

1.What is the IP address and TCP port number used by the client computer (source) that is transferring the file to gaia.cs.umass.edu? To answer this question, it's probably easiest to select an HTTP message and explore the details of the TCP packet used to carry this HTTP message, using the “details of the selected packet header window”(refer to Figure 2 in the “Getting Started with Wireshark”Lab if you’re uncertain about the Wireshark windows.

The source is 192.168.0.20 and the source port is 58550.

2.What is the IP address of gaia.cs.umass.edu? On what port number is it sending and receiving TCP segments for this connection?

The destination 128.119.245.12 and destination port is 80.

3. What is the IP address and TCP port number used by your client computer (source) to transfer the file to gaia.cs.umass.edu?

My IP address source is 192.168.0.20 sending on port 58550.

No.	Time	Source	Destination	Protocol	Length	Info
2	23:00:48.645569	54.162.83.188	192.168.0.20	TLSv1.2	85	Encrypted Alert
3	23:00:48.666680	192.168.0.20	54.162.83.188	TCP	64	59625 → 443 [ACK] Seq=1 Ack=32 Win=251 Len=0
8	23:00:48.968720	192.168.0.20	128.119.245.12	TCP	66	59679 → 80 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
9	23:00:48.968854	192.168.0.20	128.119.245.12	TCP	66	59680 → 80 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
10	23:00:49.066459	128.119.245.12	192.168.0.20	TCP	66	80 → 59679 [SYN, ACK] Seq=0 Ack=1 Win=29200 Len=0 MSS=1460 SACK_PERM=1 WS=128
11	23:00:49.066530	192.168.0.20	128.119.245.12	TCP	54	59679 → 80 [ACK] Seq=1 Ack=1 Win=65536 Len=0
12	23:00:49.067011	192.168.0.20	128.119.245.12	TCP	769	59679 → 80 [PSH, ACK] Seq=1 Ack=1 Win=65536 Len=715

> Frame 8: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interface 0
> Ethernet II, Src: AsustekC_b6:0a:1f (38:d5:47:b6:0a:1f), Dst: Netgear_3a:92:f2 (40:5d:82:3a:92:f2)
> Internet Protocol Version 4, Src: 192.168.0.20, Dst: 128.119.245.12
▼ Transmission Control Protocol, Src Port: 59679, Dst Port: 80, Seq: 0, Len: 0
Source Port: 59679
Destination Port: 80
[Stream index: 1]
[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 (0)
Flags: 0x002 (SYN)
Window size value: 64240
[Calculated window size: 64240]
Checksum: 0x3667 [Unverified]
[Checksum Status: Unverified]
Urgent pointer: 0
> Options: (12 bytes), Maximum segment size, No-Operation (NOP), Window scale, No-Operation (NOP), No-Operation (NOP), SACK permitted
> [Timestamps]

4. The sequence number of the TCP SYN segment is 0. We know is a SYN segment because it contains that SYN flag.

3	23:00:48.686698	192.168.0.20	54.162.83.188	TCP	54	59625 → 443 [ACK] Seq=1 Ack=32 Win=251 Len=0
8	23:00:48.968720	192.168.0.20	128.119.245.12	TCP	66	59679 → 80 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
9	23:00:48.968854	192.168.0.20	128.119.245.12	TCP	66	59680 → 80 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
10	23:00:49.066459	128.119.245.12	192.168.0.20	TCP	66	80 → 59679 [SYN, ACK] Seq=0 Ack=1 Win=29200 Len=0 MSS=1460 SACK_PERM=1 WS=128
11	23:00:49.066530	192.168.0.20	128.119.245.12	TCP	54	59679 → 80 [ACK] Seq=1 Ack=1 Win=65536 Len=0
12	23:00:49.067011	192.168.0.20	128.119.245.12	TCP	769	59679 → 80 [PSH, ACK] Seq=1 Ack=1 Win=65536 Len=715

