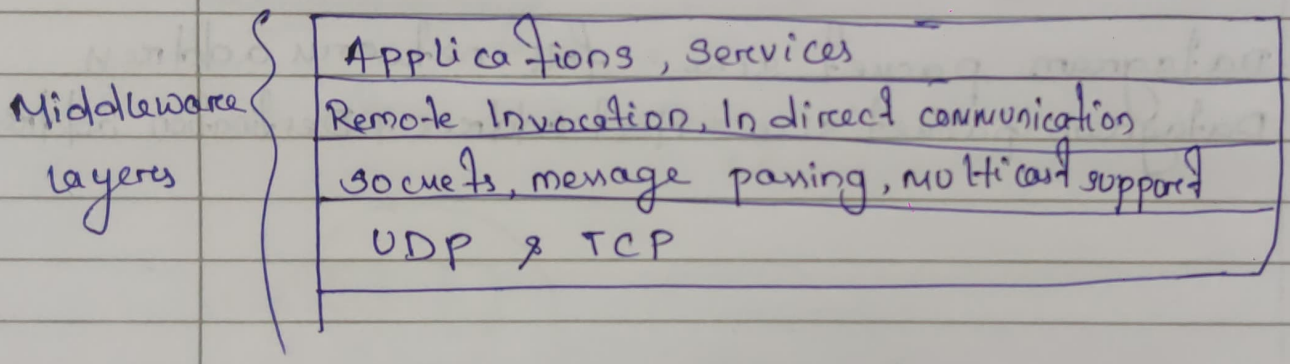
Ch-4

Interprocess communication

Sending a msg from UDP

```
import java.net;
import java.io;
Public class UDPclient {
    Public static void main (String args[]) {
        Datagram Socket aSocket = null
        try {
        }
    }
```



UDP datagram communication —

1) Message size
2) Blocking
3) Timeouts
4) Receive from any.

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Datagram packet :-

Array of Bytes (info)	Length of Menage	Internet add^{n}	Port Number

Use :-

(i) store source & destination add^{n}

(ii) Transmision of extra menages

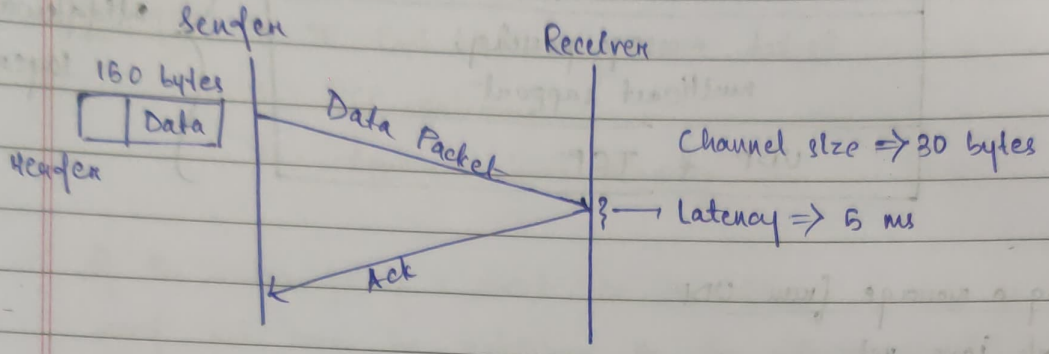
(iii) Latency for the sender.

| 8 | 24 | — Class A

| 16 | 16 | — Class B

| 24 | 8 | — Class C

Datagram Packet Transfer



Find total time taken by data packet to send the Ack at receiver end.

$$\text{No. of packets} = \frac{\text{Main packet size}}{\text{Channel capacity}}$$

Q. Data packet size = 190 B
Channel size = 27 B
Latency = 5 ms
Ack lost of 3rd packet
Find the total time to receive all the ack.

Ans $\text{No. of packets} = \frac{190}{27}$

Important for mid sem

Ch-3

N/W Principles

- Packet transfer
- Bandwidth
- Switching
- Routing
- Protocols
- Internet n/w & congestion control

