ordering	TCP	Ensures **data integrity** with error checking and retransmissions. Maintains **ordering** by delivering packets in sequence.

Task 2: Identify the use Cases and Performance of TCP and UDP.

	TCP	UDP
Use cases	File transfers, web browsing, email, remote login (reliable delivery).	Streaming, gaming, DNS, network monitoring (speed & low latency).
Performance	Slower, heavier (error checking, flow control).	Faster, lighter (no connection setup, minimal overhead).