Computer Network

What is a network ?

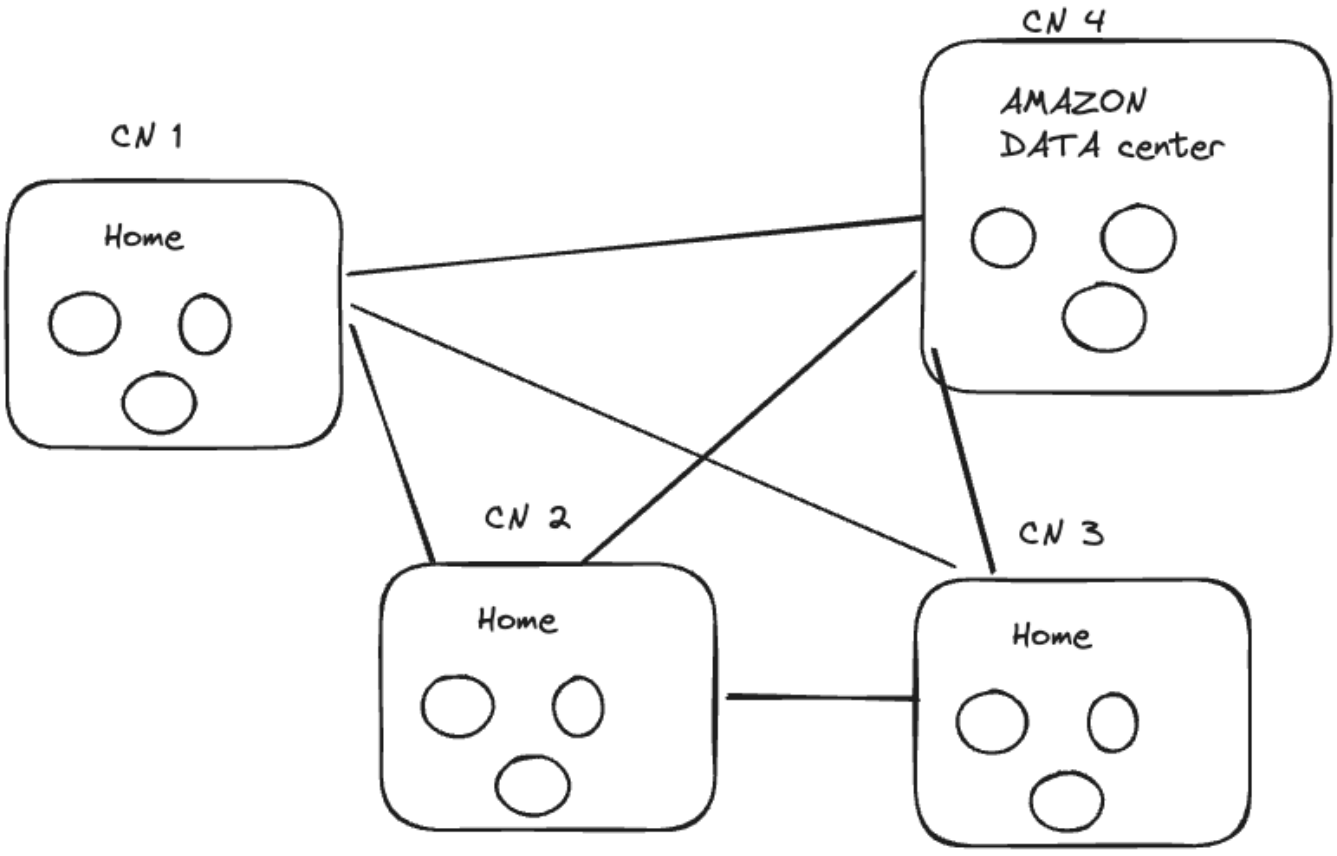
Network in simple terms is a connection between two or more entities. Ex: Social network (FB), network of roads/highways etc.

What is a computer network ?

Computer network is a network of 2 or more computers connected with each other.

What is Internet ?

Internet is network of multiple computer networks.



Here we have multiple small computer networks connected with each other over the internet.

Terminologies

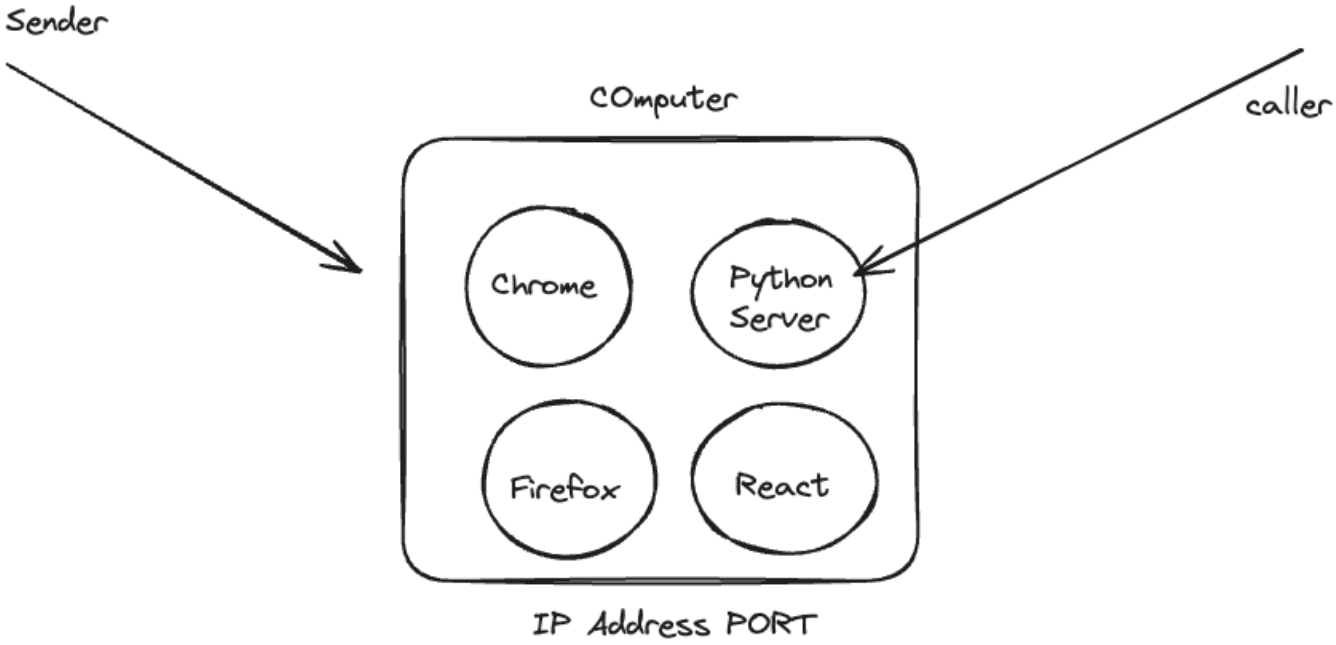
IP Address

IP Address is a unique address allocated to a machine, using which other machines can send data to it. IP Address helps us to locate where the machine is present.

But if a sender is sending data to our machine after identifying our IP address, how does it know which process to communicate to ? Because in our machine, we have probably 100s of processes running.

Port Number

It is a unique number in the 65.535 which every network oriented process is going to be allocated, using which anyone can identify the process they want to communicate to on the given machine.



Together the combination of IP address and PORT written in the form : **Ip_address:PORT** is called as **Socket Address**.

Whenever we have to refer the same machine from which we are calling then instead of giving the actual IP, we say `127.0.0.1` or `localhost` and it automatically understands that we need to communicate to the same machine from where we are calling.

