Academic Session 2024-2025
Spring Semester

Computer Networks Lab
Assignment 2: UDP Sockets

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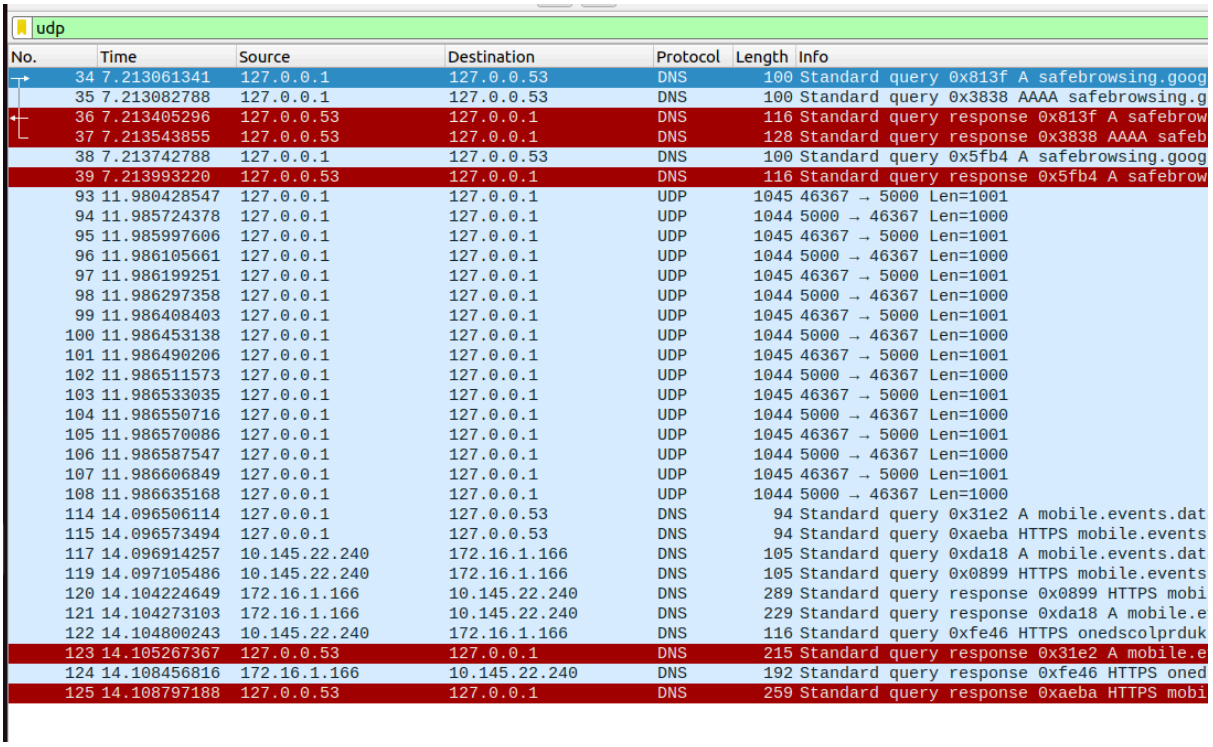
1.

