Assignment-3(yash kanojia-2018372)

Ans 1) a) command used Tshark.

```
C:\Program Files\Wireshark>tshark -f tcp -i Wi-Fi -a duration:30 -w capture.pcap
Capturing on 'Wi-Fi'
8900
```

b) Total of 135 tcp connections. AS it can be seen in the ss below.

Ethernet · 1 | IPv4 · 67 | IPv6 | TCP · 135 | UDP

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
74.109.188.139	57981	192.168.0.107	56797	5	330	0	0	5	330	1.020537	15.0025	0	
105.156.0.130	55551	192.168.0.107	51240	1	122	0	0	1	122	10.832252	0.0000	—	
150.129.237.136	62348	192.168.0.107	56848	5	362	2	120	3	242	20.014585	0.0102	93 k	
192.168.0.107	56794	117.97.139.237	40655	3	198	3	198	0	0	0.000000	12.0016	131	
192.168.0.107	56796	122.164.83.19	49160	4	264	4	264	0	0	0.012621	14.0004	150	
192.168.0.107	57227	3.235.72.199	443	3	228	2	143	1	85	1.349942	0.2791	4099	
192.168.0.107	51172	23.54.89.113	443	6	368	3	163	3	205	1.832660	10.5075	124	
192.168.0.107	51246	193.56.117.14	11638	1	66	1	66	0	0	2.014740	0.0000	—	
192.168.0.107	51189	23.54.89.113	443	61	50 k	20	4502	41	45 k	2.283785	10.0628	3579	
192.168.0.107	51187	23.54.89.113	443	67	59 k	19	5009	48	54 k	2.283827	10.0630	3982	
192.168.0.107	51188	23.54.89.113	443	68	56 k	22	5742	46	50 k	2.283832	10.0624	4565	
192.168.0.107	51185	23.54.89.113	443	70	62 k	21	5119	49	57 k	2.288674	10.0580	4071	
192.168.0.107	51190	23.54.89.113	443	55	44 k	17	4378	38	40 k	2.370619	9.9906	3505	
192.168.0.107	51186	23.54.89.113	443	56	48 k	17	3798	39	44 k	2.370643	9.9758	3045	
192.168.0.107	56789	186.19.217.89	18483	2	132	2	132	0	0	3.017838	8.0000	131	
192.168.0.107	56792	41.223.117.68	6881	2	132	2	132	0	0	3.021073	8.0005	131	
192.168.0.107	56791	41.86.46.27	35019	2	132	2	132	0	0	3.041583	8.0005	131	
192.168.0.107	51194	163.53.77.246	443	3	162	2	108	1	54	3.051636	0.0318	27 k	
192.168.0.107	51178	13.126.106.13	443	3	162	2	108	1	54	3.052111	0.0350	24 k	
192.168.0.107	51168	52.71.246.19	443	2	108	1	54	1	54	3.052557	0.2500	1727	
192.168.0.107	51167	52.71.246.19	443	3	162	2	108	1	54	3.052765	0.2337	3697	

Name resolution | Limit to display filter | Absolute start time

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
192.168.0.107	51178	13.126.106.13	443	3	162	2	108	1	54	3.052111	0.0350	24 k	
192.168.0.107	51168	52.71.246.19	443	2	108	1	54	1	54	3.052557	0.2500	1727	
192.168.0.107	51167	52.71.246.19	443	3	162	2	108	1	54	3.052765	0.2337	3697	
192.168.0.107	51200	52.214.253.49	443	3	162	2	108	1	54	3.053119	0.2243	3852	
192.168.0.107	51201	54.82.79.206	443	3	162	2	108	1	54	3.053818	0.2444	3535	
192.168.0.107	51170	52.76.214.151	443	2	108	1	54	1	54	3.054079	0.0831	5200	
192.168.0.107	51169	52.76.214.151	443	3	162	2	108	1	54	3.054291	0.0781	11 k	
192.168.0.107	56798	52.95.124.221	443	30	13 k	15	5523	15	8423	3.065901	9.4906	4655	
192.168.0.107	56799	13.224.19.47	443	287	244 k	89	10 k	198	234 k	3.079339	9.2734	9015	
192.168.0.107	56800	52.215.143.196	443	90	35 k	46	24 k	44	10 k	3.094899	9.4716	20 k	
192.168.0.107	56801	99.86.54.17	443	351	308 k	123	10 k	228	297 k	3.117565	9.2361	9209	
192.168.0.107	56802	199.232.253.16	443	34	20 k	14	1840	20	18 k	3.171451	9.1814	1603	
192.168.0.107	56803	52.215.143.196	443	18	7483	9	1153	9	6330	3.312671	9.2434	997	
192.168.0.107	51164	161.69.226.70	443	10	3844	6	2854	4	990	3.510262	8.9210	2559	
192.168.0.107	56804	52.95.124.221	443	12	1404	6	904	6	500	3.586783	8.9695	806	
192.168.0.107	56805	52.95.118.235	443	32	12 k	17	4251	15	8463	4.272347	8.2791	4107	
192.168.0.107	56806	52.95.118.235	443	27	10 k	14	2754	13	7588	4.353751	8.1983	2687	
192.168.0.107	56807	103.85.228.4	10846	5	330	5	330	0	0	5.014774	15.0024	175	
192.168.0.107	56788	154.160.14.31	55463	1	66	1	66	0	0	5.045015	0.0000	—	
192.168.0.107	56808	54.239.35.28	443	48	20 k	24	10 k	24	10 k	5.269462	7.5004	11 k	
192.168.0.107	56809	104.121.240.160	443	19	2749	10	1558	9	1191	5.416356	6.9733	1787	

