

HuiLin Zhang (917071562) (Anna Chang)

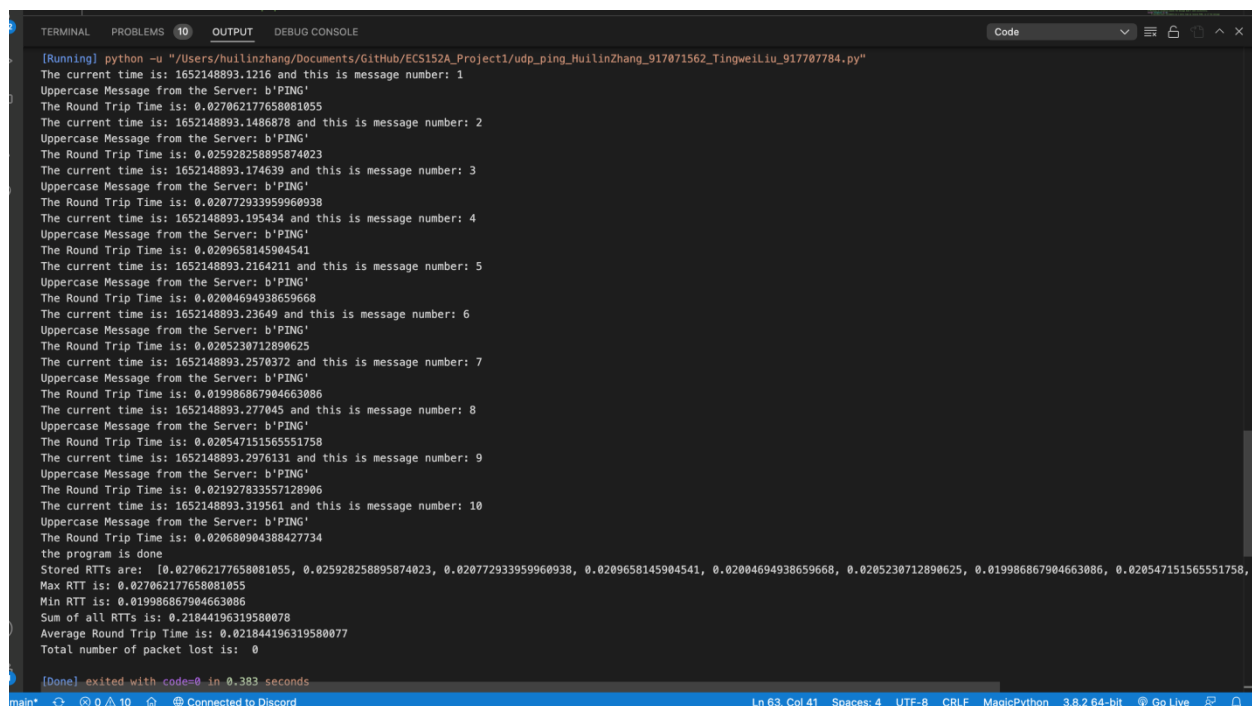
Tingwei Liu (917707784) (Anna Chang)

Code file: udp_iperf_HuilinZhang_917071562_TingweiLiu_917707784.py

udp_ping_HuilinZhang_917071562_TingweiLiu_917707784.py

Question I Ping:

1 screen shot of the execution output:



```
[Running] python -u "/Users/huilinzhang/Documents/GitHub/ECS152A_Project1/udp_ping_HuilinZhang_917071562_TingweiLiu_917707784.py"
The current time is: 1652148893.1216 and this is message number: 1
Uppercase Message from the Server: b'PING'
The Round Trip Time is: 0.027062177658081055
The current time is: 1652148893.1486878 and this is message number: 2
Uppercase Message from the Server: b'PING'
The Round Trip Time is: 0.025928258895874023
The current time is: 1652148893.174639 and this is message number: 3
Uppercase Message from the Server: b'PING'
The Round Trip Time is: 0.020772933959960938
The current time is: 1652148893.195434 and this is message number: 4
Uppercase Message from the Server: b'PING'
The Round Trip Time is: 0.0209658145904541
The current time is: 1652148893.2164211 and this is message number: 5
Uppercase Message from the Server: b'PING'
The Round Trip Time is: 0.02004694938659668
The current time is: 1652148893.23649 and this is message number: 6
Uppercase Message from the Server: b'PING'
The Round Trip Time is: 0.0205230712890625
The current time is: 1652148893.2570372 and this is message number: 7
Uppercase Message from the Server: b'PING'
The Round Trip Time is: 0.019986867904663086
The current time is: 1652148893.277045 and this is message number: 8
Uppercase Message from the Server: b'PING'
The Round Trip Time is: 0.02054715156551758
The current time is: 1652148893.2976131 and this is message number: 9
Uppercase Message from the Server: b'PING'
The Round Trip Time is: 0.021927833557128906
The current time is: 1652148893.319561 and this is message number: 10
Uppercase Message from the Server: b'PING'
The Round Trip Time is: 0.020680904388427734
the program is done
Stored RTTs are: [0.027062177658081055, 0.025928258895874023, 0.020772933959960938, 0.0209658145904541, 0.02004694938659668, 0.0205230712890625, 0.019986867904663086, 0.02054715156551758,
Max RTT is: 0.027062177658081055
Min RTT is: 0.019986867904663086
Sum of all RTTs is: 0.21844196319580078
Average Round Trip Time is: 0.021844196319580077
Total number of packet lost is: 0

[Done] exited with code=0 in 0.383 seconds
```

2 Total number of ping packet delivered : 10

Total number of ping packet lost : 0

3 Average of RTT: 0.0218

Max RTT: 0.027

Min RTT : 0.019

Sum of RTT: 0.218

4

Request :

No.	Time	Source	Destination	Protocol	Length	Info
14	3.257567	10.0.0.119	173.230.149.18	LLC	46	I P, N(R)=51, N(S)=55; DSAP 0x70 Individual, SSAP 0x68 Response
15	3.284895	173.230.149.18	10.0.0.119	LLC	56	I P, N(R)=35, N(S)=39; DSAP 0x50 Individual, SSAP 0x48 Response
16	3.284666	10.0.0.119	173.230.149.18	LLC	46	I P, N(R)=51, N(S)=55; DSAP 0x70 Individual, SSAP 0x68 Response
17	3.310167	173.230.149.18	10.0.0.119	LLC	56	I P, N(R)=35, N(S)=39; DSAP 0x50 Individual, SSAP 0x48 Response
18	3.310533	10.0.0.119	173.230.149.18	LLC	46	I P, N(R)=51, N(S)=55; DSAP 0x70 Individual, SSAP 0x68 Response
19	3.330962	173.230.149.18	10.0.0.119	LLC	56	I P, N(R)=35, N(S)=39; DSAP 0x50 Individual, SSAP 0x48 Response
20	3.331341	10.0.0.119	173.230.149.18	LLC	46	I P, N(R)=51, N(S)=55; DSAP 0x70 Individual, SSAP 0x68 Response
21	3.351952	173.230.149.18	10.0.0.119	LLC	56	I P, N(R)=35, N(S)=39; DSAP 0x50 Individual, SSAP 0x48 Response
22	3.352312	10.0.0.119	173.230.149.18	LLC	46	I P, N(R)=51, N(S)=55; DSAP 0x70 Individual, SSAP 0x68 Response
23	3.372021	173.230.149.18	10.0.0.119	LLC	56	I P, N(R)=35, N(S)=39; DSAP 0x50 Individual, SSAP 0x48 Response
24	3.372384	10.0.0.119	173.230.149.18	LLC	46	I P, N(R)=51, N(S)=55; DSAP 0x70 Individual, SSAP 0x68 Response
25	3.392545	173.230.149.18	10.0.0.119	LLC	56	I P, N(R)=35, N(S)=39; DSAP 0x50 Individual, SSAP 0x48 Response
26	3.392956	10.0.0.119	173.230.149.18	LLC	46	I P, N(R)=51, N(S)=55; DSAP 0x70 Individual, SSAP 0x68 Response
27	3.412573	173.230.149.18	10.0.0.119	LLC	56	I P, N(R)=35, N(S)=39; DSAP 0x50 Individual, SSAP 0x48 Response
28	3.412938	10.0.0.119	173.230.149.18	LLC	46	I P, N(R)=51, N(S)=55; DSAP 0x70 Individual, SSAP 0x68 Response
29	3.433146	173.230.149.18	10.0.0.119	LLC	56	I P, N(R)=35, N(S)=39; DSAP 0x50 Individual, SSAP 0x48 Response
30	3.433517	10.0.0.119	173.230.149.18	LLC	46	I P, N(R)=51, N(S)=55; DSAP 0x70 Individual, SSAP 0x68 Response
31	3.455073	173.230.149.18	10.0.0.119	LLC	56	I P, N(R)=35, N(S)=39; DSAP 0x50 Individual, SSAP 0x48 Response
32	3.455452	10.0.0.119	173.230.149.18	LLC	46	I P, N(R)=51, N(S)=55; DSAP 0x70 Individual, SSAP 0x68 Response
33	3.475794	173.230.149.18	10.0.0.119	LLC	56	I P, N(R)=35, N(S)=39; DSAP 0x50 Individual, SSAP 0x48 Response

> Frame 14: 46 bytes on wire (368 bits), 46 bytes captured (368 bits) on interface en0, id 0
> Ethernet II, Src: Apple_e4:2c:9f (38:f9:d3:e4:2c:9f), Dst: Technico_2a:b6:7f (94:6a:77:2a:b6:7f)
> Internet Protocol Version 4, Src: 10.0.0.119, Dst: 173.230.149.18
> User Datagram Protocol, Src Port: 58730, Dst Port: 12000
> Logical-Link Control

```
0000  94 6a 77 2a b6 7f 38 f9 d3 e4 2c 9f 08 00 45 00  .jw...8...E
0010  00 20 74 12 00 00 40 11 b9 4b 0a 00 00 77 ad e6  .t...@.K...w
0020  95 12 e5 6a 2e e0 00 0c bf 4a 70 69 6e 67       .j...ping
```

According to the packet bytes panes shows the data of the packet sent in, the message sent is a bunch hex hexadecimal and end with the lower case 'ping'. The non-printable bytes are written in “.”

“LLC” is the name of UDP socket when port number on 12000-12004. all character are shown in hexadecimal bytes and ASCII bytes.

The message received is “PING”

udp.port == 12000

No.	Time	Source	Destination	Protocol	Length	Info
14	3.257567	10.0.0.119	173.230.149.18	LLC	46	I P, N(R)=51, N(S)=55; DSAP 0x70 Individual, SSAP 0x68 Response
15	3.284095	173.230.149.18	10.0.0.119	LLC	56	I P, N(R)=35, N(S)=39; DSAP 0x50 Individual, SSAP 0x48 Response
16	3.284666	10.0.0.119	173.230.149.18	LLC	46	I P, N(R)=51, N(S)=55; DSAP 0x70 Individual, SSAP 0x68 Response
17	3.310167	173.230.149.18	10.0.0.119	LLC	56	I P, N(R)=35, N(S)=39; DSAP 0x50 Individual, SSAP 0x48 Response
18	3.310533	10.0.0.119	173.230.149.18	LLC	46	I P, N(R)=51, N(S)=55; DSAP 0x70 Individual, SSAP 0x68 Response
19	3.330962	173.230.149.18	10.0.0.119	LLC	56	I P, N(R)=35, N(S)=39; DSAP 0x50 Individual, SSAP 0x48 Response
20	3.331341	10.0.0.119	173.230.149.18	LLC	46	I P, N(R)=51, N(S)=55; DSAP 0x70 Individual, SSAP 0x68 Response
21	3.351952	173.230.149.18	10.0.0.119	LLC	56	I P, N(R)=35, N(S)=39; DSAP 0x50 Individual, SSAP 0x48 Response
22	3.352312	10.0.0.119	173.230.149.18	LLC	46	I P, N(R)=51, N(S)=55; DSAP 0x70 Individual, SSAP 0x68 Response
23	3.372021	173.230.149.18	10.0.0.119	LLC	56	I P, N(R)=35, N(S)=39; DSAP 0x50 Individual, SSAP 0x48 Response
24	3.372384	10.0.0.119	173.230.149.18	LLC	46	I P, N(R)=51, N(S)=55; DSAP 0x70 Individual, SSAP 0x68 Response
25	3.392545	173.230.149.18	10.0.0.119	LLC	56	I P, N(R)=35, N(S)=39; DSAP 0x50 Individual, SSAP 0x48 Response
26	3.392956	10.0.0.119	173.230.149.18	LLC	46	I P, N(R)=51, N(S)=55; DSAP 0x70 Individual, SSAP 0x68 Response
27	3.412573	173.230.149.18	10.0.0.119	LLC	56	I P, N(R)=35, N(S)=39; DSAP 0x50 Individual, SSAP 0x48 Response
28	3.412938	10.0.0.119	173.230.149.18	LLC	46	I P, N(R)=51, N(S)=55; DSAP 0x70 Individual, SSAP 0x68 Response
29	3.433146	173.230.149.18	10.0.0.119	LLC	56	I P, N(R)=35, N(S)=39; DSAP 0x50 Individual, SSAP 0x48 Response
30	3.433517	10.0.0.119	173.230.149.18	LLC	46	I P, N(R)=51, N(S)=55; DSAP 0x70 Individual, SSAP 0x68 Response
31	3.455073	173.230.149.18	10.0.0.119	LLC	56	I P, N(R)=35, N(S)=39; DSAP 0x50 Individual, SSAP 0x48 Response
32	3.455452	10.0.0.119	173.230.149.18	LLC	46	I P, N(R)=51, N(S)=55; DSAP 0x70 Individual, SSAP 0x68 Response
33	3.475794	173.230.149.18	10.0.0.119	LLC	56	I P, N(R)=35, N(S)=39; DSAP 0x50 Individual, SSAP 0x48 Response