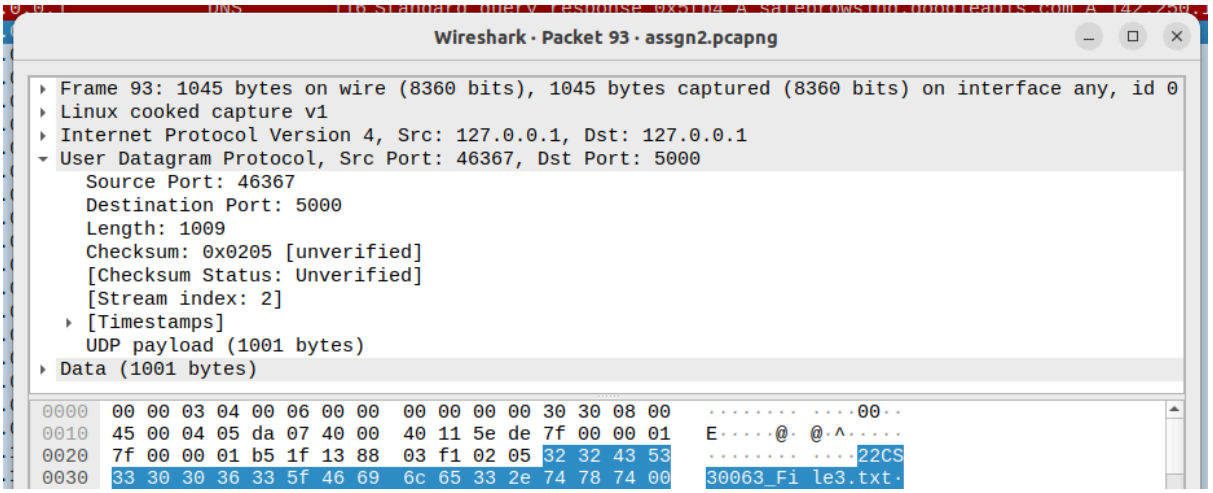


udp

No.	Time	Source	Destination	Protocol	Length	Info
34	7.213061341	127.0.0.1	127.0.0.53	DNS	100	Standard query 0x813f A safebrowsing.goog
35	7.213082788	127.0.0.1	127.0.0.53	DNS	100	Standard query 0x3838 AAAA safebrowsing.g
36	7.213405296	127.0.0.53	127.0.0.1	DNS	116	Standard query response 0x813f A safebrow
37	7.213543855	127.0.0.53	127.0.0.1	DNS	128	Standard query response 0x3838 AAAA safeb
38	7.213742788	127.0.0.1	127.0.0.53	DNS	100	Standard query 0x5fb4 A safebrowsing.goog
39	7.213993220	127.0.0.53	127.0.0.1	DNS	116	Standard query response 0x5fb4 A safebrow
93	11.980428547	127.0.0.1	127.0.0.1	UDP	1045	46367 → 5000 Len=1001
94	11.985724378	127.0.0.1	127.0.0.1	UDP	1044	5000 → 46367 Len=1000
95	11.985997606	127.0.0.1	127.0.0.1	UDP	1045	46367 → 5000 Len=1001
96	11.986105661	127.0.0.1	127.0.0.1	UDP	1044	5000 → 46367 Len=1000
97	11.986199251	127.0.0.1	127.0.0.1	UDP	1045	46367 → 5000 Len=1001
98	11.986297358	127.0.0.1	127.0.0.1	UDP	1044	5000 → 46367 Len=1000
99	11.986408403	127.0.0.1	127.0.0.1	UDP	1045	46367 → 5000 Len=1001
100	11.986453138	127.0.0.1	127.0.0.1	UDP	1044	5000 → 46367 Len=1000
101	11.986490206	127.0.0.1	127.0.0.1	UDP	1045	46367 → 5000 Len=1001
102	11.986511573	127.0.0.1	127.0.0.1	UDP	1044	5000 → 46367 Len=1000
103	11.986533035	127.0.0.1	127.0.0.1	UDP	1045	46367 → 5000 Len=1001
104	11.986550716	127.0.0.1	127.0.0.1	UDP	1044	5000 → 46367 Len=1000
105	11.986570086	127.0.0.1	127.0.0.1	UDP	1045	46367 → 5000 Len=1001
106	11.986587547	127.0.0.1	127.0.0.1	UDP	1044	5000 → 46367 Len=1000
107	11.986606849	127.0.0.1	127.0.0.1	UDP	1045	46367 → 5000 Len=1001
108	11.986635168	127.0.0.1	127.0.0.1	UDP	1044	5000 → 46367 Len=1000
114	14.096506114	127.0.0.1	127.0.0.53	DNS	94	Standard query 0x31e2 A mobile.events.dat
115	14.096573494	127.0.0.1	127.0.0.53	DNS	94	Standard query 0xaeba HTTPS mobile.events
117	14.096914257	10.145.22.240	172.16.1.166	DNS	105	Standard query 0xda18 A mobile.events.dat
119	14.097105486	10.145.22.240	172.16.1.166	DNS	105	Standard query 0x0899 HTTPS mobile.events
120	14.104224649	172.16.1.166	10.145.22.240	DNS	289	Standard query response 0x0899 HTTPS mobi
121	14.104273103	172.16.1.166	10.145.22.240	DNS	229	Standard query response 0xda18 A mobile.e
122	14.104800243	10.145.22.240	172.16.1.166	DNS	116	Standard query 0xfe46 HTTPS onedscolprduk
123	14.105267367	127.0.0.53	127.0.0.1	DNS	215	Standard query response 0x31e2 A mobile.e
124	14.108456816	172.16.1.166	10.145.22.240	DNS	192	Standard query response 0xfe46 HTTPS oned
125	14.108797188	127.0.0.53	127.0.0.1	DNS	259	Standard query response 0xaeba HTTPS mobi

