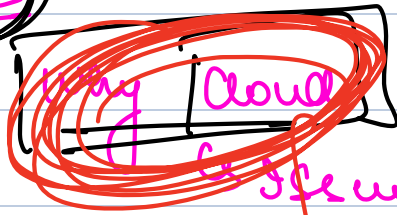


Intro to AWS

10:10

①



a) Static IPs

b) NAT

c) Global Delivery

②

Managed Infra

③

Diff Cloud Providers

④

EC2

core of AWS

AWS

GCloud

Azure

machines b/c of everything AWS

Simple Website on EC2

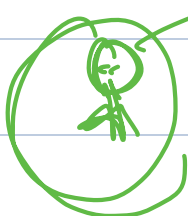
⑤

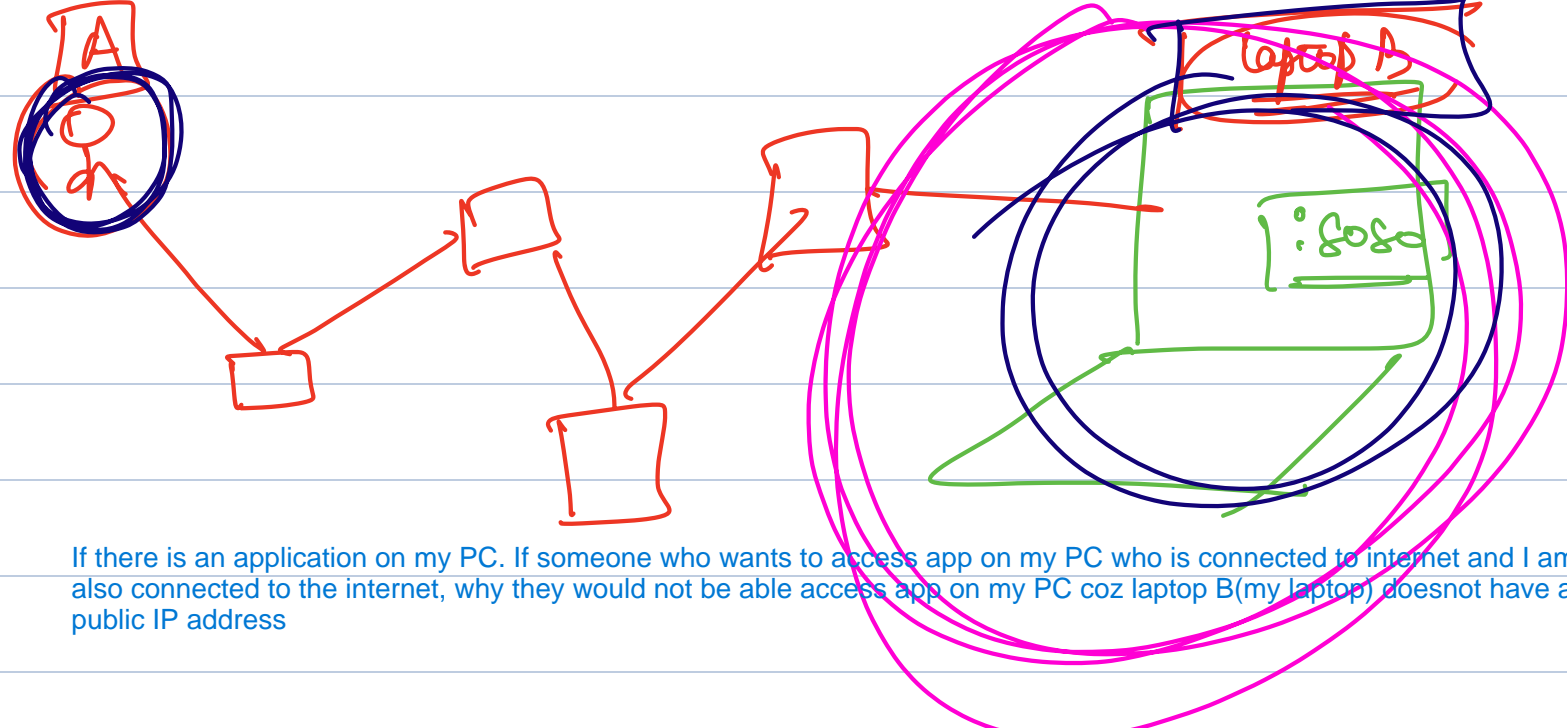
RDS

AWS Managed Infra.