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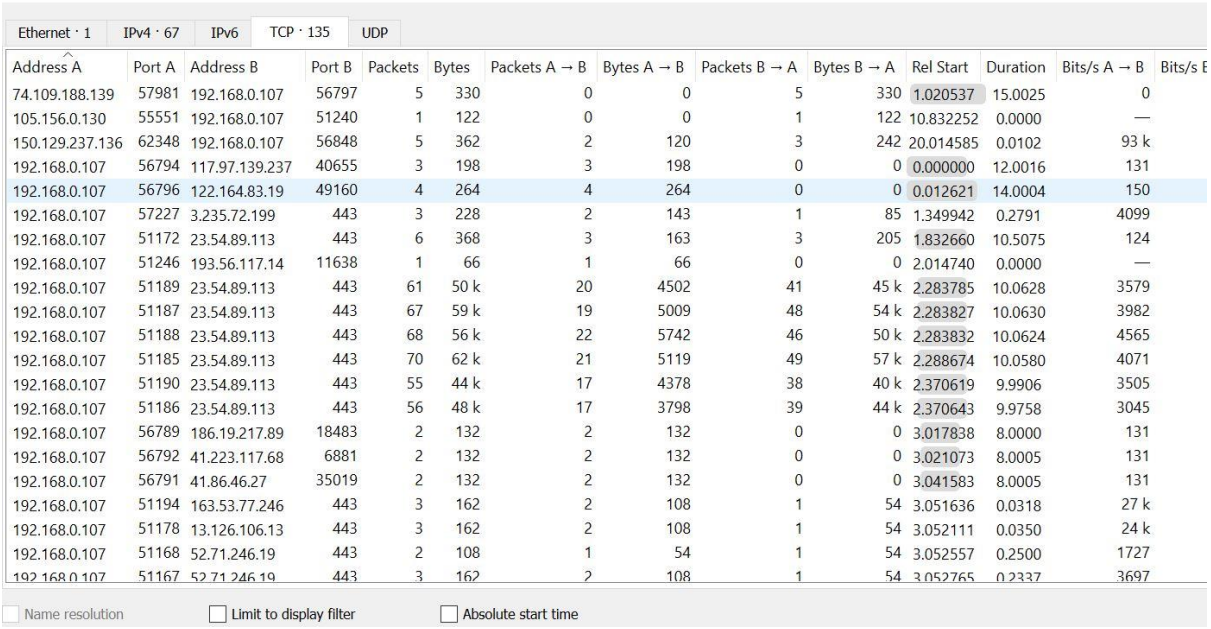
Address A	Port A	Address B	Port B	Packets	Bytes	Packets A → B	Bytes A → B	Packets B → A	Bytes B → A	Rel Start	Duration	Bits/s A → B	Bits/s B
74.109.188.139	57981	192.168.0.107	56797	5	330	0	0	5	330	1.020537	15.0025	0	
105.156.0.130	55551	192.168.0.107	51240	1	122	0	0	1	122	10.832252	0.0000	—	
150.129.237.136	62348	192.168.0.107	56848	5	362	2	120	3	242	20.014585	0.0102	93 k	
192.168.0.107	56794	117.97.139.237	40655	3	198	3	198	0	0	0.000000	12.0016	131	
192.168.0.107	56796	122.164.83.19	49160	4	264	4	264	0	0	0.012621	14.0004	150	
192.168.0.107	57227	3.235.72.199	443	3	228	2	143	1	85	1.349942	0.2791	4099	
192.168.0.107	51172	23.54.89.113	443	6	368	3	163	3	205	1.832660	10.5075	124	
192.168.0.107	51246	193.56.117.14	11638	1	66	1	66	0	0	2.014740	0.0000	—	
192.168.0.107	51189	23.54.89.113	443	61	50 k	20	4502	41	45 k	2.283785	10.0628	3579	
192.168.0.107	51187	23.54.89.113	443	67	59 k	19	5009	48	54 k	2.283827	10.0630	3982	
192.168.0.107	51188	23.54.89.113	443	68	56 k	22	5742	46	50 k	2.283832	10.0624	4565	
192.168.0.107	51185	23.54.89.113	443	70	62 k	21	5119	49	57 k	2.288674	10.0580	4071	
192.168.0.107	51190	23.54.89.113	443	55	44 k	17	4378	38	40 k	2.370619	9.9906	3505	
192.168.0.107	51186	23.54.89.113	443	56	48 k	17	3798	39	44 k	2.370643	9.9758	3045	
192.168.0.107	56789	186.19.217.89	18483	2	132	2	132	0	0	3.017838	8.0000	131	
192.168.0.107	56792	41.223.117.68	6881	2	132	2	132	0	0	3.021073	8.0005	131	
192.168.0.107	56791	41.86.46.27	35019	2	132	2	132	0	0	3.041583	8.0005	131	
192.168.0.107	51194	163.53.77.246	443	3	162	2	108	1	54	3.051636	0.0318	27 k	
192.168.0.107	51178	13.126.106.13	443	3	162	2	108	1	54	3.052111	0.0350	24 k	
192.168.0.107	51168	52.71.246.19	443	2	108	1	54	1	54	3.052557	0.2500	1727	
192.168.0.107	51167	52.71.246.19	443	3	162	2	108	1	54	3.052765	0.2337	3697	

Name resolution | Limit to display filter | Absolute start time

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	
192.168.0.107	56874	201.92.88.83	4658	8	524	5	350	3	174	24.010656	1.2003	2332		1159
192.168.0.107	56875	82.102.23.157	54601	3	198	3	198	0	0	24.012595	3.0046	527		0
192.168.0.107	56876	54.239.36.249	443	16	3959	8	2107	8	1852	24.375004	0.8793	19 k		16 k
192.168.0.107	56877	52.95.123.167	443	25	11 k	12	3075	13	8507	24.396301	0.9862	24 k		69 k
192.168.0.107	56878	3.23.172.181	443	20	8166	9	1674	11	6492	24.443963	1.0517	12 k		49 k
192.168.0.107	56879	52.95.118.235	443	27	13 k	12	3048	15	10 k	24.454631	1.3582	17 k		60 k
192.168.0.107	56880	3.23.172.181	443	14	7192	6	1050	8	6142	24.665780	0.7531	11 k		65 k
192.168.0.107	56881	18.136.20.161	443	19	6266	11	4621	8	1645	24.685026	0.3766	98 k		34 k
192.168.0.107	56882	157.240.198.35	443	23	3599	10	1918	13	1681	24.742375	0.0693	221 k		194 k
192.168.0.107	56883	99.86.54.17	443	1,433	1641 k	345	22 k	1,088	1619 k	25.140103	3.4672	51 k		3736 k
192.168.0.107	56884	13.225.105.45	443	17	8438	7	1482	10	6956	25.242336	0.6176	19 k		90 k
192.168.0.107	56885	13.35.131.40	443	47	33 k	17	3588	30	30 k	25.368334	0.0371	773 k		6554 k
192.168.0.107	56886	172.67.13.182	443	20	4021	9	1803	11	2218	25.373820	0.6647	21 k		26 k
192.168.0.107	56887	54.150.10.110	443	23	11 k	12	4696	11	6971	25.376636	0.6788	55 k		82 k
192.168.0.107	56888	52.95.118.235	443	18	7989	8	1111	10	6878	25.440248	0.6941	12 k		79 k
192.168.0.107	56889	163.53.78.51	443	16	10 k	7	1594	9	8841	26.345916	0.2258	56 k		313 k
192.168.0.107	56890	104.31.89.65	443	18	4484	8	1577	10	2907	26.520714	0.3702	34 k		62 k
192.168.0.107	56891	104.31.89.65	443	7	978	5	846	2	132	26.522611	2.0915	3235		504
192.168.0.107	56892	163.53.78.51	443	24	16 k	12	7095	12	8914	26.539759	0.2375	238 k		300 k
192.168.0.107	56893	169.61.218.43	6881	5	354	3	242	2	112	29.015554	0.6282	3081		1426

c) 6,43,778 bytes of data has been transferred or downloaded.result has been found by doing the sum bytes column in below tables.



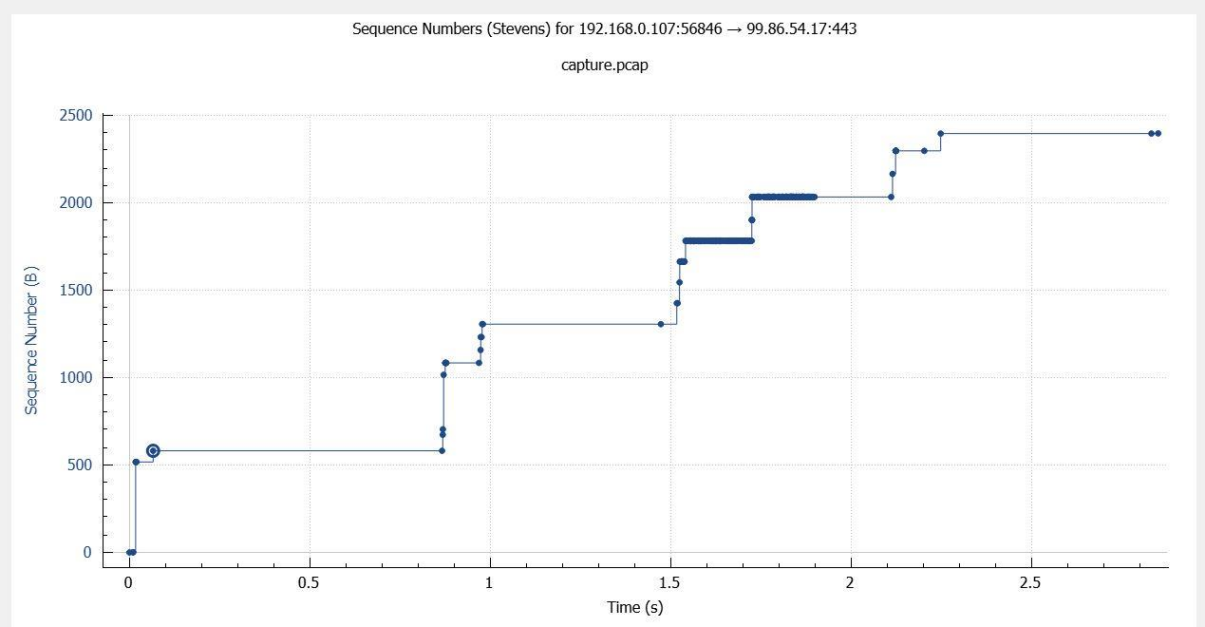
Ethernet · 1 | IPv4 · 67 | IPv6 | TCP · 135 | UDP

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
74.109.188.139	57981	192.168.0.107	56797	5	330	0	0	5	330	1.020537	15.0025	0	
105.156.0.130	55551	192.168.0.107	51240	1	122	0	0	1	122	10.832252	0.0000	—	
150.129.237.136	62348	192.168.0.107	56848	5	362	2	120	3	242	20.014585	0.0102	93 k	
192.168.0.107	56794	117.97.139.237	40655	3	198	3	198	0	0	0.000000	12.0016	131	
192.168.0.107	56796	122.164.83.19	49160	4	264	4	264	0	0	0.012621	14.0004	150	
192.168.0.107	57227	3.235.72.199	443	3	228	2	143	1	85	1.349942	0.2791	4099	
192.168.0.107	51172	23.54.89.113	443	6	368	3	163	3	205	1.832660	10.5075	124	
192.168.0.107	51246	193.56.117.14	11638	1	66	1	66	0	0	2.014740	0.0000	—	
192.168.0.107	51189	23.54.89.113	443	61	50 k	20	4502	41	45 k	2.283785	10.0628	3579	
192.168.0.107	51187	23.54.89.113	443	67	59 k	19	5009	48	54 k	2.283827	10.0630	3982	
192.168.0.107	51188	23.54.89.113	443	68	56 k	22	5742	46	50 k	2.283832	10.0624	4565	
192.168.0.107	51185	23.54.89.113	443	70	62 k	21	5119	49	57 k	2.288674	10.0580	4071	
192.168.0.107	51190	23.54.89.113	443	55	44 k	17	4378	38	40 k	2.370619	9.9906	3505	
192.168.0.107	51186	23.54.89.113	443	56	48 k	17	3798	39	44 k	2.370643	9.9758	3045	
192.168.0.107	56789	186.19.217.89	18483	2	132	2	132	0	0	3.017838	8.0000	131	
192.168.0.107	56792	41.223.117.68	6881	2	132	2	132	0	0	3.021073	8.0005	131	
192.168.0.107	56791	41.86.46.27	35019	2	132	2	132	0	0	3.041583	8.0005	131	
192.168.0.107	51194	163.53.77.246	443	3	162	2	108	1	54	3.051636	0.0318	27 k	
192.168.0.107	51178	13.126.106.13	443	3	162	2	108	1	54	3.052111	0.0350	24 k	
192.168.0.107	51168	52.71.246.19	443	2	108	1	54	1	54	3.052557	0.2500	1727	
192.168.0.107	51167	52.71.246.19	443	3	162	2	108	1	54	3.052765	0.2337	3697	

