



Homework 3: CS425

Computer Networks

Abhishek Pardhi

200026

B.Tech students

apardhi20@iitk.ac.in

INDIAN INSTITUTE OF TECHNOLOGY
KANPUR

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

March 15, 2023

Contents

| | | |
|----|------------|---|
| 1 | Problem 1 | 1 |
| 2 | Problem 2 | 1 |
| 3 | Problem 3 | 1 |
| 4 | Problem 4 | 1 |
| 5 | Problem 5 | 1 |
| 6 | Problem 6 | 1 |
| 7 | Problem 7 | 1 |
| 8 | Problem 8 | 2 |
| 9 | Problem 9 | 2 |
| 10 | Problem 10 | 2 |

1 Problem 1

The value in the upper layer protocol field is ICMP (0x01).

2 Problem 2

The IP header is 20 bytes long. The payload of the IP datagram is 28 bytes. This is determined by subtracting the IP header length (20 bytes) from the total length (56 bytes) specified in the IP header.

3 Problem 3

The IP datagram has not been fragmented. This is determined by observing the flags field in the IP header, which has the *Don't Fragment* flag (DF) set to Not set.

4 Problem 4

The value in the Identification field is 0x80b2 (32046), and the value in the TTL field is 1.

5 Problem 5

Yes, the message corresponding to the given packet has been fragmented.

6 Problem 6

The *Flags* field in the IP header indicates whether the datagram has been fragmented. Specifically, the *More Fragments* flag (MF) being set to 1 indicates that the datagram has been fragmented. Since the *More Fragments* (MF) flag field in the IP header is set to 1, therefore this indicates that the datagram has been fragmented.

7 Problem 7

The *Fragment Offset* field in the IP header indicates whether this is the first fragment versus a latter fragment. Since the Fragment Offset is zero, it indicates that this is the first fragment.

8 Problem 8

The IP header field that indicates that this is not the first datagram fragment is the *Fragment offset* field. In the given packet capture, the value of the Fragment offset field is 1480, which means that this is not the first fragment as its offset is greater than zero.

9 Problem 9

No, there are no more fragments. This is determined by looking at the *Flags* field in the IP header. Specifically, the *More fragments* bit is not set to 1, indicating that this is the last fragment in the sequence.

10 Problem 10

In the IP header between the first and second fragment, the *Identification* field remains the same to indicate that both fragments belong to the same datagram. However, the *Fragment offset* field in the second fragment is set to a non-zero value, indicating the position of the current fragment relative to the first fragment in the original datagram. Additionally, the *Total Length* field in the second fragment is smaller than the total length of the original datagram as it only contains a part of the original message. Also, the *More Fragments*(MF) flag is set to 1 in the first fragment and 0 in the second.