Non Routable Address Spaces

used for only interior network

Application Layer :-

Allows the applications to communicate in a way they understand.

TCP port & sockets

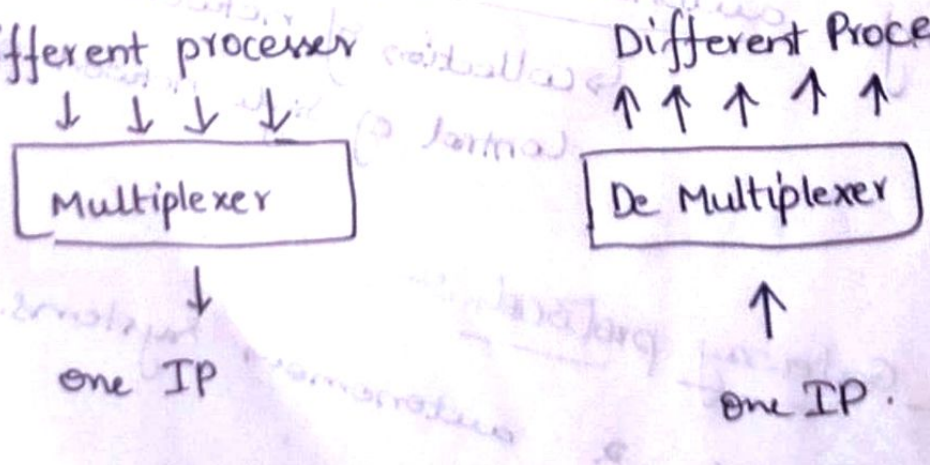
Transport Layer :-

Multiplexing, DeMultiplexing. using port

TCP vs UDP

3-way handshake

How firewalls keep networks safe...



Port :-

16 bit number (what is it?)

used to direct traffic to specific services running on a networked computer. (why is it?)

Server or a Service

A program running on a computer waiting to be asked for data.

Different network services run while listening on specific ports for incoming requests.

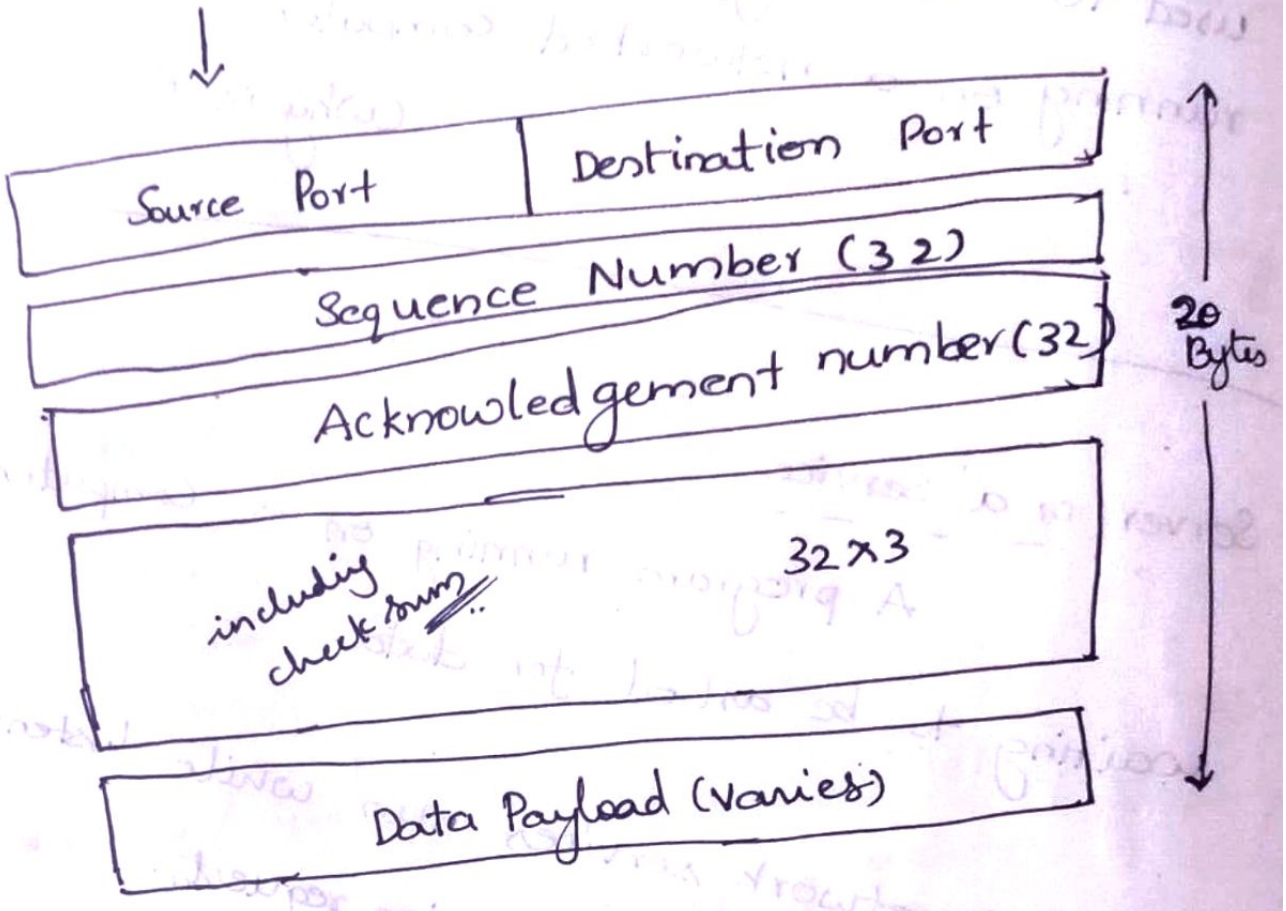
Traditional Port for HTTP is Port 80.
or
web Traffic