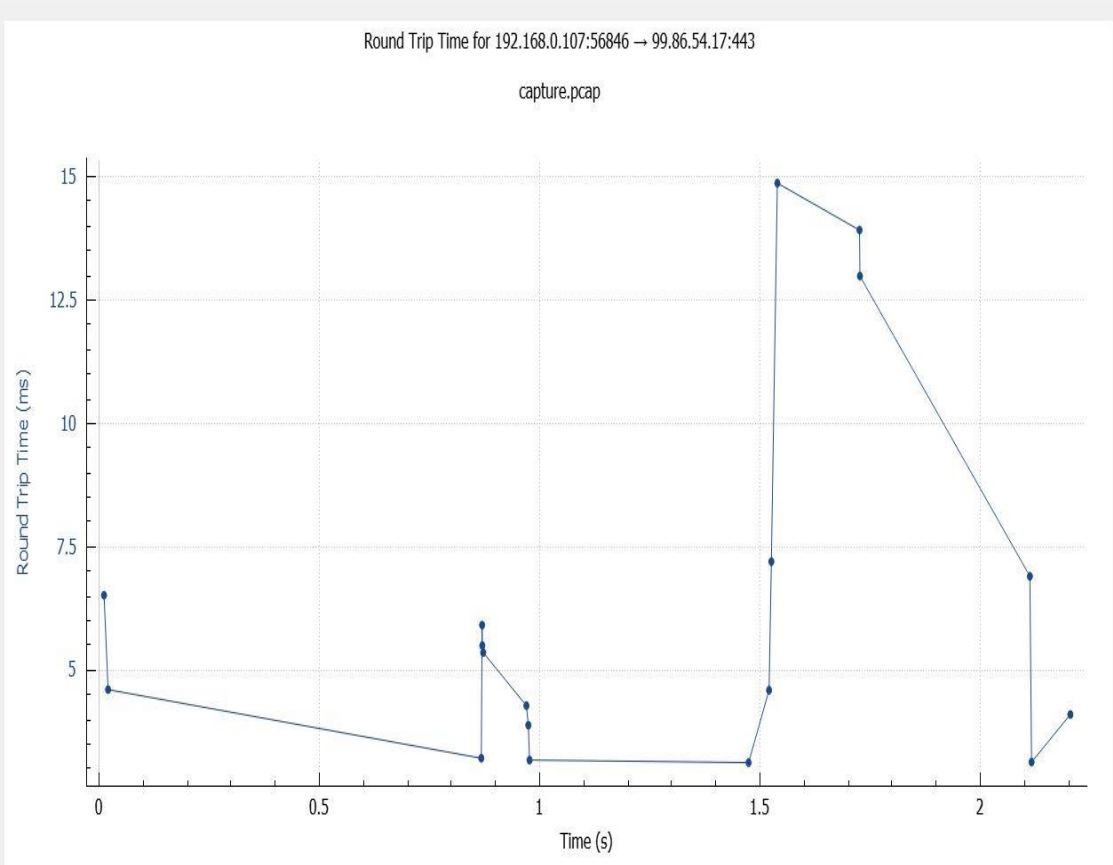
Name resolution | Limit to display filter | Absolute start time

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
192.168.0.107	51178	13.126.106.13	443	3	162	2	108	1	54	3.052111	0.0350	24 k	
192.168.0.107	51168	52.71.246.19	443	2	108	1	54	1	54	3.052557	0.2500	1727	
192.168.0.107	51167	52.71.246.19	443	3	162	2	108	1	54	3.052765	0.2337	3697	
192.168.0.107	51200	52.214.253.49	443	3	162	2	108	1	54	3.053119	0.2243	3852	
192.168.0.107	51201	54.82.79.206	443	3	162	2	108	1	54	3.053818	0.2444	3535	
192.168.0.107	51170	52.76.214.151	443	2	108	1	54	1	54	3.054079	0.0831	5200	
192.168.0.107	51169	52.76.214.151	443	3	162	2	108	1	54	3.054291	0.0781	11 k	
192.168.0.107	56798	52.95.124.221	443	30	13 k	15	5523	15	8423	3.065901	9.4906	4655	
192.168.0.107	56799	13.224.19.47	443	287	244 k	89	10 k	198	234 k	3.079339	9.2734	9015	
192.168.0.107	56800	52.215.143.196	443	90	35 k	46	24 k	44	10 k	3.094899	9.4716	20 k	
192.168.0.107	56801	99.86.54.17	443	351	308 k	123	10 k	228	297 k	3.117565	9.2361	9209	
192.168.0.107	56802	199.232.253.16	443	34	20 k	14	1840	20	18 k	3.171451	9.1814	1603	
192.168.0.107	56803	52.215.143.196	443	18	7483	9	1153	9	6330	3.312671	9.2434	997	
192.168.0.107	51164	161.69.226.70	443	10	3844	6	2854	4	990	3.510262	8.9210	2559	
192.168.0.107	56804	52.95.124.221	443	12	1404	6	904	6	500	3.586783	8.9695	806	
192.168.0.107	56805	52.95.118.235	443	32	12 k	17	4251	15	8463	4.272347	8.2791	4107	
192.168.0.107	56806	52.95.118.235	443	27	10 k	14	2754	13	7588	4.353751	8.1983	2687	
192.168.0.107	56807	103.85.228.4	10846	5	330	5	330	0	0	5.014774	15.0024	175	
192.168.0.107	56788	154.160.14.31	55463	1	66	1	66	0	0	5.045015	0.0000	—	
192.168.0.107	56808	54.239.35.28	443	48	20 k	24	10 k	24	10 k	5.269462	7.5004	11 k	
192.168.0.107	56809	104.121.240.160	443	19	2749	10	1558	9	1191	5.416356	6.9733	1787	