> Frame 10: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interface 0
> Ethernet II, Src: Netgear_3a:92:f2 (40:5d:82:3a:92:f2), Dst: AsustekC_b6:0a:1f (38:d5:47:b6:0a:1f)
> Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.0.20
▼ Transmission Control Protocol, Src Port: 80, Dst Port: 59679, Seq: 0, Ack: 1, Len: 0
Source Port: 80
Destination Port: 59679
[Stream index: 1]
[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 (0)
Flags: 0x012 (SYN, ACK)
Window size value: 29200
[Calculated window size: 29200]
Checksum: 0xe984 [Unverified]
[Checksum Status: Unverified]
Urgent pointer: 0
> Options: (12 bytes), Maximum segment size, No-Operation (NOP), No-Operation (NOP), SACK permitted, No-Operation (NOP), Window scale
> [SEQ/ACK analysis]
> [Timestamps]

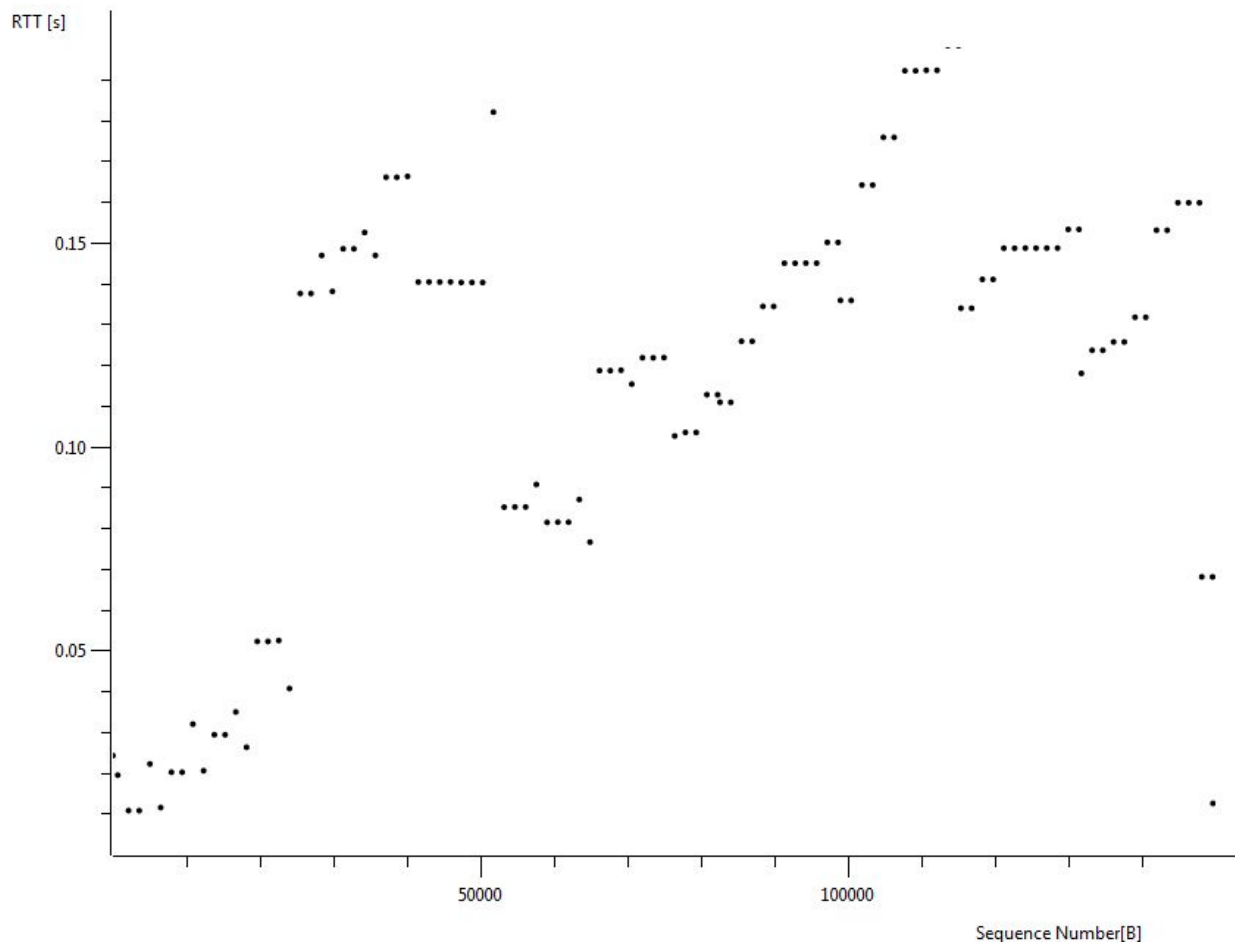
5. The sequence number is 0. Gaia server determines by doing initial sequence number plus one. The message carries flag to indicate to be a SYN ack message.

