



Exploring a Secured Socket Python Flask Framework in Real Time Communication System

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Authors' contributions

This work was carried out in collaboration between all authors. Authors UIU, USG and UNV designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors OAA, CKE, NJE, OCN and AK managed the analyses of the study. Author IUM managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Communication networks makes it easier to connect internationally in today's world. Chat systems, such as WhatsApp, Twitter, Instagram and others, enable people to connect and chat over the internet. This chat system has evolved into one of the most important intermediate tools for people to exchange information and materials over the internet, thereby requiring secured socket system. In a social cultural environment, communication with a given network goal system necessitates a stress-free method of knowledge delivery. Surfing websites like "My Room" and "Facebook" has become a common occurrence among the younger generation. Nowadays, social networking websites are an important part of people's social, educational, and professional lives. The aim of

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this study is to create a group communication framework that uses a protected socket browser interface. This architecture was created with a server scripting language, a SQLite database model, and Python web application frameworks in mind.

Keywords: Chat system; information system; community system; Intercrosses Communication (IPC).

1. INTRODUCTION

People with virtually identical goals, speculation [1], treat objections related to social affiliation as a significant social, scientific and professional element in today's times of indigenous peoples. The technique of speculating a new information measure [2] influences the quality and choice of structure of electronic media. A chat system is a type of correspondence that uses personal computer (PC) programs that constantly take into account two-way discussions between clients (events that actually happen on the network at the same speed as they actually do). The visit stage, which can be intranet or online, can be used to trade data, make requests etc. Participating in structured exchanges of comments, video, audio or multicasting with anyone via the PC network to what he says [3]. There is a need to guarantee the privacy of interchanges to speed up legal and uninterrupted sightseeing, free from fear of stealth and security interruptions. Advances that allow clients to persistently talk through worded messages are visiting workers and discussion clients. These out-of-the-ordinary employees license messages so that messages are received and posted quickly so that discussion clients can receive messages and view them in a window on client computers. Fortunately, most of the visiting customers are fairly sane shareware, and there are various chat staff that allow the customer to interact with them endlessly. Rather than meeting in the traditional report lobby, an online visit may be another option. While all members would be able to talk directly to each other, they would do so in the comfort of their own home, minus the cost and anxiety of traveling elsewhere. The purpose of this study is to create a neighborhood structure as an online medium that uses the product interface for communication. Part of the current framework is the typical manual technique of sharing data via phone calls, messages via email etc. Hijacking and sharing data via Simple Message System is truly the best tool for sharing data. The traditional technique was and works in the data exchange space using the web, attachment dividers etc. Contact with PCs is essential in the data exchange space using the web, attachment

dividers etc. The current framework, which is a standard PDA SMS, has problems, that are the cause of the inadequacy or the problem that sparked an investigation.

2. CONCEPTUAL FRAMEWORK

A neighborhood communication system is a comprehensive forum for information exchange between community members who share the same vision or goals. The structure acts as a centralized, distributed platform for the exchange of confidential information on standards and communication values. Here are some examples of contact platforms.

2.1 Instant Messaging

This message allows two people to write to each other. It has evolved rapidly in recent years and has some limitations such as continuous B messaging, voice calls, video viewing and motion recording. Today, the message is probably the standard organization on the Internet [4]. Talk Messenger is an interactive conversation used for communication in one direction or between two people at the same time, allowing clients to send messages to others via LAN connection, local connection or Bluetooth [5]. Logically and quickly via the Internet. A journey is a text, audio or video conversation. This application is used by Yahoo Messenger, Google Talk, Skype, etc [4].

2.2 Google API

APIs are written in code or application and inserted as an interface between the application or web link and its function. Some work has overcome the interoperability of clouds at the service level and shows how to use web services to connect for example the Google App Engine and Windows Azure, while some develop unified APIs to provide services using vendor resources with a cloud coating, cloud column [6]. Google APIs are modified software code that can be applied to web applications and used to receive/execute/use Google features. For example you can add [7] decoded by Google. Google API can be easily integrated with Google Code. Google offers a variety of APIs, including:

Handles Google Translate for API language misuse. JavaScript API; Maps API: Su now uses Google Maps' Momentum feature. Earth API: SuMiss uses the features of Google Earth. JavaScript API; Use Google Search in the search API. You can create charts and graphs using Google's visualization API. YouTube API: For example, if you are looking for YouTube recordings, you can use these features. Google AJAX API is an easy-to-use Google API for playgrounds. AJAX API Jungle Gym is a professional website that organizes various AJAX APIs based on Google's APIs (JavaScript and XML). You can access your JavaScript code through an AJAX-based application [8].