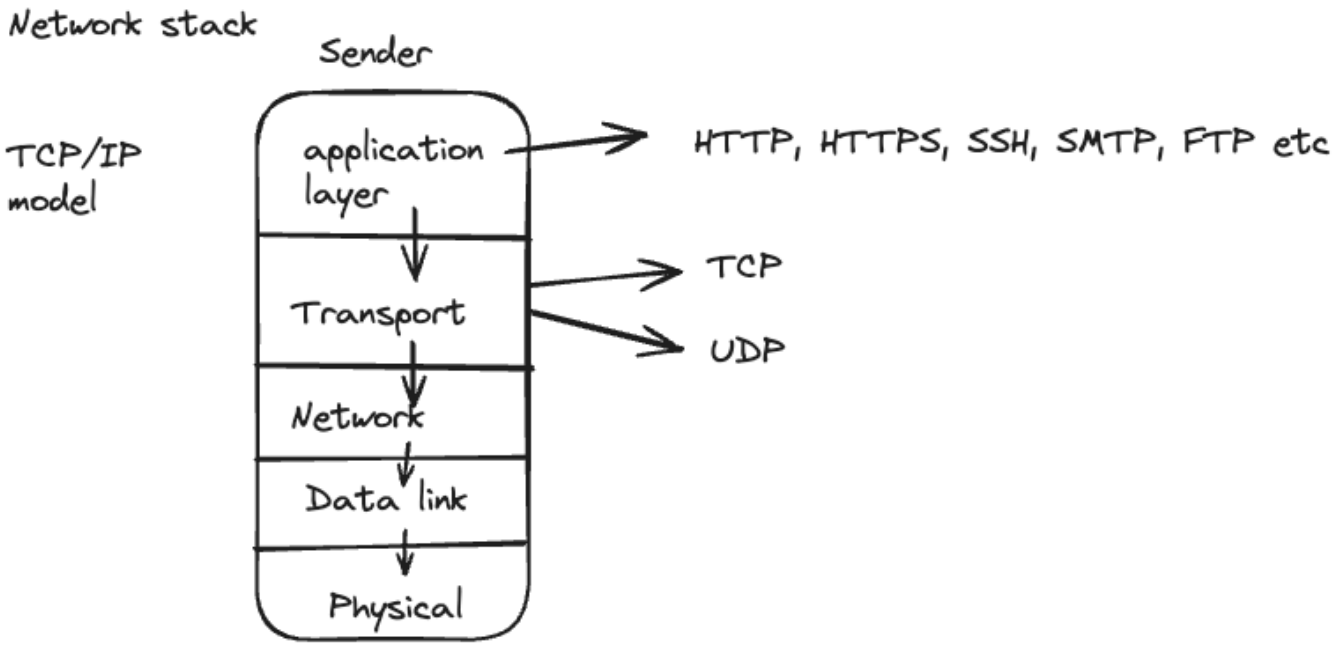
Protocols

Protocols are rules setup to define how two machine should communicate in a certain way.
If terminal of one machine has to communicate with terminal of another machine, it needs

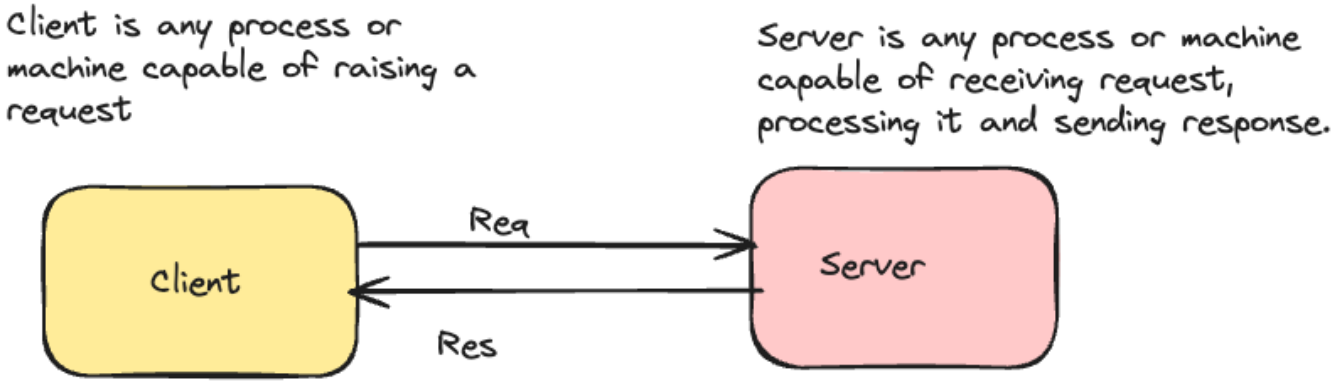
different type of rules and if browser of your machine has to communicate with a process running on another machine it will be having different set of rules.