Q. 187.26.54.12

Unicast n/w ID =>

Multicast n/w ID =>

187.26.0.0

187.26.255.255

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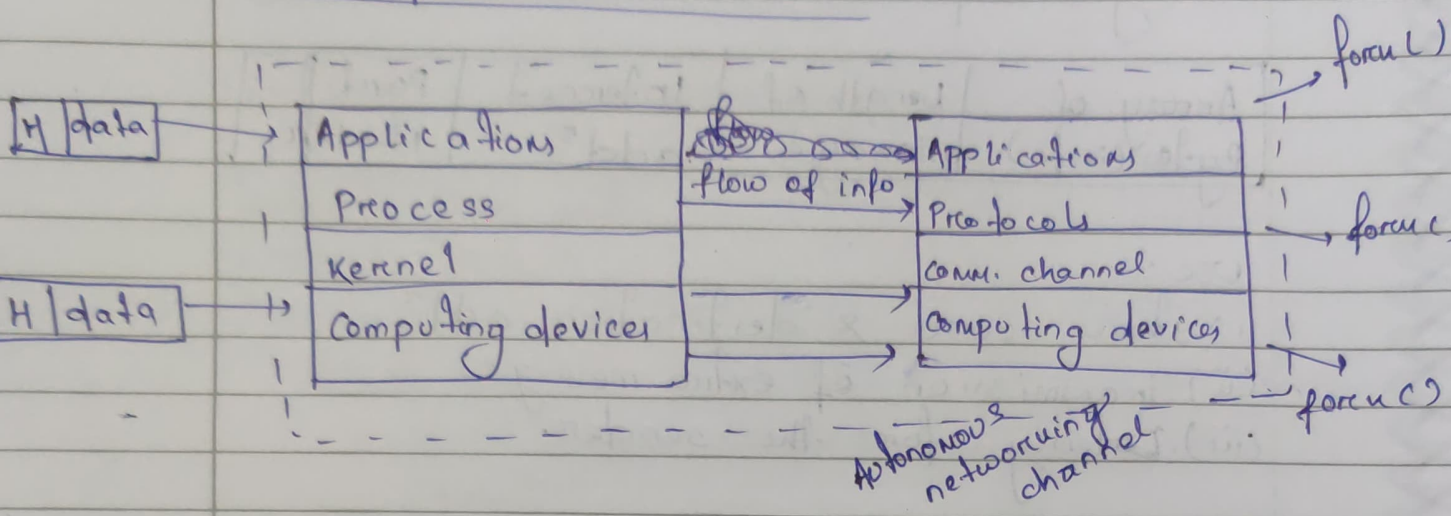
Inter process communication



~~Synchronous and~~ synchronous and asynchronous communication

Communication b/w the sending and receiving process may be either synchronous or asynchronous. In synchronous form of communication the sending and receiving process synchronize at every point. In asynchronous form of communication the use of the Set operation is non-blocking and sending process is allowed to proceed as soon as the message was been copied to a local buffer.

Message destinations

In message destination, Internet protocols, messages are sent to in the pair of internet address and local port.

Reliability

If all the actual packets of information received at the receiving channel interprocess communication is reliable.

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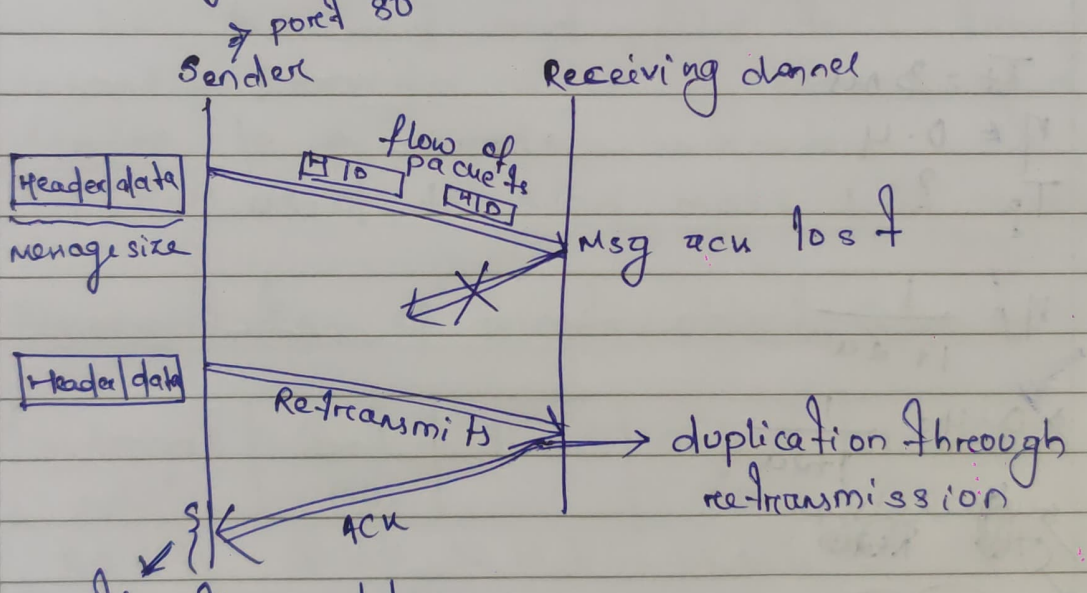
Ordering

Some application require that message be delivered in sender order. The delivery of message out of sender order is treated as a failure by such application

TCP Stream Communication

(i) Message size
(ii) Lost messages
(iii) flow control
(iv) Message duplication and ordering
(v) Message destination



Q) Transmission Time (T_t) = 1ms
Propagation Time (T_p) = 1ms
Efficiency (η) =

$$a = \frac{T_t}{T_p}$$

$$\eta = \frac{1}{1+2a} = \frac{1}{1+2} = \frac{1}{3}$$

$\eta = 50\%$

$T_p = 1\ ms$

$a = \frac{T_t}{T_p} = T_t = T_p \times a$

$T_t = \frac{1}{2}$

$\eta = \frac{1}{1+2\times a}$

$\Rightarrow 50\% = \frac{1}{1+2a}$

$\Rightarrow \frac{1}{2} = \frac{1}{1+2a}$

$1+2a = 2$

$\Rightarrow 2a = 1$

$a = \frac{1}{2}$

$T_t = T_p \times a = 1 \times \frac{1}{2} = \frac{1}{2} = 0.5\ ms$

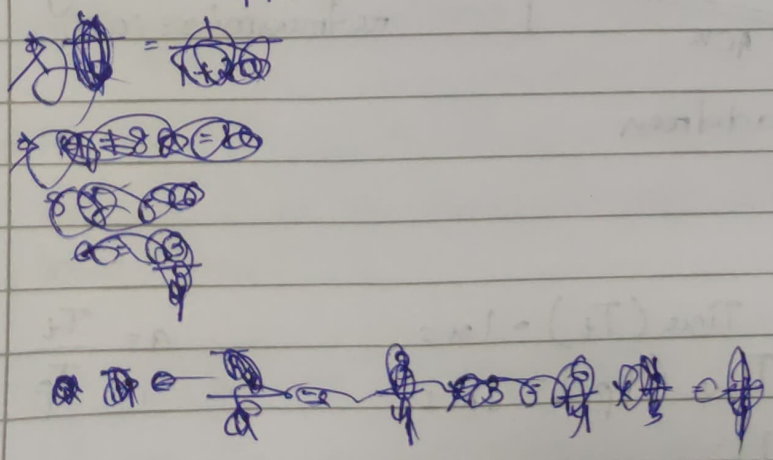
Q. $T_t = 3\ ms$

$\eta = 0.4$

$T_p = ?$

$\eta = \frac{1}{1+2a}$

$\Rightarrow 0.4 = \frac{1}{1+2a}$



Issues in stream Communication

1) Duplication of flow of data (info)
2) Matching of data items
3) Blocking of flow on the communication channel
4) Integrity problem which checking the validation of receiving data.

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Use of TCP services

HTTP → used for communication b/w web browsers and web servers
FTP → Allows directories on a remote computers to be browsed and files to be transfered.
Telnet → Provides accen by means of a terminal session to a remote computers.
SMTP → used to send mail b/w computers.

Representation of remote object Reference

Internal add^n	Port no.	time	object no.	Interface of Remote object
32 bits	32 bits	32 bits	32 bits	

Multicast Communication :-
(i) fault tolerance based on replicated services
(ii) Better performance through replicated data
(iii) Discovering services in n/w system
(iv) Propagation of event ordering.

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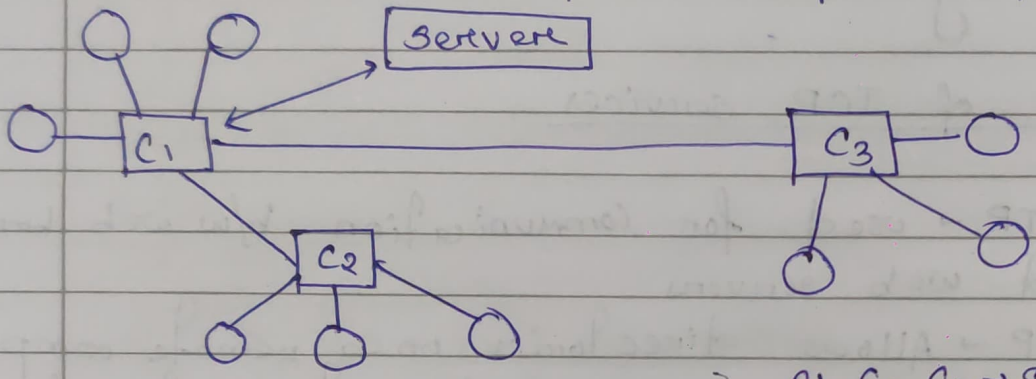
Overlay networks

It is a virtual n/w consisting of nodes and virtual links which offers :-
(a) a service for higher level communication (multimedia content transfer)
(b) Provide more efficient operation for routing



C1, C2, C3 → Super node
—○ → ordinary Host

Types of overlay

Distributed hash tables
Peer-to-Peer file sharing
Content distribution networks

wireless ad hoc networks
Disruption-tolerant networks

Multicast
Resilience
Security