3. Client Server Architecture & Internet Protocols

NS → Name Server
→ Who is responsible to now resolve that DNS query

Q. Why txt Record exist

→ It is simple used to store plain text information for a domain

It is mainly for
- Domain verification (google, GitHub, Facebook, etc)
- Email security (SPF, DKIM, DMARC)
- Ownership proof
- Custom metadata

Sample example
Google might ask you to this txt record

type : txt
name : @
value : google-site-verification = abc123

It tell you own this domain

① SPF (Protect from email spam)
↳ who is allow to send me email

imagine you own a Company

visitcodecon

You tell the office
only those claims boy can be send to my
letter

MX Record
↳ mx stored for mail exchanger

(Or) Read about SPF & DMARC

DMARC → If an email claiming to be
from my domain fails SPF or
DKIM, then do this.

Real life example

imagine your domain visitcodecon
someone send a fake mail

from: ceo@visitcodecon

But they are not using your real mail server

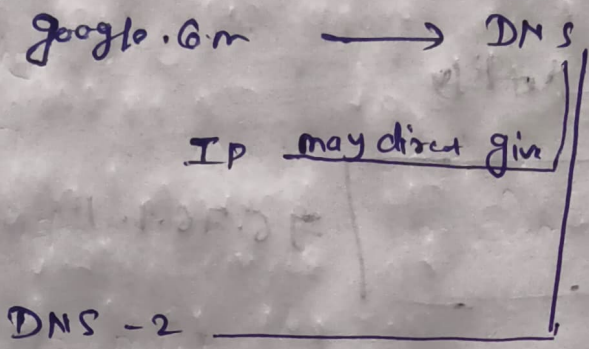
now gmail checks:
. SPF → X fail
. DKIM → X fail

DMARC rule says:

If both fail → block the email
gmail put in Spam or reject it completely

DNS → Domain to IP

DNS type :- A, Mx, NS



DNS may not have idea so they say go to hey ask to DNS - 2 for IP of your domain

So DNS has type that has own work.

→ A Record type to store IP

→ Mx type Record to mail exchange

A → IP address

Piyushgarg.dev

↳ Q7 Can host this domain or a server that has IP do that domain key to point that IP [A] record are do in Mx.

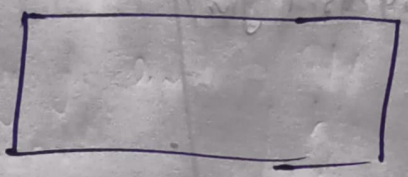
you may know → Vercel, Netlify (web hosting)

Piyushgarg.dev have hosted on Vercel, Netlify

Piyushgarg.dev

↓

Vercel, Netlify



→ Vercel says to add [A] record one which address 76.76.1.1

→ but assume in the future server crash or problem on server and then it has to change

76.76.1.1 ⟶ (A) 74.3.1.2

Vercel need to say to it all user to update

(A) Record

↳ Most all user may able to update (A) record so here [CNAME] record ^ Gw it to the val.

CNAME.

↳ mera domain ke upar CNAME add kar do

CNAME piyushgarg.dev choicode.com

It mean if you want Ip address of piyushgarg.dev but you got CNAME choicode.com and dns go to choicode.com, dns query go query and for choicode.com get Ip (2.3.4.5) that mean piyushgarg.dev point to 2.3.4.5

CNAME piyushgarg.dev → choicode.com

2.3.4.5 ← A ←

vercel done same thing

Cname.vercel.com = 7670.1.1

op: piyushgarg.dev Cname : Cname.vercel.com

Let in future vercel Crash or have some problem with vercel or that you just need to update CNAME not Ip but that help vercel. Vercel keep that Cname.vercel.com same but in the block that change Ip, but we block that change IP but we have not affect to this, because Cname.vercel.com already add in my domain Cname - CNAME RECORD

CNAME (Canonical Name)

↳ that create an alias pointing one domain (lib.blog.example.com) to another more permanent "canonical" domain name like (like example.com) instead of ~~domain~~ to an IP address

blog.piyushyog.dev
CNAME
hashnode.network

} If hashnode migrate his server then I can not need to change CNAME Record bcz in my CNAME Record —hashnode.network which is same forever.

