CMPE 472 – Computer Networks

Lab 2: UDP-TCP (3 points)

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Please fill out this given form for your submissions. Attach appropriate screenshots for all questions.

Questions

First 2 questions belong to UDP and will be answered using trace1.

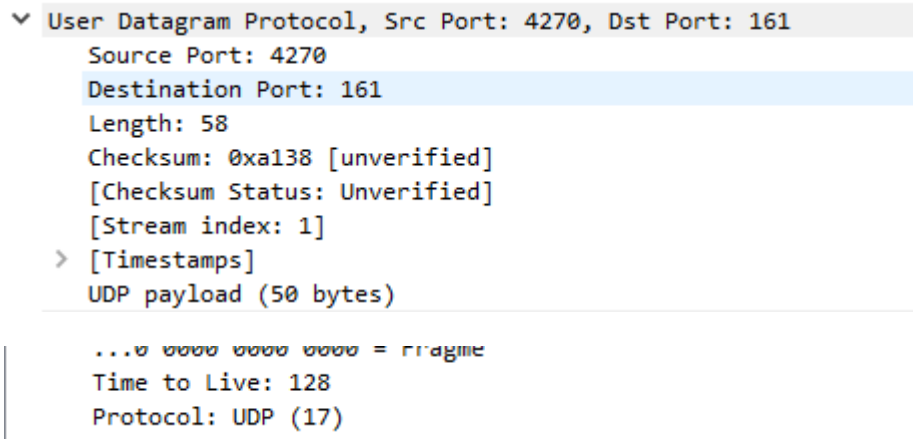
1. Look at packet 1, specify the fields of the UDP header. Explain the Length field, what is the length of UDP payload for your selected packet? *(0.75 points).*

```
User Datagram Protocol, Src Port: 4270, Dst Port: 161
    Source Port: 4270
    Destination Port: 161
    Length: 58
    Checksum: 0xa138 [unverified]
    [Checksum Status: Unverified]
    [Stream index: 1]
  > [Timestamps]
    UDP payload (50 bytes)
```

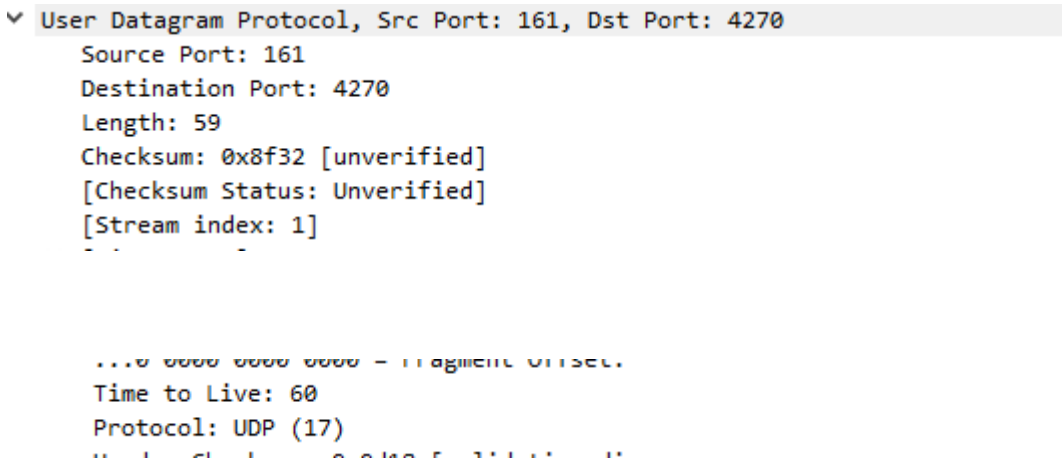
   Source port, destination port, length, and checksum.

2. What is the protocol number for UDP? Examine packet 1 and 2, describe the relationship between port numbers in the two packets. *(0.75 points).*

   The host's UDP packet's source port and the reply packet's destination port are identical, and vice versa, the reply packet's source port and the host's UDP packet's destination port are identical.



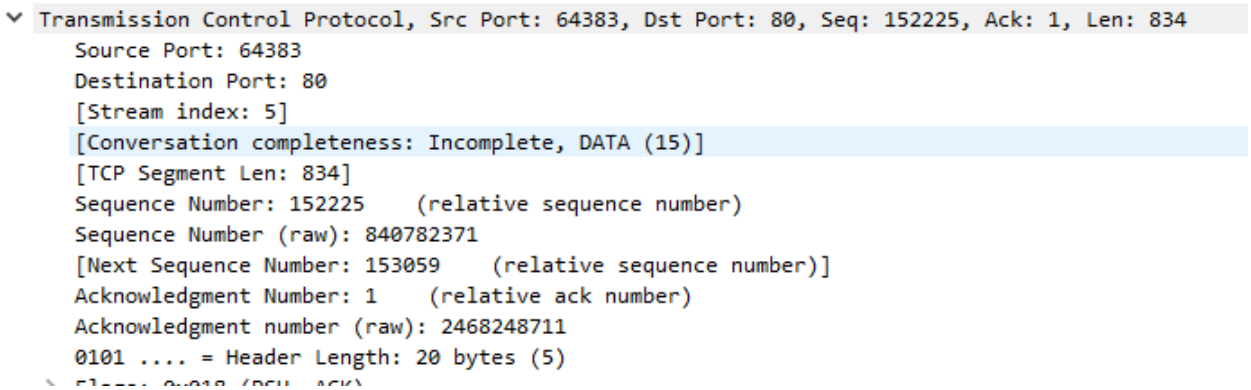
Trace1 UDP is 0x11 hex, which is 17 in decimal value.