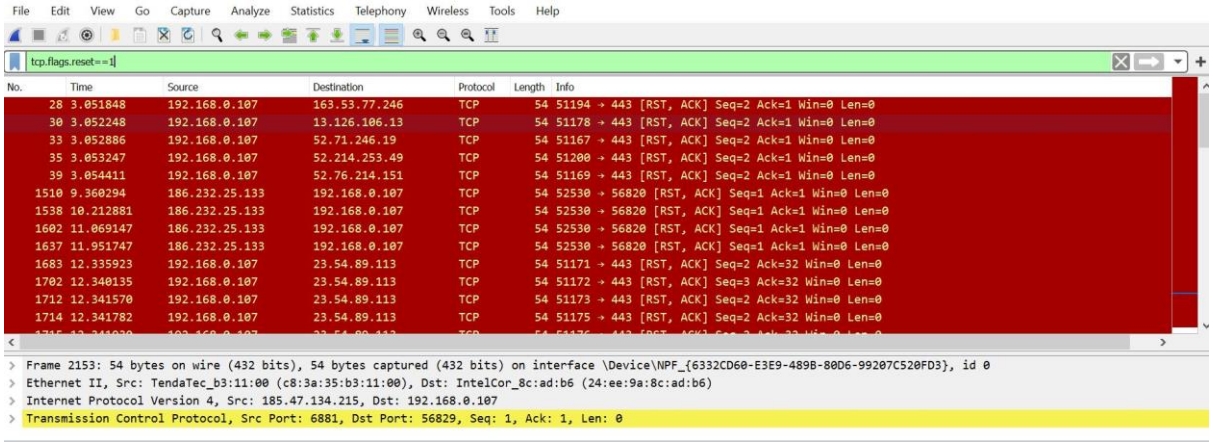
d)


Sequence Numbers (Stevens) for 192.168.0.107:56846 → 99.86.54.17:443
capture.pcap
Sequence Number (B)
Time (s)
0
500
1000
1500
2000
2500
0
0.5
1
1.5
2
2.5

e)

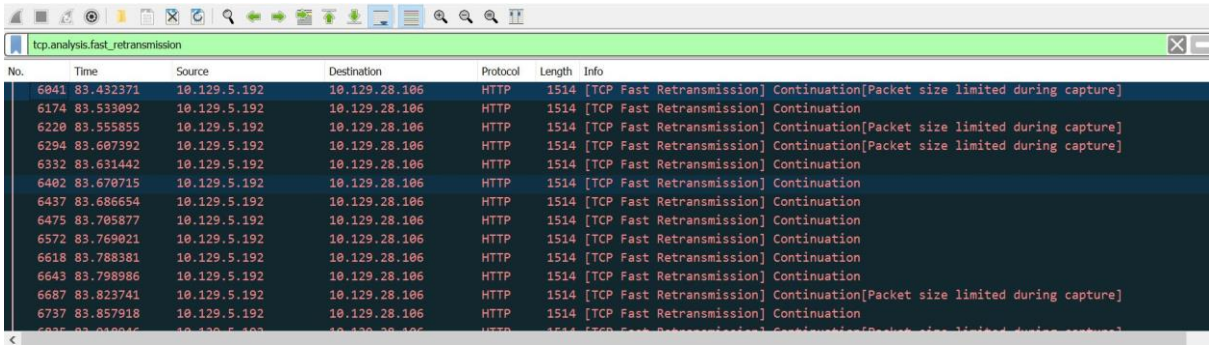

Round Trip Time for 192.168.0.107:56846 → 99.86.54.17:443
capture.pcap
Round Trip Time (ms)
Time (s)
5
7.5
10
12.5
15
0
0.5
1
1.5
2

f)



It is variable used on the sender side which tells about the data that can be send. This value will keep increasing with the good Ack and will decrease with bad ack.you are allowed to see the RWND value but not allowed to see the cwnd value.so,it is not possible to find the congestion window value.the value is calculated by an algorithm.

g) serial number of the last packet captured 1269.



	A	B	C	D	E	F	G	H	I	J	K	L	M
1250	112732	266.5659	10.129.5.1	10.129.28.	HTTP	1514	[TCP Fast Retransmission] Continuation[Packet size limited during capture]						
1251	112804	267.1621	10.129.5.1	10.129.28.	HTTP	1514	[TCP Fast Retransmission] Continuation						
1252	112899	268.1293	10.129.5.1	10.129.28.	HTTP	1514	[TCP Fast Retransmission] Continuation						
1253	112978	268.6091	10.129.5.1	10.129.28.	HTTP	1514	[TCP Fast Retransmission] Continuation						
1254	113011	268.6551	10.129.5.1	10.129.28.	HTTP	1514	[TCP Fast Retransmission] Continuation						
1255	113035	268.6779	10.129.5.1	10.129.28.	HTTP	1514	[TCP Fast Retransmission] Continuation[Packet size limited during capture]						
1256	113062	268.7085	10.129.5.1	10.129.28.	HTTP	1514	[TCP Fast Retransmission] Continuation						
1257	113080	268.7244	10.129.5.1	10.129.28.	HTTP	1514	[TCP Fast Retransmission] Continuation						
1258	113119	268.7773	10.129.5.1	10.129.28.	HTTP	1514	[TCP Fast Retransmission] Continuation						
1259	113165	268.8506	10.129.5.1	10.129.28.	HTTP	1514	[TCP Fast Retransmission] Continuation[Packet size limited during capture]						
1260	113178	268.8665	10.129.5.1	10.129.28.	HTTP	1514	[TCP Fast Retransmission] Continuation						
1261	113411	270.8964	10.129.5.1	10.129.28.	HTTP	1514	[TCP Fast Retransmission] Continuation						
1262	113443	270.9393	10.129.5.1	10.129.28.	HTTP	1514	[TCP Fast Retransmission] Continuation[Packet size limited during capture]						
1263	113476	271.0555	10.129.5.1	10.129.28.	HTTP	1514	[TCP Fast Retransmission] Continuation[Packet size limited during capture]						
1264	113571	271.4605	10.129.5.1	10.129.28.	HTTP	1514	[TCP Fast Retransmission] Continuation						
1265	113643	271.688	10.129.5.1	10.129.28.	HTTP	1514	[TCP Fast Retransmission] Continuation[Packet size limited during capture]						
1266	113938	272.5766	10.129.5.1	10.129.28.	HTTP	1514	[TCP Fast Retransmission] Continuation						
1267	113971	272.5978	10.129.5.1	10.129.28.	HTTP	1514	[TCP Fast Retransmission] Continuation						
1268	114049	272.6982	10.129.5.1	10.129.28.	HTTP	1514	[TCP Fast Retransmission] Continuation						
1269	114081	272.7192	10.129.5.1	10.129.28.	HTTP	1514	[TCP Fast Retransmission] Continuation						

Ans 2) total number of 60 tcp connection when I used netstat to see all the active tcp connection.while the number of tcp connection, while I capture the packets is 21.so,they are not same.

```
C:\Program Files\Wireshark>tshark -i Wi-Fi -a duration:30 -f "tcp" -w capture1.pcap && netstat -o -n -p tcp
Capturing on 'Wi-Fi'
120
```

