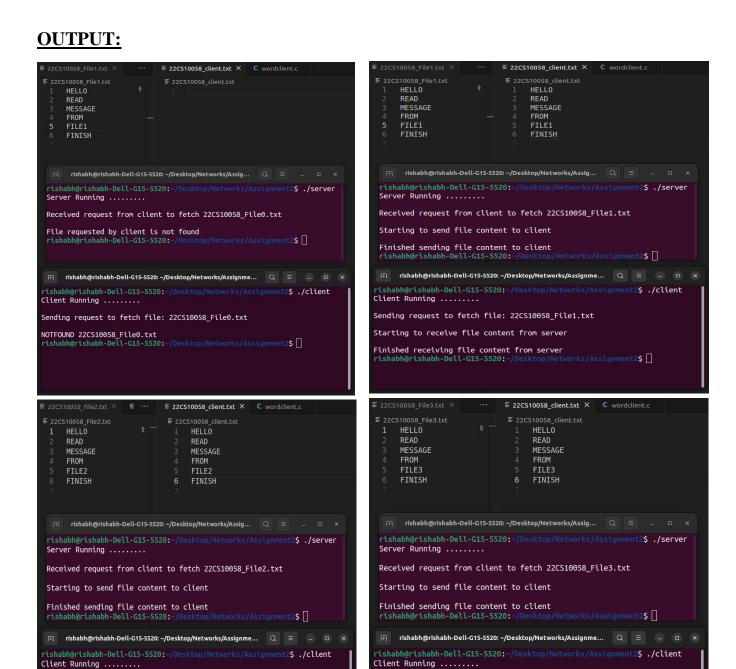
CS39006: NETWORKS LABORATORY

ASSIGNMENT – 2 REPORT

UDP Sockets

S.Rishabh 22CS10058

PART A: SOCKET PROGRAMMING



Sending request to fetch file: 22CS10058_File2.txt
Starting to receive file content from server

works/Assignment2\$

Finished receiving file content from server rishabh@rishabh-Dell-G15-5520:~/Desktop/Nets

Sending request to fetch file: 22CS10058 File3.txt

etworks/Assignment2\$

Starting to receive file content from server

Finished receiving file content from server

ishabh@rishabh-Dell-G15-5520:~/Desktop/N

PART B: WIRESHARK ANALYSIS

[Note: This part of the assignment was done using the File2. Content of file - "Hello Read Message from File2 Finish"]

1) Capture all packets exchanged between the client and server during execution. Show the screenshots.

No.	Time	Source	Destination	Protocol Length	Info
Г	1 0.000000000	127.0.0.1	127.0.0.1	UDP	1042 52710 → 5000 Len=1000
	2 0.000071823	127.0.0.1	127.0.0.1	UDP	1042 5000 → 52710 Len=1000
	3 0.000081399	127.0.0.1	127.0.0.1	UDP	1042 5000 → 52710 Len=1000
	4 0.000085029	127.0.0.1	127.0.0.1	UDP	1042 5000 → 52710 Len=1000
	5 0.000090505	127.0.0.1	127.0.0.1	UDP	1042 5000 → 52710 Len=1000
	6 0.000093949	127.0.0.1	127.0.0.1	UDP	1042 5000 → 52710 Len=1000
L	7 0.000096733	127.0.0.1	127.0.0.1	UDP	1042 5000 → 52710 Len=1000

- 2) What protocol is used for communication <u>UDP</u>
- 3) What are the source and destination IP addresses and ports?

File name (Client to Server):

Source - 127.0.0.1#52710

Destination – 127.0.0.1#5000

File content (Server to Client):

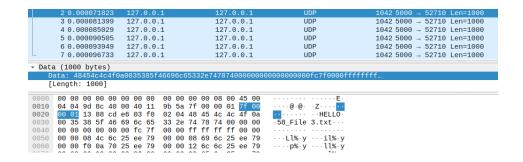
Source - 127.0.0.1#5000

Destination – 127.0.0.1#52710

- 4) What is the size (in bytes) of the FILENAME request sent by the client? Size of the request -1042 bytes
- 5) What is the size of the server's response for HELLO and the first word (WORD1)?