File transfer occurs from packet number 93 to packet number 108 in the above image.

2.



Wireshark · Packet 93 · assgn2.pcapng

```
▸ Frame 93: 1045 bytes on wire (8360 bits), 1045 bytes captured (8360 bits) on interface any, id 0
▸ Linux cooked capture v1
▸ Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
▾ User Datagram Protocol, Src Port: 46367, Dst Port: 5000
    Source Port: 46367
    Destination Port: 5000
    Length: 1009
    Checksum: 0x0205 [unverified]
    [Checksum Status: Unverified]
    [Stream index: 2]
  ▸ [Timestamps]
    UDP payload (1001 bytes)
▸ Data (1001 bytes)
```

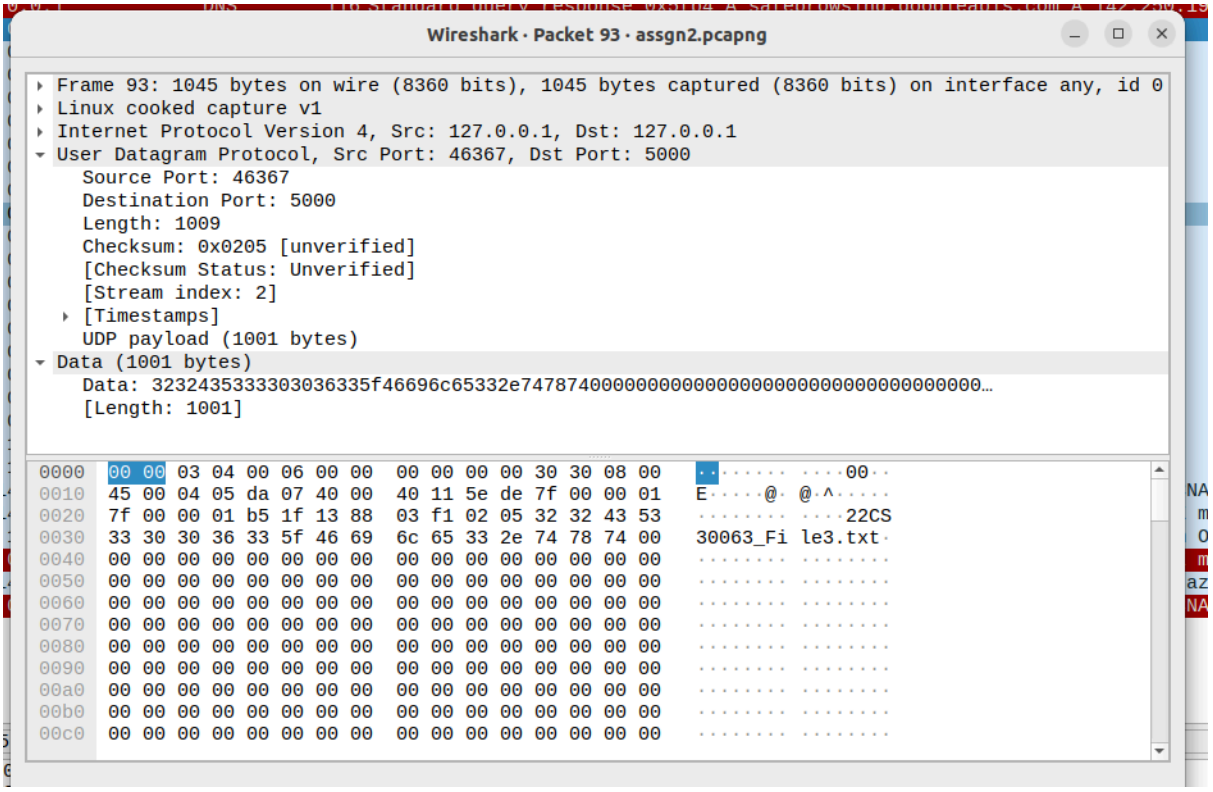
```
0000  00 00 03 04 00 06 00 00  00 00 00 00 30 30 08 00   ........ ....00..
0010  45 00 04 05 da 07 40 00  40 11 5e de 7f 00 00 01   E.....@. @.^.....
0020  7f 00 00 01 b5 1f 13 88  03 f1 02 05 32 32 43 53   ........ ....22CS
0030  33 30 30 36 33 5f 46 69  6c 65 33 2e 74 78 74 00   30063_Fi le3.txt.
```

