Agenda.

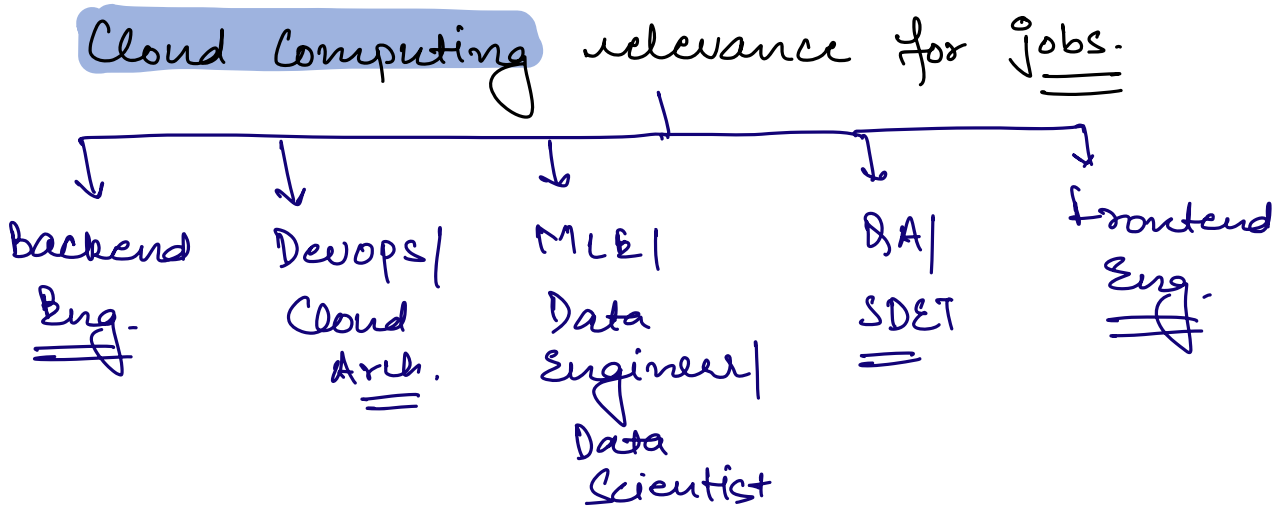
→ Intro

→ What is Cloud ?

↳ Iaas, Paas, Saas.

→ Cloud Computing relevance for jobs.

→ Story of DELL.ICIO.US.



① System Design.

② Cloud Computing

⇒ AWS

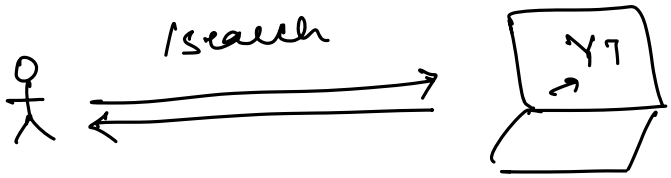
MS Azure

GCP

} Cloud Service Providers.

#

1) Single Point of failure
2) High traffic



Del.icio.us.

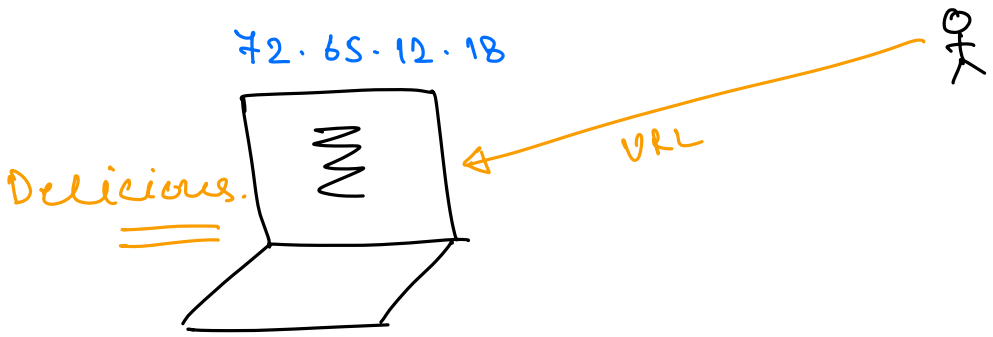
↓

2004.

⇒ Bookmark.

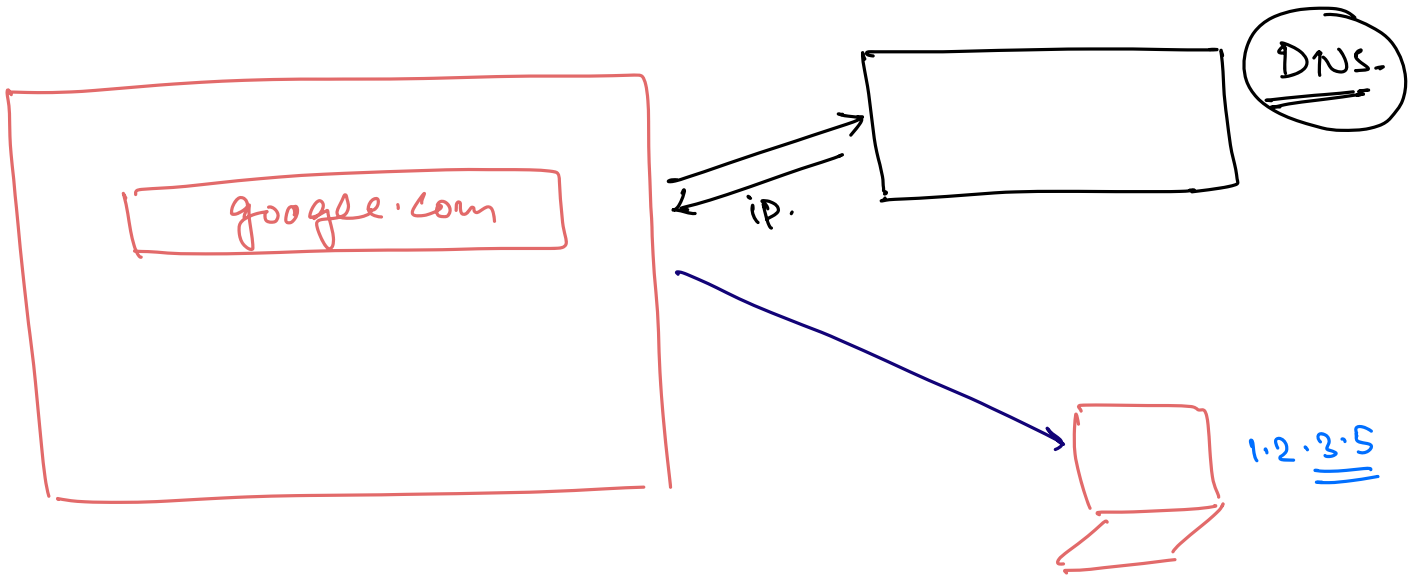
Internet Explorer.

