

Computer Networks

TCP

Name - Ashutosh Soni

Id – 2018UCP1505

Q1: What is the IP address and TCP port number used by the client computer (source) that is transferring the file to mnit.ac.in? 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".

Ans: IP address of source: 192.168.43.64

TCP port number of client computer: 59238

The screenshot shows a Wireshark interface with a packet list on the left and a packet details pane on the right. The packet list contains 12 packets. Packet 264 is selected, which is an HTTP GET request. The details pane shows the structure of the selected packet, including the Ethernet II header, Internet Protocol Version 4 header, and Transmission Control Protocol (TCP) header. The TCP header shows the source port as 59238 and the destination port as 80.

No.	Time	Source	Destination	Protocol	Length	srcport	dstport	Info
261	72.928643	216.58.203.36	192.168.43.64	UDP	217	443	58048	443 → 58048 Len=175
262	72.929433	192.168.43.64	216.58.203.36	UDP	75	58048	443	58048 → 443 Len=33
263	72.958177	192.168.43.64	216.58.203.36	UDP	75	58048	443	58048 → 443 Len=33
264	73.093917	192.168.43.64	210.212.97.131	HTTP	561	59238	80	GET / HTTP/1.1
265	73.318592	210.212.97.131	192.168.43.64	TCP	54	80	59238	80 → 59238 [ACK] Seq=1 Ack=508 Win=6912 Le...
266	73.320122	210.212.97.131	192.168.43.64	TCP	3954	80	59238	80 → 59238 [ACK] Seq=1 Ack=508 Win=6912 Le...
267	73.320969	192.168.43.64	210.212.97.131	TCP	54	59238	80	59238 → 80 [ACK] Seq=508 Ack=3901 Win=6604...
268	73.413517	210.212.97.131	192.168.43.64	TCP	1354	80	59238	80 → 59238 [ACK] Seq=3901 Ack=508 Win=6912...
269	73.416735	210.212.97.131	192.168.43.64	TCP	1354	80	59238	80 → 59238 [ACK] Seq=5201 Ack=508 Win=6912...
270	73.417154	192.168.43.64	210.212.97.131	TCP	54	59238	80	59238 → 80 [ACK] Seq=508 Ack=6501 Win=6604...
271	73.417430	210.212.97.131	192.168.43.64	TCP	2654	80	59238	80 → 59238 [ACK] Seq=6501 Ack=508 Win=6912...
272	73.417983	192.168.43.64	210.212.97.131	TCP	54	59238	80	59238 → 80 [ACK] Seq=508 Ack=9101 Win=6604...

Internet Protocol Version 4, Src: 192.168.43.64, Dst: 210.212.97.131

0100 = Version: 4
.... 0101 = Header Length: 20 bytes (5)
> Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
Total Length: 547
Identification: 0x87f2 (34802)
> Flags: 0x4000, Don't fragment
Fragment offset: 0
Time to live: 128
Protocol: TCP (6)
Header checksum: 0x50a2 [validation disabled]
[Header checksum status: Unverified]
Source: 192.168.43.64
Destination: 210.212.97.131

Transmission Control Protocol, Src Port: 59238, Dst Port: 80, Seq: 1, Ack: 1, Len: 507

Source Port: 59238
Destination Port: 80
[Stream index: 17]
[TCP Segment Len: 507]
Sequence number: 1 (relative sequence number)
Sequence number (raw): 3821470822
[Next sequence number: 508 (relative sequence number)]

Q2: What is the IP address of mnit.ac.in? On what port number is it sending and receiving TCP segments for this connection?

Ans: From above screenshot we get that

IP address of destination (mnit.ac.in): 210.212.97.131

TCP port number of destination: 80

Q3: What is the IP address and TCP port number used by your client computer (source) to transfer the file to mnit.ac.in?

