

ABSTRACT

RealChat is an online chat application. It enables users to chat with other RealChat via internet. It is a web application (i.e.) it can be used with the help of web browser that supports Java Script, Html5 like Firefox and Chrome. Most modern web browser supports this, so this application can be accessed from almost any smartphone or computers. Because it can run on web browser itself, it doesn't require any additional software. It stores all users' information and chat histories in cloud with proper security. Unlike other chat applications, RealChat restricts some functionality of forwarded messages to prevent hoax, scam, and rolling over old news. For every forwarded message it shows the owner of the message and timestamp when it created, and it doesn't save any of the forwarded message in its database. By doing this RealChat server will process data more efficiently and the size of the database is reduced. Since it is not stored in database, it is not possible to receive messages when user is offline, and it will be erased after received if the page reloaded. This makes chat more real as scam, hoax and old messages cannot be forwarded long.

CHAPTER 1

INTRODUCTION

1.1 DESCRIPTION

Chatting refers to any kind of communication that offers a real-time transmission of messages from sender to the receiver. Chatting is a method of using technology to bring people and ideas together despite the geographical barriers. The technology to provide the chatting facility has been available for years, but the acceptance is quite recent.

Number of chat messages sent and received increases day by day, at the same rate fake and scam messages gets increased. One of the main reason for rapid spread of fake and scam messages is because of anonymous forwarding. The recent popular messaging applications such as WhatsApp, Facebook and Hike allows users to forward unlimited number of messages. Many unaware users blindly trust the messages and they forward them too. This makes scam and fake news unstoppable.

This chat application mainly focus to stop forwarded messages by revealing the actual owner of the message. Additionally this application wont saves a copy of forwarded message. This completely prevents a message from forwarded for long time. User is only able to receive forwarded message when they are online. This will make strong opinion in user's mind that forwarded messages are mostly up-to-date.

1.2 EXISTING SYSTEM

There are many online chat applications available for free in internet. Each of them provides their own features. The most popular chat applications include Facebook, WhatsApp, Instagram, Hike and Telegram. Every application functions in different way and have their own pros and cons. Facebook allows users to add unknown friends and share news feeds etc. Instagram is a public gallery that developed into a social media. WhatsApp is a messaging application that is more popular now a days due to its convenience. It is more secure than other chat applications as it provides end to end encryption for all chats. But it lacks cloud storage feature and it needs special application to be installed to access it. Telegram provides more feature such as groups and channels with cloud storage, and even end to end encryption for

secret chats. Telegram is also a popular messenger as it is more customizable, flexible and faster than WhatsApp.

DISADVANTAGES

- There are many fake news and old forwarded messages spread by unaware people that makes user annoying.
- Forwarded messages are not trustable, as they cannot be identified.
- Large number of phishing attacks are done by spreading fake attractive news with a scam links.
- Due to lots of forwarded messages, it takes many space in servers that could make them slow.

1.3 PROPOSED SYSTEM

In this project RealChat, the existing chat system is not altered. But one of the popular feature “forward” is altered. RealChat doesn’t allow user to forward a message for the contacts that are offline. It doesn’t stores forwarded message in database, so that it could not occupy space. Due to this, it cannot be retrieved again once it has been received. If the user reloads the page, then the forwarded messages will disappeared. This might sounds slightly weird but it make sure that the message is not too old. Users can still be able to copy and paste the message if it needs to be delivered to client when they comes online. Last but not least, every forwarded message will have the owner name and timestamp that the owner created the message. This information will give you an idea about whether the message should be trusted or not.

ADVANTAGES

- Reduced complication in database.
- Reduced forwarded fake and scam messages.
- Easy to report the scammer who forwards the message.
- Old forwarded messages can be avoided.

