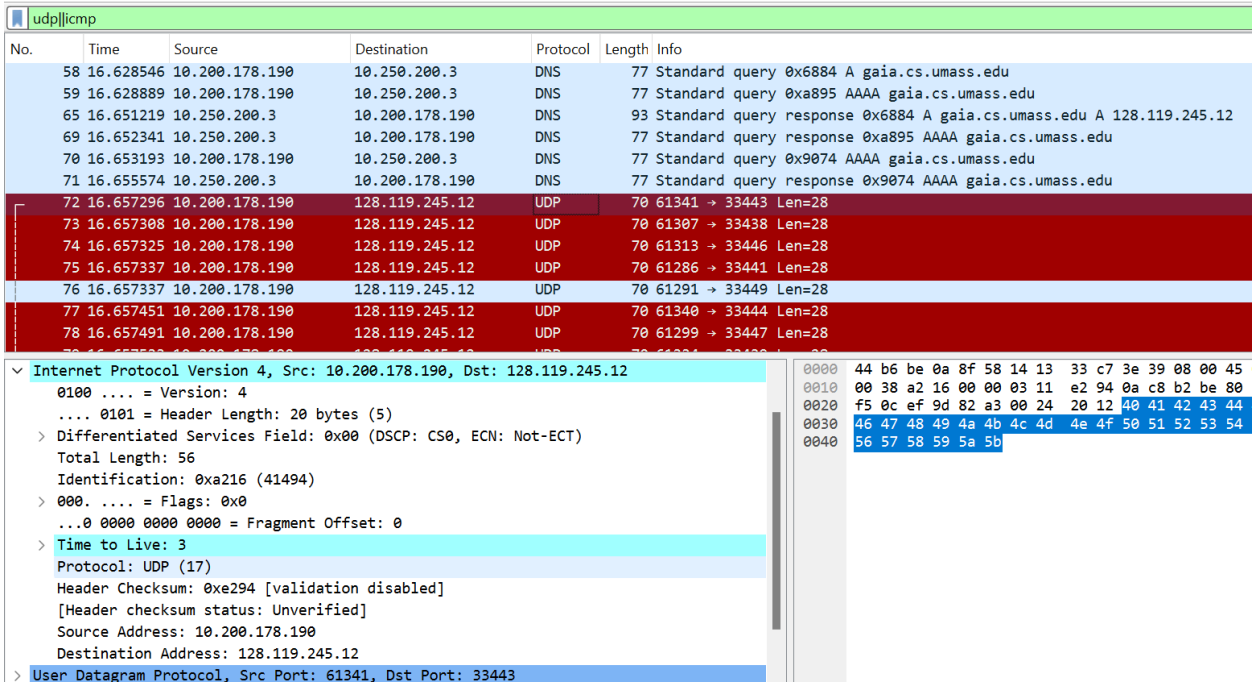
Assignment 7

Part-1



1. The IP address of my computer is: **10.200.178.190**

2. The time-to-live (TTL) value is: **3**

3. The value in the upper layer protocol field in this IPv4 datagram's header is: **UDP**

4. There are **20 bytes** in the IP header

5. The total length of the IP datagram is 56 bytes and the header length is 20 bytes. Therefore to calculate the length of payload of the IP datagram we subtract header length from total length. Hence,

Length of payload = (Total Length - Header Length)
= 56 - 20
= **36**

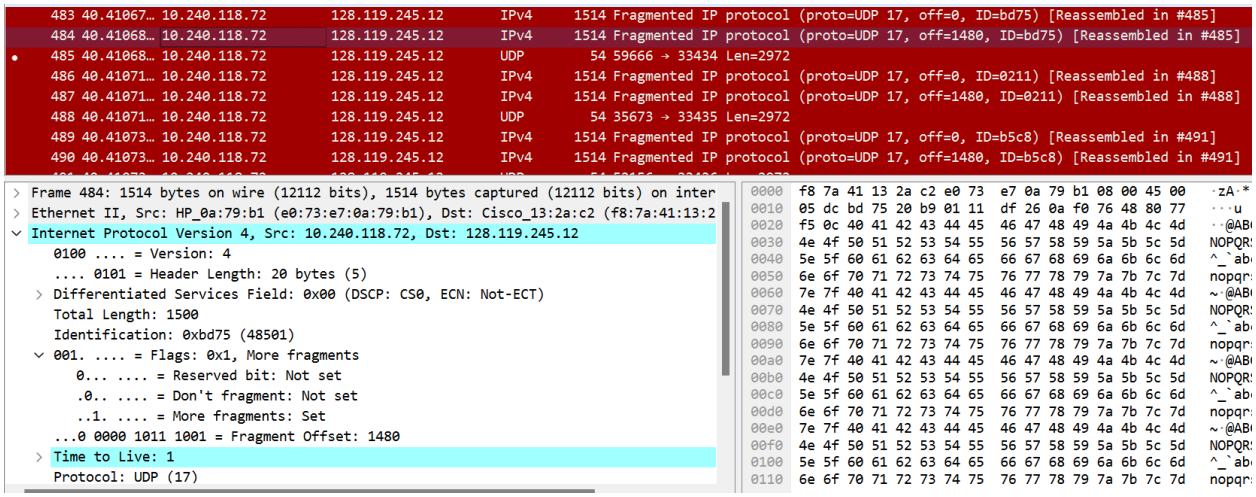
6. No, the IP datagram is not fragmented as the Fragment Offset is **0**

7. Fields in the IP datagram that always change from one datagram to the next are:
Identification (because IP packets must have different IDs)
Time to Live (because Traceroute increments each subsequent packet)
Header Checksum (Reason: As the header changes, so the checksum should also change)

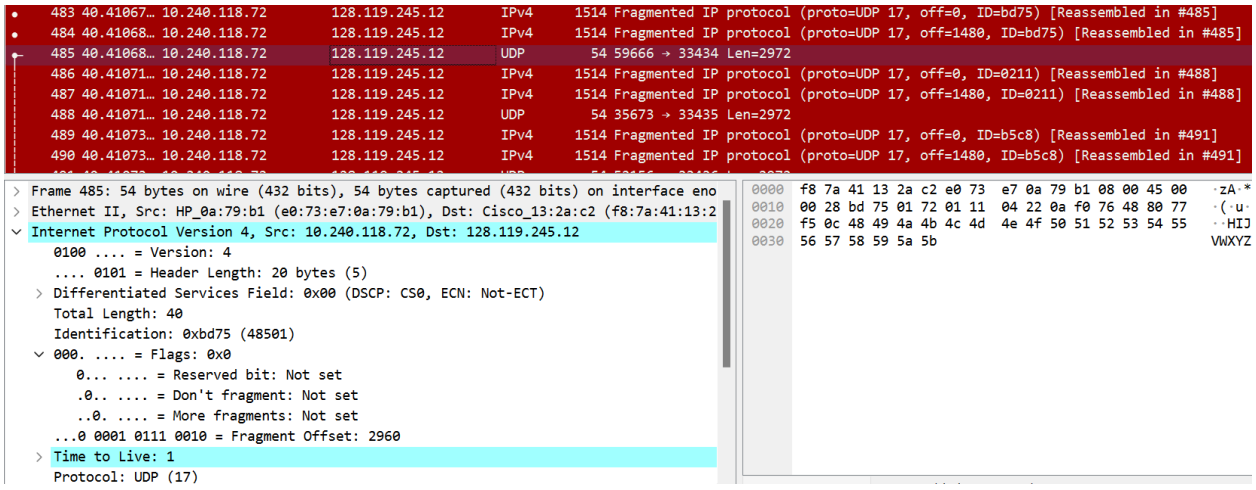
8. The fields that stay(and must stay) constant across the IP datagrams are:
Version (since we are using IPv4 for all packets)
Header Length (since these are ICMP packets)
Source IP (since we are sending from the same source)
Destination IP (since we are sending to the same dest)
Differentiated Services (since all packets are ICMP they use the same Type of Service class)
Upper Layer Protocol (since these are ICMP packets)

9. With each ICMP Echo (ping) request, the IP header Identification field displays a random integer value.
10. The value in the upper layer protocol field in this IPv4 datagram's header is: **ICMP (1)**
11. Yes, The Identification fields change the values across the sequence of all ICMP packets from all of the routers.
12. No, the values of TTL fields also change across all of the ICMP packets from all of the routers.

