

Assignment 1

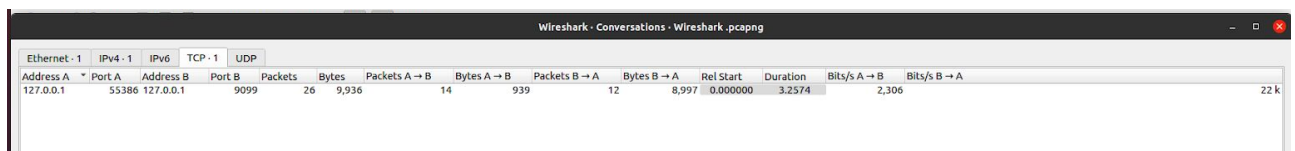
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Q1. Code for the client and server in the respective folder

- References:
 - [Youtube](#)
 - Tutorial code

Q2. Using Wireshark trace at the client side

- Under the Statistics section, Conversations, and then applying the filter for TCP connections.



The screenshot shows the Wireshark Statistics - Conversations window. The filter is set to 'TCP'. The table below summarizes the conversation data:

Address A	Port A	Address B	Port B	Packets	Bytes	Packets A → B	Bytes A → B	Packets B → A	Bytes B → A	Rel Start	Duration	Bits/s A → B	Bits/s B → A
127.0.0.1	55386	127.0.0.1	9099	26	9,936	14	939	12	8,997	0.000000	3.2574	2,306	22 k

a. NUMBER OF TCP CONNECTIONS: 1

b. Client Port Number : Port A : 55386

Server Port Number : Port B : 9099

c. Number of Packets exchanged : 26 , Bytes : 9,936

d. Time to download the file:

Timestamp for the 10th packet(where the transfer of file from server started) -> 3.256951193

Timestamp for 24rd packet(where all the packets got delivered) -> 3.257144971

Total Time: $3.257144971 - 3.256951193 = 0.000193778$

(Screenshot is attached below, Also the saved file of wireshark is also present in the folder.)

Last packet send(No. 24)