CHAPTER 2

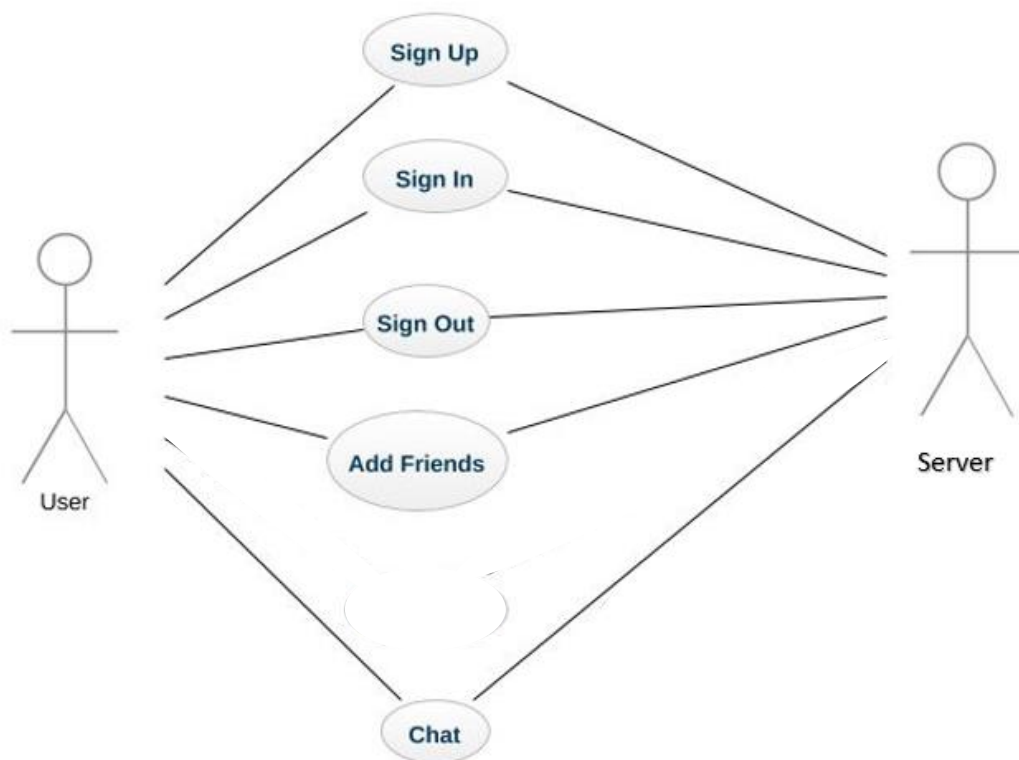
SYSTEM DESIGN

GENERAL

Design Engineering deals with the various unified modelling language diagrams for the implementation of project. Design is a meaningful engineering representation of a thing that is to be built. Software design is a process through which the requirements are translated into representation of the software. Design is the place where quality is rendered in software engineering. Design is the means to accurately translate requirements into finished product.

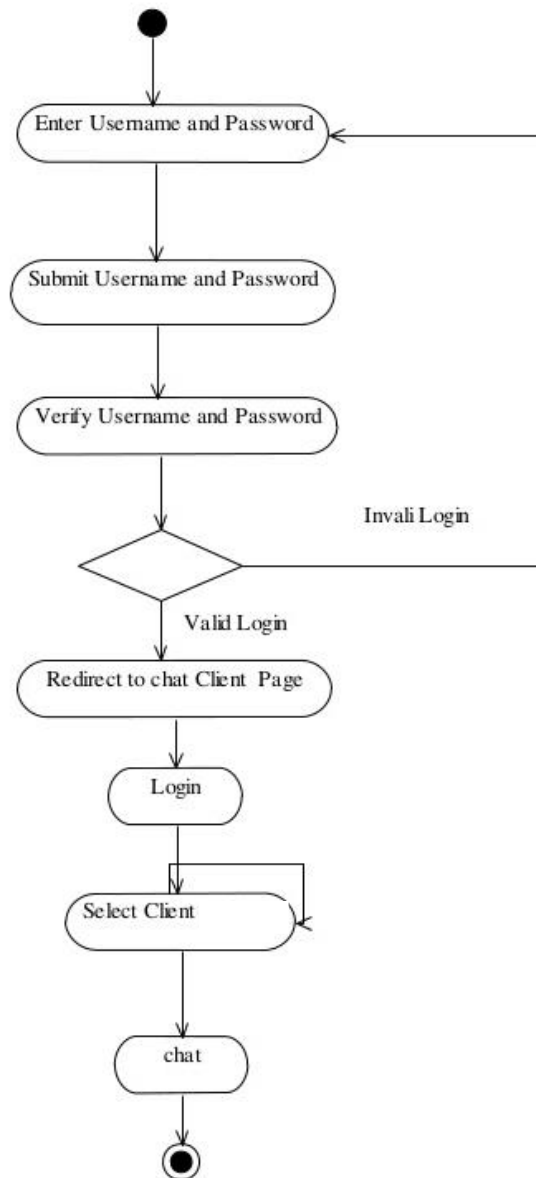
2.1 USE CASE DIAGRAM

A use case diagram is a type of behavioural diagram created from a use-case analysis. The purpose of use case is to present overview of the functionality provided by the system in terms of actors, their goals and any dependencies between those use cases.



2.2 ACTIVITY DIAGRAM

Activity diagram is defined as a UML diagram that focuses on the execution and flow of the behaviour of a system instead of implementation. It is also called object-oriented flowchart. Activity diagrams consist of activities that are made up of actions which apply to behavioural modelling technology.



CHAPTER 3

SOFTWARE SPECIFICATION

3.1 LANGUAGE, FRAMEWORK & DATABASE

RealChat is developed in python with the help of Django framework. It uses MariaDB for backend database. For instant and reliable chat, RealChat uses HTTP protocol to transfer static data such as HTML, CSS and JavaScript and media files. It uses web sockets to send chat messages. To provide high performance in chat, RealChat uses REDIS server.

