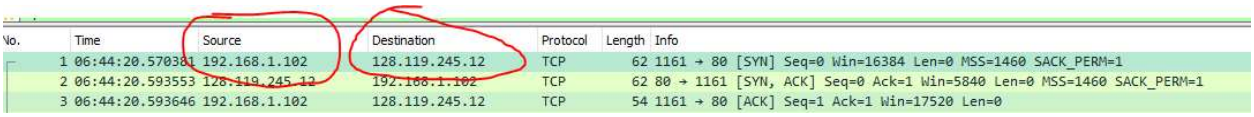
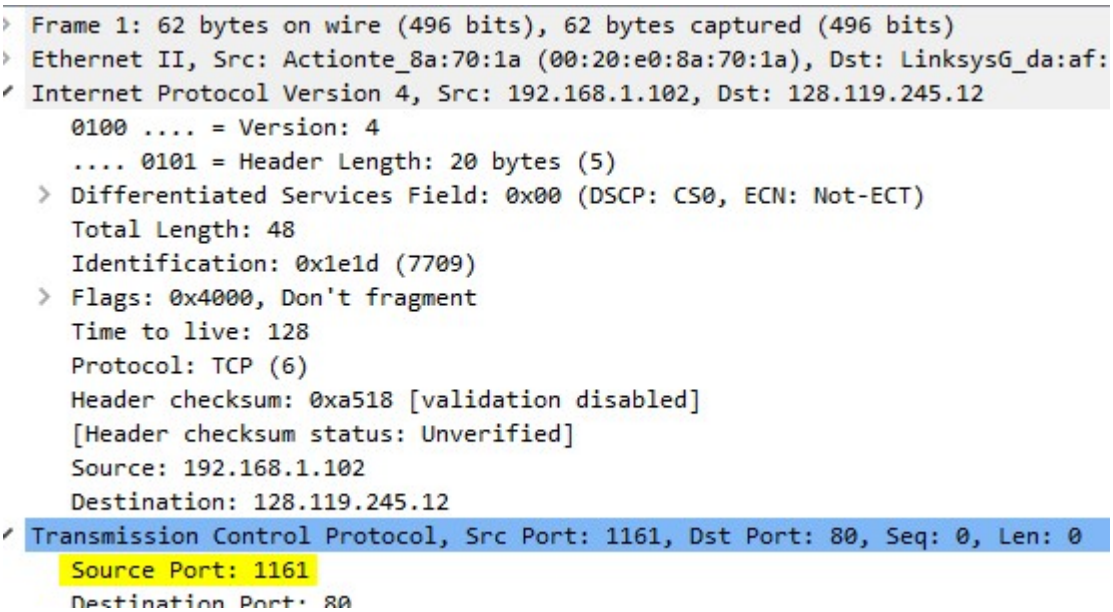
Mario Franco-Munoz
Lab 2
CS 372:400
Due Date: 7/29/2018

1. (client/source) IP address: 192.168.1.102; Port: 1161

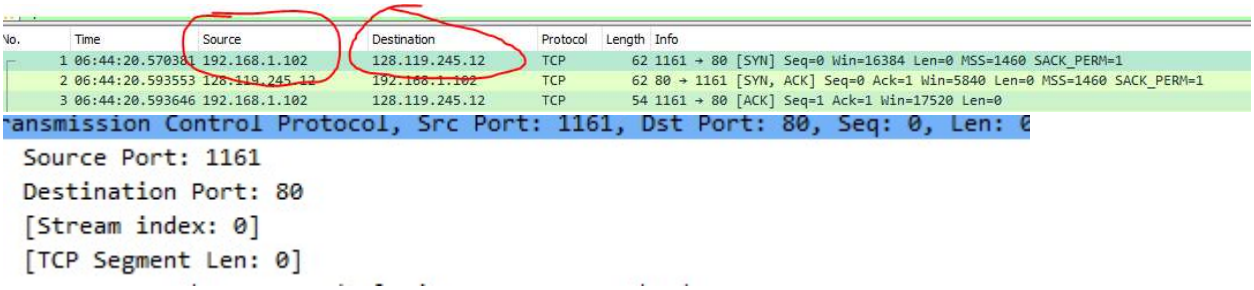


No.	Time	Source	Destination	Protocol	Length	Info
1	06:44:20.570381	192.168.1.102	128.119.245.12	TCP	62	1161 → 80 [SYN] Seq=0 Win=16384 Len=0 MSS=1460 SACK_PERM=1
2	06:44:20.593553	128.119.245.12	192.168.1.102	TCP	62	80 → 1161 [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 SACK_PERM=1
3	06:44:20.593646	192.168.1.102	128.119.245.12	TCP	54	1161 → 80 [ACK] Seq=1 Ack=1 Win=17520 Len=0



```
Frame 1: 62 bytes on wire (496 bits), 62 bytes captured (496 bits)
Ethernet II, Src: Actionte_8a:70:1a (00:20:e0:8a:70:1a), Dst: LinksysG_da:af:
Internet Protocol Version 4, Src: 192.168.1.102, Dst: 128.119.245.12
    0100 .... = Version: 4
    .... 0101 = Header Length: 20 bytes (5)
  > Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
    Total Length: 48
    Identification: 0x1e1d (7709)
  > Flags: 0x4000, Don't fragment
    Time to live: 128
    Protocol: TCP (6)
    Header checksum: 0xa518 [validation disabled]
    [Header checksum status: Unverified]
    Source: 192.168.1.102
    Destination: 128.119.245.12
Transmission Control Protocol, Src Port: 1161, Dst Port: 80, Seq: 0, Len: 0
    Source Port: 1161
    Destination Port: 80
```