Part-2

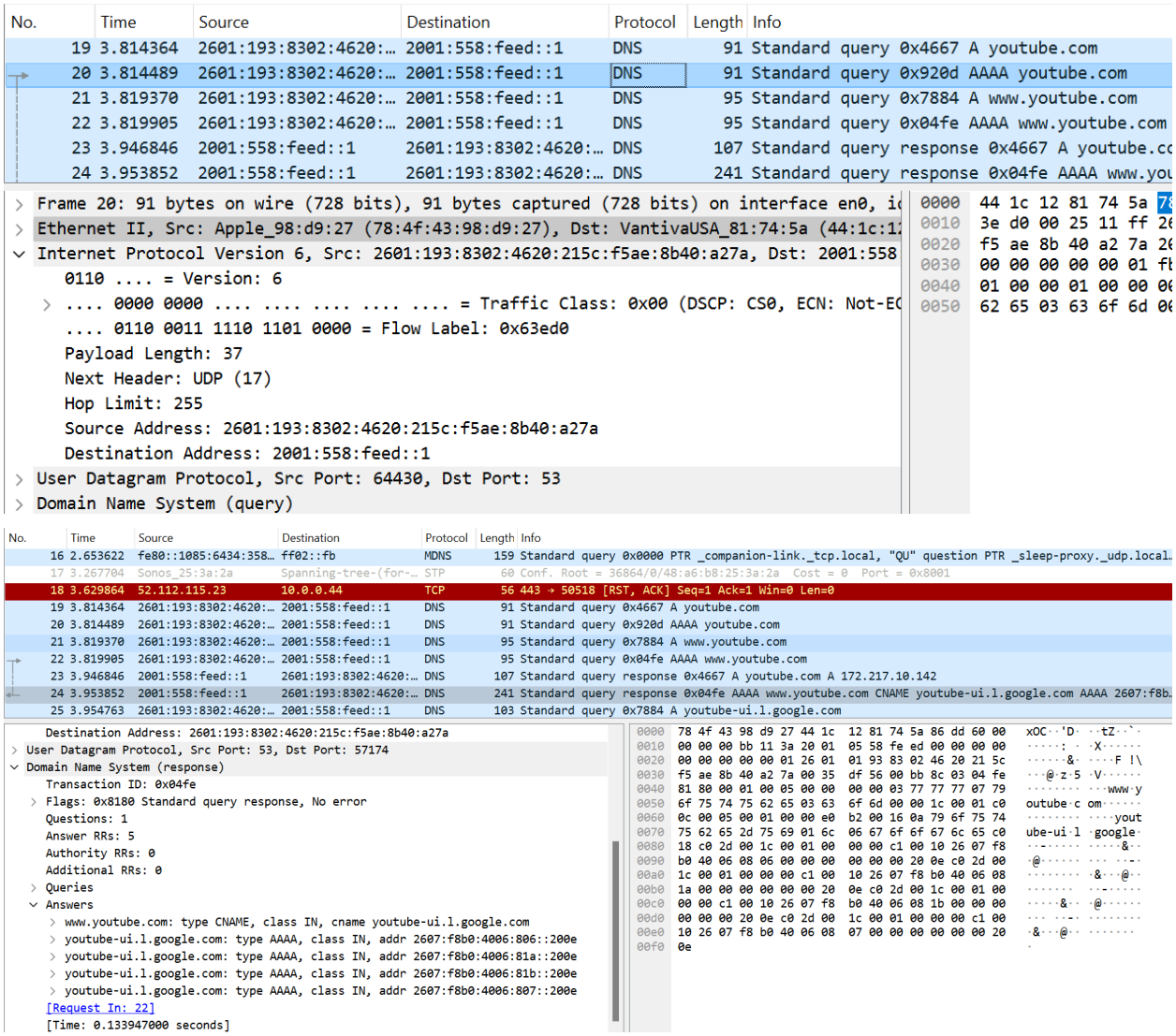


1. Yes, The segment has been fragmented across more than one IP datagram
2. The **More Fragments offset** within the flags header in IP header indicates that the datagram has been fragmented or not.
3. Since the **fragment offset is 0**, we know that this is the first fragment.
4. There are **1500 bytes** (Header Length + Payload) in this IP datagram.
5. The fields that change in the IP header between the first and second fragment are:
- **Fragment Offset**
- **Header Checksum**



6. The **More fragments section is not set**, which indicates that the 3rd fragment of the original UDP segment is the last fragment of that segment.

Part-3



1. The IPv6 address of the computer making the DNS AAAA request is:
2601:193:8302:4620:215c:f5ae:8b40:a27a

2. The IPv6 destination address for this datagram is: **2001:558:feed::1**

3. The value of the flow label for this datagram is: **0x063ed0**

4. The payload has **37 bytes** of data carried in it.

5. The upper layer protocol to which the datagram's payload will be delivered is: **UDP (17)**

6. 4 IPv6 addresses are returned in the response to this AAAA request.

7. The first of the IPv6 addresses returned by the DNS for youtube.com is:
2607:f8b0:4006:806::200e