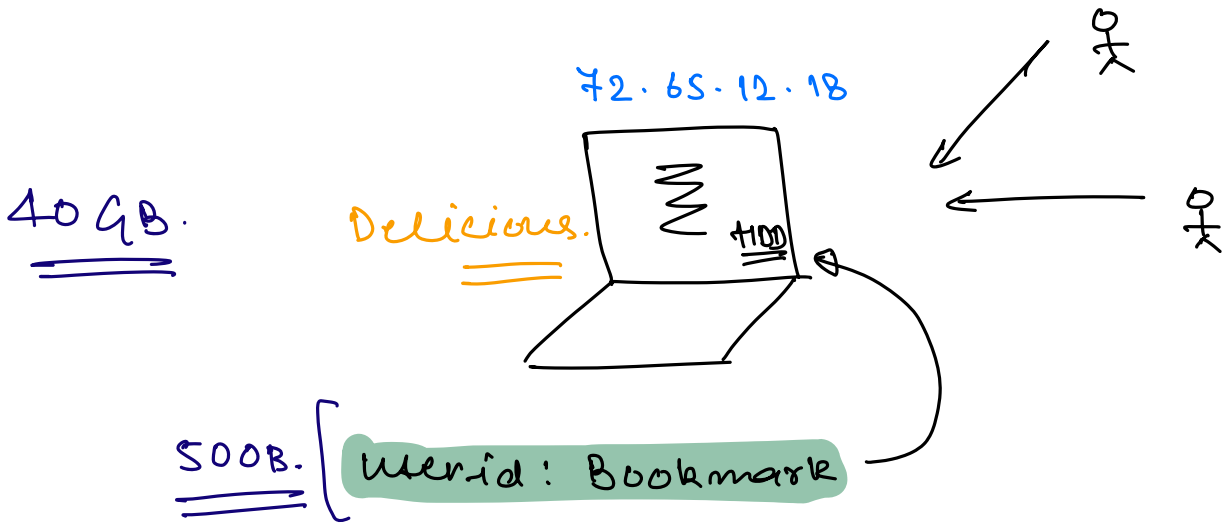
user_id : [Bookmarks ...]



→ Static Ip.

Domain	Ip
google.com :	1.2.3.5
Scaler.com :	10.20.30.40





⇒ 1M Bookmarks per day

⇒ Space/Day

1 Bookmark ⇒ 500 B.

1 Million ⇒ 500×10^6 B.

⇒ 500 MB.

1 B → 8 bits.

1000 B ⇒ 1 KB

1000 KB ⇒ 1 MB

1000 MB ⇒ 1 GB

1000 GB ⇒ 1 TB

40 GB.

↓

# of days = $\frac{40 \times 1000 \text{ MB}}{500 \text{ MB}}$

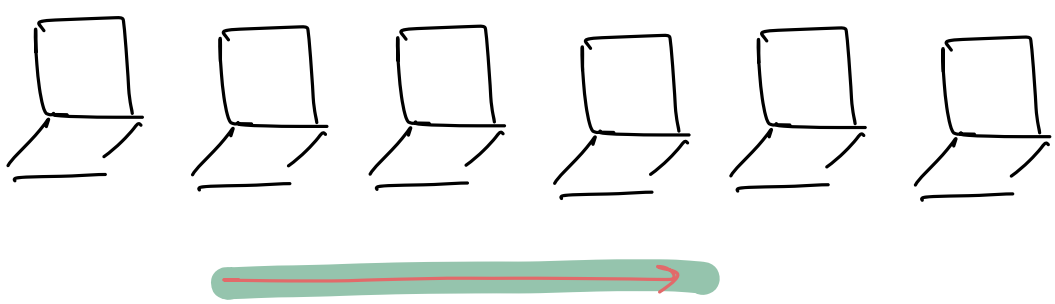
= 80

⇒ Out of Storage.

⇒ We need to add more space.

Scaling

- Vertical Scaling: Increasing the capacity of same m/c.
- Horizontal Scaling: Add more m/c.



100 m/c

⇒ If we have more m/c, maintenance would be very difficult.

⇒ Distributed architecture

Cloud Service Providers

- AWS
- Azure
- GCP

Data Centre.

- 100,000

⇒ Rent m/c from Cloud providers as per the requirement.

↓

Pay as per the usage.