2. gaia.cs.umass.edu IP address: 128.119.245.12
Sending and receiving TCP segments for this connection on the HTTP port 80



No.	Time	Source	Destination	Protocol	Length	Info
1	06:44:20.570381	192.168.1.102	128.119.245.12	TCP	62	1161 → 80 [SYN] Seq=0 Win=16384 Len=0 MSS=1460 SACK_PERM=1
2	06:44:20.593553	128.119.245.12	192.168.1.102	TCP	62	80 → 1161 [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 SACK_PERM=1
3	06:44:20.593646	192.168.1.102	128.119.245.12	TCP	54	1161 → 80 [ACK] Seq=1 Ack=1 Win=17520 Len=0

```
ransmission Control Protocol, Src Port: 1161, Dst Port: 80, Seq: 0, Len: 0
  Source Port: 1161
  Destination Port: 80
  [Stream index: 0]
  [TCP Segment Len: 0]
```

3. My IP address and TCP port number used by my client computer (source) for file transfer:
IP address: 192.168.0.5 Source Port: 56006

```
> Frame 117: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interfa
> Ethernet II, Src: Micro-St_0a:b1:6c (4c:cc:6a:0a:b1:6c), Dst: Actionte_54:6f:26
v Internet Protocol Version 4, Src: 192.168.0.5, Dst: 128.119.245.12
    0100 .... = Version: 4
    .... 0101 = Header Length: 20 bytes (5)
  > Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
    Total Length: 52
    Identification: 0x383a (14394)
  > Flags: 0x4000, Don't fragment
    Time to live: 128
    Protocol: TCP (6)
    Header checksum: 0x8c58 [validation disabled]
    [Header checksum status: Unverified]
    Source: 192.168.0.5
    Destination: 128.119.245.12
v Transmission Control Protocol, Src Port: 56006, Dst Port: 80, Seq: 0, Len: 0
    Source Port: 56006
```

4. Sequence number of the TCP SYN segment that is used to initiate the TCP connection: 0

The segment that identifies the segment as a SYN segment: Syn Flag is set as part of Flags.

```
Transmission Control Protocol, Src Port: 56006, Dst Port: 80, Seq: 0, Len: 0
  Source Port: 56006
  Destination Port: 80
  [Stream index: 14]
  [TCP Segment Len: 0]
  Sequence number: 0    (relative sequence number)
  [Next sequence number: 0    (relative sequence number)]
  Acknowledgment number: 0
  1000 .... = Header Length: 32 bytes (8)
v Flags: 0x002 (SYN)
    000. .... .... = Reserved: Not set
    ...0 .... .... = Nonce: Not set
    .... 0... .... = Congestion Window Reduced (CWR): Not set
    .... .0.. .... = ECN-Echo: Not set
    .... ..0. .... = Urgent: Not set
    .... ...0 .... = Acknowledgment: Not set
    .... .... 0... = Push: Not set
    .... .... .0.. = Reset: Not set
  > .... .... ..1. = Syn: Set
    .... .... ...0 = Fin: Not set
    [TCP Flags: ··········S·]
  Window size value: 64240
```

5. Sequence number of the SYN ACK segment sent by gaia.cs.umass.edu: 0
Value of acknowledgement field in the SYNACK segment: 1
gaia.cs.umass.edu determined this value by adding 1 to the sequence number (since this +1 represents the next bit)
Flags identify this as a SYNACK segment. Both the SYN and the ACK flags are set.

```
Transmission Control Protocol, Src Port: 80, Dst Port: 56006, Seq: 0, Ack: 1, Len: 0
    Source Port: 80
    Destination Port: 56006
    [Stream index: 14]
    [TCP Segment Len: 0]
    Sequence number: 0    (relative sequence number)
    [Next sequence number: 0    (relative sequence number)]
    Acknowledgment number: 1    (relative ack number)
    1000 .... = Header Length: 32 bytes (8)
  ▾ Flags: 0x012 (SYN, ACK)
        000. .... .... = Reserved: Not set
        ...0 .... .... = Nonce: Not set
        .... 0... .... = Congestion Window Reduced (CWR): Not set
        .... .0.. .... = ECN-Echo: Not set
        .... ..0. .... = Urgent: Not set
        .... ...1 .... = Acknowledgment: Set
        .... .... 0... = Push: Not set
        .... .... .0.. = Reset: Not set
      ▸ .... .... ..1. = Syn: Set
        .... .... ...0 = Fin: Not set
        [TCP Flags: ·····A··S·]
    Window size value: 29200
```

6. Sequence number of the TCP segment containing the HTTP POST command: 1

```
[TCP Segment Len: 677]
Sequence number: 1    (relative sequence number)
[Next sequence number: 678    (relative sequence number)]
Acknowledgment number: 1    (relative ack number)
0101 .... = Header Length: 20 bytes (5)
```