PYTHON 3.7

Python is a high level programming language also used as scripting language. It is most popular, powerful and easy to learn language. It doesn't have hard syntax like Java or C. It is cross platform compatible and interpreted language. It is an open source language. RealChat is built with python to simply reduce its complexity and makes it easy for future updates.

DJANGO

Django is a high-level Python Web framework that encourages rapid development and clean, pragmatic design. Built by experienced developers, it takes care of much of the hassle of Web development, so you can focus on writing your app without needing to reinvent the wheel. It's free and open source.

DJANGO CHANNELS

Channels is a project that takes Django and extends its abilities beyond HTTP - to handle WebSockets, chat protocols, IoT protocols, and more. It's built on a Python specification called ASGI.

It does this by taking the core of Django and layering a fully asynchronous layer underneath, running Django itself in a synchronous mode but handling connections and sockets asynchronously, and giving you the choice to write in either style.

MARIA DB

MariaDB Server is one of the most popular database servers in the world. It's made by the original developers of MySQL and guaranteed to stay open source. Notable users include Wikipedia, WordPress.com and Google.

MariaDB turns data into structured information in a wide array of applications, ranging from banking to websites. It is an enhanced, drop-in replacement for MySQL. MariaDB is used because it is fast, scalable and robust, with a rich ecosystem of storage engines, plugins and many other tools make it very versatile for a wide variety of use cases.

MariaDB is developed as open source software and as a relational database it provides an SQL interface for accessing data. The latest versions of MariaDB also include GIS and JSON features.

REDIS SERVER

Redis is an open source (BSD licensed), in-memory data structure store, used as a database, cache and message broker. It supports data structures such as strings, hashes, lists, sets, sorted sets with range queries, bitmaps, hyperloglogs, geospatial indexes with radius queries and streams. Redis has built-in replication, Lua scripting, LRU eviction, transactions and different levels of on-disk persistence, and provides high availability via Redis Sentinel and automatic partitioning with Redis Cluster.

3.2 PROTOCOLS

HTTP

HTTP is the underlying communication protocol of World Wide Web. HTTP functions as a request–response protocol in the client–server computing model. HTTP/1.1 is the most common version of HTTP used in modern web browsers and servers. In comparison to early versions of HTTP, this version could implement critical performance optimizations and feature enhancements such as persistent and pipelined connections, chunked transfers, new header fields in request/response body etc. Among them, the following two headers are very notable, because most of the modern improvements to HTTP rely on these two headers.

Keep-Alive header to set policies for long-lived communications between hosts (timeout period and maximum request count to handle per connection)

Upgrade header to switch the connection to an enhanced protocol mode such as HTTP/2.0 (h2, h2c) or Web sockets (web socket)

WEB SOCKETS

Web Sockets allow both the server and the client to push messages at any time without any relation to a previous request. One notable advantage in using web sockets is, almost every browser support web sockets.

Web Socket solves a few issues with HTTP:

Bi-directional protocol — either client/server can send a message to the other party (In HTTP, the request is always initiated by client and the response is processed by server — making HTTP a uni-directional protocol)

Full-duplex communication — client and server can talk to each other independently at the same time.

Single TCP connection — after upgrading the HTTP connection in the beginning, client and server communicate over that same TCP connection throughout the lifecycle of Web socket connection.

3.3 WORKING ENVIRONMENT

OPERATING SYSTEM

An operating system is the set of basic programs and utilities that make your computer run. At the core of an operating system is the kernel. The kernel is the most fundamental program on the computer and does all the basic housekeeping and lets you start other programs.

RealChat is deployed in a Debian OS. It is world's most stable Linux distro suited for servers. Deploying in Debian is easy as well as secure and stable.

Debian systems currently use the Linux kernel or the FreeBSD kernel. Linux is a piece of software started by Linus Torvalds and supported by thousands of programmers worldwide. FreeBSD is an operating system including a kernel and other software.

VIRTUAL ENVIRONMENT

A virtual environment is a tool that helps to keep dependencies required by different projects separate by creating isolated python virtual environments for them. This is one of the most important tools that most of the Python developers use.

REQUIREMENTS FOR REALCHAT (python packages with versions)

Modules	Version
asgi-redis	1.0.0
asgiref	1.0.0
attrs	16.3.0
autobahn	0.17.1
Automat	0.5.0
channels	1.0.3
constantly	15.1.0
daphne	1.0.3
Django	1.10.5
incremental	16.10.1
msgpack-python	0.4.8
redis	2.10.5
six	1.10.0
Twisted	17.1.0
txaio	2.6.1
zope.interface	4.3.3

