LAB ASSIGNMENT 4

AIM:

To investigate the IP protocol, focusing on the IP datagram

Question1: What is the IP of your computer?  
Answer: The IP address of my computer is 192.168.0.103  
  
Question2: Within the IP packet header, what is the value in the upper layer protocol field?

Answer: Within the header the value in the upper layer protocol field is KMP (0x01)

Question3: How many bytes are in the IP header? How many bytes are in the payload of the IP datagram?  
Explain how are you determined the number of payload bytes.

Answer: There are 20 bytes in the IP later, and 56 bytes total end, this gives 36 bytes in the payload of IP datagram.  
  
Question4: Has this IP datagram been fragmented? Explain the whole you determine whether or not the datagram has been fragmented?  
Answer: The more fragments bit= 0, so the data is not fragmented.

Question5: Which fields in the IP datagram always change from one datagram to the next within this series of ICMP messages sent by your computer?

Answer: Identification, time to live and header checksum always change.

Question6: Which fields stay constant? Which of the fields must stay constant? Which fields must change? Why

Answer: The fields that stay constant across IP datagram are:

* Version (since we are using IPV4for all packets)
* Header length (since these are ICMP packets)
* Source IP (since we are sending from the same source closing bracket)
* Destination IP (since we are sending to the same destination)
* Upper layer protocol (since these are ICMP packets)
* Differentiated services (since all packets are ICMP they use the same type of service class)

The fields that must change are:

* Identification (IP packets must have different IDs)
* Time to live (Trace route increment each subsequent packet)
* Header checksum (since header changes, so most checksum

Question7: Describe the pattern you see in the values in the Identification field of the IP datagram?

Answer: The pattern is that the IP header identification fields increment with each ICMP echo (ping) request

Question8: What is the value in the identification field and the TTL field?  
Answer: Identification – 30767  
TTL – 64

Question9: Do these values remain unchanged for all the ICMP exceeded replies sent to your computer by the nearest router? Why?

Answer:  The identification field changes for all the ICMP TTL exceeded replies because identification field is a unique value. When 2 or more IP datagram’s have the same identification value, then it mean these IP datagram’s are fragments of a single large IP datagram.

The TTL feel remains and changed because the TTL for the first router is always the same.

Question10: Find the first ICMP echo request message that was sent by your computer after you changed the packet size in ping platter to be 2000. Has that message being fragmented across more than one IP datagram?  
Answer: Yes, this packet has been fragmented across more than one IP datagram.

Question11: 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?

Answer: The flags bit for more fragments are set, indicating that the datagram has been fragmented. Since the fragment offset is 0,we know that this is the first fragment. This first datagram has a total length of 1500, including the header.

Question12: 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?

Answer: We can tell that this is not the first fragment, since the fragment offset is1480. It is the last fragment, since the more fragments flags is not set.

Question13: What fields change in the IP header between the first and second fragment?

Answer: The IP headers fields that changed between the fragments are: total length, flag, fragment of set and checksum.

Question14: How many fragments were created from the original datagram?

Answer: After switching to 3500, there are three packets created from the original data room.  
  
Question15: What fields change in the IP header among the fragments?

Answer: The IP headers fields that changed between all of the packets are: fragment offset and the Checksum.

we see a total change in total length and also in the flags. The first two packets have a total length of 1500, with the more fragments bit set to one, and the last packet has a total length of 540.

CONCLUSION: This assignment gives us a clearer view of the IP protocol and IP datagram.