Size of the response of each message - 1042 bytes

- 6) Inspect the payload of packets where the words are transmitted. Show the UDP payloads of those packets.
 - a) HELLO Message –



b) WORD1 Message –

	ored i wessage			
2 0.000073		127.0.0.1 127.0.0.1	UDP UDP	1042 5000 → 52710 Len=1000 1042 5000 → 52710 Len=1000
4 0.00008		127.0.0.1	UDP	1042 5000 → 52710 Len=1000
5 0.000090		127.0.0.1	UDP	1042 5000 → 52710 Len=1000
6 0.000093 7 0.000096		127.0.0.1 127.0.0.1	UDP UDP	1042 5000 → 52710 Len=1000 1042 5000 → 52710 Len=1000
		127.0.0.1	ODF	1042 3000 → 32710 Len=1000
	0204 [unverified] atus: Unverified]			
[Stream inde	x: 0]			
0020 00 01 13 8		2 45 41 44 0a 00	· · · · · · · · · · · · · READ · ·	***************************************
0030 00 35 38 5	of 46 69 6c 65 33 2e 74	1 78 74 00 00 00	·58_File 3.txt···	
0040 00 00 00 0	0 00 00 fc 7f 00 00 ff	ff ff ff 00 00		
0050 00 00 08 4	0a 70 25 ee 79 00 00 08	3 69 6c 25 ee 79 2 6c 6c 25 ee 79	···Ll%·y ···il%·y ····p%·y ···ll%·y	
	00 00 00 00 00 00 00 90		· · · · · · · · e1% · v	
c) W(ORD2 Message	· <u> </u>		
<i>c)</i> ***	JND2 Message			
2 0.000071823	127.0.0.1	127.0.0.1	UDP	1042 5000 → 52710 Len=1000
3 0.000081399	127.0.0.1	127.0.0.1	UDP	1042 5000 → 52710 Len=1000
4 0.000085029	127.0.0.1	127.0.0.1	UDP	1042 5000 → 52710 Len=1000
5 0.000090505	127.0.0.1	127.0.0.1	UDP	1042 5000 → 52710 Len=1000
6 0.000093949	127.0.0.1	127.0.0.1	UDP	1042 5000 → 52710 Len=1000
7 0.000096733	127.0.0.1		UDP	1042 5000 → 52710 Len=1000
- 70.000090733	127.0.0.1	127.0.0.1	ODF	1042 3000 → 32710 Len-1000
Checksum: 0x0204				
[Checksum Status	: Unverified]			
[Stream index: 0]			
Timostomnol	-0.00 50	4F FO FO		
0020 00 01 13 88 cd		45 53 53 41 47	MESSAG	
0030 45 0a 00 5f 46		78 74 00 00 00	E··_File 3.txt···	
0040 00 00 00 00 00 0050 00 00 08 4c 6c		ff ff ff 00 00	110/ 1/ 110/ 1/	
		69 6c 25 ee 79	···Ll%·y ···il%·y	
0060 00 00 f0 0a 70 0070 00 00 00 00 00		6c 6c 25 ee 79 65 6c 25 ee 79	· · · · p% · y · · · ll% · y	
0080 00 00 50 fa 6f		68 6c 25 ee 79	·········el%·y ··P·o%·y ···hl%·y	