3. REVIEW OF RELATED LITERATURE

In a customer/worker model system, a client is the less-than-desirable recipient of assistance or the requestor of assistance. The customer is often located on another system or computer that can be accessed by an agency. This concept was first applied to devices that couldn't run their own projects and was later associated with remote PCs that could do so through an internet connection in organization. According to Low et al. [9], these were known as dumb terminals, and they were served by time-sharing centralized server PCs. The following are examples of current system writing audits:

According to Formolo and Bosse [10], another structure was created that captures emotions from human voice and, when combined with the environment of a particular situation, uses this to influence the inner state of the specialist and alter its behavior. In Gratch et al. [11] portray a framework, in light of psycholin-guistic hypothesis, intended to make a feeling of compatibility between a human speaker and virtual human audience.

As indicated by, [12] is an answer for transfer recordings progressively for texting and additionally video-talk applications created by an organization named Charamel. It furnishes constant 3D symbol delivering with direct video-transfer yield and programmed lip synchronization live through headset. It is broadly utilized for informing administrations, video creation, worker side video producing, email advertising, and intuitive advanced colleagues (IDA).

Parniak [13] proposed a Voodoo Chat, which is a book based talk program with voice visit

highlights made in the wake of Excite's Virtual Places conclusion because of the organization's insolvency following obtaining by the Home Network. Voodoo Chat utilizes two techniques for security. The first is encryption. The second is the utilization of framework hashes. It has the center point worker which arranges different workers, login worker which is a firewall and the talk worker that controls the visit interaction. The impediments of Voodoo incorporate that a client is limited to a specific PC: when a client's PC is enlisted, the client can't utilize another PC to talk, and if the PC is taken, there is a simple admittance to infiltrate into the worker.

As indicated by Gammon [14], Proposed a Mush customer Chat System and its Characteristics incorporate calling another player (having gotten the player's TCP/IP address, and what port to use for talking), getting calls from at least one different players, and approving approaching calls and tolerating or dismissing them. It empowers parting of clients into gatherings, permits talks with the gathering individuals, and empowers sending or accepting of records from different individuals. Its limits incorporate low security level: the chat system is prone to attack by penetration. MUSH client Chat System is a peer to peer chat system.

In Betabeat [15], States that Google Talk is a texting administration that gives both content and voice correspondence. Google Talk applications are accessible for Microsoft Windows (XP, Server 2003, Vista, and Windows 7), Android, Blackberry, and Google Chrome OS working frameworks. Since the Google Talk workers speak with customers utilizing an open convention, XMPP, the assistance can likewise be gotten to utilizing whatever other customer that upholds XMPP. The association between the Google Talk customer and the Google Talk worker is scrambled, aside from when utilizing Gmail's visit over HTTP, a united organization that doesn't uphold encryption, or when utilizing an intermediary like IMLogic. Start to finish messages are decoded. Some XMPP customers locally support encryption with Google Talk's workers Google Talk Beta, 2011; Google Talk Help, 2013). The innovation utilized inside the Google worker organization, in any case, isn't openly known. Its impediments incorporate being inclined to assault while talking over HTTP or IMLogic.

As indicated by Higginbotham [16], States that Skype is a product program that utilizes the web

to settle on phone decisions. It additionally offers video, talk, SMS and presence mindfulness across the board application. Except for logon workers, Skype has no focal worker to keep up the organization. All things considered, Skype utilizes distributed innovation to decentralize the organization and to help guarantee an exceptionally high uptime rate. When you sign in to Skype, your framework turns out to be important for the actual organization assisting with decentralizing the heap of steering calls. Skype has an encryption framework for security. This framework can't be turned on or off. Skype gives an uncontrolled enrollment framework to clients. Individuals can utilize the framework securely without uncovering their genuine character to different clients of the framework, however its absolutely impossible to realize that the individual they speak with is the one they say they are. By utilizing VoIP to settle on the decisions, it is modest to call another telephone. It doesn't cost cash to call another Skype client. Each Skype client has an interesting username which different clients can use to chat with them (Wikipedia Skype, 2013). One of Skype impediments is absence of protection (Skype has the keys to unscramble calls or meetings). Skype likewise makes it difficult to implement a (corporate) security strategy. What's more, there are bugs and postponements in the Linux form.