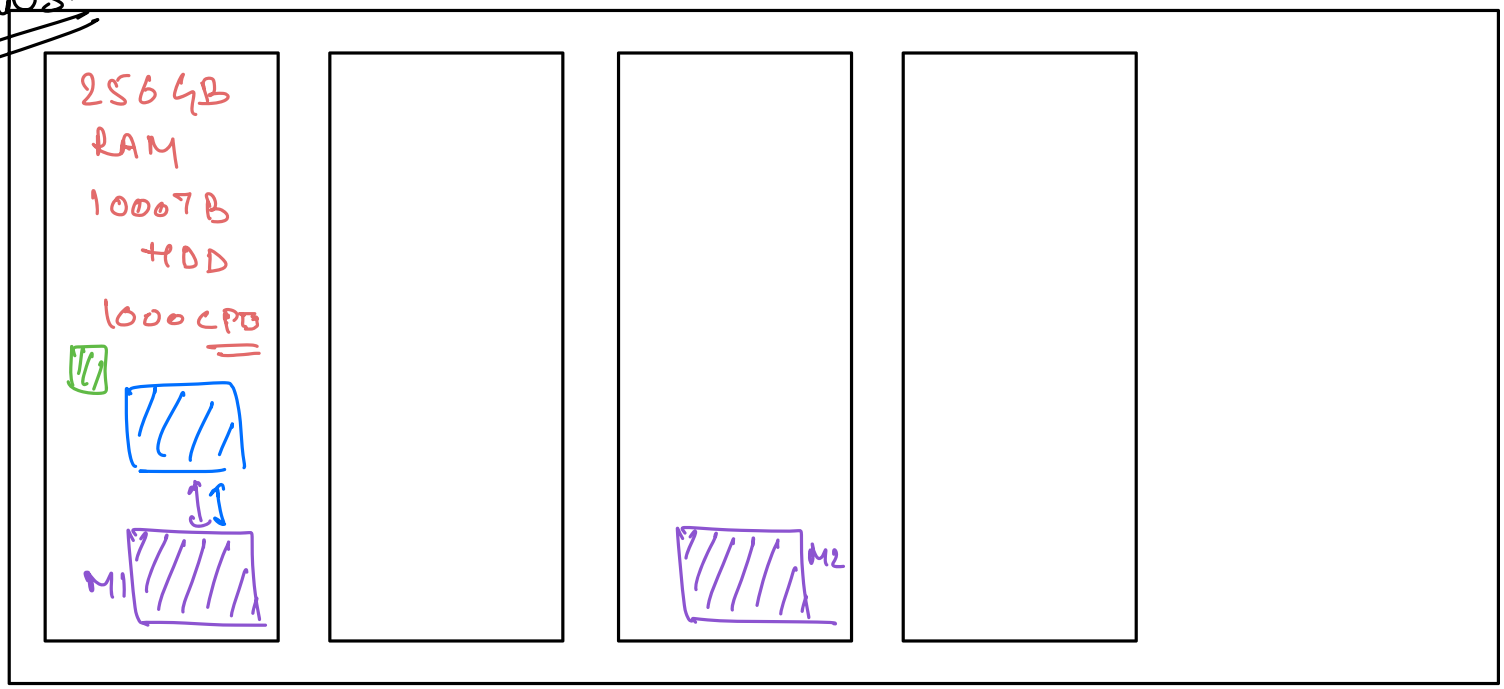
SCALER.

- 9PM - 11:30 PM
- 7AM - 9:30 AM

} 100 m/c

19 hrs : 20 m/c

AWS:

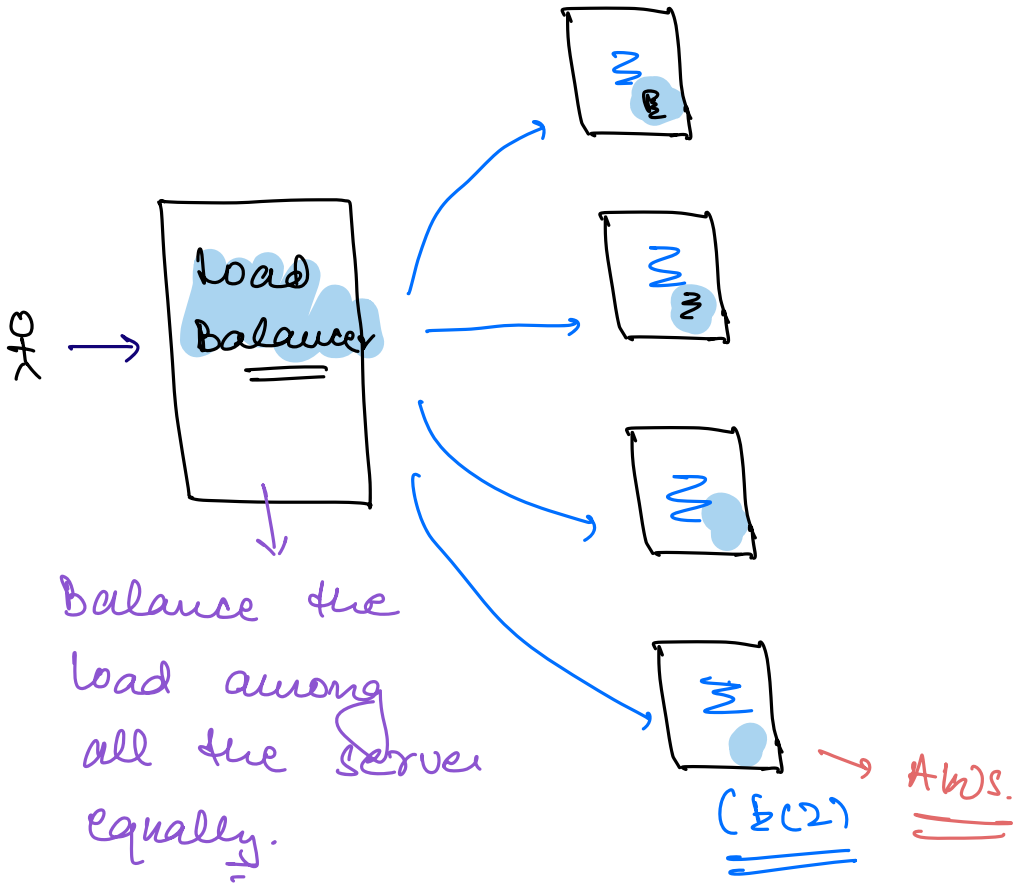


M1 : 2 CPU
2 GB RAM
100 GB HDD.

⇒ Isolated.

⇒ Hypervisor.

M2 : 2 CPU
2 GB RAM
100 GB HDD.



⇒ Elastic Load Balancer.

⇒ Auto Scaling

4 - 20

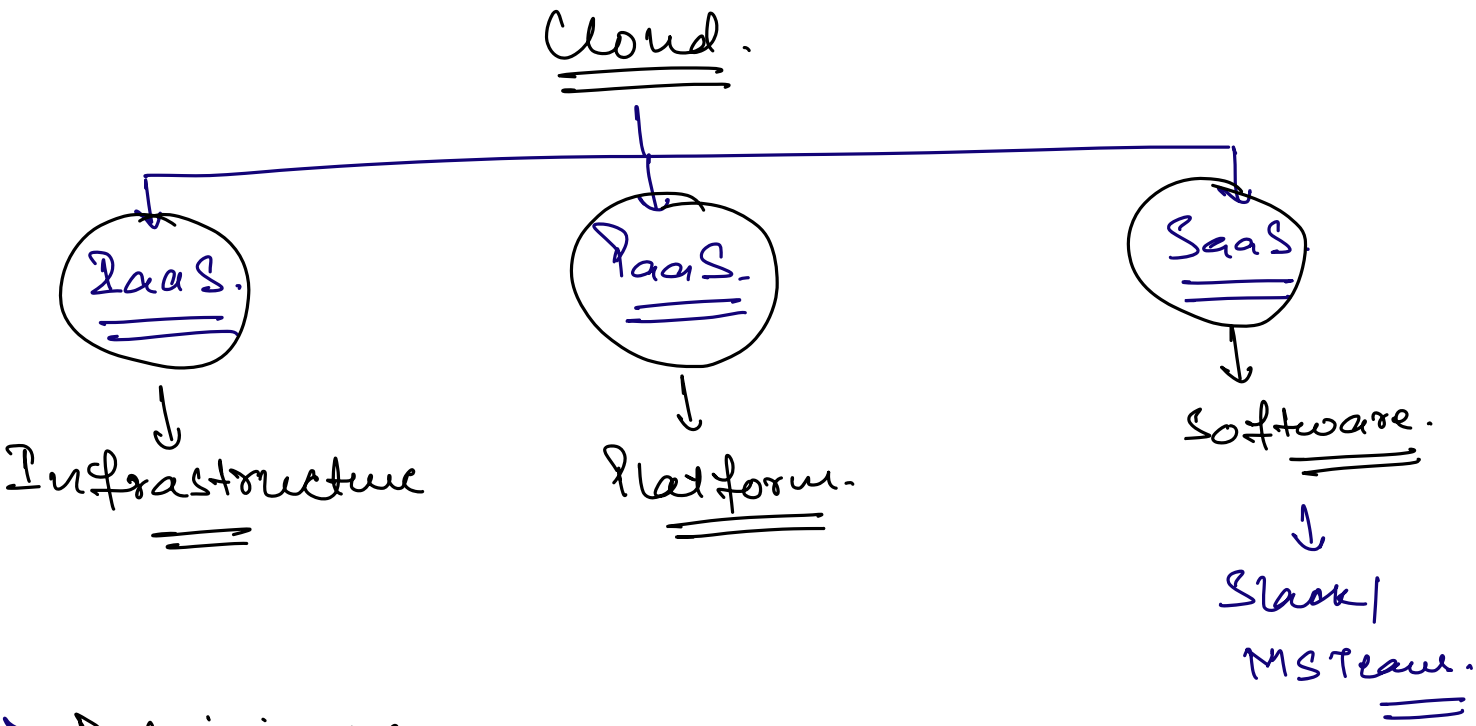
Min

Max.

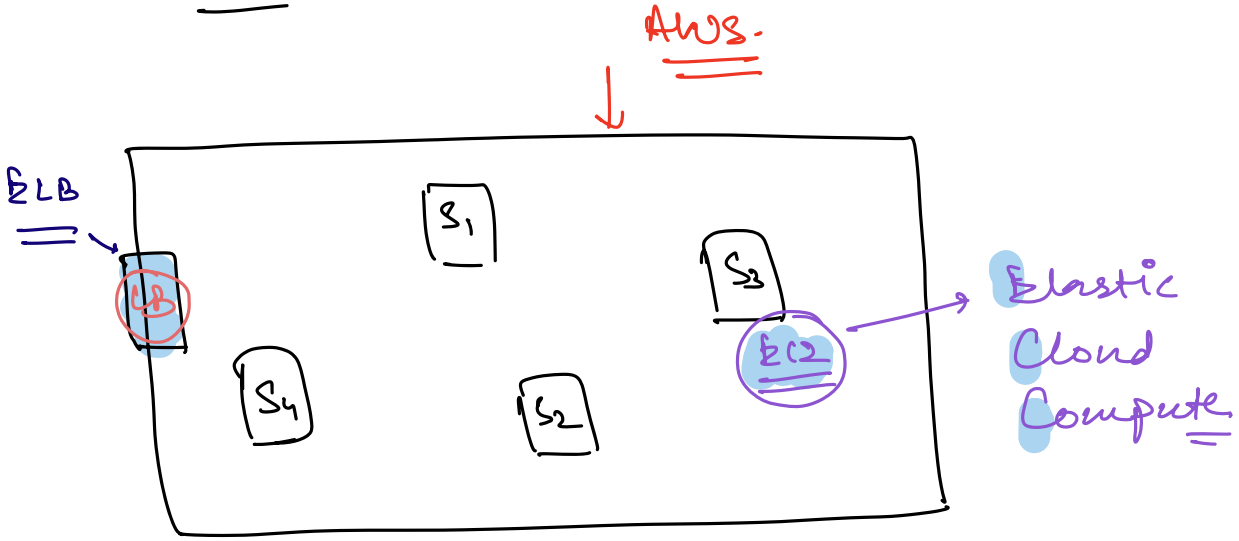
Rules

- if RAM utilization > 70% ⇒ (+1)
- if CPU utilization > 70% ⇒ (+1)
- if RAM utilization < 30% ⇒ (-1)
- if CPU utilization < 30 ⇒ (-1)

⇒ Stateless.



⇒ Del.icio.us.



AWS: Type of EC2 m/c

C : Cpu Intesive. : C6i.large ⇒ 60-70 $ / month

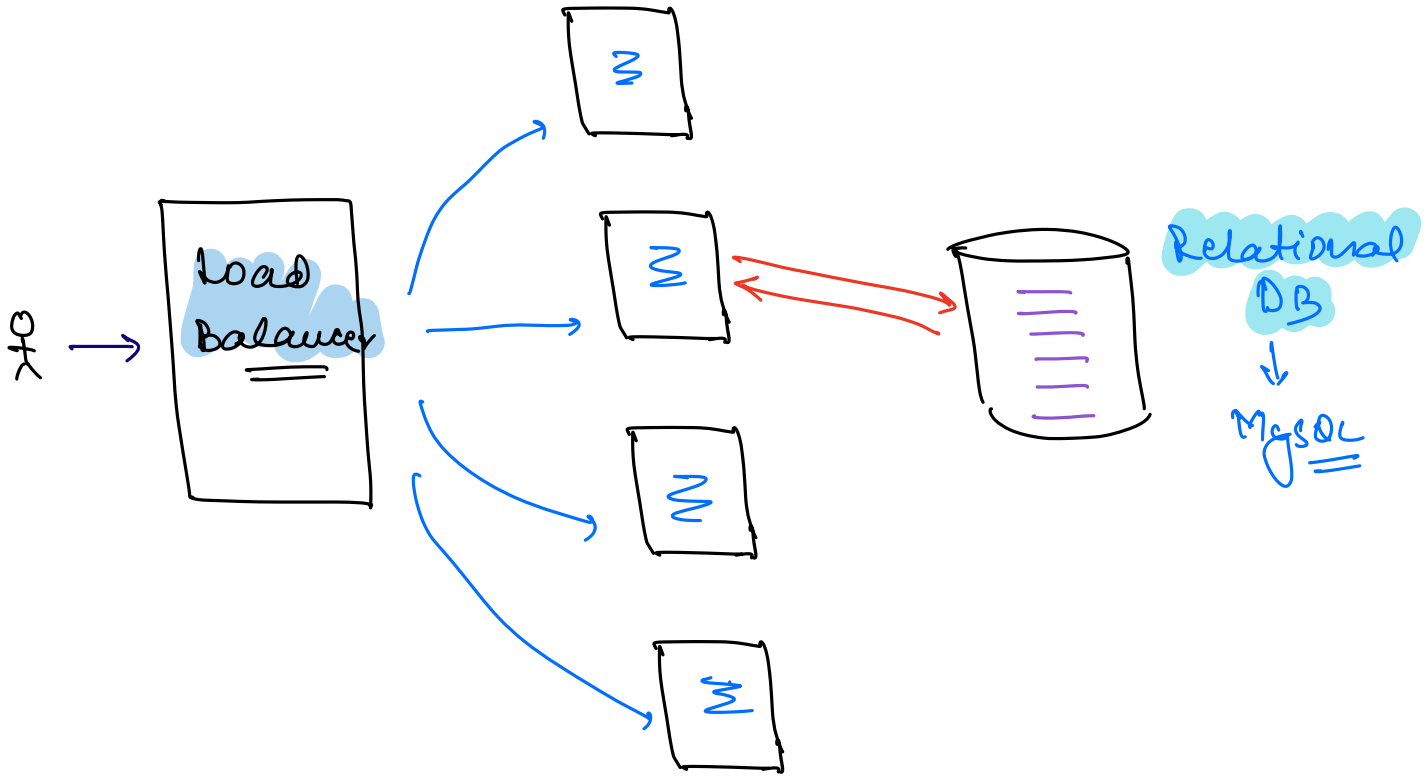
M : Storage Intesive: M6i. large ⇒ 70 $ / month

R : RAM intensive: R6i. large ⇒ 90-100 $ / month

T : Small & cheap m/c

⇒ Delicious.

↳ Store Bookmarks.



Databases.

Amazon → User Details.

→ Product Details.

Shirt

Phone

laptop

TV

=

=

=

⇒ More than one DB m/c.

⇒ SHARDING.

↓

Dividing data across multiple m/c.

user1 : [- - - - -]

user2 : [- - - - - -]

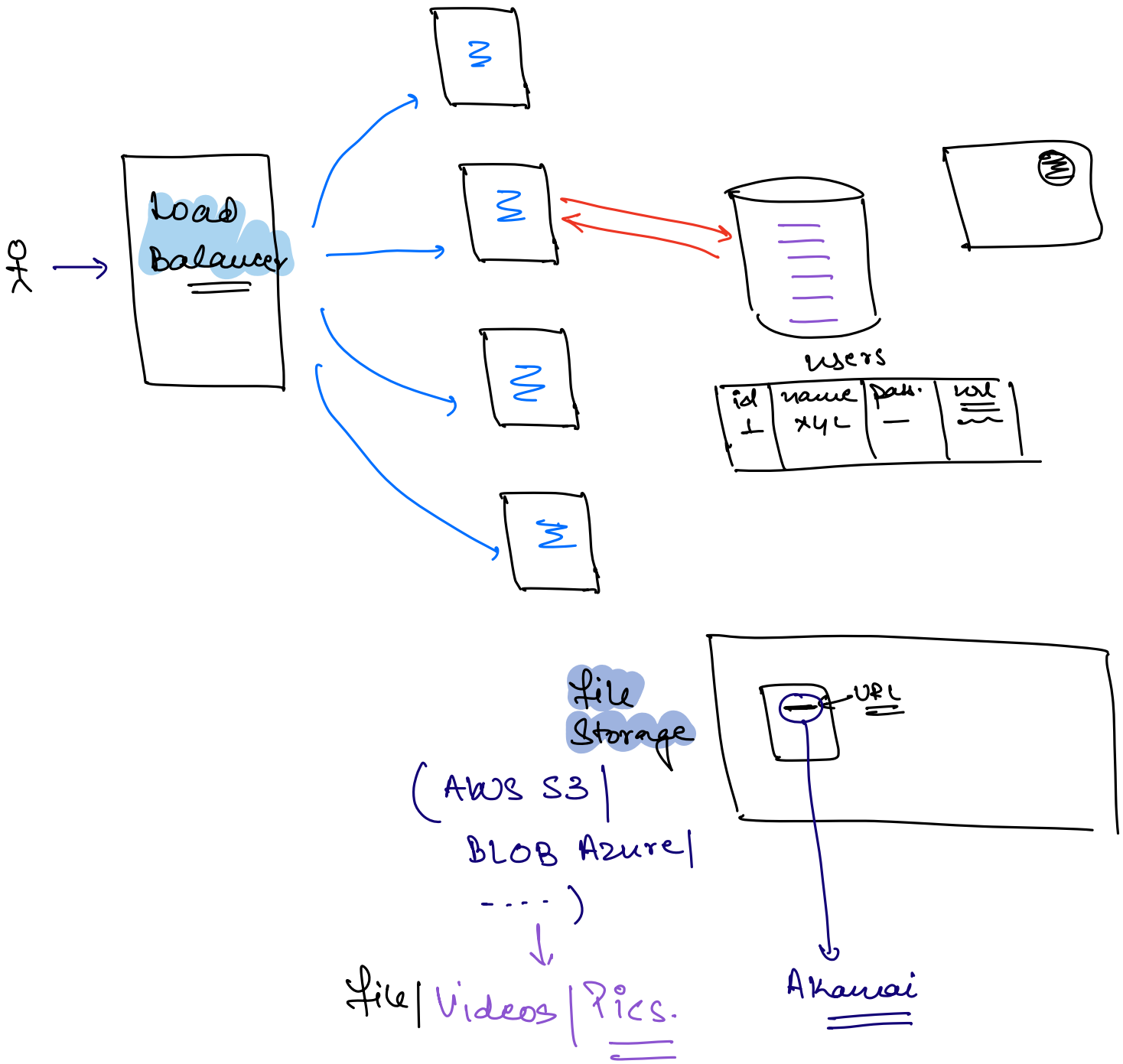
user3 : [- - - - - -]

⋮

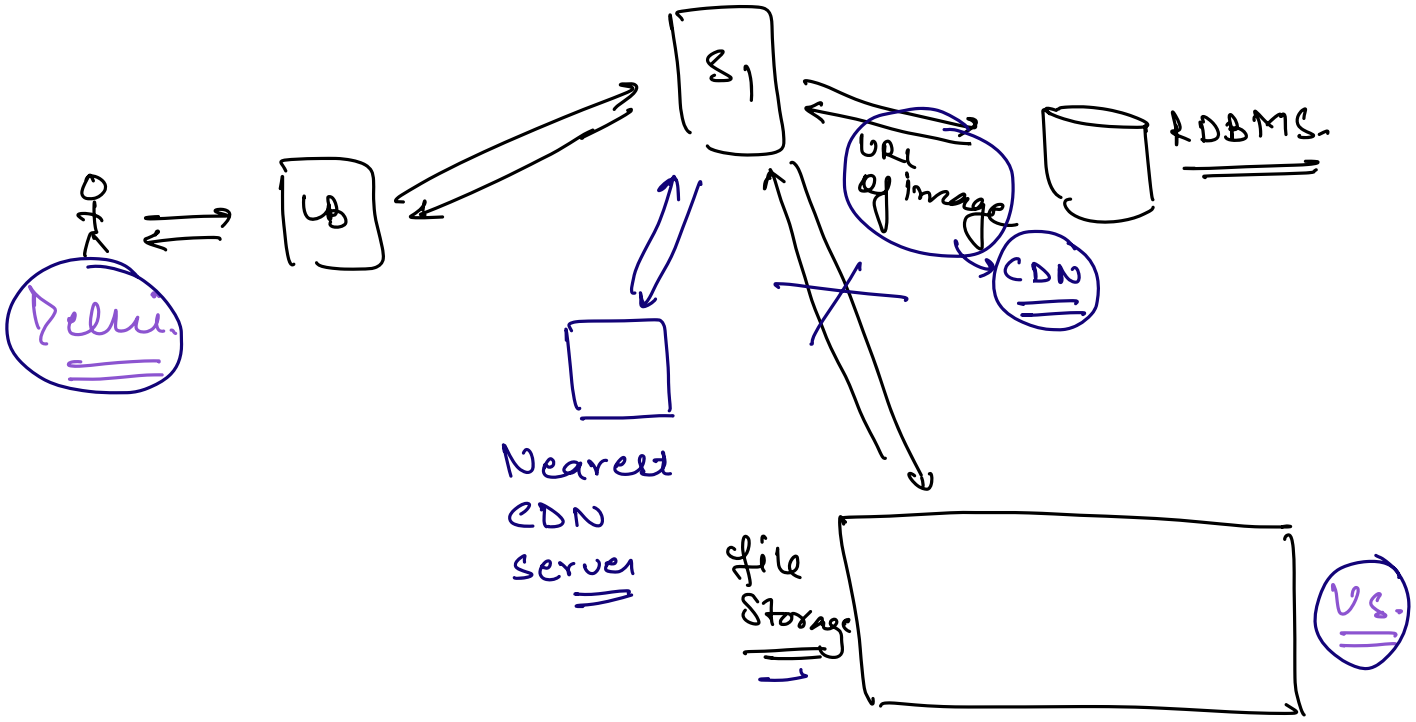
Sharding Key. : user_id

New feature.

↳ profile pic.



FB. | Instagram



latency ↑.

CDN. → $

↓

Content Delivery Network.

↳ Akamai

↳ AWS CloudFront

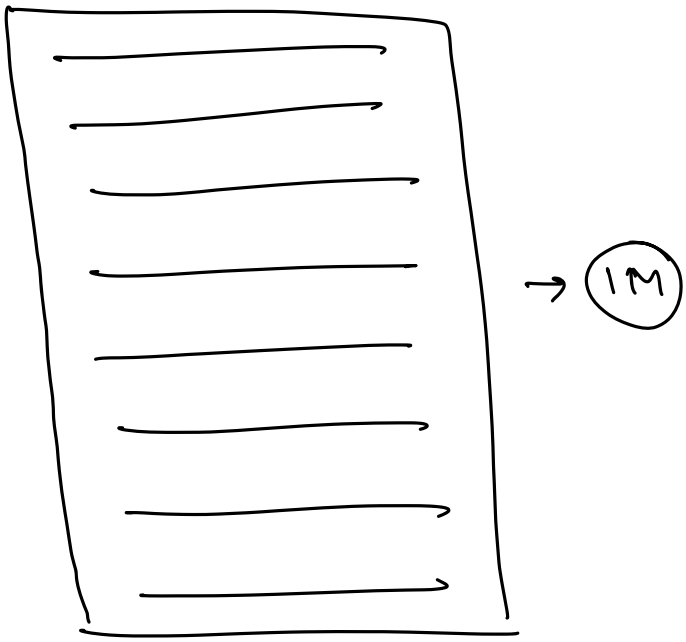
=

Live Cricket Match on Hotstar

↳ CDN.

Searching.

Delicious.



Cloud.

⇒ Full Text Searching.

⇒ ElasticSearch.

↓

DB optimized for full text Searching.

"iphone" → Doc1, Doc5, Doc7, ..

"cloud" → Doc2, Doc3, Doc6, ..

"scaler" → Doc7, Doc10, ...

"~~the~~" →

"~~is~~" →

Inverted Index.

[NLP].

⇒ find all the docs which contains the word "Cloud".

⇒ AWS Cloudwatch.

⇒ Notification.

When a user adds a bookmark, we need to notify all of their followers.

User1 ⇒ 10,000 followers.

List of followers.

for (——→) {

notify()

}

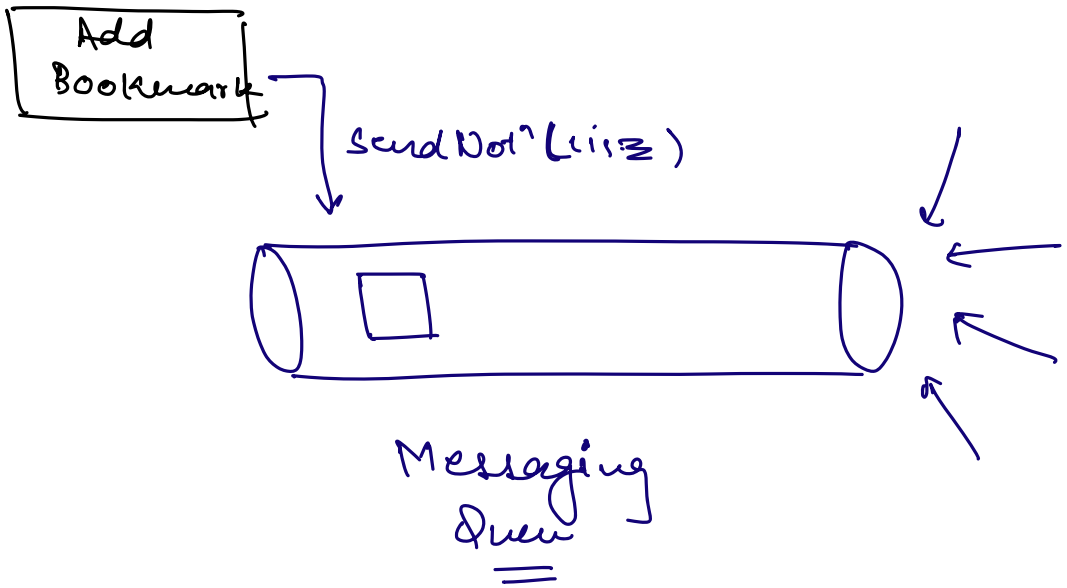
Time Consuming.

