Network:

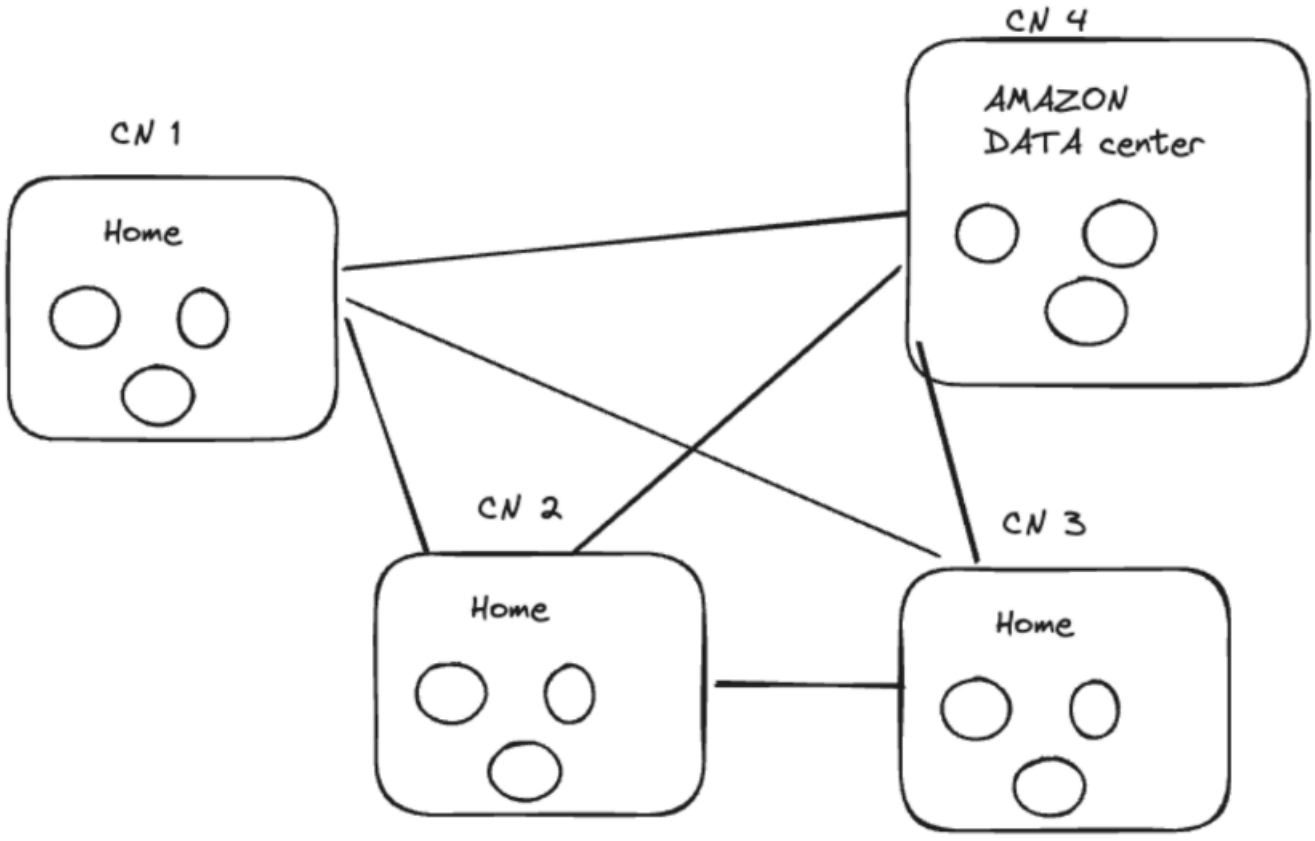
Network in simple terms is a connection between two or more entities.

Computer Network:

A computer network is a collection of devices that are connected to each other and can share resources and data. These devices can be connected by wire or wireless signals, and they use communication protocols to send information.