As per Yadav [17], States that Facebook is the second biggest interpersonal organization on the web, behind just MySpace as far as traffic Facebook tends to impart client data to outsiders, incorporating organizations with which they have a relationship. Thus, protection isn't completely guaranteed. Facebook likewise gathers data about clients from different sources, for example, papers and texting administrations. This data is assembled paying little heed to utilization of the site.

4. THEORETICAL BACKGROUND

Chat with client and server is minimal effort, little force, uses Wi-Fi and advancement in the area of interest planned to replace the linkages between handheld phones, PDAs and other compact gadgets. It can impressively organize your work area by creating wires between your workstation, mouse, PC with many different gadgets [18]. The web visit application is an attachment to the text correspondence. A client of a client registers to become a registered client of the assembly. When a customer is not included in the dataset,

a person cannot proceed to the stage to visit other approved people. The term " chat room " or " visiting room " is basically used to describe any type of coordinated conference, periodically even atypical. The term could therefore cover any innovation that goes from constant internet chats and online connections with outsiders (eg online meetings) to fully vivid graphical social conditions. Developing applications for discussion with familiar web application stacks such as Python Flask has usually been extremely difficult. It includes reviewing a specialist for changes, watching for time stamps, and is a ton slower than it should be. Connections were usually a game plan around which the most advanced visit systems were designed, providing a two-way channel of correspondence between client and specialist. This means that a specialist can send messages to clients. Every time you send a message for a visit, you think the worker will get it and pass it on to all other clients related to the visit. Client / server registration is a computing model in which client and specialist computers communicate with each other as an association [19]. In the case of customer / specialist service, the worker accepts requests from client computers and offers his resources, applications or possibly data in each case with one client computer in the association and the client is the recording device that starts contacting the specialist to use the shared resource. From the important customer / specialist enrollment model introduced at Xerox PARC in the 1970s to the present-day particularly advanced customer association preparer, our customer / employee glossary offers a glossary of key terms to know [20]. The client is not very attractive to provide help or request help in the case of a client / specialist structure. The client is consistently distributed over a different structure or computer that can be accessed through association. The term was first used to refer to devices that could not perform their own tasks and were associated with removed PCs that could run by association. These were called nudist terminals and were operated by unified time-sharing job computers. The client may be the necessary application or the entire system that is delivered to the organization by a specialist. The client can connect with the specialist through various strategies such as territorial connections, named connections, shared memory or internet programs, which are the most notable system used since the widespread use of the internet. Clients are divided into three types of clients: thin, thick / thick and hybrid.

A client is a computer or a program that, as part of its operation, relies on sending a request to another program or a computer hardware or software that accesses a service made available by a server (which may or may not be located on another computer). For example, web browsers are clients that connect to web servers and retrieve web pages for display. Email clients retrieve email from mail servers. Online chat uses a variety of clients, which vary depending on the chat protocol being used. Multiplayer video games or online video games may run as a client on each computer. The term "client" may also be applied to computers or devices that run the client software or users that use the client software [17].

With our new service you will get an access to the intelligent server that is located in our office [21]. Workers will do their computing on a virtual desktop residing on the central server, and they will be able to access the server from any electronic device: PC, laptop, playbook, tablet, PDA and much more. You don't need to have powerful connection to work efficiently [22]. A simple application will allow your employees to connect to the main server, use and edit the data.

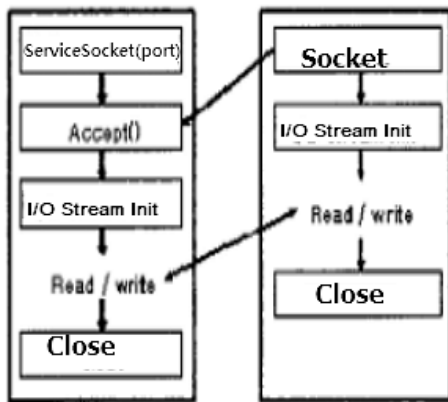
An understanding of how the Bluetooth radio works is importance [23]. The Bluetooth radio is a lowest layer of Bluetooth communication. The Industrial, Scientific and Medical (ISM) band at 2.4 GHz is used for radio communication 02.11b/g and microwave oven may cause interference in this band. The Bluetooth radio utilizes a signaling technique called Frequency Hopping Spread Spectrum (FHSS). The radio band is divided into 79 sub-channels. The Bluetooth radio uses one of these frequency hops per second. Frequency hopping is used to reduce interference caused by nearby Bluetooth devices and other devices that using the same frequency band. n. Several technologies used this band as well. For example Wi-Fi technologies like IEEE 8 channels at a given time according to Zachary [18].

