

System Design Document

Name : Dhanushmanth savaturi

Institute : IIT Bhubaneswar

Department : Computer Science and Engineering .(B-Tech)

- 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 .

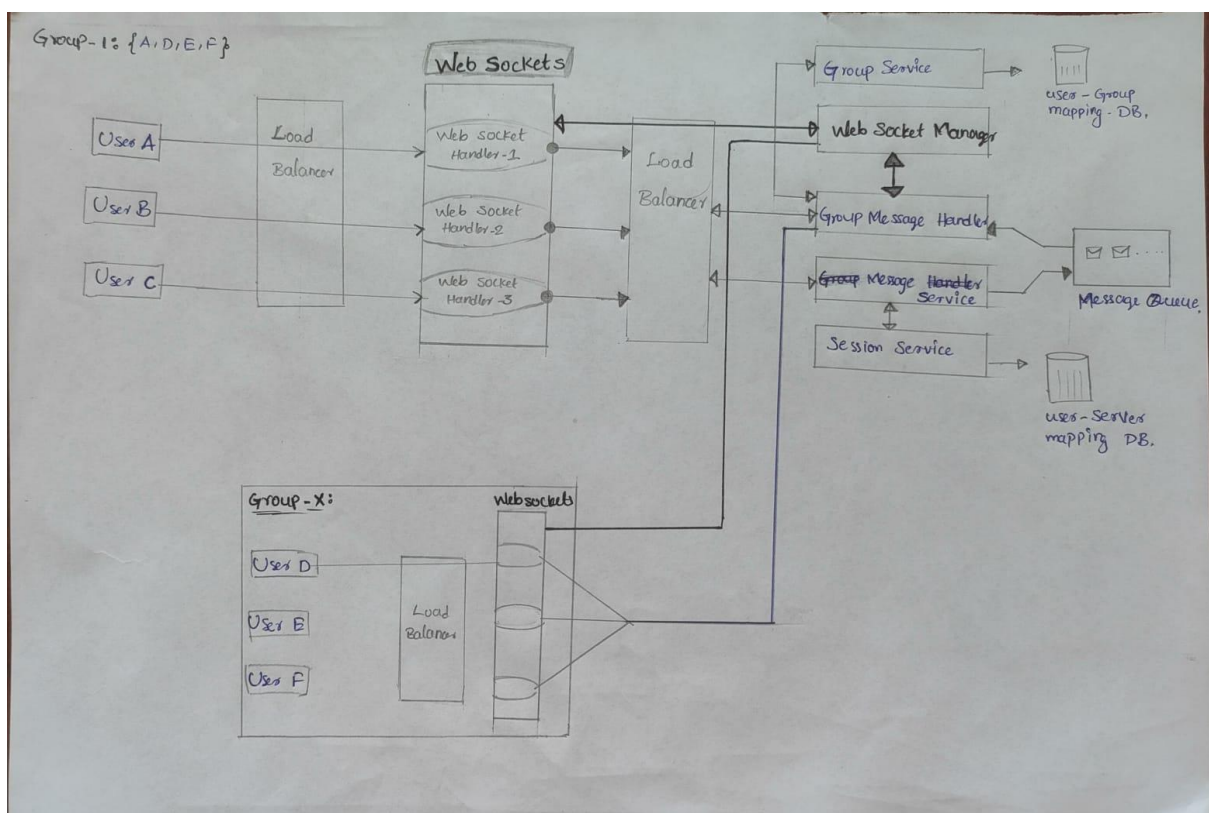
APP:

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:

- This is a hand drawn diagram , I will update it with a screenshot of diagram drawn on a online system board .