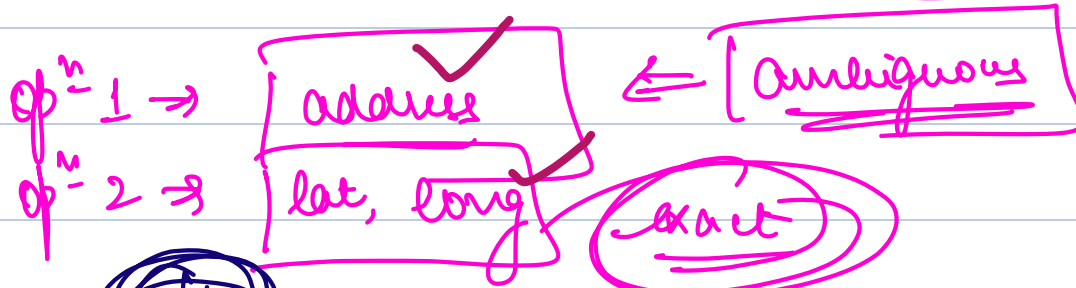
Why Cloud

Another appⁿ sitting on the same laptop only can access my service





If there is an application on my PC. If someone who wants to access app on my PC who is connected to internet and I am also connected to the internet, why they would not be able access app on my PC coz laptop B(my laptop) doesnot have a public IP address