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
Wireshark - pcapng

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000000	127.0.0.1	127.0.0.1	TCP	74	55386 → 9099 [SYN] Seq=0 Win=65495 Len=0 MSS=65495 SACK_PERM=1 TSval=2342406322 TSecr=0 WS=128
2	0.000032840	127.0.0.1	127.0.0.1	TCP	74	9099 → 55386 [SYN, ACK] Seq=0 Ack=1 Win=65483 Len=0 MSS=65495 SACK_PERM=1 TSval=23424083162 TSecr=23424083202 WS=128
3	0.000056384	127.0.0.1	127.0.0.1	TCP	66	55386 → 9099 [ACK] Seq=1 Ack=1 Win=65536 Len=0 TSval=2342408362 TSecr=2342408362
4	0.256674963	127.0.0.1	127.0.0.1	TCP	73	55386 → 9099 [PSH, ACK] Seq=1 Ack=1 Win=65536 Len=7 TSval=2342406450 TSecr=23424003162
5	0.256704385	127.0.0.1	127.0.0.1	TCP	66	9099 → 55386 [ACK] Seq=1 Ack=8 Win=64256 Len=0 TSval=2342406458 TSecr=2342406458
6	0.256819790	127.0.0.1	127.0.0.1	TCP	67	9099 → 55386 [PSH, ACK] Seq=1 Ack=8 Win=64256 Len=1 TSval=2342406459 TSecr=2342406458
7	0.256829165	127.0.0.1	127.0.0.1	TCP	66	55386 → 9099 [ACK] Seq=8 Ack=2 Win=65536 Len=0 TSval=2342406459 TSecr=2342406459
8	0.256911586	127.0.0.1	127.0.0.1	TCP	70	9099 → 55386 [PSH, ACK] Seq=2 Ack=8 Win=64256 Len=4 TSval=2342406459 TSecr=2342406459
9	0.256921988	127.0.0.1	127.0.0.1	TCP	66	55386 → 9099 [ACK] Seq=8 Ack=6 Win=65536 Len=0 TSval=2342406459 TSecr=2342406459
10	0.256951193	127.0.0.1	127.0.0.1	TCP	1890	9099 → 55386 [PSH, ACK] Seq=6 Ack=8 Win=64256 Len=1024 TSval=2342406459 TSecr=2342406459
11	0.256959528	127.0.0.1	127.0.0.1	TCP	66	55386 → 9099 [ACK] Seq=8 Ack=1030 Win=64512 Len=0 TSval=2342406459 TSecr=2342406459
12	0.256980762	127.0.0.1	127.0.0.1	TCP	1890	9099 → 55386 [PSH, ACK] Seq=1030 Ack=8 Win=64256 Len=1024 TSval=2342406459 TSecr=2342406459
13	0.256989697	127.0.0.1	127.0.0.1	TCP	66	55386 → 9099 [ACK] Seq=8 Ack=2054 Win=63872 Len=0 TSval=2342406459 TSecr=2342406459
14	0.256997318	127.0.0.1	127.0.0.1	TCP	1890	9099 → 55386 [PSH, ACK] Seq=2054 Ack=8 Win=64256 Len=1024 TSval=2342406459 TSecr=2342406459
15	0.257013865	127.0.0.1	127.0.0.1	TCP	66	55386 → 9099 [ACK] Seq=8 Ack=3078 Win=63360 Len=0 TSval=2342406459 TSecr=2342406459
16	0.257032588	127.0.0.1	127.0.0.1	TCP	1890	9099 → 55386 [PSH, ACK] Seq=3078 Ack=8 Win=64256 Len=1024 TSval=2342406459 TSecr=2342406459
17	0.257039238	127.0.0.1	127.0.0.1	TCP	66	55386 → 9099 [ACK] Seq=8 Ack=4182 Win=64384 Len=0 TSval=2342406459 TSecr=2342406459
18	0.257065521	127.0.0.1	127.0.0.1	TCP	1890	9099 → 55386 [PSH, ACK] Seq=4182 Ack=8 Win=64256 Len=1024 TSval=2342406459 TSecr=2342406459
19	0.257072982	127.0.0.1	127.0.0.1	TCP	66	55386 → 9099 [ACK] Seq=8 Ack=5126 Win=64384 Len=0 TSval=2342406459 TSecr=2342406459
20	0.257092082	127.0.0.1	127.0.0.1	TCP	1890	9099 → 55386 [PSH, ACK] Seq=5126 Ack=8 Win=64256 Len=1024 TSval=2342406459 TSecr=2342406459
21	0.257097390	127.0.0.1	127.0.0.1	TCP	66	55386 → 9099 [ACK] Seq=8 Ack=6150 Win=64384 Len=0 TSval=2342406459 TSecr=2342406459
22	0.257117587	127.0.0.1	127.0.0.1	TCP	1890	9099 → 55386 [PSH, ACK] Seq=6150 Ack=8 Win=64256 Len=1024 TSval=2342406459 TSecr=2342406459
23	0.257131285	127.0.0.1	127.0.0.1	TCP	66	55386 → 9099 [ACK] Seq=8 Ack=7174 Win=63360 Len=0 TSval=2342406459 TSecr=2342406459
24	0.257144512	127.0.0.1	127.0.0.1	TCP	1890	9099 → 55386 [PSH, ACK] Seq=7174 Ack=8 Win=64256 Len=1024 TSval=2342406459 TSecr=2342406459
25	0.257157571	127.0.0.1	127.0.0.1	TCP	66	55386 → 9099 [ACK] Seq=8 Ack=8198 Win=62336 Len=0 TSval=2342406459 TSecr=2342406459
26	0.257300386	127.0.0.1	127.0.0.1	TCP	66	55386 → 9099 [RST, ACK] Seq=8 Ack=8198 Win=65536 Len=0 TSval=2342406459 TSecr=2342406459

Frame 24, 1890 bytes on wire (8720 bits), 1890 bytes captured (872