# Computer Networks - I

* Network - comm./sharing.

* Internet n/w of n/ws.

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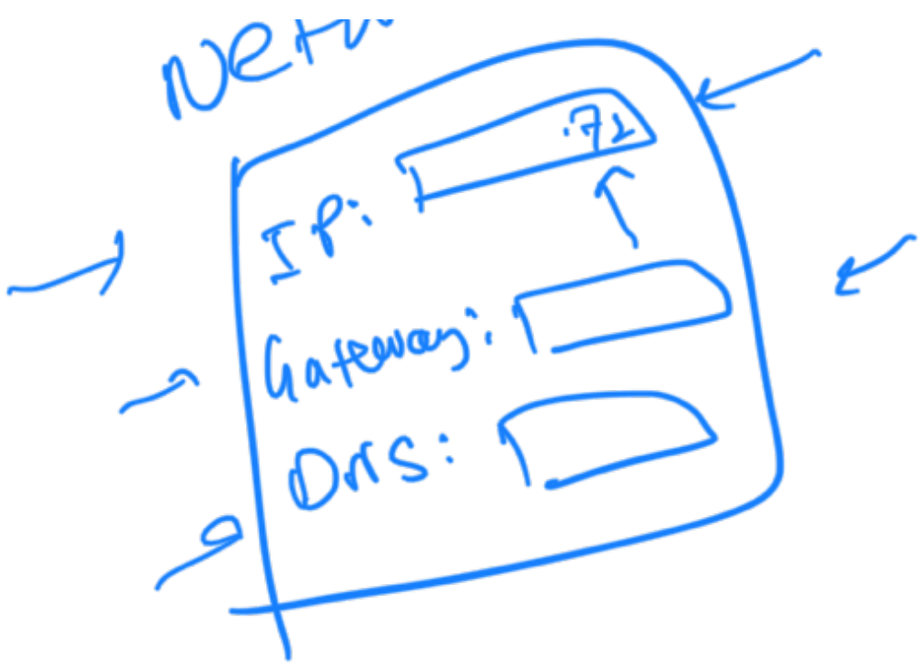
Computer