CHAPTER 4

APPLICATION DESIGN

4.1 REGISTRATION MODULE

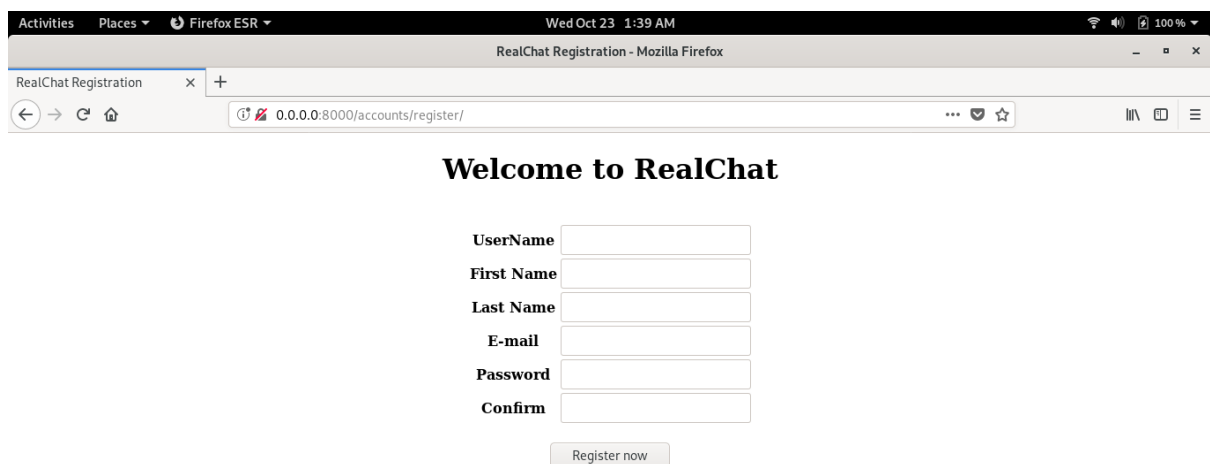
RealChat registration form have simple interface asking for basic user details that is necessary to authenticate. The information is validated before saving into database.

The username should be unique for all users and it is not case sensitive.

E-mail is validated and checked for existence in database (i.e.) E-mail also unique for every user.

Password should be minimum of 8 characters and password and register button will clickable only if password and confirm field matches.

If any error occurred such as username taken or email already exists, then it will be printed on screen.

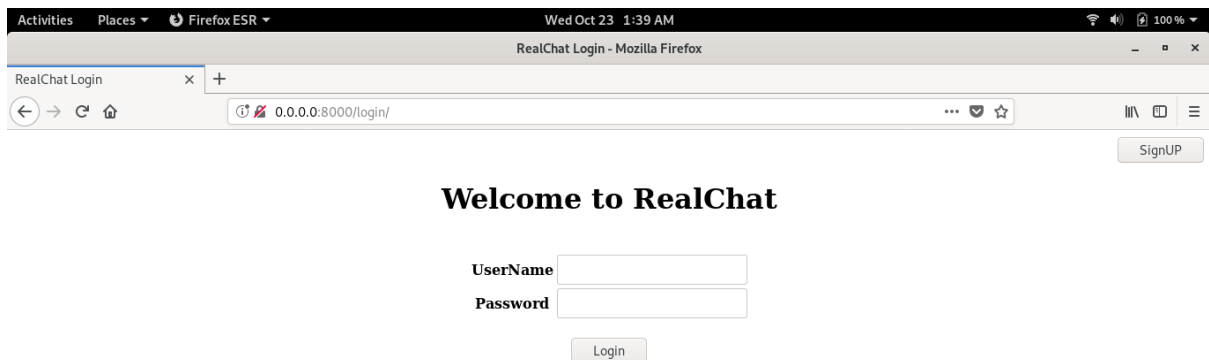


The screenshot shows a web browser window titled "RealChat Registration - Mozilla Firefox". The address bar displays "0.0.0.0:8000/accounts/register/". The page content includes the heading "Welcome to RealChat" and a registration form with the following fields: "UserName", "First Name", "Last Name", "E-mail", "Password", and "Confirm". Each field is represented by a text input box. Below the "Confirm" field is a "Register now" button.

4.2 LOGIN MODULE

After successful registration RealChat automatically redirects user to login page. It contains username and password field. User should provide username and password that they have chosen while registration.