Internet:

The internet is the global system of interconnected computer networks that uses the internet protocol suite(TCP/IP) to communicate between networks and devices. It is network of networks.



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

Terminologies

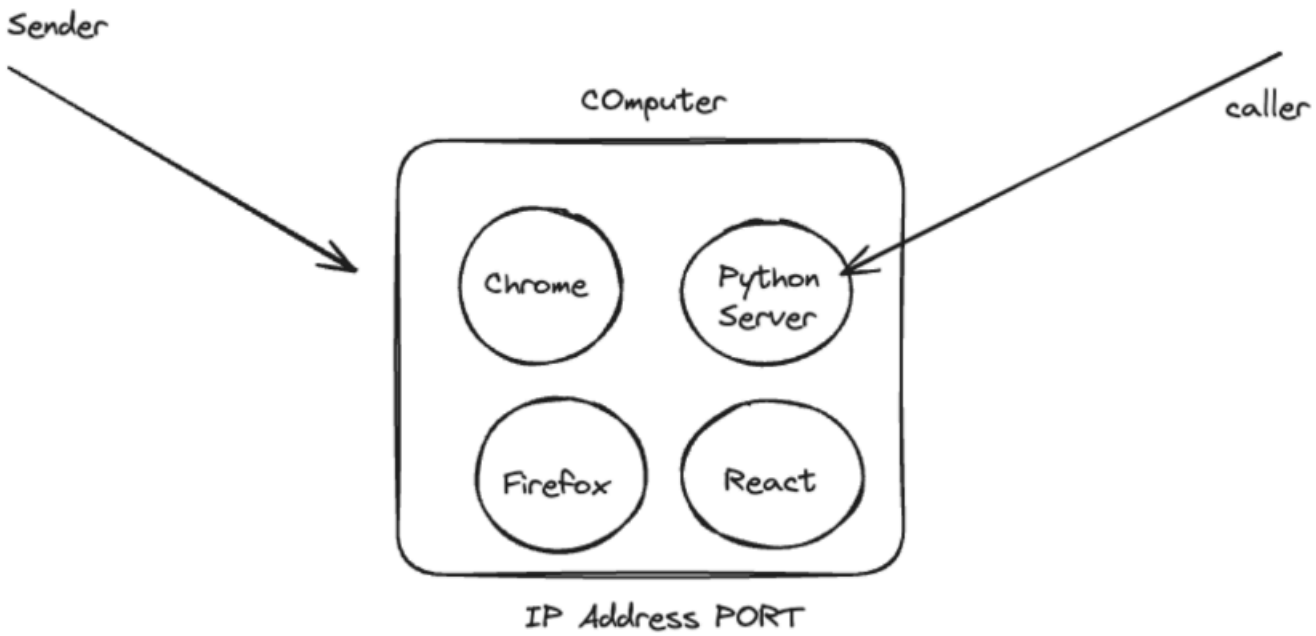
IP address : (Internet Protocol)

An IP address is a unique number that identifies a device on the internet or local network. IP address are essential for the internet to function because they allow devices to communicate with each other by sending and receiving data packets.

But if a sender 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 (like chrome, firefox, react, python etc...)

Port Number :

The range of port number is 0 to 65,535 which every network oriented process is going to be allocated to unique port number, using which anyone can identify the process they want to communicate on the given machine.



Together 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 (means receiver and sender machines is same machine like within same computer we want to share) from which we are calling then instead of giving the actual IP, we say `127.0.01` or `localhost` and it automatically understands that we need to communicate to the same machine form where we are calling.