Wireshark · Conversations · capture1.pcap

Ethernet · 1 | IPv4 · 21 | IPv6 | TCP · 21 | UDP

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
91.75.103.82	64910	192.168.0.107	64052	5	330	0	0	5	330	4.003630	15.0020	0	
192.168.0.107	64050	103.214.63.219	10453	9	578	5	350	4	228	0.000000	0.1201	23 k	
192.168.0.107	64048	207.232.5.148	64008	2	132	2	132	0	0	1.004170	8.0003	131	
192.168.0.107	64051	104.18.21.226	80	7	1038	4	439	3	599	1.478867	0.1376	25 k	
192.168.0.107	64049	47.29.139.40	40999	2	132	2	132	0	0	3.003906	8.0006	131	
192.168.0.107	64053	59.153.123.252	48870	10	600	5	330	5	270	4.983693	2.1704	1216	
192.168.0.107	64044	220.255.182.229	6881	1	66	1	66	0	0	4.999228	0.0000	—	
192.168.0.107	64045	78.30.2.224	1758	1	66	1	66	0	0	5.001632	0.0000	—	
192.168.0.107	50953	3.208.72.94	443	6	778	3	409	3	369	5.512674	3.2150	1017	
192.168.0.107	64037	13.35.131.40	443	8	1637	4	1006	4	631	5.784309	0.1315	61 k	
192.168.0.107	64046	36.227.238.100	16881	1	66	1	66	0	0	5.993768	0.0000	—	
192.168.0.107	64054	185.21.216.167	52702	16	1541	8	1017	8	524	8.019995	0.9722	8368	
192.168.0.107	60495	52.139.250.253	443	3	379	2	151	1	228	8.256632	0.1125	10 k	
192.168.0.107	64055	27.34.20.208	12469	5	362	3	242	2	120	14.992761	0.5553	3486	
192.168.0.107	64008	104.208.16.0	443	3	162	2	108	1	54	15.518701	0.2558	3377	
192.168.0.107	64056	66.115.146.83	14181	4	264	4	264	0	0	16.990587	7.0016	301	
192.168.0.107	64057	192.168.68.101	7680	4	264	4	264	0	0	17.346781	7.0018	301	
192.168.0.107	64058	197.14.92.255	35788	18	3088	10	1624	8	1464	24.000191	2.9667	4379	
192.168.0.107	65018	52.202.62.248	443	3	228	2	143	1	85	26.511510	0.2778	4117	
192.168.0.107	64059	103.83.213.164	43778	10	600	5	330	5	270	26.971591	2.1557	1224	
192.168.0.107	64060	197.185.115.250	40513	2	132	2	132	0	0	28.001030	1.0005	1055	

Name resolution | Limit to display filter | Absolute start time

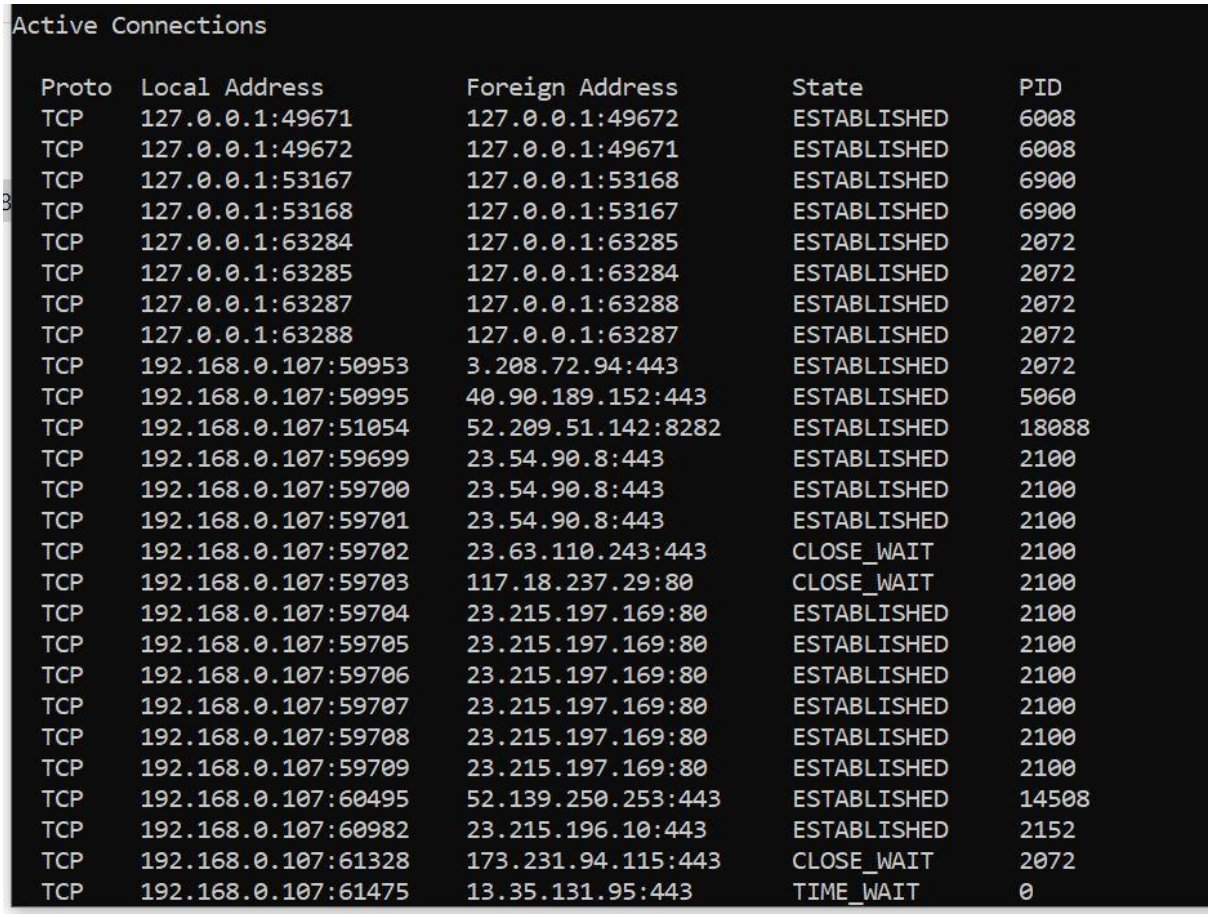
```
Active Connections

  Proto  Local Address          Foreign Address        State           PID
  TCP    127.0.0.1:49671        127.0.0.1:49672        ESTABLISHED     6008
  TCP    127.0.0.1:49672        127.0.0.1:49671        ESTABLISHED     6008
  TCP    127.0.0.1:53167        127.0.0.1:53168        ESTABLISHED     6900
  TCP    127.0.0.1:53168        127.0.0.1:53167        ESTABLISHED     6900
  TCP    127.0.0.1:63284        127.0.0.1:63285        ESTABLISHED     2072
  TCP    127.0.0.1:63285        127.0.0.1:63284        ESTABLISHED     2072
  TCP    127.0.0.1:63287        127.0.0.1:63288        ESTABLISHED     2072
  TCP    127.0.0.1:63288        127.0.0.1:63287        ESTABLISHED     2072
  TCP    192.168.0.107:50953    3.208.72.94:443        ESTABLISHED     2072
  TCP    192.168.0.107:50995    40.90.189.152:443      ESTABLISHED     5060
  TCP    192.168.0.107:51054    52.209.51.142:8282     ESTABLISHED     18088
  TCP    192.168.0.107:59699    23.54.90.8:443         ESTABLISHED     2100
  TCP    192.168.0.107:59700    23.54.90.8:443         ESTABLISHED     2100
  TCP    192.168.0.107:59701    23.54.90.8:443         ESTABLISHED     2100
  TCP    192.168.0.107:59702    23.63.110.243:443      CLOSE_WAIT      2100
  TCP    192.168.0.107:59703    117.18.237.29:80       CLOSE_WAIT      2100
  TCP    192.168.0.107:59704    23.215.197.169:80      ESTABLISHED     2100
  TCP    192.168.0.107:59705    23.215.197.169:80      ESTABLISHED     2100
  TCP    192.168.0.107:59706    23.215.197.169:80      ESTABLISHED     2100
  TCP    192.168.0.107:59707    23.215.197.169:80      ESTABLISHED     2100
  TCP    192.168.0.107:59708    23.215.197.169:80      ESTABLISHED     2100
  TCP    192.168.0.107:59709    23.215.197.169:80      ESTABLISHED     2100
  TCP    192.168.0.107:60495    52.139.250.253:443     ESTABLISHED     14508
  TCP    192.168.0.107:60982    23.215.196.10:443      ESTABLISHED     2152
  TCP    192.168.0.107:61328    173.231.94.115:443     CLOSE_WAIT      2072
  TCP    192.168.0.107:61475    13.35.131.95:443       TIME_WAIT       0
  TCP    192.168.0.107:63996    40.90.137.126:443      ESTABLISHED     560
  TCP    192.168.0.107:63997    40.90.137.126:443      ESTABLISHED     560
  TCP    192.168.0.107:63998    40.90.137.126:443      ESTABLISHED     560
  TCP    192.168.0.107:63999    40.90.137.126:443      ESTABLISHED     560
  TCP    192.168.0.107:64000    20.189.123.78:443      TIME_WAIT       0
  TCP    192.168.0.107:64001    13.107.42.23:443       TIME_WAIT       0
  TCP    192.168.0.107:64002    204.79.197.219:443     TIME_WAIT       0
  TCP    192.168.0.107:64003    51.105.218.222:443     TIME_WAIT       0
  TCP    192.168.0.107:64007    40.90.137.126:443      TIME_WAIT       0
  TCP    192.168.0.107:64008    104.208.16.0:443       TIME_WAIT       0
  TCP    192.168.0.107:64010    8.8.8.8:443            TIME_WAIT       0
  TCP    192.168.0.107:64013    13.107.21.200:443      TIME_WAIT       0
  TCP    192.168.0.107:64015    116.75.191.41:41482    TIME_WAIT       0
  TCP    192.168.0.107:64019    204.79.197.219:443     TIME_WAIT       0
  TCP    192.168.0.107:64020    52.139.250.253:443     TIME_WAIT       0
  TCP    192.168.0.107:64021    51.105.218.222:443     TIME_WAIT       0
  TCP    192.168.0.107:64026    27.34.20.94:47045      TIME_WAIT       0
  TCP    192.168.0.107:64032    51.105.218.222:443     TIME_WAIT       0
  TCP    192.168.0.107:64037    13.35.131.40:443       ESTABLISHED     18088
  TCP    192.168.0.107:64040    52.184.217.37:443      ESTABLISHED     18260
  TCP    192.168.0.107:64041    52.184.216.246:443     ESTABLISHED     18260
  TCP    192.168.0.107:64051    104.18.21.226:80       ESTABLISHED     4824
  TCP    192.168.0.107:64055    27.34.20.208:12469     ESTABLISHED     15092
  TCP    192.168.0.107:64056    66.115.146.83:14181    SYN_SENT        15092
  TCP    192.168.0.107:64057    192.168.68.101:7680    SYN_SENT        18260
  TCP    192.168.0.107:64060    197.185.115.250:40513  SYN_SENT        15092
  TCP    192.168.0.107:65018    52.202.62.248:443      ESTABLISHED     2072
  TCP    192.168.0.107:65122    74.125.24.188:5228     ESTABLISHED     18088
```

b) Established state : 37 tcp connection.

Time wait state :17 tcp connection.

Fin-wait-1 : 0 tcp connection.



```
Active Connections

  Proto  Local Address          Foreign Address        State           PID
  TCP    127.0.0.1:49671        127.0.0.1:49672        ESTABLISHED     6008
  TCP    127.0.0.1:49672        127.0.0.1:49671        ESTABLISHED     6008
  TCP    127.0.0.1:53167        127.0.0.1:53168        ESTABLISHED     6900
  TCP    127.0.0.1:53168        127.0.0.1:53167        ESTABLISHED     6900
  TCP    127.0.0.1:63284        127.0.0.1:63285        ESTABLISHED     2072
  TCP    127.0.0.1:63285        127.0.0.1:63284        ESTABLISHED     2072
  TCP    127.0.0.1:63287        127.0.0.1:63288        ESTABLISHED     2072
  TCP    127.0.0.1:63288        127.0.0.1:63287        ESTABLISHED     2072
  TCP    192.168.0.107:50953    3.208.72.94:443        ESTABLISHED     2072
  TCP    192.168.0.107:50995    40.90.189.152:443      ESTABLISHED     5060
  TCP    192.168.0.107:51054    52.209.51.142:8282     ESTABLISHED     18088
  TCP    192.168.0.107:59699    23.54.90.8:443         ESTABLISHED     2100
  TCP    192.168.0.107:59700    23.54.90.8:443         ESTABLISHED     2100
  TCP    192.168.0.107:59701    23.54.90.8:443         ESTABLISHED     2100
  TCP    192.168.0.107:59702    23.63.110.243:443      CLOSE_WAIT      2100
  TCP    192.168.0.107:59703    117.18.237.29:80       CLOSE_WAIT      2100
  TCP    192.168.0.107:59704    23.215.197.169:80      ESTABLISHED     2100
  TCP    192.168.0.107:59705    23.215.197.169:80      ESTABLISHED     2100
  TCP    192.168.0.107:59706    23.215.197.169:80      ESTABLISHED     2100
  TCP    192.168.0.107:59707    23.215.197.169:80      ESTABLISHED     2100
  TCP    192.168.0.107:59708    23.215.197.169:80      ESTABLISHED     2100
  TCP    192.168.0.107:59709    23.215.197.169:80      ESTABLISHED     2100
  TCP    192.168.0.107:60495    52.139.250.253:443     ESTABLISHED     14508
  TCP    192.168.0.107:60982    23.215.196.10:443      ESTABLISHED     2152
  TCP    192.168.0.107:61328    173.231.94.115:443     CLOSE_WAIT      2072
  TCP    192.168.0.107:61475    13.35.131.95:443       TIME_WAIT       0
```

TCP	192.168.0.107:63996	40.90.137.126:443	ESTABLISHED	560
TCP	192.168.0.107:63997	40.90.137.126:443	ESTABLISHED	560
TCP	192.168.0.107:63998	40.90.137.126:443	ESTABLISHED	560
TCP	192.168.0.107:63999	40.90.137.126:443	ESTABLISHED	560
TCP	192.168.0.107:64000	20.189.123.78:443	TIME_WAIT	0
TCP	192.168.0.107:64001	13.107.42.23:443	TIME_WAIT	0
TCP	192.168.0.107:64002	204.79.197.219:443	TIME_WAIT	0
TCP	192.168.0.107:64003	51.105.218.222:443	TIME_WAIT	0
TCP	192.168.0.107:64007	40.90.137.126:443	TIME_WAIT	0
TCP	192.168.0.107:64008	104.208.16.0:443	TIME_WAIT	0
TCP	192.168.0.107:64010	8.8.8.8:443	TIME_WAIT	0
TCP	192.168.0.107:64013	13.107.21.200:443	TIME_WAIT	0
TCP	192.168.0.107:64015	116.75.191.41:41482	TIME_WAIT	0
TCP	192.168.0.107:64019	204.79.197.219:443	TIME_WAIT	0
TCP	192.168.0.107:64020	52.139.250.253:443	TIME_WAIT	0
TCP	192.168.0.107:64021	51.105.218.222:443	TIME_WAIT	0
TCP	192.168.0.107:64026	27.34.20.94:47045	TIME_WAIT	0
TCP	192.168.0.107:64032	51.105.218.222:443	TIME_WAIT	0
TCP	192.168.0.107:64037	13.35.131.40:443	ESTABLISHED	18088
TCP	192.168.0.107:64040	52.184.217.37:443	ESTABLISHED	18260
TCP	192.168.0.107:64041	52.184.216.246:443	ESTABLISHED	18260
TCP	192.168.0.107:64051	104.18.21.226:80	ESTABLISHED	4824
TCP	192.168.0.107:64055	27.34.20.208:12469	ESTABLISHED	15092
TCP	192.168.0.107:64056	66.115.146.83:14181	SYN_SENT	15092
TCP	192.168.0.107:64057	192.168.68.101:7680	SYN_SENT	18260
TCP	192.168.0.107:64060	197.185.115.250:40513	SYN_SENT	15092
TCP	192.168.0.107:65018	52.202.62.248:443	ESTABLISHED	2072
TCP	192.168.0.107:65122	74.125.24.188:5228	ESTABLISHED	18088

c) Total number of tcp connection has reduced to 21 tcp connection from 37 tcp connection.

Established connections : 18.

Close wait : 3.

```
C:\Program Files\Wireshark>netstat -n -o -p tcp

Active Connections

  Proto  Local Address          Foreign Address        State           PID
  TCP    127.0.0.1:49671        127.0.0.1:49672        ESTABLISHED     6008
  TCP    127.0.0.1:49672        127.0.0.1:49671        ESTABLISHED     6008
  TCP    127.0.0.1:53167        127.0.0.1:53168        ESTABLISHED     6900
  TCP    127.0.0.1:53168        127.0.0.1:53167        ESTABLISHED     6900
  TCP    127.0.0.1:63284        127.0.0.1:63285        ESTABLISHED     2072
  TCP    127.0.0.1:63285        127.0.0.1:63284        ESTABLISHED     2072
  TCP    127.0.0.1:63287        127.0.0.1:63288        ESTABLISHED     2072
  TCP    127.0.0.1:63288        127.0.0.1:63287        ESTABLISHED     2072
  TCP    192.168.0.107:59699    23.54.90.8:443         ESTABLISHED     2100
  TCP    192.168.0.107:59700    23.54.90.8:443         ESTABLISHED     2100
  TCP    192.168.0.107:59701    23.54.90.8:443         ESTABLISHED     2100
  TCP    192.168.0.107:59702    23.63.110.243:443      CLOSE_WAIT      2100
  TCP    192.168.0.107:59703    117.18.237.29:80       CLOSE_WAIT      2100
  TCP    192.168.0.107:59704    23.215.197.169:80      ESTABLISHED     2100
  TCP    192.168.0.107:59705    23.215.197.169:80      ESTABLISHED     2100
  TCP    192.168.0.107:59706    23.215.197.169:80      ESTABLISHED     2100
  TCP    192.168.0.107:59707    23.215.197.169:80      ESTABLISHED     2100
  TCP    192.168.0.107:59708    23.215.197.169:80      ESTABLISHED     2100
  TCP    192.168.0.107:59709    23.215.197.169:80      ESTABLISHED     2100
  TCP    192.168.0.107:61819    52.11.29.25:443        CLOSE_WAIT      7204
  TCP    192.168.0.107:64427    23.215.196.10:443      ESTABLISHED     2152
```