> Frame 15: 56 bytes on wire (448 bits), 56 bytes captured (448 bits) on interface en0, id 0
> Ethernet II, Src: Technico_2a:b6:7f (94:6a:77:2a:b6:7f), Dst: Apple_e4:2c:9f (38:f9:d3:e4:2c:9f)
> Internet Protocol Version 4, Src: 173.230.149.18, Dst: 10.0.0.119
> User Datagram Protocol, Src Port: 12000, Dst Port: 58730
> Logical-Link Control

0000 38 f9 d3 e4 2c 9f 94 6a 77 2a b6 7f 08 00 45 00 8...j wk...E-
0010 00 20 11 e0 40 00 32 11 e9 7d ad e6 95 12 0a 00 . .@ 2 . .).....
0020 00 77 2e e0 e5 6a 00 0c ff 8a 50 49 4e 47 00 00 .W. .j . . .PING..
0030 00 00 00 00 00 00 00 00

wireshark_Wi-FiHINL1.pcapng

Packets: 59 · Displayed: 20 (33.9%) · Dropped: 0 (0.0%)

Profile: Default

Question II Ping:

5. Attached screen shot of lperf:

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL

received %: 84
received %: 85
received %: 85
received %: 85
received %: 86
received %: 86
received %: 86
received %: 87
received %: 87
received %: 94
received %: 94
received %: 94
received %: 95
received %: 95
received %: 95
received %: 96
received %: 96
received %: 96
received %: 97
received %: 97
received %: 97
received %: 98
received %: 98
received %: 98
received %: 99
received %: 99
received %: 99
received %: 100
break
Time elapsed: 6.024640798568726 seconds
Throughput: 215968.72635279942 bps
Size of file is 1301134 bites
File Downloaded
PS C:\Users\huli\Documents\GitHub\ECS152A_Project1>
```