—hashnode might or not his server not need

→ CNAME always take another domain

A

CNAME

NS → Name Server

piyushyog.dev
↓ purchase
Hostinger

Cf DNS
Let's somewhere play DNS Server and that has domain 1.1.1.1 he decide to Create domain like ns1.cf.com

ns1. cf. com A 1.1.1.1

* Cloudflare DNS Server Run on 1.1.1.1

So now we got Domain manage and put NS → ns1. cf. com

Piyushgarg. dev
↳ hostinger

NS → ns1 . cf . com

CF DNS
DNS Server
↓
1.1.1.1

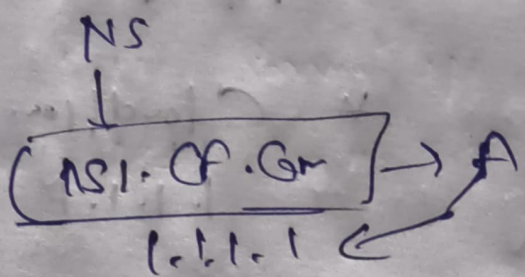
ns1. cf. com . A 1.1.1.1

तो ns1. cf. com को dns query से resolve करेंगे तो हमें IP 1.1.1.1 मिलेगा that means ये वो server है जिसपर DNS query करना है।

ns1. cf. com . पर DNS query resolve होगी। उसे add करने के बाद अब हमें ये जानना है होगा है piyushgarg.dev का IP क्या होगा तो ns1 . cf. com से देगा

Browser

Piyushgarg.dev

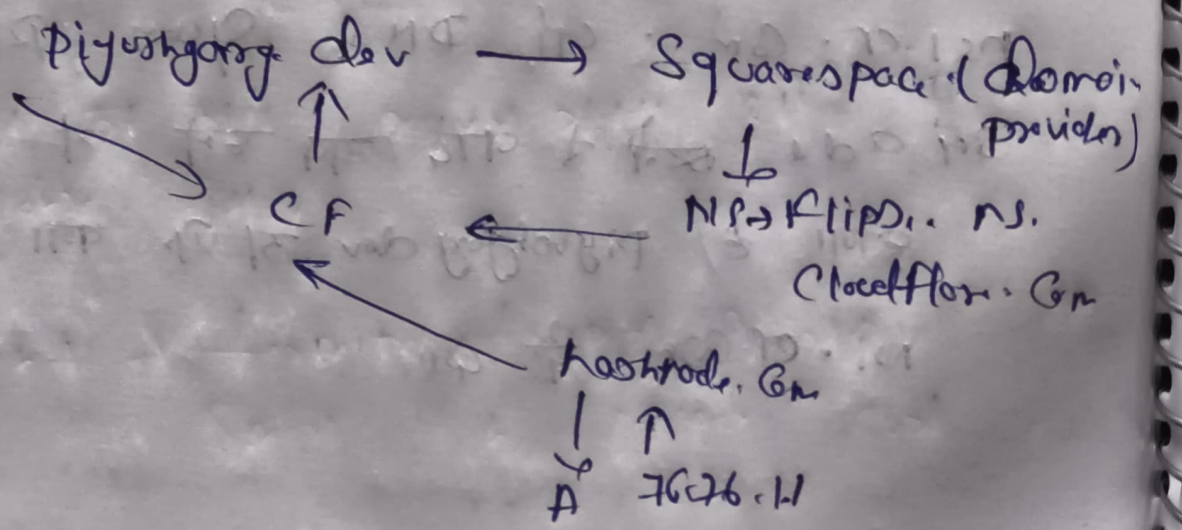


Browser जब NS Record of Piyushgarg.dev पर गया तो वहा से ns1.cf.com का A record 1.1.1.1 मिला। जब DNS Server 1.1.1.1 से पूछेगा की मुझे piyushgarg.dev website का IP बताओ।

Cf'o उसको Return किया 69.12.3.4.5

this is the IP where browser redirect to me

NS बताता है इस particular domain का dns कौन है। (who is authoritative server)



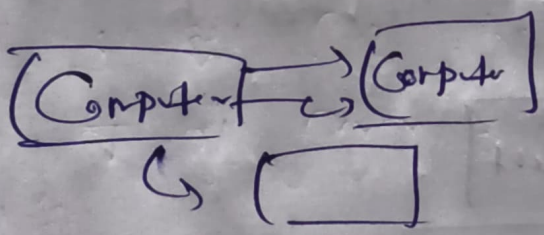
Q7 We build software on a single computer we just create node and Calculator and also accounting software built in computer.

Computer

The computer in big size and this Cloud mainframe.