Full SS with post located:

```
[TCP Segment Len: 677]
Sequence number: 1    (relative sequence number)
[Next sequence number: 678    (relative sequence number)]
Acknowledgment number: 1    (relative ack number)
0101 .... = Header Length: 20 bytes (5)
Flags: 0x018 (PSH, ACK)
Window size value: 260
[Calculated window size: 66560]
[Window size scaling factor: 256]
```

```
9c 1e 95 54 6f 20 4c cc  6a 0a b1 6c 08 00 45 00   ···To L· j··l··E·
02 cd 38 3c 40 00 80 06  89 bd c0 a8 00 05 80 77   ··8<@··· ·······w
f5 0c da c6 00 50 24 c7  78 9a a9 ee 8d d7 50 18   ·····P$· x·····P·
01 04 82 be 00 00 50 4f  53 54 20 2f 77 69 72 65   ·····PO ST /wire
73 68 61 72 6b 2d 6c 61  62 73 2f 6c 61 62 33 2d   shark-la bs/lab3-
31 2d 72 65 70 6c 79 2e  68 74 6d 20 48 54 54 50   1-reply. htm HTTP
2f 31 2e 31 0d 0a 48 6f  73 74 3a 20 67 61 69 61   /1.1··Ho st: gaia
2e 63 73 2e 75 6d 61 73  73 2e 65 64 75 0d 0a 43   .cs.umas s.edu··C
6f 6e 6e 65 63 74 69 6f  6e 3a 20 6b 65 65 70 2d   onnectio n: keep-
61 6c 69 76 65 0d 0a 43  6f 6e 74 65 6e 74 2d 4c   alive··C ontent-L
65 6e 67 74 68 3a 20 31  35 32 33 32 31 0d 0a 43   ength: 1 52321··C
```

7.

Note: as per lab instructions I had to switch to the trace file provided by the book authors since there was an inconsistency between my Ethernet driver and the Wireshark software.

Sequence numbers of the first six segments: 1, 566, 2026, 3486, 4946, 6406

Segment No.	1	2*	3	4	5	6
Time Sent:	06:44:20.596858	20.612118	20.624407	20.625071	20.647786	20.648538
ACK segment Received:	06:44:20.624318	20.647675	20.694466	20.739499	20.787680	20.838183
Dif. Between TCP send and ACK rec.:	0.02746	0.035557	0.070059	0.114428	0.139894	0.189645
RTT value:	0.02746	0.035557	0.070059	0.114428	0.139894	0.189645
EstimatedRTT:	0.02746	0.028472	0.033670	0.043765	0.055781	0.072539

*The hour and minute have been omitted to save space. Since these segments were all sent within the same minute.

Estimated RTT values were calculated using formula given in the book with constant value of .125.

EstmatedRTT = 0.875*EstimatedRTT + 0.125*SampleRTT

Segment1:

```
4 06:44:20.596858 192.168.1.102   128.119.245.12    TCP   619 1161 → 80 [PSH, ACK] Seq=1 Ack=1 Win=17520 Len=565
6 06:44:20.624318 128.119.245.12  192.168.1.102     TCP    60 80 → 1161 [ACK] Seq=1 Ack=566 Win=6780 Len=0
```

EstimatedRTT = 0.02746 (as per instructions)

Segment2:

```
5 06:44:20.612118 192.168.1.102   128.119.245.12    TCP   1514 1161 → 80 [PSH, ACK] Seq=566 Ack=1 Win=17520 Len=1460
9 06:44:20.647675 128.119.245.12  192.168.1.102     TCP    60 80 → 1161 [ACK] Seq=1 Ack=2026 Win=8760 Len=0
```

EstimatedRTT = .02746*0.875 + 0.125*.035557
= 0.028472

Segment3:

```
7 06:44:20.624407 192.168.1.102   128.119.245.12    TCP   1514 1161 → 80 [ACK] Seq=2026 Ack=1 Win=17520 Len=1460
12 06:44:20.694466 128.119.245.12  192.168.1.102    TCP    60 80 → 1161 [ACK] Seq=1 Ack=3486 Win=11680 Len=0
```

EstimatedRTT = .028472*0.875 + .070059*0.125
= 0.033670

Segment4:

```
8 06:44:20.625071 192.168.1.102   128.119.245.12    TCP   1514 1161 → 80 [ACK] Seq=3486 Ack=1 Win=17520 Len=1460
14 06:44:20.739499 128.119.245.12  192.168.1.102    TCP    60 80 → 1161 [ACK] Seq=1 Ack=4946 Win=14600 Len=0
```

EstimatedRTT = 0.033670 * 0.875 + 0.114428*0.125
= 0.043765

Segment5:

```
10 06:44:20.647786 192.168.1.102   128.119.245.12    TCP   1514 1161 → 80 [ACK] Seq=4946 Ack=1 Win=17520 Len=1460
15 06:44:20.787680 128.119.245.12  192.168.1.102    TCP    60 80 → 1161 [ACK] Seq=1 Ack=6406 Win=17520 Len=0
```

EstimatedRTT = 0.043765* 0.875 + 0.139894 * 0.125
= 0.055781

Segment6:

```
11 06:44:20.648538 192.168.1.102      128.119.245.12       TCP      1514 1161 → 80 [ACK] Seq=6406 Ack=1 Win=17520 Len=1460 [

16 06:44:20.838183 128.119.245.12      192.168.1.102        TCP        60 80 → 1161 [ACK] Seq=1 Ack=7866 Win=20440 Len=0
```