UDP protocol used for communication

3.

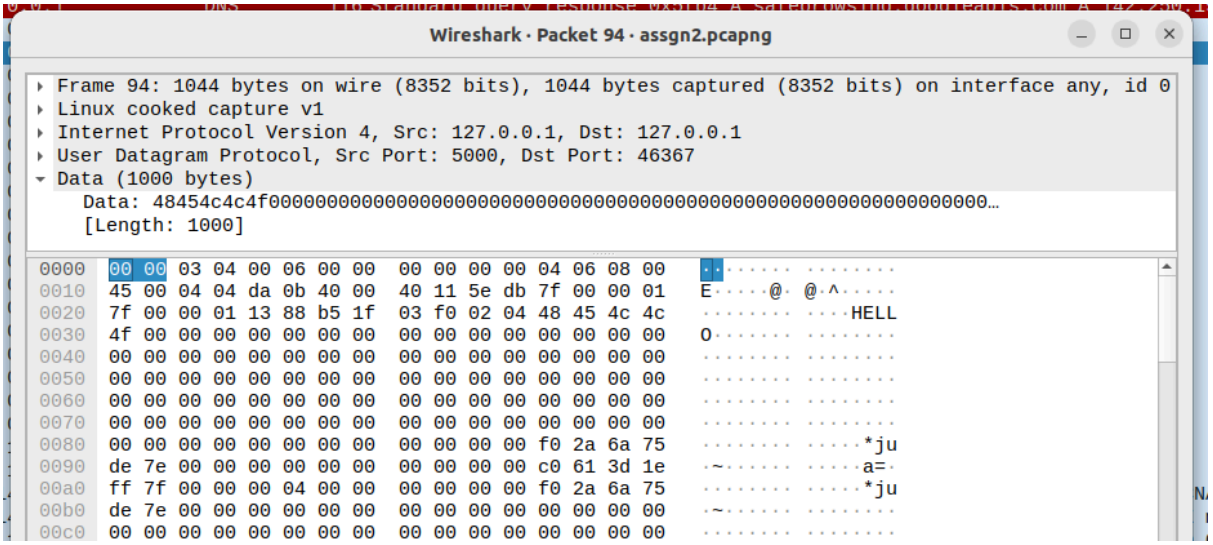
Both client and server have the IP address 127.0.0.1 (the local machine).
Client has port number 46367.
Server has port number 5000.

4.



The packet size is 1045 bytes and the data contained in the packet is of size 1001 bytes.

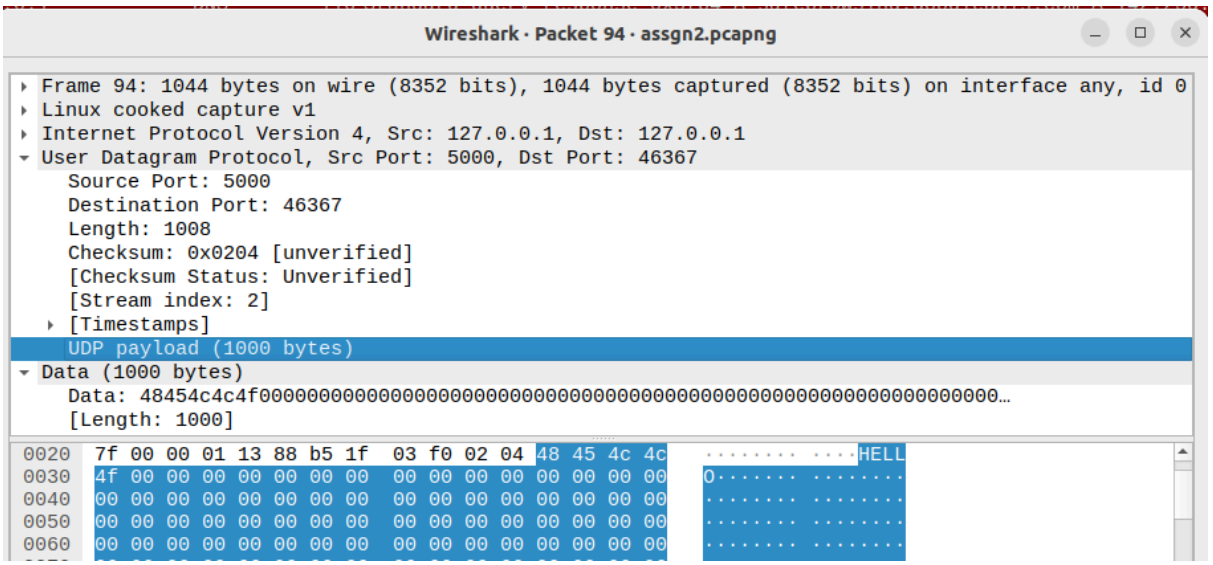
5.

