

Kingdom of Saudi Arabia
Ministry of Education
Qassim University
College of Computer
Computer Science Dept.



المملكة العربية السعودية
وزارة التعليم
جامعة القصيم
كلية الحاسب
قسم علوم الحاسب

CS471 – Web Technologies
Lab 1 The Internet Protocols
Semester (462)
2025/1446

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Task 2: Filter HTTP packets and analyze them.

No.	Time	Source	Destination	Protocol	Length Info
2	0.046675	192.168.100.29	34.223.124.45	HTTP	55 Continuation
94	7.090386	192.168.100.29	34.223.124.45	HTTP	490 GET / HTTP/1.1
117	7.355743	34.223.124.45	192.168.100.29	HTTP	915 HTTP/1.1 200 OK (text/html)
223	9.540124	192.168.100.29	31.13.69.61	HTTP	59 POST /chat HTTP/1.1

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223	9.540124	192.168.100.29	31.13.69.61	HTTP	59 POST /chat HTTP/1.1

Frame 94: 490 bytes on wire (3920 bits), 490 bytes captured (3920 bits) on interface \	0000	98 35 ed da 4b 8e 38 68	93 05 ac a3 00 00 45 00	5 - K 8h - - - - - E
Ethernet II, Src: Intel_05:ac:a3 (38:68:93:05:ac:a3), Dst: HuaweiTechno_da:4b:8e (98:3	0010	01 dc b5 2f 40 00 80 06	00 00 c0 a8 64 1d 22 df	- - - /@ - - - - - d "
Internet Protocol Version 4, Src: 192.168.100.29, Dst: 34.223.124.45	0020	7c 2d df 80 00 50 56 2d	06 f6 d7 33 5c d5 50 18	- - - PV - - - 3 \ P
Transmission Control Protocol, Src Port: 57216, Dst Port: 80, Seq: 2, Ack: 1, Len: 436	0030	01 03 c5 a0 00 00 47 45	54 20 2f 20 48 54 54 50	- - - - - GE T / HTTP
Hypertext Transfer Protocol	0040	2f 31 2e 31 0d 0a 48 6f	73 74 3a 20 6e 65 76 65	/1.1: Ho st: neve
	0050	72 73 73 6c 2a 63 6f 6d	0d 0a 43 6f 6e 6a 65 63	rsil.com - Connec
	0060	74 69 6f 6e 3a 20 6b 65	65 70 2d 61 6c 69 76 65	tion: ke ep-alive
	0070	0d 0a 55 70 67 72 61 64	65 2d 49 6e 73 65 63 75	- Upgrad e-Insecu
	0080	72 65 2d 52 65 71 75 65	73 74 73 3a 20 31 0d 0a	re-Reqe sts: 1 -
	0090	55 73 65 72 2d 41 67 65	6e 74 3a 20 4d 6f 7a 69	User-Age nt: Mozi
	00a0	6c 6c 61 2f 35 2e 30 20	28 57 69 6e 64 6f 77 73	lla/5.0 (Windows
	00b0	20 4e 54 20 31 30 2e 30	3b 20 57 69 6e 36 3a 3b	NT 10.0 ; Win64;
	00c0	20 78 36 34 29 20 41 70	70 6c 65 57 65 62 4b 69	x64) Ap pleWebKi
	00d0	74 2f 35 33 37 2e 33 36	20 28 4b 48 54 4d 4c 2c	t/537.36 (KHTML,
	00e0	20 6c 69 6b 65 20 47 65	63 6b 6f 29 20 43 68 72	like Ge cko) Chr
	00f0	6f 6d 65 2f 31 33 32 2e	30 2e 30 2e 30 20 53 61	ome/132. 0.0.0 Sa
	0100	66 61 72 69 2f 35 33 37	2e 33 36 0d 0a 41 63 63	fari/537 .36 Acc

Part 2: Analyzing TCP/IP Traffic.

Task 1: Filter TCP packets

No.	Time	Source	Destination	Protocol	Length	Info
3	0.062535	192.168.100.29	34.223.124.45	TCP	55	57217 → 80 [ACK] Seq=1 Ack=1 Win=259 Len=1
7	0.387698	34.223.124.45	192.168.100.29	TCP	66	80 → 57217 [ACK] Seq=1 Ack=2 Win=211 Len=0 SLE=1 SRE=2

Frame 3: 55 bytes on wire (440 bits), 55 bytes captured (440 bits) on interface \Device...	0000	88 35 ed da 4b 8e 38 68	93 05 ac a3 08 00 45 00	51 K 8h E
Ethernet II, Src: Intel_05:ac:a3 (38:68:93:05:ac:a3), Dst: HuaweiTechno_da:4b:8e (98:10:00:00:00:00)	0010	00 29 b5 2c 40 00 00 06	00 00 c0 a0 64 1d 22 df	7 0 d ..
Internet Protocol Version 4, Src: 192.168.100.29, Dst: 34.223.124.45	0020	7c 2d df 81 00 50 21 83	bd e4 33 ed 33 6c 50 10		.. PI ... 3 31P
Transmission Control Protocol, Src Port: 57217, Dst Port: 80, Seq: 1, Ack: 1, Len: 1	0030	01 03 c3 ed 00 00 00		