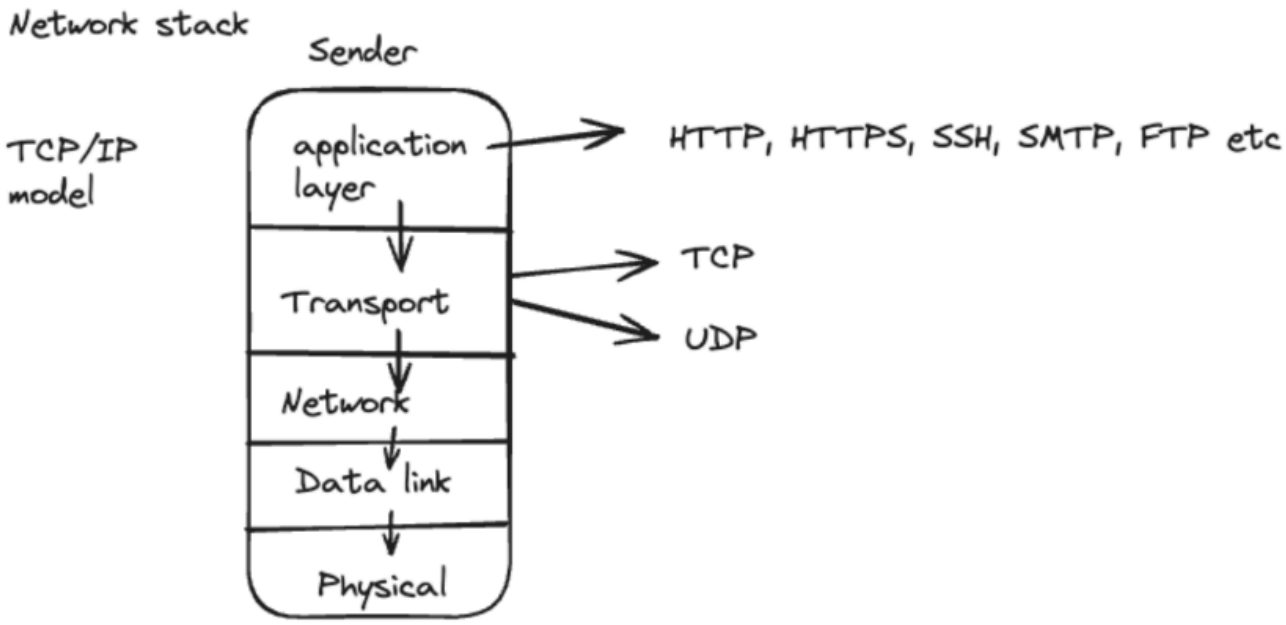
Protocols:

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 need different types 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 :

TCP/IP is a five layer model which helps you to send the data over the internet.



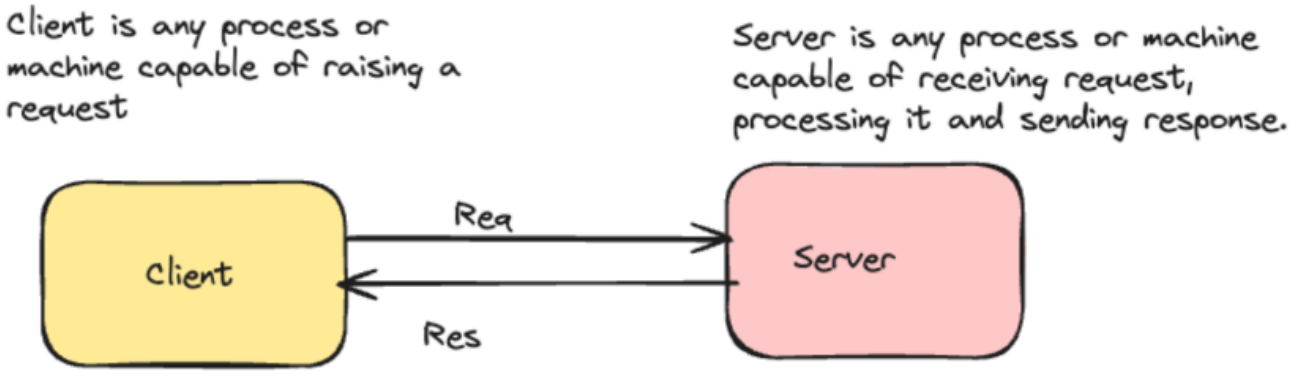
OSI model :

OSI model is a seven layer model which helps you you to send the data over the internet .

7	Application Layer	Human-computer interaction layer, where applications can access the network services
6	Presentation Layer	Ensures that data is in a usable format and is where data encryption occurs
5	Session Layer	Maintains connections and is responsible for controlling ports and sessions
4	Transport Layer	Transmits data using transmission protocols including TCP and UDP
3	Network Layer	Decides which physical path the data will take
2	Data Link Layer	Defines the format of data on the network
1	Physical Layer	Transmits raw bit stream over the physical medium

Client server architecture :

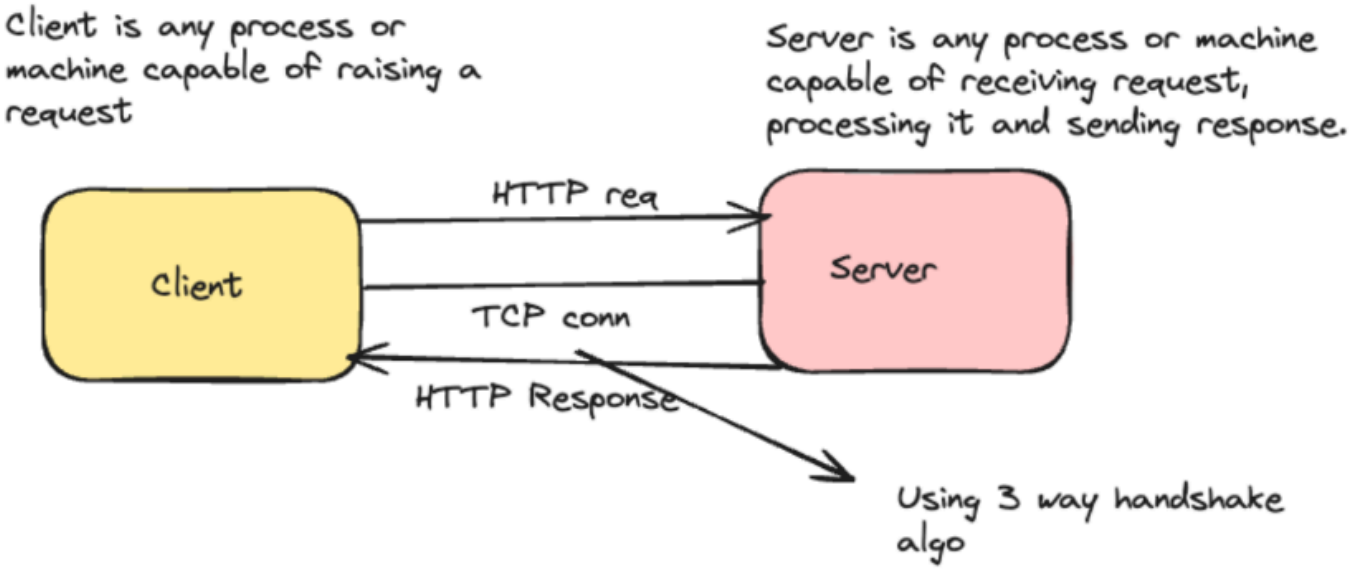
In a client server architecture, client makes a request and sends all the relevant details requires for processing the request.
Server collects the request and the incoming details, processes it and then send a response.



HTTP Protocol :

HTTP(Hyper text transfer protocol). Any document having a hyperlink, is classifies 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 :

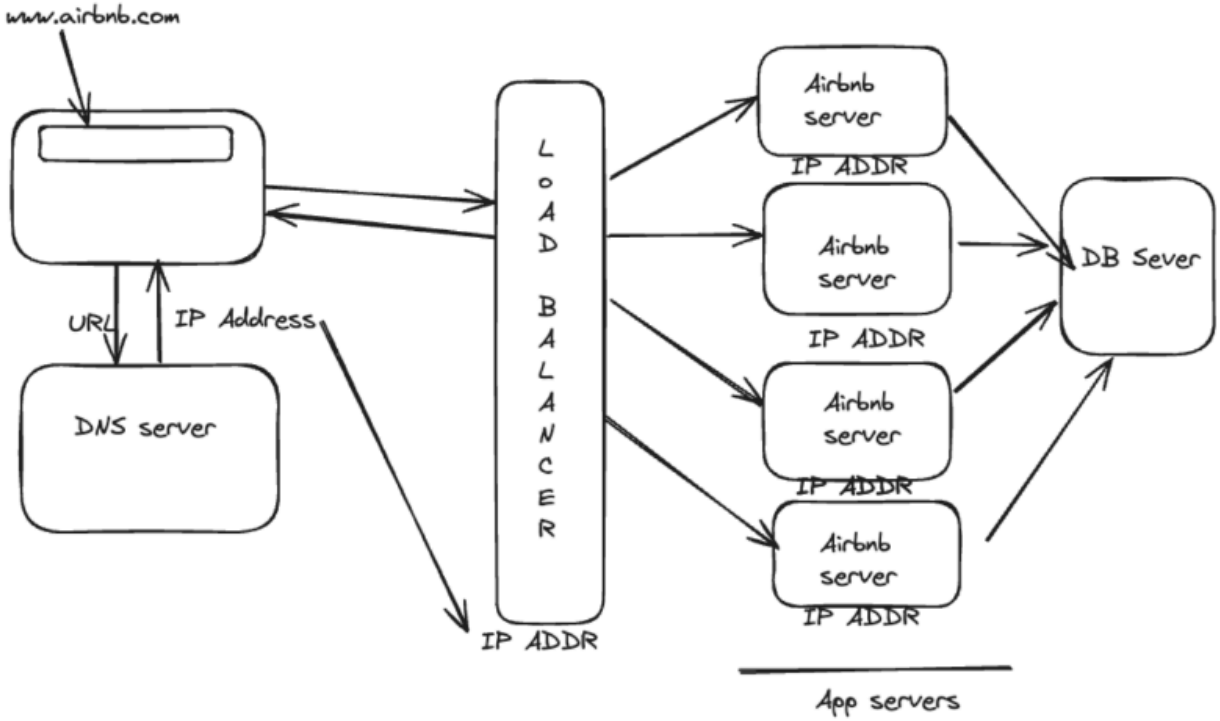
- URL
- HTTP method
- Request headers
- Request Body

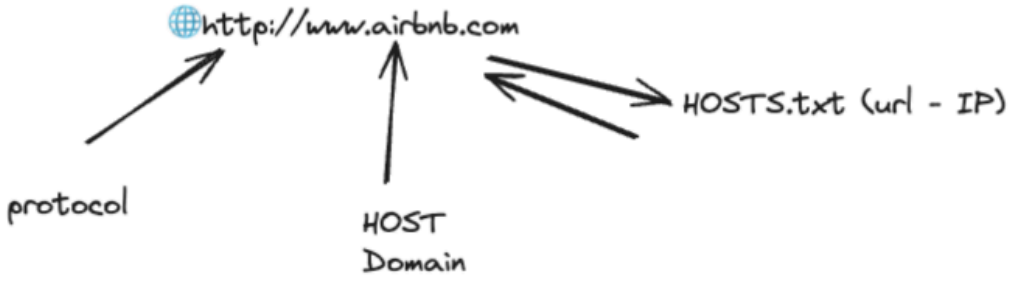
HTTP Response :

- Response header
- response payload

What happens when we do www.google.com ? or www.airbnb.com anything (interview question)

- HTTP Response code





DNS (Domain name server)

URL - IP