Ans: From above screenshot we get that

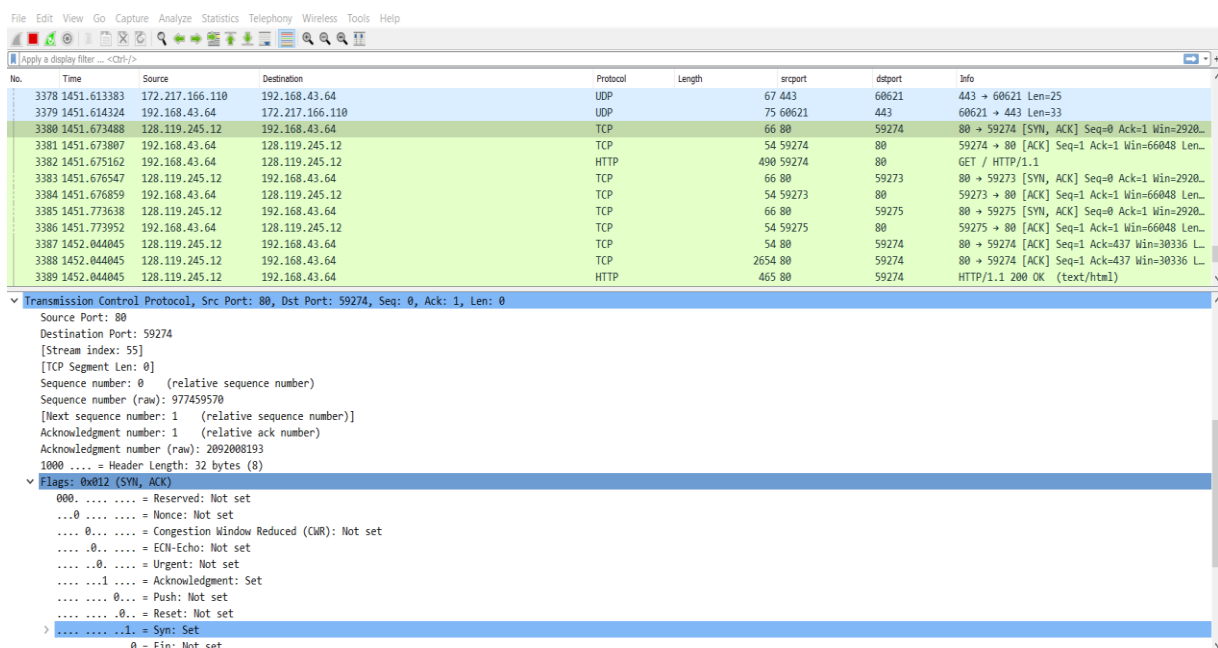
IP address of source: 192.168.43.64

TCP port number of client computer: 59238

Q4: What is the sequence number of the TCP SYN segment that is used to initiate the TCP connection between the client computer and gaia.cs.umass.edu? What is it in the segment that identifies the segment as a SYN segment?

Ans: Sequence number of the TCP SYN segment is used to initiate the TCP connection between the client and gaia.cs.umass.edu. This value is 0 in this trace.

The SYN flag is set to 1 and it indicates that this segment is a SYN segment.



No.	Time	Source	Destination	Protocol	Length	srcport	dstport	Info
3378	1451.613383	172.217.166.110	192.168.43.64	UDP	67	443	60621	443 → 60621 Len=25
3379	1451.614324	192.168.43.64	172.217.166.110	UDP	75	60621	443	60621 → 443 Len=33
3380	1451.673488	128.119.245.12	192.168.43.64	TCP	66	80	59274	80 → 59274 [SYN, ACK] Seq=0 Ack=1 Win=2920...
3381	1451.673887	192.168.43.64	128.119.245.12	TCP	54	59274	80	59274 → 80 [ACK] Seq=1 Ack=1 Win=66048 Len...
3382	1451.675162	192.168.43.64	128.119.245.12	HTTP	490	59274	80	GET / HTTP/1.1
3383	1451.676547	128.119.245.12	192.168.43.64	TCP	66	80	59273	80 → 59273 [SYN, ACK] Seq=0 Ack=1 Win=2920...
3384	1451.676859	192.168.43.64	128.119.245.12	TCP	54	59273	80	59273 → 80 [ACK] Seq=1 Ack=1 Win=66048 Len...
3385	1451.773638	128.119.245.12	192.168.43.64	TCP	66	80	59275	80 → 59275 [SYN, ACK] Seq=0 Ack=1 Win=2920...
3386	1451.773952	192.168.43.64	128.119.245.12	TCP	54	59275	80	59275 → 80 [ACK] Seq=1 Ack=1 Win=66048 Len...
3387	1452.044045	128.119.245.12	192.168.43.64	TCP	54	80	59274	80 → 59274 [ACK] Seq=1 Ack=437 Win=30336 L...
3388	1452.044045	128.119.245.12	192.168.43.64	TCP	2654	80	59274	80 → 59274 [ACK] Seq=1 Ack=437 Win=30336 L...
3389	1452.044045	128.119.245.12	192.168.43.64	HTTP	465	80	59274	HTTP/1.1 200 OK (text/html)