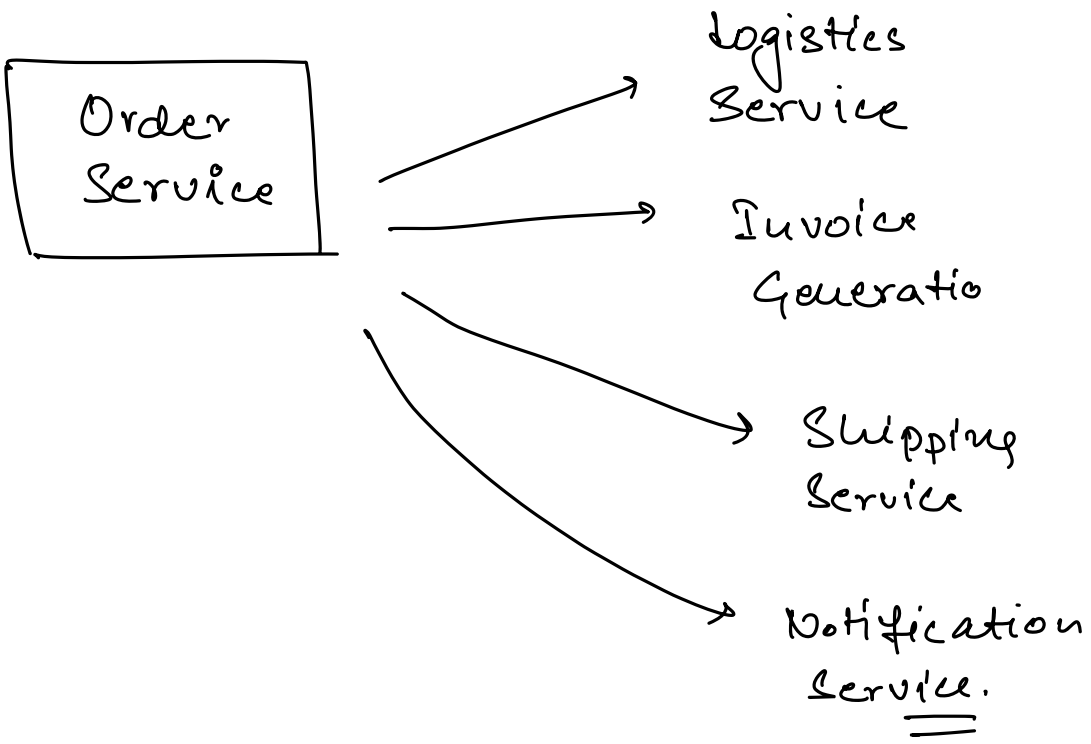
Synchronous

Asynchronous

↓

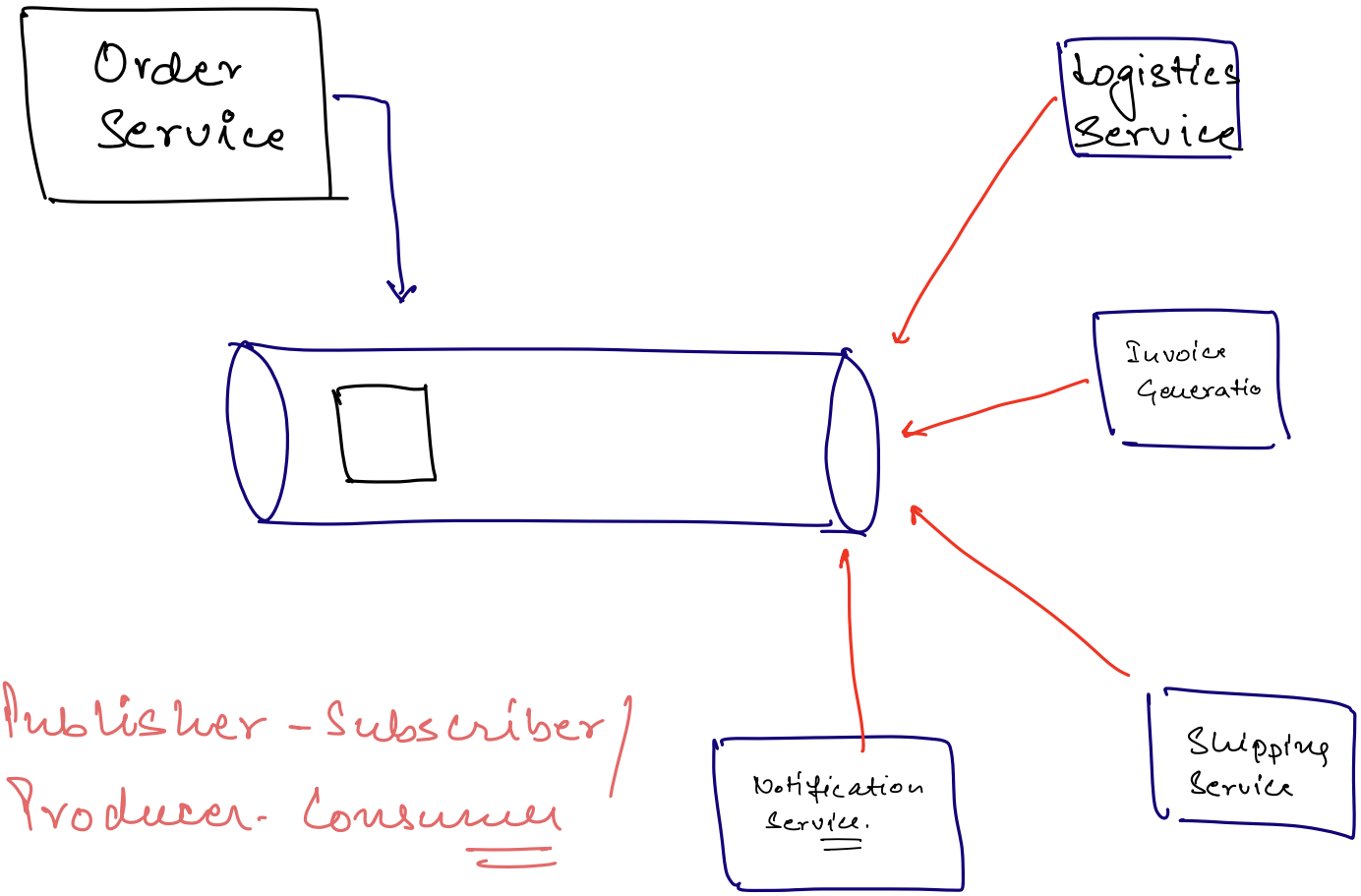
Parallel.





⇒ Message Queue

- Kafka
- RabbitMQ
- Active MQ.



⇒ Publisher - Subscriber / Producer - Consumer

⇒ AWS : → Kafka

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