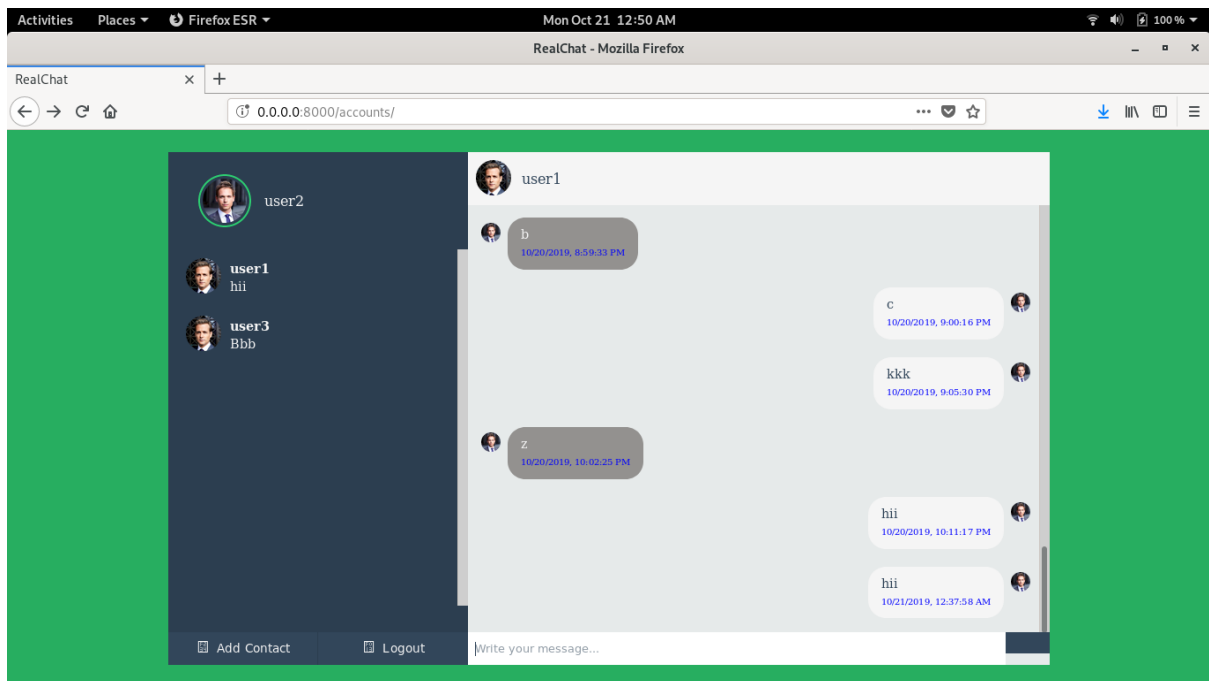
If the username doesn't exist or password doesn't match, then it will print "invalid credentials" on screen. Else user will be granted access to chat.



The screenshot shows a web browser window titled "RealChat Login - Mozilla Firefox". The address bar displays "0.0.0.0:8000/login/". The page content includes a "SignUP" button in the top right corner. Below this, the heading "Welcome to RealChat" is centered. Under the heading, there are two input fields: "UserName" and "Password". Below these fields is a "Login" button.

4.3 CHAT MODULE

After successful login, user will get their chat page on screen. The side panel on left will show the contacts of user. Right side will show chat of selected contact. Add contact button is given to search and add new contacts. Once user started chatting with another user, they will be shown in contacts automatically in next session.



4.4 DATABASE DESIGN

Django automatically creates database based on our models. RealChat uses its default `auth_user` table to store user information in secure. The passwords are saved by hashing them into SHA256.

```
Activities Places ▾ Terminal ▾ Wed Oct 23 1:43 AM
sri@debian: ~

File Edit View Search Terminal Help

+-----+
| id | password | last_login | is_superuser | username | fir |
+-----+
| 1 | pbkdf2_sha256$150000$Pq0j7WahDBUw$JW3FnxGAgHm4+EwNI$20mkugBxi2kwTb9Jle92mNKfqq= | 2019-10-21 14:31:27.830554 | 0 | user1 | use |
| 2 | pbkdf2_sha256$150000$2bpbkqZbrvjne$1XZvgd+m0qWoYAQHILopqk8nG4pwlVw+/b0kb9tXbg= | 2019-10-22 20:11:37.170449 | 0 | user2 | use |
| 3 | pbkdf2_sha256$150000$64N0Ua0pcgWG$xxJJCP+uLXoImaJoEicZ5+H7ZMh8ooFHXl/H0ffekY= | 2019-10-17 09:59:33.699993 | 0 | user3 | use |
| 4 | pbkdf2_sha256$150000$EzNl5DBMj0lN$tiMil9ji3RWOX3KZMD0thpTJs1S68k00turcjgA0Z8= | 2019-10-19 19:11:34.574754 | 0 | user4 | use |
| 5 | pbkdf2_sha256$150000$SuyCFJRsfqis0JXT73MuNrbsXlSdVHfNm2Dpi0hxPHvq3K1RbyxNlKg= | 2019-10-21 09:33:53.881918 | 0 | Abcd | Abc |
| 6 | pbkdf2_sha256$150000$Z4RLg1l2k3K5/iu/qRnpLId8qaL6l8Gj8Ni7f7h1/6l9oiwo1vcjtl8= | 2019-10-21 15:19:04.873696 | 0 | Srikanth | Sri |
| 7 | pbkdf2_sha256$150000$Xhc6WkZujPa0$3AJyYpe8YauW/tft98dR6cKwKpKhCpgVY34dclC+G5I= | 2019-10-21 14:57:02.113479 | 0 | Sharumathi | Sha |
| 8 | pbkdf2_sha256$150000$918UspM0BYyn$G8V6We4GhKKVewLNrxJ6o0qJL/dRg4fggS/BKSfG6PA= | 2019-10-21 15:03:58.216970 | 0 | Kowsi | Kow |
| 9 | pbkdf2_sha256$150000$KJGB5ELBsILi$VZlBmW$HL+gGU90B5vsyVzdm+SbcVPE1VdsKjCf2Gs= | 2019-10-21 15:14:34.519465 | 0 | anonymous mj | Moh |
| 10 | pbkdf2_sha256$150000$918UspM0BYyn$G8V6We4GhKKVewLNrxJ6o0qJL/dRg4fggS/BKSfG6PA= | 2019-10-21 15:14:24.789680 | 0 | Simi | Sim |
| 11 | pbkdf2_sha256$150000$504PVHNK7o3Nys$RF5u1+sZCULQb4o5CIXlhex3+kv/rv3LktJr0ujrE10= | 2019-10-21 15:24:21.272990 | 0 | anonymousmj | Moh |
| 12 | pbkdf2_sha256$150000$504PVHNK7o3Nys$RF5u1+sZCULQb4o5CIXlhex3+kv/rv3LktJr0ujrE10= | 2019-10-21 15:24:21.272990 | 0 | Sridhar | Sri |
| 13 | pbkdf2_sha256$150000$0GmMnZ8krPwN$LfocbLYTHXjgpSxqqd6qZ6isURnRKssYqP8pzemiM4C= | 2019-10-22 11:13:00.704911 | 0 | Arthi | Art |
+-----+

13 rows in set (0.000 sec)

MariaDB [realchat]>
```

