

# Assignment 2

## UDP Sockets

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```
harshit@acer-aspire-lite-52:~/Documents/net/A2$ ./server
```

```
Server Running at port 8008
```

```
Request from Client at port 39023: 22CS10030_File3.txt
Request from Client at port 39023: WORD 1
Request from Client at port 39023: WORD 2
Request from Client at port 39023: WORD 3
Request from Client at port 39023: WORD 4
Request from Client at port 39023: WORD 5
Request from Client at port 39023: WORD 6
Request from Client at port 39023: WORD 7
Request from Client at port 39023: WORD 8
Request from Client at port 39023: WORD 9
Request from Client at port 39023: WORD 10
Request from Client at port 39023: WORD 11
Request from Client at port 39023: WORD 12
```

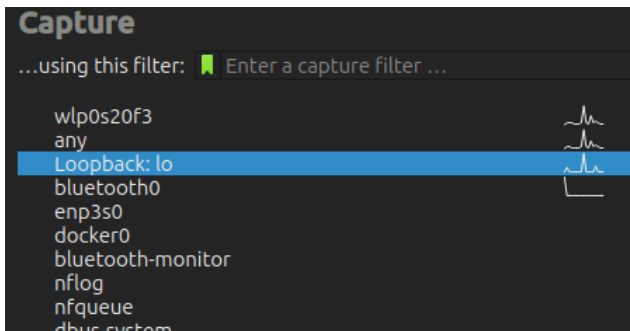
```
harshit@acer-aspire-lite-52:~/Documents/net/A2$ ./client 22CS10030_File3.txt
```

```
Response from Server: HELLO
Response from Server: Long
Response from Server: Words
Response from Server: Pneumonoultramicroscopicsilicovolcanoconiosis
Response from Server: Supercalifragilisticexpialidocious
Response from Server: Hippopotomonstrosesquippedaliophobia
Response from Server: Antidisestablishmentarianism
Response from Server: Floccinaucinihilipilification
Response from Server: Honorificabilitudinitatibus
Response from Server: Pseudopseudohypoparathyroidism
Response from Server: Dichlorodiphenyltrichloroethane
Response from Server: Methionylthreonylthreonylglutaminylarginyltyrosylglutaminylarginylisoleucine
Response from Server: FINISH
```

```
File Edit View Search Terminal Help
harshit@acer-aspire-lite-52:~/Documents/net/A2$ cat 22CS10030_File3.txt
HELLO
Long
Words
Pneumonoultramicroscopicsilicovolcanoconiosis
Supercalifragilisticexpialidocious
Hippopotomonstrosesquippedaliophobia
Antidisestablishmentarianism
Floccinaucinihilipilification
Honorificabilitudinitatibus
Pseudopseudohypoparathyroidism
Dichlorodiphenyltrichloroethane
Methionylthreonylthreonylglutaminylarginyltyrosylglutaminylarginylisoleucine
FINISHharshit@acer-aspire-lite-52:~/Documents/net/A2$
```

