- TCP → Transmission control protocol → acknowledge based mechanism. (feedback)
  (Transport layer protocol)

① What does TCP does?

① send data (appropriate transmission rate)

② segment data

③ Congestion control
↳ a technique to prevent the network from becoming overloaded with too much data at once.

④ Identify and retransmit message.

* Application

① FTP → port 21 or 22

② SSH →

③ email →

④ web browsing → HTTP | HTTPS

- Key features *
  - connection oriented
  - full duplex
  - Point to point transmission (should have 2 endpoints)
  - Error control
  - Congesion control

- segment Header

• Headers •

↳ small blocks of metadata attached to data that tells the network how to handle, route and deliver the data.

• TCP

- Byte streaming
- connection oriented
- Full Duplex
- Piggybacking
- Error control
- Flow control
- Congestion control

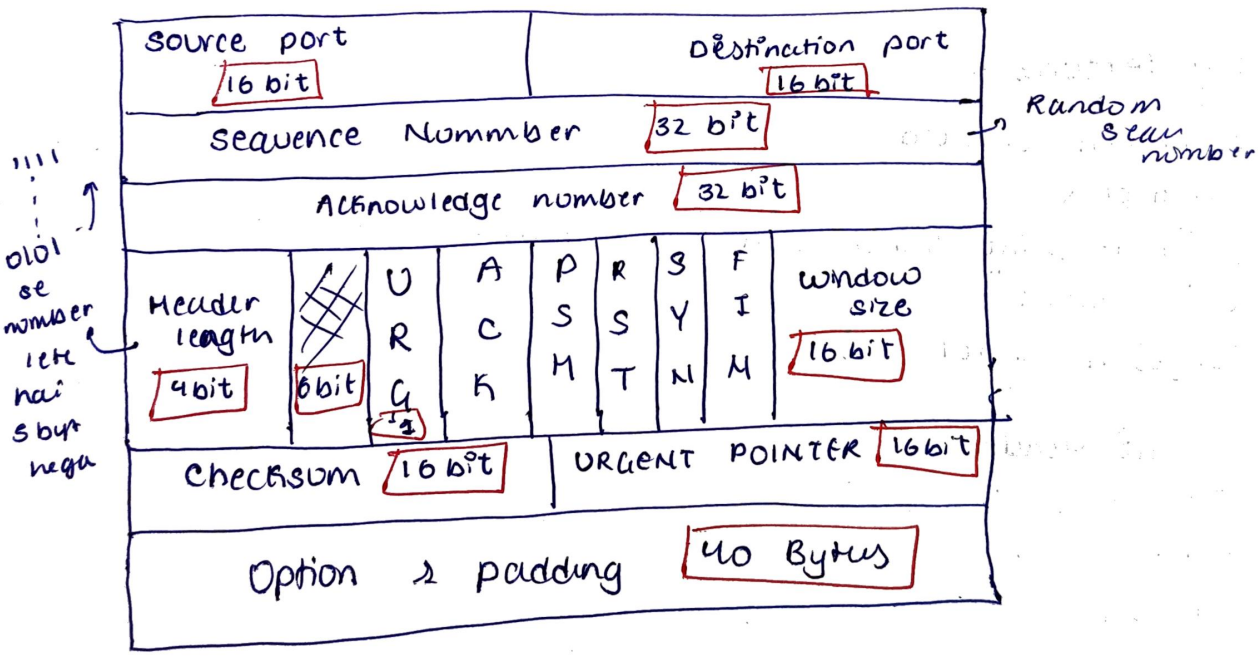
0-1023 → well known port

16 bit ⇒ 2^{16}
↓
0-65535

o

collection of byte → segment

• * TCP Header (20 - 60B) (min, max.)