5. COMMUNICATION FRAMEWORKS

5.1 Client/Server Communication

At a basic level, network-based systems consist of a server, client, and a media for communication as shown a computer running a program that makes a request for services is called client machine [22,24]. A computer running a program that offers requested services from one or more clients is called server machine. The media for communication can be wired or wireless network.

Generally, programs running on client machines make requests to a program (often called as server program) running on a server machine. They involve networking services provided by the transport layer, which is part of the Internet software stack, often called TCP/IP (Transport Control Protocol/Internet Protocol) stack Fig. 4. The transport layer comprises two types of protocols, TCP (Transport Control Protocol) and UDP (User Datagram Protocol) [24]. The most widely used programming interfaces for these protocols are sockets. TCP is a connection-oriented protocol that provides a reliable flow of data between two computers. HTTP, FTP, and Telnet are examples of applications that use such services. UDP is a protocol for sending datagrams, or separate packets of data, from one device to another with no assurances regarding delivery or sequencing. Clock server and Ping are two examples of applications that use such facilities. The TCP and UDP protocols use ports to map incoming data to a specific computer process. A positive (16-bit) integer value represents the port. Some ports have been



CONNECTION TO A SERVER AND A CLIENT USING SOCKET

Fig. 1. Client/Server Chat [20]

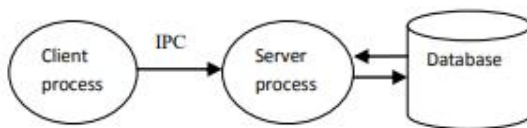


Fig. 2. Client Server Communication [22]

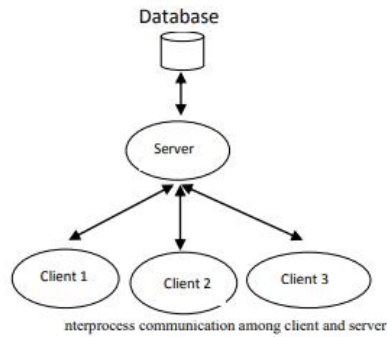


Fig. 3. Client / Server Communication [22]

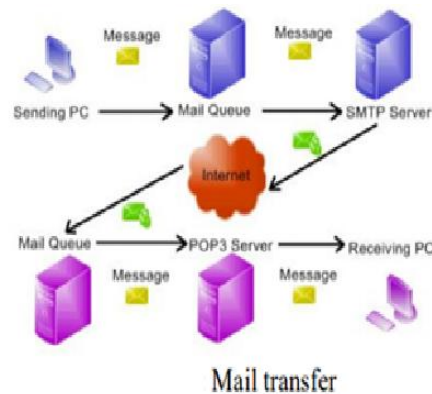


Fig. 4. Mail transfer protocol [22]

set aside to support well-known/common services. login 513/tcp, ftp 21/tcp, telnet 23/tcp, smtp 25/tcp, ftp 21/tcp http 80/tcp,udp, https 443/tcp,udp, http 80/tcp,udp, http 80/tcp,udp, http 80/tcp,udp, http 80/t, User-level process/services generally use port number value ≥ 1024 [25].

5.2 Hosts Identification and Service Ports

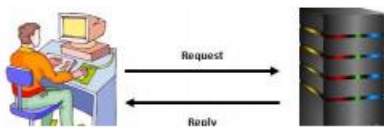
An IP address is a four-byte number that distinguishes every gadget on the Internet. This is generally composed as 128.250.25.158 in dabbed quad design, with every byte addressing an unsigned worth somewhere in the range of 0 and 255. This portrayal is clearly not easy to use since it gives little data about the substance and is thusly hard to review. Thus, IP delivers are planned to simpler to-recall names, for example, www.buyya.com or www.google.com. Name workers on the Internet convert these names to IP addresses. By and large, each machine has just a single Internet address. For instance, there might be numerous ftp meetings, web associations, and visit programs all running simultaneously. To recognize these administrations, an idea of port s, a legitimate

passage, addressed by a 16-cycle number is utilized. That implies, each assistance offered by a PC is extraordinarily recognized by a port number. Every Internet bundle contains both the objective host address and the port number on that host to which the message/demand must be conveyed. The host PC dispatches the parcels it gets to programs by taking a gander at the port numbers determined inside the bundles. That is, IP address can be considered as a house address when a letter is sent through post/snail mail and port number as the name of a particular individual to whom the letter must be conveyed.

5.3 Sockets and Socket-based Communication

At the transport layer, sockets provide an interface for programming networks. Using Sockets to communicate over a network is somewhat similar to performing file I/O. Socket handles are handled similarly to file handles. Streams that are used in file I/O can also be used in socket-based I/O. The programming language used to implement socket-based communication is unimportant [26]. That means,

a socket program written in Java language can communicate to a program written in non-Java (say C or C++) socket program. A server (program) runs on a specific computer and has a socket that is bound to a specific port. The server listens to the socket for a client to make a connection requested. If everything goes well, the server accepts the connection. Upon acceptance, the server gets a new socket bound to a different port. It needs a new socket (consequently a different port number) so that it can continue to listen to the original socket for connection requests while serving the connected client [26].

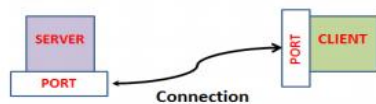


Client Server Communication

Fig. 5. Establishment of path for 2-way communication between client and server [26]

5.4 Tcp/Ip Socket Programming

The following are two main classes from the java.net package that are used in the development of server and client programs: Client Socket, Server Socket A server software generates a particular type of socket (server socket) to listen for client requests. When a communication request is received, the program creates a new socket to exchange data with the client using input and output streams. The socket abstraction is similar to the file abstraction in that it requires developers to open a socket, perform I/O, and then close it. The main steps in developing socket-based server and client programs are depicted in Fig. 6.



Established connections with the use of temporary ports assigned

Fig. 6. Socket based client and server [26]

The Online stage support for the wifi/area of interest network stack. It permits a gadget to remotely trade information with other Bluetooth gadgets. The new essentialness to the portable space has infused due to the arrival of Android shrewd stage. Android is a working framework

dependent on Linux portion. It is intended for the touch screen cell phones. The UI of Android depends on direct control [27]. The Android framework gives numerous Bluetooth APIs to designers to call. Bluetooth innovation permits clients to trade voice and information transmission between at least two gadgets. It is essentially a remote correspondence innovation. Wifi/Area of interest innovation is reflected in the low value, simple to control and non-visual Distance constraints. Bluetooth is incorporated into the android stage as an android portable organization correspondence module. BlueZ is utilized to interface the Android telephones into a neighborhood. It assists with speaking with one another. Bluetooth needn't bother with a permit all throughout the planet for the functioning recurrence band. In the association introduction stage, first and foremost, it begins the application and searches the Bluetooth gadgets. Second, it conveys the messages to the worker class. After this it can run, respite and stop the application. Third, it shows ready utilizing set Alarm work on each evolving. Worker goes dynamic and conveys the messages to different gadgets. Customer class attempts to react the other Bluetooth gadget worker. This permits a two-route visit over Bluetooth. No GSM or Wi-Fi association required. Notwithstanding the individual to-individual talk, visit rooms can be utilized to assemble multiple people all at once [28].

5.5 Writing Review Summary

The analysis of the work involved a lot of texts, and the end is that other pieces of text keep the data dissipating, for example, text sharing via electronic gadgets and phones. This gadget connects via Bluetooth and sends and receives instant messages. Exploration is an observational task that has been arranged and familiarized with addressing problems in the electronic speaking stage using the Python Cup structure. SQLite is the information database model that was used during execution. It is an extremely lightweight information base model that accompanies a package that comes with a program. The advantages of the proposed system are as follows:

- Ease of messaging
- Continuous sharing and dissemination of data
- Customers create documentation and gain access to the visit list.

6. OUR PROPOSED DESIGN

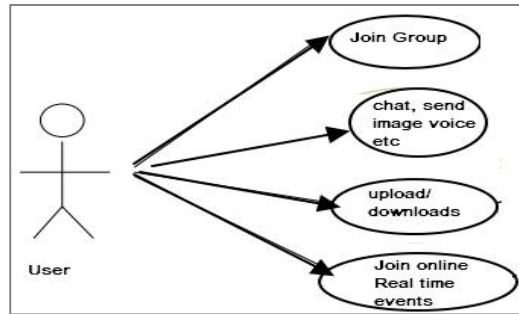
The blueprint of the system design explains the entire value and operability of the specific situation. The structure was arranged and done using the Python framework with some other progression language like bootstrap 4 for frontend. These applications after plan are taken a stab at using a twofold focus or greater gear structure. This application contain three huge modules: the utilitarian development of the modules are coupled together to for neighborhood application specialist and client through connection accessibility. The people make account through register associate, and approach the nearby assembling for information. The login module is used for approach the application neighborhood i.e. the nearby assembling board. The logout associate is used for sign-out of the visit bundle. The advancement for information correspondence measure is the online pass on connection divider correspondence development. The system interfaces with a couple of device like the adaptable, PC and iPad, etc.

6.1 Proposed Use Case Diagram

The use case diagram describe the activities of the new system in a web based platform. The actors are the community users. The activities explain users with common opinion in terms of business and work. It is an interaction between

actors, trying to make the system functional. A direction of flow between the operators and the designed system.

The users' Use case below in Fig. 7 is showing the tasks performed by the user which are: logically stated in the diagram.



User Use Case

Fig. 7. User use case diagram

The Use case Fig. 8 is showing the errands performed by the administrator which are consistently expressed in the outline.

6.2 Architectural Design

The map below shows how the system will be designed. Fig. 9 illustrates the shell view of the system.

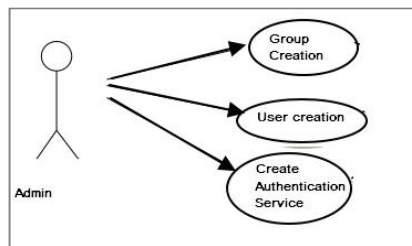


Fig. 8. Admin use case diagram

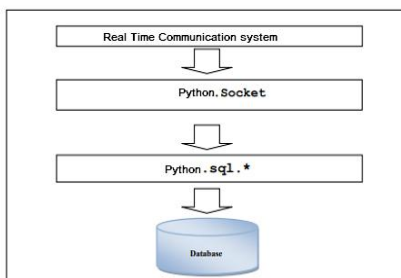


Fig. 9. Architectural design


```

from flask import (Flask, g, render_template, flash, redirect, url_for, abort)
from flask_bcrypt import check_password_hash
from flask_login import (LoginManager, login_user, logout_user,
                        login_required, current_user)

import forms
import models

DEBUG = True
PORT = 8000
HOST = '0.0.0.0'
app = Flask(__name__)
app.secret_key = 'asdnafnj#46sjsnvd(*$43sfjkdjvnskb6441531@#$6sddf'
"""here secret_key is a random string of alphanumerics"""
login_manager = LoginManager()
login_manager.init_app(app)
login_manager.login_view = 'login'
@login_manager.user_loader
def load_user(userid):
    try:
        return models.User.get(models.User.id == userid)
    except models.DoesNotExist:
        return None

@app.before_request
def before_request():
    """Connect to database before each request
    g is a global object, passed around all time in flask, used to setup things which
    we want to have available everywhere.
    """
    g.db = models.DATABASE
    g.db.connect()
    g.user = current_user

```

7. RESULT AND DISCUSSION

The system was designed and implemented using the Python framework with some other development language like bootstrap 4 for frontend. These applications after compilation are tested using a dual core or more hardware system and Linux and any Windows Operating System. This application consist of three major modules: the functional activity of the modules are coupled together to for community information chat application server and client through socket connectivity. The user create account via register link, and have access to the chat group for information exchange. The login module is used for have access to the application community chat dashboard. The logout link is used for sign-out of the chat group community. This paper focus on development of real-time chatting android application for data exchange (Text) in a real-time process. The real-time chatting application require user to register on the platform and login module allow user to have access to the chat group. Once a user the is registered, the user can chat (send and receive message). The applications execute on a browser and made visible on different user system when ran on this host ip 0.0.0.0 and any port. This community Information in a network is one of the most important tasks in network

analysis. The user's login after a proper account has been created, to the dashboard. In a large

scale network, such as an online social network like twitter, Facebook etc, sample text with a millions of nodes and edges. Information communities in such networks becomes a herculean task. Find below few script of the python framework.

8. CONCLUSION

The framework is fit to be utilized by any gadget accessible with empowered Bluetooth innovation and the android Bluetooth visit application. It runs under an android working framework stage as the host motor or machine. The can be useful with a lower controlled cell phone at a restricted distance. This framework is likewise operational with low force utilization at a restricted far off. This work investigates an electronic application intended to give clients data progressively. The informing stage is a framework that data are traded in bunch design. The miniature structure utilized is python flask, which was utilized to plan and execute of the call machine. The application runs on an internet browser.

This framework is prescribed to be utilized by any group attempting to accomplish intranet, safe and cheaper correspondence stage.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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