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

No.	Time	Source	Destination	Protocol	Length	Info
58	6.599916	192.168.100.29	31.13.69.61	TCP	66	57226 → 80 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM
59	6.666682	31.13.69.61	192.168.100.29	TCP	66	80 → 57226 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1392 SACK_PERM WS=256
103	7.278824	192.168.100.29	94.97.224.34	TCP	66	57227 → 443 [SYN] Seq=0 Win=65535 Len=0 MSS=1460 WS=256 SACK_PERM
109	7.293264	94.97.224.34	192.168.100.29	TCP	66	443 → 57227 [SYN, ACK] Seq=0 Ack=1 Win=32016 Len=0 MSS=1392 SACK_PERM WS=256
149	7.450435	192.168.100.29	34.223.124.45	TCP	66	57228 → 80 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM
150	7.450861	192.168.100.29	34.223.124.45	TCP	66	57229 → 80 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM
151	7.451630	192.168.100.29	34.223.124.45	TCP	66	57230 → 443 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM
165	7.673390	34.223.124.45	192.168.100.29	TCP	66	80 → 57228 [SYN, ACK] Seq=0 Ack=1 Win=26883 Len=0 MSS=1412 SACK_PERM WS=128
167	7.673782	34.223.124.45	192.168.100.29	TCP	66	80 → 57229 [SYN, ACK] Seq=0 Ack=1 Win=26883 Len=0 MSS=1412 SACK_PERM WS=128
169	7.700273	34.223.124.45	192.168.100.29	TCP	66	443 → 57230 [SYN, ACK] Seq=0 Ack=1 Win=26883 Len=0 MSS=1412 SACK_PERM WS=4096
211	8.732993	192.168.100.29	13.89.179.8	TCP	66	57231 → 443 [SYN] Seq=0 Win=65535 Len=0 MSS=1460 WS=256 SACK_PERM
213	8.996038	13.89.179.8	192.168.100.29	TCP	66	443 → 57231 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1412 WS=256 SACK_PERM

Frame 109: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interface \Dev...	0000	38 68 93 05 ac a3 98 35	ed da 4b 8e 08 00 45 00	8h 5 K .. E
Ethernet II, Src: HuaweiTechno_da:4b:8e (98:35:ed:da:4b:8e), Dst: Intel_05:ac:a3 (38:68:93:05:ac:a3)	0010	00 34 00 00 40 00 5a 06	bd 7a 5e 61 e0 22 c0 a8	4	@ Z .. z ^ ..
Internet Protocol Version 4, Src: 94.97.224.34, Dst: 192.168.100.29	0020	64 1d 01 bb df 8b 13 5e	ca 8b d5 c0 d0 fb 80 12	d
Transmission Control Protocol, Src Port: 443, Dst Port: 57227, Seq: 0, Ack: 1, Len: 0	0030	7d 10 28 fd 00 00 02 04	05 70 01 01 04 02 01 03	}	(..... p
	0040	03 08			

No.	Time	Source	Destination	Protocol	Length	Info
102	7.269910	192.168.100.29	94.97.224.34	TCP	54	57208 → 443 [FIN, ACK] Seq=1 Ack=1 Win=1024 Len=0
106	7.290630	94.97.224.34	192.168.100.29	TCP	54	443 → 57208 [FIN, ACK] Seq=1 Ack=2 Win=124 Len=0
224	9.540366	192.168.100.29	31.13.69.61	TCP	54	57226 → 80 [FIN, ACK] Seq=827 Ack=1538 Win=66560 Len=0
235	9.733190	31.13.69.61	192.168.100.29	TCP	54	80 → 57226 [FIN, ACK] Seq=1538 Ack=828 Win=67840 Len=0
250	11.863343	31.13.69.61	192.168.100.29	TCP	54	443 → 57201 [FIN, ACK] Seq=64 Ack=1 Win=282 Len=0
254	12.375134	34.223.124.45	192.168.100.29	TCP	54	80 → 57216 [FIN, ACK] Seq=2274 Ack=438 Win=219 Len=0
256	12.579704	34.223.124.45	192.168.100.29	TCP	54	[TCP Retransmission] 80 → 57216 [FIN, ACK] Seq=2274 Ack=438 Win=219 Len=0
259	14.116484	34.223.124.45	192.168.100.29	TCP	54	443 → 57230 [FIN, ACK] Seq=8219 Ack=4046 Win=90112 Len=0