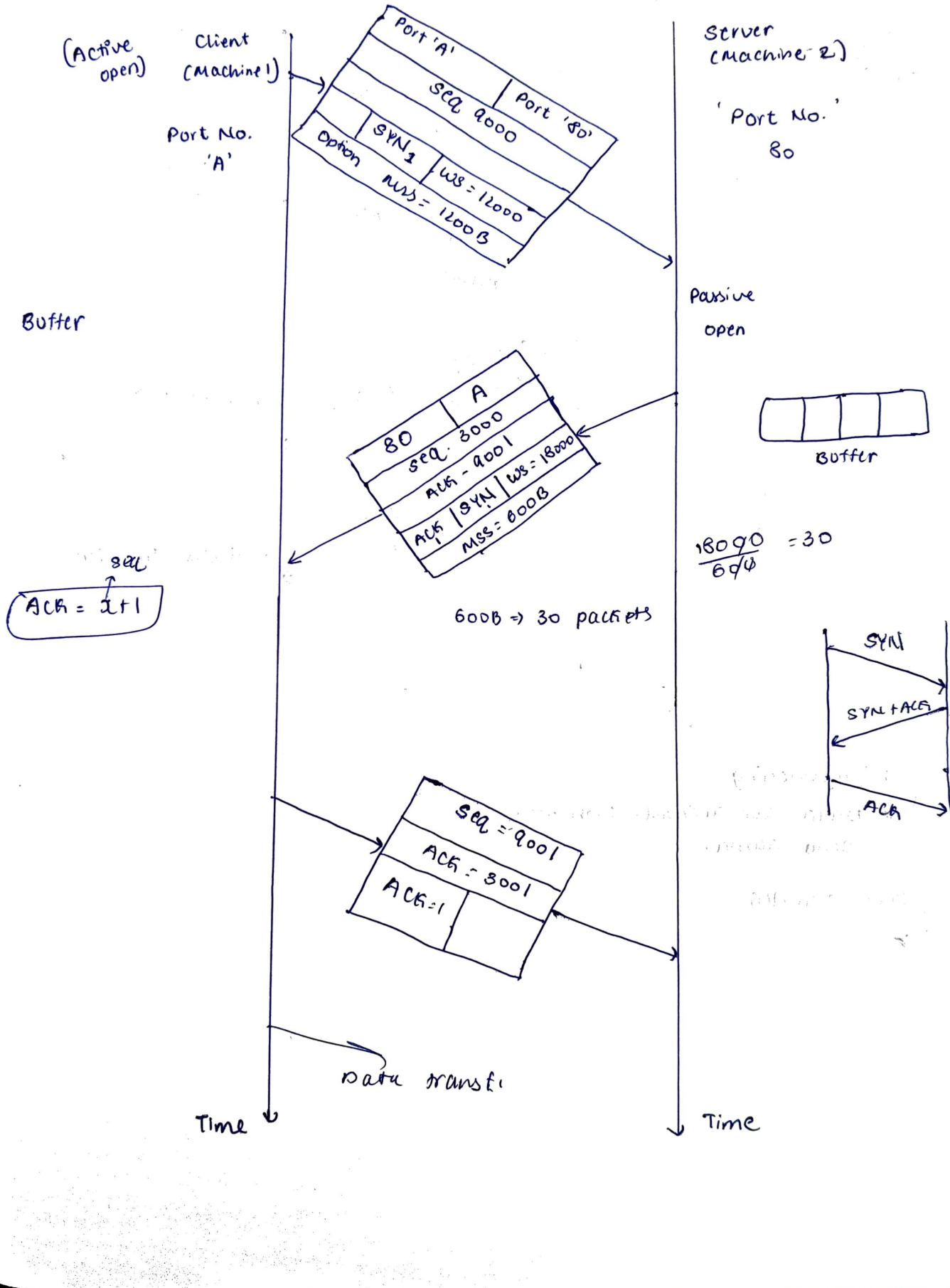
Checksum → used in error control

↳ urgent pointer → isma data urgent hai aur baaki normal hai.

① → O & P → Maximum segment size (MSS)