Network





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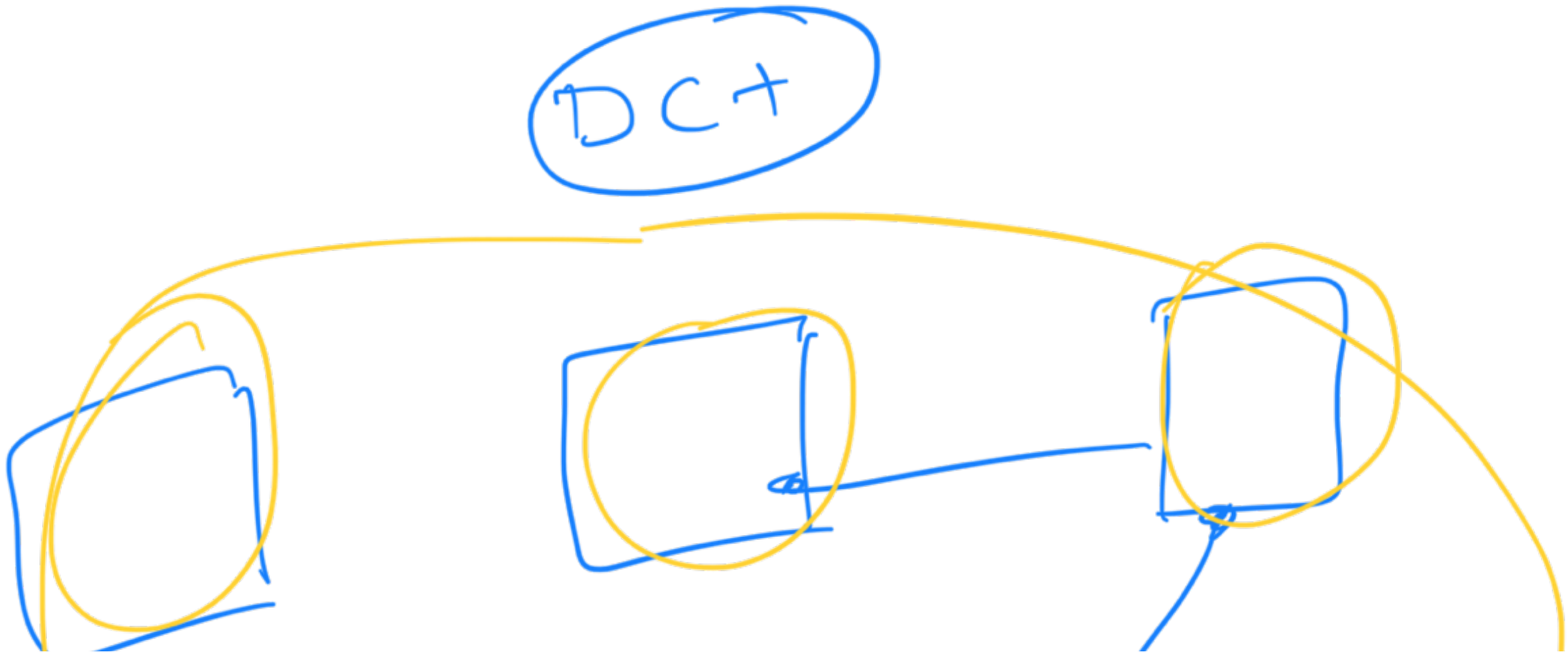
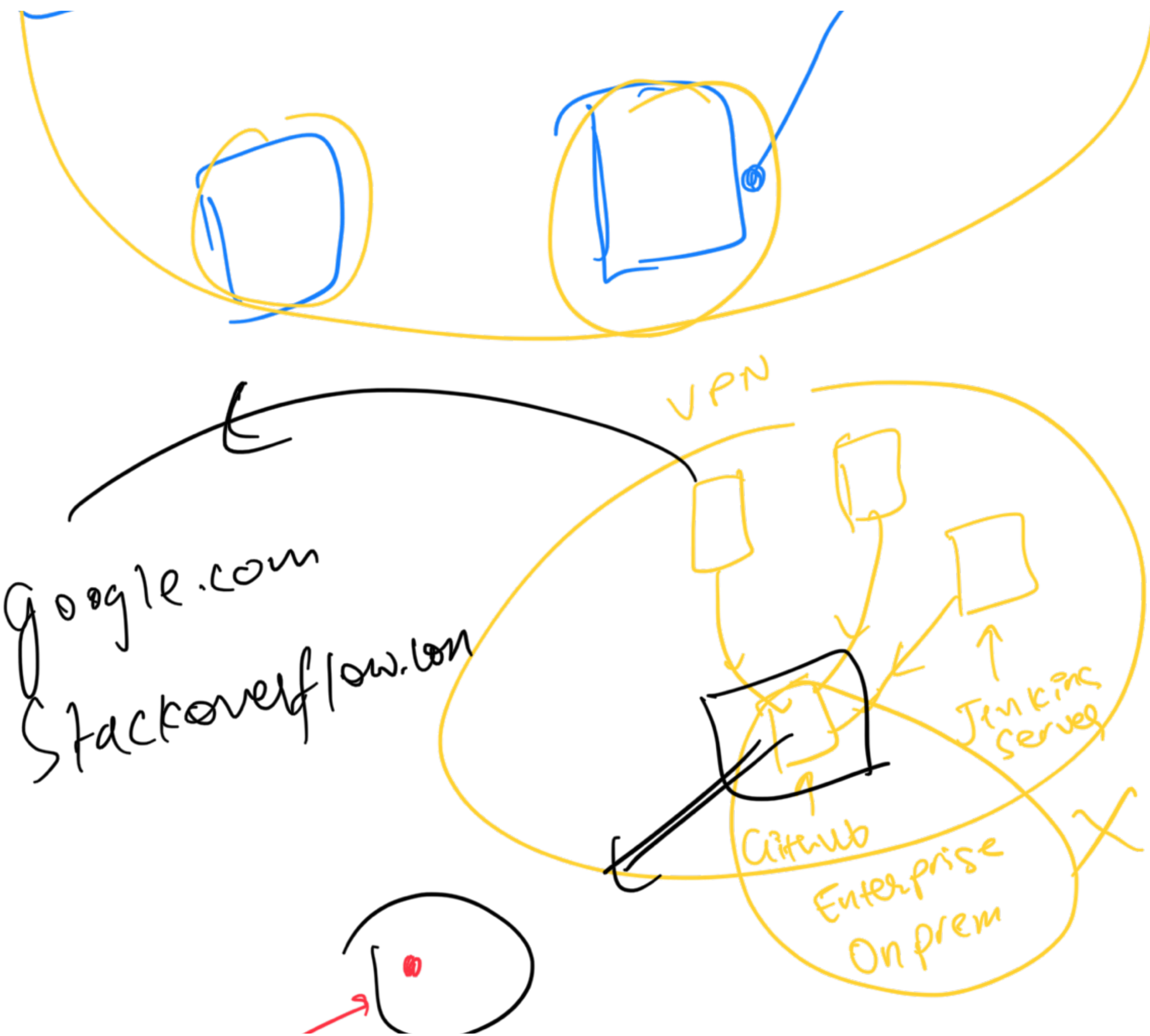
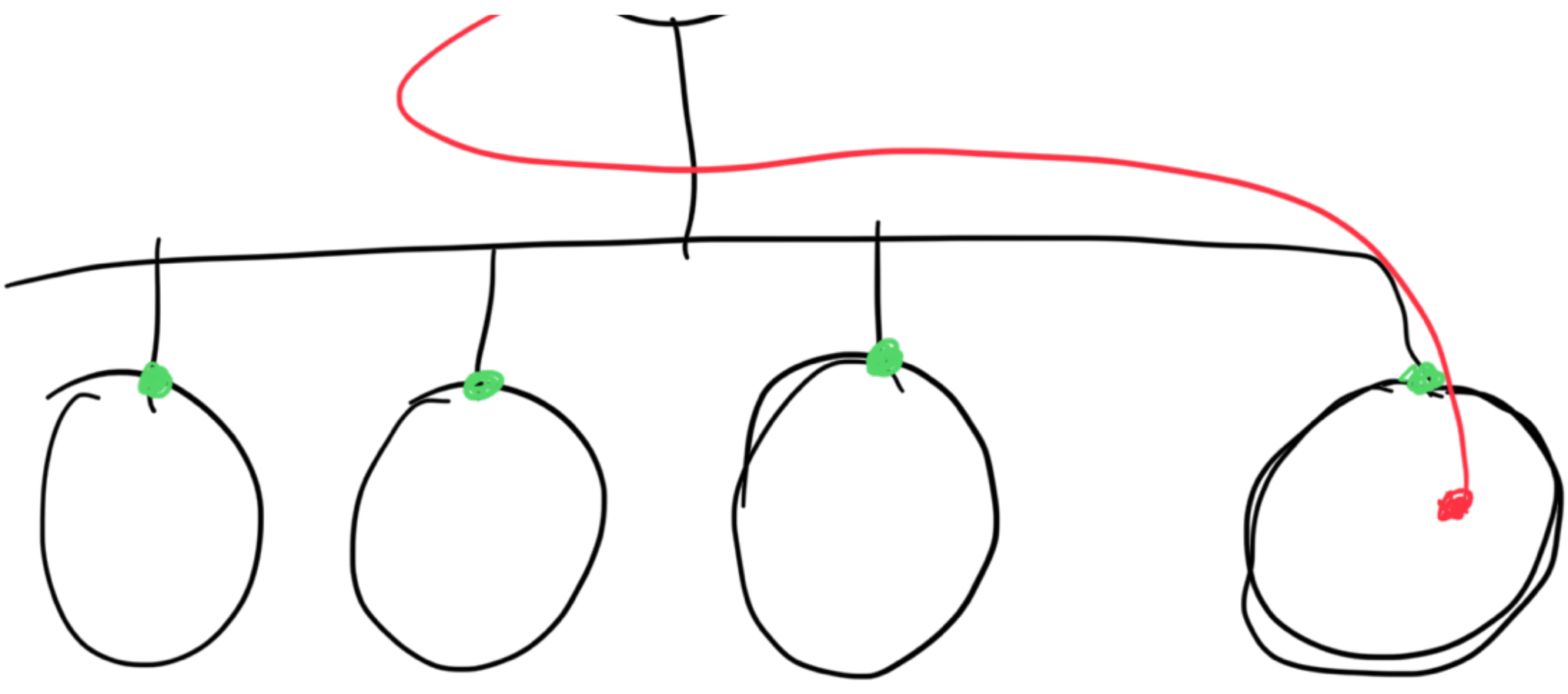



