

AIMAN SIDDIQUA - 2K18/MC/008

## COMPUTER NETWORKS

MC-308

### ASSIGNMENT - II

#### ① Disadvantages of classful addressing:

(i) Wastage of IP Addresses

The existence of only three block sizes (Class A, B and C) leads to waste of limited IP address space.

(ii) No Flexibility for users

If a company needs 2000 addresses we can assign class B network. But it has  $2^{16}$  addresses. So it will lead to wastage of addresses.

(iii) Maintenance is time consuming. (If we don't use Subnetting).

#### ② Address of the block = 140.15.89.97/26 Divided into 4 equal blocks

$$\begin{aligned}\text{No of addresses in block} &= 2^{32-n} \quad n = \text{Mask} \\ &= 2^{32-26} \\ &= 2^6 = 64 \text{ IP addresses}\end{aligned}$$

$$97 \Rightarrow 01100001$$

$$01000000 = 64$$

1<sup>st</sup> address of the block

$$01111111 = 127$$

Last address of the block



$\therefore$  Range of Block = 140.15.89.64/26 to 140.15.89.127/26

for subblocks we will fix 2 more bits.

Subblock 1: 140.15.89.01000000 to 140.15.89.01001111  
 $\equiv$  140.15.89.64/28 to 140.15.89.79/28

Subblock 2: 140.15.89.01010000 to 140.15.89.01011111  
 $\equiv$  140.15.89.80/28 to 140.15.89.95/28

Subblock 3: 140.15.89.01100000 to 140.15.89.01101111  
 $\equiv$  140.15.89.96/28 to 140.15.89.111/28

Subblock 4: 140.15.89.01110000 to 140.15.89.01111111  
140.15.89.112/28 to 140.15.89.127/28

### ③ FRAGMENTATION OFFSET

It is a field in the IP header. This field helps the destination device to place the fragments in the proper sequence to build the original packet.

It indicates the ~~the~~ starting position of the data in the fragment in relation to the start of the data in the original packet.

In the first fragment the offset is 0 as the data in this packet starts in the same place as the data in the original packet.

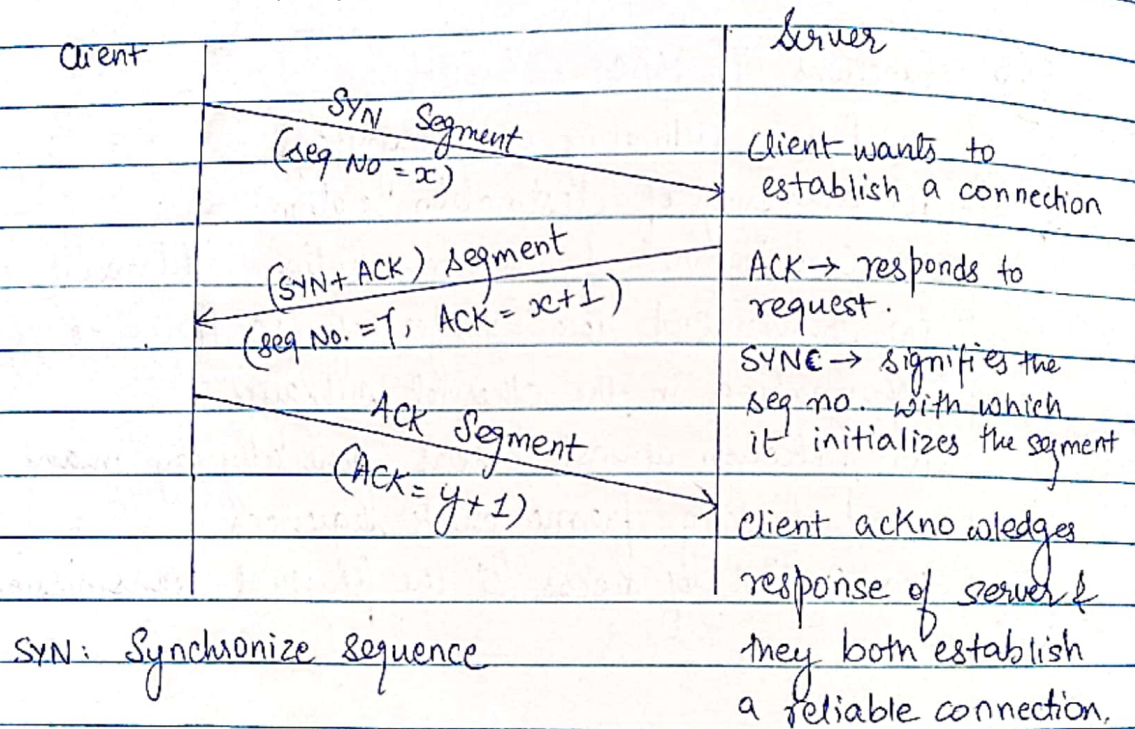


Fragment offset has 13 bits. But maximum fragment offset possible =  $(65535 - 20) - 1 = 65514$   
 So we need to scale down fragment offset field by  $2^{16} / 2^{13} = 8$  which acts as a scaling factor.

#### (4) Three way handshaking technique

It is a process used in a TCP/IP network to make a connection b/w the server & client.

It is a three step process.

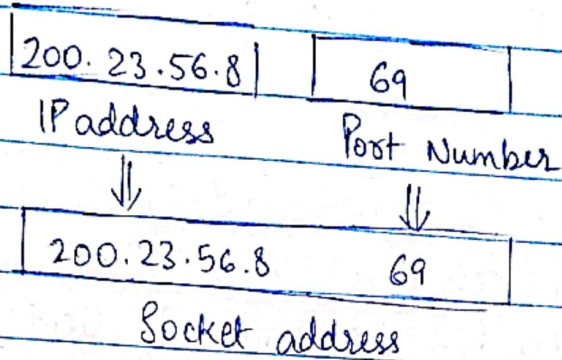


#### (5)

- Socket interface is based on UNIX, defines a set of system calls or procedure. The communication structure needed in such a programming is called a socket.
- Socket acts as an end point.
- 2 processes can communicate iff they have a socket at each end.



- Socket address is a combination of IP address and Port No.
- It is a 48 bit address



### ⑥ Functions of MAC:

- (i) Frame delimiting and recognition.
- (ii) Addressing of destination station.
- (iii) Convergence of source-station addressing information
- (iv) Transparent data transfer of LLC PDUs or of equivalent information in the ethernet sublayer.
- (v) Protection against errors generally by means of generating and checking frame check sequences.
- (vi) Control of access to the physical transmission medium.

### ⑦ Transport layer features are:

\* Process to Process delivery:  $\pi$  header includes services point address which is port address. This layer gets the message to the correct process on the computer unlike Network layer, which gets each packet to the correct computer.



\* Segmentation & reassembling: A message is divided into segments each segment contains sequence number which enables this layer in reassembling the message.

\* Connection Control: Two types: Connectionless & connection-oriented.

\* Flow Control: In this layer flow control is performed end to end.

\* Error Control: Performed end to end to ensure complete message arrives without any error. Error correction is done through retransmission.

8.

(a) 182.270.37.102

(b) 182.270.118.155

(c) 182.270.189.23

All of these IP addresses are invalid.

9.

The Internet Group Management Protocol (IGMP) is a communications protocol used by hosts & adjacent routers on IPv4 networks to establish multicast group memberships. The IGMP is an integral part of IP multicast & allows the network to direct multicast transmissions only to hosts that have requested them.



Computers & other devices connected to a network use IGMP when they want to join a multicast group. A router that supports IGMP listens to IGMP transmissions from devices in order to figure out which devices belong to which multicast group.

(10) UDP wraps datagrams with a UDP header. The header size is 8 bytes.

The header contains the following four fields.

\* Source Port: The port of the device sending the data. The field can be set to zero if the destination computer doesn't need to reply to the sender.

\* Destination Port: It identifies which port is going to accept the information.

\* Length: It is a 16 bit field that specifies the entire length of the UDP packet that includes the header also.

\* Checksum: It allows the receiving device to verify the integrity of the packet header & payload.

Source Port No (16 Bit)	Destination Port No (16 Bit)
Total Length (16 Bit)	Checksum (16 Bit)