```
File Edit View Search Terminal Help
harshit@acer-aspire-lite-52:~/Documents/net/A2$ cat response_22CS10030_File3.txt
HELLO
Long
Words
Pneumonoultramicroscopicsilicovolcanoconiosis
Supercalifragilisticexpialidocious
Hippopotomonstrosesquippedaliophobia
Antidisestablishmentarianism
Floccinaucinihilipilification
Honorificabilitudinitatibus
Pseudopseudohypoparathyroidism
Dichlorodiphenyltrichloroethane
Methionylthreonylthreonylglutaminylarginyltyrosylglutaminylarginylisoleucine
FINISH
harshit@acer-aspire-lite-52:~/Documents/net/A2$
```

For packet analysis, only the Loopback (lo) interface was observed:



## 1. Packets Exchanged

No.	Time	Source	Destination	Protocol	Length	Info
5	0.833491	127.0.0.1	127.0.0.1	UDP	61	39023 → 8008 Len=19
6	0.833878	127.0.0.1	127.0.0.1	UDP	47	8008 → 39023 Len=5
7	0.834255	127.0.0.1	127.0.0.1	UDP	48	39023 → 8008 Len=6
8	0.834383	127.0.0.1	127.0.0.1	UDP	46	8008 → 39023 Len=4
9	0.834420	127.0.0.1	127.0.0.1	UDP	48	39023 → 8008 Len=6
10	0.834517	127.0.0.1	127.0.0.1	UDP	47	8008 → 39023 Len=5
11	0.834551	127.0.0.1	127.0.0.1	UDP	48	39023 → 8008 Len=6
12	0.834662	127.0.0.1	127.0.0.1	UDP	87	8008 → 39023 Len=45
13	0.834763	127.0.0.1	127.0.0.1	UDP	48	39023 → 8008 Len=6
14	0.834854	127.0.0.1	127.0.0.1	UDP	76	8008 → 39023 Len=34
15	0.835007	127.0.0.1	127.0.0.1	UDP	48	39023 → 8008 Len=6
16	0.835130	127.0.0.1	127.0.0.1	UDP	78	8008 → 39023 Len=36
17	0.835186	127.0.0.1	127.0.0.1	UDP	48	39023 → 8008 Len=6
18	0.835293	127.0.0.1	127.0.0.1	UDP	70	8008 → 39023 Len=28
19	0.835325	127.0.0.1	127.0.0.1	UDP	48	39023 → 8008 Len=6
20	0.835439	127.0.0.1	127.0.0.1	UDP	71	8008 → 39023 Len=29
21	0.835485	127.0.0.1	127.0.0.1	UDP	48	39023 → 8008 Len=6
22	0.835570	127.0.0.1	127.0.0.1	UDP	69	8008 → 39023 Len=27
23	0.835599	127.0.0.1	127.0.0.1	UDP	48	39023 → 8008 Len=6
24	0.835709	127.0.0.1	127.0.0.1	UDP	72	8008 → 39023 Len=30
25	0.835736	127.0.0.1	127.0.0.1	UDP	49	39023 → 8008 Len=7
26	0.835836	127.0.0.1	127.0.0.1	UDP	73	8008 → 39023 Len=31
27	0.835862	127.0.0.1	127.0.0.1	UDP	49	39023 → 8008 Len=7
28	0.835895	127.0.0.1	127.0.0.1	UDP	118	8008 → 39023 Len=76
29	0.835917	127.0.0.1	127.0.0.1	UDP	49	39023 → 8008 Len=7
30	0.835948	127.0.0.1	127.0.0.1	UDP	48	8008 → 39023 Len=6

## 2. Protocol Used

User Datagram Protocol (**UDP**)

### 3. Source & Destination

IP Address	
Server	127.0.0.1 (loopback address)
Client	
Port	
Server	8008 (set by user)
Client	39023 (allocated)

### 4. *FILENAME* request sent by the client

Packet Size: **61 bytes**

Data Length: 19 bytes

```
▶ Frame 5: 61 bytes on wire (488 bits), 61 bytes captured (488 bits)
▶ Ethernet II, Src: 00:00:00_00:00:00 (00:00:00:00:00:00), Dst: 00:00:00_00:00:00
▶ Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
▶ User Datagram Protocol, Src Port: 39023, Dst Port: 8008
▶ Data (19 bytes)