- HTTP, HTTPS
- SSH
- FTP
- SMTP
- Web rtc
- and more ....

Network Stack - TCP/IP Model



Client server architecture



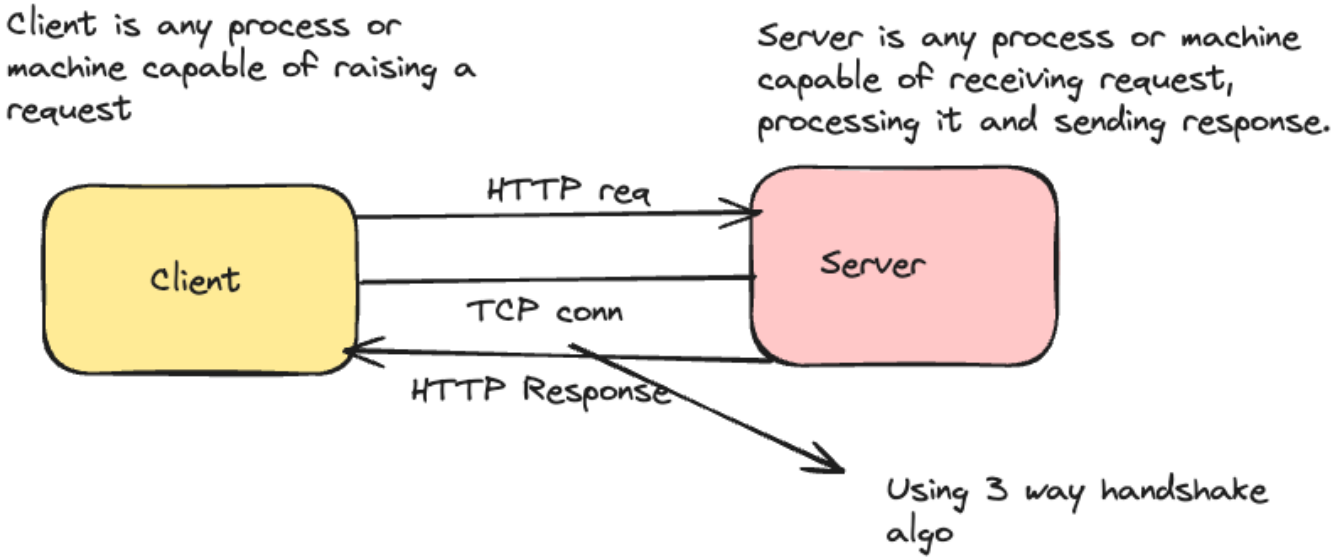
In a client server architecture, client makes a request and sends all the relevant details required

for processing the request.
Server collects the request and the incoming details, processes it and then send a response back.

HTTP Protocol

HTTP (Hyper text transfer protocol). Any document having a hyperlink, is classified as a hyper text. Hyperlink is any link using which we can redirect to any other hyper text document.

HTTP protocol depends on TCP. There is a TCP connection that is setup between client and server using 3 way handshake algorithm and then only we can send / receive http req/res.



Every HTTP request and response has a lot of details.