Chats are stored in `chat_message` table which is based on our model.

```
Activities Places ▾ Terminal ▾ Wed Oct 23 1:46 AM
sri@debian: ~

File Edit View Search Terminal Help

+-----+
| 13127 | Inimel tha start pananum | 6 | 12 |
| 2019-10-21 15:52:18.654597 |
| 13128 | Php exam ku prepare panlaya? | 12 | 6 |
| 2019-10-21 15:52:25.496486 |
| 13129 | No | 6 | 12 |
| 2019-10-21 15:52:35.610193 |
| 13130 | K da bye, I've no time | 6 | 12 |
| 2019-10-21 15:52:45.810191 |
| 13131 | Ok da | 12 | 6 |
| 2019-10-21 15:53:01.629296 |
| 13132 | Hello | 3 | 1 |
| 2019-10-22 03:52:29.093591 |
| 13133 | hello world | 1 | 3 |
| 2019-10-22 03:52:44.361909 |
| 13134 | Testing | 13 | 1 |
| 2019-10-22 10:58:11.801116 |
| 13135 | abcd | 1 | 13 |
| 2019-10-22 10:58:32.038798 |
| 13136 | ggg | 1 | 13 |
| 2019-10-22 10:58:45.974210 |
| 13137 | aaa | 1 | 13 |
| 2019-10-22 10:58:54.236410 |
| 13138 | www | 1 | 13 |
| 2019-10-22 10:59:10.720339 |
| 13139 | Test notification | 13 | 1 |
| 2019-10-22 10:59:39.713965 |
| 13140 | hey there | 1 | 13 |
| 2019-10-22 11:12:48.819509 |
| 13141 | This is not forwarded | 1 | 13 |
| 2019-10-22 20:10:33.044237 |
| 13142 | hey | 2 | 1 |
| 2019-10-22 20:11:44.775723 |
+-----+

257 rows in set (0.001 sec)

MariaDB [realchat]>
```

CHAPTER 5

TESTING & DEBUGGING

5.1 TESTING

Software testing is defined as an activity to check whether the actual results match the expected results and to ensure that the software system is Defect free. It involves execution of a software component or system component to evaluate one or more properties of interest.

Software testing also helps to identify errors, gaps or missing requirements in contrary to the actual requirements. It can be either done manually or using automated tools. Some prefer saying Software testing as a White Box and Black Box Testing.

In simple terms, Software Testing means Verification of Application Under Test (AUT).

5.1.1 UNIT TESTING

A level of the software testing process where individual units/components of a software/system are tested. The purpose is to validate that each unit of the software performs as designed.

5.1.2 INTEGRATION TESTING

A level of the software testing process where individual units are combined and tested as a group. The purpose of this level of testing is to expose faults in the interaction between integrated units.