→ Peer to peer में 2, 4, 5 या ज्यादे Computer Connect होते है, पास-पास या Cable में

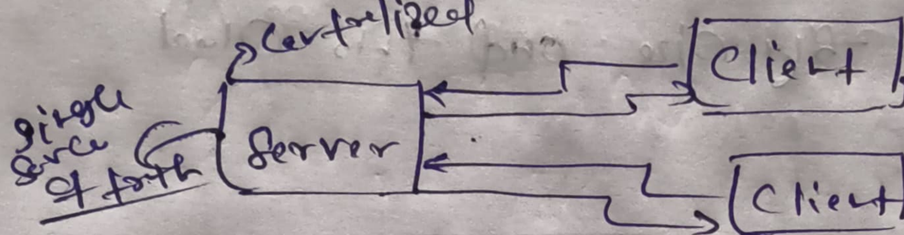
→ Peer to peer में कोई भी Centralized Server नहीं होता है



Q7 one Computer Need file to both Computer then file सही से जाया या होना या गलत तो नहीं चला जाया।

Do Concern is :-
- Security
- Control
- Privacy
- Violatory

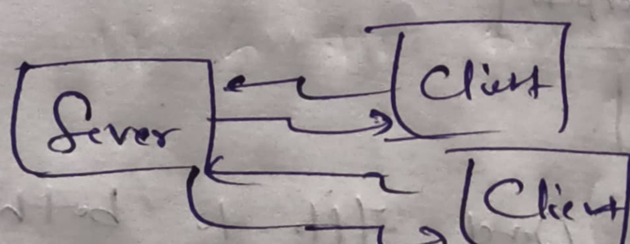
तो इन सब problem का एक ही solution है।
हम एक Computer रखेंगे जिसे Server या
software बोलेंगे जो काम करेगा Server के उसी
Client वालों।



→ if i update 'security update' and then for user security update

→ Trust का भी issue था पहले peer to peer में अब इसमें भी trust है।

user ⇒ ऐसा कोई भी device जो closed to user हो।



Client का काम है request भेजना और response लेना।

Client → terminal, touchpad, Smart TV, Smartwatch, Pattern, card

Note

Client not to be trustable

↓

Untrusted

↓ also known as

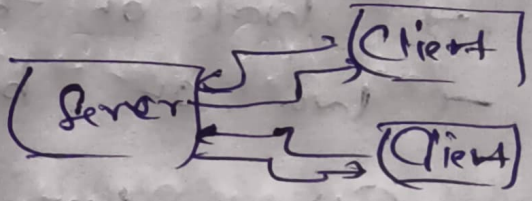
Zero trust architecture

Server के पास बड़ा बड़ा काम पड़ते रहते हैं।

- Central Authority
- Source of truth

→ Server को Centralised Environment होना है
no one Charge everything

Responsibility
- Business Logic
- Authentication
- Data usage
- Security



Restaurant

Client → customer

Server → kitchen

Menu → api

Order + data → request

food → response

* Client never can't be entry in kitchen
so that client not should be enter in
server