VPN
Google.com
Stackoverflow.com
Jenkins Server
Github Enterprise On prem




* PROTOCOL
Set of rules

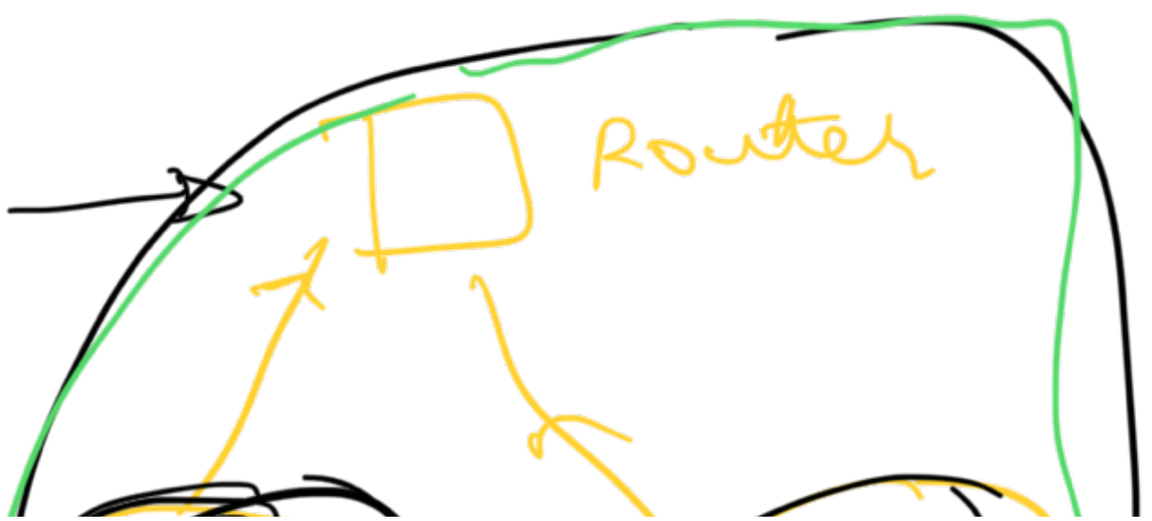
client



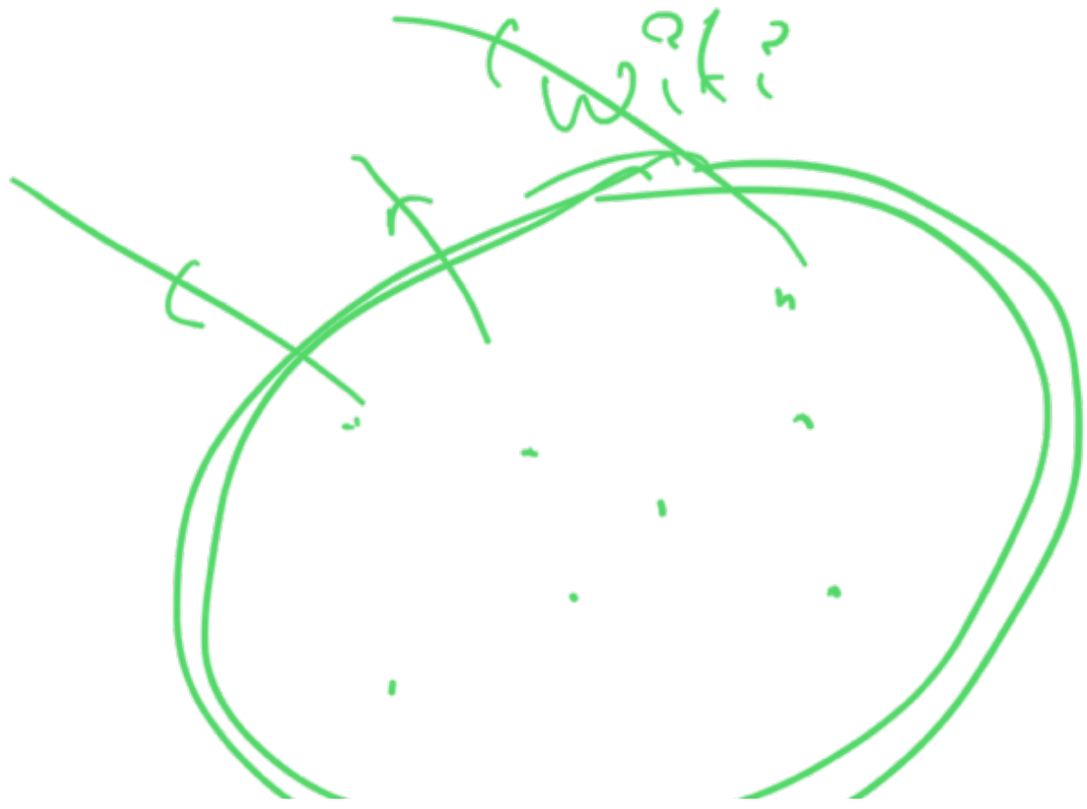
server

http, https, ssh, ftp, ...

*




Internal IPs

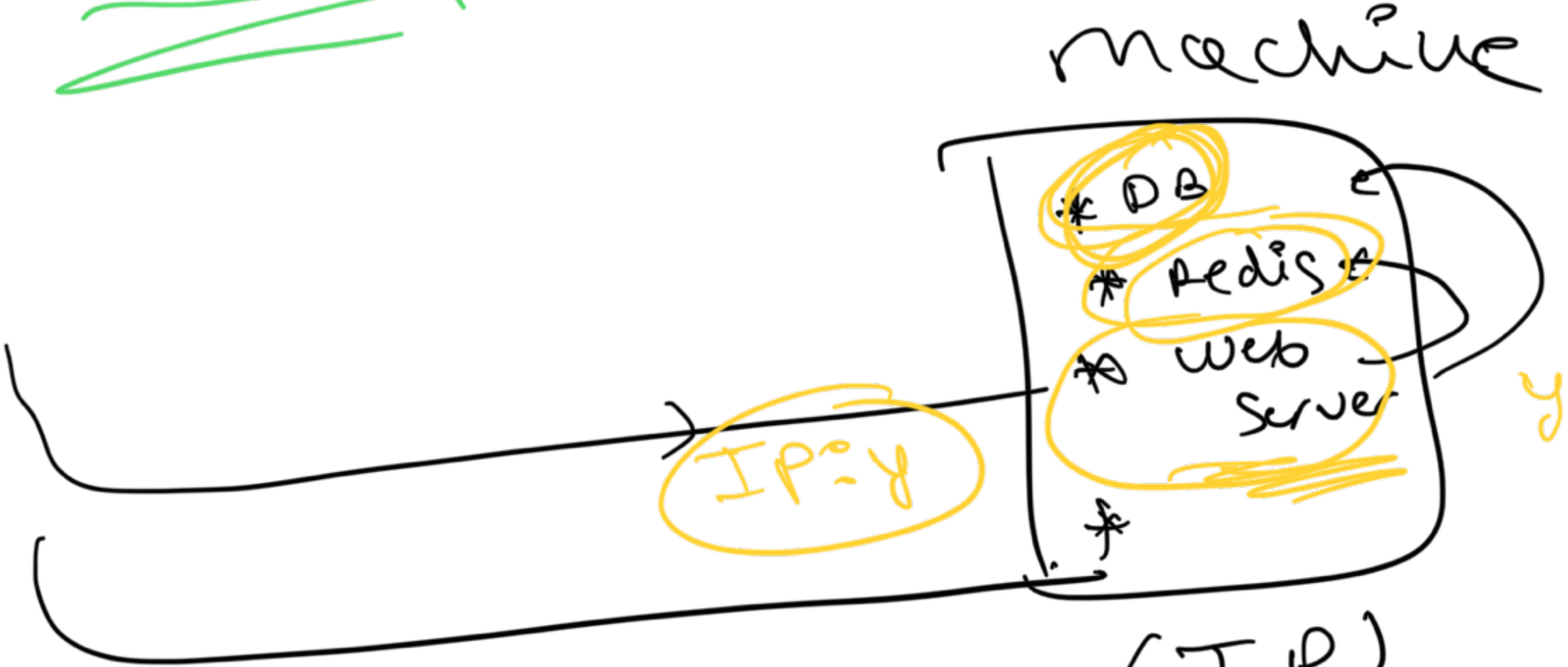



32 bit address

x . x . x . x

google.com ⟷ (IP)

# * PORTS



- localhost ≡ 127.0.0.1

↳ (16 bit number (0-65535)

* 0-1023 well known ports

Default port

:80

* 1024 - 49151 Registered ports

* 49152 - 65535 client programs

web browsers.