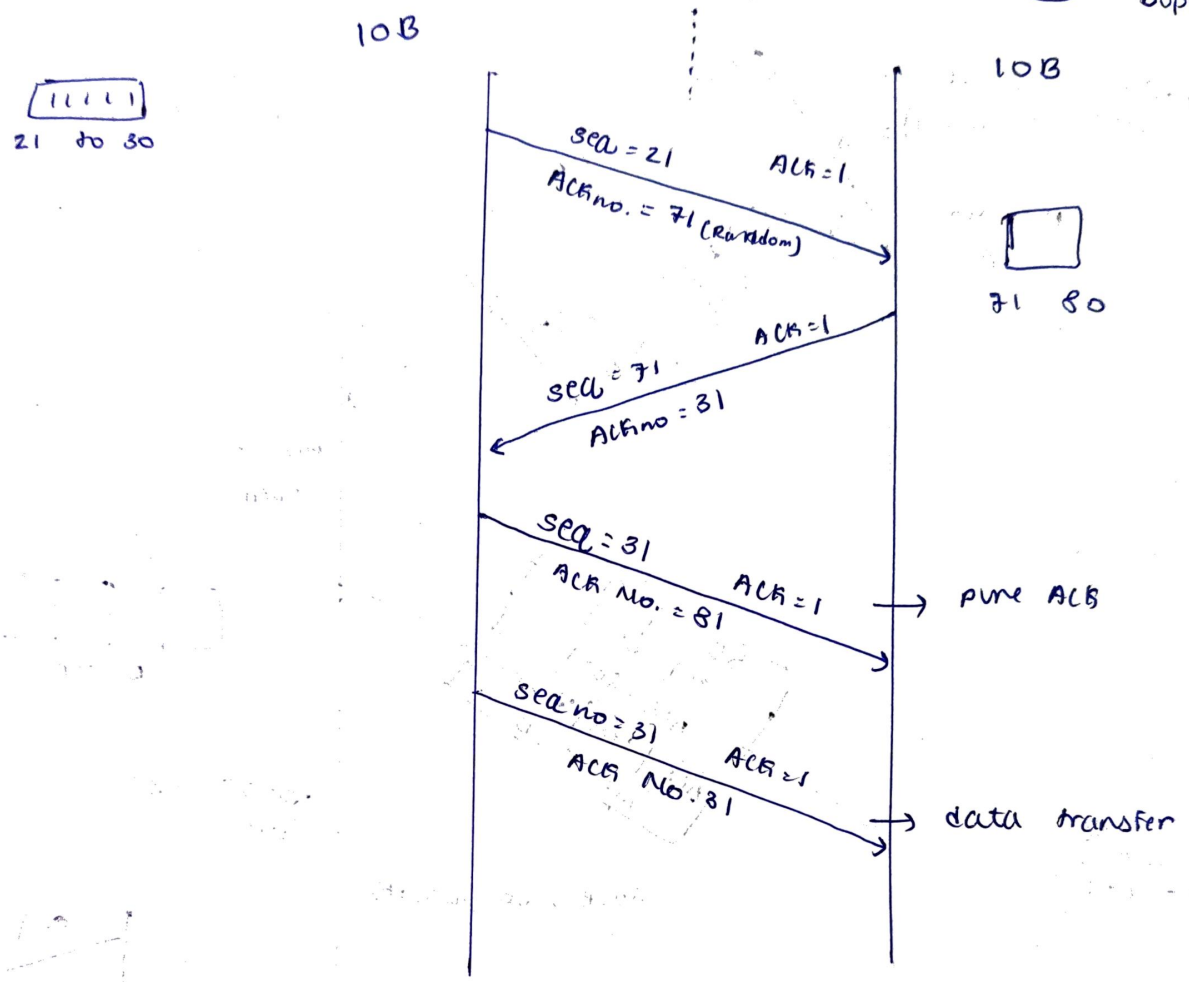
→ TCP 3 way connection Establishment :