Server

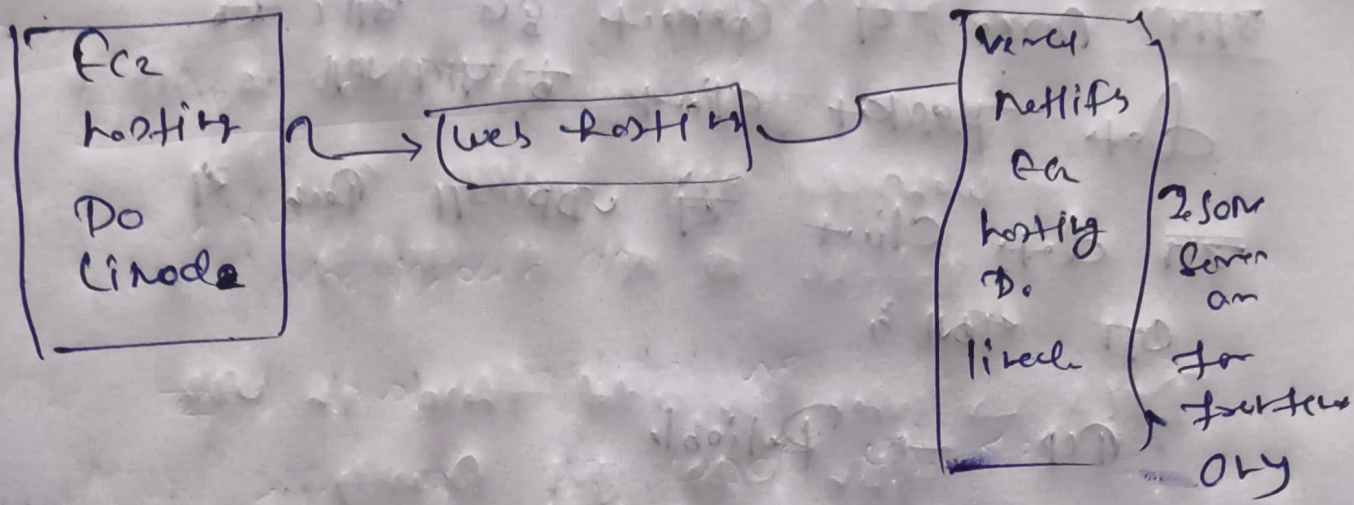
Client

→ Internet का major आधारित HTTP पर है,
→ HTTP वेब्ब वाले protocol में एक protocol है।
→ HTTP front of the internet
→ HTTP is stateless (याददाश्त नहीं
कुछ याद नहीं)
→ HTTP text based
→ work on browser
→ web or ; based request
→ Client server से HTTP के
through बात करेंगा।

Server
JJ

Client → ये will be
laptop, phone

"Server में कुछ"
तो इसका होना चाहिए
न यें Server हम
अपने laptop
में चला सकते है



→ ~~http~~ का मतलब ~~Internet~~

→ web Server का मतलब database → ×

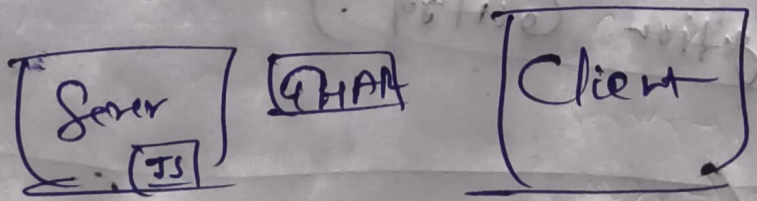
↳ ~~gf~~ also ~~Sr~~ Software

इतने सारे Computer है, कुछ तो agreed Rules होना चाहिए, Communication करने के लिए

Interoperability

↳ अलग अलग device ~~Software~~ होता है, Communication करने के लिए,

Two major Protocol



TCP

UDP

अब server से connect हुए और वह data packet client के पास गया।

अब data client से UDP या Tech से आ सकता है।

TCP → Reliable

UDP → Less Reliable

Reliable

ordering → जिस order में data भेजेंगे उसी order में मिलेगा।

loss detection → detect which data miss

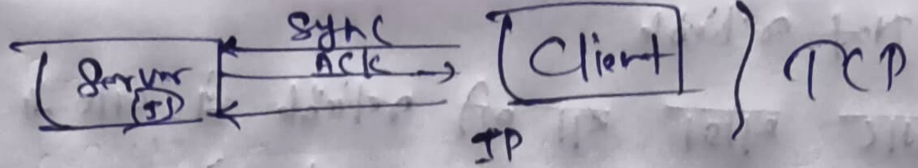
retransmission → if data lost then retransmission - flow control. किया क्या जा रहा है

(Congestion Control)

TCP → पर बनाने की guarantee TCP लेगा

UDP → fast (क्योंकि हां है)

Less reliable
No retransmission
No Order
No Congestion



UDP
↳ online cricket match (live.. if data packet lost no issue)

TCP
↳ message
↳ to send message not UDP
↳ There is chance to loss data

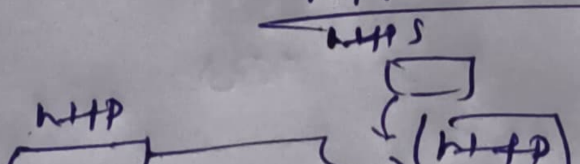
TCP & HTTP difference

TCP
- ↳ How data send
- ↳ In order
- ↳ data flow

HTTP
- → एक application level network protocol है जिसे Get, Post, method होता है, जो बात करने का तरीका है,

Server has decide what protocol need to send file and chat

Application level protocol



HTML
CSS
JS

UDP → Not reliable

- अगर थोड़ा सा भी reliable हो जाए तो
- WebSocket and WebRTC में थोड़ा Reliable तो हो जाता है।

DTLS → When you add these in UDP then UDP get Security

SCTP → When you add these in UDP the UDP has reliability has been increased (a bit not more than TCP)