0000  00 00 00 00 00 00 00 00  00 00 00 00 08 00 45 00  .....E.
0010  00 2f 13 54 40 00 40 11  29 68 7f 00 00 01 7f 00  ./T@.@. )h.....
0020  00 01 98 6f 1f 48 00 1b  fe 2e 32 32 43 53 31 30  ...o.H.. .22CS10
0030  30 33 30 5f 46 69 6c 65  33 2e 74 78 74          030_File 3.txt
```

## 5. Server's first responses:

Server's response for *HELLO*

6 0.833878	127.0.0.1	127.0.0.1	UDP	47 8008 → 39023 Len=5	
7 0.834255	127.0.0.1	127.0.0.1	UDP	48 39023 → 8008 Len=6	
Frame 6: 47 bytes on wire (376 bits), 47 bytes captured (376 bits)	0000	00 00 00 00 00 00 00 00 00 00 00 00 08 00 45 00	.....E		
Ethernet II, Src: 00:00:00:00:00:00 (00:00:00:00:00:00), Dst: 00:00:00:00:00:00	0010	00 21 13 55 40 00 40 11 29 75 7f 00 00 01 7f 00	..!U@.@.)u.....		
Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1	0020	00 01 1f 48 98 6f 00 0d fe 20 48 45 4c 4c 4f	...H.o...HELLO		
User Datagram Protocol, Src Port: 8008, Dst Port: 39023					
Source Port: 8008					
Destination Port: 39023					
Length: 13					
Checksum: 0xfe20 [unverified]					
[Checksum Status: Unverified]					
[Stream index: 1]					
[Timestamps]					
UDP payload (5 bytes)					
Data (5 bytes)					
Data: 48454c4c4f					
[Length: 5]					

Packet size: **47 bytes**

Server's response for *WORD<sub>1</sub>*

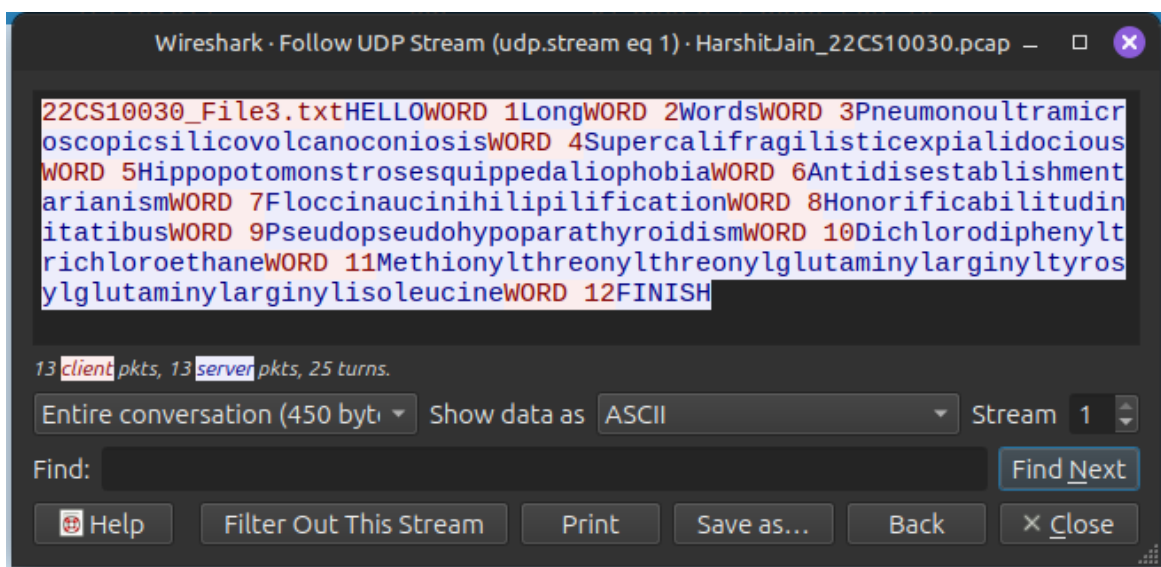
7 0.834255	127.0.0.1	127.0.0.1	UDP	48 39023 → 8008 Len=6	
8 0.834383	127.0.0.1	127.0.0.1	UDP	46 8008 → 39023 Len=4	
9 0.834400	127.0.0.1	127.0.0.1	UDP	48 39023 → 8008 Len=6	
Frame 8: 46 bytes on wire (368 bits), 46 bytes captured (368 bits)	0000	00 00 00 00 00 00 00 00 00 00 00 00 08 00 45 00	.....E		
Ethernet II, Src: 00:00:00:00:00:00 (00:00:00:00:00:00), Dst: 00:00:00:00:00:00	0010	00 20 13 57 40 00 40 11 29 74 7f 00 00 01 7f 00	..W@.@.)t.....		
Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1	0020	00 01 1f 48 98 6f 00 0c fe 1f 4c 6f 6e 67	...H.o...Long		
User Datagram Protocol, Src Port: 8008, Dst Port: 39023					
Source Port: 8008					
Destination Port: 39023					
Length: 12					
Checksum: 0xfe1f [unverified]					
[Checksum Status: Unverified]					
[Stream index: 1]					
[Timestamps]					
UDP payload (4 bytes)					
Data (4 bytes)					
Data: 4c6f6e67					
[Length: 4]					

Packet size: **46 bytes**

6. Payload of word packets:

10.0.834517	127.0.0.1	127.0.0.1	UDP	47 8008 → 39023 Len=5
11.0.834551	127.0.0.1	127.0.0.1	UDP	48 39023 → 8008 Len=6
12.0.834662	127.0.0.1	127.0.0.1	UDP	87 8008 → 39023 Len=45
13.0.834763	127.0.0.1	127.0.0.1	UDP	48 39023 → 8008 Len=6
<p>Frame 11: 48 bytes on wire (384 bits), 48 bytes captured (384 bits) on 0</p> <p>Ethernet II, Src: 00:00:00:00:00:00 (00:00:00:00:00:00), Dst: 00:00:00:00:00:00 (00:00:00:00:00:00)</p> <p>Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1</p> <p>User Datagram Protocol, Src Port: 39023, Dst Port: 8008</p> <p>Source Port: 39023</p> <p>Destination Port: 8008</p> <p>Length: 14</p> <p>Checksum: 0xfe21 [Unverified]</p> <p>[Checksum Status: Unverified]</p> <p>[Stream index: 1]</p> <p>[Timestamps]</p> <p>UDP payload (6 bytes)</p> <p>Data (6 bytes)</p> <p>Data: 574f52442033</p> <p>[Length: 6]</p>				

10 0.834551	127.0.0.1	127.0.0.1	UDP	48 39023 → 8008 Len=6	
12 0.834662	127.0.0.1	127.0.0.1	UDP	87 8008 → 39023 Len=45	
13 0.834763	127.0.0.1	127.0.0.1	UDP	48 39023 → 8008 Len=6	
14 0.834854	127.0.0.1	127.0.0.1	UDP	76 8008 → 39023 Len=34	
<ul style="list-style-type: none"> <li>Frame 12: 87 bytes on wire (696 bits), 87 bytes captured (696 bits) on 0</li> <li>Ethernet II, Src: 00:00:00:00:00:00 (00:00:00:00:00:00), Dst: 00:00:00:00:00:00 (00:00:00:00:00:00)</li> <li>Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1</li> <li>User Datagram Protocol, Src Port: 8008, Dst Port: 39023 <ul style="list-style-type: none"> <li>Source Port: 8008</li> <li>Destination Port: 39023</li> <li>Length: 53</li> <li>Checksum: 0xfe48 [unverified]</li> <li>[Checksum Status: Unverified]</li> <li>[Stream index: 1]</li> <li>[Timestamps]</li> <li>UDP payload (45 bytes)</li> <li>Data (45 bytes) <ul style="list-style-type: none"> <li>Data: 506e65756d6f6e6f756c7472616d6963726f73636f70696373696c696361</li> <li>[Length: 45]</li> </ul> </li> </ul> </li> </ul>					<pre> 0000  00 08 00 45 00 0010  00 49 13 5b 40 00 40 11 29 47 7f 00 00 01 7f 00 0020  00 01 1f 48 98 6f 00 35 fe 48 50 6e 65 75 6d 6f 0030  6e 6f 75 6c 74 72 61 6d 69 63 72 6f 73 63 6f 70 0040  69 63 73 69 6c 69 63 6f 76 6f 6c 63 61 6e 6f 63 0050  6f 6e 69 6f 73 69 73 </pre>



## 7. Time Taken

UDP · 1														
Address A ▾	Port A	Address B	Port B	Packets	Bytes	Stream ID	Total Packets	Percent Filtered	Packets A → B	Bytes A → B	Packets B → A	Bytes B → A	Rel Start	Duration
127.0.0.1	39023	127.0.0.1	8008	26	2 kB	1	26	100.00%	13	640 bytes	13	902 bytes	0.833491	0.0025

Total time taken for the file transfer from start to finish: **0.002457 sec**

## 8. Packet size statistics

Wireshark · Packet Lengths · HarshitJain\_22CS10030.pcap

Topic / Item	Count	Average	Min Val	Max Val	Rate (ms)	Percent	Burst Rate	Burst Start
▼ Packet Lengths	26	59.31	46	118	10.5820	100%	0.2600	0.833
0-19	0	-	-	-	0.0000	0.00%	-	-
20-39	0	-	-	-	0.0000	0.00%	-	-
40-79	24	55.71	46	78	9.7680	92.31%	0.2400	0.833
80-159	2	102.50	87	118	0.8140	7.69%	0.0200	0.835
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%	-	-

Display filter: `udp.port == 8008`

Apply

Copy

Save as...

✕ Close

Avg size of packets: **59.31 bytes**