Task 2: Filter and analysis UDP Packets

No.	Time	Source	Destination	Protocol	Length	Info
4	2.014378	192.168.100.29	172.217.19.142	UDP	1285	62599 → 443 Len=1243
5	2.014544	192.168.100.29	172.217.19.142	UDP	1292	62599 → 443 Len=1250
6	2.014631	192.168.100.29	172.217.19.142	UDP	1274	62599 → 443 Len=1232
7	2.103605	172.217.19.142	192.168.100.29	UDP	80	443 → 62599 Len=38
8	2.128208	172.217.19.142	192.168.100.29	UDP	1287	443 → 62599 Len=1245
9	2.128208	172.217.19.142	192.168.100.29	UDP	346	443 → 62599 Len=304
10	2.128208	172.217.19.142	192.168.100.29	UDP	257	443 → 62599 Len=215
11	2.128739	192.168.100.29	172.217.19.142	UDP	81	62599 → 443 Len=39
12	2.157298	192.168.100.29	172.217.19.142	UDP	75	62599 → 443 Len=33
13	2.239881	172.217.19.142	192.168.100.29	UDP	68	443 → 62599 Len=26
20	7.163030	192.168.100.29	172.217.19.142	UDP	1285	62599 → 443 Len=1243
21	7.163148	192.168.100.29	172.217.19.142	UDP	1292	62599 → 443 Len=1250
22	7.163190	192.168.100.29	172.217.19.142	UDP	1274	62599 → 443 Len=1232
23	7.285270	172.217.19.142	192.168.100.29	UDP	75	443 → 62599 Len=33
24	7.288669	172.217.19.142	192.168.100.29	UDP	1287	443 → 62599 Len=1245
25	7.288669	172.217.19.142	192.168.100.29	UDP	338	443 → 62599 Len=226

Frame 6: 1274 bytes on wire (10192 bits), 1274 bytes captured (10192 bits) on interface
 Ethernet II, Src: Intel_05:ac:a3 (38:68:93:05:ac:a3), Dst: HuaweiTechno_da:4b:8e (98:13:
 Destination: HuaweiTechno_da:4b:8e (98:13:ed:da:4b:8e)
 Source: Intel_05:ac:a3 (38:68:93:05:ac:a3)
 Type: IPv4 (0x0800)
 [Stream index: 1]
 Internet Protocol Version 4, Src: 192.168.100.29, Dst: 172.217.19.142
 User Datagram Protocol, Src Port: 62599, Dst Port: 443
 Data (1232 bytes)

0000 98 35 ed da 4b 8e 38 68 93 05 ac a3 08 00 45 00 .5 K 8h E
 0010 04 ec 38 09 40 00 80 11 00 00 c0 a8 64 1d ac d9 .8 @ d
 0020 13 8e f4 87 01 bb 04 d8 ea 16 56 f8 62 b1 f8 22 V b -
 0030 8e d3 35 15 3a 86 38 36 f8 8e 6d 90 53 32 2a fc .5 : 86 m 52*
 0040 bf 8c 73 ea 22 58 71 63 00 91 49 80 3c 63 62 2d .s "Xqc -I <cb-
 0050 4f ac 27 5d 38 86 e4 4f 46 54 0d e9 2e eb 5f O 'WJ8 - OFT -
 0060 45 d7 e7 fd 25 f1 4a 23 bd 77 0a 41 bd e3 15 d2 E - % 3# w A -
 0070 de d4 c9 94 40 d4 00 32 59 40 4f 5a f0 8d 5a 26 @ . 2 Y6OZ Z6
 0080 31 f1 37 c0 81 e2 7a d6 05 8e af 1e 34 ca 25 62 1 7 - z - 4 Nb
 0090 22 3c 25 2f d3 ea 15 78 dc dc a2 3d cf a4 c4 7c "cK/ X - - - -
 00a0 49 0c ba f5 9e c0 74 ea 16 45 88 d8 d3 07 38 d3 I - t - E - 8
 00b0 b6 c4 af 6b 93 1d f3 33 33 68 0e 89 55 4a da e4 - k - 3 3h UJ -
 00c0 9c 1d 05 67 9d 05 ba 0c 11 00 94 7b 02 e4 c0 65 - g - - - - { - e
 00d0 34 34 b3 59 2d 47 20 81 2e 14 d4 90 41 03 3b ca 44 Y-G - - - A ;
 00e0 7b ac b8 73 21 99 e5 cd 09 51 49 a0 5e 17 26 c6 { s l - - - QI - &
 00f0 48 10 65 0e 2f 4c 86 e5 08 10 59 f7 e0 84 2b 34 H e 2L - - - Y - +4
 0100 63 34 58 2b a5 32 54 ed 1b df 79 e4 3e 15 a3 63 c4X+ 2T - - - y > c

Step 5: Compare the simplicity of UDP headers with TCP headers.

UDP is simpler than TCP because:

- No Three-Way Handshake (SYN, SYN-ACK, ACK).
- No Acknowledgment Numbers.
- No Retransmission (if a packet is lost, it is not resent).

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 – It makes sure data is received correctly by using a handshake before sending data. UDP does not check if the data arrives.
Data Integrity and Ordering	TCP – It keeps data in order and resends lost packets. UDP sends data quickly but doesn't check if it's in order.

Task 2: Use Cases and Performance

	TCP	UDP
Use Cases	Good for important data like web browsing, email, and file downloads.	Good for speed like video streaming, online gaming, and voice calls.
Performance	Slower but accurate – Checks errors and resends lost data.	Faster but may lose data – Does not check errors or resend data.