52	23:00:49.352432	128.119.245.12	192.168.0.20	TCP	60	80 → 59679 [ACK] Seq=1 Ack=66416 Win=162048 Len=0
53	23:00:49.352433	128.119.245.12	192.168.0.20	TCP	60	80 → 59679 [ACK] Seq=1 Ack=67876 Win=164992 Len=0
54	23:00:49.352433	128.119.245.12	192.168.0.20	TCP	60	80 → 59679 [ACK] Seq=1 Ack=72256 Win=173824 Len=0
55	23:00:49.352522	192.168.0.20	128.119.245.12	HTTP	12543	POST /wireshark-labs/lab3-1-reply.htm HTTP/1.1 (text/plain)
56	23:00:49.352572	128.119.245.12	192.168.0.20	TCP	60	80 → 59679 [ACK] Seq=1 Ack=73716 Win=176640 Len=0
57	23:00:49.352699	128.119.245.12	192.168.0.20	TCP	60	80 → 59679 [ACK] Seq=1 Ack=76636 Win=181632 Len=0
58	23:00:49.354360	128.119.245.12	192.168.0.20	TCP	60	80 → 59679 [ACK] Seq=1 Ack=79556 Win=182528 Len=0
59	23:00:49.356345	128.119.245.12	192.168.0.20	TCP	60	80 → 59679 [ACK] Seq=1 Ack=82476 Win=182528 Len=0

> Frame 55: 12543 bytes on wire (100344 bits), 12543 bytes captured (100344 bits) on interface 0
 > Ethernet II, Src: AsustekC_b6:0a:1f (38:d5:47:b6:0a:1f), Dst: Netgear_3a:92:f2 (40:5d:82:3a:92:f2)
 > Internet Protocol Version 4, Src: 192.168.0.20, Dst: 128.119.245.12
 ✓ Transmission Control Protocol, Src Port: 59679, Dst Port: 80, Seq: 140548, Ack: 1, Len: 12489
 Source Port: 59679
 Destination Port: 80
 [Stream index: 1]
 [TCP Segment Len: 12489]
 Sequence number: 140548 (relative sequence number)
 [Next sequence number: 150037 (relative sequence number)]
 Acknowledgment number: 1 (relative ack number)
 0101 = Header Length: 20 bytes (5)
 > Flags: 0x018 (PSH, ACK)
 Window size value: 256
 [Calculated window size: 65536]

6. The sequence number for the HTTP POST command is 140548.

7.