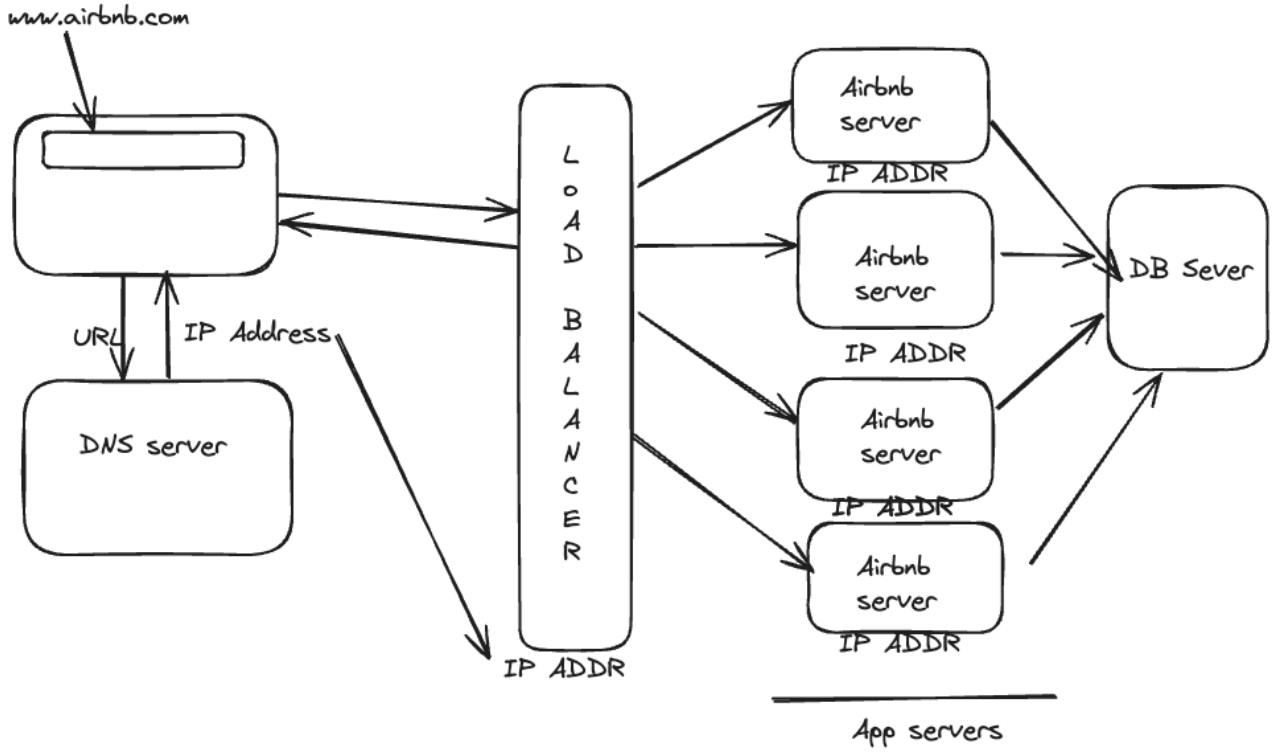
HTTP Request

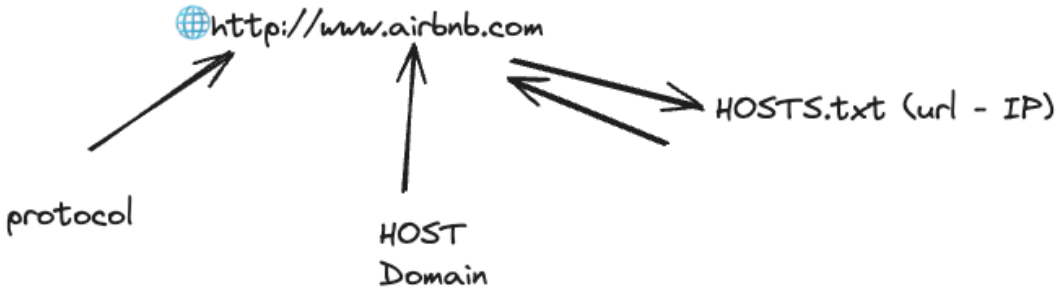
- URL
- HTTP method
- Request headers
- Request Body

HTTP Response

- Response header
- response payload

- HTTP Response code





DNS (Domain name server)

URL - IP