```
TERMINAL  PROBLEMS  OUTPUT  DEBUG CONSOLE  Code

[Running] python -u "Users/huilinzhang/Documents/GitHub/ECS152A_Project1/udp_iperf_HuilinZhang_917071562_TingweiLiu_917707784.py"
received %: 0
received %: 0
received %: 0
received %: 1
received %: 1
received %: 1
received %: 2
received %: 2
received %: 2
received %: 3
```

6: number of packet: 321.

The data was separated into 320 packet with length 4068 and one last packet with length 2308. The total length was 1,300,000 as result.

The screenshot shows a Wireshark packet capture of a UDP stream. The filter is 'udp.port == 5007'. The packet list shows 321 packets. The first 320 packets have a length of 4068 bytes, and the last packet (No. 321) has a length of 2308 bytes. The packet details for packet 1101 (the last packet) are expanded, showing the Ethernet II header, Internet Protocol Version 4 header, and User Datagram Protocol header. The data payload is shown as a hex dump and ASCII text: 'worldHello, worldHello, worldHello, worldHello'.

No.	Time	Source	Destination	Protocol	Length	Info
998	18.064671	173.230.149.18	10.0.0.119	UDP	1150	5007 → 64522 Len=4068
1004	18.085169	173.230.149.18	10.0.0.119	UDP	1150	5007 → 64522 Len=4068
1009	18.103441	173.230.149.18	10.0.0.119	UDP	1150	5007 → 64522 Len=4068
1012	18.123445	173.230.149.18	10.0.0.119	UDP	1150	5007 → 64522 Len=4068
1016	18.144834	173.230.149.18	10.0.0.119	UDP	1150	5007 → 64522 Len=4068
1021	18.164822	173.230.149.18	10.0.0.119	UDP	1150	5007 → 64522 Len=4068
1024	18.184475	173.230.149.18	10.0.0.119	UDP	1150	5007 → 64522 Len=4068
1033	18.204382	173.230.149.18	10.0.0.119	UDP	1150	5007 → 64522 Len=4068
1036	18.225566	173.230.149.18	10.0.0.119	UDP	1150	5007 → 64522 Len=4068
1043	18.245465	173.230.149.18	10.0.0.119	UDP	1150	5007 → 64522 Len=4068
1046	18.266312	173.230.149.18	10.0.0.119	UDP	1150	5007 → 64522 Len=4068
1049	18.287812	173.230.149.18	10.0.0.119	UDP	1150	5007 → 64522 Len=4068
1054	18.306232	173.230.149.18	10.0.0.119	UDP	1150	5007 → 64522 Len=4068
1061	18.326678	173.230.149.18	10.0.0.119	UDP	1150	5007 → 64522 Len=4068
1064	18.346468	173.230.149.18	10.0.0.119	UDP	1150	5007 → 64522 Len=4068
1069	18.368733	173.230.149.18	10.0.0.119	UDP	1150	5007 → 64522 Len=4068
1072	18.387857	173.230.149.18	10.0.0.119	UDP	1150	5007 → 64522 Len=4068
1075	18.407268	173.230.149.18	10.0.0.119	UDP	1150	5007 → 64522 Len=4068
1078	18.427478	173.230.149.18	10.0.0.119	UDP	1150	5007 → 64522 Len=4068
1081	18.448288	173.230.149.18	10.0.0.119	UDP	1150	5007 → 64522 Len=4068
1084	18.467851	173.230.149.18	10.0.0.119	UDP	1150	5007 → 64522 Len=4068
1087	18.488241	173.230.149.18	10.0.0.119	UDP	1150	5007 → 64522 Len=4068
1090	18.510145	173.230.149.18	10.0.0.119	UDP	1150	5007 → 64522 Len=4068
1093	18.530369	173.230.149.18	10.0.0.119	UDP	1150	5007 → 64522 Len=4068
1096	18.548787	173.230.149.18	10.0.0.119	UDP	1150	5007 → 64522 Len=4068
1101	18.570888	173.230.149.18	10.0.0.119	UDP	1150	5007 → 64522 Len=4068
1103	18.590869	173.230.149.18	10.0.0.119	UDP	870	5007 → 64522 Len=2308

Frame 1101: 1150 bytes on wire (9200 bits), 1150 bytes captured (9200 bits) on interface en0, id 0
> Ethernet II, Src: Technico_2a:b6:7f (94:6a:77:2a:b6:7f), Dst: Apple_e4:2c:9f (38:f9:d3:e4:2c:9f)
> Internet Protocol Version 4, Src: 173.230.149.18, Dst: 10.0.0.119
> User Datagram Protocol, Src Port: 5007, Dst Port: 64522
Data (4068 bytes)
Data: 776f726c640a48656c6c6f2c20776f726c640a48656c6c6f2c20776f726c640a48656c6c...
[Length: 4068]

0000 13 8f fc 0a 0f ec e0 f7 77 6f 72 6c 64 0a 48 65 worldHe
0010 6c 6c 6f 2c 20 77 6f 72 6c 64 0a 48 65 6c 6c 6f llo, wor ldHello
0020 2c 20 77 6f 72 6c 64 0a 48 65 6c 6c 6f 2c 20 77 , world: Hello, w
0030 6f 72 6c 64 0a 48 65 6c 6c 6f 2c 20 77 6f 72 6c orldHel lo, worl
0040 64 0a 48 65 6c 6c 6f 2c 20 77 6f 72 6c 64 0a 48 dHello, world:H
0050 65 6c 6c 6f 2c 20 77 6f 72 6c 64 0a 48 65 6c 6c ello, wo rldHell

Frame (1150 bytes) Reassembled IPv4 (4076 bytes)

wireshark_Wi-FiB4YL1.pcapng Packets: 2237 · Displayed: 321 (14.3%) · Dropped: 0 (0.0%) Profile: Default

7: Total number of time: 6.02 seconds

8: Through put: 215968 bps