

Twitter < System Design



Functional Requirements:

- 1) post a tweet (can contain audio, video, links)
- 2) User Timeline
- 3) Home Timeline
- 4) Search
- 5) Follow

Non-Functional Requirements:

- 1) Fast Tweet
- 2) Read heavy
- 3) Fast Rendering
- 4) Lag is ok in certain cases.

Scale Estimation:

Daily Active Users: 200 million / day

Monthly Active Users: 450 million / month

Daily Tweet Count: 700 million / day

∴ We need to design a system that can support above estimations

Architecture: Client - Server Architecture

Types of Users:

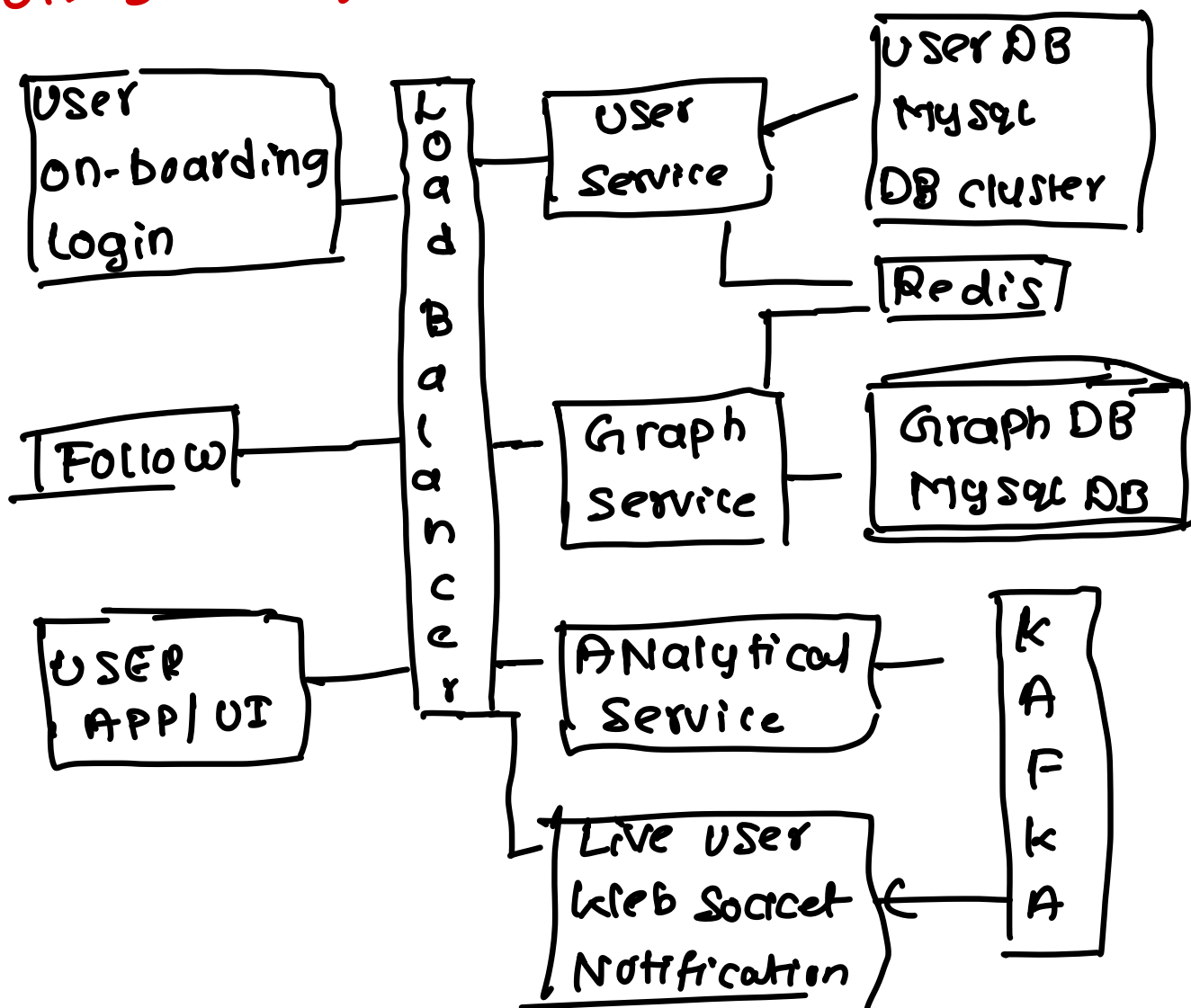
- 1) Famous (Celebrities, politicians etc...)
- 2) Active users (who opened the app in last 3 days)
- 3) Live (who is using the app)
- 4) Passive users (who didn't open the app in last 3 days)
- 5) In-Active users (last 3 days)
(deactivated)

ARCHITECTURE:

Lets divide the diagram into three Components

- 1) On-boarding, Follow, Analytical Service, Live WebSocket Notification Service
- 2) Post a tweet
- 3) Search a tweet, Analytics

ON-Boarding, Follow, ANALYTICAL, NOTIFICATION:



Redis:

- 1) user-id : user-details
- 2) user-id : Follower-id
- 3) user-id : Type of user
- 4) user-id : Last-seen
- 5) user-id : Following id

(1) User Service :

Helps in posting and getting user related information like user-id, user image, name, etc...

