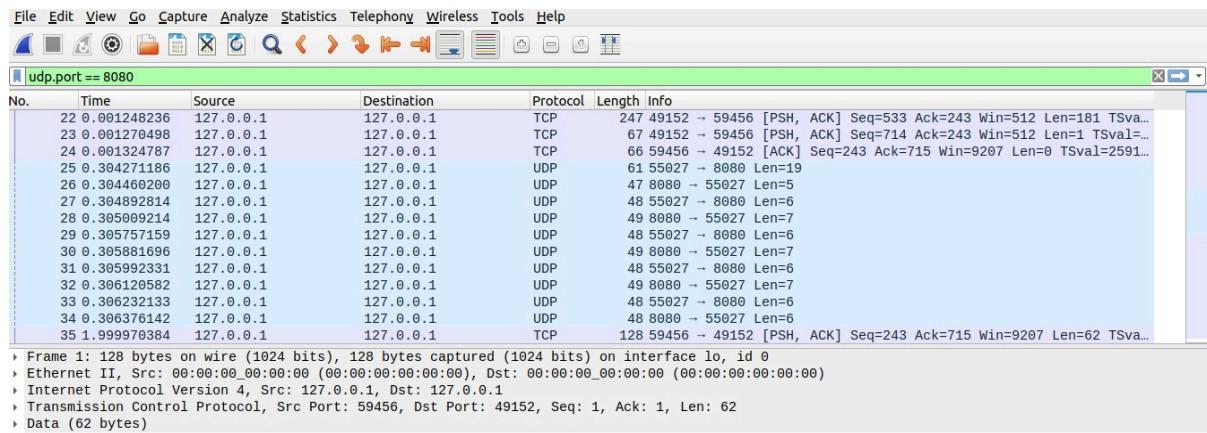


# UDP FILE TRANSFER WIRESHARK ANALYSIS

## 1. PACKET CAPTURE OVERVIEW:

Overall packets capture screenshot:



The screenshot shows the contents of the transferred file (22CS10045\_File1.txt) in Wireshark. The ASCII dump shows the following text:

```
0000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 .....  
0008 00000000 00000000 00000000 00000000 00001000 00000000 01000101 00000000 .....E  
0010 00000000 01110010 11001111 11011000 01000000 00000000 01000000 00000110 .r. @.  
0018 01101100 10101011 01111111 00000000 00000000 00000001 01111111 00000000 l.....  
0020 00000000 00000001 11001000 01000000 11000000 00000000 11011010 11010110 ...@...  
0028 11011111 11010011 00100111 10001110 01010001 10100010 10000000 00011000 ..'Q..  
0030 00100011 11110111 11111110 01000110 00000000 00000000 00000001 00000001 #.f...  
0038 00001000 00001010 10011010 01110111 01000010 01000100 10011010 01110111 ...wBD.w  
0040 00111010 01110101 01110111 00100010 01110110 01100101 01110010 01110011 :u{"vers  
0048 01101001 01101111 01101110 00100010 00111010 00110001 00101100 00100010 ion":1,"  
0050 01101011 01101001 01101110 01100100 00100010 00111010 00110010 01000101 kind":1,  
0058 01100011 01000101 01101110 01100001 01100010 01101100 01100101 01100100 sEnabled  
0060 00100010 00101100 00100010 01100010 01101111 01100100 01110011 00100010 ", "body"
```

The contents of the file(name is 22CS10045\_File1.txt) transferred are:

**HELLO  
CS31206  
CS39006  
CS31208  
FINISH**

## Individual packets capture screenshots:

22 0.001248236	127.0.0.1	127.0.0.1	TCP	247 49152 → 59456 [PSH, ACK] Seq=533 Ack=243 Win=512 Len=181 TSva...
23 0.001270498	127.0.0.1	127.0.0.1	TCP	67 49152 → 59456 [PSH, ACK] Seq=714 Ack=243 Win=512 Len=1 TSval=...
24 0.001324787	127.0.0.1	127.0.0.1	TCP	66 59456 → 49152 [ACK] Seq=243 Ack=715 Win=9207 Len=0 TSval=2591...
25 0.304271186	127.0.0.1	127.0.0.1	UDP	61 55027 → 8080 Len=19
26 0.304460200	127.0.0.1	127.0.0.1	UDP	47 8080 → 55027 Len=5
27 0.304892814	127.0.0.1	127.0.0.1	UDP	48 55027 → 8080 Len=6
28 0.305009214	127.0.0.1	127.0.0.1	UDP	49 8080 → 55027 Len=7
29 0.305757159	127.0.0.1	127.0.0.1	UDP	48 55027 → 8080 Len=6
30 0.305881696	127.0.0.1	127.0.0.1	UDP	49 8080 → 55027 Len=7
31 0.305992331	127.0.0.1	127.0.0.1	UDP	48 55027 → 8080 Len=6
32 0.306120582	127.0.0.1	127.0.0.1	UDP	49 8080 → 55027 Len=7
33 0.306232133	127.0.0.1	127.0.0.1	UDP	48 55027 → 8080 Len=6
34 0.306376142	127.0.0.1	127.0.0.1	UDP	48 8080 → 55027 Len=6
35 1.999970384	127.0.0.1	127.0.0.1	TCP	128 59456 → 49152 [PSH, ACK] Seq=243 Ack=715 Win=9207 Len=62 TSva...
► Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1				
▼ User Datagram Protocol, Src Port: 55027, Dst Port: 8080				
Source Port: 55027				
Destination Port: 8080				
Length: 27				
Checksum: 0xfe2e [unverified]				
[Checksum Status: Unverified]				
[Stream index: 0]				
► [Timestamps]				
▼ Data (19 bytes)				
Data: 3232435331303034355f46696c65312e747874				
0000	00000000	00000000	00000000	00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0008	00000000	00000000	00000000	00000000 00001000 00000000 01000101 00000000
0010	00000000	00101111	10110100	00001001 01000000 00000000 01000000 000010001
0018	10001000	10110010	01111111	00000000 00000000 00000001 01111111 00000000
0020	00000000	00000001	11010110	11110011 00011111 10010000 00000000 00011011
0028	11111110	00101110	00110010	00110010 01000011 01010011 00110001 00110000
0030	00110000	00110100	00110101	01011111 01000110 01101001 01101100 01100101
0038	00110001	00101110	01110100	01111000 01110100
				045_File 1.txt

No.	Time	Source	Destination	Protocol	Length	Info
22 0.001248236	127.0.0.1	127.0.0.1	TCP	247 49152 → 59456 [PSH, ACK] Seq=533 Ack=243 Win=512 Len=181 TSva...		
23 0.001270498	127.0.0.1	127.0.0.1	TCP	67 49152 → 59456 [PSH, ACK] Seq=714 Ack=243 Win=512 Len=1 TSval=...		
24 0.001324787	127.0.0.1	127.0.0.1	TCP	66 59456 → 49152 [ACK] Seq=243 Ack=715 Win=9207 Len=0 TSval=2591...		
25 0.304271186	127.0.0.1	127.0.0.1	UDP	61 55027 → 8080 Len=19		
26 0.304460200	127.0.0.1	127.0.0.1	UDP	47 8080 → 55027 Len=5		
27 0.304892814	127.0.0.1	127.0.0.1	UDP	48 55027 → 8080 Len=6		
28 0.305009214	127.0.0.1	127.0.0.1	UDP	49 8080 → 55027 Len=7		
29 0.305757159	127.0.0.1	127.0.0.1	UDP	48 55027 → 8080 Len=6		
30 0.305881696	127.0.0.1	127.0.0.1	UDP	49 8080 → 55027 Len=7		
31 0.305992331	127.0.0.1	127.0.0.1	UDP	48 55027 → 8080 Len=6		
32 0.306120582	127.0.0.1	127.0.0.1	UDP	49 8080 → 55027 Len=7		
33 0.306232133	127.0.0.1	127.0.0.1	UDP	48 55027 → 8080 Len=6		
34 0.306376142	127.0.0.1	127.0.0.1	UDP	48 8080 → 55027 Len=6		
35 1.999970384	127.0.0.1	127.0.0.1	TCP	128 59456 → 49152 [PSH, ACK] Seq=243 Ack=715 Win=9207 Len=62 TSva...		
► Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1						
▼ User Datagram Protocol, Src Port: 8080, Dst Port: 55027						
Source Port: 8080						
Destination Port: 55027						
Length: 13						
Checksum: 0xfe20 [unverified]						
[Checksum Status: Unverified]						
[Stream index: 0]						
► [Timestamps]						
▼ Data (5 bytes)						
Data: 48454c4c4f						
0000	00000000	00000000	00000000	00000000 00000000 00000000 00000000 00000000		
0008	00000000	00000000	00000000	00001000 00000000 01000101 00000000		
0010	00000000	00100001	10110100	00001010 01000000 00000000 01000000 00010001		
0018	10001000	10111111	01111111	00000000 00000000 00000001 01111111 00000000		
0020	00000000	00000001	00011111	10010000 11010110 11110011 00000000 00001101		
0028	11111110	00100000	01001000	01000101 01001100 01001100 01001111		
				HELLO		

udp.port == 8080						
No.	Time	Source	Destination	Protocol	Length	Info
22	0.001248236	127.0.0.1	127.0.0.1	TCP	247	49152 → 59456 [PSH, ACK] Seq=533 Ack=243 Win=512 Len=181 TSva...
23	0.001270498	127.0.0.1	127.0.0.1	TCP	67	49152 → 59456 [PSH, ACK] Seq=714 Ack=243 Win=512 Len=1 TSval=...
24	0.001324787	127.0.0.1	127.0.0.1	TCP	66	59456 → 49152 [ACK] Seq=243 Ack=715 Win=9207 Len=0 TSval=2591...
25	0.304271186	127.0.0.1	127.0.0.1	UDP	61	55027 → 8080 Len=19
26	0.304460200	127.0.0.1	127.0.0.1	UDP	47	8080 → 55027 Len=5
27	0.304892814	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
28	0.305009214	127.0.0.1	127.0.0.1	UDP	49	8080 → 55027 Len=7
29	0.305757159	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
30	0.305881696	127.0.0.1	127.0.0.1	UDP	49	8080 → 55027 Len=7
31	0.305992331	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
32	0.306120582	127.0.0.1	127.0.0.1	UDP	49	8080 → 55027 Len=7
33	0.306232133	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
34	0.306376142	127.0.0.1	127.0.0.1	UDP	48	8080 → 55027 Len=6
35	1.999970384	127.0.0.1	127.0.0.1	TCP	128	59456 → 49152 [PSH, ACK] Seq=243 Ack=715 Win=9207 Len=62 TSva...
► Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1						
► User Datagram Protocol, Src Port: 55027, Dst Port: 8080						
Source Port: 55027 Destination Port: 8080 Length: 14 Checksum: 0xfe21 [unverified] [Checksum Status: Unverified] [Stream index: 0] [Timestamps]						
► Data (6 bytes)						
Data: 574f52442031						
0000	00000000 00000000 00000000 00000000 00000000 00000000 00000000					.....
0008	00000000 00000000 00000000 00000000 00001000 00000000 01000101 00000000					..... E
0010	00000000 00100010 10110100 00001011 01000000 00000000 01000000 00010001					" .. @ ..
0018	10001000 10111101 01111111 00000000 00000000 00000001 01111111 00000000					.....
0020	00000000 00000001 11010110 11100011 00011111 10010000 00000000 00001110					.....
0028	11111110 00100001 01001011 01010010 01000100 00100000 00110001					!WORD 1

udp.port == 8080						
No.	Time	Source	Destination	Protocol	Length	Info
22	0.001248236	127.0.0.1	127.0.0.1	TCP	247	49152 → 59456 [PSH, ACK] Seq=533 Ack=243 Win=512 Len=181 TSva...
23	0.001270498	127.0.0.1	127.0.0.1	TCP	67	49152 → 59456 [PSH, ACK] Seq=714 Ack=243 Win=512 Len=1 TSval=...
24	0.001324787	127.0.0.1	127.0.0.1	TCP	66	59456 → 49152 [ACK] Seq=243 Ack=715 Win=9207 Len=0 TSval=2591...
25	0.304271186	127.0.0.1	127.0.0.1	UDP	61	55027 → 8080 Len=19
26	0.304460200	127.0.0.1	127.0.0.1	UDP	47	8080 → 55027 Len=5
27	0.304892814	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
28	0.305009214	127.0.0.1	127.0.0.1	UDP	49	8080 → 55027 Len=7
29	0.305757159	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
30	0.305881696	127.0.0.1	127.0.0.1	UDP	49	8080 → 55027 Len=7
31	0.305992331	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
32	0.306120582	127.0.0.1	127.0.0.1	UDP	49	8080 → 55027 Len=7
33	0.306232133	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
34	0.306376142	127.0.0.1	127.0.0.1	UDP	48	8080 → 55027 Len=6
35	1.999970384	127.0.0.1	127.0.0.1	TCP	128	59456 → 49152 [PSH, ACK] Seq=243 Ack=715 Win=9207 Len=62 TSva...
► Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1						
► User Datagram Protocol, Src Port: 8080, Dst Port: 55027						
Source Port: 8080 Destination Port: 55027 Length: 15 Checksum: 0xfe22 [unverified] [Checksum Status: Unverified] [Stream index: 0] [Timestamps]						
► Data (7 bytes)						
Data: 4353331323036						
0000	00000000 00000000 00000000 00000000 00000000 00000000 00000000					.....
0008	00000000 00000000 00000000 00000000 00001000 00000000 01000101 00000000					..... E
0010	00000000 00100011 10110100 00001100 01000000 00000000 01000000 00010001					# .. @ ..
0018	10001000 10111011 01111111 00000000 00000000 00000001 01111111 00000000					.....
0020	00000000 00000001 00011111 10010000 11010110 11100011 00000000 00001111					.....
0028	11111110 00100010 01000011 01010011 00110011 00110010 00110009					"CS3128
0030	00110116					0

udp.port == 8080						
No.	Time	Source	Destination	Protocol	Length	Info
22	0.001248236	127.0.0.1	127.0.0.1	TCP	247	49152 → 59456 [PSH, ACK] Seq=533 Ack=243 Win=512 Len=181 TSva...
23	0.001270498	127.0.0.1	127.0.0.1	TCP	67	49152 → 59456 [PSH, ACK] Seq=714 Ack=243 Win=512 Len=1 TSval=...
24	0.001324787	127.0.0.1	127.0.0.1	TCP	66	59456 → 49152 [ACK] Seq=243 Ack=715 Win=9207 Len=0 TSval=2591...
25	0.304271186	127.0.0.1	127.0.0.1	UDP	61	55027 → 8080 Len=19
26	0.3044660200	127.0.0.1	127.0.0.1	UDP	47	8080 → 55027 Len=5
27	0.304892814	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
28	0.305009214	127.0.0.1	127.0.0.1	UDP	49	8080 → 55027 Len=7
29	0.305757159	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
30	0.305881696	127.0.0.1	127.0.0.1	UDP	49	8080 → 55027 Len=7
31	0.305992331	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
32	0.306120582	127.0.0.1	127.0.0.1	UDP	49	8080 → 55027 Len=7
33	0.306232133	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
34	0.306376142	127.0.0.1	127.0.0.1	UDP	48	8080 → 55027 Len=6
35	1.099970384	127.0.0.1	127.0.0.1	TCP	128	59456 → 49152 [PSH, ACK] Seq=243 Ack=715 Win=9207 Len=62 TSva...
▶ Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1						
▶ User Datagram Protocol, Src Port: 55027, Dst Port: 8080						
Source Port: 55027 Destination Port: 8080 Length: 14 Checksum: 0xfe21 [unverified] [Checksum Status: Unverified] [Stream index: 0] [Timestamps]						
Data (6 bytes)						
Data: 574f52442032						
0000	00000000	00000000	00000000	00000000	00000000	00000000 00000000 .....
0008	00000000	00000000	00000000	00000000	00000000	01000101 00000000 .....
0010	00000000	00100010	10110100	00001101	01000000	00000000 01000000 " .@ @ .
0018	10001000	10111011	01111111	00000000	00000000	00000001 01111111 00000000 .....
0020	00000000	00000001	11010110	11100011	00011111	10010000 00000000 000001110 .....
0028	11111110	00100001	01010111	01010010	01000100	00100000 00110010 !WORD 2

udp.port == 8080						
No.	Time	Source	Destination	Protocol	Length	Info
22	0.001248236	127.0.0.1	127.0.0.1	TCP	247	49152 → 59456 [PSH, ACK] Seq=533 Ack=243 Win=512 Len=181 TSva...
23	0.001270498	127.0.0.1	127.0.0.1	TCP	67	49152 → 59456 [PSH, ACK] Seq=714 Ack=243 Win=512 Len=1 TSval=...
24	0.001324787	127.0.0.1	127.0.0.1	TCP	66	59456 → 49152 [ACK] Seq=243 Ack=715 Win=9207 Len=0 TSval=2591...
25	0.304271186	127.0.0.1	127.0.0.1	UDP	61	55027 → 8080 Len=19
26	0.3044660200	127.0.0.1	127.0.0.1	UDP	47	8080 → 55027 Len=5
27	0.304892814	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
28	0.305009214	127.0.0.1	127.0.0.1	UDP	49	8080 → 55027 Len=7
29	0.305757159	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
30	0.305881696	127.0.0.1	127.0.0.1	UDP	49	8080 → 55027 Len=7
31	0.305992331	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
32	0.306120582	127.0.0.1	127.0.0.1	UDP	49	8080 → 55027 Len=7
33	0.306232133	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
34	0.306376142	127.0.0.1	127.0.0.1	UDP	48	8080 → 55027 Len=6
35	1.099970384	127.0.0.1	127.0.0.1	TCP	128	59456 → 49152 [PSH, ACK] Seq=243 Ack=715 Win=9207 Len=62 TSva...
▶ Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1						
▶ User Datagram Protocol, Src Port: 8080, Dst Port: 55027						
Source Port: 8080 Destination Port: 55027 Length: 15 Checksum: 0xfe22 [unverified] [Checksum Status: Unverified] [Stream index: 0] [Timestamps]						
Data (7 bytes)						
Data: 43533339303036						
0000	00000000	00000000	00000000	00000000	00000000	00000000 00000000 .....
0008	00000000	00000000	00000000	00000000	00000000	00000000 01000101 00000000 .....
0010	00000000	00100011	10110100	00001100	01000000	00000000 01000000 00001001 # .@ @ .
0018	10001000	10111001	01111111	00000000	00000000	00000001 01111111 00000000 .....
0020	00000000	00000001	00011111	10010000	11010110	11100011 00000000 00000111 .....
0028	11111110	00100010	01000011	01010011	00110001	00110000 00110000 .."CS3906
0030	00110110					5

No.	Time	Source	Destination	Protocol	Length	Info
22	0.001248236	127.0.0.1	127.0.0.1	TCP	247	49152 → 59456 [PSH, ACK] Seq=533 Ack=243 Win=512 Len=181 TSva...
23	0.001270498	127.0.0.1	127.0.0.1	TCP	67	49152 → 59456 [PSH, ACK] Seq=714 Ack=243 Win=512 Len=1 TSval=...
24	0.001324787	127.0.0.1	127.0.0.1	TCP	66	59456 → 49152 [ACK] Seq=243 Ack=715 Win=9207 Len=0 TSval=2591...
25	0.304271186	127.0.0.1	127.0.0.1	UDP	61	55027 → 8080 Len=19
26	0.304466200	127.0.0.1	127.0.0.1	UDP	47	8080 → 55027 Len=5
27	0.304892814	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
28	0.305009214	127.0.0.1	127.0.0.1	UDP	49	8080 → 55027 Len=7
29	0.305757159	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
30	0.305881696	127.0.0.1	127.0.0.1	UDP	49	8080 → 55027 Len=7
31	0.305992331	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
32	0.306120582	127.0.0.1	127.0.0.1	UDP	49	8080 → 55027 Len=7
33	0.306232133	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
34	0.306376142	127.0.0.1	127.0.0.1	UDP	48	8080 → 55027 Len=6
35	1.999970384	127.0.0.1	127.0.0.1	TCP	128	59456 → 49152 [PSH, ACK] Seq=243 Ack=715 Win=9207 Len=62 TSva...
► Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1						
► User Datagram Protocol, Src Port: 55027, Dst Port: 8080						
Source Port: 55027						
Destination Port: 8080						
Length: 14						
Checksum: 0xfe21 [unverified]						
[Checksum Status: Unverified]						
[Stream index: 0]						
► [Timestamps]						
- Data (6 bytes)						
Data: 574f52442033						
0000	00000000	00000000	00000000	00000000	00000000	.....
0008	00000000	00000000	00000000	00001000	00000000	.....E
0010	00000000	00100010	10110100	00011111	01000000	00000000
0018	10001000	10111001	01111111	00000000	00000000	0010001
0020	00000000	00000001	11010110	11110011	00011111	10010000
0028	11111110	00100001	01010111	01001111	01010010	00100000
						WORD 3

NetworkMiner Screenshot showing traffic analysis for UDP port 8080.

Selected packet details:

No.	Time	Source	Destination	Protocol	Length	Info
22	0.001248236	127.0.0.1	127.0.0.1	TCP	247	49152 → 59456 [PSH, ACK] Seq=533 Ack=243 Win=512 Len=181 TSva...
23	0.001270498	127.0.0.1	127.0.0.1	TCP	67	49152 → 59456 [PSH, ACK] Seq=714 Ack=243 Win=512 Len=1 Tsval=...
24	0.001324787	127.0.0.1	127.0.0.1	TCP	66	59456 → 49152 [ACK] Seq=243 Ack=715 Win=9207 Len=0 Tsval=2591...
25	0.004271186	127.0.0.1	127.0.0.1	UDP	61	55027 → 8080 Len=19
26	0.0044460200	127.0.0.1	127.0.0.1	UDP	47	8080 → 55027 Len=5
27	0.004892814	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
28	0.005009214	127.0.0.1	127.0.0.1	UDP	49	8080 → 55027 Len=7
29	0.005751759	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
30	0.005881696	127.0.0.1	127.0.0.1	UDP	49	8080 → 55027 Len=7
31	0.005992331	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
32	0.006120582	127.0.0.1	127.0.0.1	UDP	49	8080 → 55027 Len=7
33	0.006232133	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
34	0.006376142	127.0.0.1	127.0.0.1	UDP	48	8080 → 55027 Len=6
35	1.999970384	127.0.0.1	127.0.0.1	TCP	128	59456 → 49152 [PSH, ACK] Seq=243 Ack=715 Win=9207 Len=62 TSva...

Selected packet details expanded:

- Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
- User Datagram Protocol, Src Port: 8080, Dst Port: 55027
  - Source Port: 8080
  - Destination Port: 55027
  - Length: 15
  - Checksum: 0xfe22 [unverified]
  - [Checksum Status: Unverified]
  - [Stream index: 0]
  - [Timestamps]
- Data (7 bytes)  
Data: 43533331323038

Hex dump of selected data:

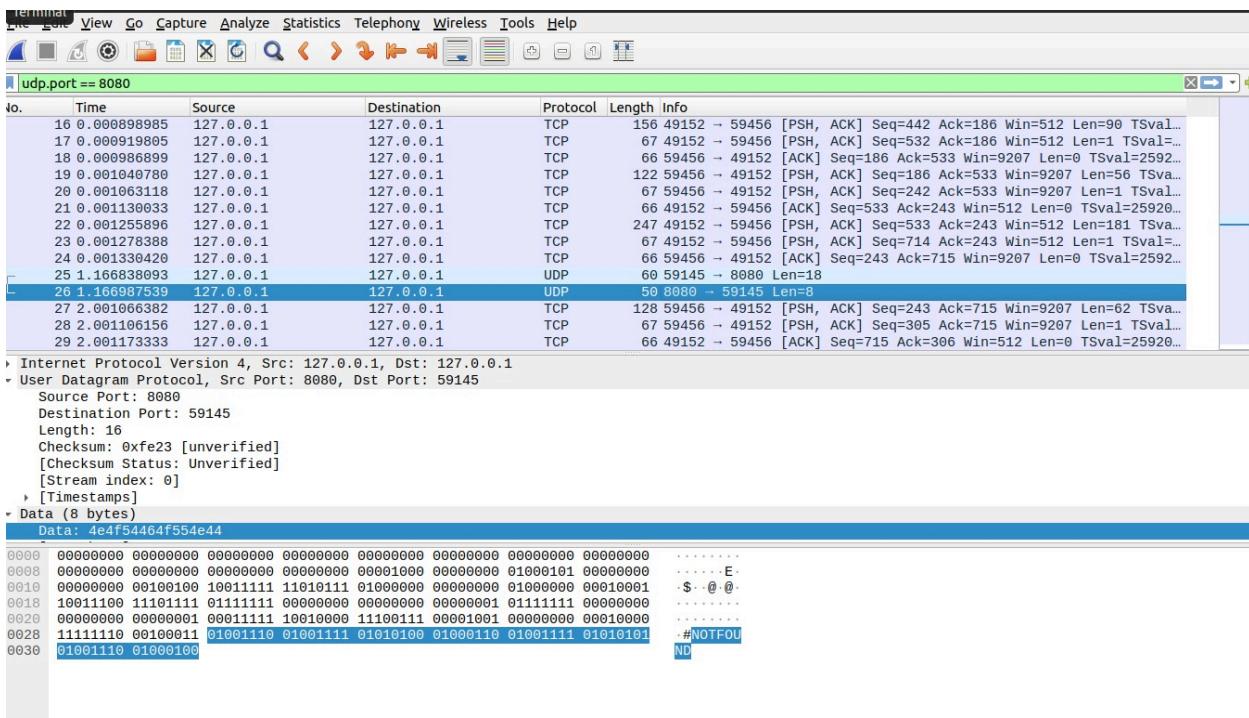
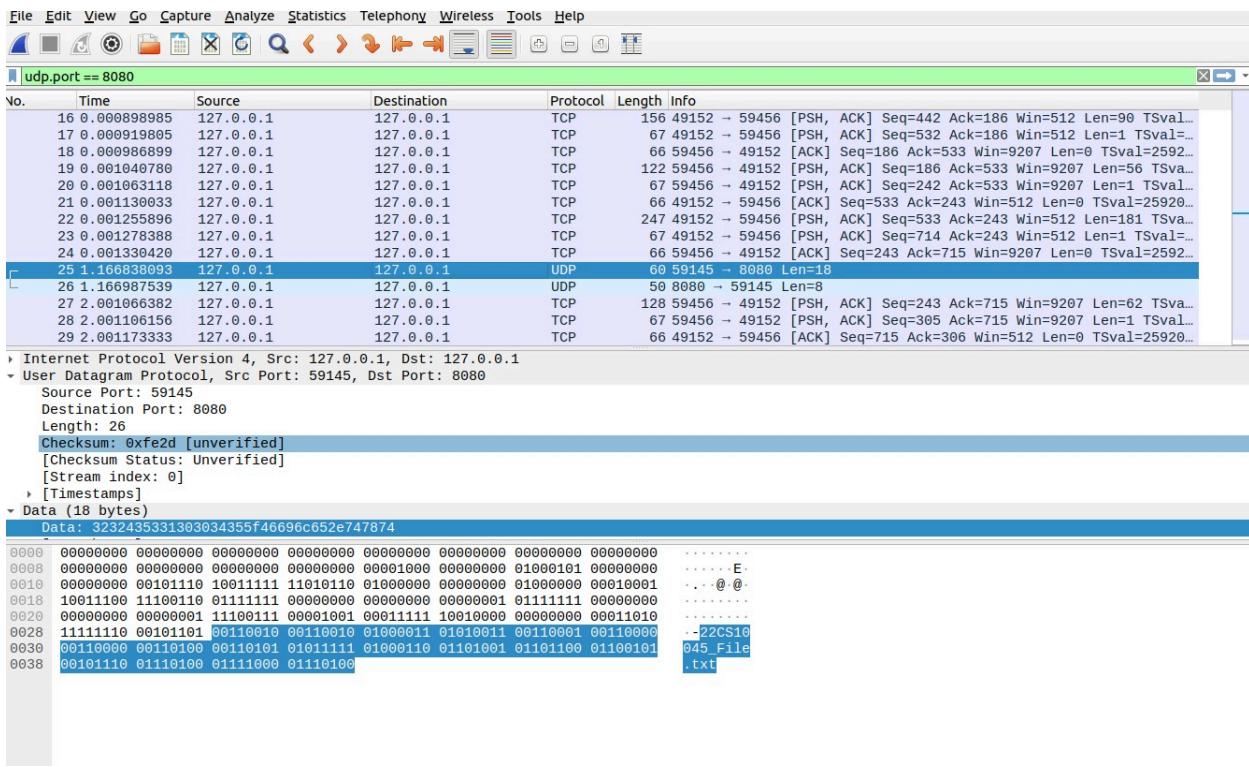
Offset	0000	00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000	0001	00000000 00000000 00000000 00000000 00001000 00000000 010000101 00000000	0002	..... E·
0000	00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000	0001	00000000 00000000 00000000 00000000 00001000 00000000 010000101 00000000	0002	# · @ · @ ·	
0003	00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000	0004	.....	0005	"CS3120	
0006	00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000	0007	.....	0008	8	

udp.port == 8080						
No.	Time	Source	Destination	Protocol	Length	Info
22	0.001248236	127.0.0.1	127.0.0.1	TCP	247	49152 → 59456 [PSH, ACK] Seq=533 Ack=243 Win=512 Len=181 TSva...
23	0.001270498	127.0.0.1	127.0.0.1	TCP	67	49152 → 59456 [PSH, ACK] Seq=714 Ack=243 Win=512 Len=1 TSval=...
24	0.001324787	127.0.0.1	127.0.0.1	TCP	66	59456 → 49152 [ACK] Seq=243 Ack=715 Win=9207 Len=0 TSval=2591...
25	0.304271186	127.0.0.1	127.0.0.1	UDP	61	55027 → 8080 Len=19
26	0.304466200	127.0.0.1	127.0.0.1	UDP	47	8080 → 55027 Len=5
27	0.304892814	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
28	0.305009214	127.0.0.1	127.0.0.1	UDP	49	8080 → 55027 Len=7
29	0.305757159	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
30	0.305881696	127.0.0.1	127.0.0.1	UDP	49	8080 → 55027 Len=7
31	0.305992331	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
32	0.306120582	127.0.0.1	127.0.0.1	UDP	49	8080 → 55027 Len=7
33	0.306232133	127.0.0.1	127.0.0.1	UDP	48	55027 → 8080 Len=6
34	0.306376142	127.0.0.1	127.0.0.1	UDP	48	8080 → 55027 Len=6
35	1.999970384	127.0.0.1	127.0.0.1	TCP	128	59456 → 49152 [PSH, ACK] Seq=243 Ack=715 Win=9207 Len=62 TSva...
▶ Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1						
▶ User Datagram Protocol, Src Port: 55027, Dst Port: 8080						
Source Port: 55027						
Destination Port: 8080						
Length: 14						
Checksum: 0xfe21 [unverified]						
[Checksum Status: Unverified]						
[Stream index: 0]						
▶ [Timestamps]						
▶ Data (6 bytes)						
Data: 574f52442034						
0000	00000000	00000000	00000000	00000000	00000000	.....
0008	00000000	00000000	00000000	00001000	00000000	01000101 00000000 .....
0010	00000000	00100010	10110100	00010001	01000000	00000000 00010001 ....."@@..
0018	10001000	10110110	01111111	00000000	00000000	01111111 00000000 .....
0020	00000000	00000001	11010110	11100111	10010000	00000000 00001110 .....
0028	11111110	00100001	01010111	01010010	01000100	00110100 ..WORD 4
▶ Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1						
▶ User Datagram Protocol, Src Port: 8080, Dst Port: 55027						
Source Port: 8080						
Destination Port: 55027						
Length: 14						
Checksum: 0xfe21 [unverified]						
[Checksum Status: Unverified]						
[Stream index: 0]						
▶ [Timestamps]						
▶ Data (6 bytes)						
Data: 46494e495348						
0000	00000000	00000000	00000000	00000000	00000000	.....
0008	00000000	00000000	00000000	00010000	00000000	01000101 00000000 .....
0010	00000000	00100010	10110100	00010010	01000000	00000000 00010001 ....."@@..
0018	10001000	10110110	01111111	00000000	00000000	01111111 00000000 .....
0020	00000000	00000001	00011111	10010000	11010110	11110011 00000000 00000110 .....
0028	11111110	00100001	01000110	01001001	01001001	01001000 ..!FINISH

The above case is for successful file transfer.

Now, considering the case of **FILE NOT FOUND**, that is trying to transfer the elements of a file, which is not present in the local directory.

In this case, only 2 packets are captured, one is the name of the file and other is the NOTFOUND message.(File name: 22CS10045\_File.txt)



## **2. PROTOCOL INFORMATION:**

- Protocol Used: UDP (User Datagram Protocol)
- The application uses connectionless datagram sockets (SOCK\_DGRAM)

## **3. CONNECTION DETAILS:**

Server Address : 127.0.0.1

Server Port : 8080

Client Address : 127.0.0.1

Client Port : Dynamic for different file transfers

The client port is different for different file transfers because when the client creates a UDP socket without explicitly binding it to a specific port, the operating system automatically assigns a random available port number from the ephemeral port range.

## **4. FILENAME REQUEST ANALYSIS**

The size of the FILENAME request is 61 bytes for successful file transfer and is 60 bytes for FILENOTFOUND case.

## **5. SERVER RESPONSE ANALYSIS**

HELLO response size : 47 bytes

WORD 1 response size(CS31206 in this case) : 49 bytes

## **6. UDP PAYLOAD ANALYSIS**

The screenshots for the data transmitted in each packet is pasted above in the first part of the analysis.(The payloads are present in the screenshots itself in the data section)

## 7. TIME ANALYSIS

As observed from the screenshots,

For successful file transfer,

Time of the first packet : 0.304271186

Time of the last packet : 0.306376142

Hence, total time taken is **0.0021 seconds or 2.1 milliseconds**

For unsuccessful file transfer,

Time of first packet : 1.166838093

Time of second(last) packet : 1.166987539

Hence, time taken is **0.00014 seconds or 0.14 milliseconds**

## 8. PACKET SIZE STATISTICS

Using the Statistics tool from Wireshark, the following screenshots have been captured:

Topic / Item	Count	Average	Min val	Max val	Rate (ms)	Percent	Burst rate	Burst start
Packet Lengths	10	49.50	47	61	4.7507	100%	0.1000	0.304
0-19	0	-	-	-	0.0000	0.00%	-	-
20-39	0	-	-	-	0.0000	0.00%	-	-
40-79	10	49.50	47	61	4.7507	100.00%	0.1000	0.304
80-159	0	-	-	-	0.0000	0.00%	-	-
160-319	0	-	-	-	0.0000	0.00%	-	-
320-639	0	-	-	-	0.0000	0.00%	-	-
640-1279	0	-	-	-	0.0000	0.00%	-	-
1280-2559	0	-	-	-	0.0000	0.00%	-	-
2560-5119	0	-	-	-	0.0000	0.00%	-	-
5120 and greater	0	-	-	-	0.0000	0.00%	-	-

The above one is for successful file transfer...Average packet size is **49.5 bytes**

Topic / Item	Count	Average	Min val	Max val	Rate (ms)	Percent	Burst rate	Burst start
Packet Lengths	2	55.00	50	60	13.3828	100%	0.0200	1.167
0-19	0	-	-	-	0.0000	0.00%	-	-
20-39	0	-	-	-	0.0000	0.00%	-	-
40-79	2	55.00	50	60	13.3828	100.00%	0.0200	1.167
80-159	0	-	-	-	0.0000	0.00%	-	-
160-319	0	-	-	-	0.0000	0.00%	-	-
320-639	0	-	-	-	0.0000	0.00%	-	-
640-1279	0	-	-	-	0.0000	0.00%	-	-
1280-2559	0	-	-	-	0.0000	0.00%	-	-
2560-5119	0	-	-	-	0.0000	0.00%	-	-
5120 and greater	0	-	-	-	0.0000	0.00%	-	-

The above one is for NOTFOUND file transfer...Average Packet size is **55 bytes**

### The screenshot of terminal for the client and server are:

```

user@swlab-PC:~/Desktop/DSP_CN2$ gcc -o wordclient wordclient.c
user@swlab-PC:~/Desktop/DSP_CN2$ ./wordclient file1.txt file2.txt
file transfer completed successfully

user@swlab-PC:~/Desktop/DSP_CN2$ ./wordclient file1.txt file2.txt
file transfer completed successfully

user@swlab-PC:~/Desktop/DSP_CN2$ gcc -o wordclient wordclient.c
user@swlab-PC:~/Desktop/DSP_CN2$ ./wordclient file1.txt file2.txt
file transfer completed successfully

user@swlab-PC:~/Desktop/DSP_CN2$ ./wordclient 22CS10045_File1.txt 22CS10045_File1_new.txt
file transfer completed successfully

user@swlab-PC:~/Desktop/DSP_CN2$ ./wordclient 22CS10045_File2.txt 22CS10045_File2_new.txt
file transfer completed successfully

user@swlab-PC:~/Desktop/DSP_CN2$ ./wordclient 22CS10045_File3.txt 22CS10045_File3_new.txt
file transfer completed successfully

user@swlab-PC:~/Desktop/DSP_CN2$ ./wordclient 22CS10045_File1.txt 22CS10045_File1_new.txt
FILE NOT FOUND

user@swlab-PC:~/Desktop/DSP_CN2$ ./wordclient 22CS10045_File.txt 22CS10045_File1_new.txt
FILE NOT FOUND

```

```

user@swlab-PC:~/Desktop/DSP_CN2$ ./wordserver
Server listening on port 8080...
Received request for file: 22CS10045_File3.txt
Sending HELLO to client
Waiting for WORD request...
Received request : WORD 1
Waiting for WORD request...
Received request : WORD 2
Waiting for WORD request...
Received request : WORD 3
Waiting for WORD request...
Received request : WORD 4
Sent FINISH, closing server
Server terminated successfully

user@swlab-PC:~/Desktop/DSP_CN2$ ./wordserver
Server listening on port 8080...
Received request for file: 22CS10045_File1.txt
Sending HELLO to client
Waiting for WORD request...
Received request : WORD 1
Waiting for WORD request...
Received request : WORD 2
Waiting for WORD request...
Received request : WORD 3
Waiting for WORD request...
Received request : WORD 4
Sent FINISH, closing server
Server terminated successfully

user@swlab-PC:~/Desktop/DSP_CN2$ ./wordserver
Server listening on port 8080...
Received request for file: 22CS10045_File.txt

user@swlab-PC:~/Desktop/DSP_CN2$ ./wordserver
Server listening on port 8080...
Received request for file: 22CS10045_File.txt

```