Chrome



localhost :5000.



server.

google.com:80

Firefox

cricket → google.com

Basketball → google.com

machine

sip, sport

dip, dport

IP + 80 200

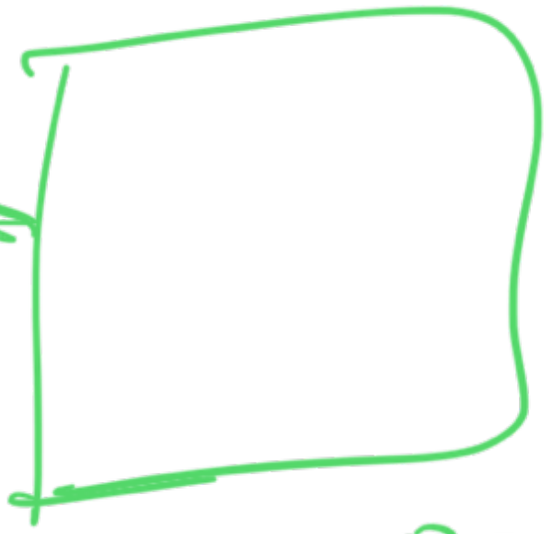
IP + ○

Socket ≡ ⟨IP + port⟩

Google IP+ 80 port

(sip, sport, dip, dport)

