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PAPER: NETWORKING

SECTION: B

DEPARTEMENT: SOFTWARE ENGINEERING

DATE-24-06-2020

Q1: In a block of adresses, we know the IP adress of one host is 101.10.11.X/ID 4+5. What is the first adress (network adress) and the last adress (limited broadcast adress) in the block?

Sol:

ID = 14840

X = 17

4th = 4

5th = 0

= 4th + 5th ⇒ 4+0 = 4

In a block of adressess, we know the IP address is 101.10.11.17/4.

Convert into binary numbers.

1100101 1010 1011 10001 100

First adress

17 - 4 = 13

Convert last 13 bits to 0

1100101 1010 000 0000 000

Now convert this into decimal

101.10.0.0/0

last address.

Convert right most bit into 1

11001101 1010 1011 1000 111

101.10.11.177.

Q2: Take your Roll No as decimal notation, now convert it to Binary notation. Draw the graph of the NRZ-L scheme using the binary notation of your roll no as data stream, assuming that the last signal level has been positive.

Sol: Roll No = 14840

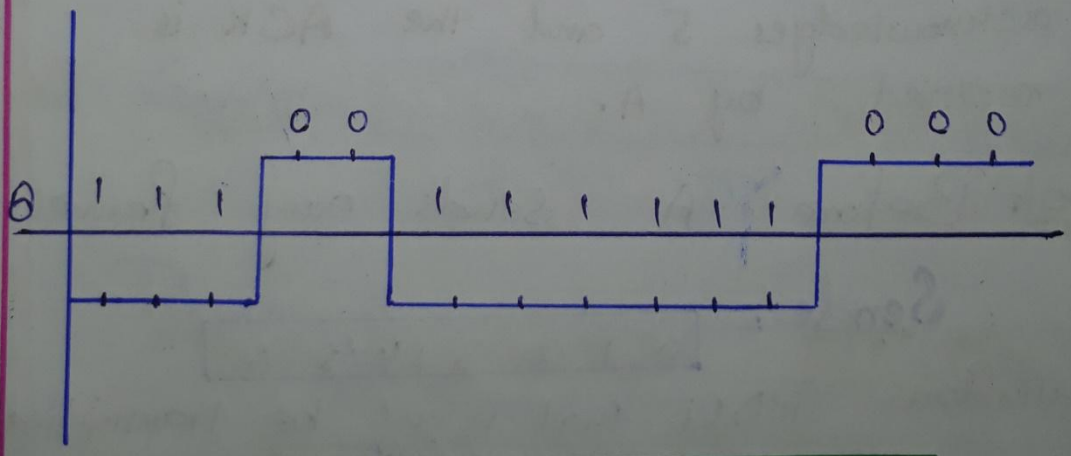
How to convert into binary numbers.

14840 = 11100111111000

2	14840
2	7420 – 0
2	3710 – 0
2	1855 – 0
2	927 – 1
2	436 – 1
2	231 – 1
2	115 – 1
2	57 – 1
2	28 – 1
2	14 – 0
2	7 – 0
2	3 – 1
	1 – 1

NRZ-L Scheme

Graph:



14840

By #4

Q3: Two neighbouring nodes (A and B) use a sliding-window protocol with a 3-bit sequence number. As the ARQ mechanism, go-back-N is used with a window size of 1D last.

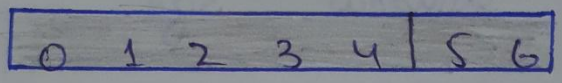
Assuming A is transmitting and B is receiving, show the window positions ~~from B for 0, 1 and 2~~ for the following succession of events:

* Before A sends any frames.
* After A sends frames 0, 1, 2, 3, 4 and receives acknowledgment from B for 0, 1 and 2.
* After A sends frames 5, 6 and B acknowledges 5 and the ACK is received by A.

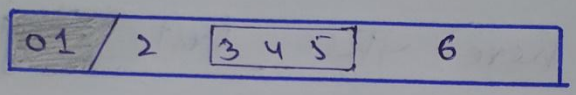
Sol: Before A sends any frames:

(A) Sender:- 0 1 2 3 4 5 6

Window PDU that may be transmitted 4 bits window.

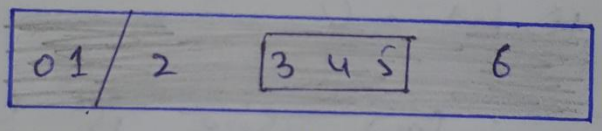
Reciver:- 

B) Sender:- A has shrunk its window as it has transmitted 3 PDUs but has received ask for 2 PDUs hense it is :-

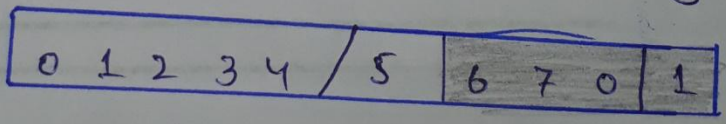


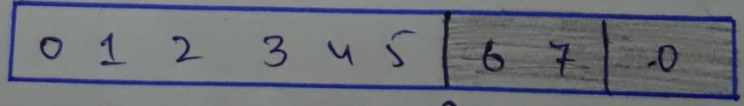
Acknowledgment receive for two bits.

Reciver:-



Reciver has received all data hawee the window remain in 4 bits size.

C) Sender:- 

Reciver:- 

Acknewledgment recived for 3 bits.

Now window size.

ID = 14840.

by formula.

ID last > 5 then ID last / 2

But here the last digit of ID is 0 so we write as it as.

ID last = 0

So window size is 0.

Q4: An ISP is granted a block of addresses starting with 160.(X).(ID_{3+4}).0/16.

The ISP needs to distribute these addresses to three groups of customers as follows:

Design the sub-blocks and find out how many addresses are still available after these allocations.

★ A. The first group has 16 customers; each needs 64 addresses.

Sol:- Address = 160.(X).(ID_{3+4}).0/16

ID (X) = 14840

Sum of ID = 17

ID_{3+4} = 12

160.17.12.0/16

(A) The first group has 16 customers each customers need 64 address.

First group:-

For this group each customer needs 64 address. This means that 6 ($\log_2 64$) bit are needed to define each host.

The prefix is the

$32 - 6 = 26$

First customer = 160.17.12.0/26

2nd customer = 160.17.12.1/26

⋮ ⋮

64 customers = 160.17.12.63/26

= 160.17.12.255/26

Total = $16 \times 64 = 1024$

B. The second group has 64 customers each need 32 address.

Sol:-

1st Customer:- 160.17.12.0/28

= 160.17.12.255/28

2nd Customer:- 160.17.12.1/28

= 160.17.12.254/28

16 Customer:- 160.17.12.15/28

= 160.17.12.240/28

Total = 16 x 64 = 1024

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