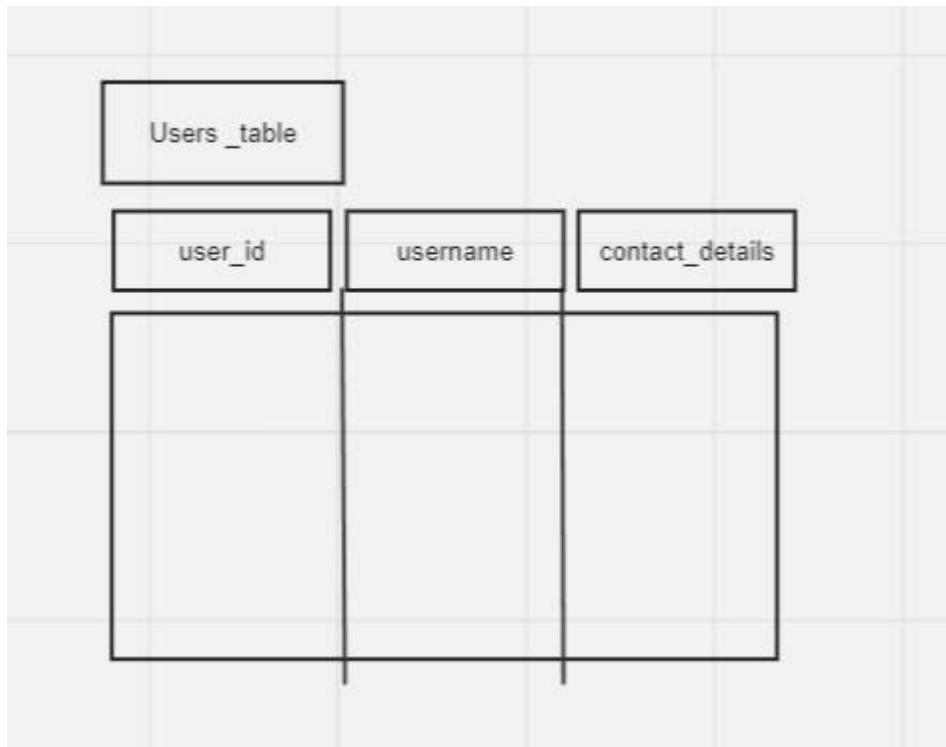


Architecture overview:

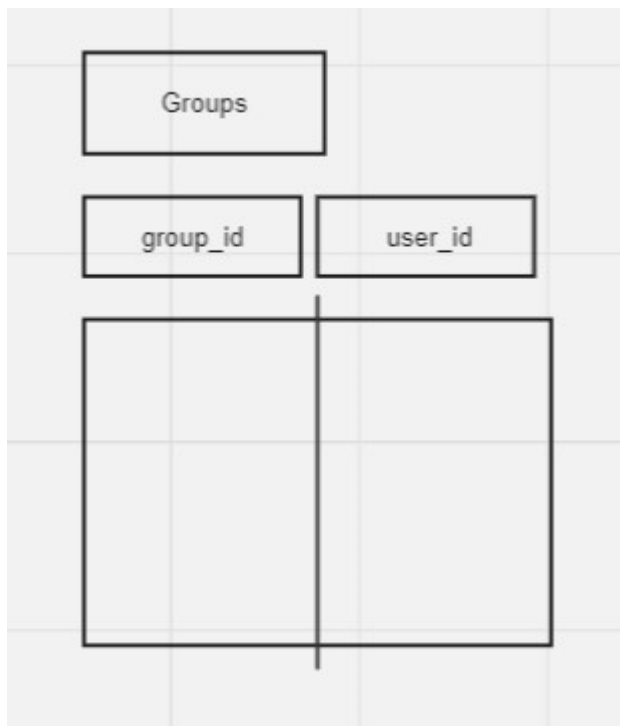
- Lets assume when User A wants to send a message to User B ,then first user A establishes a persistent connection with Messaging service via websocket protocol .
 - Then User A sends a message request to Messaging service with a ID of User B .
 - Websocket protocol comes in handy with the feature that 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 .
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- 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 Automation 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 .
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Database Schema :

- Users table – which contains user_id , username and other contact details .



- Groups table :



- Sessions table : contains user_id and server_id which can be used to send the message to that respective server_id while delivering the message .