Post /user-image GET /user-image

Post /user-name GET ./user-details

User Data is relational. Therefore, MySQL cluster is opted.

Since we need to support low latency --
we keep user details in redis cache

(2) Graph Service:

It keep track of users followers and whom the user is following.

The data is relation. Therefore, Graph MySQL DB cluster is chosen.

For low Latency, This information is stored in Redis.

user-id : follower id

user-id : following id.

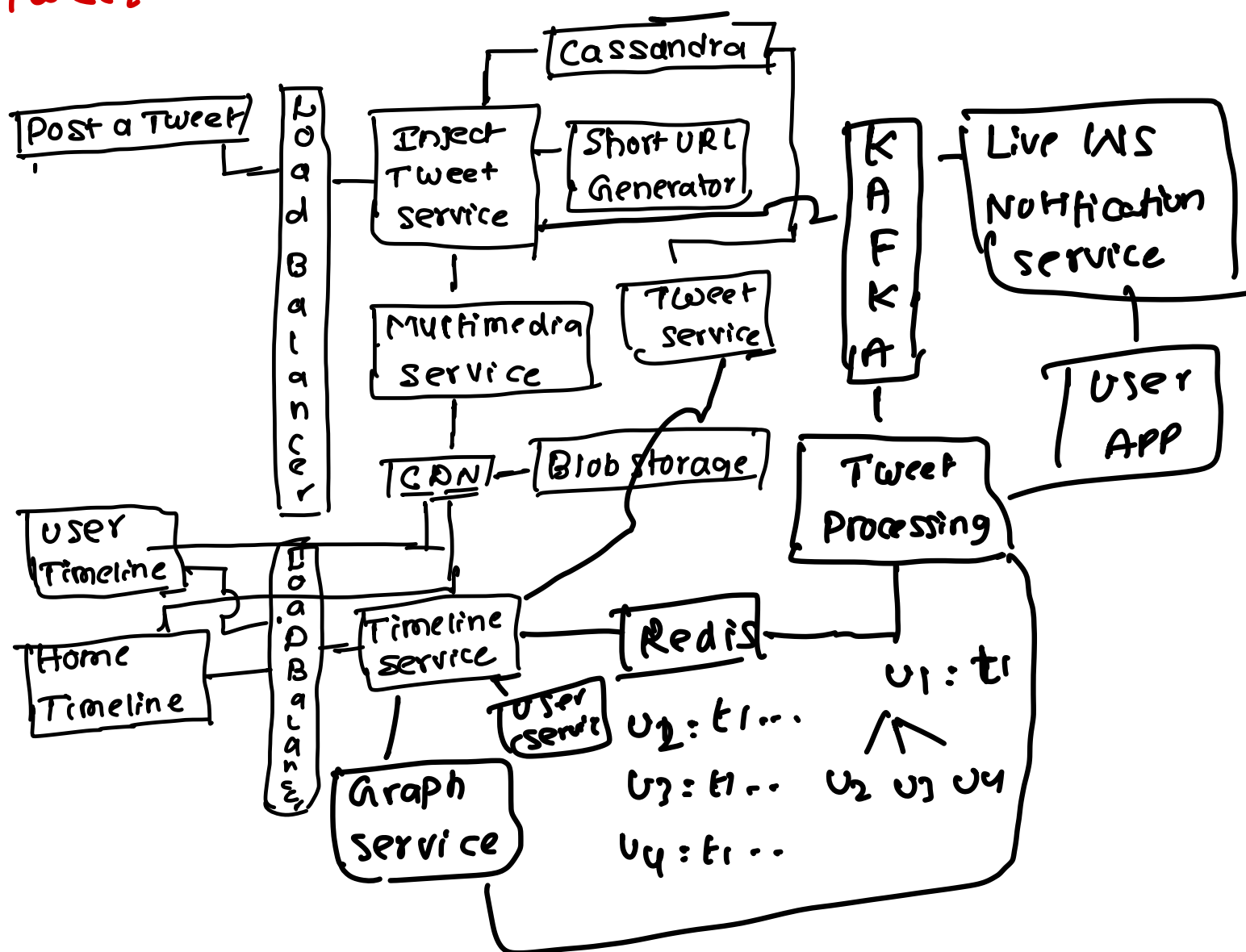
3) Analytical Service:

If the user is spending more time reading particular type of tweets. This information is captured via Analytical Service and pushed to KAPKA

4) Live USER websocket Notification:

- Since live users are already connected to the system. They receive notifications when the following people post tweets

Tweet Service:



Search:

