Bluetooth Chat Room

Ishupreet Kaur[1], Aashna Anith Kumar[2], Rajath M Baliga[3]
[1](SCOPE, Vellore Institute of Technology, Tamil Nadu
Email: ishupreet.kaur2015@vit.ac.in)
[2] (SCOPE, Vellore Institute of Technology, Tamil Nadu
Email: aashna.anithkumar2015@vit.ac.in)
[3] (SCOPE, Vellore Institute of Technology, Tamil Nadu
Email: rajathm.baliga2015@vit.ac.in)

ABSTRACT

Bluetooth is a wireless technology that is in every mobile phone for exchanging data over small distances. The information sent between the devices can be a text file or media file. Bluetooth gives us a low power and low cost wireless connection in mobile phones and other electronic devices, which is used by a lot of people around the world for implementing short range communication. Bluetooth is inn most of the androids which is a mainstream in smartphones and it is the latest technology which gives open sourcing and good application. There are a lot of messenger apps that are being used nowadays, for example, WhatsApp, hangouts but all these apps need Wi-Fi or mobile data which is not always available. Therefore, we have designed a chatting app that gives a connection between smartphones using Bluetooth.

Keywords *– Android, Bluetooth, Chatting, Wireless Communication*

1. Introduction

In recent times with the development of mobile technology especially after the release of android, it has become a new vitality to mobile space. Android platform has an operating system, user interface and application software. Bluetooth is a wireless technology which is most of the android phones. The advantage of Bluetooth is that it's easy to use and easy to control. Bluetooth is an important feature of the smart phone. When an android is connected to Bluetooth it can wirelessly exchange data with other Bluetooth devices. Bluetooth devices allow people to exchange data and voice between two or more devices and are a wireless communication technology.

The purpose of the chatroom through Bluetooth is to connect phones into local area network and can communicate with each other at no cost. The Bluetooth Chat App does not need any sort of Wi-Fi connection, all it needs is two Bluetooth compatible Android devices in range of about 50 feet of each other. Through the Bluetooth module, android phones are divided into client and server side and then the real time chat between people can be done. The proposed app has some advantages over existing chatting apps. It works as a client and a server at the same time speaking from a network and perspective view. The app is easy to use. It can also send smiley emoticons and exchanges files and allows more than two users to chat with each other.

2. Proposed Method

The Android working framework is an open source and free stage; it isn't bound to one equipment supplier or producer. This receptiveness of Android is permitting a snappy pick up of the piece of the pie. For an Android gadget to be certified as perfect; it needs to take after certain equipment rules including however not constrained to a compass, a Global Positioning System (GPS) quality, a camera and a Bluetooth handset which is required for the Blue Chat application. [3]

The Android stage support for the Bluetooth organizes stack. It enables a gadget to remotely trade information with other Bluetooth gadgets. Android is a working framework in view of Linux piece. It is intended for the touch screen cell phones. The UI of Android depends on coordinate control. The Android framework gives numerous Bluetooth APIs to designers to call. Bluetooth innovation enables clients to trade voice and information transmission between at least two gadgets. It is essentially a remote correspondence innovation. Bluetooth is a remote innovation standard for trading information over short separations. This minimal effort transmission innovation for the handheld gadgets and different electronic items. [2]

The fundamental reason for this undertaking is to convey a valuable Bluetooth visiting application that objectives the boundless Android working framework-controlled gadgets. The most imperative element to be fulfilled is that application should share or trade instant messages among the Blue talk application clients and to present or offer this component in an engaging method to pull android's client's resemblance to the application through utilizing the profile highlight for each client demonstrating his/her own data. Including that, the application ought to be good with various Android working framework-controlled gadgets that come in a wide range of shapes, sizes and abilities. [3]

The present talk application can later be improved for a multilingual visit which helps to impart two diverse dialect individuals. We are likewise expanding the scope of the Bluetooth which helps in lessening one of the weaknesses of Bluetooth. We can likewise actualize information move module in our application. [5]

Frequency Hopping is a strategy which is utilized by Bluetooth to keep away from obstruction among the signs. Bluetooth works in the open unlicensed range and consequently isn't shielded from obstruction from different signs like Wi-Fi and other radio signs. The Bluetooth recurrence range shifts from 2400 MHz to 2483.5 MHz This recurrence go has been separated into 79 different channels and the parcels being transmitted bounces among these channels (changes channels) so obstruction is less on the off chance that that recurrence is being utilized by some other innovation flag. Bluetooth bounces around 1500 times each second in this manner loaning efficiency in transmission [4]

3. The process of Bluetooth Chat Application

It first checks whether the Bluetooth of the gadgets is in ON/OFF mode. ii. On the off chance that the Bluetooth of the gadgets is in OFF mode then it makes the demand to empower the Bluetooth. iii. Perform examining of the gadgets which are in their range. iv. Show the rundown of the considerable number of gadgets in the range. v. Select the gadget with which one needs to do the visit. vi. On the off chance that the gadget interfaces at that point set up the talk. [2]

3.1 User interface

3.2 Asking for Connection: This UI is on the customer side that sends a demand to the next gadget (server) for setting up a visit session.

3.3 Correspondence: This is basic to both the customer and the server. This is the place both the gadgets visit and trade data.

3.4 Disabling Session: Any of the two devices can ask to terminate the session.

3.5 Sync: The messages sent between the two devices can be stored as well as the previous history of messages can be synced from the device itself.

It gives classes that oversee Bluetooth usefulness, for example, checking for gadgets, associating with gadgets and overseeing information exchange between gadgets. [2]

3.6 The Bluetooth APIs let applications:

Output for other Bluetooth gadgets (counting BLE [BT Low Energy] gadgets). Inquiry the neighborhood Bluetooth connector for combined

Bluetooth gadgets. iii. Buildup RFCOMM channels/attachments. iv. Interface with indicated attachments on different gadgets. v. Exchange information to and from different gadgets. vi. Speak with BLE gadgets, for example, nearness sensors, heart rate screens, wellness gadgets, et cetera.

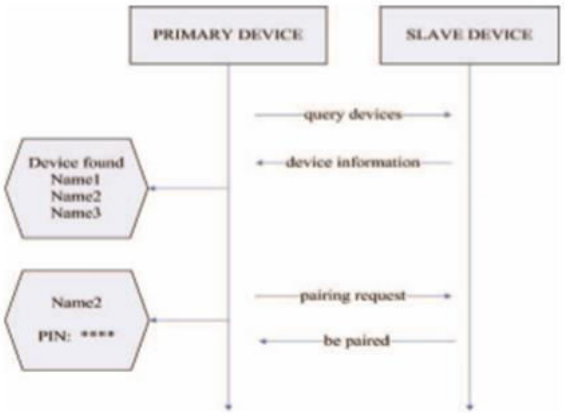


Fig. 1

4. Assumptions and Dependencies

The android working framework is the working arrangement of the gadget which the Blue Chat application would be introduced in. An Internet association is required keeping in mind the end goal to stack additional usefulness. The android working framework needs to have a worked in Bluetooth connector keeping in mind the end goal to interface with other Blue Chat application clients and trade instant messages and files. [3]

5. Constraints

The application ought to be introduced on more than one gadget keeping in mind the end goal to work or capacity with each other.

The android working framework must be within the scope of Bluetooth connector of the gadget with a specific end goal to filter, find, trade or send instant messages or files.

The android working framework needs to empower Bluetooth connector (turn it on) to begin the application.

The android working needs to empower Bluetooth connector to be discoverable to be noticeable by other application's clients. [3]

6. Architecture

Bluetooth is a wireless technology standard for exchanging data over short distances. This low-cost transmission technology for the handheld devices and various electronic products. Bluetooth is like any other communication protocol that you use every day, such as HTTP, FTP, SMTP or IMTP. Bluetooth has clients-server architecture; the one that initiates the connection is the client, and the one who receives the connection is the serve

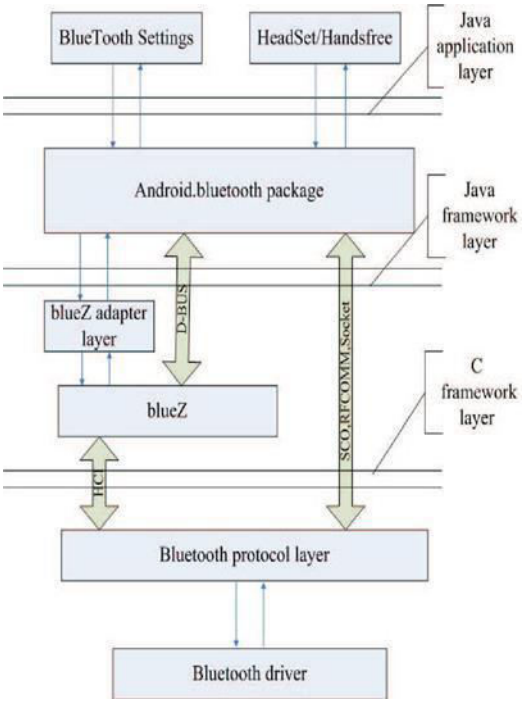


Fig. 2

7. The Overall Design of a Bluetooth Chatroom

Bluetooth communication, between two devices, is set with the help of a server and a client module. In this application, the main menu will have two option host and join. When one of the users hosts a connection then the other device just joins with that devices. The devices which host Bluetooth connection should create a chat room

and the other device can easily join that chatroom. Here the one who hosts connection and creates a chat room is the server and the devices which try to join the chat room is the client.

A client connected to the server and receives message txt from the server, also send message text to the server. The server also able to send and receive text messages.

In this application, we have 5 modules and each of the modules depends on each other as all these create an app:

1. HOST MODULE: This is the module for the person who wishes to host Bluetooth chatroom and connect to the other visible Bluetooth devices.

2. CLIENT MODULE: This module is a search for any chatroom and tries to get connected to it to send and receive messages.

3. CHATBOX MODULE: In this module, all the text which is to be shared is kept. Both ways of communication between two devices are executed in this module. This module is of great importance.

4. MAIN ACTIVITY MODULE: In this module, the user can decide whether to host a chatroom or to join any chatroom.

5. USER MODULE: This module contains all the accounts and login system for both the senders and the receivers.

The Android platform support for the Bluetooth network stack. It allows a device to wirelessly exchange data with other Bluetooth devices. The new vitality to the mobile space has injected because of the release of Android smart platform. Android is an operating system based on Linux kernel. It is designed for the touch screen mobile devices. The user interface of Android is based on direct manipulation. The Android system provides many Bluetooth APIs for developers to call. Bluetooth technology allows users to exchange voice and data transmission between two or more devices. It is basically a wireless communication technology. Bluetooth technology is reflected in the low price, easy to control and non-visual distance limitations. Bluetooth is integrated into the android platform as an android mobile network communication module. The chat room is used to connect the Android phones to a local area network. It helps to communicate with each other. Bluetooth does not need a license around the globe for the working frequency band. In the connection initialization phase, firstly, it starts the application and searches the Bluetooth devices. Second, it sends the signals to the server class. After this, it can run, pause and stop the application. Third, it shows alert using set Alert function on every changing. Server goes active and sends the signals to other devices. Client class works to respond the other Bluetooth device server. This allows a two-way chat over Bluetooth. No GSM or Wi-Fi connection required. In addition to the person-to-person chat, chatrooms can be used to gather more than two persons at a time.II.

Bluetooth is a wireless technology standard for exchanging data over short distances. This low-cost transmission technology for the handheld devices and various electronic products.

Fig. 3

8. Outgoing connection(Client)

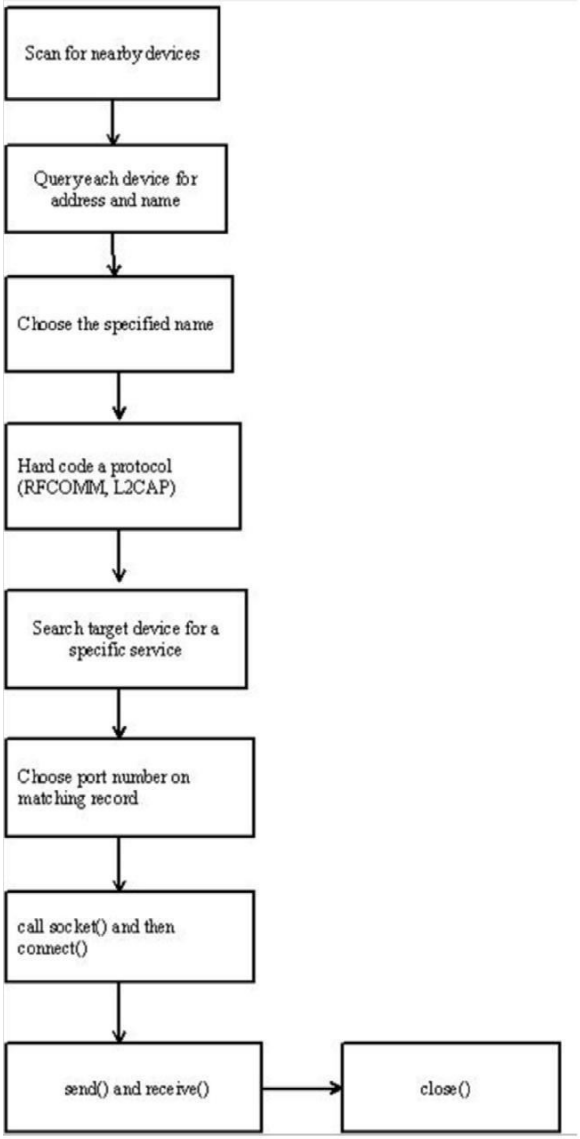


Fig. 4

9. Incoming connection (Server)

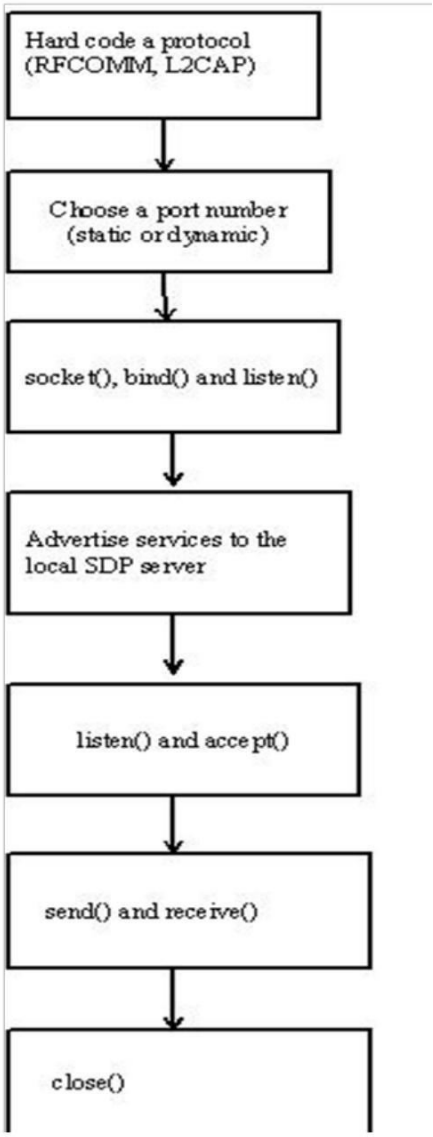


Fig. 5

10. Bluetooth programming in Android Environment

Classes Interfaces required:

1. Bluetooth Adapter: Represents the local Bluetooth adapter (Bluetooth radio)

2. Bluetooth Device: Represents a remote Bluetooth device. Use this to re-quest a connection with a remote device through a Bluetooth Socket or query information about the device such as its name, address, class, and bonding state.