Socket Address :-

10.1.1.100 : 80
IP — port number.

TCP Segment :-

TCP header and data section



Source Port :-

high numbered port chosen from a special section of ports known as ephemeral ports.

Sequence Number :-

Sequence Number in the divided parts.

TCP control Flags and 3-way handshakes :-

(URG) → Urgent

(ACK) → Acknowledgment

(PSH) → Push

The transmitting device wants the receiving device to push currently-buffered data to application on recieving end as soon as possible.

(RST) → Reset.

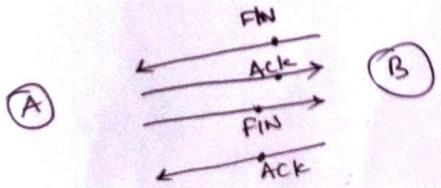
one of reciever/sender messed up reading and want to startover from scratch.

(SYN) Synchronize

Synchronize the sequence number field at the recieving end.

(FIN) Finish.

Three way handshake to establish TCP connection.



Four way handshake to close TCP connection.

TCP socket states :-

You can send traffic to any port you want but you are going to get a response if a program opened a socket on that Port.

LISTEN — socket is ready and listening.

SYN_SENT — (synchronization request is sent but Connection not established)

SYN_RECEIVED

ESTABLISHED

FIN_WAIT → Finished but acknowledgment not recieved from other side.

CLOSED

Connection Oriented & Connectionless Protocal

↓
Establishes a connection and make sure all data is properly transmitted. (TCP)

Too much traffic for every acknowledgement

Only used if you want to transmit Perfectly.

UDP

Just set destination port and send the data

Lot less traffic could but lose some data on the way

used for Video Streaming.

Firewalls:- Device that blocks traffic that meets certain criteria.

HTTP:- (web browsers & Servers)

Name Resolution → DNS :-

DNS's function

Strings of letters → IP Addresses

Domain Name → IP Address — Name Resolution.

MAC Address — Hardcoded for a device

IP Address
Subnet Mask
Gateway for a host
DNS Server

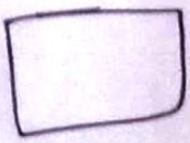
} Must be Configured for a host to operate on a network.

DNS uses (UDP) for communications.

Because only 1 UDP datagram is needed,
if more is needed, establish a TCP Connection.

user

DNS Server
(Caching / recursive)



DHCP :- Application layer protocol that automates the configuration process of hosts on a network.

Dynamic Allocation :-

A range of IP addresses is set aside for client devices and one of theses IP's is issued to these devices when they request one.

Network Address Translation :-

IP masquerading..

(Middleman hiding the source IP)

Port Preservation :-

Middle man router remembers/keeps the same port for communication

Port forwarding :-