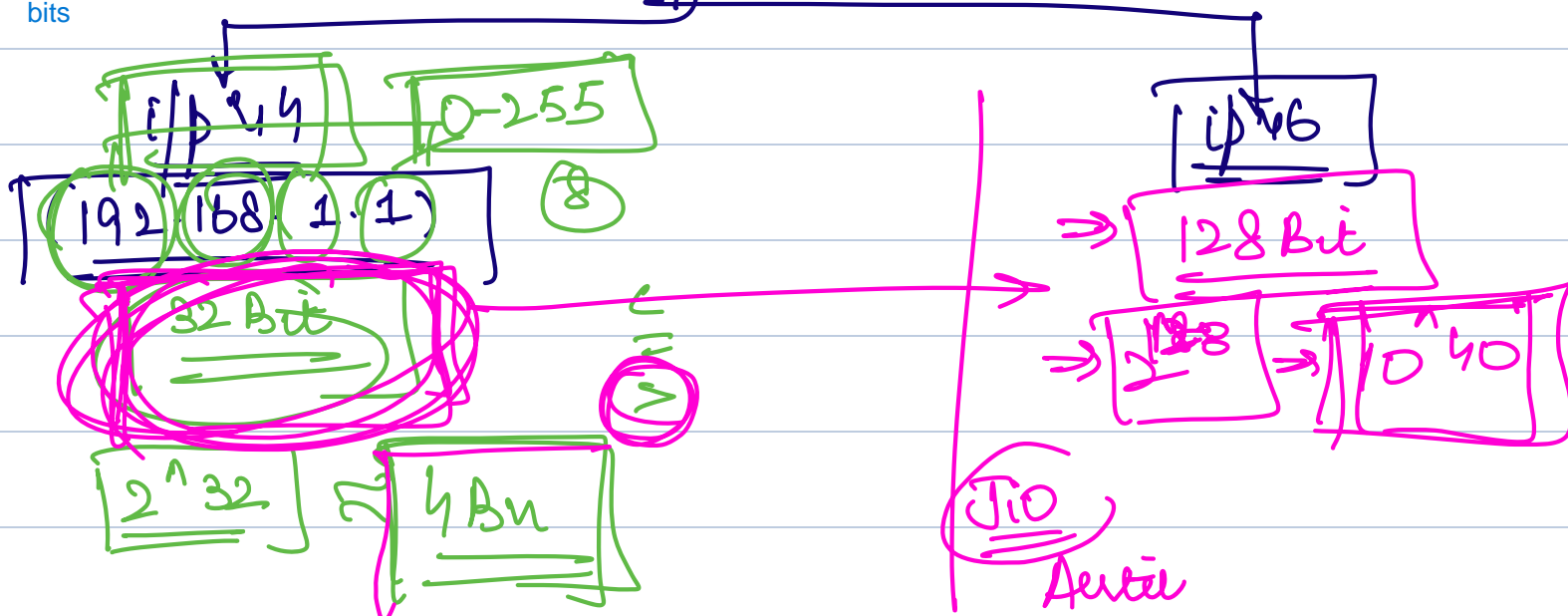


Computers doesnot understand ambiguity, it cannot fill ip address on our behalf so we need to give computers ip address . ip address is the coordinate of every computer connected to internet.

Using this internet routers can route the traffic correctly. Internet routers can create a path to reach from source to destination

Size of ip v4 address is 32 bits. To store one ipv4 address how many bytes it takes -> 32 bits. ipv4 address is formed out of 4 numbers. Each # can be in the range 0-255(256 numbers). How many bits are required to store 256 numbers -> 8, so $8 \times 4 = 32$ bits

In 32 bits, how many unique ip address can be there $2^{32} \sim 4$ Billion but the #of devices in the world is much larger than the 4 B including TV, laptop, phone, ipad hence we introduced ip v6 which have $2^{128} \sim 10^{40}$. So every device connected to internet should have ip address



NAT

⇒ N/W address translator

⇒ allows to create an internet within internet

allows to create an internet within internet

ICANN

⇒ assign IP addresses to diff orgs

⇒ auctions

ICANN is an organization to assign IP addresses to different orgs. This org run auctions where they sell ip addresses ranges in wholesale and ISP (Internet Service Providers), Cloud providers participate in this

⇒ sell IP address ranges in wholesale.

(ISPs, cloud providers)

AWS

10.41. XXX.XXX

Amazon lets say buy all of the IP address starting from 10

Google lets say buy all IP addresses starting from 15

15.XX.XX.XX

But still if they buy these 10. or 15. addresses, will they be able to support all of the devices connected? No

Airtel ⇒ 5 IP addresses

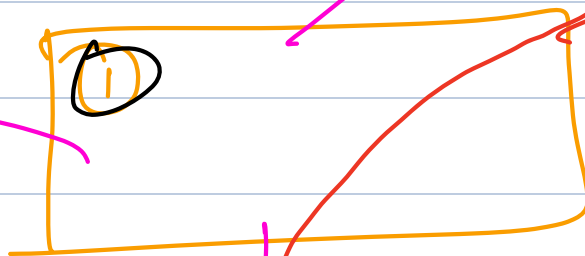
Now suppose Airtel has bought 5 ip addresses

So lets say this is Airtel HQ, Airtel will keep 1 ip address in its HQ. Then instead of giving the other 4 directly to ppl, they will put some NAT servers across India. They put NAT server in Jaipur and give them ip address -2, they put a NAT server in Bangalore and give them ip address 3 and so on.

NAT servers are coded in a way that behind them, they create a complete private internet. So what happens is in the yellow range all of 2^{32} ip addresses are visible. So let us say for this person, there is a GS (Google server) here, for the GS what is the ip address of A, B or C -> the ip address is 3. For the private internet, this request came from 3. They don't know these many computers are running

Technically with 1 ip address, Airtel can have infinite customers with just buying one ip address

NAT ②
Jaipur



NAT ③
Mumbai

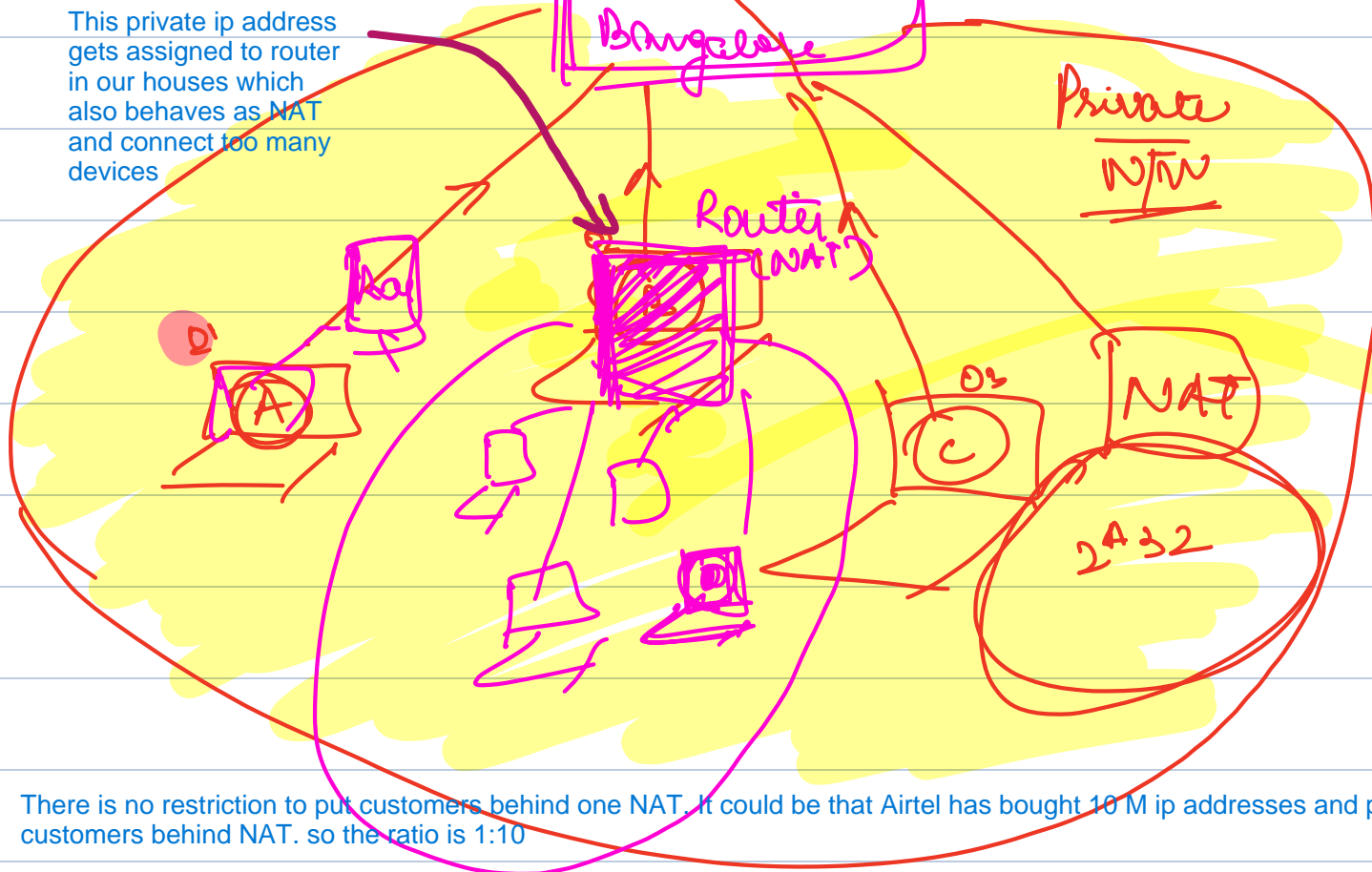
16.5

NAT ④
Gurgaon

in VPN, it is a link between NAT and GS and GS will never know from which ip address the request is coming in

This private ip address gets assigned to router in our houses which also behaves as NAT and connect too many devices

NAT ③
Bangalore



There is no restriction to put customers behind one NAT. It could be that Airtel has bought 10 M ip addresses and put 100M customers behind NAT. so the ratio is 1:10

10M

⇒

100M

(1:10)

① Public ^(Static) IP

⇒ ₹ 8000/month

So if you are running a website on your laptop, your laptop has private ip address, if someone at other place has to access the website, he cannot do as they don't know your laptop id address, ip address is private and not public.

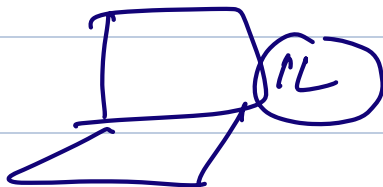
So if you want to host a website on your laptop, you need to have a public static ip address (static coz ip address should not keep changing else ppl will not be able to access the website)

① Buy public IP add and host ourselves.

⇒ NO

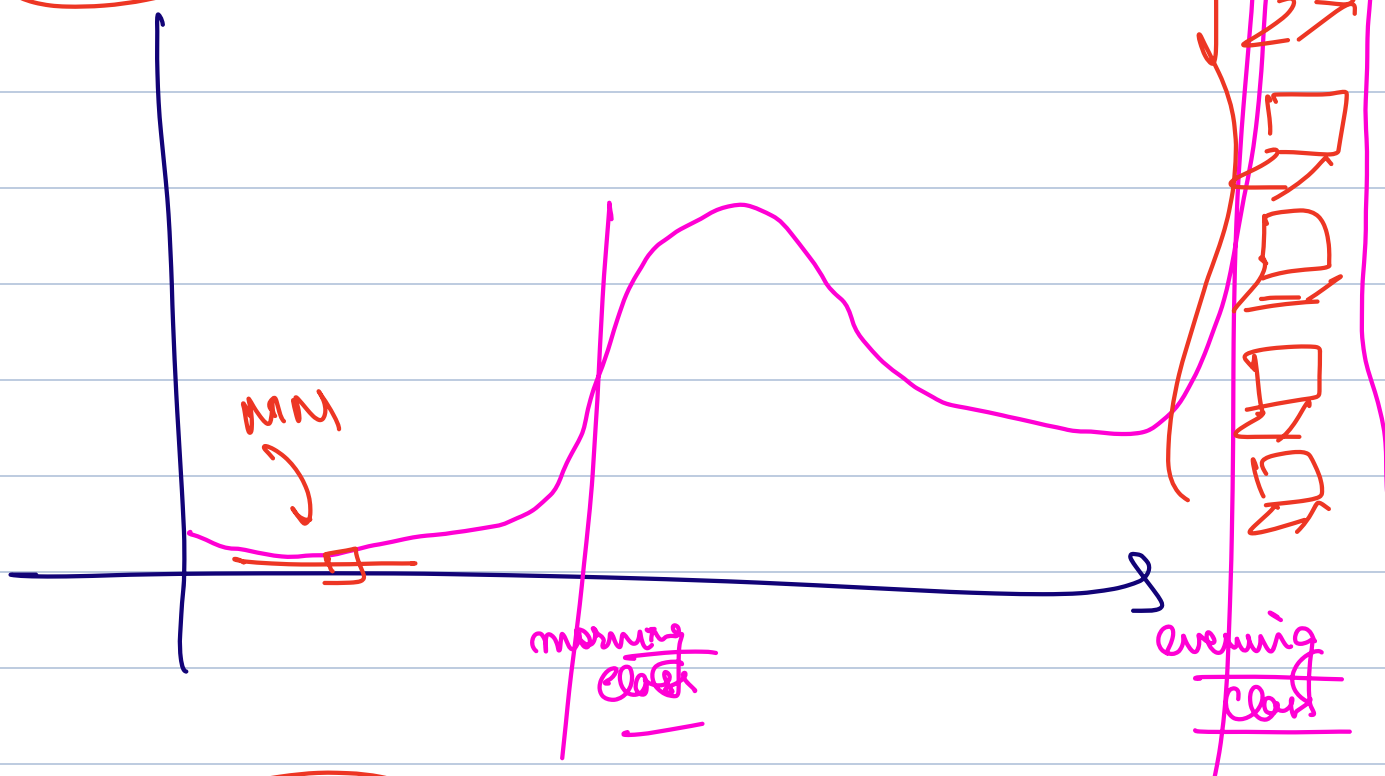
Buy Public ip address has some issues -> a) Upfront investment - buy too many laptops to take this much load
b) Scaling -> buy laptops to handle high traffic

a) Upfront investment

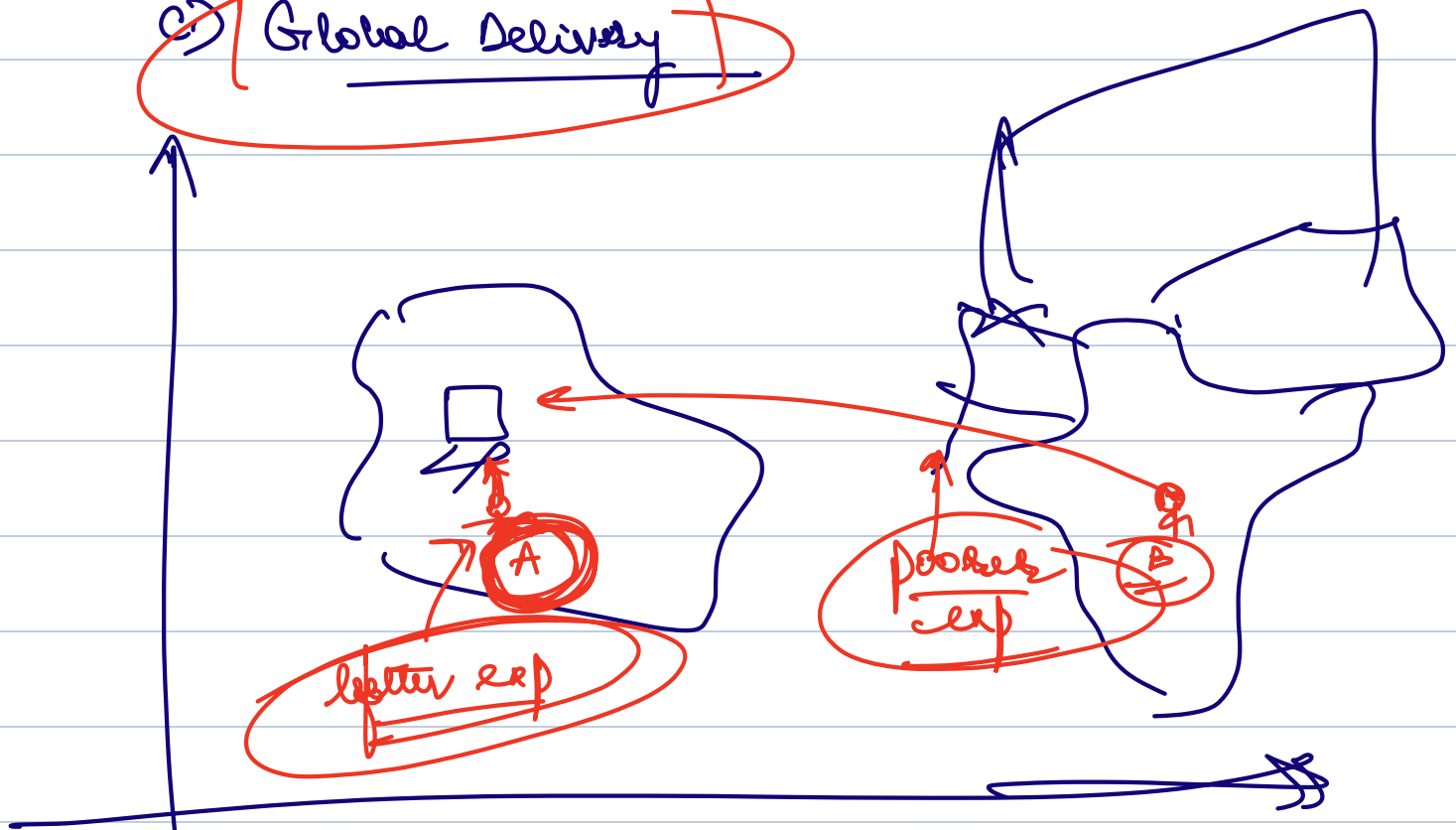


MAP

b) Scaling



c) Global Delivery



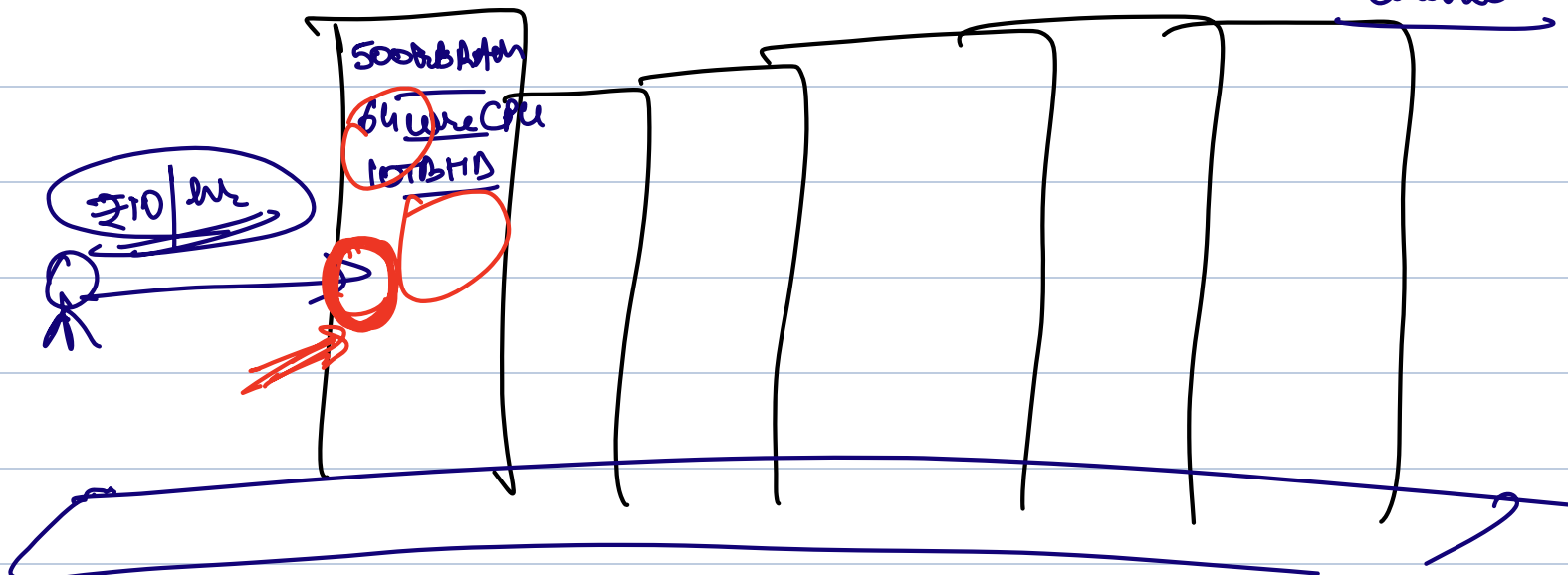
How Cloud allows us to connect two machines

Why Cloud

- ↳ Amazon
- ↳ Google
- ↳ Microsoft

These tech giants buy too many machines -> image them to be servers and they lease / rent them to other people.

Servers: leasing trend



- 1 core CPU
- 1GB RAM
- 10GB HD

You need to tell them you need 1GB CPU, 1GB RAM, 10GB HD. Google will reserve that amt of space here

Examples

Examples of Cloud Providers

AWS

Amazon

Azure

MC

: Google Cloud → Google

Lindy's Effect

Due to Lindy's Effect, it says that something is popular for large amt of time, will remain popular for huge amt of time-
→ like java & AWS

Linux

v1

v2

DB Hosting

Problems with DB Hosting

① Backups

② Redundancy

my data should be present somewhere else so if nuclear attack happens still my data is safe

③ Security

(only app^m Servers should be able to connect)

④ Upgrades

only application servers should be able to connect with the DB -> for security purpose

upgrading to a bigger version of DB

RDS

AWS - Relational Database Service

You go there you say I need my MySQL, there should be 3 replicas of it. It should be having a backup everyhour. This should be the version of MySQL, it should be updated every particular time. Thats it. AWS will manage everything for yourself

① Kafka

② Redis

③ E.S.

(MKS)

Elastic Cache

Managed Infra

This is called Managed Infra, AWS is managing hosting of Kafka, MKS, Redis etc.

Infra being managed by cloud provider directly

you will only be required to configure it a bit

AWS

EC2

⇒ Service of AWS that allows you to lease a machine of your liking

Elastic Compute

(1) Leasing Machines to you

AWS > EC2 > Create Machine

Customized machine k/a EC2 machine

EC2

Machine

1 Ubuntu 22.04

2 8 GB RAM

3 4 cores CPU

4 1 TB HDD

AWS
RDS

or

AWS
MSK

or

AWS
Elastic Cache

EC2
Machine