3. Bluetooth Socket: Represents the interface for a Bluetooth socket (like a TCP Socket).

4. BluetoothServerSocket: Represents an open server socket that listens for incoming requests (like a TCP Server Socket)

5. Bluetooth Class: The general characteristics and capabilities of a Blue-tooth device are described in this class.

11. Server-Side Architecture

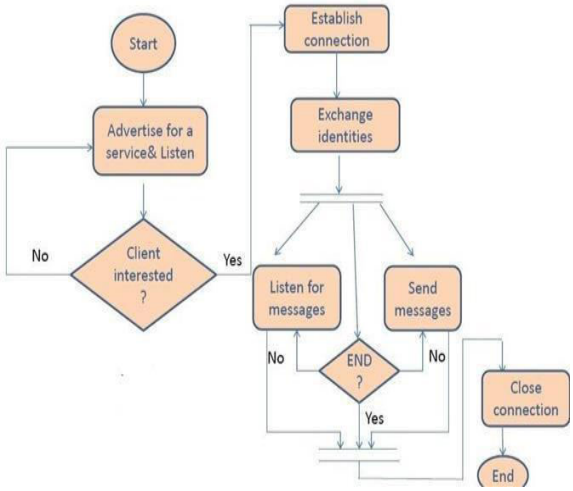


Fig. 6

12. Client Flowchart

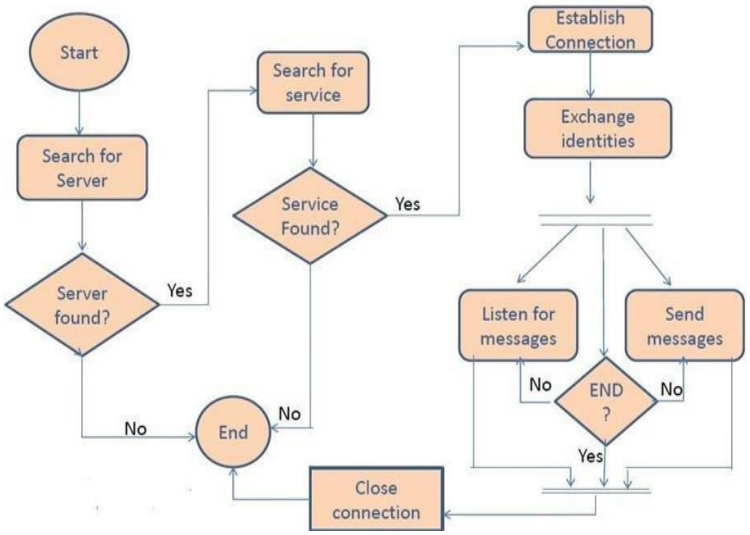


Fig. 7

13. Working Model of Single Server-Multiple Client Application

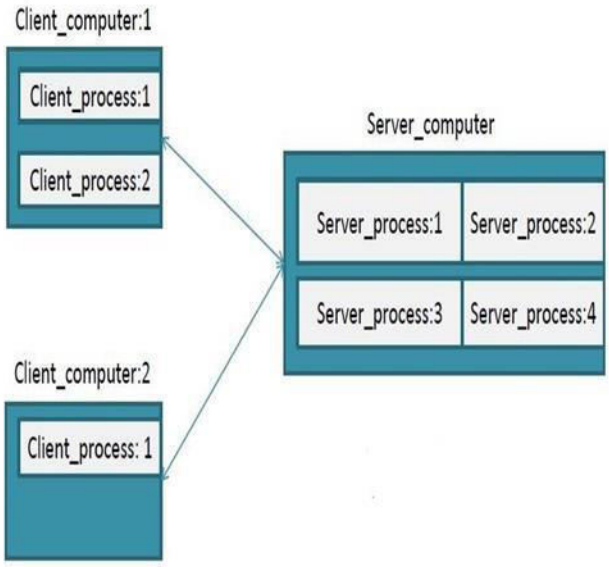


Fig. 8

14. Implementation and Results

14.1 User interface:

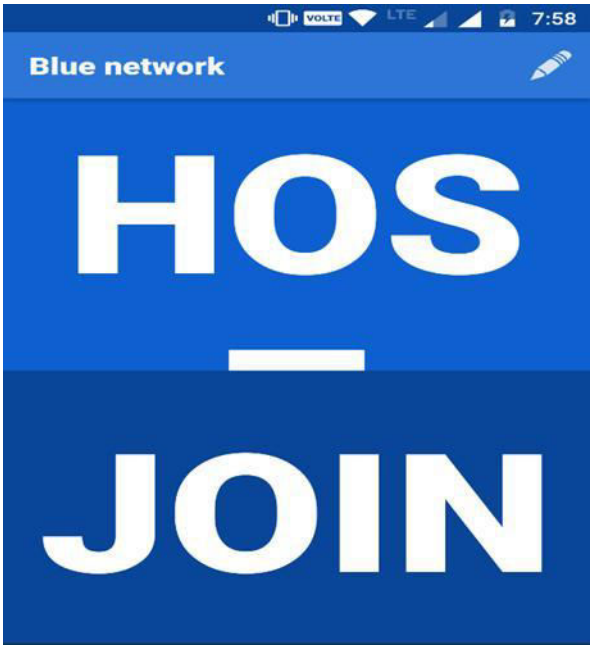


Fig. 9

14.2 Host and creating a chat room:

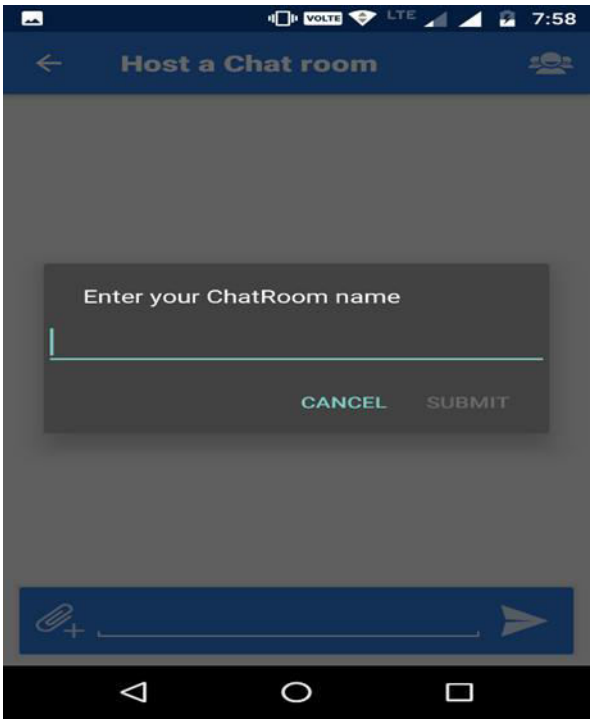


Fig. 10

14.3 Chat connection is set:

14.3.1 Server side:

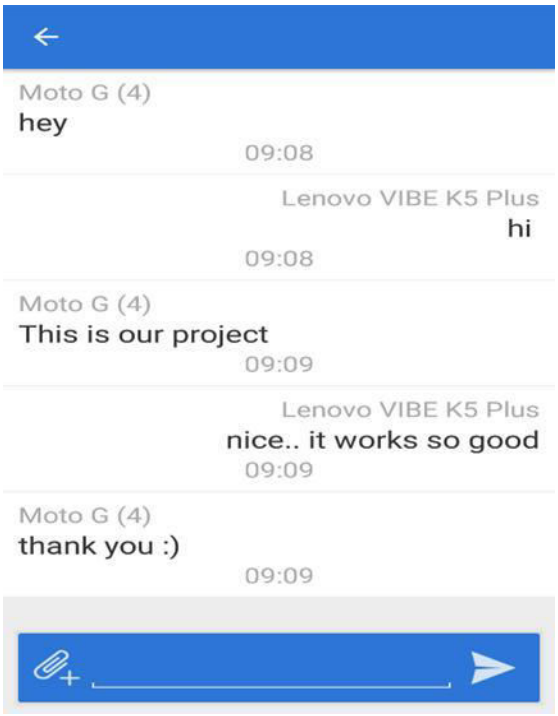


Fig.11

14.3.2 Client side:

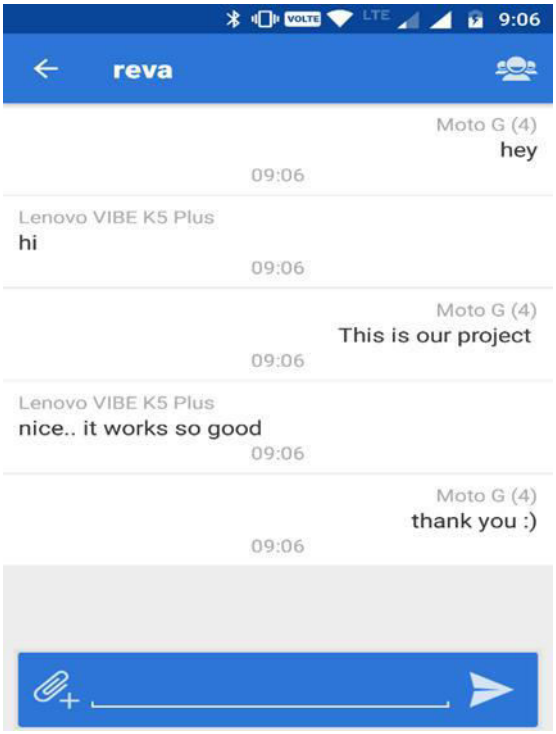


Fig. 12

14.4 Attachment of files:

14.4.1 Server side:

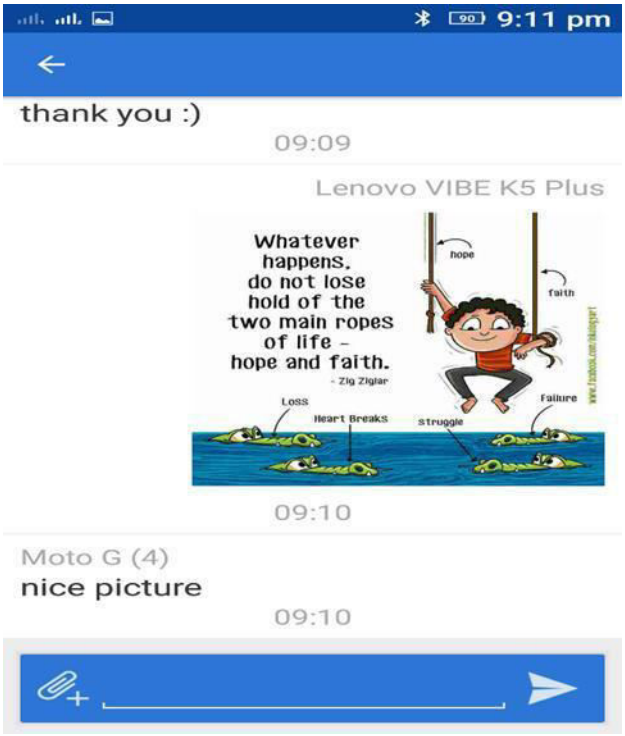
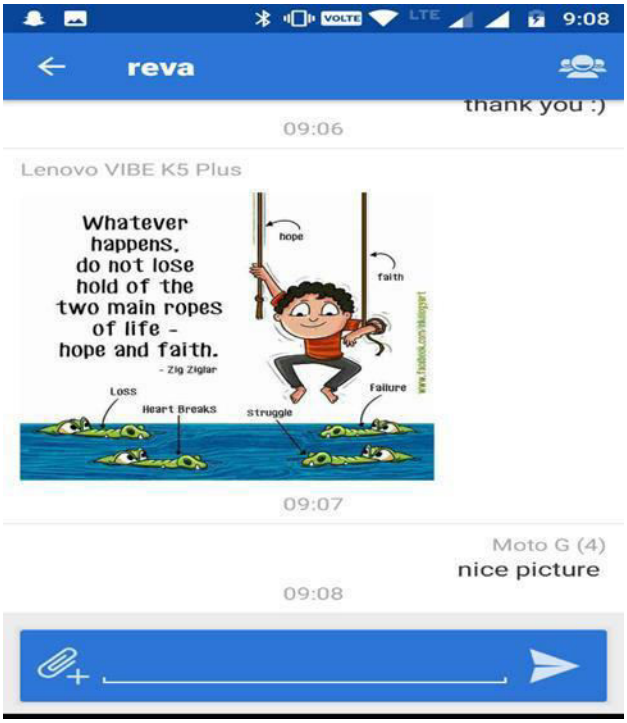