seq → 0 → $2^{32}-1$



TCP Data Transfer

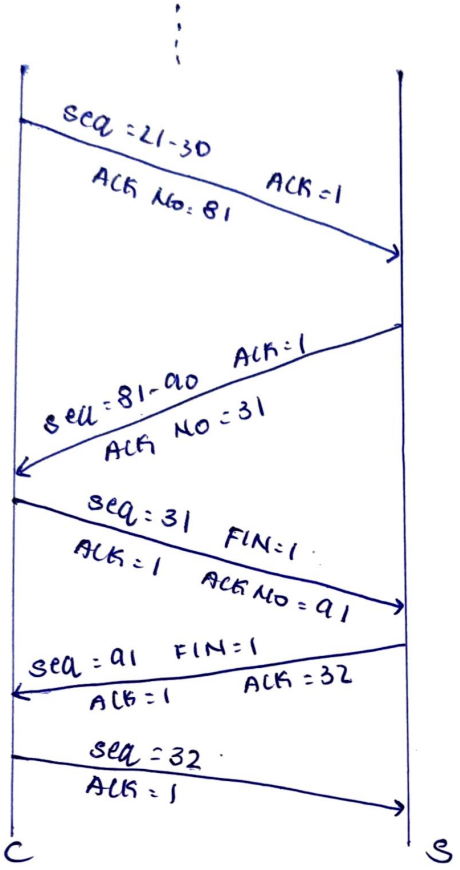
C ⇄ S Full Duplex

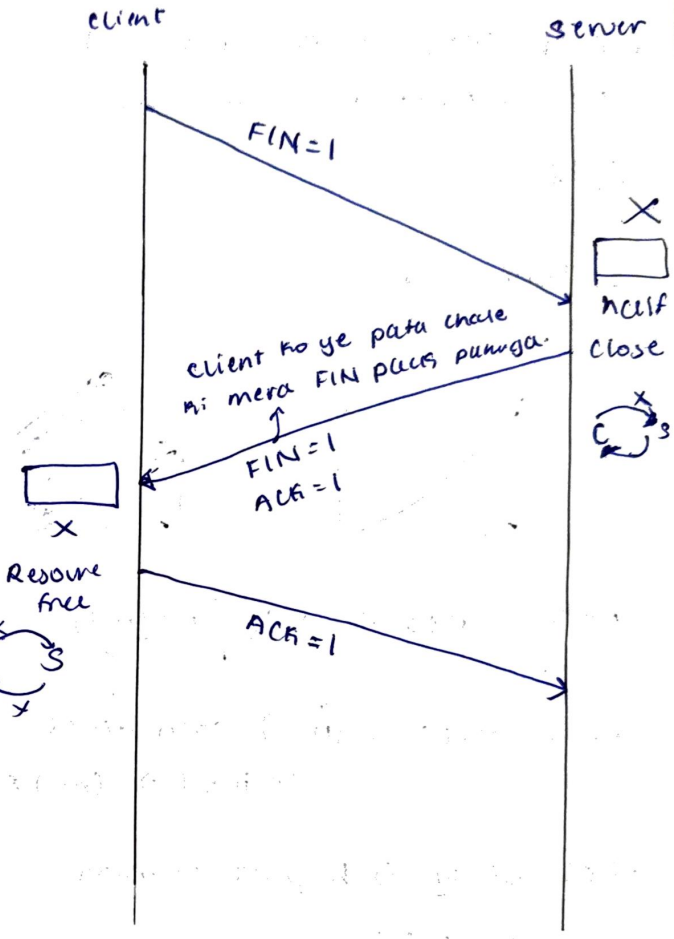


Piggybacking
↳ Data aur ack wali sath mai send karna.

Pure ~~ACK~~ ACK
↳

TCP connection termination ; 3 step or 4 step

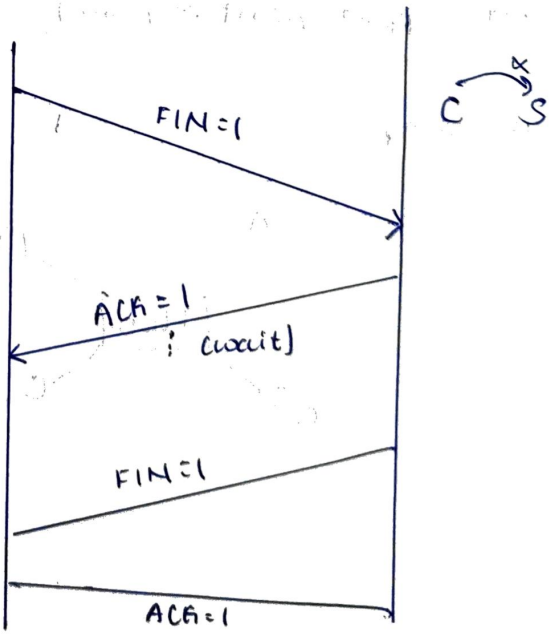




FIN :) FINISH → ye seaveuce number consume karta hai.

X → Jo bhi resources server reserve kiya hai unko release kar dega.

seq = 31 → ye consume nhi hoga.



Agar server ka man nhi kar rha hai toh vo bas ACK = 1 aur data bhej sakta hai. Bad mai jab FIN = 1 hoga connection band hoga.

Application Layer Protocol :

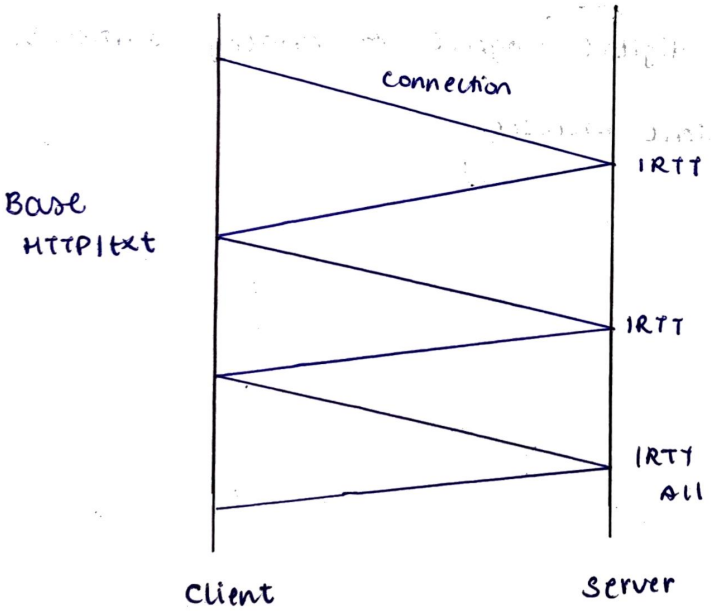
HTTP (Hyper text transfer protocol)

- Port 80
- Itself not reliable
- Inband Protocol
- Stateless
- HTTP 1.0 Non-Persistent
- HTTP 1.1 Persistent
- Commands (Head, Get, Post, Put, Delete, Connect)

- **Persistant HTTP connection (HTTP/1.1)**

① server leaves connection open after sending response 1 RTT for all referenced object

② Less overhead



Non-Persistant HTTP (HTTP/1.0)

1. It require 2 RTTs per object
2. More overhead