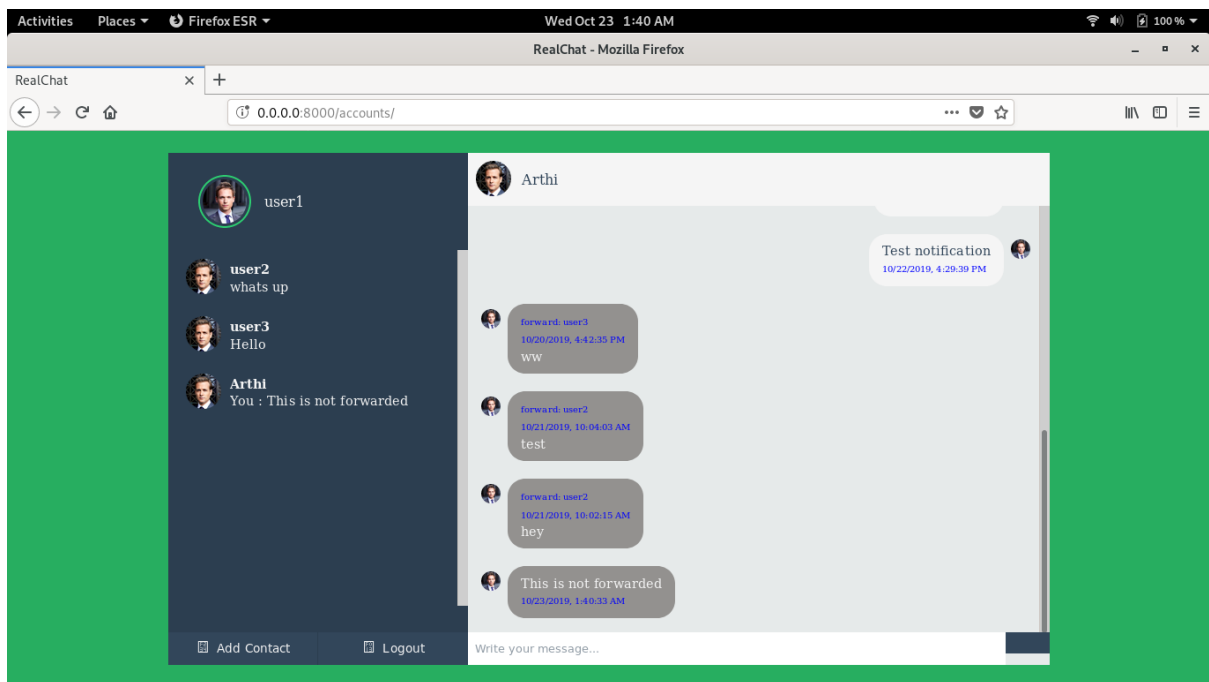
5.1.3 SYSTEM TESTING

A level of the software testing process where a complete, integrated system/software is tested. The purpose of this test is to evaluate the system's compliance with the specified requirements

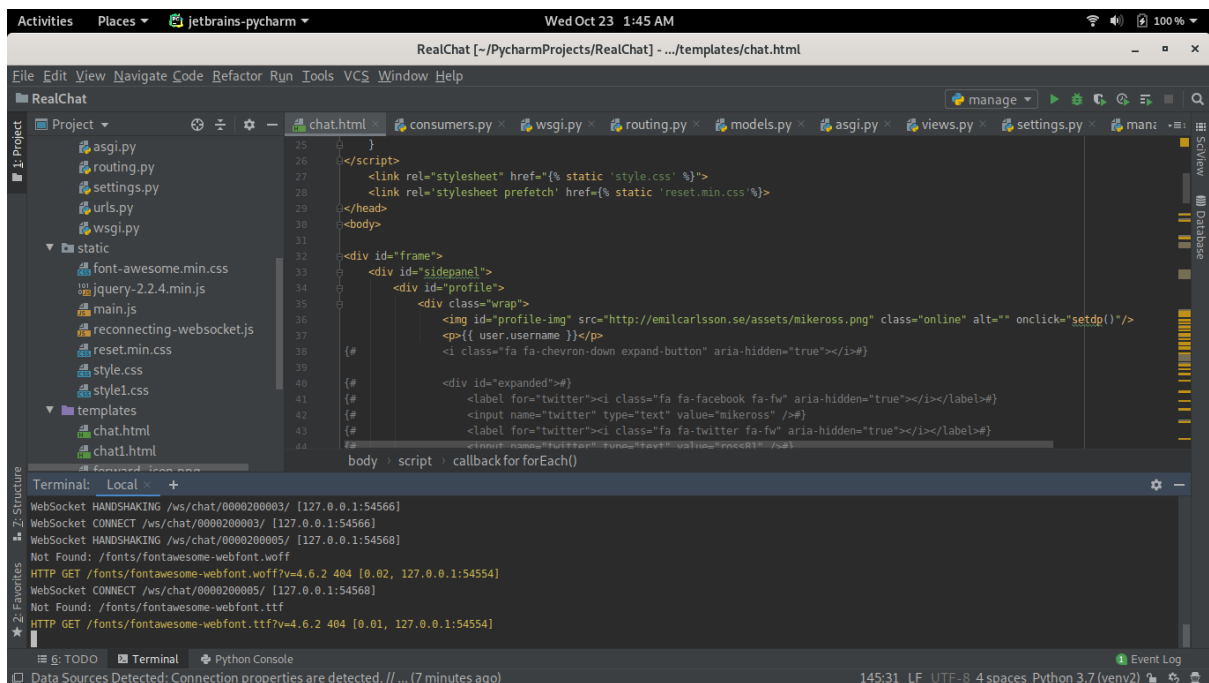
5.1.4 ACCEPTANCE TESTING

A level of the software testing process where a system is tested for acceptability. The purpose of this test is to evaluate the system's compliance with the business requirements and assess whether it is acceptable for delivery.

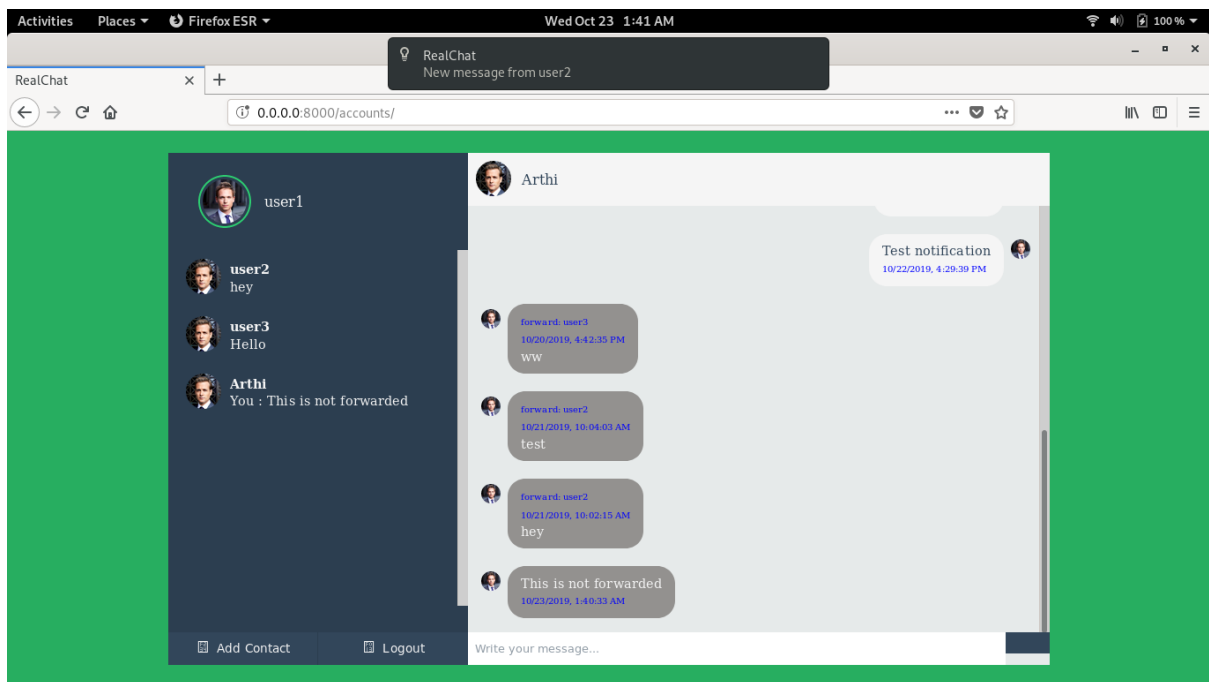
5.2 TESTING FORWARDED MESSAGES



5.3 DEBUG MODE IN CONSOLE



5.4 TESTING POPUP NOTIFICATION



CHAPTER 6

CONCLUSION

RealChat is a chat application that mainly focus to make chats real. It prevent hoax and scam messages. It shows timestamp of message when it was created and owner of message. Forwarded messages are not stored in database, so that it cannot be forwarded for long period. RealChat is so fast as it uses its database efficiently and uses websockets with high speed cache database server redis(Remote Dictionary Server). It is highly secured and easily upgradable. It doesn't need additional software to be installed and can run on any device that have JavaScript enabled web browsers.

CHAPTER 7

FUTURE SCOPE

RealChat can be upgraded to add group chats, channels, voice and video calls. Blood donating system can be implemented to send automatic forwards of blood donating requests for donors. School, College and organization groups can be included and grouped with help of organization mail id. Advanced spam filter and automatic duplicate message finding techniques can be implemented to enhance chat experience.

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WEBSITE REFERENCE

- 1) <https://docs.djangoproject.com>
- 2) <https://channels.readthedocs.io>
- 3) <https://docs.python.org/3/>
- 4) <https://www.youtube.com/watch?v=OTmQOjSl0eg>
- 5) <https://www.youtube.com/watch?v=Wv5jlmJs2sU>
- 6) <https://asgi.readthedocs.io/en/latest/>
- 7) <https://mariadb.org/>
- 8) <https://redis.io/documentation>