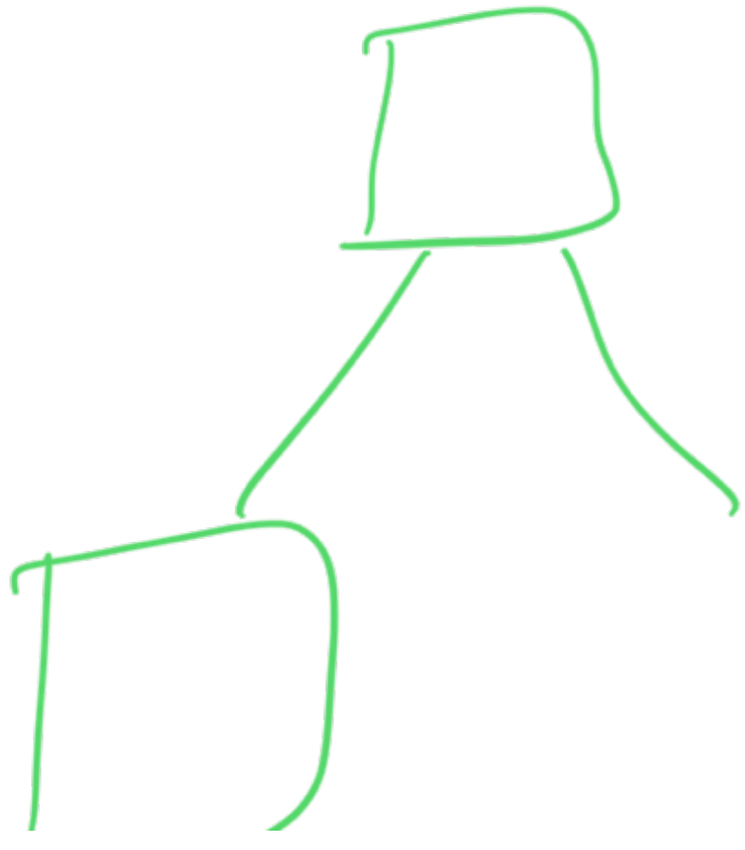
chrome :x

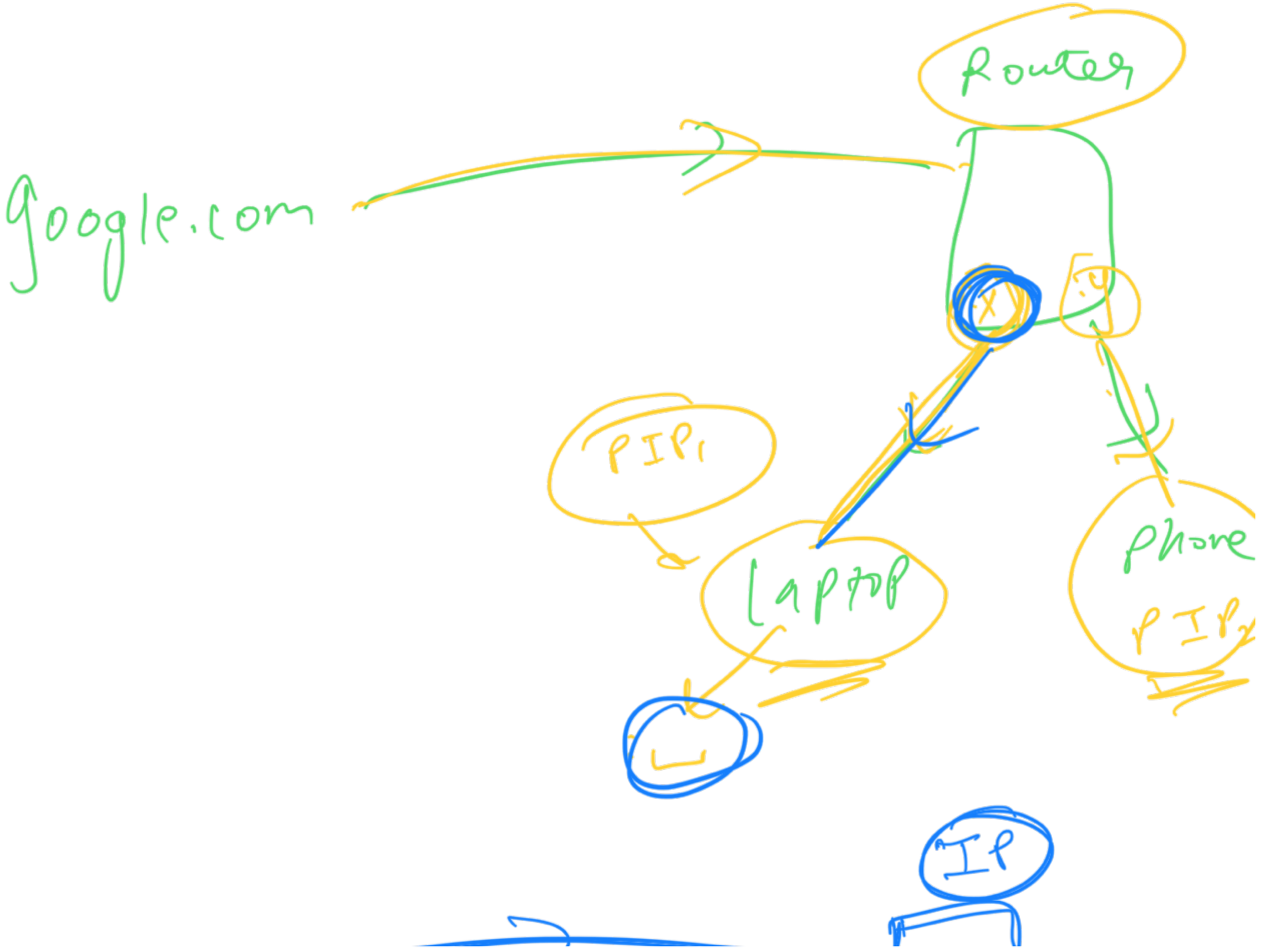


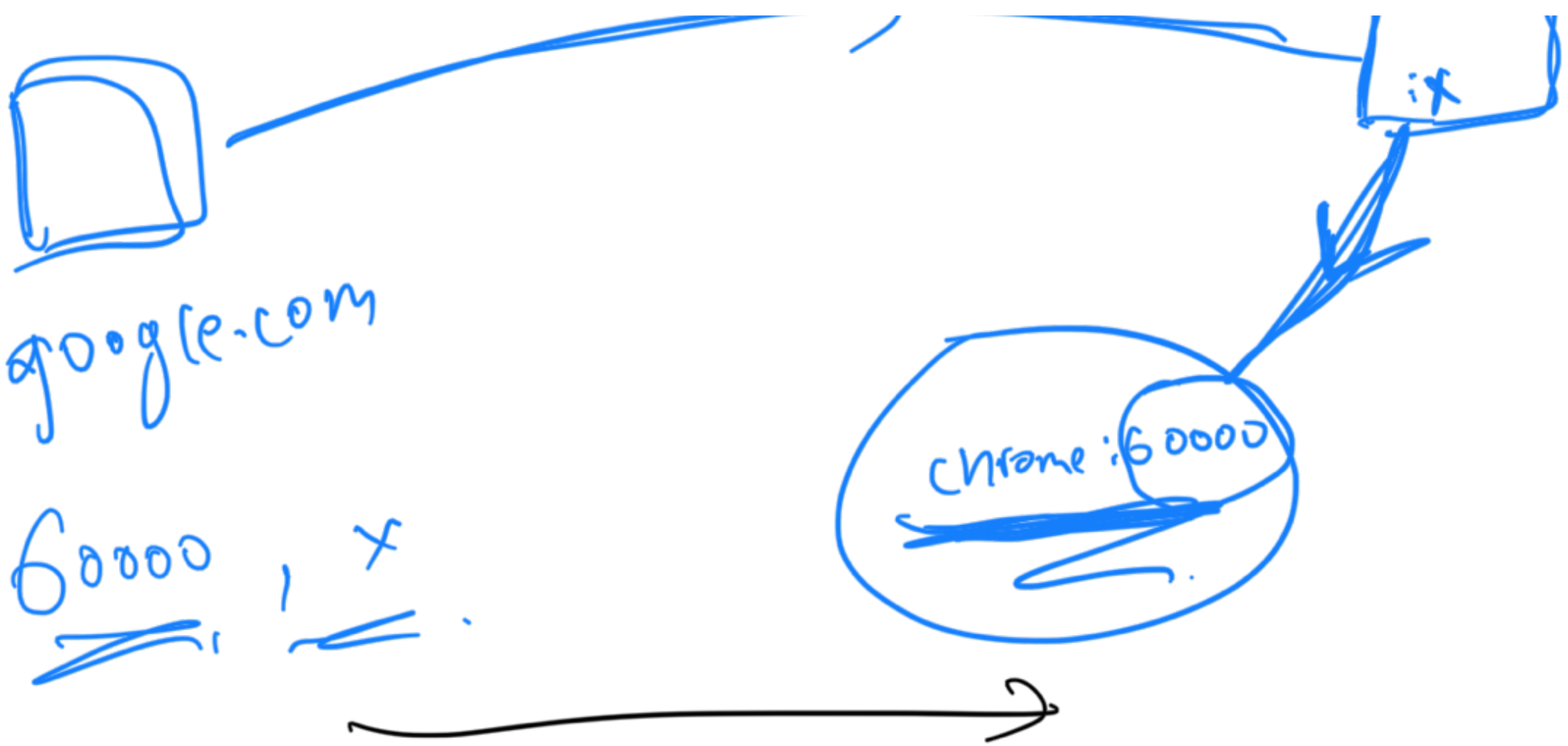
IP :80

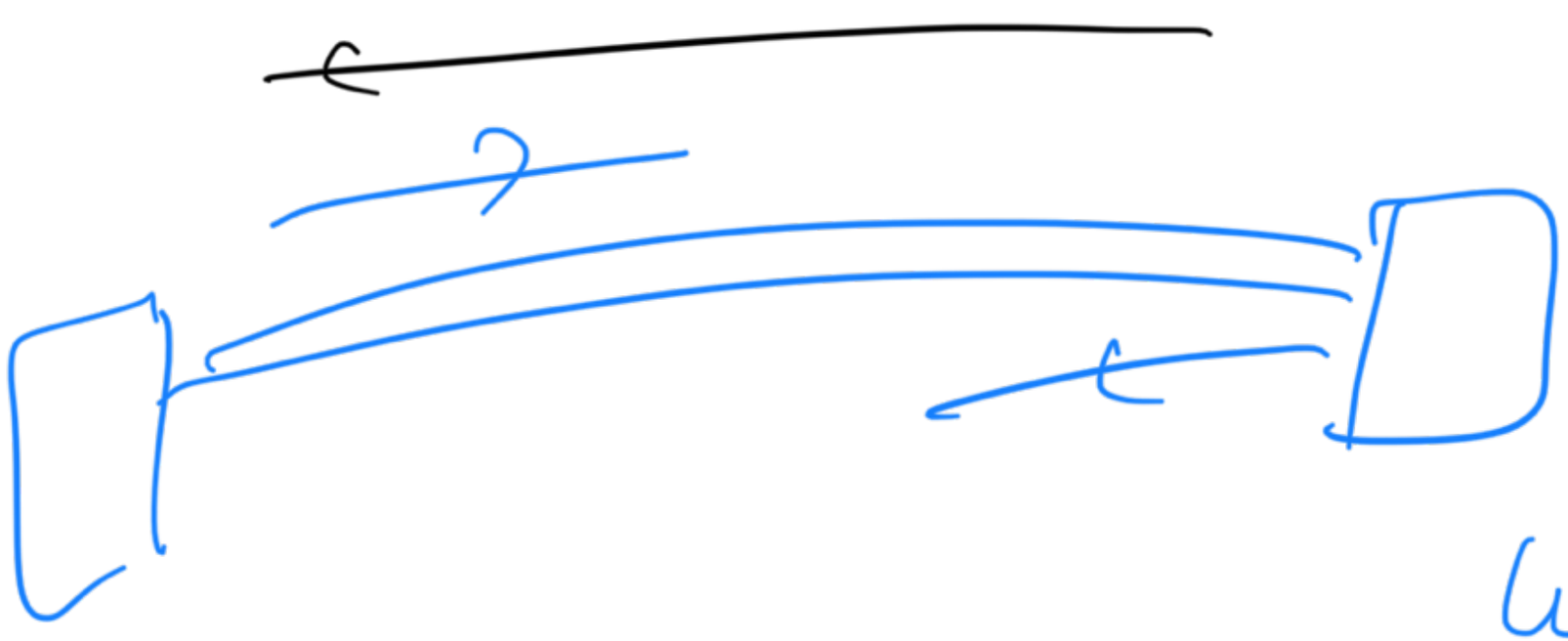
machine

machine

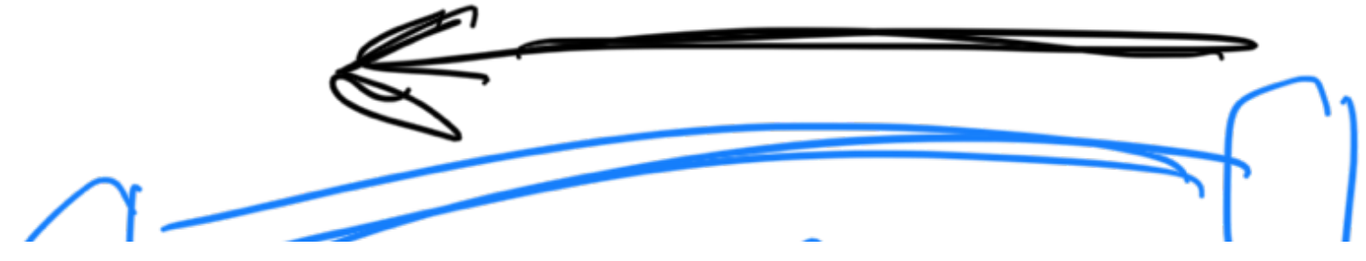



google.com
Router
PIP1
Laptop
phone
pIP2
IP

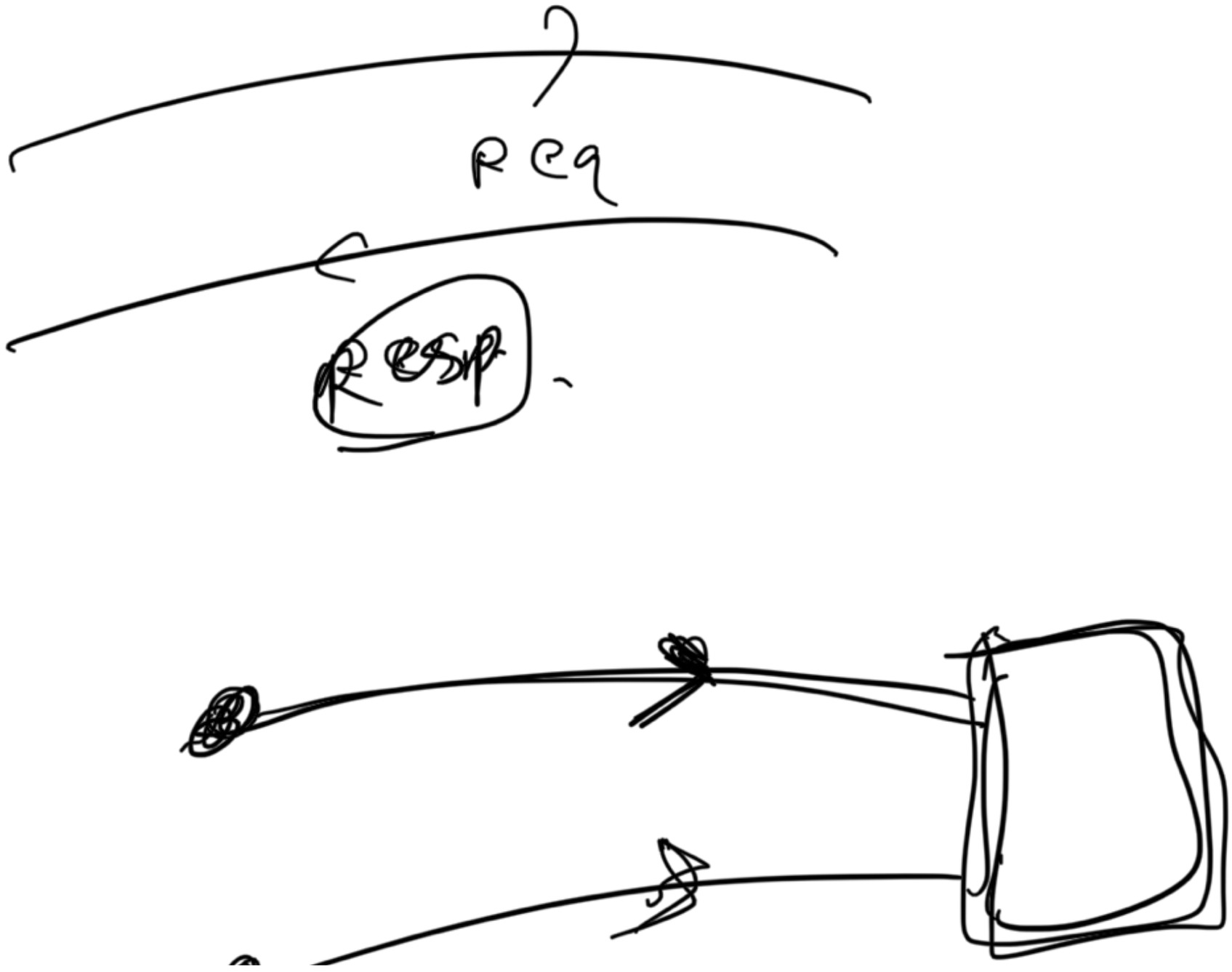


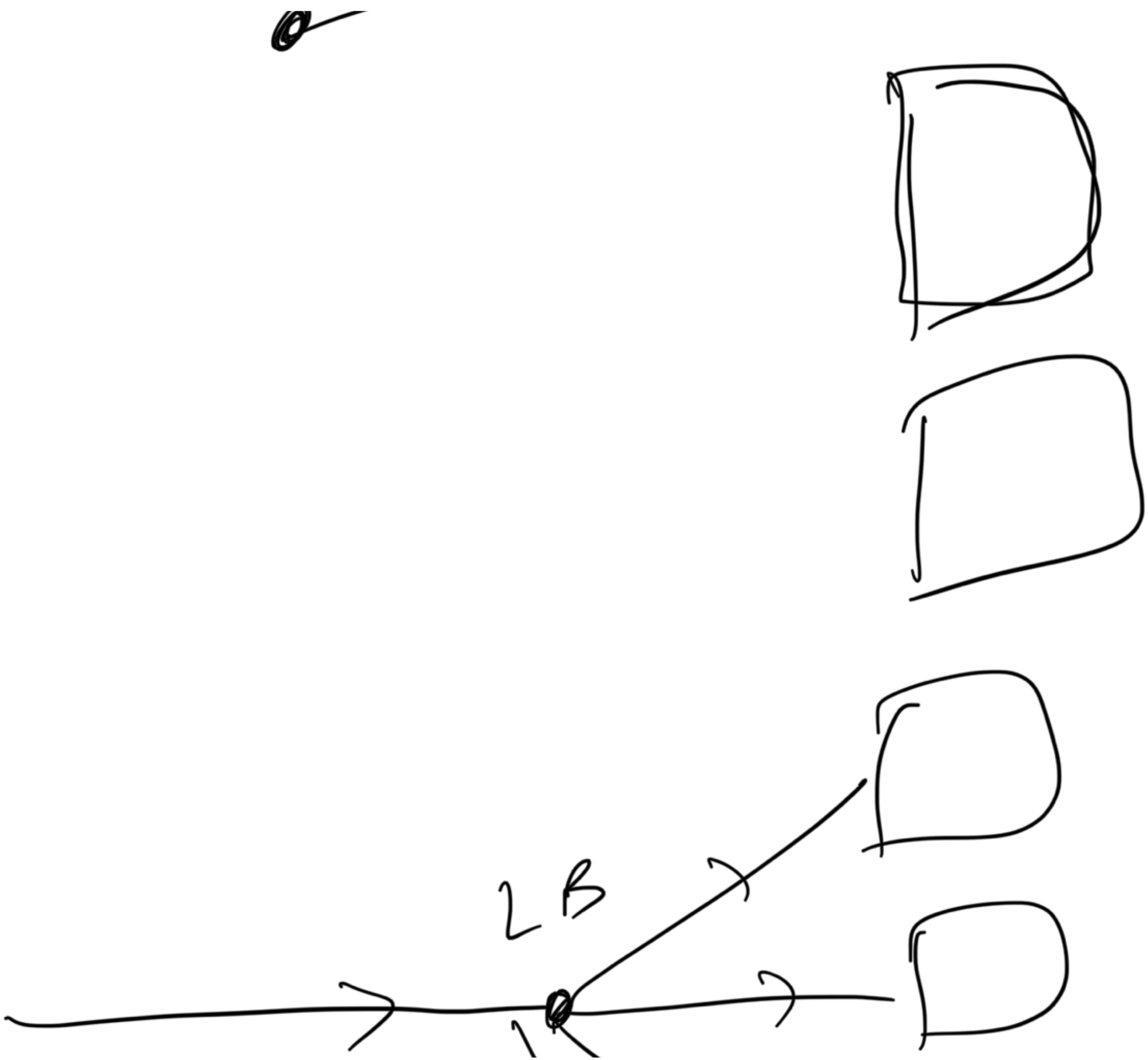



Websockets



Server sent


Req
Resp


2B
1

# OSI model

HTTP

GET

POST

PATCH

http headers,
http req.
] L7 Application

↓

[ Encrypt ] L6 Presentation )

Add in session-id.

L5. Session layer

Segment.

123 | Data | 80

Sport | Data | dport

L4. (Transport)

