1. Select the first ICMP Echo Request message sent by your computer, and expand the Internet Protocol part of the packet in the packet details window. What is the IP address of your computer?

Based on the provided packet trace, my IP address is 192.168.1.8

2. Within the IP packet header, what is the value in the upper layer protocol field?

ICMP 1

3. How many bytes are in the IP header? How many bytes are in the payload of the IP datagram? Explain how you determined the number of payload bytes.

20 bytes in the header, and a total number of 56 bytes, means that the payload was 36 bytes

4. Has this IP datagram been fragmented? Explain how you determined whether or not the datagram has been fragmented.

Not fragmented, we can see the more fragments flag is set to 0

5. Which fields in the IP datagram always change from one datagram to the next within this series of ICMP messages sent by your computer?

Identification, Time to live and Header checksum change in each request sent from my computer

6. Which fields stay constant? Which of the fields must stay constant? Which fields must change? Why?

Constant: Version(all are IPv4) header length(all ICMP have same header length) source IP(all being sent from the same device) destination IP(all being sent to the same device) Upper Layer Protocol(all are ICMP)

Change: Identification(all packets have distinct ids), Time to live(are sent sequentially), and Header Checksum(the header changes from packet to packer)

7. Describe the pattern you see in the values in the Identification field of the IP datagram

The identification field increases with each echo ping

8. What is the value in the Identification field and the TTL field?

ID: 0

Time to live: 1

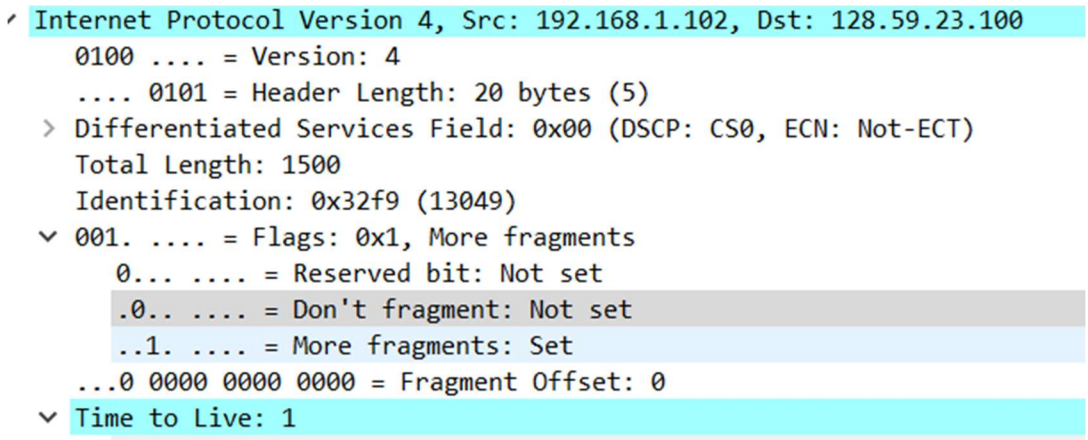
9. Do these values remain unchanged for all of the ICMP TTL-exceeded replies sent to your computer by the nearest (first hop) router? Why?

Yes, because they are all fragments.

10. Find the first ICMP Echo Request message that was sent by your computer after you changed the Packet Size in pingplotter to be 2000. Has that message been fragmented across more than one IP datagram?

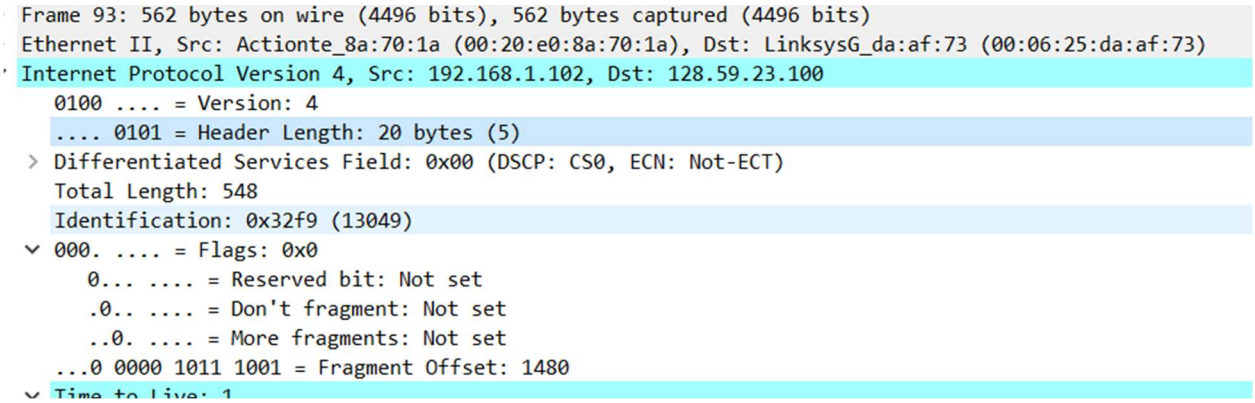
yes

11. Print out the first fragment of the fragmented IP datagram. What information in the IP header indicates that the datagram been fragmented? What information in the IP header indicates whether this is the first fragment versus a latter fragment? How long is this IP datagram?



Fragment offset is 0 indicating this is the first fragment, more fragments is set to one indicating it is fragmented. Length is 1500

12. Print out the second fragment of the fragmented IP datagram. What information in the IP header indicates that this is not the first datagram fragment? Are the more fragments? How can you tell?



Fragment offset is set to 1480 indicating it is the second fragment, more fragments is set to 0 indicating this is the last.

13. What fields change in the IP header between the first and second fragment?

    Length, fragment offset, and checksum

14. How many fragments were created from the original datagram?

    3

15. What fields change in the IP header among the fragments?

    Fragment offset and checksum change across all 3. The first two packets have the same length and more fragments value, but the third one is different.