

Computer Networks

Tutorial - 1

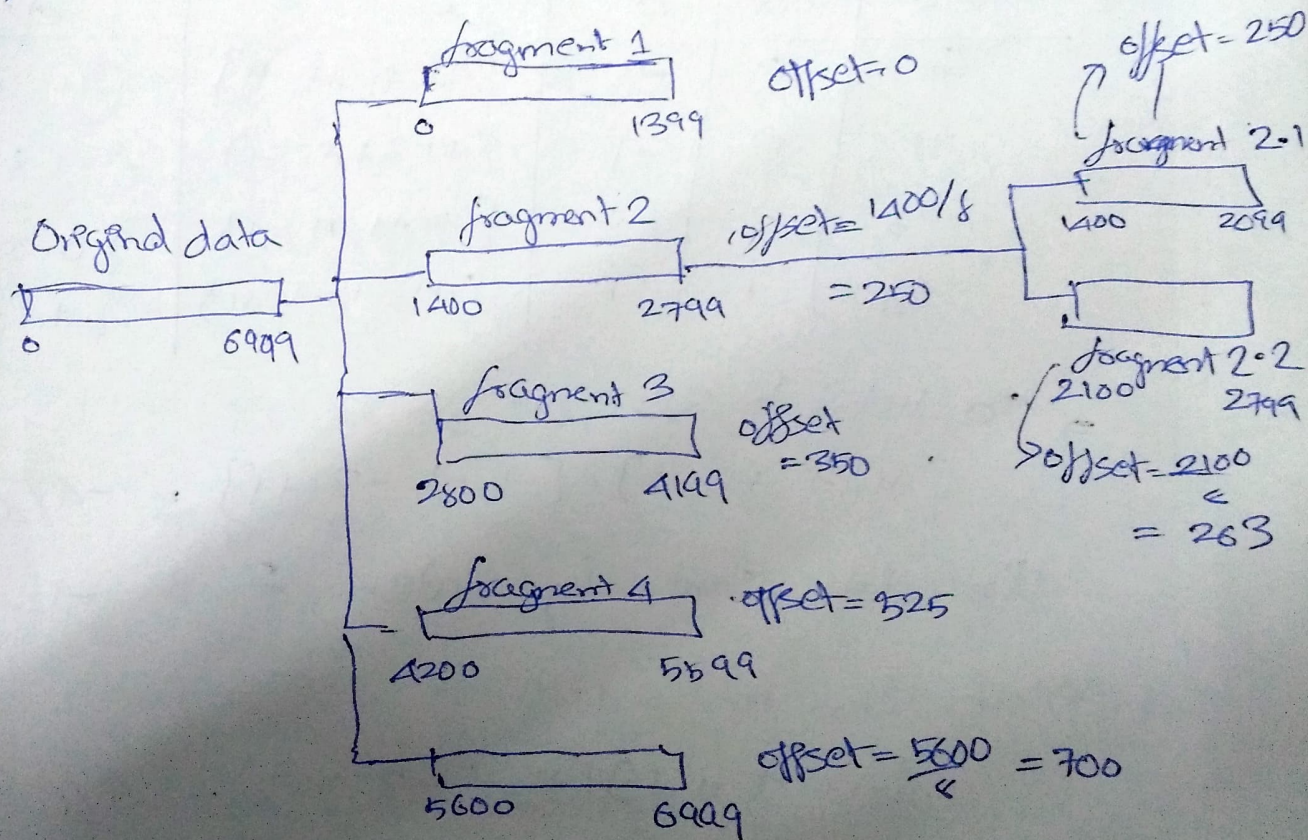
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CSE-B

- 1) Data of 7000 bytes received fragmented with MPU of 1400 bytes and also fragment 2 takes another route with MPU 700.

⇒ Data received 7000 bytes



Data length = 7000 bytes

fragment length = 1400 bytes

No. of fragment = $7000/1400 = 5$

offset value = $\frac{\text{Start addr}}{8}$

2)

Chirp sequence:

$$C_1 \quad C_2$$

$$[+1 \ +1 \ +1 \ +1] \quad [+1 \ -1 \ +1 \ -1]$$

$$C_3 \quad C_4$$

$$[+1 \ +1 \ -1 \ -1] \quad [+1 \ -1 \ -1 \ +1]$$

S_1 sending the bit 0 ; S_2 sending the bit 0
 $S_3 \rightarrow$ silent ; $S_4 \rightarrow 1$

Station	bit	d	C	doc
S_1	0	-1	$[+1 \ +1 \ +1 \ +1]$	$[-1 \ -1 \ -1 \ -1]$
S_2	0	-1	$[+1 \ -1 \ +1 \ -1]$	$[-1 \ +1 \ -1 \ +1]$
S_3	-	0	$[+1 \ +1 \ -1 \ -1]$	$[0 \ 0 \ 0 \ 0]$
S_4	1	1	$[+1 \ -1 \ -1 \ +1]$	$[+1 \ -1 \ -1 \ +1]$

\rightarrow To listen to S_2

$$[+1 \ -1 \ +1 \ -1] \cdot [-1 \ -1 \ -3 \ +1] = -4/4 = -1$$

The data sent by station 2 is -1.

\rightarrow To listen to S_4

$$[+1 \ -1 \ -1 \ +1] [-1 \ -1 \ -3 \ +1] = 4/4 = 1$$

3)

Data = 11011001 ; $m=8$

$$2^a \geq m+r+1 \text{ for } r=4 ; 2^4 \geq 8+4+1$$

Hamming code:

12	11	10	9	8	7	6	5	4	3	2	1
1	1	0	1	1	1	0	0	0	1	1	0
r_8				r_4				r_2		r_1	

$$a_1 \rightarrow 1, 3, 5, 7, 9, 11 \rightarrow 0$$

$$a_2 \rightarrow 2, 3, 6, 7, 10, 11 \rightarrow 1$$

$$a_4 \rightarrow 4, 5, 6, 7, 12 \rightarrow 0$$

$$a_8 \rightarrow 8, 9, 10, 11, 12 \rightarrow 1$$

$$\Rightarrow \text{Code} : 110111000110$$

Detection:

12	11	10	9	8	7	6	5	4	3	2	1
1	1	0	1	1	1	1	0	0	1	1	0

$$a_1 \rightarrow 1, 3, 5, 7, 9, 11 \rightarrow 0$$

$$a_2 \rightarrow 2, 3, 6, 7, 10, 11 \rightarrow 1$$

$$a_3 \rightarrow 4, 5, 6, 7, 12 \rightarrow 1$$

$$a_4 \rightarrow 8, 9, 10, 11, 12 \rightarrow 0$$

$$(a_4 \ a_3 \ a_2 \ a_1) = (0 \ 11 \ 0)_2 = (6)_{10}$$

There is error at 6th ~~bit~~ bit.

4)

$$\text{offset} = 900 ; \text{HLEN} = 10 ; \text{length} = 300.$$

$$\text{first byte} = ? \quad \text{last byte} = ?$$

$$\Rightarrow \text{first byte} = \text{offset} \times 8 = 900 \times 8 = 7200 //$$

$$\text{Header len} = 10 \times 4 = 40 \text{ byte}.$$

$$\begin{aligned} \text{length of data} &= \text{total length} - \text{header} \\ &= 300 - 40 = 260 \end{aligned}$$

$$\begin{aligned}\text{last byte} &= \text{first byte addr} + \text{Data length} \\ &= 7200 + 260 = 7460//\end{aligned}$$

$$\Rightarrow \text{last byte address} = 7459//$$