8. The length of each of the first TCP segment is 708. The following segments are all 1514.

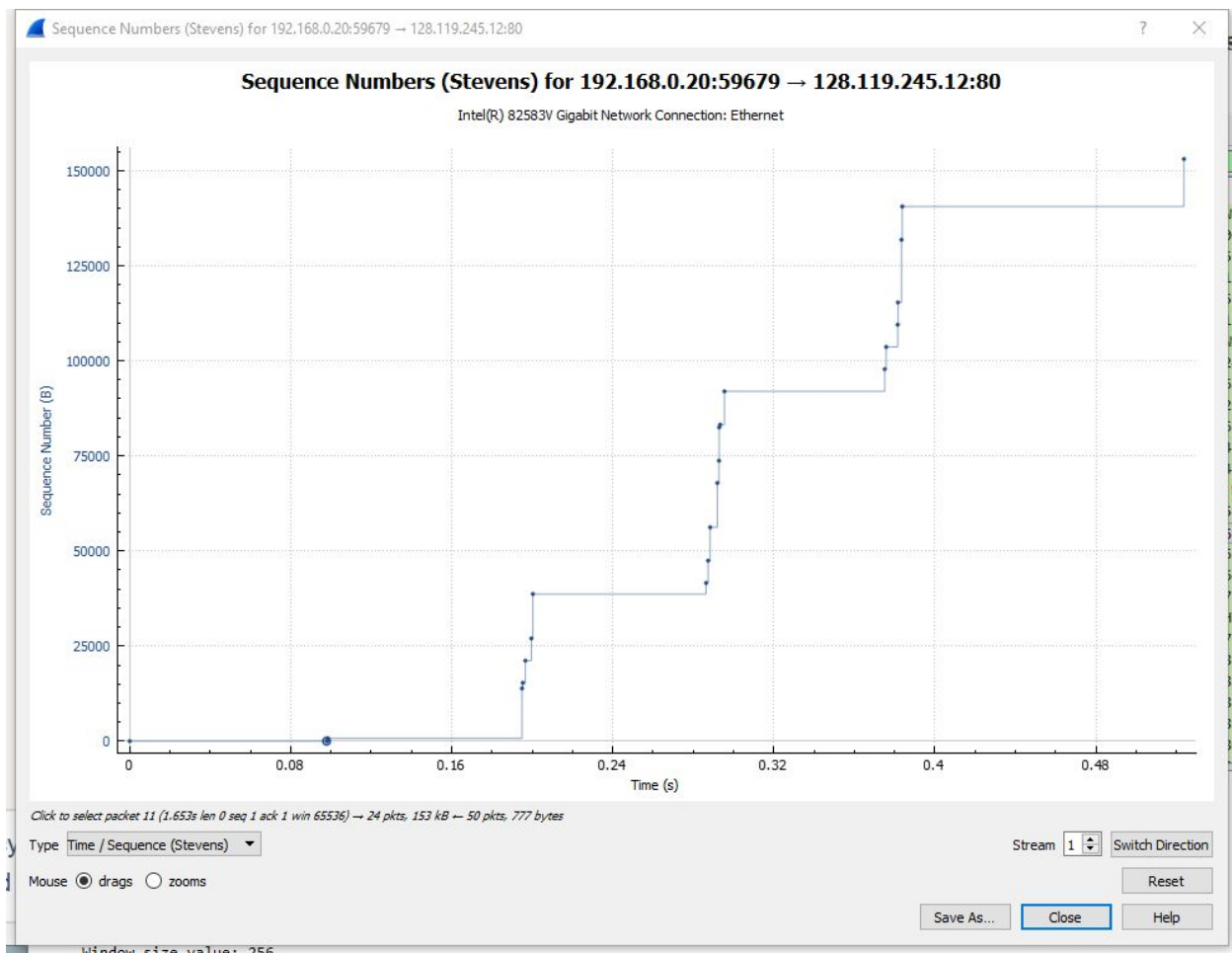
9. The minimum amount of available buffer space is listed as 65535. The sender is never throttled because we never reach full capacity of the window.

10. no segments needed to retransmitted. Old ACK was never resent in order to re-request former packets.

11. receiver usually acking 432 bits. Sometimes the receiver will acks every other segment. This is shown when more than one ack occurs in a row.

12. What is the throughput (bytes transferred per unit time) for the TCP connection? Explain how you calculated this value.

The throughput can be calculated by using the value of the last ack(148,221)- the first sequence number(1) divided by the time since first frame (1.4) = 105872.14 bps.



13/14. Slow start begins around the 10,000 range and ends around half way between 25000-50000. Congestion guidance takes over at around 37500.