▼ Transmission Control Protocol, Src Port: 80, Dst Port: 59274, Seq: 0, Ack: 1, Len: 0

Source Port: 80
Destination Port: 59274
[Stream index: 55]
[TCP Segment Len: 0]
Sequence number: 0 (relative sequence number)
Sequence number (raw): 977459570
[Next sequence number: 1 (relative sequence number)]
Acknowledgment number: 1 (relative ack number)
Acknowledgment number (raw): 2892808193
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

Q5: What is the sequence number of the SYNACK segment sent by mnit.ac.in to the client computer in reply to the SYN? What is the value of the Acknowledgement field in the SYNACK segment? How did mnit.ac.in determine that value? What is it in the segment that identifies the segment as a SYNACK segment?

Ans: Sequence number of the SYNACK segment from gais.cs.umass.edu to the client computer in reply to the SYN has the value of 0 in this trace.

The value of the Acknowledgement field in the SYNACK segment is 1. The value of the Acknowledgement field in the SYNACK segment is determined by gaia.cs.umass.edu by adding 1 to the initial sequence number of SYN segment from the client computer (i.e. the sequence number of the SYN segment initiated by the client computer is 0.).

The SYN flag and Acknowledgement flag in the segment are set to 1 and they indicate that this segment is a SYNACK segment.

The image shows a Wireshark packet capture of a TCP Reset (RST) from a local host (192.168.43.64) to a remote host (172.217.166.110). The packet is a GET request for / HTTP/1.1. The RST flag is set, and the sequence number is 59274. The window size is 0.

No.	Time	Source	Destination	Protocol	Length	srcport	dstport	Info
3378	1451.613383	172.217.166.110	192.168.43.64	UDP	67	443	60621	443 → 60621 Len=25
3379	1451.614324	192.168.43.64	172.217.166.110	UDP	75	60621	443	60621 → 443 Len=33
3380	1451.673488	128.119.245.12	192.168.43.64	TCP	66	80	59274	80 → 59274 [SYN, ACK] Seq=0 Ack=1 Win=2920...
3381	1451.673807	192.168.43.64	128.119.245.12	TCP	54	59274	80	59274 → 80 [ACK] Seq=1 Ack=1 Win=66048 Len=...
3382	1451.675162	192.168.43.64	128.119.245.12	HTTP	490	59274	80	GET / HTTP/1.1
3383	1451.676547	128.119.245.12	192.168.43.64	TCP	66	80	59273	80 → 59273 [SYN, ACK] Seq=0 Ack=1 Win=2920...
3384	1451.676859	192.168.43.64	128.119.245.12	TCP	54	59273	80	59273 → 80 [ACK] Seq=1 Ack=1 Win=66048 Len=...
3385	1451.773638	128.119.245.12	192.168.43.64	TCP	66	80	59275	80 → 59275 [SYN, ACK] Seq=0 Ack=1 Win=2920...
3386	1451.773952	192.168.43.64	128.119.245.12	TCP	54	59275	80	59275 → 80 [ACK] Seq=1 Ack=1 Win=66048 Len=...
3387	1452.044045	128.119.245.12	192.168.43.64	TCP	54	80	59274	80 → 59274 [ACK] Seq=1 Ack=437 Win=30336 Len=...
3388	1452.044045	128.119.245.12	192.168.43.64	TCP	2654	80	59274	80 → 59274 [ACK] Seq=1 Ack=437 Win=30336 Len=...
3389	1452.044045	128.119.245.12	192.168.43.64	HTTP	465	80	59274	HTTP/1.1 200 OK (text/html)

Sequence number (raw): 2282498436
 [Next sequence number: 1 (relative sequence number)]
 Acknowledgment number: 1 (relative ack number)
 Acknowledgment number (raw): 3326724125
 1000 = Header Length: 32 bytes (24)
 ▾ **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-5-]
 Window size value: 29200
 [Calculated window size: 29200]
 Checksum: 0x7452 [unverified]
 [Checksum Status: Unverified]
 Urgent pointer: 0