System Design Document

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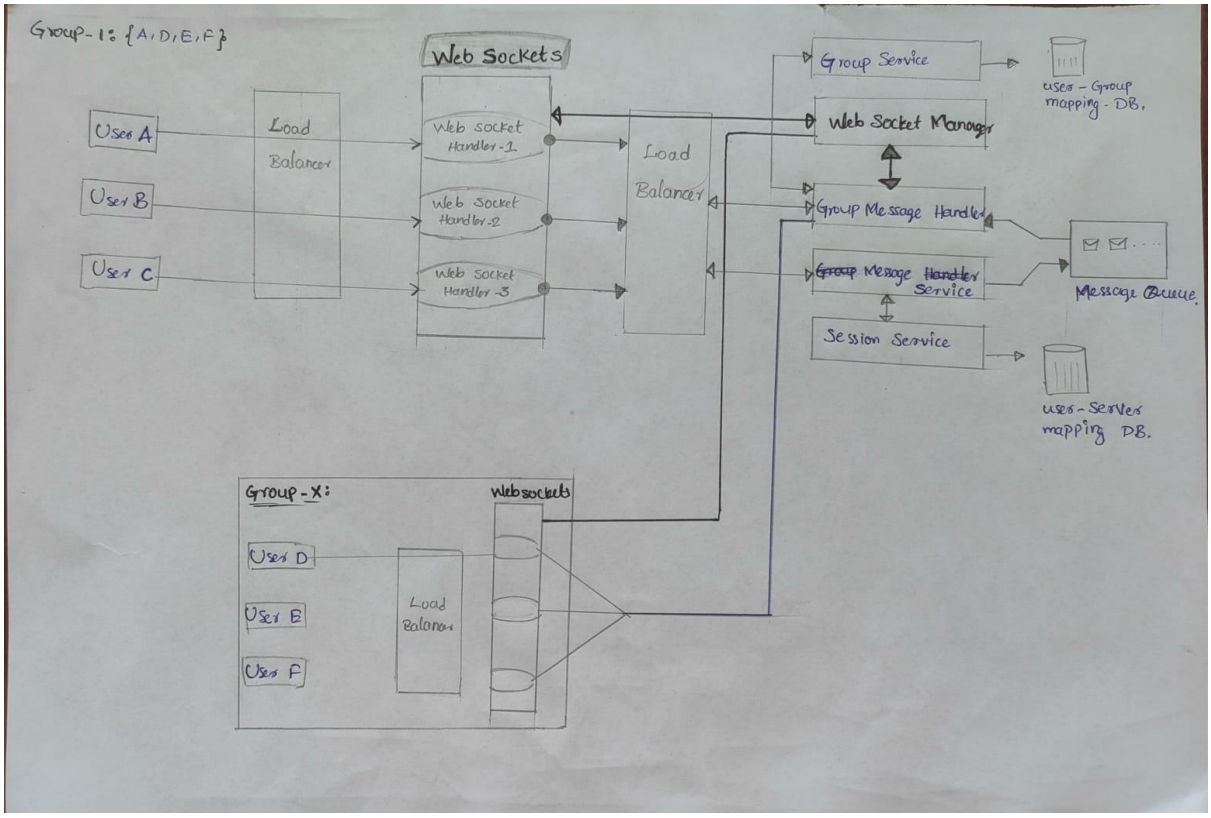
- Project setup and dependencies installation steps has been mentioned in the project folder README file in this Github repo link .
- Also few screenshots of the prototype has also been attached int the folder .

APP:

Wechat – A web messaging service prototype build with Django framework , channels , websockets , REST APIs with user registration and authentication .

System Architecture :

High-Level Architecture Diagram:



Architecture overview:

- Lets assume when User A wants to send a message to User B ,then first user A establishes a persistent connection with Messaging service via websocket protocol .
- Then User A sends a message request to Messaging service with a ID of User B .
- Websocket protocol comes in handy with the feature that the websocket protocol server can respond without any client request to be made .
- This is unlike a traditional HTTP protocol where the client needs to send a request every time when it requires some response .
- Now , the messaging service identifies User B via session service to deliver the message .
- The sessions service works in a way that whenever a user connects to the messaging service , it will tell the session service in which server that particular user has established the connection which is stored in a database .
- And later this data can be used to deliver messages to the other end .

- When a user wants to send a message to a particular group . Websocket gets in touch with Message handler .
- Now , this message service will store the message in Queue / kafka message queue . And Automatation such as which user is sending message to which group basically Message service will act as kafka producer .
- Whenever message service posts a message to kafka message queue that a particular user is sending a message to a group . Group message handler will query Group service to get the list of all users which are in that particular group id .It gives that data from user – group mapping database .
- After that , when the Group message handler gets the list of all the users , this handler now needs the data of the respective list of machines those users are connected to which it will get from the websocket manager .
- Once it gets list of machines the Message handler will send message to individual machines by contacting the respective websocket handler .
- Where websocket is a light weight server which keeps an open bi-directional connection with all users .

Database Schema :