EstimatedRTT = 0.055781*0.875 + 0.189645 * 0.125

= 0.072539

Complete Screen Shot:

```
 4 06:44:20.596858 192.168.1.102      128.119.245.12       TCP       619 1161 → 80 [PSH, ACK] Seq=1 Ack=1 Win=17520 Len=565
 5 06:44:20.612118 192.168.1.102      128.119.245.12       TCP      1514 1161 → 80 [PSH, ACK] Seq=566 Ack=1 Win=17520 Len=14
 6 06:44:20.624318 128.119.245.12     192.168.1.102        TCP        60 80 → 1161 [ACK] Seq=1 Ack=566 Win=6780 Len=0
 7 06:44:20.624407 192.168.1.102      128.119.245.12       TCP      1514 1161 → 80 [ACK] Seq=2026 Ack=1 Win=17520 Len=1460
 8 06:44:20.625071 192.168.1.102      128.119.245.12       TCP      1514 1161 → 80 [ACK] Seq=3486 Ack=1 Win=17520 Len=1460
 9 06:44:20.647675 128.119.245.12     192.168.1.102        TCP        60 80 → 1161 [ACK] Seq=1 Ack=2026 Win=8760 Len=0
10 06:44:20.647786 192.168.1.102      128.119.245.12       TCP      1514 1161 → 80 [ACK] Seq=4946 Ack=1 Win=17520 Len=1460
11 06:44:20.648538 192.168.1.102      128.119.245.12       TCP      1514 1161 → 80 [ACK] Seq=6406 Ack=1 Win=17520 Len=1460
12 06:44:20.694466 128.119.245.12     192.168.1.102        TCP        60 80 → 1161 [ACK] Seq=1 Ack=3486 Win=11680 Len=0
13 06:44:20.694566 192.168.1.102      128.119.245.12       TCP      1201 1161 → 80 [PSH, ACK] Seq=7866 Ack=1 Win=17520 Len=1
14 06:44:20.739499 128.119.245.12     192.168.1.102        TCP        60 80 → 1161 [ACK] Seq=1 Ack=4946 Win=14600 Len=0
15 06:44:20.787680 128.119.245.12     192.168.1.102        TCP        60 80 → 1161 [ACK] Seq=1 Ack=6406 Win=17520 Len=0
16 06:44:20.838183 128.119.245.12     192.168.1.102        TCP        60 80 → 1161 [ACK] Seq=1 Ack=7866 Win=20440 Len=0
17 06:44:20.875188 128.119.245.12     192.168.1.102        TCP        60 80 → 1161 [ACK] Seq=1 Ack=9013 Win=23360 Len=0
```

8. Length of each of the first six TCP segments:

Segment 1: 565

```
Transmission Control Protocol, Src Port: 1161, Dst Port: 80, Seq: 1, Ack: 1, Len: 565
   Source Port: 1161
   Destination Port: 80
   [Stream index: 0]
   [TCP Segment Len: 565]
   Sequence number: 1    (relative sequence number)
   [Next sequence number: 566    (relative sequence number)]
```

Segment 2: 1460

```
Transmission Control Protocol, Src Port: 1161, Dst Port: 80, Seq: 566, Ack: 1, Len: 1460
   Source Port: 1161
   Destination Port: 80
   [Stream index: 0]
   [TCP Segment Len: 1460]
   Sequence number: 566    (relative sequence number)
   [Next sequence number: 2026    (relative sequence number)]
   Acknowledgment number: 1    (relative ack number)
   0101 .... = Header Length: 20 bytes (5)
```

Segment 3: 1460

```
Transmission Control Protocol, Src Port: 1161, Dst Port: 80, Seq: 2026, Ack: 1, Len: 1460
   Source Port: 1161
   Destination Port: 80
   [Stream index: 0]
   [TCP Segment Len: 1460]
   Sequence number: 2026    (relative sequence number)
   [Next sequence number: 3486    (relative sequence number)]
   Acknowledgment number: 1    (relative ack number)
   0101 .... = Header Length: 20 bytes (5)
```

Segment 4: 1460

```
Transmission Control Protocol, Src Port: 1161, Dst Port: 80, Seq: 3486, Ack: 1, Len: 1460
    Source Port: 1161
    Destination Port: 80
    [Stream index: 0]
    [TCP Segment Len: 1460]
    Sequence number: 3486    (relative sequence number)
    [Next sequence number: 4946    (relative sequence number)]
    Acknowledgment number: 1    (relative ack number)
    0101 .... = Header Length: 20 bytes (5)
```

Segment 5: 1460

```
Transmission Control Protocol, Src Port: 1161, Dst Port: 80, Seq: 4946, Ack: 1, Len: 1460
    Source Port: 1161
    Destination Port: 80
    [Stream index: 0]
    [TCP Segment Len: 1460]
    Sequence number: 4946    (relative sequence number)
    [Next sequence number: 6406    (relative sequence number)]
    Acknowledgment number: 1    (relative ack number)
    0101 .... = Header Length: 20 bytes (5)
```

Segment 6: 1460

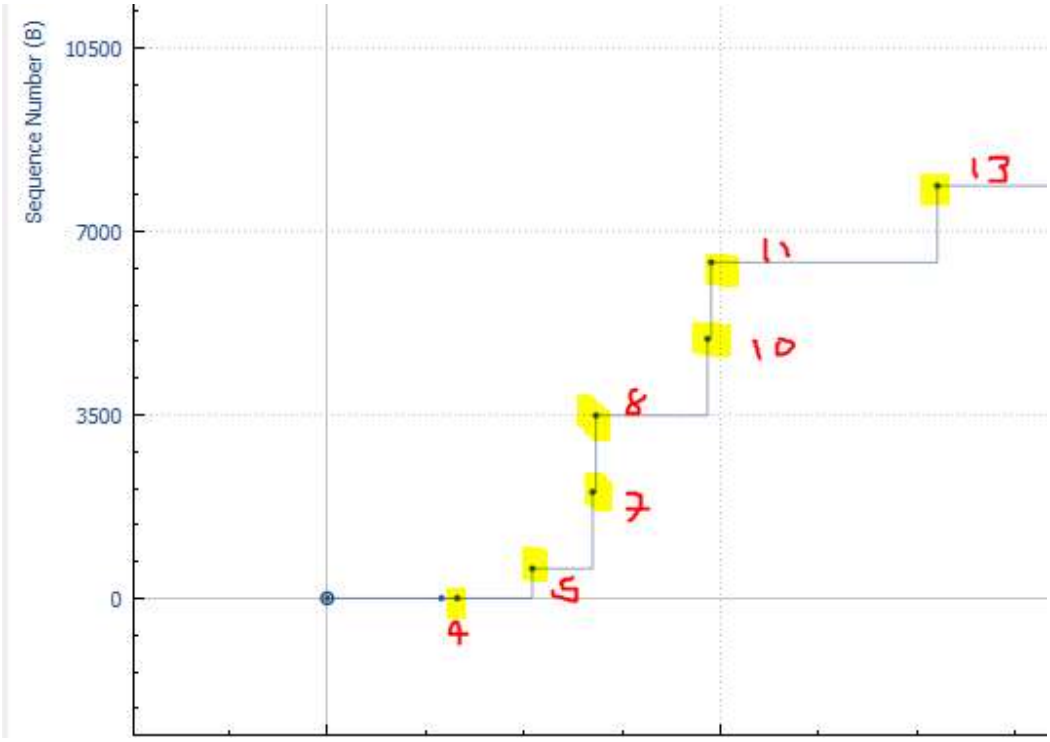
```
Transmission Control Protocol, Src Port: 1161, Dst Port: 80, Seq: 6406, Ack: 1, Len: 1460
    Source Port: 1161
    Destination Port: 80
    [Stream index: 0]
    [TCP Segment Len: 1460]
    Sequence number: 6406    (relative sequence number)
    [Next sequence number: 7866    (relative sequence number)]
    Acknowledgment number: 1    (relative ack number)
    0101 .... = Header Length: 20 bytes (5)
```

9. Minimum amount of available buffer space advertised at the received for entire trace: 6780
This does not throttle the sender since the sender's TCP segment lengths are well below this number.

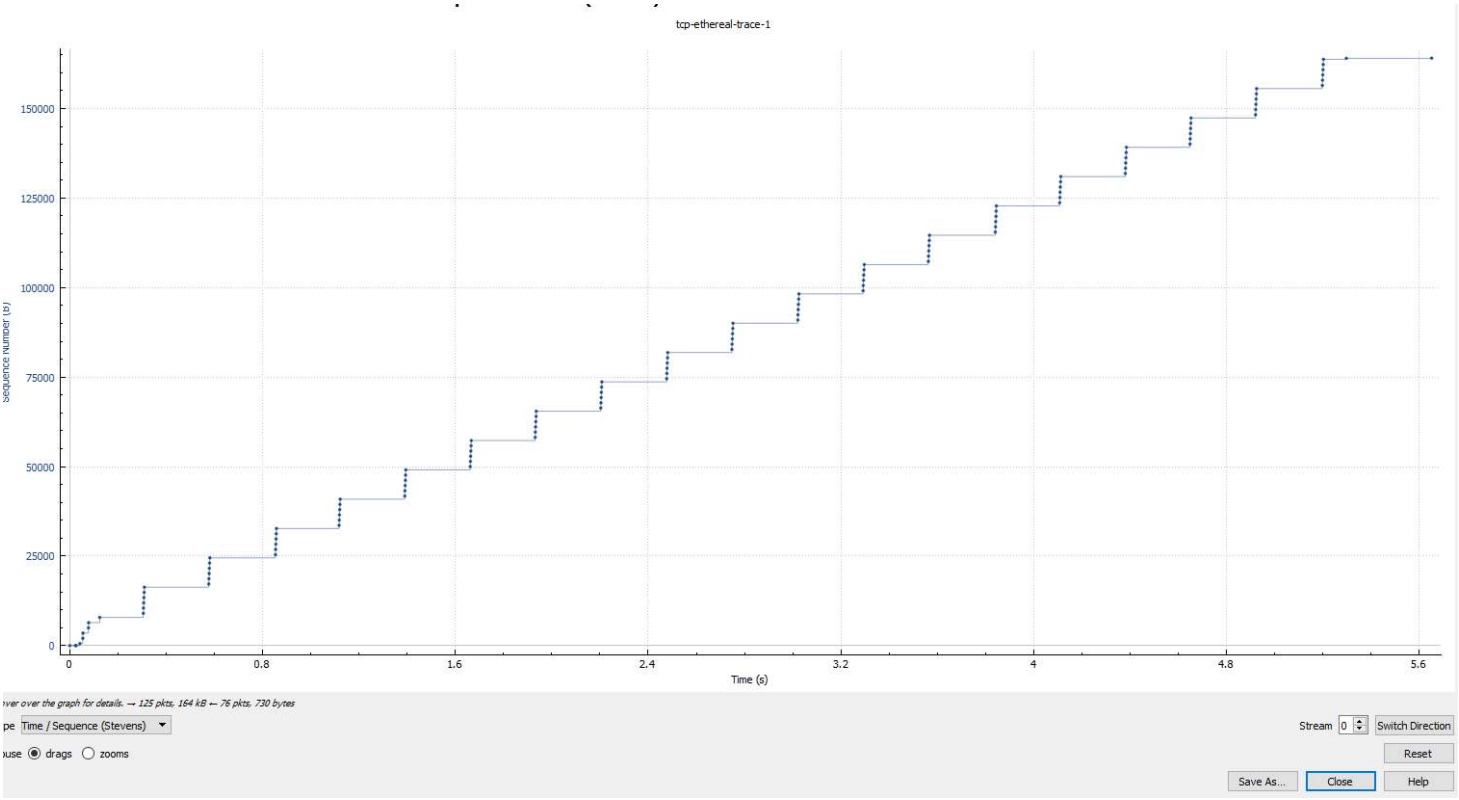
```
    3 06:44:20.593646 192.168.1.102       128.119.245.12        TCP        54 1161 → 80 [ACK] Seq=1 Ack=1 Win=1
    4 06:44:20.596858 192.168.1.102       128.119.245.12        TCP       619 1161 → 80 [PSH, ACK] Seq=1 Ack=1
    5 06:44:20.612118 192.168.1.102       128.119.245.12        TCP      1514 1161 → 80 [PSH, ACK] Seq=566 Ack=
    6 06:44:20.624318 128.119.245.12      192.168.1.102         TCP        60 80 → 1161 [ACK] Seq=1 Ack=566 Wir
    7 06:44:20.624407 192.168.1.102       128.119.245.12        TCP      1514 1161 → 80 [ACK] Seq=2026 Ack=1 Wi
    8 06:44:20.625071 192.168.1.102       128.119.245.12        TCP      1514 1161 → 80 [ACK] Seq=3486 Ack=1 Wi
    9 06:44:20.647675 128.119.245.12      192.168.1.102         TCP        60 80 → 1161 [ACK] Seq=1 Ack=2026 Wi
Frame 6: 60 bytes on wire (480 bits), 60 bytes captured (480 bits)
Ethernet II, Src: LinksysG_da:af:73 (00:06:25:da:af:73), Dst: Actionte_8a:70:1a (00:20:e0:8a:70:1a)
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.1.102
Transmission Control Protocol, Src Port: 80, Dst Port: 1161, Seq: 1, Ack: 566, Len: 0
    Source Port: 80
    Destination Port: 1161
    [Stream index: 0]
    [TCP Segment Len: 0]
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 1    (relative sequence number)]
    Acknowledgment number: 566    (relative ack number)
    0101 .... = Header Length: 20 bytes (5)
  > Flags: 0x010 (ACK)
    Window size value: 6780
    [Calculated window size: 6780]
```

10. There are no retransmitted segments in the trace file, and this can be seen by the fact that sequence always increase.

Snapshot of the 6 packets being analyzed above:



Snapshot of entire trace:



11.

The receiver typically acknowledges ~1460 bytes

2026 – 566 = 1460 **4946 – 3486 = 1460** **7866 – 6406 = 1460**

3486 – 2026 = 1440 **6406 – 4946 = 1460** **etc…**

Based on the constant increase in ACK numbers, there are no cases in which the receiver ACK'd every other rec. seg.

```
 4 06:44:20.596858 192.168.1.102 128.119.245.12 TCP 619 1161 → 80 [PSH, ACK] Seq=1 Ack=1 Win=17520
 5 06:44:20.612118 192.168.1.102 128.119.245.12 TCP 1514 1161 → 80 [PSH, ACK] Seq=566 Ack=1 Win=175
 6 06:44:20.624318 128.119.245.12 192.168.1.102 TCP 60 80 → 1161 [ACK] Seq=1 Ack=566 Win=6780 Len
 7 06:44:20.624407 192.168.1.102 128.119.245.12 TCP 1514 1161 → 80 [ACK] Seq=2026 Ack=1 Win=17520 L
 8 06:44:20.625071 192.168.1.102 128.119.245.12 TCP 1514 1161 → 80 [ACK] Seq=3486 Ack=1 Win=17520 L
 9 06:44:20.647675 128.119.245.12 192.168.1.102 TCP 60 80 → 1161 [ACK] Seq=1 Ack=2026 Win=8760 Le
10 06:44:20.647786 192.168.1.102 128.119.245.12 TCP 1514 1161 → 80 [ACK] Seq=4946 Ack=1 Win=17520 L
11 06:44:20.648538 192.168.1.102 128.119.245.12 TCP 1514 1161 → 80 [ACK] Seq=6406 Ack=1 Win=17520 L
12 06:44:20.694466 128.119.245.12 192.168.1.102 TCP 60 80 → 1161 [ACK] Seq=1 Ack=3486 Win=11680 L
13 06:44:20.694566 192.168.1.102 128.119.245.12 TCP 1201 1161 → 80 [PSH, ACK] Seq=7866 Ack=1 Win=17
14 06:44:20.739499 128.119.245.12 192.168.1.102 TCP 60 80 → 1161 [ACK] Seq=1 Ack=4946 Win=14600 L
15 06:44:20.787680 128.119.245.12 192.168.1.102 TCP 60 80 → 1161 [ACK] Seq=1 Ack=6406 Win=17520 L
16 06:44:20.838183 128.119.245.12 192.168.1.102 TCP 60 80 → 1161 [ACK] Seq=1 Ack=7866 Win=20440 L
17 06:44:20.875188 128.119.245.12 192.168.1.102 TCP 60 80 → 1161 [ACK] Seq=1 Ack=9013 Win=23360 L
18 06:44:20.875421 192.168.1.102 128.119.245.12 TCP 1514 1161 → 80 [ACK] Seq=9013 Ack=1 Win=17520 L
19 06:44:20.876194 192.168.1.102 128.119.245.12 TCP 1514 1161 → 80 [ACK] Seq=10473 Ack=1 Win=17520
20 06:44:20.877073 192.168.1.102 128.119.245.12 TCP 1514 1161 → 80 [ACK] Seq=11933 Ack=1 Win=17520
21 06:44:20.877952 192.168.1.102 128.119.245.12 TCP 1514 1161 → 80 [ACK] Seq=13393 Ack=1 Win=17520
22 06:44:20.879080 192.168.1.102 128.119.245.12 TCP 1514 1161 → 80 [ACK] Seq=14853 Ack=1 Win=17520
23 06:44:20.879934 192.168.1.102 128.119.245.12 TCP 946 1161 → 80 [PSH, ACK] Seq=16313 Ack=1 Win=1
24 06:44:20.926818 128.119.245.12 192.168.1.102 TCP 60 80 → 1161 [ACK] Seq=1 Ack=10473 Win=26280
25 06:44:20.970545 128.119.245.12 192.168.1.102 TCP 60 80 → 1161 [ACK] Seq=1 Ack=11933 Win=29200
26 06:44:21.018994 128.119.245.12 192.168.1.102 TCP 60 80 → 1161 [ACK] Seq=1 Ack=13393 Win=32120
27 06:44:21.070410 128.119.245.12 192.168.1.102 TCP 60 80 → 1161 [ACK] Seq=1 Ack=14853 Win=35040
28 06:44:21.115433 128.119.245.12 192.168.1.102 TCP 60 80 → 1161 [ACK] Seq=1 Ack=16313 Win=37960
29 06:44:21.146798 128.119.245.12 192.168.1.102 TCP 60 80 → 1161 [ACK] Seq=1 Ack=17205 Win=37960
```

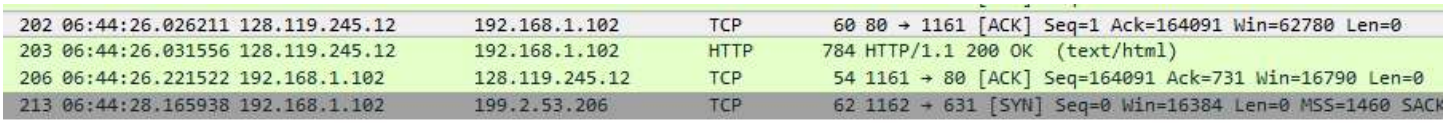
12.

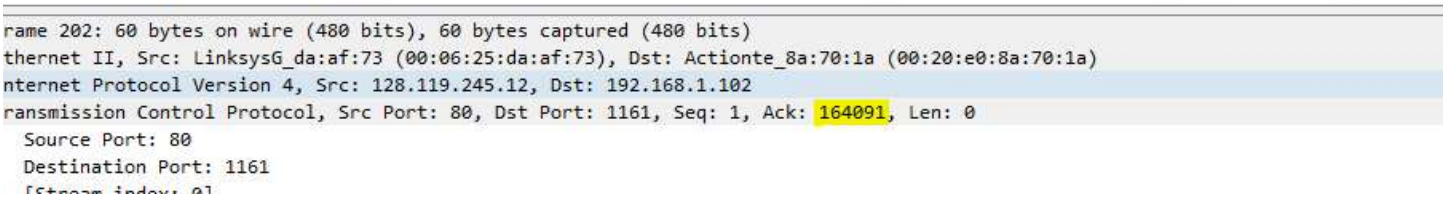
Total Bits Sent / Duration of Transmission = Throughput

Last Acknowledgement byte number: 164091

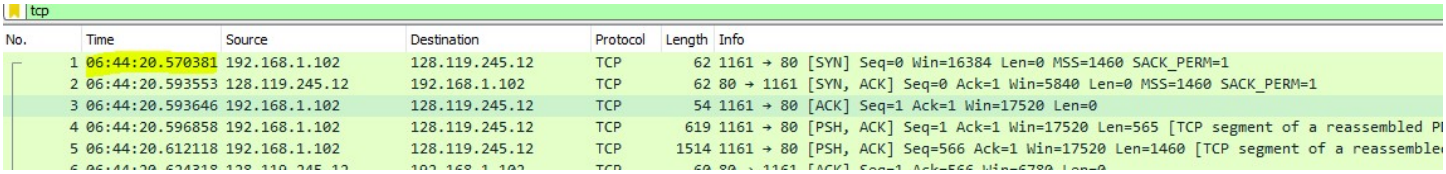
Throughput (including initial 3-way handshake and TCP connection close as part of transmission time):

164091*8/ (26.221522 – 20.570381) = 232294 bps
or 29037 Bytes per Second

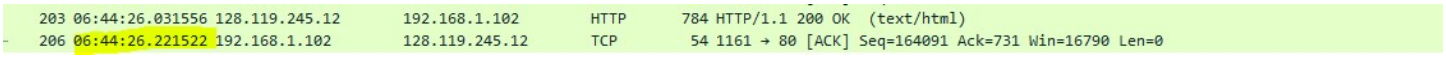




Start:

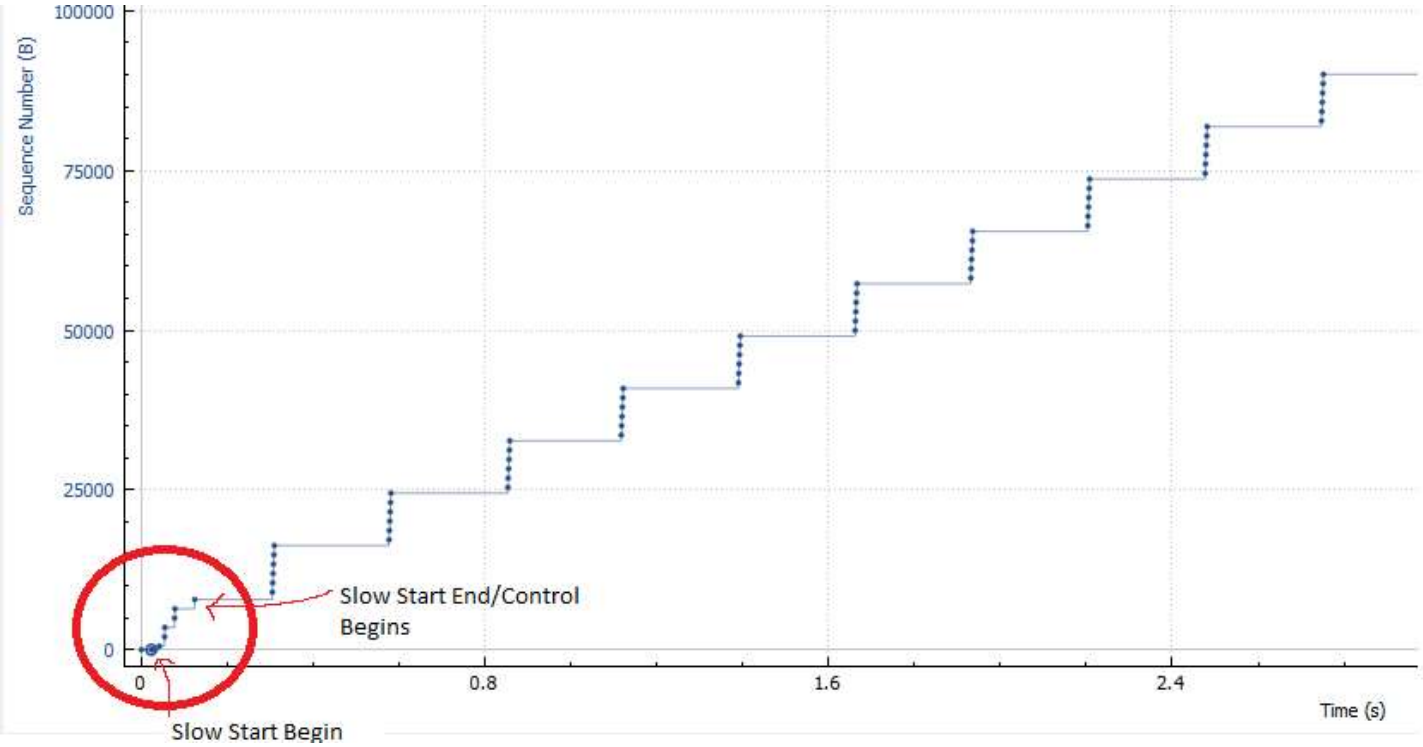


End:



Part 4: TCP congestion control in action

13. This behavior matches the idealized behavior of TCP fairly well from what has been studied in the text. After a sharp increase to the congestion window we see that the CongWin levels off.



14. My IP to gaia.cs.umass.edu:

Not much in the way of congestion avoidance here, it seems as if the connection takes off at a constant rate and there doesn't appear to be an indication of a slow start. This graph does not really match what we have been learning in lecture/reading as we would expect a more fluctuant behavior (the initial fast growing CongWin being reduced either by reaching the limit or because of packet timeout/or 3 duplicate ACK's).