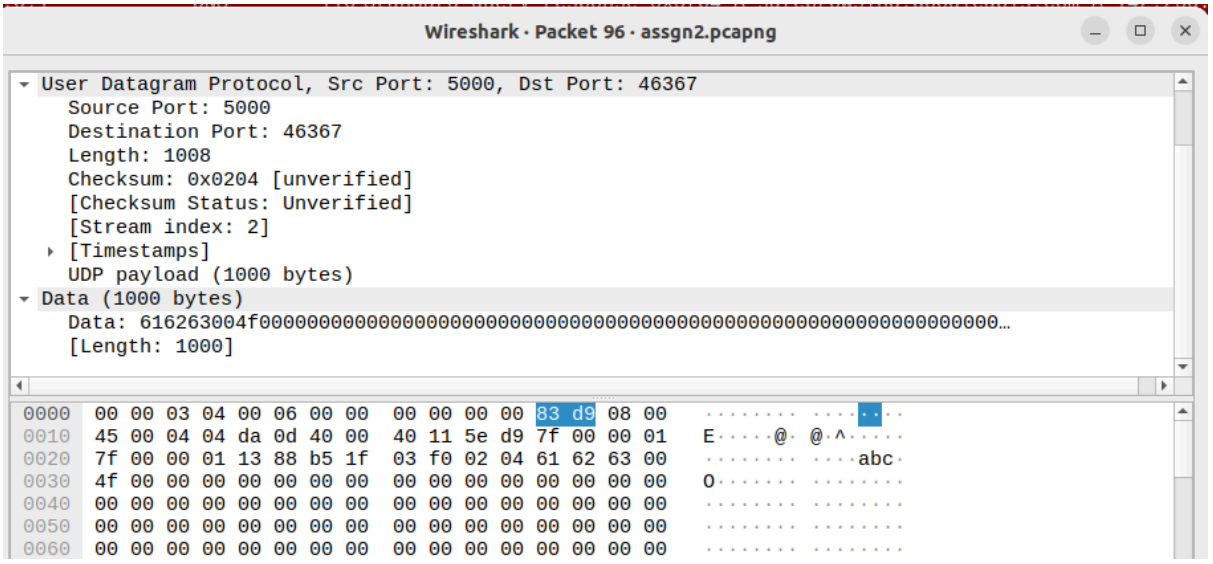


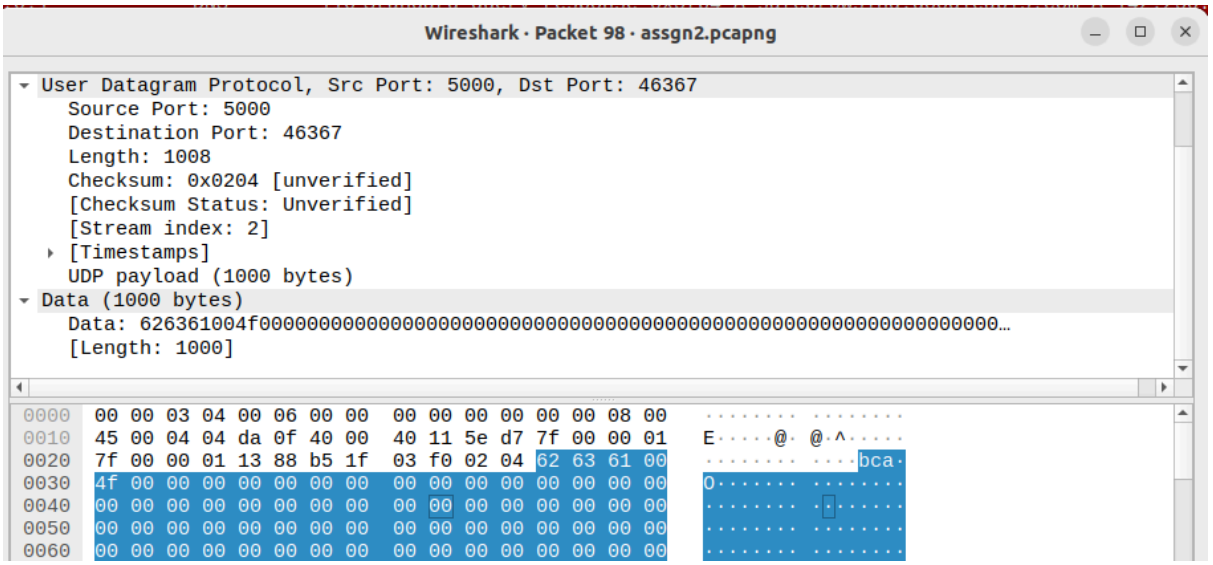
The packet size is 1044 bytes and the data contained in the packet is of size 1000 bytes.

6.