info

Packet

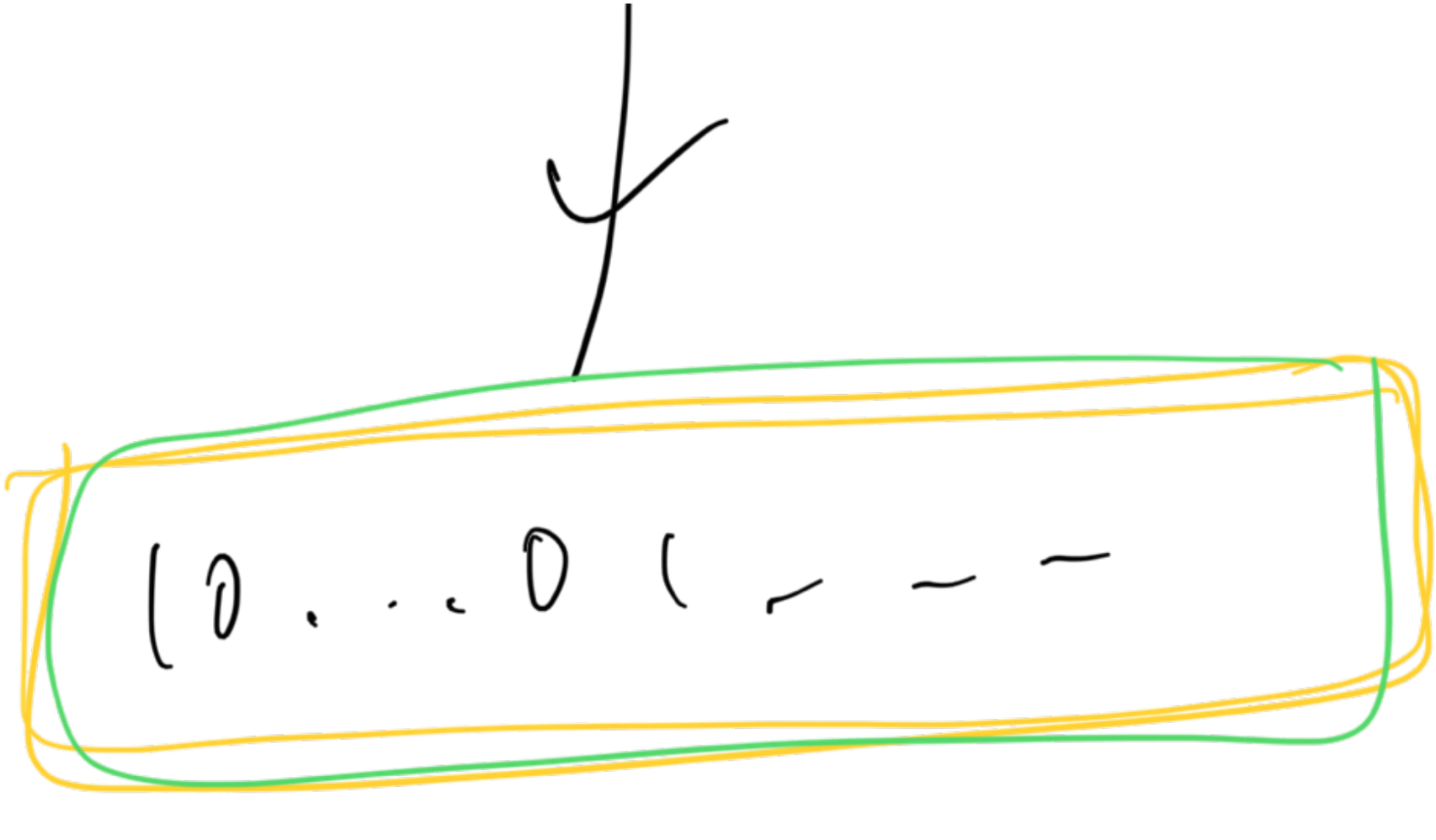
sip | info | dip

sip | info | dip

L3 Network

mac1 | data | mac2

L2 Frames




L1

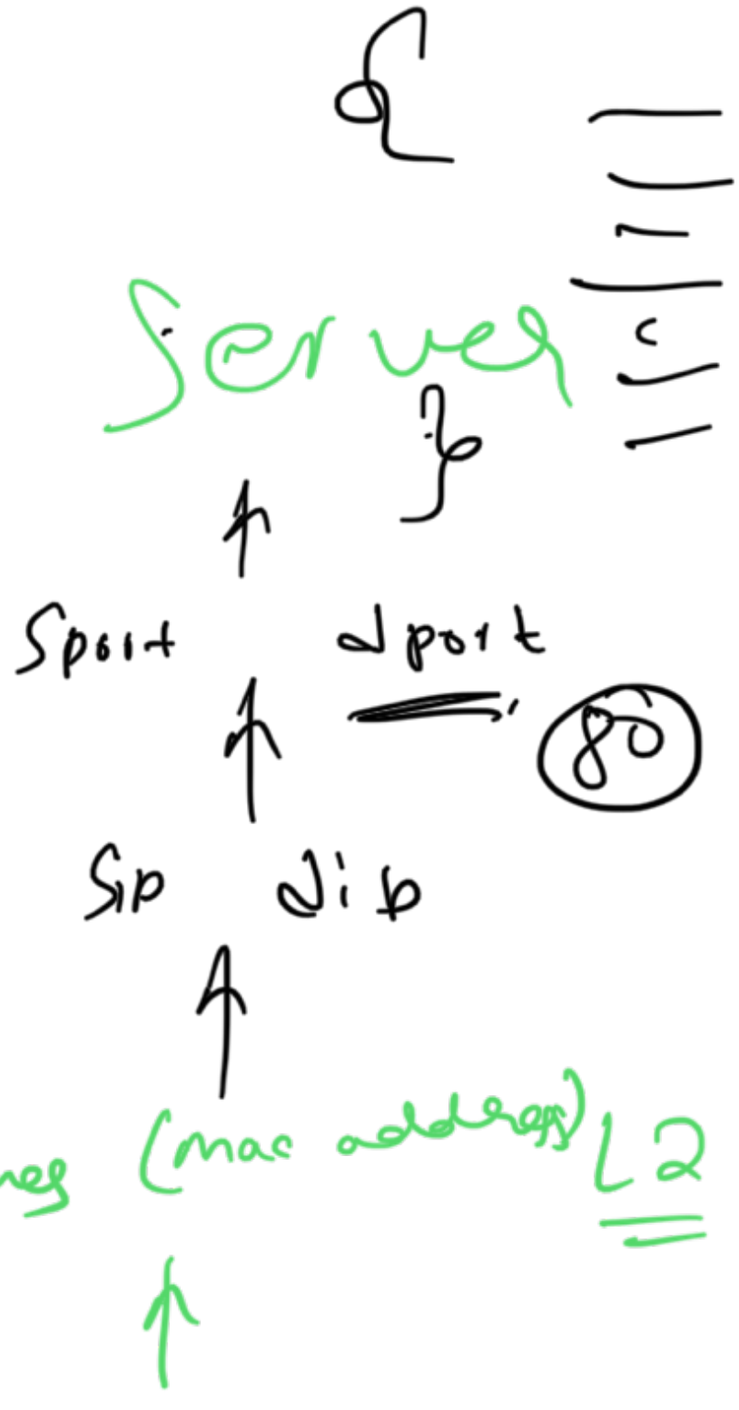
Physical

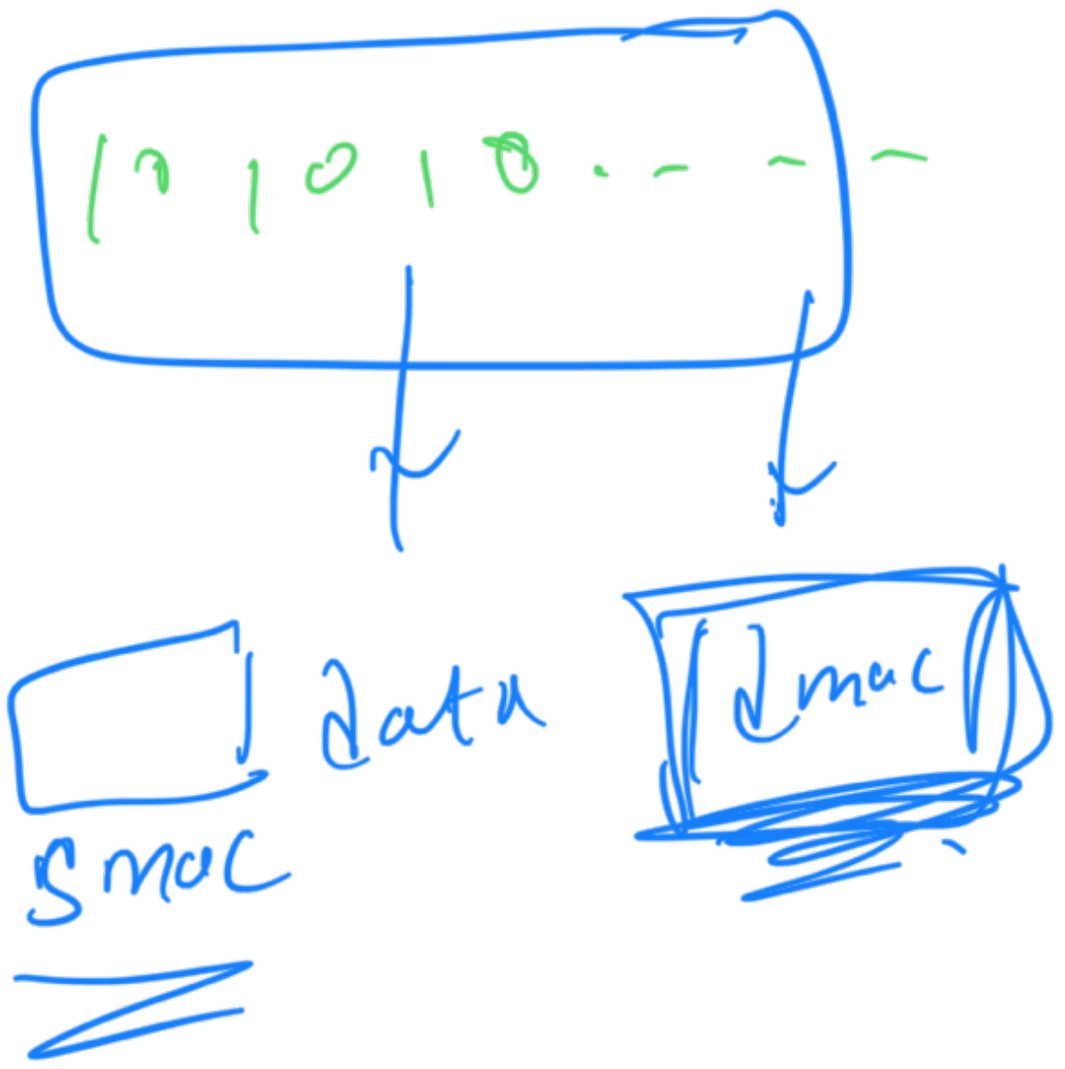
Voltages

Wire

Radio

Light.




Smac
data
Dmac

L7

L6

L5

L4 } TCP, UDP

L3 } Routers (IP)

L2 } Switches (MAC).

L1 } Hub.

IP ⟷ MAC

B
.20
bbbb

C
.30
cccc

Switch

Router

Switch

X

X

A
.10
aaaa

D
.40
dddd

IP.

11.11.11.0/24

22.22.22.0/24

* A knows D's IP.

* A knows D is on a different network.

* A needs to create L2 header to get it to router.

↓

A needs to know MAC address

of router.

A knows IP, & it wants mac address of router.

P 11.11.11.1

ARP.

* X receives frame & broadcasts to everyone

* B drops the frame, whereas router returns it MAC address.

* A knows Routers MAC address.

mac

is not routable

IP

is routable

10.x.y.x

10.0.0.1

2(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