Fig. 13

14.4.2 Client side:



Fig, 14

Bluetooth chat is very convenient and efficient as it consumes less power and will be very helpful in certain circumstances where there is no internet connection, its advantages and limitations are as follows:

Low-power & low-cost wireless connection. Open standard short-range wireless communication. Bluetooth offers higher level service profiles, such as FTP-like file servers, voice transport, and more. An innovative approach to the mobile world. No GSM or Wi-Fi connection required. Bluetooth does not need a license around the globe for the working frequency band. Low cost transmission technology for the handheld devices.

But Bluetooth chat does have some disadvantages of its own such as Strangers can communicate with others using Bluetooth devices. Someone might send some unwanted spam message, unauthenticated messages may reach the user, long distance communication is not possible. But to prevent all these disadvantages the app could be made more secure by adding security for connecting with new devices.

13. Conclusion

The Bluetooth Chat application can be utilized anyplace and at whatever point between the PC and cell phone like classrooms, conferences et cetera. The application gives fitting warning at whatever point a Bluetooth revelation, fizzled association, message entries et cetera. With this, the application gives proficient visiting office between two clients. The Bluetooth application enables two clients to impart to each other effectively in a short range.

References

[1] W. Pan, F. Luo, and L. Xu, "Research and design of chatting room system based on Android Bluetooth," 2012 2nd Int. Conf. Consum. Electron. Commun. Networks, CECNet 2012 - Proc., pp. 3390–3393, 2012.

[2] A. S. Bote, N. Ghare, P. K. Rahurkar, and M. Latkar, "Bluetooth Chat Application: Bluez," vol. 4, no. 3, pp. 10674–10679, 2015.

[3] C. Paper, "Interactive Collaborative Robotics," vol. 10459, no. December 2017, 2017.

[4] A. Banerjee, "A Bluetooth Messenger Application A Bluetooth Messenger," 2015.

[5] S. S. Sahu, A. R. Sonavane, D. Kumar, and M. Deshmukh, "Multilingual Bluetooth Chat," vol. 4, no. 2, pp. 6–8, 2016.

[6] M. P. Hingle and M. S. Giripunje, "Real Time Multiple Cross Platform Communication through Bluetooth," vol. 6, no. 2, pp. 710–714, 2015.

[7] N. Mahajan, G. Verma, G. Erale, S. Bonde, and D. Arya, "Design of Chatting Application Based on Android Bluetooth," vol. 3, no. 3, pp. 712–717,