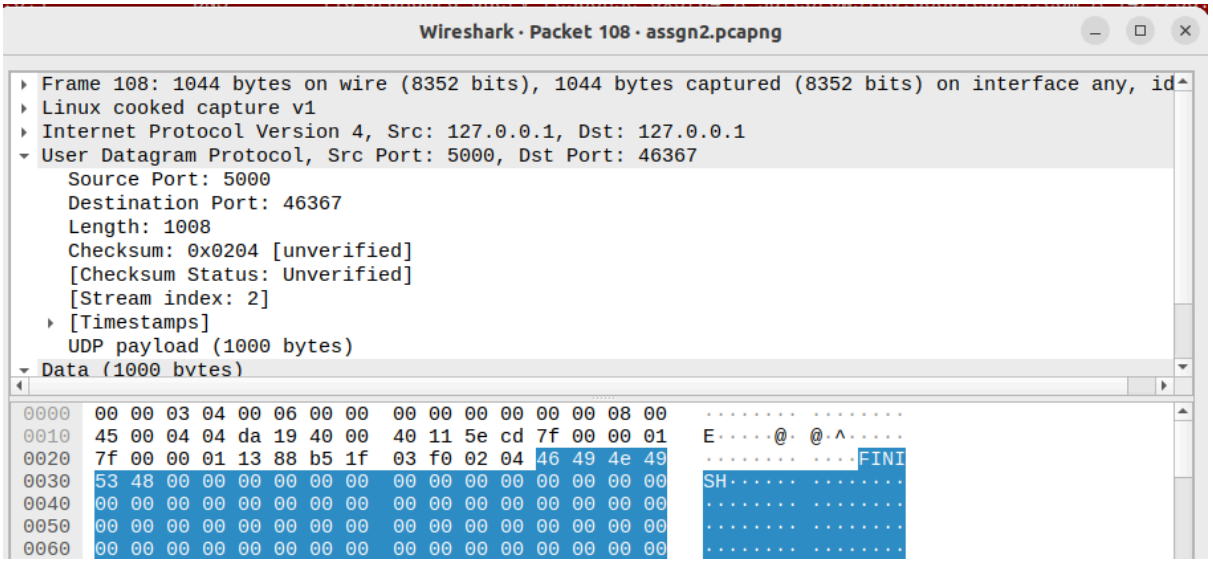
Word transmission with the first special keyword HELLO.



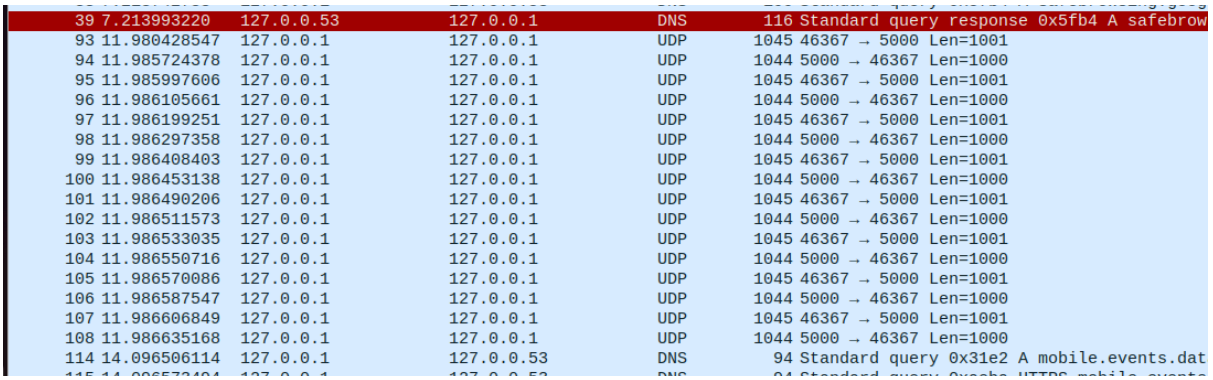




… similarly for packets 100, 102, 104, 106 and finally packet 108 transfers the special keyword FINISH.



7.



By packet inspection, I observe that the client sends a request to the server (in the form of file name at packet 93) and the server sends back to the client the last word (word FINISH) at packet 108.
Time when packet 93 was sent = 11.980428547 sec
Time when packet 108 was sent = 11.986635168 sec;
Time required for transfer = 0.006206620999998691 sec ≅ 6.2 ms

8.

Total number of packets sent = 16
Sum of packets sizes which were sent = 1045*8 + 1044*8 = 16712 bytes
Average size of each packet = 1044.5 bytes