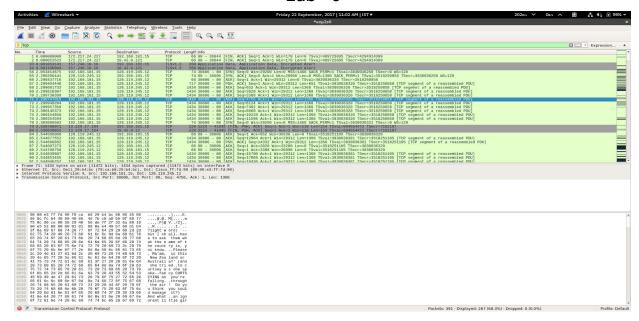
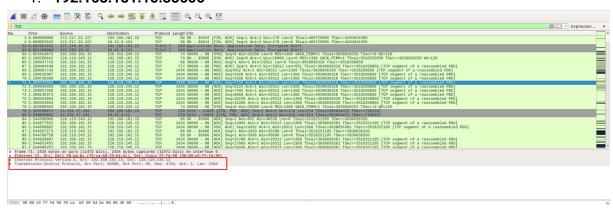
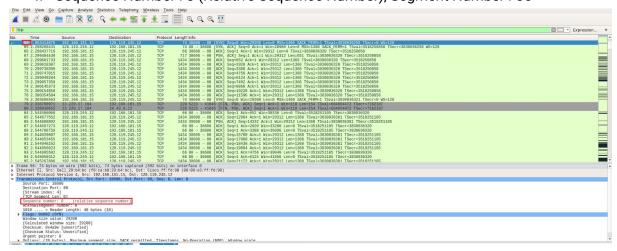
Lab - 6



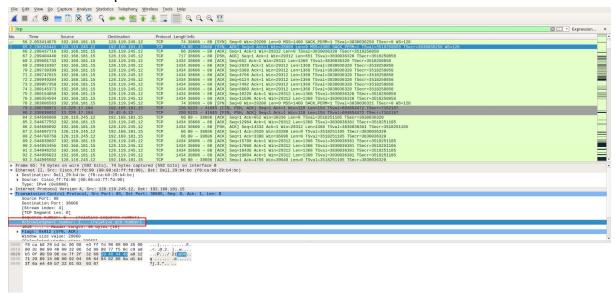
1. **192.168.181.15:38606**



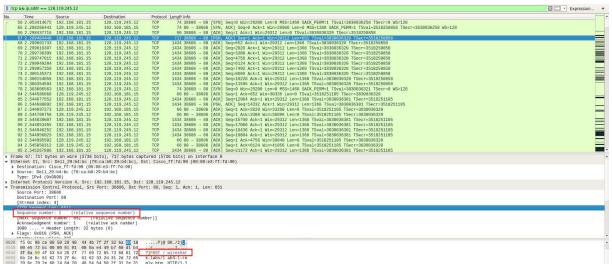
- 2. **128.119.245.12:80**
- 3. **192.168.181.15:38606**
- 4. Sequence Number: 0 (Relative Sequence Number), Segment Number: 56



5. Acknowledgement Number: 1. It is 1 greater than the SYN packet as SYN packet consumes 1 sequence number. Both the flags SYN and ACK are sent which sets it as SYNACK packet.



6. Sequence number of POST: 1 (Relative sequence number)



7. Following table shows various times

Segment Number	Sent	ACK Received	Difference
1	2.29940	2.54458	0.24518
2	2.29960	2.54469	0.24509
3	2.29961	2.54470	0.24509
4	2.29973	2.54499	0.24526
5	2.29974	2.54505	0.24531
6	2.29994	2.54533	0.24539

Estimated RTT = 0.875 * Estimated RTT + 0.125 * Sample RTT

RTT 1 = 0.24518 (Absolute for the first)

RTT 2 = 0.24517

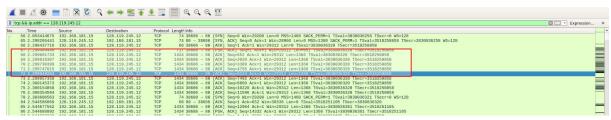
RTT 3 = 0.24516

RTT 4 = 0.24517

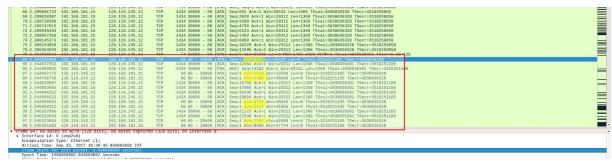
RTT 5 = 0.24519

RTT 6 = 0.24522

Sent:



Received:

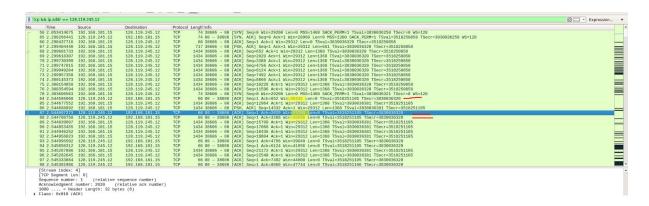


8. Length:

Segment Number	Sequence	Length	
1	1	651	
2	652	1368	
3	2020	1368	
4	3388	1368	
5	4756	1368	
6	6124	1368	

9. Receive window size at end of each acknowledge:

Segment Number	Window Size
1	30336
2	33280
3	36096



No throttle as size is increasing

- 10. 1 packet was fast retransmitted. It is checked using the following in filters:
 - a. tcp.analysis.retransmission
 - b. tcp.analysis.fast_retransmission

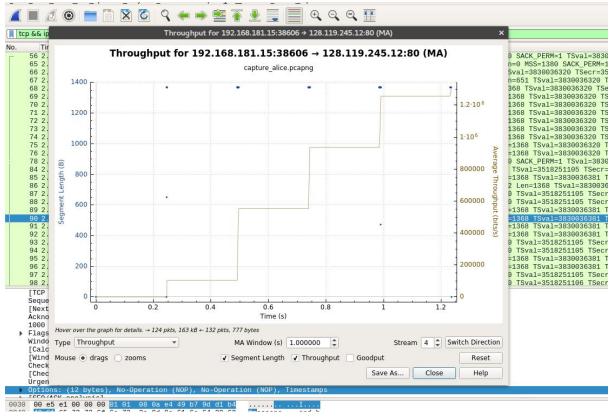


11. Following is the ACK trend

Sequence Number	ACK Number	Data	
1	652	651	
652	2020	1368	
2020	3388	1368	
3388	4756	1368	
4756	6124	1368	
6124	7492	1368	

There is **NO** instance where every other segment is **ACKed** together.

12. Following is the throughput graph obtained from Statistics -> TCP Stream Graphs -> Throughput



he average throughput for this TCP connection is computed as the ratio between the total amount data and the total transmission time. The total amount data transmitted can be computed by the difference between the sequence number of the first TCP segment (i.e. 1 byte for No. 67 segment) and the acknowledged sequence number of the last ACK (152973 bytes for No. 346 segment). Therefore, the total data are 152973 - 1 = 152972 bytes. The whole transmission time is the difference of the time instant of the first TCP segment (i.e., 2.29940 second for No 67 segment) and the time instant of the last ACK (i.e., 3.28933 second for No. 346 segment). Therefore, the total transmission time is 3.28933 - 2.29940 = 0.98993 seconds. Hence, the throughput for the TCP connection is computed as 152972/0.98993 = **150.906 KByte/sec**.

First:

No.	Time	Source	Destination	Protocol	Lengtr Info
Е	56 2.053414675	192.168.181.15	128.119.245.12	TCP	74 38606 - 80 [SYN] Seq=0 Win=29200 Len=0 MSS=1460 SACK_PERM=1 TSval=3830036258 TSecr=0 WS=128
	65 2.298266441	128.119.245.12	192.168.181.15	TCP	74 80 - 38606 [SYN, ACK] Seq=0 Ack=1 Win=28960 Len=0 MSS=1380 SACK_PERM=1 TSval=3518250858 TSecr=3830036258 WS=128
	66 2 200437746	102,169,101,15	120.110.215.12	TCP	86 38606 80 [ACK] Seg-1 Ack-1 Win-20312 Len-0 T6vel-3030036320 T6cor-3510250050
	67 2.299404440	192.168.181.15	128.119.245.12		717 38606 - 80 [PSH, ACK] Seq=1 Ack=1 Win=29312 Len=651 TSval=3830036320 TSecr=3518250858
	60 2.299601700	192.160.101.15	120:119:245:12	TOP	1494 98686 + 80 [A6K] Seq-652 Ack-1 Win-29912 Len-1960 T5val-9808086920 T6cer-9510250850
	69 2.299618307	192.168.181.15	128.119.245.12	TCP	1434 38696 → 80 [ACK] Seq=2020 Ack=1 Win=29312 Len=1368 TSval=3830036320 TSecr=3518250858
	70 2.299730399	192.168.181.15	128.119.245.12	TCP	1434 38606 → 80 ACK Seq=3388 Ack=1 Win=29312 Len=1368 TSval=3830036320 TSecr=3518250858
	71 2.299747015	192.168.181.15	128.119.245.12	TCP	1434 38606 → 80 ACK Seq=4756 Ack=1 Win=29312 Len=1368 TSval=3830036320 TSecr=3518250858
	72 2.299949284	192.168.181.15	128.119.245.12	TCP	1434 38606 → 80 [ACK] Seq=6124 Ack=1 Win=29312 Len=1368 TSval=3830936320 TSecr=3518250858
	73 2.299957358	192.168.181.15	128.119.245.12	TCP	1434 38606 → 80 [ACK] Seq=7492 Ack=1 Win=29312 Len=1368 TSval=3830936320 TSecr=3518250858
	74 2.300145373	192.168.181.15	128.119.245.12	TCP	1434 38606 80 [ACK] Seq=8860 Ack=1 Win=29312 Len=1368 TSval=3830936320 TSecr=3518250858
	75 2.300154858	192.168.181.15	128.119.245.12	TCP	1434 38606 - 80 [ACK] Seq=10228 Ack=1 Win=29312 Len=1368 TSval=3830036320 TSecr=3518250858
	76 2.309354594	192.168.181.15	128.119.245.12	TCP	1434 38606 → 80 ACK Seq=11596 Ack=1 Win=29312 Len=1368 TSval=3830936320 TSecr=3518250858
	78 2.303606563	192.168.181.15	128.119.245.12	TCP	74 38608 - 80 [SYN] Seq=0 Win=29200 Len=0 MSS=1460 SACK_PERM=1 TSval=3830036321 TSecr=0 WS=128
	84 2.544586068	128.119.245.12	192.168.181.15	TCP	66 80 - 38606 [ACK] Seq=1 Ack=652 Win=30336 Len=0 TSval=3518251105 TSecr=3830036320
	85 2.544677552	192.168.181.15	128.119.245.12	TCP	1434 38606 → 80 [ACK] Seq=12964 Ack=1 Win=29312 Len=1368 TSval=3830036381 TSecr=3518251105
	86 2.544688892	192.168.181.15	128.119.245.12	TCP	1434 38606 → 80 [PSH, ACK] Seg=14332 Ack=1 Win=29312 Len=1368 TSval=3839036381 TSecr=3518251105
	87 2.544697273	128.119.245.12	192.168.181.15	TCP	66 80 - 38606 [ACK] Seq=1 Ack=2020 Win=33280 Len=0 TSval=3518251105 TSecr=3830036320
	88 2.544708758	128.119.245.12	192.168.181.15	TCP	66 80 - 38606 ACK Seq=1 Ack=3388 Win=36096 Len=0 TSval=3518251105 TSecr=3830036320
	89 2.544839607	192.168.181.15	128.119.245.12	TCP	1434 38696 → 80 [ACK] Seq=15700 Ack=1 Win=29312 Len=1368 TSval=3830936381 TSecr=3518251105
	90 2.544853455	192.168.181.15	128.119.245.12	TCP	1434 38606 - 80 [ACK] Seq=17068 Ack=1 Win=29312 Len=1368 TSval=3830036381 TSecr=3518251105
	91 2.544946252	192.168.181.15	128.119.245.12	TCP	1434 38606 → 80 ACK Seq=18436 Ack=1 Win=29312 Len=1368 TSval=3830936381 TSecr=3518251105
	92 2.544956023	192.168.181.15	128.119.245.12	TCP	1434 38606 - 80 ACK Seq=19804 Ack=1 Win=29312 Len=1368 TSval=3830036381 TSecr=3518251105

Last:

