60004220215 C-186

NAME: Vruddhi Shah STD.: DIV.: DATE: PAGE:

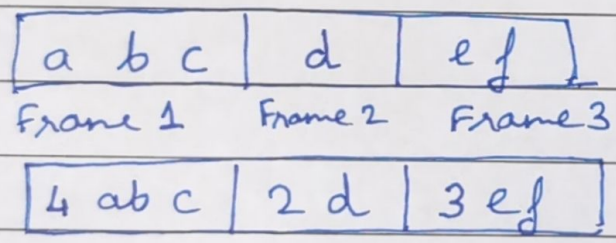
Computer Networks
Experiment 2

Aim: Write a program to implement Framing

Theory:

1. **Character count:** The total number of characters that are present in frame are counted using field in header. The receiver is given the number of characters for every frame, so they know when a frame ends. If character count is disturbed or distorted by an error during transmission, then the receiver might lose synchronisation.

Eg:



2. **Byte stuffing:** This is also called character stuffing. There is a flag start flag, an end flag and an escape flag. The start and end flags indicate the start and end of a frame. If those flags appear in a string, while stuffing, they are preceeded by a special escape flag. This indicates that they are a part of the string. An escape flag inside the string is also preceeded by an escape flag.

Eg: Start flag - s End flag - d Stuffed flag - o.
Message: goodbye Stuffed string = sgooooodbyed

NAME: STD.: DIV.:

DATE :
PAGE :

3. Bit stuffing : It is also called bit oriented framing or bit-oriented approach. Extra bits are being added by network protocol designers to data streams. 01111110 is the flag at the beginning and end of every ~~tok~~ frame. If 0 followed by 5 consecutives 1's is encountered in the message, we insert a 0 after. We continue the algorithm on the new message.

Eg: Message: 0 1 1 0 1 1 1 1 1 1 1 1 1 1 0 0 1 0
Stuffed message: 0 1 1 0 1 1 1 1 1 0 1 1 1 1 1 0 0 0 1 0

Conclusion: Thus, we have studied and implemented the various framing techniques.

Department of Computer Engineering
Class: S.Y. B.Tech. Semester: V
Course Name: Computer Networks Lab

Name: Vruddhi Shah	SAP ID: 60004220215
Date of Performance: 14.08.24	Date of Submission: 14.08.24

Experiment No: 2

Aim: Write a program to implement Framing:

Techniques: Character count, Byte stuffing, Bit stuffing.

Program:

```
k = int(input("Which stuffing do you want?\nPress 1 for
character count\nPress 2 for byte stuffing\nPress 3 for bit
stuffing\n"))
def characterCount():
    n = int(input("How many frames? "))
    ans = ""
    for i in range(n):
        frame = input("Enter frame " + str(i) + " ")
        k = len(frame)
        ans += str(k+1)
        ans += frame
    return ans
def byteStuffing():
    start = input("Enter start flag ")
    end = input("Enter end flag ")
    escape = input("Enter escape flag ")
    mess = input("Enter message to be sent ")
    i = 0
    while i < len(mess):
        if (mess[i] == start) or (mess[i] == end) or (mess[i]
== escape):
            mess = mess[:i] + escape + mess[i:]
            i += 2
        else:
            i += 1
    mess = start + mess + end
```

```
    return mess
def bitStuffing():
    mess = input("Enter message to be sent")
    if len(mess) < 6:
        return mess
    i = 6
    while i < len(mess):
        if mess[i-6:i] == "011111":
            mess = mess[:i] + "0" + mess[i:]
            i += 1
        i += 1
    return mess
```

Screenshots:

Bit stuffing:

```
PS C:\Users\djsce.student\Desktop> python -u c:\Users\dj
Which stuffing do you want?
Press 1 for character count
Press 2 for byte stuffing
Press 3 for bit stuffing
3
Enter message to be sent01101111111111111111110010
Stuffed string is  011011111011111011111010010
```

Byte stuffing:

```
Which stuffing do you want?
Press 1 for character count
Press 2 for byte stuffing
Press 3 for bit stuffing
2
Enter start flag s
Enter end flag d
Enter escape flag o
Enter message to be sent goodbye
Stuffed string is  sgooooodbyed
```

Character count:

```
PS C:\Users\djsce.student\Desktop> python -u "c:\User
Which stuffing do you want?
Press 1 for character count
Press 2 for byte stuffing
Press 3 for bit stuffing
1
How many frames? 2
Enter frame 0 abc
Enter frame 1 de
Stuffed string is  4abc3de
```

Conclusion:

Thus, we have studied and implemented the various framing techniques.