00 00 30 1a 01	25 ee 79 00 00 d8 0	30 OC 23 EE 73	те ожту ттижту	
1) 177	000011			
d) Wo	ORD3 Message	: —		
,				1010 5000 50710 1 1000
2 0.000071823	127.0.0.1	127.0.0.1	UDP	1042 5000 → 52710 Len=1000
3 0.000081399	127.0.0.1	127.0.0.1	UDP	1042 5000 → 52710 Len=1000
4 0.000085029	127.0.0.1	127.0.0.1	UDP	1042 5000 → 52710 Len=1000
5 0.000090505	127.0.0.1	127.0.0.1	UDP	1042 5000 → 52710 Len=1000
6 0.000093949	127.0.0.1	127.0.0.1	UDP	1042 5000 → 52710 Len=1000
	127.0.0.1	127.0.0.1	UDP	1042 5000 → 52710 Len=1000
Checksum: 0x0204	[unverified]			
[Checksum Status				
[Stream index: 0	_			
[Timestamps]				
0020 00 01 13 88 cd		52 4f 4d 0a 00	FROM · ·	
0030 45 0a 00 5f 46		78 74 00 00 00	E··_File 3.txt···	
0040 00 00 00 00 00		ff ff ff 00 00		
0050 00 00 08 4c 6c		69 6c 25 ee 79	···Ll%·y ···il%·y	
0060 00 00 f0 0a 70		6c 6c 25 ee 79	· · · · p% · y · · · · ll% · y	
0070 00 00 00 00 00		65 6c 25 ee 79	······ el%·y	
0080 00 00 50 fa 6f		68 6c 25 ee 79	··P·o%·y ···hl%·y	
2) 11/4				
e) w	ORD4 Message	; —		
2 0 000071002	127 0 0 1	127 0 0 1	IIDD	1042 5000 52740 Lon-1000
2 0.000071823	127.0.0.1	127.0.0.1	UDP	1042 5000 → 52710 Len=1000
3 0.000081399	127.0.0.1	127.0.0.1	UDP	1042 5000 → 52710 Len=1000
4 0.000085029	127.0.0.1	127.0.0.1	UDP	1042 5000 → 52710 Len=1000
5 0.000090505	127.0.0.1	127.0.0.1	UDP	1042 5000 → 52710 Len=1000
6 0.000093949	127.0.0.1	127.0.0.1	UDP	1042 5000 → 52710 Len=1000
7 0.000096733	127.0.0.1	127.0.0.1	UDP	1042 5000 → 52710 Len=1000
Checksum: 0x0204	[unverified]			
[Checksum Status				
[Stream index: 0	_			
Timestampal				
0020 00 01 13 88 cd		49 4c 45 33 0a	·····FILE3	
0030 00 0a 00 5f 46		78 74 00 00 00	···_File 3.txt···	
0040 00 00 00 00 00		ff ff ff 00 00		
0050 00 00 08 4c 6c		69 6c 25 ee 79	···Ll%·y ···il%·y	
0060 00 00 f0 0a 70		ôc 6c 25 ee 79	····p%·y ····ll%·y	
0070 00 00 00 00 00		65 6c 25 ee 79	· · · · · · · · el% · y	
0080 00 00 50 fa 6f		68 6c 25 ee 79	· · P · o% · y · · · h l% · y	
0090 00 00 d4 31 6d		92 00 00 00 00	· · · 1m% · y · · · · · · · ·	
00a0 00 00 0d 00 00	00 00 00 00 00 60 4	41 6c 25 ee 79	·············`Al%·y	

f) FINISH Message –

	2 0.00	00718	23	127.0	9.0.1			12	7.0.	0.1		JDP		1042 5	000 →	52710	Len=100	00
	3 0.00	00813	99	127.0	9.0.1			12	7.0.	0.1	ı	JDP		1042 5	000 →	52710	Len=100	00
	4 0.00	00850	29	127.0	9.0.1			12	7.0.	0.1		JDP		1042 5	000 →	52710	Len=100	00
	5 0.00	00905	05	127.0	9.0.1			12	7.0.	0.1	ı	JDP		1042 5	000 →	52710	Len=100	00
	6 0.00	00939	49	127.0	0.0.1			12	7.0.	0.1		JDP		1042 5	000 →	52710	Len=100	00
L	7 0.00	00967	33	127.0	0.0.1			12	7.0.	0.1		JDP		1042 5	i000 →	52710	Len=100	00
C	hecksum:	0x02	204 [ι	nver	ified													
Г	Checksun	n Stat	us: l	nver	ified													
L.	01100110411																	
	Stream i																	
Ĩ		index:																
Ĩ	Stream i	index:	0]	6 03	f0 0	2 04	46 4	49 4e	49	53 48		··FINI	[SH					
. [Stream i	index:	0] cd e6							53 48 00 00								
0020	Stream i	index: 13 88 00 5f	0] cd e6 46 69	6c	65 3	3 2e	74	78 74	00		···_File	3.txt						
0020 0030	Stream i 00 01 : 0a 00 (index: 13 88 00 5f 00 00	0] cd e6 46 69 00 00	6c fc	65 3 7f 0	3 2e 9 00	74 ff 1	78 74 ff ff	00 ff	00 00	···_File	3.txt						
0020 0030 0040	Stream i 7 00 01 1 0a 00 0	index: 13 88 90 5f 90 00 98 4c	0] cd e6 46 69 00 00 6c 25	6c fc ee	65 3 7f 0 79 0	3 2e 0 00 0 00	74 ff f	78 74 ff ff 69 6c	00 ff 25	00 00 00 00	···_File ····Ll%·y	3.txt· ····il%	 6 · y					
0020 0030 0040 0050	Stream i 00 01 : 0a 00 (00 00 (00 00 (index: 13 88 90 5f 90 00 98 4c f0 0a	0] cd e6 46 69 00 00 6c 25 70 25	6c fc ee ee	65 3 7f 0 79 0 79 0	3 2e 9 00 9 00 9 00	74 7 ff 1 08 6 12 6	78 74 ff ff 69 6c 6c 6c	00 ff 25 25	00 00 00 00 ee 79	···_File ····Ll%·y ····p%·y	3.txt il% ll%	6 · y 6 · y					
0020 0030 0040 0050 0060	Stream i 00 01 : 0a 00 (00 00 (00 00 (index: 13 88 90 5f 90 00 98 4c f0 0a 90 00	0] cd e6 46 69 00 06 6c 25 70 25 00 06	6c fc ee ee 000	65 3 7f 0 79 0 79 0 00 0	3 2e 0 00 0 00 0 00 0 00	74 7 ff 1 08 6 12 6 90 6	78 74 ff ff 69 6c 6c 6c 65 6c	00 ff 25 25 25	00 00 00 00 ee 79 ee 79	···_File	3.txt il% il% el%	6 · y 6 · y 6 · y					
0020 0030 0040 0050 0060 0070	Stream in Stream	index: 13 88 90 5f 90 00 98 4c f0 0a 90 00 50 fa	0] cd e6 46 69 00 00 6c 25 70 25 00 00 6f 25	6c fc ee ee 0 00 ee	65 3 7f 0 79 0 79 0 00 0 79 0	3 2e 9 00 9 00 9 00 9 00 9 00	74 7 ff 1 08 6 12 6 90 6 d8 6	78 74 ff ff 69 6c 6c 6c 65 6c 68 6c	00 ff 25 25 25 25	00 00 00 00 ee 79 ee 79 ee 79	File Ll%.y p%.y	3.txt· ···il% ···il% ···el% ···hl%	6 · y 6 · y 6 · y 6 · y					

7) Measure the total time taken for the file transfer from start to finish.

The time taken for the total file transfer can be seen in the picture of captured packets. The first packet from the client to the server containing the file name was sent at t = 0, and the final message 'FINISH' from the server to the client was sent at t = 0.096733 ms. Hence,

Total time taken = 0.096733 ms

8) What is the average size of each packet during the communication?

The size of data being sent by the server to the client or vice-versa is 1000 bytes every time. Additionally, the network adds 42 bytes of data to the packet to facilitate the transfer. Hence, a total of 1042 bytes is transferred through each packet. Therefore,

Average size of each packet = <u>1042 bytes</u>