Trace2 UDP is 0x11 hex, which is 17 in decimal value.

Questions 3 and 4 belong to TCP and will be answered using trace2. (You should complete the steps *Capturing a bulk TCP transfer from your computer to a remote server* from pre-lab.)

3. What is the sequence number of the TCP segment containing the HTTP POST command? How many TCP Segments are there in this packet? Observe and explain the relationship between frame number and payloads *(0.75 points)*.



TCP segment containing the HTTP POST command. The sequence number of this segment has the value of 834. The data unit used in the network layer is a packet, while the data unit used in the data link layer of the OSI model is a frame.

4. Consider the TCP segment containing the HTTP POST as the first segment in the TCP connection. At what time was each segment sent? When was the ACK for each segment received? Given the difference between when each TCP segment was sent, and when its acknowledgement was received, what is the RTT value for each of the six segments? What is the EstimatedRTT value (see Section 3.5.3, page 242 in text) after the receipt of each ACK? Assume that the value of the EstimatedRTT is equal to the measured RTT for the first segment, and then is computed using the EstimatedRTT equation on page 242 for all subsequent segments *(0.75 points)*.


Süre
192.168.1.102
128.119.245.12
0.000000 1161 1161 → 80 [SYN] Seq=0 Win=16384 Len=0 MS... 80
0.023172 1161 80 → 1161 [SYN, ACK] Seq=0 Ack=1 Win=58... 80
0.023265 1161 1161 → 80 [ACK] Seq=1 Ack=1 Win=17520 Le... 80
0.026477 1161 1161 → 80 [PSH, ACK] Seq=1 Ack=1 Win=17... 80
0.041737 1161 1161 → 80 [PSH, ACK] Seq=566 Ack=1 Win=... 80
0.053937 1161 80 → 1161 [ACK] Seq=1 Ack=566 Win=6780 L... 80
0.054026 1161 1161 → 80 [ACK] Seq=2026 Ack=1 Win=1752... 80
0.054690 1161 1161 → 80 [ACK] Seq=3486 Ack=1 Win=1752... 80
0.077294 1161 80 → 1161 [ACK] Seq=1 Ack=2026 Win=8760 ... 80
0.077405 1161 1161 → 80 [ACK] Seq=4946 Ack=1 Win=1752... 80
0.078157 1161 1161 → 80 [ACK] Seq=6406 Ack=1 Win=1752... 80
0.124085 1161 80 → 1161 [ACK] Seq=1 Ack=3486 Win=1168... 80
0.124185 1161 1161 → 80 [PSH, ACK] Seq=7866 Ack=1 Win... 80
0.169118 1161 80 → 1161 [ACK] Seq=1 Ack=4946 Win=1460... 80
0.217299 1161 80 → 1161 [ACK] Seq=1 Ack=6406 Win=1752... 80
0.267802 1161 80 → 1161 [ACK] Seq=1 Ack=7866 Win=2044... 80
0.304807 1161 80 → 1161 [ACK] Seq=1 Ack=9013 Win=2336... 80
0.305040 1161 1161 → 80 [ACK] Seq=9013 Ack=1 Win=1752... 80
0.305813 1161 1161 → 80 [ACK] Seq=10473 Ack=1 Win=175... 80
0.306692 1161 1161 → 80 [ACK] Seq=11933 Ack=1 Win=175... 80
0.307571 1161 1161 → 80 [ACK] Seq=13393 Ack=1 Win=175... 80
0.308699 1161 1161 → 80 [ACK] Seq=14853 Ack=1 Win=175... 80
0.309553 1161 1161 → 80 [PSH, ACK] Seq=16313 Ack=1 Win... 80
0.356437 1161 80 → 1161 [ACK] Seq=1 Ack=10473 Win=262... 80
0.400164 1161 80 → 1161 [ACK] Seq=1 Ack=11933 Win=292... 80
0.448613 1161 80 → 1161 [ACK] Seq=1 Ack=13393 Win=321... 80
0.500029 1161 80 → 1161 [ACK] Seq=1 Ack=14853 Win=350... 80
0.545052 1161 80 → 1161 [ACK] Seq=1 Ack=16313 Win=379... 80
0.576417 1161 80 → 1161 [ACK] Seq=1 Ack=17205 Win=379... 80
0.576671 1161 1161 → 80 [ACK] Seq=17205 Ack=1 Win=175... 80
0.577385 1161 1161 → 80 [ACK] Seq=18665 Ack=1 Win=175... 80
0.578329 1161 1161 → 80 [ACK] Seq=20125 Ack=1 Win=175... 80
0.579195 1161 1161 → 80 [ACK] Seq=21585 Ack=1 Win=175... 80
0.580149 1161 1161 → 80 [ACK] Seq=23045 Ack=1 Win=175... 80