# TCP Basics :

1. The first segment is the number 4, and the last is 199 (the one seen as POST in Wireshark).
2. The IP address of the client is 192.168.1.102 and it uses the source port 1161.
3. The IP address of gaia is 128.119.245.12, and receiving on port 80 (since it’s an HTTP request) and sending on 1161.
4. The (absolute) sequence number of the TCP SYN segment is 232129012. The Flag 0x002 identifies the segment as SYN segment.
5. The (absolute) sequence number of the SYN ACK segment is 883061785. The value of the ACKnowledge field is 232129013 (which is the sequence number of the TCP SYN segment+1).

Gaia determines this value by using the sequence number of the client reaching it. In the segment, the flag 0x012 identifies it as the SYN ACK segment.

1. The sequence number of the segment containing the POST is: 232293053.
2. The sequence numbers of the first 6 segments are respectively:

(From frame 4, since when we have a look at the raw data, we see it is the first TCP segment to contain POST)

Delta1 (Sample RTT1): 0,02746

Delta2 (Sample RTT2): 0,035557

Delta3 (Sample RTT3): 0,070059

Delta4 (Sample RTT4): 0,114428

Delta5 (Sample RTT5): 0,139894

Detla6 (Sample RTT6): 0,189645

EstimatedRTT = (1-0.125) \* PreviousEstimatedRTT + 0.125 \* Sample RTT

EstimatedRTT1 = 0,02746

EstimatedRTT2 = 0.875\*0,02746 + 0.125\*0,035557 = 0.028472125

EstimatedRTT3 = 0.875\*0.028472125 + 0.125\*0,070059 = 0,033670484375

EstimatedRTT4 = 0.875\*0,033670484375 + 0.125\*0,114428 = 0,043765173828125

EstimatedRTT5 = 0.875\*0,043765173828125 + 0.125\*0,139894 = 0,055781277099609375

EstimatedRTT6 = 0.875\*0,055781277099609375 + 0.125\*0,189645 = 0,07251424246215820

|  |  |  |
| --- | --- | --- |
| Sequence number | Sent time | Ack received time |
| 232129013 | Aug 21, 2004 15:44:20,596858000 | Aug 21, 2004 15:44:20,624318000 |
| 232129578 | Aug 21, 2004 15:44:20,612118000 | Aug 21, 2004 15:44:20,647675000 |
| 232131038 | Aug 21, 2004 15:44:20,624407000 | Aug 21, 2004 15:44:20,694466000 |
| 232138498 | Aug 21, 2004 15:44:20,625071000 | Aug 21, 2004 15:44:20,739499000 |
| 232133958 | Aug 21, 2004 15:44:20,647786000 | Aug 21, 2004 15:44:20,787680000 |
| 232135418 | Aug 21, 2004 15:44:20,648538000 | Aug 21, 2004 15:44:20,838183000 |

1. Segment1: Length = 565 (619)

Segment2: Length = 1460 (1514)

Segment3: Length = 1460 (1514)

Segment4: Length = 1460 (1514)

Segment5: Length = 1460 (1514)

Segment6: Length = 1460 (1514)

1. The minimum buffer size available in the trace is 5840, the one corresponding the handshake. The sender is never throttle because the window size is always greater than 0.